

Minutes, 4/18/05 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:

- TBT (5000 turn) problem
- Missing TCLK problem
- 10/7\*RF (from Tevatron Dept meeting discussion)
- Installation status and plans
- AOB

1. TBT and missing TCLK problem

- We had a discussion of the status of both problems. First there was a discussion of whether the "new" timing card firmware should be loaded into all 11 houses (at the moment it has been loaded on A3 and C2). We decided against this until the newest timing card firmware with additional debugging capability is available.

- The 6000 turn (or 7800 turn) problem has been significantly reduced by changes to the front-end (thanks Luciano, Margaret, Jim, Rob, Bill, any others who helped out!). The last couple of injections before shots have not shown this problem so the rate has reduced from roughly 10-20% to below 10%, it is felt.

- The problem is not completely solved -- it still shows up on the teststand where we can run high rate tests. So work continues to really find and solve this.

- However, given the improvement Mike would like to see the remaining houses connected to the new system. This should be done as quickly as it can when opportunities present themselves. The front-end patch to remove bad measurements and only report good ones (above some threshold) should not be included yet so we can monitor the rate of problem.

2. Installation status and plans

- Given the above we should continue to fix, connect and install crates. Marv and others worked during the Monday between-store period to fix bad connections, etc. The next step is to connect proton signals for 4 houses at the next opportunity. There has been email sent around to indicate which houses are next and the number that should be done each time.

- There are 4 houses not installed -- A0, F1, F3, F4. It was thought at the meeting that F3 and F4 can be installed in the old MR racks and that extension cables for the proton

signals exist and are ready to connect. In that case F3 and F4 should be installed first (our of these four and once all of the other 12 houses are connected to proton signals.)

- A0 and F1 are trickier and they need to be installed in the location where the old BPM electronics is now. It makes sense to install only one of these at a time (A0 first) to ensure that the work can be done safely, correctly and without rushing.

### 3. $10/7*RF$ clock.

- We had a discussion of the features that show up in the TBT frequency spectrum when the position measurements are fourier transformed to frequency. Some features are seen in locations that may or may not be convenient for understanding the accelerator.

- The choice of  $7/5*RF$ , which is what we use, does make sense in that the closed orbit measurements do have the precision and accuracy required and the TBT measurements satisfy the requirements (Mike and Jim will check).

- Bill can provide a timing card that works at  $10/7*RF$  (therefore synchronized with the beam). It does have some features that may not be desirable (the errors are concentrated in one place) but we do have the hardware to make a test if we want to.

- To change the PLL to  $10/7*RF$  is not terribly difficult. Other ratios are also possible.

- Mike will discuss the issues with members of the Tevatron department (Yuri and Eliana are looking at the data). Jim pointed out that some of the analysis might better be done with other dedicated instrumentation.

- At the moment there is no plan to make any changes or tests until the issues are better understood. Priority goes to solving the TBT and TCLK problems, installing and debugging the remaining systems, and implementing the remaining functionality.

### 4. AOB

- One of the old systems will be removed soon to see what (if any) the effect will be.

- We will meet Wednesday at 11:00 A.M. in the Penthouse.