POINT OUT TO JOHN H. OUR EXPERIENCE THAT H.E. BEAM SIZE IS STRONGLY DEPENDENT ON MACHINE CONDITIONS.

[redacted]

No. 59

Horizontal Beam Size Measurements (data of 4/1/74)

Measurements of horizontal beam size were made by intercepting 5% of the beam with horizontally flipped aluminum targets.

Conditions

1) Horizontal targets at F-20 (β_{AV})
2) Beam intensity 5.5 to 6 × 10^{11} p/p
3) Average ring vacuum ~ 3×10^{-7} Torr
4) These conditions very similar to those existing on 3/9/74 when V size was measured.

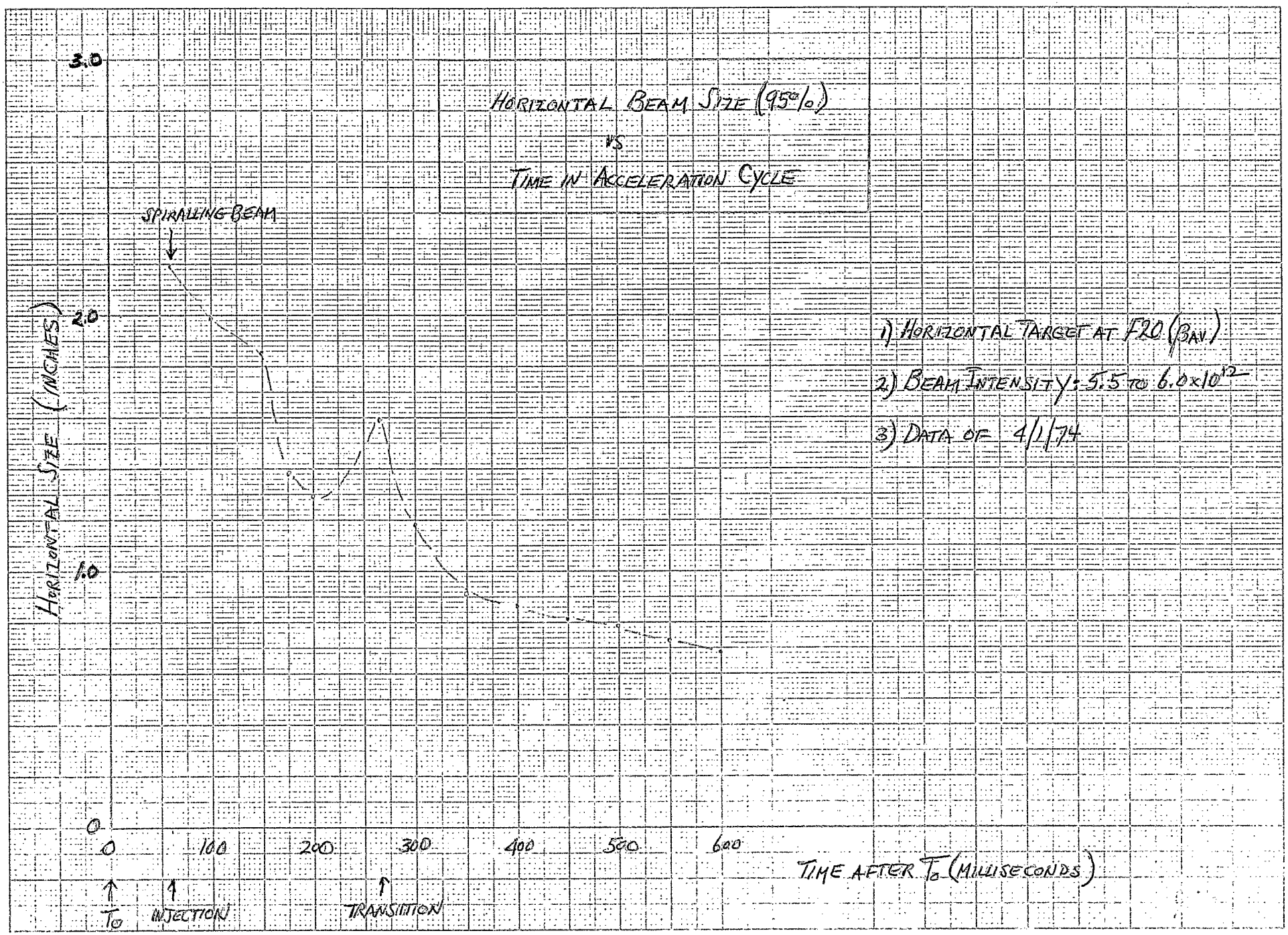
was any effort made to vary transition tuning, phase shift, and radius shifts, to get MINIMUM HE horizontal size?

Results

1) Initial measurements shown on accompanying graph.
2) H.E. Horizontal size at F20 ≃ 0.68" (~1.7 cm at β_{AV} ⇒ 2.1 cm at β_{max})
3) L.E. horizontal size ≃ 2.2" (~5.5 cm at β_{AV} ⇒ 6.8 cm at β_{max})
4) Overall damping ratio $\approx \frac{2.2}{0.68} = 3.2/1$.
5) H.E. beam is larger than measurement made previously (see 5/10/73 data, which was made at 4 × 10^{11} p/p)
6) L.E. beam is smaller than measurement made previously (see 5/10/73 data), 2.2 inches compared with 2.9 inches.

J. Herrera
3/8/74

This is larger than we see at H10 flag, which is between β_{AV} and β_{max}. We see ~ ½" with well-behaved AGS.


HORIZONTAL BEAM SIZE (95%)
VS
TIME IN ACCELERATION CYCLE
SPIRALLING BEAM
1) HORIZONTAL TARGET AT F20 (βAV)
2) BEAM INTENSITY: 5.5 TO 6.0×10^12
3) DATA OF 4/1/74
HORIZONTAL SIZE (INCHES)
3.0
2.0
1.0
0
0
100
200
300
400
500
600
TIME AFTER T0 (MILLISECONDS)
T0
INJECTION
TRANSITION