D0 Trigger Status

- 7 MHz input rate
- Framework
- L1 4.2 ?s 5-10 kHz 256 terms 128 bits
- L2 100? s 128 bits
- L3 48+ ms 1000 Hz 48 nodes

Data

- 50 Hz
- Log

Brief status reports
Where will we be March 1st?
Detector/L1/L2 Components

- L1FW: Combined objects (e, ?, j)
- L1FW: towers, tracks, correlations
- L1LUM
- L1CAL
- L1FPS
- L1CTP
- L1Muon
- L1FPD
- L2Cal
- L2PS
- L2CFT
- L2STT
- Global L2
- LUM
- CAL
- FPS
- CFT/CPS
- SMT
- Muon
- FPD

Blazey NIU/FNAL
ADM, Jan 10, 01
Luminosity Monitor
March 1

Installation

- Cables Early Feb
- Electronics in preprod.
- Software Designed.
- And/or Terms April

Run I Fast Z

- Intended to serve as a temporary step until LM electronics is fully tested, calibrated, and commissioned
- Form analog sums of N/S LM signals
- Use constant fraction discriminator to generate N/S timing signals
- Use Run I FASTZ module to calculate vertex position
  \[ z_v = c \times (t_N - t_S) / 2 \]
- Use FASTZ module to select events with both N and S detectors having hits consistent with \(|z_v| < 100\)

Luminosity, Halo Counters

- Already done for TeV engineering run
- Used a FASTZ module with a PLD programmed differently
- ECL PLD's obsolete, could be a problem for open position

March L1 Luminosity: Minbias
L1 CTP/FPS/FPD
Analog Status

AFE 8MCM (CFTax), (Fermilab-D0)
- Have twelve prototypes.
- Not released for production, need to demonstrate full functionality & noise specs. Still need two weeks.
- Bare PCB 0/50 yield!
- Once board qualified, six weeks to stuff should arrive mid-March. Need at least two weeks to study. Earliest installation late March.

12MCM (FPS):
- Looking at mechanical prototypes to study space problems.
- Motherboard layout nearly done.
- Daughter layout 75%.
- No estimate.

Crates/Cables/PS on hand all installed next 3 wks.
Mixer(Fermilab-CD)
- A half super-sector expected in February (2 of 20 boards.)
- Full order in March
- Full Mixer April-May

Broadcasters/Collectors(Fermi-D0)
- All 120 Motherboards here.
- All 125 Transition modules here.
- 35 of 88 CTP single-wide daughter boards here. Remainder arriving.
- FPS double-wide daughter board pcbs here, parts mostly here, reconsidering largest FPGAs.

Crates/Cables/PS all installed next 3 wks.

Firmware
- AFE & Mixer complete
- DFE 50%
- Collector/Broadcaster 50%
- This could be close.
L1 CTP/FPS/FPD in March

? Analog
- Install 10 AFE8 prototypes 2/15.
- Populate outer layers of upward pointing sector. Need to coordinate overlap with minimal L1 Muon configuration
- Balance at FNAL by 3/15/01

? Digital
- One-half sector mixer available
- Full broadcaster/collector complement available.
- Useful commissioning exercise.
- Could trigger on hits, requires special firmware, not clear its worth it.

March L1 Tracking:
Installation and Commissioning
L1 CAL Component Status

? 10000 first stage adders (SUSB)
- One for each electromagnetic and hadronic tower
- Printed circuit boards just released. Full complement mid-February
- Require surface mounted resistors. Values determined imminently. Need today for delivery by March 1st.
- Will concentrate on CC

? 2500 Drivers (SUSB)
- 4 calorimeter, 1 trigger tower per driver
- Hybrid prototypes, 2 week turnaround, balance, six weeks.
- Also need resistor values
- Sufficient prototypes for 8-10 trigger towers

? 320 analog pick-offs (MSU)
- Now prototyped.
- Goal $-0.8 < ? < 0.8$ by March 1st.

? 40 quadrant circuit boards/firmware have been designed (MSU)

Blazey NIU/FNAL
ADM, Jan 10, 01
L1 Cal in March

? Tower Availability
- March 1\textsuperscript{st} 8-10 towers
- March 15\textsuperscript{th}-20\textsuperscript{th} CC
  - Towers over threshold
  - Global terms
- March 30\textsuperscript{th} Start EC
- April-May? Quadrants

? Detector/Trigger Commissioning.
- Beam data to time in calorimeter towers
- Calibrate L1 calorimeter trigger
- Turn to EC

March L1 Calorimeter:
Commission w/ handful of towers
Increasing capability through month
L1 MUON
Component Status

? Crate Manager
- Production version available & reading out
- Still verifying functions
- Professor KJ’s Grade: B

? Motherboard
- Production in assembly, at Az next week
- Should know in 2 weeks if ready for March, very similar to preprod
- Preproduction as backup.
- Grade: C

? Trigger Manager Flavor Board
- Production in assembly
- Should know in 2 weeks if ready for March
- Preproduction as backup
- Grade: B

? Scintillator Flavor Board
- Submit for fabrication next week
- Preproduction as backup
- Grade: C
L1 MUON
Component Status

? PDT Flavor Board
  - Assembly next week
  - Preproduction as backup
  - Grade: C

? Infrastructure & Software
  - Cables/ PS in progress
  - Still need ORC.
  - Download in place
  - Preproduction versions of all firmware.
  - No alarms, monitoring
  - Grade: C
L1 MUON in March

? Plan:
- No forward muon triggers.
- As many central muon scintillator and PDT octants as possible.
  - Coordinate with CTT
  - Need PDT HV!

