*BOOSTER SURVEY and
LINEAR LATTICE PARAMETERS
with PROGRAM MAD*

AD

*Booster Technical Note
No. 99*

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ABSTRACT

This note describes the coordinates of AGS Booster in the Booster centered frame of reference, with program MAD. The results agree with and confirm our earlier calculation. The linear lattice parameters for $\Delta(P)/P = -.01$ to $.01$ in increments of $.002$ are also included.

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I. INTRODUCTION

This note includes the results of the Booster Survey obtained with program MAD [1] (versions [2] 4.03 and 6 produced same results).

In Table I, we present the definition of the ring elements inputed into program MAD, (with lengths in meters).

In Table II, linear lattice parameters with $\Delta(P)/P = 0$ are summarized and in Table III, the results of the MAD program Survey (for the Booster is given. This table (III), show the coordinates of an on axis point of the downstream end of that element when viewed in clockwise direction.

Table IV, gives the lattice functions for the Booster, calculated with program MAD6, for $\Delta(P)/P = -.01$ to $+.01$ in increments of $.002$.

II. BOOSTER SURVEY WITH MAD

Coordinates of the AGS Booster in the Booster centered reference system, was generated with program MAD. The values listed in Table III correspond to the coordinates of an on - axis point of the downstream end of that element when viewed in a clockwise direction. Assuming the magnets have sharp edges where the field becomes zero. These coordinates (given in Table III) agrees with and confirm our previous results [3], we obtained using a CDC - version of the Geometry program [4].

In the present calculation (shown in Table I) we used thick lens sextupoles of length $.1$ m; whereas in reference [3] thin lens sextupoles of zero length were assumed.

Figures 1 and 2 are also included showing the conventions used in program MAD (e.g. coordinates and angles given in Table III), and in the layout of the Booster lattice (e.g relative positions of magnets and Booster superperiods) respectively.

The transformation from the Booster centered reference system to the AGS and BNL grids are discussed and tabulated in subsequent note [5].

III. COORDINATE SYSTEM CONVENTIONS

Figure 1 shows the Global reference coordinates as follows:

X (displacement of the local origin in the X direction),
 Y (displacement of the local origin in the Y direction),
 Z (displacement of the local origin in the Z direction).

Where X is the East (E) and -Z is the North (N) direction.

Θ (THETA in Table III) is the azimuth angle (i.e. the rotation angle about the global Y axis, between the projection of the reference orbit onto the (Z,X) plane, and the global Z axis).

ϕ (PHI) is the elevation angle and Ψ (PSI) is the roll angle about the local s axis (see Figure 1 (c)). For more detail of MAD conventions see the MAD program manual [1].

IV. CONCLUSION

The coordinates of the Booster were generated using program MAD. The result obtained agreed with and confirms our previous calculation given in the Booster Design Manual. The transformations from the Booster centered reference system to AGS and BNL grids and the coordinates of the apex of the dipoles and centers of the quadrupoles and sextupoles are generated and given in the subsequent note [5].

V. REFERENCES

1. F. C. Iselin, CERN, Geneva, Switzerland, Principal author of program MAD (versions 4 and 6).
2. Available in BNLDAG::DUA0:[PARSA1.MAD] DIRECTORY.
3. Z. Parsa, Booster Technical Note No. 27 and Booster Design Manual.
4. Originally was designed for ISABEL (E. Courant). Now modified for the Booster (I refer to it as) BSTGEO.FOR (VAX version), and a version we use for the RHIC coordinate calculation, (will be referred to as) GEOMETRY.FOR (also VAX version).
5. Z. Parsa, AGS Booster Geometry and Coordinates, Booster Technical Note; November 1987, (No. 100).
6. E. Courant, Z. Parsa, Booster Lattice, Booster Technical Note No. 1; January 1986.

Figure 1 (a):
Reference Coordinate
Conventions Used

Figure 1 (b and c):
Local and Global
Coordinate Conventions
Used.

Fig.2 Layout of the AGS Booster showing the relative position of magnets (e.g. Dipole Apex locations) and labeling convention of the Booster Superperiods. (A to F, with the Beam in the Clockwise direction).

TABLE I
DEFINITION AND MAGNITUDE OF THE ELEMENTS AND PARAMETERS

TABLE I

AGS BOOSTER LATTICE FOR SURVEY ZOHREH PARSA 19-NOV-8 08:07:18
 INPUT STREAM TO PROGRAM MAD (SHOWING THE DEFINITION AND MAGNITUDE OF THE ELEMENTS AND

PARAMETER DEFINITIONS

BR := 2.14962
 TH := .174532925199
 SF := 1.36066306
 SD := -8.105988
 SV := .11164764
 GF := .558211184119
 GD := -.575416218362
 LQ := .251875

DRIFT SPACES

S2H : DRIFT, L=.25
 S1 : DRIFT, L=.1
 S3 : DRIFT, L=.3
 S3H : DRIFT, L=.35
 S5H : DRIFT, L=.55
 S10 : DRIFT, L=1.
 S32H : DRIFT, L=3.25
 S37 : DRIFT, L=3.7

BENDING MAGNET WITH EDDY CURRENT SEXTUPOLES

BEND : SBEND, L=2.4, ANGLE=TH, K2=SV

QUADRUPOLES

QF : QUADRUPOLE, L=LQ, K1=GF
 QD : QUADRUPOLE, L=LQ, K1=GD

SEXTUPOLES (CHROMATICITY CORRECTING AND EDDY CURRENT)

SXF : SEXTUPOLE, L=.1, K2=SF
 SXD : SEXTUPOLE, L=.1, K2=SD

THE KICKERS

CT : DRIFT, L=.1

HALF CELLS

HCDF : LINE=(QD, S3, BEND, S5H, CT, SXF, S2H, QF)
 HCDFD : LINE=(QF, S3, BEND, S5H, CT, SXD, S2H, QD)
 HCDFL : LINE=(QD, S3, BEND, S5H, CT, S3H, QF)
 HCDFLM : LINE=(QD, S3, BEND, S10, QF)
 HCDFDL : LINE=(QF, S3, BEND, S5H, CT, S3H, QD)
 HCDFDLM : LINE=(QF, S3, BEND, S10, QD)
 HCDFDFO : LINE=(QD, S32H, CT, S3H, QF)
 HCDFDO : LINE=(QF, S32H, CT, S3H, QD)
 HCDFDOM : LINE=(QD, S37, QF)
 HCDFDOM : LINE=(QF, S37, QD)

SUPERPERIODS

B4SA : LINE=(HCDF, HCDFD, HCDFDFO, HCDFDLM, HCDFD, HCDFDLM, HCDFD, HCDFDL)
 B4SC : LINE=(HCDF, HCDFD, HCDFDFO, HCDFDLM, HCDFD, HCDFDLM)
 B4SF : LINE=(HCDF, HCDFD, HCDFDFO, HCDFDLM, HCDFD, HCDFDLM)
 B4S : LINE=(HCDF, HCDFD, HCDFDFO, HCDFDLM, HCDFD, HCDFDLM)

