

MICE Tracker DAQ Update

- Project Goals and Schedule
- IIT Analog Front End (AFE) Test Stand
- AFE Conceptual Design Report

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AFE IIt Project Goals for MICE

- AFE IIt boards need to acquire, digitize, and read out data for up to 600 muons/ms in MICE.
- AFE I boards are already being used for D0 DAQ.
- AFE IIt boards have been designed and prototypes are being tested ('t' is for time) for D0 upgrade.
- The MICE IIT group will assist in D0 production AFE IIt testing and determine special MICE requirements for the boards.

IIT Test Stand Proposed Schedule

- Current : Test stand has been assembled at Fermilab and is being commissioned.
- Next few months: Learn about AFE IIt boards by helping D0 with their AFE IIt prototype testing.
- Jan.06: Release MICE AFE IIt Conceptual Design Report (CDR).
- July06: Prototype MICE firmware tested.
- Oct.06: Finalize MICE firmware.
- March07: Deliver hardware (16 boards + spares) to Rutherford Appleton Laboratory.

IIT AFE II_t Test Stand

- IIT People: Dan Kaplan, Terry Hart, Bill Luebke, Dan Olive
- We have all test stand hardware components at Fermilab.
 - VME crate
 - Computer
 - VME64 to PCI adapter with fiber optic cable
- We are expecting one of the AFE II boards from the KEK test run or AFE II_t prototype from D0.

IIT AFE IIt Test Stand

- Bob Angstadt has installed driver for SBS 810 adapter and diagnostic software on our computer.
- Single word and DMA block transfers work (See next slide.).
- Next week, we will assist Paul Rubinov and Kwame Bowie with the testing of the three D0 AFE IIt prototype boards.
- We will also learn about
 - Further hardware tests with the IIT AFE IIt test stand.
 - What AFE board tests we should do specific to MICE.
 - Coordination of D0 and MICE AFE IIt tests.

VME Bus Analyzer Output of Bob Angstadt's DMA Test

```
| TIME   BUS ADDRESS  DATA  R/W SIZE STAT  IRQ*  IACK* AMEX  
| rel.   LEVEL                7654321 OC IO
```

```
-----  
=>TRIG|      0 ns - C6000000  ....0001  W WORD  OK  ---4---  1 0 09 1  
  1|  4.44 us - C6000000  ....0001  W WORD  OK  ---4---  1 0 09 1  
  2|  3.40 us - C6000000  ....0001  W WORD  OK  ---4---  1 0 09 1  
  3|  3.36 us - C6000000  ....0001  W WORD  OK  ---4---  1 0 09 1  
  4|  3.48 us - C6000000  ....FFFF  R WORD  OK  ---4---  1 0 09 1  
  5|  4.00 us - C6000000  ....FFFF  R WORD  OK  ---4---  1 0 09 1  
  6|  3.96 us - C6000000  ....FFFF  R WORD  OK  ---4---  1 0 09 1  
  7|  3.92 us - C6000000  ....FFFF  R WORD  OK  ---4---  1 0 09 1  
  8|  3.96 us - C6000000  ....FFFF  R WORD  OK  ---4---  1 0 09 1  
  9|  4.08 us - C6000000  ....0001  W WORD  OK  ---4---  1 0 09 1  
 10|  3.40 us - C6000000  ....0001  W WORD  OK  ---4---  1 0 09 1  
 11|  3.36 us - C6000000  ....0001  W WORD  OK  ---4---  1 0 09 1  
 12|  3.36 us - C6000000  ....0001  W WORD  OK  ---4---  1 0 09 1  
 13|  25.2 us -      000000  B9D4FFFF  R LONG  OK  ---4---  1 0 3B 1  
 14|   80 ns - ..000000  B9D4FFFF  BLK LONG  OK  ---4---  1 0 3B 1  
 15|   80 ns - ..000000  B9D4FFFF  BLK LONG  OK  ---4---  1 0 3B 1
```

Successful DMA
transfer



```
Time:T Group:1,2,3 Disas:D Jump:J Search:S Extr:E Help:? Print:AP  
Quit:Q  
Ok.
```

AFE II_t CDR

- Preparation of a CDR of the AFE II_t board is underway and an initial draft should be done soon.
- The CDR will likely include
 - MICE, ISIS, and AFE board introduction and motivation
 - Block diagram and/or schematic drawing of the AFE boards
 - Specific requirements for various data running modes:
 - 1) Charge, time, and discriminator data
 - 2) Charge data only
 - 3) Discriminator data only (fastest mode)
 - Requirements for achieving data acquisition of as many as 600 muons/ms from current capability of 150 muons/ms.
- This may develop into a Technical Reference Document (TRD) chapter for the AFE II_t.

AFE II_t Summary

- Continue testing hardware test stand components.
- Coordinate with D0 AFE II_t tests.
- Determine special MICE requirements and test AFE II_t boards for these.
- Prepare CDR and TRD.