? Best Guess:
- “A few” central octants with preproduction models
- Likely an up and a down octant

March L1 Muon:
A few central octants to start
Increasing capability through month
L2 Component Status

??processors (MSU,UIC,UVa):

Production Status
- First production failed. 0/~25 boards
- 2 preprod worked “out-of-the-box”

Diagnostics @ CD,UIC
- Extensive repair program at CD, UIC
- ~3-5 boards work up to VME interface
- Problems with broken chips, vias, non-standard practices.
- Still examining performance specs.

Considering a range of options
- Continue repair effort. Could have at least five if VME interface replacement succeeds (only possibility for something in March)
- Re-layout board and use remaining parts to make ~12 new boards. This may take 3-5 months to working boards.
- Complete redesign based on off-the-shelf hardware, prototype spring-summer
MBT I/O Cards (U-Maryland):
- All production cards received.
- Firmware functionality 80% done.

FIC L1/L2 Interface (SACLAY):
- Boards complete
- At SACLAY for signal conditioning.

SLIC Parallel Proc. (NIU, Columbia):
- Boards complete
- DSP Central algorithm meet speed/efficiency requirements. Significant work on DSP forward

CIC, SFO Muon/L2 Interface (U-Neb):
- Latest prototypes under test at this time.
- Expect to approve for production this month
- Delivery in February.
Software
- C++ Framework exists
- Communications software still in development, hampered by lack of ?'s.
- Processor algorithms fairly well developed

Infrastructure:
- MCH and test stand racks and crates 95% done.
- Cabling 65%, will start final dressing soon.

March 1
- Commissioning sequence on hold until ? production resolved.
- Branch point end of January when board numbers & capabilities understood.
- Prospect for five soon.
- Priorities:
  - GLOBAL&CAL (5 cards)
  - L2MUON (4 cards)
  - L2CTT&L2FPS (4-5 cards)
- Once components are on hand assembly of crates <1 month.

March L2:
Depends on Repair Success,
At best GLOBAL/CAL
Evolved to a single multipurpose card used in VRC, SB, processor nodes (~300)

VHDL code specific to VRC, SB, Node

ETG is one of a kind.
L3 Nomenclature

VRB \(
\otimes
\) VRC(8) \(
\otimes
\) SB(4) \(
\otimes
\) Node(64)

\(\checkmark\)

ETG(1)

\(\checkmark\) Four unique types of cards

- Event Tag Generator (ETG) (1)
- Event Tag Generator Int. (ETGI) (4)
- VRB Interface (VRBI) (8)
- Serial Interface Board (SIB) (256)

\(\checkmark\) Components

- VRC = VRBI + SIB
- SB = ETGI + 12 SIB
- Node = Motherboard + 4 SIB
- ETG

\(\checkmark\) Currently VRC, SB, ETG emulated w/ capability of ~500 kbyte/second.
L3 Component Status

- **SIB**
  - Layout currently at vendor
  - Prototype delivery late-January
  - Ready for Brown mid-February

- **VRBI**
  - Design and layout nearly done
  - Prototype delivery early February?
  - Ready for Brown mid-February

- **ETG and ETGI design underway**

- **Node purchases**
  - Scheduled for 32 nodes by March
  - Parts for 8 in hand Jan 15th
  - Expect delivery to D0 next two weeks.
First Increase of Capability
- Requires SIBs, VBDIs
- Will install VRC on 3N, 3S, 2S, 1N
- 30 Hz
- 8 nodes
- Late February?

Second Increase
- Add SB emulator w/ four SIB's
- Some software development required
- 100's Hz
- Mid March?

System then gradually brought up to specs.

March L3:
Ten’s of Hz
Improving Capability
Filtering

Components (Various Institutions)

- Operational version of ScriptRunner
- Unpacking code for cal, smt and muon
- electron, muon, jet, missing et, and tau tools

Operating Experience

- Participated in SiDet Test, 10% tests.
- Participating in 10%!

March 1st

- Will have cal, smt, muon unpacking
- Will support jet/em, muon filtering (have diverted resources from L2 to filtering.)
- Other tools will come on line as hardware arrives.

March L3 filtering:
Muon/Calorimeter
As needed
March 1st?

? Level 1:
- Minbias trigger
- Commissioning Tracker
- Handful Calorimeter Trigger Towers
- A few Muon Octants

? Level 2:
- Not clear
- Global/Cal first

? Level 3:
- Tens of Hz
- Cal/Muon filtering

March:
Minimal Start
Rapidly Changing