TABLE II

LATTICE PARAMETERS FOR $\Delta(P)/P = 0$

TABLE II

AGS BOOSTER LATTICE FOR SURVEY															"MAD" VERSION: 6.01/03 RUN: 21-NOV-8 10:18:00														
LINEAR LATTICE PARAMETERS FOR BEAM LINE: "RING"															ZOHREH PARSA														
DELTA(P)/P = 0.000000															PAGE 1														
ELEMENT SEQUENCE		I		H O R I Z O N T A L					I		V E R T I C A L					D P V													
POS. NO.	ELEMENT NAME	NO.	DIST [M]	BETAX [M]	ALFAX [1]	MUX [2PI]	X(CO) [MM]	PX(CO) [MM]	DX [M]	DPX [1]	BETAY [M]	ALFAY [1]	MUY [2PI]	Y(CO) [MM]	PY(CO) [MM]	DV [M]													
BEGIN RING																													
1	RING		0.000	3.642	0.009	0.000	0.000	0.000	0.540	-0.015	13.644	0.000	0.000	0.000	0.000	0.000													
55	QD	9	33.882	3.789	-0.602	0.814	0.000	0.000	0.546	0.064	13.157	1.912	0.808	0.000	0.000	0.000													
56	S3	7	34.182	4.183	-0.710	0.826	0.000	0.000	0.565	0.064	12.041	1.806	0.812	0.000	0.000	0.000													
57	BEND	7	36.582	9.447	-1.461	0.888	0.000	0.000	0.918	0.229	5.413	0.956	0.860	0.000	0.000	0.000													
58	S5H	6	37.132	11.154	-1.643	0.897	0.000	0.000	1.045	0.229	4.467	0.762	0.878	0.000	0.000	0.000													
59	CT	8	37.232	11.486	-1.676	0.898	0.000	0.000	1.068	0.229	4.319	0.727	0.881	0.000	0.000	0.000													
60	SXF	3	37.332	11.825	-1.710	0.900	0.000	0.000	1.090	0.229	4.177	0.691	0.885	0.000	0.000	0.000													
61	S2H	5	37.582	12.700	-1.793	0.903	0.000	0.000	1.148	0.229	3.853	0.603	0.895	0.000	0.000	0.000													
62	QF	9	37.834	12.158	-0.005	0.906	0.000	0.000	1.185	0.065	3.703	0.000	0.906	0.000	0.000	0.000													
63	QF	10	38.086	12.705	1.783	0.909	0.000	0.000	1.180	-0.102	3.853	-0.603	0.916	0.000	0.000	0.000													
64	S3	8	38.386	11.665	1.685	0.913	0.000	0.000	1.150	-0.102	4.247	-0.709	0.928	0.000	0.000	0.000													
65	BEND	8	40.786	5.266	0.954	0.962	0.000	0.000	1.098	0.059	9.687	-1.558	0.989	0.000	0.000	0.000													
66	S5H	7	41.336	4.326	0.755	0.981	0.000	0.000	1.131	0.059	11.508	-1.752	0.997	0.000	0.000	0.000													
67	CT	9	41.436	4.178	0.719	0.984	0.000	0.000	1.136	0.059	11.862	-1.788	0.999	0.000	0.000	0.000													
68	SXD	3	41.536	4.038	0.682	0.988	0.000	0.000	1.142	0.059	12.223	-1.823	1.003	0.000	0.000	0.000													
69	S2H	6	41.786	3.720	0.592	0.998	0.000	0.000	1.157	0.059	13.157	-1.912	1.003	0.000	0.000	0.000													
70	QD	10	42.037	3.575	-0.011	1.009	0.000	0.000	1.193	0.229	13.644	0.000	1.006	0.000	0.000	0.000													
71	QD	11	42.289	3.731	-0.615	1.021	0.000	0.000	1.273	0.407	13.157	1.912	1.009	0.000	0.000	0.000													
72	S32H	3	45.539	11.627	-1.815	1.103	0.000	0.000	2.595	0.407	4.467	0.762	1.079	0.000	0.000	0.000													
73	CT	10	45.639	11.993	-1.852	1.104	0.000	0.000	2.636	0.407	4.319	0.727	1.083	0.000	0.000	0.000													
74	S3H	4	45.989	13.335	-1.981	1.108	0.000	0.000	2.778	0.407	3.853	0.603	1.096	0.000	0.000	0.000													
75	QF	11	46.241	13.866	-0.102	1.111	0.000	0.000	2.831	0.011	3.703	0.000	1.107	0.000	0.000	0.000													
76	QF	12	46.493	13.435	1.791	1.114	0.000	0.000	2.784	0.385	3.853	-0.603	1.118	0.000	0.000	0.000													
77	S3	9	46.793	12.389	1.697	1.118	0.000	0.000	2.669	0.385	4.247	-0.709	1.129	0.000	0.000	0.000													
78	BEND	9	49.193	5.820	1.012	1.163	0.000	0.000	1.919	0.239	9.687	-1.558	1.199	0.000	0.000	0.000													
79	S5H	8	49.743	4.812	0.821	1.180	0.000	0.000	1.787	0.239	11.508	-1.752	1.199	0.000	0.000	0.000													
80	CT	11	49.843	4.651	0.786	1.183	0.000	0.000	1.763	0.239	11.862	-1.788	1.200	0.000	0.000	0.000													
81	SXD	4	49.943	4.498	0.751	1.187	0.000	0.000	1.740	0.239	12.223	-1.823	1.201	0.000	0.000	0.000													
82	S2H	7	50.193	4.144	0.664	1.196	0.000	0.000	1.680	0.239	13.157	-1.912	1.205	0.000	0.000	0.000													
83	QD	12	50.445	3.976	0.008	1.206	0.000	0.000	1.650	0.002	13.644	0.000	1.207	0.000	0.000	0.000													
84	QD	13	50.697	4.135	-0.646	1.216	0.000	0.000	1.681	0.242	13.157	1.912	1.210	0.000	0.000	0.000													
85	S3	10	50.997	4.553	-0.749	1.227	0.000	0.000	1.754	0.242	12.041	1.806	1.214	0.000	0.000	0.000													
86	BEND	10	53.397	9.894	-1.453	1.285	0.000	0.000	2.515	0.390	5.413	0.956	1.262	0.000	0.000	0.000													
87	S5H	9	53.947	11.588	-1.627	1.293	0.000	0.000	2.729	0.390	4.467	0.762	1.280	0.000	0.000	0.000													
88	CT	12	54.047	11.916	-1.658	1.294	0.000	0.000	2.768	0.390	4.319	0.727	1.284	0.000	0.000	0.000													
89	S3H	5	54.397	13.115	-1.768	1.299	0.000	0.000	2.905	0.390	3.853	0.603	1.297	0.000	0.000	0.000													
90	QF	13	54.649	13.546	0.079	1.302	0.000	0.000	2.951	0.023	3.703	0.000	1.308	0.000	0.000	0.000													

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TABLE III

SURVEY OF THE AGS - BOOSTER

AGS BOOSTER LATTICE FOR SURVEY
SURVEY OF BEAM LINE "RING",

ZOHREH PARSA

"MAD" VERSION: 6.01/03 RUN: 21-NOV-8 10:18:00

Page 1

* TABLE III GIVES THE SURVEY, WITH X0=31.86063, Z0=5.55399, THETA0=-.161765

POS. NO.	E L E M E N T ELEMENT OCC. NAME NO.	S E Q U E N C E SUM(L) M		I I	P O S I T I O N S Y M		Z M	I I	T H E T A RAD	A N G L E S PHI RAD		P S I RAD
BEGIN	RING	1	0.000000	0.000000	31.860630	0.000000	5.553990	-0.161765	0.000000	0.000000	0.000000	0.000000
1	QD	1	0.251875	0.251875	31.820063	0.000000	5.802577	-0.161765	0.000000	0.000000	0.000000	0.000000
2	S3	1	0.551875	0.551875	31.771745	0.000000	6.098660	-0.161765	0.000000	0.000000	0.000000	0.000000
3	BEND	1	2.951875	2.951875	31.180978	0.000000	8.421673	-0.336298	0.000000	0.000000	0.000000	0.000000
4	S5H	1	3.501875	3.501875	30.999481	0.000000	8.940863	-0.336298	0.000000	0.000000	0.000000	0.000000
5	CT	1	3.601875	3.601875	30.966482	0.000000	9.035262	-0.336298	0.000000	0.000000	0.000000	0.000000
6	SXF	1	3.701875	3.701875	30.933482	0.000000	9.129660	-0.336298	0.000000	0.000000	0.000000	0.000000
7	S2H	1	3.951875	3.951875	30.850984	0.000000	9.365656	-0.336298	0.000000	0.000000	0.000000	0.000000
8	QF	1	4.203750	4.203750	30.767866	0.000000	9.603421	-0.336298	0.000000	0.000000	0.000000	0.000000
9	QF	2	4.455625	4.455625	30.684749	0.000000	9.841187	-0.336298	0.000000	0.000000	0.000000	0.000000
10	S3	2	4.755625	4.755625	30.585750	0.000000	10.124382	-0.336298	0.000000	0.000000	0.000000	0.000000
11	BEND	2	7.155625	7.155625	29.600572	0.000000	12.309517	-0.510831	0.000000	0.000000	0.000000	0.000000
12	S5H	2	7.705625	7.705625	29.331676	0.000000	12.789303	-0.510831	0.000000	0.000000	0.000000	0.000000
13	CT	2	7.805625	7.805625	29.282786	0.000000	12.876537	-0.510831	0.000000	0.000000	0.000000	0.000000
14	SXD	1	7.905625	7.905625	29.233895	0.000000	12.963771	-0.510831	0.000000	0.000000	0.000000	0.000000
15	S2H	2	8.155625	8.155625	29.111670	0.000000	13.181856	-0.510831	0.000000	0.000000	0.000000	0.000000
16	QD	2	8.407500	8.407500	28.988528	0.000000	13.401576	-0.510831	0.000000	0.000000	0.000000	0.000000
17	QD	3	8.659375	8.659375	28.865385	0.000000	13.621296	-0.510831	0.000000	0.000000	0.000000	0.000000
18	S32H	1	11.909375	11.909375	27.276453	0.000000	16.456397	-0.510831	0.000000	0.000000	0.000000	0.000000
19	CT	3	12.009375	12.009375	27.227563	0.000000	16.543631	-0.510831	0.000000	0.000000	0.000000	0.000000
20	S3H	1	12.359375	12.359375	27.056447	0.000000	16.848949	-0.510831	0.000000	0.000000	0.000000	0.000000
21	QF	3	12.611250	12.611250	26.933305	0.000000	17.068669	-0.510831	0.000000	0.000000	0.000000	0.000000
22	QF	4	12.863125	12.863125	26.810163	0.000000	17.288390	-0.510831	0.000000	0.000000	0.000000	0.000000
23	S3	3	13.163125	13.163125	26.663492	0.000000	17.550091	-0.510831	0.000000	0.000000	0.000000	0.000000
24	BEND	3	15.563125	15.563125	25.313836	0.000000	19.530955	-0.685364	0.000000	0.000000	0.000000	0.000000
25	S5H	3	16.113125	16.113125	24.965711	0.000000	19.956759	-0.685364	0.000000	0.000000	0.000000	0.000000
26	CT	4	16.213125	16.213125	24.902415	0.000000	20.034178	-0.685364	0.000000	0.000000	0.000000	0.000000
27	SXD	2	16.313125	16.313125	24.839120	0.000000	20.111597	-0.685364	0.000000	0.000000	0.000000	0.000000
28	S2H	3	16.563125	16.563125	24.680881	0.000000	20.305144	-0.685364	0.000000	0.000000	0.000000	0.000000
29	QD	4	16.815000	16.815000	24.521456	0.000000	20.500143	-0.685364	0.000000	0.000000	0.000000	0.000000
30	QD	5	17.066875	17.066875	24.362030	0.000000	20.695142	-0.685364	0.000000	0.000000	0.000000	0.000000
31	S3	4	17.366875	17.366875	24.172144	0.000000	20.927398	-0.685364	0.000000	0.000000	0.000000	0.000000
32	BEND	4	19.766875	19.766875	22.499019	0.000000	22.643803	-0.859897	0.000000	0.000000	0.000000	0.000000
33	S10	1	20.766875	20.766875	21.741244	0.000000	23.296319	-0.859897	0.000000	0.000000	0.000000	0.000000
34	QF	5	21.018750	21.018750	21.550379	0.000000	23.460671	-0.859897	0.000000	0.000000	0.000000	0.000000
35	QF	6	21.270625	21.270625	21.359514	0.000000	23.625024	-0.859897	0.000000	0.000000	0.000000	0.000000
36	S32H	2	24.520625	24.520625	18.896745	0.000000	25.745700	-0.859897	0.000000	0.000000	0.000000	0.000000

