

Notes from the 06/20/06 MI BPM Upgrade Meeting
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These notes can be found in Beams docDB #1526.

Agenda as announced:

MI operation status, status of MI-40 BPMs - Dave C.
Installation/commissioning schedule for MI-30, BPM and BLM
Hardware status:
 Transition Board: checkout and testing
 Transition Board controller status
 Timing Board
Software status:
 Front-end software
 Online software
 Status of full system tests
Validation
AOB

1. Main Injector Status/MI40 installation discussion

- The MI40 installation went well, according to Dave Capista. One problem that remains, probably not related to the upgrade, is the scaling for the extra wide aperture BPMs.
- One Echotek channel was not performing properly (there was a position dependence on intensity that did not make sense). That board was replaced but still needs to be debugged.
- The new hardware went in beginning at 8 A.M. on June 14 (or a bit later due to some confusion with the crew chief). There were some problems getting the information properly read out. This was partially due to the fact that both the BLM and BPMs were replaced, something that was not done in the Tevatron. By 8 P.M. on June 14 the new system in MI40 was up and running.
- Since then the system has been exercised and some improvements have been made to timing and other capabilities have been tested. Some things work, a few do not.
- Ioanis mentioned that some of the new features have already been used and have been useful for running the accelerator. This is great and should encourage us all that this upgrade is going to be quite helpful.
- The official installation order is:

* MI40, MI30, MI20, MI60S, MI60N, MI10, MI50 *

2. Installation/commissioning schedule for MI-30, BPM and BLM

- Jonathan Lewis and Randy Thurman-Keup came to today's meeting so that we could discuss the next installation in MI30. The MI40 BLM installation still has some problems (probably a combination of H/W and S/W) so it is not possible to jointly install them both in MI30 this week.

- We can either decouple (for now) the installations or can hold off on the next BPM installation until next week, giving the BLM time to sort out the issues.

- After hearing from people about the feasibility of leaving MI40 as is, installing only BPM in MI30, and then either catching up the BLM in MI30 or other buildings, we decided that we would plan to install the MI30 BPM only on June 21. Marv knows how to move things around so that the current BLM electronics can stay while at the same time installing the new BPM electronics. It will take a little more time but can be done. Brian knows how to handle the online software. In any case house 50 needs to be at the end of the installation order for Brian's scheme to work.

- Manfred suggested installing two houses in a single day. At this point most people were not enthusiastic about the idea. However, once we have more experience with installation a somewhat faster schedule can be discussed. The intention is to speed up installations as soon as we can.

- Marv will coordinate the installation, along with Dave Capista, to ensure that people are contacted and approvals are obtained. Marv will send out email to the mailing list mi-bpm-project@fnal.gov to announce that the installation is on and when various phases are completed. Others will step in and complete their work as required.

3. Hardware status:

Transition Board: checkout and testing

Transition Board controller status

Timing Board

- 56 timing boards (the number required for the full MI system) have now been tested and pass! Work will continue on repairing and testing the remaining 16 boards. Andrea will do the bulk of the

remaining work. A handful of bad boards will be brought to LACE to discuss what happened and why. Procurement knows that we are in discussions with the company. Bob Forster is leading this effort and welcomes any who wish to go along with him. Andrea will go.

- Stefano gave an update on the controller. As usual his report is available in docdb-1526. He has made progress and improvements in firmware and would like to install this firmware at MI40, MI30 and the hot spare. After some discussion we decided that MI30 should be upgraded and once it is established that it is working then MI40 should be upgraded at a convenient time (with some notice given to operations, of course).

- There was some discussion of the board-by-board gain setting possibilities and how to implement it (to correct for losses in the cables being significantly different in long vs short cables). Bob Webber recommends that this occur "as soon as possible". This does look like a tricky operation, requiring careful testing, before we install it into production systems.

4. Software status:

Front-end software

Online software

Status of full system tests

- There are some front-end software issues that are still being worked (see also the AOB below). One is the status bits and it is being looked at. The extra wide angle BPM scaling is hard-coded in the front-end software at the moment.

- Steve Foulkes reports that the integration testing is working and that MI30 and MI20 have both passed. Steve showed some plots of the 2.5 MHz test signal and discussed the problems that were found because the test signal was too large and was saturating the Echotek (not a good idea). Once the gain was lowered in the transition board the position measurement looks good. The results of the integration tests will be loaded into the Beams docDB.

- Brian reported some troubles reported with I39 that are being looked at. I44 needs some work having to do with state and front-end and application issues. Some discussion on possible fixes. There was some discussion about storing and restoring files. A clear protocol is required so that the system can always be restored to a proper and understood operational state.

5. Validation - Rob Kutschke

- Rob is wrapping up his work understanding the wire measurements of the BPMs. There were questions about the shape of the curves (the symmetry seen was not the same as many people expected). People will go away and think about it.

- The conclusions of the study are that there is some BPM-to-BPM variation and it is quantified. The off-axis component gives a much larger "error". Rob will write all of this up.

6. AOB

- Bob Webber had a large number of questions/observations/issues to discuss. I will try to capture them properly here.

-- What is the maximum delay available from the timing board? A: About 3 1/2 turns.

-- Should we use buckets in all applications? I44, I43, etc. Lots of discussion. Some pros and cons. I44 is buckets. I43 is still half-buckets. Should it be changed?

-- FLASH buffer gives the first turn with non-zero values. This is OK. The midstream TBT is using location 601 as the "seam".

-- Some issues with I43, BES, MIBS, RRBS, AA marker, triggers, etc. Need to sort out and clarify. Things are probably working as planned but it does need to be checked.

-- Raw mode from I44? Steve Foulkes will write up instructions (already done beams-doc-2192).

-- Timing window is defined by the start of the sample window (not by center). Can be adjusted if necessary to properly include all of the beam.

-- Diagnostic signals. We need software and applications to produce a functioning diagnostic for the system. Marv will need to be involved. Possibly others.