

Booster Parameter List

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January 1986

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U.S. Department of Energy

USDOE Office of Science (SC)

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BOOSTER PARAMETER LIST

*Booster Technical Note
No. 2*

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January 16, 1986*

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ABSTRACT

THIS NOTE DESCRIBES THE PARAMETER LIST FOR THE AGS - BOOSTER. A SCHEMATIC LAYOUT OF THE LATTICE AND ITS SUPERPERIODS ARE ALSO INCLUDED.

INTRODUCTION

In this note we describe the parameter list of the AGS - Booster. In section II the present values of the Booster parameters are tabulated. This updates the Booster parameter list given in References 1 and 2. Schematic diagram of the lattice [3,4] showing the layout of the AGS Booster, the labling convention of the lattice and its superperiods are also included.

References:

1. AGS Booster Conceptual Design Report, Vol.I, (April 1984);
AGS Booster Parameter List, Y.Y. Lee, (Sept. 26, 1985).
2. R & D For The AGS Booster, E.B. Forsyth, (Dec. 12, 1985).
3. Booster Lattice, Booster Tech. Note No. 1, E. Courant and Z. Parsa, (January 15, 1986).
4. Booster Coordinates, Booster Tech. Note No. 3, Z. Parsa, G.F. Dell (January 1986).

AGS BOOSTER PARAMETER LIST -----

ENERGY [MeV] -----

INJECTION:

PROTONS	200 MeV
POL PROTONS	200 MeV
HEAVY IONS	> 1 MeV/AMU

[POL == POLARIZED]

EJECTION (MAXIMUM)

PROTONS	1	GeV
POL PROTONS	1	GeV
HEAVY IONS	P = 5	Q/A GeV/AMU

[Q is the charge of the Heavy Ions (whether fully stripped or not) delivered from the Tandem.]

LATTICE -----

CIRCUMFERENCE	201.78 M (1/4 AGS)
PERIODICITY	6
NUMBER OF CELLS	24 FODO [SEPARATE FUNCTION, MISSING DIPOLES]
LENGTH	8.4075 M
PHASE ADVANCE/CELL	71.25
QX ~ QY	4.75
BETAX MAX/MIN	13.88/3.67 M
BETAY MAX/MIN	13.67/3.80 M

XP MAX	2.94 M
TRANSITION GAMMA	4.795

RF SYSTEM

NUMBER OF STATIONS

1 FOR PROTONS

1 FOR POL PROTONS

2 FOR HEAVY IONS

[where POL== POLARIZED]

HARMONIC NUMBER

3 FOR PROTONS

3 FOR POL PROTONS

3 FOR HEAVY IONS (1 FOR RHIC)

FREQUENCY RANGE (MHz)

FOR PROTONS 2.5 - 3.9

FOR POL PROTONS 2.5 - 3.9

FOR HEAVY IONS 0.178 - 2.5 (.06 - .84 FOR RHIC)

PEAK RF VOLTAGE [KV]

FOR PROTONS 35

FOR POL PROTONS 35

FOR HEAVY IONS 17

ACCELERATION TIME [M-SEC]

FOR PROTONS 50

FOR POL PROTONS 50

FOR HEAVY IONS 500

REPETITION RATE

FOR PROTONS 10 Hz (4 PULSES/AGS PULSE)

FOR POL PROTONS 1 Hz (1 PULSE/AGS PULSE)

FOR HEAVY IONS 1 Hz (1 PULSE/AGS PULSE)

DIPOLES

[DIPOLES ARE CURVED AND WEDGED FOR 0 ENTRANCE ANGLE]

NUMBER 36

LENGTH (MAGNETIC) 2.4 M

GAP 82.55 MM

GAP VACUUM CHAMBER 66 MM

GOOD FIELD REGION ($<10^{-4}$) 16 X 6.6 CM

INJECTION FIELD [KG]

FOR PROTONS 1.56

FOR POL PROTONS 1.56

FOR HEAVY IONS 0.105 A/Q

[Q is the charge of the Heavy Ions, (whether fully stripped or not), delivered from the Tandem.]

EJECTION FIELD [KG]

FOR PROTONS 4.0

FOR POL PROTONS 4.0

FOR HEAVY IONS 12.0

LAMINATION THICKNESS 1.5 MM
 [0.6 MM AROUND ENDS]

QUADRUPOLES

NUMBER	48
LENGTH (MAGNETIC)	0.50375 M
APERTURE	16.5 CM
VACUUM CHAMBER AP.	15.5 CM

[AP.== APERTURE]

INJECTION POLE TIP FIELD [KG]

FOR PROTONS	1.02
FOR POL PROTONS	1.02
FOR HEAVY IONS	0.068 A/Q

[Q is the charge of the Heavy Ions, (whether fully stripped or not), delivered from the Tandem.]