TABLE III (CONTINUES)

AGS BOOSTER LATTICE FOR SURVEY SURVEY OF BEAM LINE "RING", ZOHREH PARSA "MAD" VERSION: 6.01/03 RUN: 21-NOV-8 10:18:00 P

POS. NO.	ELEMENT NAME	ELEMENT OCC. NO.	SEQUENCE SUM(L) M	ARC M	I I	X M	POSITIONS		Z M	I I	THETA RAD	ANGLES		PSI RAD
							Y M					PHI RAD		
37	CT	5	24.620625	24.620625	24.620625	18.820968	0.000000	0.000000	25.810951	-0.859897	-0.859897	0.000000	0.000000	0.000000
38	S3H	2	24.970625	24.970625	24.970625	18.555746	0.000000	0.000000	26.039332	-0.859897	-0.859897	0.000000	0.000000	0.000000
39	QD	6	25.222500	25.222500	25.222500	18.364882	0.000000	0.000000	26.203684	-0.859897	-0.859897	0.000000	0.000000	0.000000
40	QD	7	25.474375	25.474375	25.474375	18.174017	0.000000	0.000000	26.368037	-0.859897	-0.859897	0.000000	0.000000	0.000000
41	S3	5	25.774375	25.774375	25.774375	17.946685	0.000000	0.000000	26.563791	-1.034430	-1.034430	0.000000	0.000000	0.000000
42	BEND	5	28.174375	28.174375	28.174375	16.000927	0.000000	0.000000	27.963585	-1.034430	-1.034430	0.000000	0.000000	0.000000
43	S5H	4	28.724375	28.724375	28.724375	15.528163	0.000000	0.000000	28.244644	-1.034430	-1.034430	0.000000	0.000000	0.000000
44	CT	6	28.824375	28.824375	28.824375	15.442206	0.000000	0.000000	28.295746	-1.034430	-1.034430	0.000000	0.000000	0.000000
45	SXF	2	28.924375	28.924375	28.924375	15.356249	0.000000	0.000000	28.346847	-1.034430	-1.034430	0.000000	0.000000	0.000000
46	S2H	4	29.174375	29.174375	29.174375	15.141356	0.000000	0.000000	28.474601	-1.034430	-1.034430	0.000000	0.000000	0.000000
47	QF	7	29.426250	29.426250	29.426250	14.924852	0.000000	0.000000	28.603314	-1.034430	-1.034430	0.000000	0.000000	0.000000
48	QF	8	29.678125	29.678125	29.678125	14.708347	0.000000	0.000000	28.732026	-1.034430	-1.034430	0.000000	0.000000	0.000000
49	S3	6	29.978125	29.978125	29.978125	14.450476	0.000000	0.000000	28.885331	-1.208963	-1.208963	0.000000	0.000000	0.000000
50	BEND	6	32.378125	32.378125	32.378125	12.291208	0.000000	0.000000	29.925981	-1.208963	-1.208963	0.000000	0.000000	0.000000
51	S5H	5	32.928125	32.928125	32.928125	11.776821	0.000000	0.000000	30.120676	-1.208963	-1.208963	0.000000	0.000000	0.000000
52	CT	7	33.028125	33.028125	33.028125	11.683296	0.000000	0.000000	30.156075	-1.208963	-1.208963	0.000000	0.000000	0.000000
53	S3H	3	33.378125	33.378125	33.378125	11.355958	0.000000	0.000000	30.279971	-1.208963	-1.208963	0.000000	0.000000	0.000000
54	QD	8	33.630000	33.630000	33.630000	10.884827	0.000000	0.000000	30.369132	-1.208963	-1.208963	0.000000	0.000000	0.000000
55	QD	9	33.881875	33.881875	33.881875	10.604252	0.000000	0.000000	30.458293	-1.208963	-1.208963	0.000000	0.000000	0.000000
56	S3	7	34.181875	34.181875	34.181875	8.297081	0.000000	0.000000	30.564490	-1.383495	-1.383495	0.000000	0.000000	0.000000
57	BEND	7	36.581875	36.581875	36.581875	7.756700	0.000000	0.000000	31.214378	-1.383495	-1.383495	0.000000	0.000000	0.000000
58	S5H	6	37.131875	37.131875	37.131875	7.658449	0.000000	0.000000	31.316792	-1.383495	-1.383495	0.000000	0.000000	0.000000
59	CT	8	37.231875	37.231875	37.231875	7.560198	0.000000	0.000000	31.335413	-1.383495	-1.383495	0.000000	0.000000	0.000000
60	SXF	3	37.331875	37.331875	37.331875	7.560198	0.000000	0.000000	31.354034	-1.383495	-1.383495	0.000000	0.000000	0.000000
61	S2H	5	37.581875	37.581875	37.581875	7.314570	0.000000	0.000000	31.400586	-1.383495	-1.383495	0.000000	0.000000	0.000000
62	QF	9	37.833750	37.833750	37.833750	7.067100	0.000000	0.000000	31.447487	-1.383495	-1.383495	0.000000	0.000000	0.000000
63	QF	10	38.085625	38.085625	38.085625	6.819631	0.000000	0.000000	31.494388	-1.383495	-1.383495	0.000000	0.000000	0.000000
64	S3	8	38.385625	38.385625	38.385625	6.524877	0.000000	0.000000	31.550250	-1.558028	-1.558028	0.000000	0.000000	0.000000
65	BEND	8	40.785625	40.785625	40.785625	4.139905	0.000000	0.000000	31.789628	-1.558028	-1.558028	0.000000	0.000000	0.000000
66	S5H	7	41.335625	41.335625	41.335625	3.589950	0.000000	0.000000	31.796650	-1.558028	-1.558028	0.000000	0.000000	0.000000
67	CT	9	41.435625	41.435625	41.435625	3.489958	0.000000	0.000000	31.797927	-1.558028	-1.558028	0.000000	0.000000	0.000000
68	SXD	3	41.535625	41.535625	41.535625	3.389967	0.000000	0.000000	31.799204	-1.558028	-1.558028	0.000000	0.000000	0.000000
69	S2H	6	41.785625	41.785625	41.785625	3.139987	0.000000	0.000000	31.802396	-1.558028	-1.558028	0.000000	0.000000	0.000000
70	QD	10	42.037500	42.037500	42.037500	2.888132	0.000000	0.000000	31.805612	-1.558028	-1.558028	0.000000	0.000000	0.000000
71	QD	11	42.289375	42.289375	42.289375	2.636278	0.000000	0.000000	31.808827	-1.558028	-1.558028	0.000000	0.000000	0.000000
72	S32H	3	45.539375	45.539375	45.539375	-0.613457	0.000000	0.000000	31.850322	-1.558028	-1.558028	0.000000	0.000000	0.000000
73	CT	10	45.639375	45.639375	45.639375	-0.713449	0.000000	0.000000	31.851599	-1.558028	-1.558028	0.000000	0.000000	0.000000

TABLE III (CONTINUES)

