

## Booster Parameter List

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# *BOOSTER PARAMETER LIST*

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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

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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.

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## 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

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## 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

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

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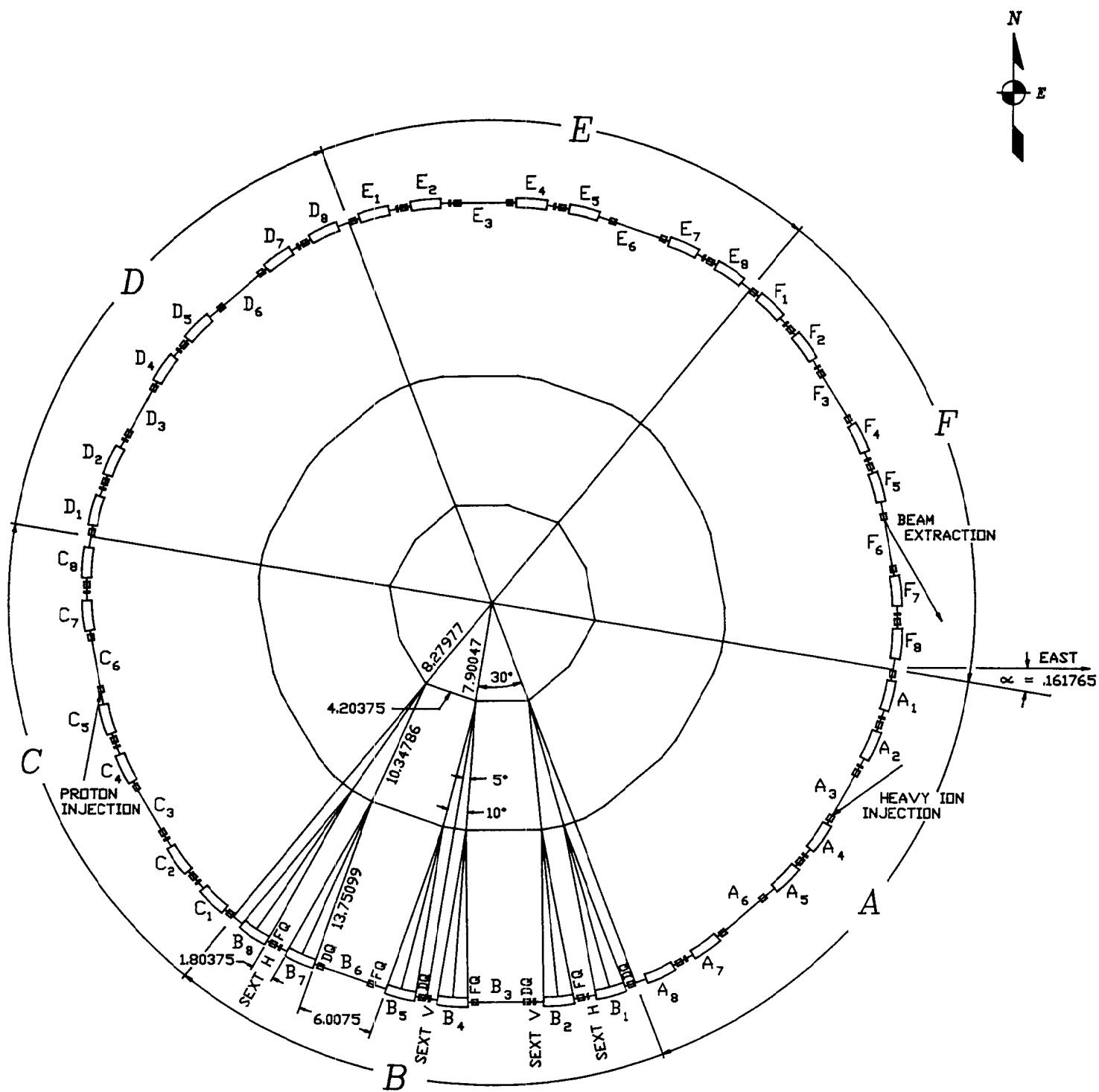


Fig. 1 The Booster Lattice

0 5  
METERS  
NOTE: ALL DIMENSIONS ARE IN METERS