



Brookhaven  
National Laboratory

BNL-103909-2014-TECH

AGS.SN28;BNL-103909-2014-IR

## Measure Horizontal profiles of FEB in Test Beam

G. W. Bennett

May 1973

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.AT(30-1)-16 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.

NO. 28

FEB COMMISSIONING STUDY

THURS. MAY 17, 1973

Bennett, Blumberg, Guthy, Soukas

Scheduled: 0001-0800 Actual: 0200-0800

Objective: Measure horizontal profiles of FEB

Result: Obtained numerous profiles at each of 22 settings of quadrupole UQ1. The horizontal width went through a minimum at quad settings quite close to the predicted values. Peaks are asymmetric — certainly non-Gaussian — and will probably require band analysis for widths. This result is expected since, of the 7 bunches which appear on output of external current transformer, none appeared to be totally extracted — a consequence of the large internal beam width at the  $\sim 5 \times 10^{12}$  ppp used in this run. The extracted beam is thus horizontally shaved and the resulting profile is truncated. We should repeat this data when we have the capability in the C15 + E15 kickers to do total extraction.

The H10 magnet position was varied to determine the amount of separation between the circulating and kicked beam at high circulating beam intensity. The result, on attached graph, shows .2" of clearance. This value will decrease when we extract a de-bunched beam because of additional momentum spread and will further decrease when the AGS attains  $10^{13}$  ppp. It is therefore unlikely that an ejector septum significantly thicker than the present .09" will be possible.

An effort to optimize the skew angle of the E10 septum, presently set at the computed  $-4.7$  mrad, was not successful due to instability in the CBM. The beam size was probably varying as a result.

The post-FEB intermittent instability is still with us. When complete beam loss occurred, a second spot was observed on external U16 flag about  $\frac{1}{4}$ " below the main spot.

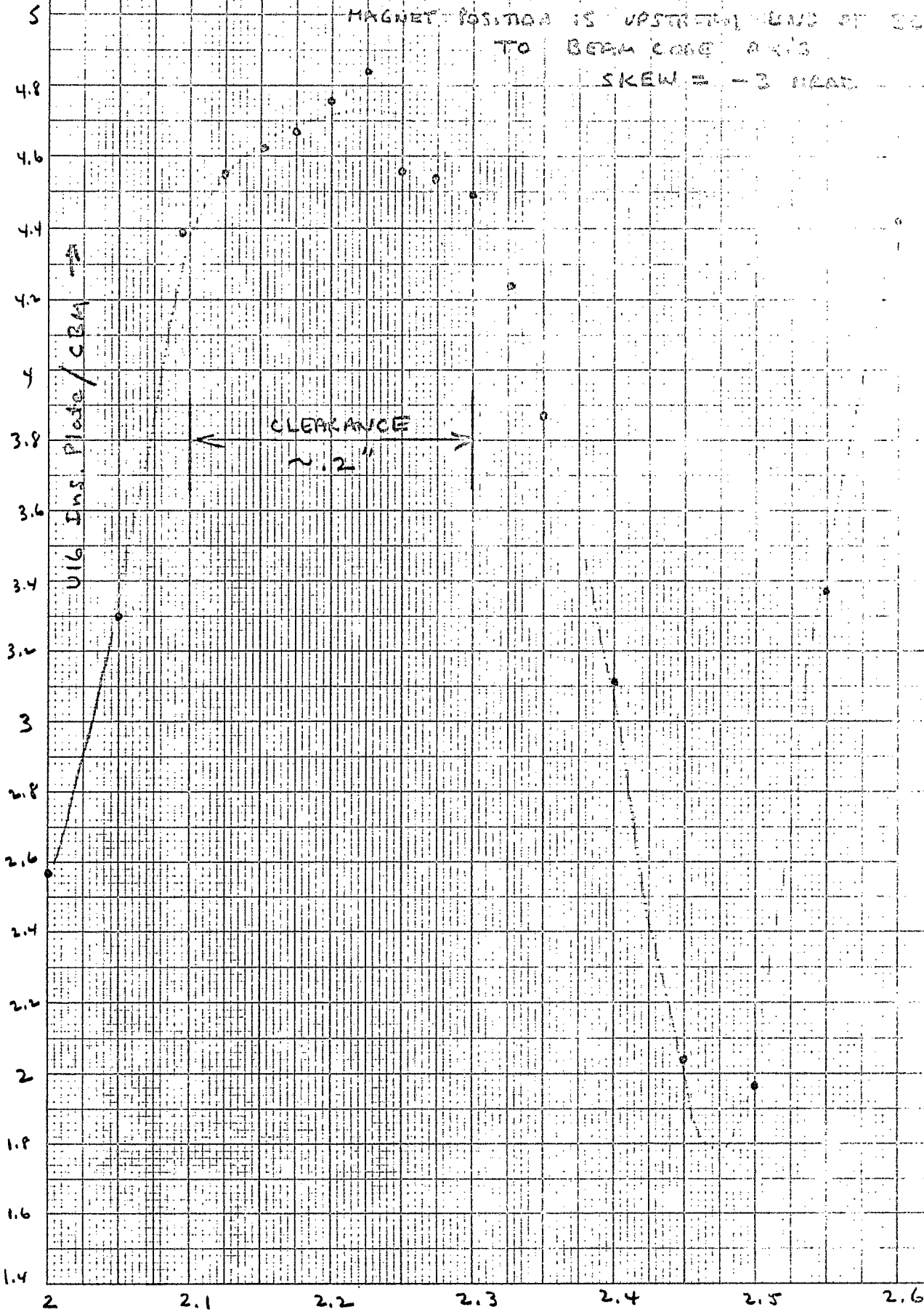
We noted that output of U16 insulated plate varied with current in quadrupole UQ1 which is adjacent to instrument box. Probably stray field affects electron collection.

# EXTRACTED BEAM VS. H10 MAGNET (A)

NORMALIZED TO CBM      CBM  $\sim 4.2$  A

MAGNET POSITION IS UPSTREAM END OF SECTOR  
TO BEAM CORE AXIS

SKEW = -3 RAD



KE 10 X 10 TO 1/2 INCH 46 1320  
7 X 10 INCHES MADE IN U.S.A.  
KEUFFEL & ESSER CO.