AGS BOOSTER LATTICE FOR SURVEY
 SURVEY OF BEAM LINE "RING",
 ZOHREH PARSA
 "MAD" VERSION: 6.01/03 RUN: 21-NOV-8 10:18:00
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POS. NO.	E L E M E N T ELEMENT OCC. NAME NO.	S E Q U E N C E		I I	P O S I T I O N S			I I	A N G L E S		
		SUM(L) M	ARC M		X M	Y M	Z M		THETA RAD	PHI RAD	PSI RAD
74	S3H	45.989375	45.989375		-1.063420	0.000000	31.856067		-1.558028	0.000000	0.000000
75	QF	46.241250	46.241250		-1.315275	0.000000	31.859283		-1.558028	0.000000	0.000000
76	QF	46.493125	46.493125		-1.567129	0.000000	31.862499		-1.558028	0.000000	0.000000
77	S3	46.793125	46.793125		-1.867105	0.000000	31.866329		-1.558028	0.000000	0.000000
78	BEND	49.193125	49.193125		-4.257411	0.000000	31.687925		-1.732561	0.000000	0.000000
79	S5H	49.743125	49.743125		-4.800231	0.000000	31.599342		-1.732561	0.000000	0.000000
80	CT	49.843125	49.843125		-4.898925	0.000000	31.583236		-1.732561	0.000000	0.000000
81	SXD	49.943125	49.943125		-4.997620	0.000000	31.567130		-1.732561	0.000000	0.000000
82	S2H	50.193125	50.193125		-5.244356	0.000000	31.526864		-1.732561	0.000000	0.000000
83	QD	50.445000	50.445000		-5.492943	0.000000	31.486297		-1.732561	0.000000	0.000000
84	QD	50.696875	50.696875		-5.741529	0.000000	31.445730		-1.732561	0.000000	0.000000
85	S3	50.996875	50.996875		-6.037613	0.000000	31.397412		-1.732561	0.000000	0.000000
86	BEND	53.396875	53.396875		-8.360625	0.000000	30.806646		-1.907094	0.000000	0.000000
87	S5H	53.946875	53.946875		-8.879816	0.000000	30.625149		-1.907094	0.000000	0.000000
88	CT	54.046875	54.046875		-8.974214	0.000000	30.592149		-1.907094	0.000000	0.000000
89	S3H	54.396875	54.396875		-9.304608	0.000000	30.476651		-1.907094	0.000000	0.000000
90	QF	54.648750	54.648750		-9.542374	0.000000	30.393534		-1.907094	0.000000	0.000000
91	QF	54.900625	54.900625		-9.780139	0.000000	30.310416		-1.907094	0.000000	0.000000
92	S32H	58.150625	58.150625		-12.848084	0.000000	29.237933		-1.907094	0.000000	0.000000
93	CT	58.250625	58.250625		-12.942482	0.000000	29.204934		-1.907094	0.000000	0.000000
94	S3H	58.600625	58.600625		-13.272876	0.000000	29.089436		-1.907094	0.000000	0.000000
95	QD	58.852500	58.852500		-13.510641	0.000000	29.006318		-1.907094	0.000000	0.000000
96	QD	59.104375	59.104375		-13.748407	0.000000	28.923201		-1.907094	0.000000	0.000000
97	S3	59.404375	59.404375		-14.031602	0.000000	28.824200		-1.907094	0.000000	0.000000
98	BEND	61.804375	61.804375		-16.216737	0.000000	27.839024		-2.081627	0.000000	0.000000
99	S5H	62.354375	62.354375		-16.696524	0.000000	27.570128		-2.081627	0.000000	0.000000
100	CT	62.454375	62.454375		-16.783757	0.000000	27.521238		-2.081627	0.000000	0.000000
101	SXF	62.554375	62.554375		-16.870991	0.000000	27.472348		-2.081627	0.000000	0.000000
102	S2H	62.804375	62.804375		-17.089076	0.000000	27.350122		-2.081627	0.000000	0.000000
103	QF	63.056250	63.056250		-17.308796	0.000000	27.226980		-2.081627	0.000000	0.000000
104	QF	63.308125	63.308125		-17.528517	0.000000	27.103838		-2.081627	0.000000	0.000000
105	S3	63.608125	63.608125		-17.790218	0.000000	26.957167		-2.081627	0.000000	0.000000
106	BEND	66.008125	66.008125		-19.771082	0.000000	25.607511		-2.256160	0.000000	0.000000
107	S5H	66.558125	66.558125		-20.196886	0.000000	25.259386		-2.256160	0.000000	0.000000
108	CT	66.658125	66.658125		-20.274305	0.000000	25.196090		-2.256160	0.000000	0.000000
109	S3H	67.008125	67.008125		-20.545271	0.000000	24.974556		-2.256160	0.000000	0.000000
110	QD	67.260000	67.260000		-20.740270	0.000000	24.815131		-2.256160	0.000000	0.000000

TABLE III (CONTINUES)

AGS BOOSTER LATTICE FOR SURVEY
SURVEY OF BEAM LINE "RING",
ZOHREH PARSA
"MAD" VERSION: 6.01/03
RUN: 21-NOV-8
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POS. NO.	E L E M E N T ELEMENT OCC. NAME NO.	S E Q U E N C E SUM(L) M	A R C M	I I	P O S I T I O N S			I I	A N G L E S			P S I RAD
					X M	Y M	Z M		T H E T A RAD	P H I RAD		
111	QD	17	67.511875	67.511875	-20.935268	0.000000	24.655705	-2.256160	0.000000	0.000000	0.000000	
112	S3	13	67.811875	67.811875	-21.167525	0.000000	24.465819	-2.256160	0.000000	0.000000	0.000000	
113	BEND	13	70.211875	70.211875	-22.883930	0.000000	22.792694	-2.430693	0.000000	0.000000	0.000000	
114	S5H	12	70.761875	70.761875	-23.242814	0.000000	22.375917	-2.430693	0.000000	0.000000	0.000000	
115	CT	16	70.861875	70.861875	-23.308065	0.000000	22.300140	-2.430693	0.000000	0.000000	0.000000	
116	SXF	5	70.961875	70.961875	-23.373317	0.000000	22.224362	-2.430693	0.000000	0.000000	0.000000	
117	S2H	9	71.211875	71.211875	-23.536446	0.000000	22.034919	-2.430693	0.000000	0.000000	0.000000	
118	QF	17	71.463750	71.463750	-23.700798	0.000000	21.844054	-2.430693	0.000000	0.000000	0.000000	
119	QF	18	71.715625	71.715625	-23.865150	0.000000	21.653189	-2.430693	0.000000	0.000000	0.000000	
120	S3	14	72.015625	72.015625	-24.060905	0.000000	21.425857	-2.430693	0.000000	0.000000	0.000000	
121	BEND	14	74.415625	74.415625	-25.460699	0.000000	19.480100	-2.605226	0.000000	0.000000	0.000000	
122	S5H	13	74.965625	74.965625	-25.741758	0.000000	19.007335	-2.605226	0.000000	0.000000	0.000000	
123	CT	17	75.065625	75.065625	-25.792859	0.000000	18.921378	-2.605226	0.000000	0.000000	0.000000	
124	SXD	5	75.165625	75.165625	-25.843961	0.000000	18.835421	-2.605226	0.000000	0.000000	0.000000	
125	S2H	10	75.415625	75.415625	-25.971715	0.000000	18.620529	-2.605226	0.000000	0.000000	0.000000	
126	QD	18	75.667500	75.667500	-26.00427	0.000000	18.404024	-2.605226	0.000000	0.000000	0.000000	
127	QD	19	75.919375	75.919375	-26.229140	0.000000	18.187520	-2.605226	0.000000	0.000000	0.000000	
128	S32H	5	79.169375	79.169375	-27.889943	0.000000	15.393914	-2.605226	0.000000	0.000000	0.000000	
129	CT	18	79.269375	79.269375	-27.941044	0.000000	15.307957	-2.605226	0.000000	0.000000	0.000000	
130	S3H	8	79.619375	79.619375	-28.119900	0.000000	15.007107	-2.605226	0.000000	0.000000	0.000000	
131	QF	19	79.871250	79.871250	-28.248612	0.000000	14.790602	-2.605226	0.000000	0.000000	0.000000	
132	QF	20	80.123125	80.123125	-28.377324	0.000000	14.574098	-2.605226	0.000000	0.000000	0.000000	
133	S3	15	80.423125	80.423125	-28.530629	0.000000	14.316227	-2.605226	0.000000	0.000000	0.000000	
134	BEND	15	82.823125	82.823125	-29.571280	0.000000	12.156958	-2.779759	0.000000	0.000000	0.000000	
135	S5H	14	83.373125	83.373125	-29.765974	0.000000	11.642571	-2.779759	0.000000	0.000000	0.000000	
136	CT	19	83.473125	83.473125	-29.801373	0.000000	11.549046	-2.779759	0.000000	0.000000	0.000000	
137	SXD	6	83.573125	83.573125	-29.836772	0.000000	11.455521	-2.779759	0.000000	0.000000	0.000000	
138	S2H	11	83.823125	83.823125	-29.925269	0.000000	11.221709	-2.779759	0.000000	0.000000	0.000000	
139	QD	20	84.075000	84.075000	-30.014431	0.000000	10.986143	-2.779759	0.000000	0.000000	0.000000	
140	QD	21	84.326875	84.326875	-30.103592	0.000000	10.750577	-2.779759	0.000000	0.000000	0.000000	
141	S3	16	84.626875	84.626875	-30.209789	0.000000	10.470002	-2.779759	0.000000	0.000000	0.000000	
142	BEND	16	87.026875	87.026875	-30.859676	0.000000	8.162831	-2.954292	0.000000	0.000000	0.000000	
143	S10	2	88.026875	88.026875	-31.045884	0.000000	7.180321	-2.954292	0.000000	0.000000	0.000000	
144	QF	21	88.278750	88.278750	-31.092785	0.000000	6.932851	-2.954292	0.000000	0.000000	0.000000	
145	QF	22	88.530625	88.530625	-31.139686	0.000000	6.685381	-2.954292	0.000000	0.000000	0.000000	
146	S32H	6	91.780625	91.780625	-31.744861	0.000000	3.492222	-2.954292	0.000000	0.000000	0.000000	
147	CT	20	91.880625	91.880625	-31.763482	0.000000	3.393971	-2.954292	0.000000	0.000000	0.000000	

TABLE III (CONTINUES)

AGS BOOSTER LATTICE FOR SURVEY
SURVEY OF BEAM LINE "RING",
ZOHREH PARSA
"MAD" VERSION: 6.01/03 RUN: 21-NOV-8 10:18:00
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POS. NO.	E L E M E N T ELEMENT OCC. NAME NO.	S E Q U E N C E SUM(L) M	A R C M	I I	X M	P O S I T I O N S			I I	T H E T A RAD	A N G L E S		P S I RAD
						Y M	Z M				PHI RAD		
148	S3H	9	92.230625	92.230625	-31.828654	0.000000	3.050093			-2.954292	0.000000	0.000000	0.000000
149	QD	22	92.482500	92.482500	-31.875555	0.000000	2.802623			-2.954292	0.000000	0.000000	0.000000
150	QD	23	92.734375	92.734375	-31.922456	0.000000	2.555153			-2.954292	0.000000	0.000000	0.000000
151	S3	17	93.034375	93.034375	-31.978319	0.000000	2.260400			-2.954292	0.000000	0.000000	0.000000
152	BEND	17	95.434375	95.434375	-32.217697	0.000000	-0.124572			-3.128825	0.000000	0.000000	0.000000
153	S5H	15	95.984375	95.984375	-32.224719	0.000000	-0.674527			-3.128825	0.000000	0.000000	0.000000
154	CT	21	96.084375	96.084375	-32.225996	0.000000	-0.774519			-3.128825	0.000000	0.000000	0.000000
155	SXF	6	96.184375	96.184375	-32.227273	0.000000	-0.874511			-3.128825	0.000000	0.000000	0.000000
156	S2H	12	96.434375	96.434375	-32.230455	0.000000	-1.124491			-3.128825	0.000000	0.000000	0.000000
157	QF	23	96.686250	96.686250	-32.233680	0.000000	-1.376345			-3.128825	0.000000	0.000000	0.000000
158	QF	24	96.938125	96.938125	-32.236896	0.000000	-1.628200			-3.128825	0.000000	0.000000	0.000000
159	S3	18	97.238125	97.238125	-32.240726	0.000000	-1.928175			-3.128825	0.000000	0.000000	0.000000
160	BEND	18	99.638125	99.638125	-32.062322	0.000000	-4.318482			-3.303358	0.000000	0.000000	0.000000
161	S10	3	100.638125	100.638125	-31.901262	0.000000	-5.305426			-3.303358	0.000000	0.000000	0.000000
162	QD	24	100.890000	100.890000	-31.860694	0.000000	-5.554013			-3.303358	0.000000	0.000000	0.000000
163	QD	25	101.141875	101.141875	-31.820127	0.000000	-5.802600			-3.303358	0.000000	0.000000	0.000000
164	S3	19	101.441875	101.441875	-31.771809	0.000000	-6.098683			-3.303358	0.000000	0.000000	0.000000
165	BEND	19	103.841875	103.841875	-31.181043	0.000000	-8.421696			-3.477891	0.000000	0.000000	0.000000
166	S5H	16	104.391875	104.391875	-30.995546	0.000000	-8.940886			-3.477891	0.000000	0.000000	0.000000
167	CT	22	104.491875	104.491875	-30.965546	0.000000	-9.035284			-3.477891	0.000000	0.000000	0.000000
168	SXF	7	104.591875	104.591875	-30.933547	0.000000	-9.129683			-3.477891	0.000000	0.000000	0.000000
169	S2H	13	104.841875	104.841875	-30.851048	0.000000	-9.365678			-3.477891	0.000000	0.000000	0.000000
170	QF	25	105.093750	105.093750	-30.767931	0.000000	-9.603444			-3.477891	0.000000	0.000000	0.000000
171	QF	26	105.345625	105.345625	-30.684813	0.000000	-9.841210			-3.477891	0.000000	0.000000	0.000000
172	S3	20	105.645625	105.645625	-30.585815	0.000000	-10.124405			-3.477891	0.000000	0.000000	0.000000
173	BEND	20	108.045625	108.045625	-29.600636	0.000000	-12.309540			-3.652424	0.000000	0.000000	0.000000
174	S5H	17	108.595625	108.595625	-29.331740	0.000000	-12.789326			-3.652424	0.000000	0.000000	0.000000
175	CT	23	108.695625	108.695625	-29.282850	0.000000	-12.876560			-3.652424	0.000000	0.000000	0.000000
176	SXD	7	108.795625	108.795625	-29.233960	0.000000	-12.963794			-3.652424	0.000000	0.000000	0.000000
177	S2H	14	109.045625	109.045625	-29.111734	0.000000	-13.181879			-3.652424	0.000000	0.000000	0.000000
178	QD	26	109.297500	109.297500	-28.988592	0.000000	-13.401599			-3.652424	0.000000	0.000000	0.000000
179	QD	27	109.549375	109.549375	-28.865450	0.000000	-13.621319			-3.652424	0.000000	0.000000	0.000000
180	S32H	7	112.799375	112.799375	-27.276518	0.000000	-16.456420			-3.652424	0.000000	0.000000	0.000000
181	CT	24	112.899375	112.899375	-27.227627	0.000000	-16.543654			-3.652424	0.000000	0.000000	0.000000
182	S3H	10	113.249375	113.249375	-27.056512	0.000000	-16.848972			-3.652424	0.000000	0.000000	0.000000
183	QF	27	113.501250	113.501250	-26.933369	0.000000	-17.068692			-3.652424	0.000000	0.000000	0.000000

TABLE III (CONTINUES)

AGS BOOSTER LATTICE FOR SURVEY
SURVEY OF BEAM LINE "RING",
ZOHREH PARSA
"MAD" VERSION: 6.01/03
RUN: 21-NOV-8
10.18:00
PAGE 6

POS. NO.	ELEMENT NAME	ELEMENT OCC. NO.	SEQUENCE		ANGLE		POSITION		THETA		ANGLE		PSI	
			SUM(L)	M	ARC	I	X	M	Z	M	I	I	PHI	RAD
184	QF	28	113.753125		113.753125	-26.810227	-17.288413	-3.652424	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
185	S3	21	114.053125		114.053125	-26.663557	-17.550114	-3.652424	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
186	BEND	21	116.453125		116.453125	-25.313900	-19.530978	-3.826956	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
187	S5H	18	117.003125		117.003125	-24.965775	-19.956782	-3.826956	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
188	CT	25	117.103125		117.103125	-24.902480	-20.034201	-3.826956	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
189	SXD	8	117.203125		117.203125	-24.839184	-20.111620	-3.826956	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
190	S2H	15	117.453125		117.453125	-24.680946	-20.305167	-3.826956	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
191	QD	28	117.705000		117.705000	-24.521520	-20.500155	-3.826956	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
192	QD	29	117.956875		117.956875	-24.362095	-20.695165	-3.826956	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
193	S3	22	118.256875		118.256875	-24.172208	-20.927421	-3.826956	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
194	BEND	22	120.656875		120.656875	-22.499083	-22.643826	-4.001489	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
195	S5H	19	121.206875		121.206875	-22.082307	-23.002710	-4.001489	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
196	CT	26	121.306875		121.306875	-22.006529	-23.067961	-4.001489	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
197	S3H	11	121.656875		121.656875	-21.741308	-23.296342	-4.001489	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
198	QF	29	121.908750		121.908750	-21.550444	-23.460694	-4.001489	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
199	QF	30	122.160625		122.160625	-21.359579	-23.625047	-4.001489	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
200	S32H	8	125.410625		125.410625	-18.896810	-25.745723	-4.001489	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
201	CT	27	125.510625		125.510625	-18.821032	-25.810974	-4.001489	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
202	S3H	12	125.860625		125.860625	-18.555811	-26.039355	-4.001489	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
203	QD	30	126.112500		126.112500	-18.364946	-26.203707	-4.001489	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
204	QD	31	126.364375		126.364375	-18.174082	-26.368060	-4.001489	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
205	S3	23	126.664375		126.664375	-17.946749	-26.563814	-4.001489	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
206	BEND	23	129.064375		129.064375	-16.000992	-27.963608	-4.176022	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
207	S5H	20	129.614375		129.614375	-15.528228	-28.244667	-4.176022	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
208	CT	28	129.714375		129.714375	-15.442271	-28.295769	-4.176022	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
209	SXF	8	129.814375		129.814375	-15.356314	-28.346870	-4.176022	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
210	S2H	16	130.064375		130.064375	-15.141421	-28.474624	-4.176022	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
211	QF	31	130.316250		130.316250	-14.924916	-28.603336	-4.176022	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
212	QF	32	130.568125		130.568125	-14.708412	-28.732049	-4.176022	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
213	S3	24	130.868125		130.868125	-14.450541	-28.865354	-4.176022	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
214	BEND	24	133.268125		133.268125	-12.291272	-29.926004	-4.350555	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
215	S5H	21	133.818125		133.818125	-11.776885	-30.120698	-4.350555	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
216	CT	29	133.918125		133.918125	-11.683360	-30.156097	-4.350555	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
217	S3H	13	134.268125		134.268125	-11.356023	-30.279994	-4.350555	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
218	QD	32	134.520000		134.520000	-11.120457	-30.369155	-4.350555	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
219	QD	33	134.771875		134.771875	-10.884891	-30.458316	-4.350555	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

TABLE III (CONTINUES)

AGS BOOSTER LATTICE FOR SURVEY
SURVEY OF BEAM LINE "RING".

ZOHREH PARSA

"MAD" VERSION: 6.01/03 RUN: 21-NOV-8 10:18:00

PAG 7

POS. NO.	E L E M E N T ELEMENT OCC. NAME NO.	S E Q U E N C E SUM(L) M	A R C M	I I	P O S I T I O N S			I I	A N G L E S			PSI RAD
					X M	Y M	Z M		THETA RAD	PHI RAD		
220	S3	135.071875	135.071875	-10.604316	0.000000	-30.564513	-4.350555	0.000000	0.000000	0.000000	0.000000	
221	BEND	137.471875	137.471875	-8.297145	0.000000	-31.214401	-4.525088	0.000000	0.000000	0.000000	0.000000	
222	S5H	138.021875	138.021875	-7.756764	0.000000	-31.316815	-4.525088	0.000000	0.000000	0.000000	0.000000	
223	CT	138.121875	138.121875	-7.658513	0.000000	-31.335436	-4.525088	0.000000	0.000000	0.000000	0.000000	
224	SXF	138.221875	138.221875	-7.560262	0.000000	-31.354056	-4.525088	0.000000	0.000000	0.000000	0.000000	
225	S2H	138.471875	138.471875	-7.314635	0.000000	-31.400608	-4.525088	0.000000	0.000000	0.000000	0.000000	
226	QF	138.723750	138.723750	-7.067165	0.000000	-31.447509	-4.525088	0.000000	0.000000	0.000000	0.000000	
227	QF	138.975625	138.975625	-6.819695	0.000000	-31.494410	-4.525088	0.000000	0.000000	0.000000	0.000000	
228	S3	139.275625	139.275625	-6.524942	0.000000	-31.550273	-4.525088	0.000000	0.000000	0.000000	0.000000	
229	BEND	141.675625	141.675625	-4.139970	0.000000	-31.789651	-4.699621	0.000000	0.000000	0.000000	0.000000	
230	S5H	142.225625	142.225625	-3.590015	0.000000	-31.796673	-4.699621	0.000000	0.000000	0.000000	0.000000	
231	CT	142.325625	142.325625	-3.490023	0.000000	-31.797950	-4.699621	0.000000	0.000000	0.000000	0.000000	
232	SXD	142.425625	142.425625	-3.390031	0.000000	-31.799227	-4.699621	0.000000	0.000000	0.000000	0.000000	
233	S2H	142.675625	142.675625	-3.140051	0.000000	-31.802419	-4.699621	0.000000	0.000000	0.000000	0.000000	
234	QD	142.927500	142.927500	-2.888197	0.000000	-31.805634	-4.699621	0.000000	0.000000	0.000000	0.000000	
235	QD	143.179375	143.179375	-2.636342	0.000000	-31.808850	-4.699621	0.000000	0.000000	0.000000	0.000000	
236	S32H	146.429375	146.429375	-0.613393	0.000000	-31.850345	-4.699621	0.000000	0.000000	0.000000	0.000000	
237	CT	146.529375	146.529375	0.713384	0.000000	-31.851622	-4.699621	0.000000	0.000000	0.000000	0.000000	
238	S3H	146.879375	146.879375	1.063356	0.000000	-31.856090	-4.699621	0.000000	0.000000	0.000000	0.000000	
239	QF	147.131250	147.131250	1.315210	0.000000	-31.859306	-4.699621	0.000000	0.000000	0.000000	0.000000	
240	QF	147.383125	147.383125	1.567065	0.000000	-31.862522	-4.699621	0.000000	0.000000	0.000000	0.000000	
241	S3	147.683125	147.683125	1.867040	0.000000	-31.866352	-4.699621	0.000000	0.000000	0.000000	0.000000	
242	BEND	150.083125	150.083125	4.257347	0.000000	-31.687948	-4.874154	0.000000	0.000000	0.000000	0.000000	
243	S5H	150.633125	150.633125	4.800166	0.000000	-31.599364	-4.874154	0.000000	0.000000	0.000000	0.000000	
244	CT	150.733125	150.733125	4.898861	0.000000	-31.583258	-4.874154	0.000000	0.000000	0.000000	0.000000	
245	SXD	150.833125	150.833125	4.997555	0.000000	-31.567152	-4.874154	0.000000	0.000000	0.000000	0.000000	
246	S2H	151.083125	151.083125	5.244291	0.000000	-31.526887	-4.874154	0.000000	0.000000	0.000000	0.000000	
247	QD	151.335000	151.335000	5.492878	0.000000	-31.486320	-4.874154	0.000000	0.000000	0.000000	0.000000	
248	QD	151.586875	151.586875	5.741465	0.000000	-31.445753	-4.874154	0.000000	0.000000	0.000000	0.000000	
249	S3	151.886875	151.886875	6.037548	0.000000	-31.397435	-4.874154	0.000000	0.000000	0.000000	0.000000	
250	BEND	154.286875	154.286875	8.360561	0.000000	-30.806668	-5.048687	0.000000	0.000000	0.000000	0.000000	
251	S5H	154.836875	154.836875	8.879751	0.000000	-30.625171	-5.048687	0.000000	0.000000	0.000000	0.000000	
252	CT	154.936875	154.936875	8.974150	0.000000	-30.592172	-5.048687	0.000000	0.000000	0.000000	0.000000	
253	S3H	155.286875	155.286875	9.304544	0.000000	-30.476674	-5.048687	0.000000	0.000000	0.000000	0.000000	
254	QF	155.538750	155.538750	9.542309	0.000000	-30.393556	-5.048687	0.000000	0.000000	0.000000	0.000000	
255	QF	155.790625	155.790625	9.780075	0.000000	-30.310439	-5.048687	0.000000	0.000000	0.000000	0.000000	
256	S32H	159.040625	159.040625	12.848019	0.000000	-29.237956	-5.048687	0.000000	0.000000	0.000000	0.000000	
257	CT	159.140625	159.140625	12.942417	0.000000	-29.204957	-5.048687	0.000000	0.000000	0.000000	0.000000	
258	S3H	159.490625	159.490625	13.272811	0.000000	-29.089459	-5.048687	0.000000	0.000000	0.000000	0.000000	

TABLE III (CONTINUES)

AGS BOOSTER LATTICE FOR SURVEY "RING", ZOHREH PARSA "MAD" VERSION: 6.01/03 RUN: 21-NOV-8 10:18:00
 SURVEY OF BEAM LINE "RING" PAGE 8

POS. NO.	ELEMENT NAME	OCC. NO.	S E Q U E N C E		P O S I T I O N S		I		T H E T A		A N G L E S		PSI RAD
			SUM(L) M	ARC M	I	X	Y	Z	M	I	PHI RAD	THETA RAD	
259	QD	38	159.742500	159.742500	I	13.510577	0.000000	-29.006341	-5.048687	I	0.000000	-5.048687	0.000000
260	QD	39	159.994375	159.994375	I	13.748343	0.000000	-28.923224	-5.048687	I	0.000000	-5.048687	0.000000
261	S3	29	160.294375	160.294375	I	14.031538	0.000000	-28.8024226	-5.048687	I	0.000000	-5.048687	0.000000
262	BEND	29	162.694375	162.694375	I	16.216673	0.000000	-27.839047	-5.223220	I	0.000000	-5.223220	0.000000
263	S5H	26	163.244375	163.244375	I	16.696459	0.000000	-27.570151	-5.223220	I	0.000000	-5.223220	0.000000
264	CT	36	163.344375	163.344375	I	16.783693	0.000000	-27.521261	-5.223220	I	0.000000	-5.223220	0.000000
265	SXF	10	163.444375	163.444375	I	16.870927	0.000000	-27.472370	-5.223220	I	0.000000	-5.223220	0.000000
266	S2H	20	163.694375	163.694375	I	17.069012	0.000000	-27.350145	-5.223220	I	0.000000	-5.223220	0.000000
267	QF	39	163.946250	163.946250	I	17.308732	0.000000	-27.227003	-5.223220	I	0.000000	-5.223220	0.000000
268	QF	40	164.198125	164.198125	I	17.528452	0.000000	-27.103860	-5.223220	I	0.000000	-5.223220	0.000000
269	S3	30	164.498125	164.498125	I	17.790154	0.000000	-26.957190	-5.223220	I	0.000000	-5.223220	0.000000
270	BEND	30	166.898125	166.898125	I	19.771018	0.000000	-25.607534	-5.397753	I	0.000000	-5.397753	0.000000
271	S5H	37	167.448125	167.448125	I	20.196821	0.000000	-25.259409	-5.397753	I	0.000000	-5.397753	0.000000
272	CT	37	167.548125	167.548125	I	20.274240	0.000000	-25.196113	-5.397753	I	0.000000	-5.397753	0.000000
273	S3H	17	167.898125	167.898125	I	20.545206	0.000000	-24.974579	-5.397753	I	0.000000	-5.397753	0.000000
274	QD	40	168.150000	168.150000	I	20.740205	0.000000	-24.815154	-5.397753	I	0.000000	-5.397753	0.000000
275	QD	41	168.401875	168.401875	I	20.935204	0.000000	-24.655728	-5.397753	I	0.000000	-5.397753	0.000000
276	S3	31	168.701875	168.701875	I	21.167461	0.000000	-24.465842	-5.397753	I	0.000000	-5.397753	0.000000
277	BEND	31	171.101875	171.101875	I	22.883865	0.000000	-22.792717	-5.572286	I	0.000000	-5.572286	0.000000
278	S5H	28	171.651875	171.651875	I	23.242749	0.000000	-22.375940	-5.572286	I	0.000000	-5.572286	0.000000
279	CT	38	171.751875	171.751875	I	23.308001	0.000000	-22.300163	-5.572286	I	0.000000	-5.572286	0.000000
280	SXF	11	171.851875	171.851875	I	23.373252	0.000000	-22.224385	-5.572286	I	0.000000	-5.572286	0.000000
281	S2H	21	172.101875	172.101875	I	23.536381	0.000000	-21.844077	-5.572286	I	0.000000	-5.572286	0.000000
282	QF	41	172.353750	172.353750	I	23.700734	0.000000	-21.653212	-5.572286	I	0.000000	-5.572286	0.000000
283	QF	42	172.605625	172.605625	I	23.865086	0.000000	-21.425880	-5.572286	I	0.000000	-5.572286	0.000000
284	S3	32	172.905625	172.905625	I	24.060041	0.000000	-19.480122	-5.746819	I	0.000000	-5.746819	0.000000
285	BEND	32	175.305625	175.305625	I	25.450634	0.000000	-19.007358	-5.746819	I	0.000000	-5.746819	0.000000
286	S5H	29	175.855625	175.855625	I	25.741693	0.000000	-18.921401	-5.746819	I	0.000000	-5.746819	0.000000
287	CT	39	175.955625	175.955625	I	25.792795	0.000000	-18.620551	-5.746819	I	0.000000	-5.746819	0.000000
288	SXD	11	176.055625	176.055625	I	25.843897	0.000000	-18.535444	-5.746819	I	0.000000	-5.746819	0.000000
289	S2H	22	176.305625	176.305625	I	25.971651	0.000000	-18.404047	-5.746819	I	0.000000	-5.746819	0.000000
290	QD	42	176.557500	176.557500	I	26.100363	0.000000	-18.187542	-5.746819	I	0.000000	-5.746819	0.000000
291	QD	43	176.809375	176.809375	I	26.229075	0.000000	-15.007130	-5.746819	I	0.000000	-5.746819	0.000000
292	S37	1	180.509375	180.509375	I	28.119835	0.000000	-14.790625	-5.746819	I	0.000000	-5.746819	0.000000
293	QF	43	180.761250	180.761250	I	28.248548	0.000000			I	0.000000		0.000000

