CESR TA Machine Studies Task Overview

I. Experiment Description

Experimental Topic	Electron Cloud Stability Studies	
Classification*	EC	
Coordinator/ Experimenters	Billing/Dugan	Billing, Dugan, Sonnad, Ramirez, Palmer, Williams, Forster
Primary Goals	Measure BPM sensitivity to	

Description†	**Setup** 1. Measure transverse beam spectrum in the neighborhood of the m = ±1 head-tail modes a. Use BPM button for signal source i. Follow procedure for setup: ii. Generally use BPM33W button 1 iii. Can use BPM14W button 4 for Horz modes iv. Can use BPM23W button 4 for Vert modes v. Be sure to checking timing: Dtime 9 for B1 b. Initially observe a single bunch 2. Gated Shaking with 14ns Feedback a. The beam is excited using the external modulation inputs to the 14ns feedback system. b. Be sure to time in the feedback modulation. The output timing is determined by the database node: c. TIM CSR FDBK 28 (horizontal) d. and e. TIM CSR FDBK 29 (vertical) f. Timing adjustment for the CBPM delays is TIM CSR INIT 10 3. Take reference measurement (perhaps) a. 30 bunch train 14 nsec spacing 0.75 mA/b **Instability/Damping Measurements (INST/DAMP)** 1. Study Head-tail Motion detected by BPM & xBSM a. 2 GeV lowest emittance (Big D)

* Machine Studies Classifications:
- EC - Electron Cloud
- LET - Optics Correction and Low Emittance Tuning
- xBSM - x-ray Beam Size Monitor
- INST - Instrumentation (BPM development, RFA development, other)
- MDEV - Machine Development (includes injection configuration, injection tuning, custom orbit setup, instrumentation preparation, etc.)
- MREC - Machine Startup (recovering conditions after down time)

† Attach additional pages for experimental description if needed

	b. Single bunch c. 0.75 mA current in 1 bunch d. Positrons e. Tune for bunch 1 i. fh/fv = 211.5/226 kHz f. Energy 2.1, g. Concurrent xBSM bunch-by-bunch data & CBPM turn-by-turn measurements h. Drive RF phase	
Special Needs/Requests		
Prerequisites‡	**Personnel**	**Description**
	Billing, Forster,	Establish stored beams & test RF phase excitiation
	Rider, et al	xBSM set up for positrons
Time Requested§	**No. Shifts**	**Principal Tasks**
3-4 hours		Measurement of train-head tail motion of single bunch + setup measurement

II. Machine Studies Assignments

Reserved for Project Management Team Use		
Topic ID		
Priority**		
Shift Assignments	**Date**	**Shift**

‡ Indicate other machine work that is required in preparation for this machine studies experiment.
§ Indicate the principal shift topics and estimated number of shifts required
** Priority Scale:

1. Critical – results are necessary for preparation for subsequent down/run periods
2. Very high – results are strongly desired for achieving program milestones or in preparation for subsequent down/run periods
3. High – results are of immediate interest but not require
4. Moderate – results should be pursued at the first convenient opportunity
5. Low – results are not presently a high priority for either project milestones or planning

Notes: