Minutes, 3/07/05 Tevatron BPM Upgrade Meeting
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This set of minutes, and all future minutes, are or will be deposited in the Beams Document Database as document number 792.

The agenda as announced consisted of:

- A3, B3, C3 status (including Mike Martens observation of odd PROFILE data)
- Installation plans for D3, E3
- AOB (e.g., updates on diagnostic signal)

1. A3, B3, C3 status

- Mike showed some nearly invisible plots of PROFILE data during shot setup. The measurements do not agree with beam position measurements coming from the data logger, at least not in detail.

- After some discussion the problem was thought to be a problem with the order of data in the buffers. The PROFILE data order should have 0 be the oldest (in time) value. This is not the same as the SNAPSHOT buffer.

- Luciano can fix it. And will do so on Monday. Mike will look at the data after the fix and will see if the problem is solved.

- Mike also reported that the BPM systems passed all the diagnostic tests on the weekend.

- Other issues that are being actively (or not so actively) investigated include the 6 phase problem (thought to be timing) and the non-phase-lock problem (thought to be an Echotek or some kind of initialization problem).

2. Diagnostic signal non-uniformity

- Vince, Bill and Ken came to report that they have a solution for the diagnostic signal non-uniformity.

- The final iteration consists of the following :

    - Timing card firmware changes.
    - Timing card hardware change -- 47 pf capacitor on driver.

- Terminator on right side of VME crate, 50 ohm.
- 53 MHz single line signal on the backplane.

- Data taken so far with this arrangement shows very good test-to-test stability (1 part in thousands variation) as well as good channel-to-channel variability (<10%).

- This solution goes back to the original design of using one line on the backplane and 53 MHz on the backplane. The timing card changes are easy to make. The termination on the far right side of the VME crate will be made by replacing the air dam with a similar plug in that has the resistive circuit attached. These are being made now and should be ready soon. Prototypes are available if necessary.

- Bill showed some signals (old and new) with this new solution at the output of the timing card and the signals look very much better.

- The D3 crate has all the new changes (except for the new terminator card) and is ready to install.

3. Installation plans

- We should move forward with installation, and aim for installation of two crates (D3 and E3) this week. Jim, Marv and Ken will organize the installation of those crates.

4. Antiproton position measurements - Rob Kutschke

- Rob showed quite a few plots (which I assume will be a new Beams docDB soon). But first he showed that he can rearrange the equations for proton cancellation and write the position as a complex quantity and use the new parameterization to study the behavior of the cancellation. This will allow him to get a better feel for the quality of the cancellation and how much it changes.

- Rob has much of the infrastructure he needs ready to collect the data for many stores for analysis of the proton cancellation alorithm, how well it works, the error/spread associated with using old calibrations for the cancellation, etc.

- Rob is also working on the infrastructure (with Marc Mengel) for the calibration database needed to implement time-dependent calibrations.

4. Bob Webber - Diagnostic signal use

- Bob, working with Marv Olson, is writing a note that details the strategy for using the

diagnostic signals to :

- Test if something is not working at all
- See if something in the system is wandering in time

- Bob sees four main options for making use of the diagnostic signals. These are:

- No active signals (normal data-collecting mode)
- Inject signals to Echotek front-end only
- Inject proton signals to tunnel and to the front-end
- Inject antiproton signals to tunnel and to front-end

- It was suggested that only half of the plates are done at once because of the strong plate-to-plate coupling in each pair of plates.

- Bob would like the amplitude of the signal (in final Echotek units) to be consistent with the setup for normal running. This would make it possible to make the measurements without changing the Echotek files.

- There was some discussion of which buffers to fill, how to store and present the data, whether to use magnitude and sigma or also the I's and Q's, scaled or unscaled data, how to scale the data.

4. AOB.

- We agreed to update the front-end software on Monday after the updates to fix the PROFILE order and to implement 500 Hz in all houses.