TABLE III (CONTINUES)

AGS BOOSTER LATTICE FOR SURVEY
SURVEY OF BEAM LINE "RING",
"MAD" VERSION: 6.01/03 RUN: 21-NOV-8 10:18:00
ZOHREH PARSA
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POS. NO.	ELEMENT NAME	ELEM NO.	SUM(L) M	S E Q U E N C E		I I	P O S I T I O N S		Z M	I I	A N G L E S		PSI RAD
				ARC M	X M		Y M	M			THETA RAD	PHI RAD	
294	QF	44	181.013125	181.013125	28.377260		0.000000		-14.574121		-5.746819	0.000000	0.000000
295	S3	33	181.313125	181.313125	28.530565		0.000000		-14.316249		-5.746819	0.000000	0.000000
296	BEND	33	183.713125	183.713125	29.571215		0.000000		-12.156981		-5.921352	0.000000	0.000000
297	S5H	30	184.263125	184.263125	29.765910		0.000000		-11.642594		-5.921352	0.000000	0.000000
298	CT	40	184.363125	184.363125	29.801309		0.000000		-11.549069		-5.921352	0.000000	0.000000
299	SXD	12	184.463125	184.463125	29.836708		0.000000		-11.455544		-5.921352	0.000000	0.000000
300	S2H	23	184.713125	184.713125	29.925205		0.000000		-11.221732		-5.921352	0.000000	0.000000
301	QD	44	184.965000	184.965000	30.014366		0.000000		-10.986166		-5.921352	0.000000	0.000000
302	QD	45	185.216875	185.216875	30.103527		0.000000		-10.750600		-5.921352	0.000000	0.000000
303	S3	34	185.516875	185.516875	30.209724		0.000000		-10.470025		-5.921352	0.000000	0.000000
304	BEND	34	187.916875	187.916875	30.859612		0.000000		-8.162854		-6.095884	0.000000	0.000000
305	S5H	31	188.466875	188.466875	30.962026		0.000000		-7.622473		-6.095884	0.000000	0.000000
306	CT	41	188.566875	188.566875	30.980647		0.000000		-7.524222		-6.095884	0.000000	0.000000
307	S3H	18	188.916875	188.916875	31.045820		0.000000		-7.180344		-6.095884	0.000000	0.000000
308	QF	45	189.168750	189.168750	31.092721		0.000000		-6.932874		-6.095884	0.000000	0.000000
309	QF	46	189.420625	189.420625	31.139622		0.000000		-6.685404		-6.095884	0.000000	0.000000
310	S37	2	193.120625	193.120625	31.828590		0.000000		-3.050115		-6.095884	0.000000	0.000000
311	QD	46	193.372500	193.372500	31.875491		0.000000		-2.802646		-6.095884	0.000000	0.000000
312	QD	47	193.624375	193.624375	31.922392		0.000000		-2.555176		-6.095884	0.000000	0.000000
313	S3	35	193.924375	193.924375	31.978254		0.000000		-2.260423		-6.095884	0.000000	0.000000
314	BEND	35	196.324375	196.324375	32.217632		0.000000		0.124549		-6.270417	0.000000	0.000000
315	S5H	32	196.874375	196.874375	32.224655		0.000000		0.674505		-6.270417	0.000000	0.000000
316	CT	42	196.974375	196.974375	32.225931		0.000000		0.774496		-6.270417	0.000000	0.000000
317	SXF	12	197.074375	197.074375	32.227208		0.000000		0.874488		-6.270417	0.000000	0.000000
318	S2H	24	197.324375	197.324375	32.230400		0.000000		1.124468		-6.270417	0.000000	0.000000
319	QF	47	197.576250	197.576250	32.233616		0.000000		1.376322		-6.270417	0.000000	0.000000
320	QF	48	197.828125	197.828125	32.236832		0.000000		1.628177		-6.270417	0.000000	0.000000
321	S3	36	198.128125	198.128125	32.240662		0.000000		1.928152		-6.270417	0.000000	0.000000
322	BEND	36	200.528125	200.528125	32.062258		0.000000		4.318459		-6.444950	0.000000	0.000000
323	S10	4	201.528125	201.528125	31.901197		0.000000		5.305403		-6.444950	0.000000	0.000000
324	QD	48	201.780000	201.780000	31.860630		0.000000		5.553990		-6.444950	0.000000	0.000000

TOTAL LENGTH = 201.780000 ARC LENGTH = 201.780000

ERROR(X) = 0.865636E-10 ERROR(Y) = 0.000000E+00 ERROR(Z) = -0.496590E-09

ERROR(THETA) = 0.155864E-10 ERROR(PHI) = 0.000000E+00 ERROR(PSI) = 0.000000E+00

ZOHREH PARSA 21-NOV-8 10:18:34

*USED BNLDAG: :DUA0:[PARSA1.MAD.MAD6]MAD6.EX

TABLE IV

a - k

LATTICE FUNCTIONS FOR THE AGS - BOOSTER

WITH

$\Delta(P)/P = -.01$ TO $+.01$ with $.002$ increments.