EJECTION POLE TIP FIELD [KG]

FOR PROTONS	2.7
FOR POL PROTONS	2.7
FOR HEAVY IONS	7.9

LAMINATION THICKNESS 0.6 MM

FIELD QUALITY

SEXTUPOLE HARMONIC (6 θ / 2 θ)	0.0 (SHAPE POLE TIP TO ELIMINATE)
ALL OTHER HARMONICS	< 10^{-4}

MAX. VACUUM PRESSURE (N2 EQU.)	10^{-10}	TORR
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MAX. INTENSITY (PARTICLES PER PULSE)

FOR PROTONS	$1 - 1.5 \times 10^{13}$
FOR POL PROTONS	10^{12}
FOR HEAVY IONS	$2 \times 10^{11} / Z .$

Acknowledgement:

We thank E. Courant, and other members of the Booster Design study group for discussions and Ms. K. Brown for our drawings.

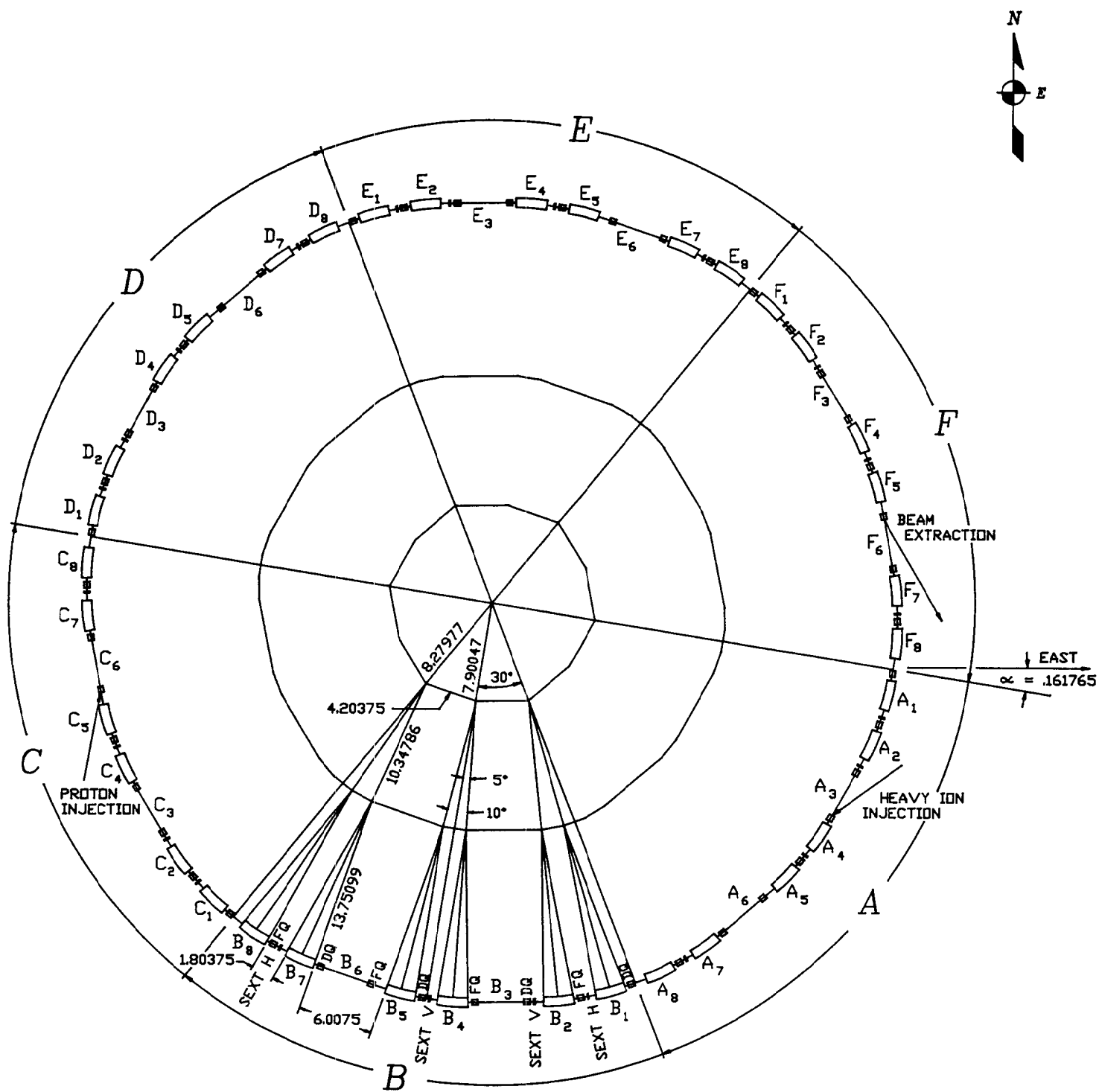


Fig. 1 The Booster Lattice