



Brookhaven  
National Laboratory

BNL-103977-2014-TECH

AGS.SN99;BNL-103977-2014-IR

## Control of rf Verniers During Phaseback and Flat Top

E. Gill

October 1977

Collider Accelerator Department  
**Brookhaven National Laboratory**

**U.S. Department of Energy**

USDOE Office of Science (SC)

Notice: This technical note has been authored by employees of Brookhaven Science Associates, LLC under Contract No.EY-76-C-02-0016 with the U.S. Department of Energy. The publisher by accepting the technical note for publication acknowledges that the United States Government retains a non-exclusive, paid-up, irrevocable, world-wide license to publish or reproduce the published form of this technical note, or allow others to do so, for United States Government purposes.

## **DISCLAIMER**

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the results of such use of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

Date 10/6/77 Time 1200-1300 Experimenters E. Gill, J.W. Glenn, H. Weisberg

Subject Control of RF Verniers During Phaseback and Flattop.

### OBSERVATIONS AND CONCLUSION

Objective: To improve the stability and reproducibility of the slow extracted beam spill.

Procedure: Until now the tuning servos have been left on during phaseback and flattop. The rf vernier current fluctuates during phaseback and settles at an ill-defined value after rf turnoff. We changed over to a system in which all the vernier currents (except for the one in the locked out station) are clamped at preset levels, starting at the beginning of phaseback. The levels were set to be the same as just before phaseback, so all cavities resonate at the same frequency.

Results: With the change made, the H7 radial difference signal holds more constant during phaseback, and it is possible to have stable operation with a longer phaseback time. There are two stable operating points of the off-frequency bias separated by about 1 harmonic number, with stable ranges of about  $\pm 0.1$  harmonic number, where before there was only one stable setting and it was very critical. The change has been made operational and the spill stability and reproducibility seem to have improved.

#### Recommendations:

- (1) Install a spill duty factor monitor telescope.
- (2) Extend the flattop vernier control to the locked out station.
- (3) After (1) and (2) are finished, do experiments to see if further improvement can be made by staggering the cavity tunes during flattop.