

## Affect of Lower B on Capture Efficiency

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Purpose: To lower the injection  $\dot{B}$  value with the hope of increasing the rf capture.

Background: Measurements made on 4/24/73 indicated that with the present  $\dot{B}$  of  $\approx 2.6$  kG/sec and a nominal setting of rf level 2, the equilibrium phase angle near injection is  $\approx 21^\circ$ . This corresponds to a bucket of  $\approx 220^\circ$  width, height of .055 eV-sec and area of .29 eV-sec. The bunch width a few msec after injection was measured to be about  $210^\circ$ . The total net gap voltage, calculated from the  $\dot{B}$  and measured  $f_\varphi$ , was found to be  $\approx 50$  keV or about 1.6 kV/gap (8 stations on this date).

Results: The injection  $\dot{B}$  was lowered to  $\approx 1.45$  kG/sec and the rf parameters adjusted for best intensity (this was  $3-4 \times 10^{11}$  less than with the higher  $\dot{B}$ ). The bunch width a few msec after injection was measured and found to be  $\approx 210^\circ$ . At the lower  $\dot{B}$  and with the same gap voltage (50 kV) the bucket width should be  $\approx 275^\circ$ . A measured bunch width of  $204^\circ$  was obtained at the larger  $\dot{B}$  ( $\approx 2.6$  kG/sec). One would have expected a wide bunch and perhaps a higher intensity, but this was not the case. Intermediate values of  $\dot{B}$  were also tried, i.e.,  $\approx 2$  and 2.3 kG/sec. and they gave essentially the same intensity as obtained at 2.6 kG/sec. The latter value was retained for operations.