TABLE IV a

AGS BOOSTER LATTICE FOR SURVEY
 LINEAR LATTICE PARAMETERS FOR BEAM LINE: "RING
 DELTA(P)/P = -0.010000 SYMM = F

"MAD" VERSION: 6.01/03 RUN: 19-NOV-8 08:07:18

PAGE 1

ELEMENT SEQUENCE		H O R I Z O N T A L				I		V E R T I C A L				DPY				
POS. NO.	ELEMENT NAME	OCCL NO.	DIST I [M]	BETAX [M]	ALFAX [1]	MUX [2PI]	X(CO) [MM]	PX(CO) [.001]	DX [M]	DPX [1]	BETAY [M]	ALFAY [1]	MUY [2PI]	Y(CO) [MM]	PY(CO) [.001]	DY [M]
BEGIN	RING	1	0.000	3.721	0.018	0.000	-4.957	0.096	0.451-0.005	-0.005	13.368	-0.045	0.000	0.000	0.000	0.000
BEGIN	B4S	1	33.630	3.720	0.018	0.004	-4.957	0.096	0.451-0.005	-0.005	13.375	-0.045	0.804	0.000	0.000	0.000
BEGIN	HCDF	3	33.630	3.720	0.018	0.804	-4.957	0.096	0.451-0.005	-0.005	13.375	-0.045	0.804	0.000	0.000	0.000
55	QD	9	33.882	3.867	-0.603	0.815	-5.024	-0.625	0.458 0.061	0.061	12.915	1.831	0.807	0.000	0.000	0.000
56	S3	7	34.182	4.265	-0.710	0.827	-5.213	-0.625	0.476 0.061	0.061	11.836	1.729	0.811	0.000	0.000	0.000
57	BEND	7	36.582	9.575	-1.466	0.888	-8.755	-2.292	0.831 0.229	0.229	5.412	0.922	0.860	0.000	0.000	0.000
58	S5H	6	37.132	11.305	-1.648	0.897	-10.028	-2.292	0.960 0.229	0.229	4.494	0.732	0.878	0.000	0.000	0.000
59	CT	8	37.232	11.641	-1.682	0.898	-10.260	-2.292	0.983 0.229	0.229	4.350	0.697	0.881	0.000	0.000	0.000
60	SXF	3	37.332	11.986	-1.732	0.899	-10.491	-2.300	1.006 0.230	0.230	4.212	0.668	0.885	0.000	0.000	0.000
61	S2H	5	37.582	12.882	-1.816	0.903	-11.072	-2.300	1.065 0.230	0.230	3.896	0.582	0.895	0.000	0.000	0.000
62	QF	9	37.834	13.350	-0.002	0.906	-11.456	-0.711	1.105 0.077	0.077	3.757	-0.027	0.906	0.000	0.000	0.000
END	HCDF	3	37.834	13.350	-0.002	0.906	-11.456	-0.711	1.105 0.077	0.077	3.757	-0.027	0.906	0.000	0.000	0.000
BEGIN	HCDF	3	37.834	13.350	-0.002	0.906	-11.456	-0.711	1.105 0.077	0.077	3.757	-0.027	0.906	0.000	0.000	0.000
63	QF	10	38.086	12.884	1.812	0.909	-11.432	0.903	1.104-0.079	0.079	3.924	-0.639	0.916	0.000	0.000	0.000
64	S3	8	38.386	11.816	1.711	0.913	-11.158	0.903	1.080-0.079	0.079	4.344	-0.748	0.928	0.000	0.000	0.000
65	BEND	8	40.786	5.313	0.952	0.962	-10.939	-0.722	1.089 0.086	0.086	10.021	-1.590	0.988	0.000	0.000	0.000
66	S5H	7	41.336	4.366	0.753	0.980	-11.340	-0.722	1.137 0.086	0.086	11.896	-1.786	0.996	0.000	0.000	0.000
67	CT	9	41.436	4.217	0.717	0.984	-11.413	-0.722	1.145 0.086	0.086	12.260	-1.821	0.997	0.000	0.000	0.000
68	SXD	3	41.536	4.072	0.718	0.988	-11.483	-0.669	1.153 0.075	0.075	12.643	-1.974	0.999	0.000	0.000	0.000
69	S2H	6	41.786	3.733	0.624	0.998	-11.652	-0.669	1.173 0.075	0.075	13.665	-2.072	1.002	0.000	0.000	0.000
70	QD	10	42.037	3.571	0.020	1.009	-12.038	-2.380	1.214 0.247	0.247	14.221	-0.085	1.005	0.000	0.000	0.000
END	HCDF	3	42.037	3.571	0.020	1.009	-12.038	-2.380	1.214 0.247	0.247	14.221	-0.085	1.005	0.000	0.000	0.000
BEGIN	HCDF	2	42.037	3.571	0.020	1.009	-12.038	-2.380	1.214 0.247	0.247	14.221	-0.085	1.005	0.000	0.000	0.000
71	QD	11	42.289	3.713	-0.582	1.021	-12.870	-4.180	1.300 0.429	0.429	13.749	1.914	1.007	0.000	0.000	0.000
72	S32H	3	45.539	11.418	-1.765	1.105	-26.590	-4.180	2.722 0.429	0.429	4.838	0.800	1.073	0.000	0.000	0.000
73	CT	10	45.639	11.779	-1.802	1.106	-27.012	-4.180	2.766 0.429	0.429	4.680	0.766	1.077	0.000	0.000	0.000
74	S3H	4	45.989	13.098	-1.929	1.111	-28.490	-4.180	2.916 0.429	0.429	4.180	0.646	1.089	0.000	0.000	0.000
75	QF	11	46.241	13.616	-0.084	1.114	-29.039	-0.123	2.976 0.013	0.013	4.017	0.003	1.099	0.000	0.000	0.000
END	HCDF	4	46.241	13.616	-0.084	1.114	-29.039	-0.123	2.976 0.013	0.013	4.017	0.003	1.099	0.000	0.000	0.000
BEGIN	HCDF	4	46.241	13.616	-0.084	1.114	-29.039	-0.123	2.976 0.013	0.013	4.017	0.003	1.099	0.000	0.000	0.000
76	QF	12	46.493	13.181	1.772	1.117	-28.552	3.937	2.926-0.403	0.403	4.178	-0.640	1.109	0.000	0.000	0.000
77	S3	9	46.793	12.136	1.677	1.120	-27.359	3.937	2.802-0.403	0.403	4.597	-0.743	1.120	0.000	0.000	0.000
78	BEND	9	49.193	5.759	0.951	1.167	-19.665	2.413	2.014-0.243	0.243	10.043	-1.502	1.178	0.000	0.000	0.000
79	S5H	8	49.743	4.804	0.768	1.184	-18.325	2.413	1.878-0.243	0.243	11.811	-1.682	1.186	0.000	0.000	0.000
80	CT	11	49.843	4.652	0.734	1.187	-18.061	2.413	1.853-0.243	0.243	12.154	-1.714	1.188	0.000	0.000	0.000
81	SXD	4	49.943	4.501	0.766	1.191	-17.831	2.544	1.827-0.270	0.270	12.522	-1.929	1.189	0.000	0.000	0.000
82	S2H	7	50.193	4.136	0.677	1.200	-17.189	2.544	1.758-0.270	0.270	13.521	-2.025	1.192	0.000	0.000	0.000
83	QD	12	50.445	3.960	0.022	1.210	-16.856	0.084	1.721-0.019	0.019	14.057	-0.059	1.195	0.000	0.000	0.000
END	HCDF	4	50.445	3.960	0.022	1.210	-16.856	0.084	1.721-0.019	0.019	14.057	-0.059	1.195	0.000	0.000	0.000
BEGIN	HCDF	4	50.445	3.960	0.022	1.210	-16.856	0.084	1.721-0.019	0.019	14.057	-0.059	1.195	0.000	0.000	0.000
84	QD	13	50.697	4.113	-0.631	1.220	-17.146	-2.372	1.748 0.232	0.232	13.579	1.915	1.198	0.000	0.000	0.000
85	S3	10	50.997	4.527	-0.733	1.231	-17.865	-2.372	1.819 0.232	0.232	12.450	1.811	1.202	0.000	0.000	0.000
86	BEND	10	53.397	9.925	-1.490	1.290	-25.476	-3.909	2.580 0.391	0.391	5.612	1.009	1.248	0.000	0.000	0.000
87	S5H	9	53.947	11.681	-1.671	1.298	-27.647	-3.909	2.799 0.391	0.391	4.602	0.809	1.266	0.000	0.000	0.000
88	CT	12	54.047	12.022	-1.703	1.300	-28.042	-3.909	2.839 0.391	0.391	4.443	0.772	1.269	0.000	0.000	0.000
89	S3H	5	54.397	13.267	-1.818	1.304	-29.424	-3.909	2.979 0.391	0.391	3.942	0.645	1.283	0.000	0.000	0.000
90	QF	13	54.649	13.722	0.051	1.307	-29.888	0.273	3.025-0.032	0.032	3.772	0.031	1.293	0.000	0.000	0.000
END	HCDF	1	54.649	13.722	0.051	1.307	-29.888	0.273	3.025-0.032	0.032	3.772	0.031	1.293	0.000	0.000	0.000

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AGS BOOSTER LATTICE FOR SURVEY
LINEAR LATTICE PARAMETERS FOR BEAM LINE: "RING
          DELTA(P)/P = -0.010000 SYMM = F
          ZOHREH PARSA /
"RAD" VERSION: 6.01/03 RUN: 19-NOV-8 08:07:18
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ELEMENT SEQUENCE		I		H O R I Z O N T A L		I		V E R T I C A L		P Y (C O)		D Y				
POS. NO.	ELEMENT NAME	DIST [M]	I	BETAX [M]	ALFAX [1]	MUX [2PI]	X(CO) [MM]	PX(CO) [MM]	DX [M]	DPX [1]	BETAY [M]	ALFAY [1]	MUY [2PI]	Y(CO) [MM]	PV(CO) [MM]	DPY [1]
BEGIN	HCEDO	2	54.649	13.722	0.051	1.307	-29.888	0.273	3.025	-0.032	3.772	0.031	1.293	0.000	0.000	0.000
91	QF	14	54.901	13.216	1.913	1.310	-29.286	4.445	2.963	-0.454	3.910	-0.579	1.304	0.000	0.000	0.000
92	S32H	4	58.151	4.456	0.756	1.380	-14.693	4.445	1.457	-0.454	11.399	-1.702	1.386	0.000	0.000	0.000
93	CT	13	58.251	4.307	0.720	1.384	-14.243	4.445	1.411	-0.454	11.746	-1.737	1.387	0.000	0.000	0.000
94	S3H	6	58.601	3.841	0.596	1.398	-12.673	4.445	1.249	-0.454	13.017	-1.858	1.392	0.000	0.000	0.000
95	QD	14	58.852	3.697	-0.022	1.409	-11.770	2.680	1.155	-0.280	13.487	0.033	1.395	0.000	0.000	0.000
END	HCEDO	2	58.852	3.697	-0.022	1.409	-11.770	2.680	1.155	-0.280	13.487	0.033	1.395	0.000	0.000	0.000
BEGIN	HCDF	4	58.852	3.697	-0.022	1.409	-11.770	2.680	1.155	-0.280	13.487	0.033	1.395	0.000	0.000	0.000
96	QD	15	59.104	3.864	-0.643	1.420	-11.301	1.013	1.104	-0.117	12.984	1.919	1.398	0.000	0.000	0.000
97	S3	11	59.404	4.288	-0.754	1.431	-10.994	1.013	1.068	-0.117	11.854	1.810	1.402	0.000	0.000	0.000
98	BEND	11	61.804	9.907	-1.547	1.492	-10.511	-0.615	0.983	0.047	5.155	0.949	1.452	0.000	0.000	0.000
99	SEH	10	62.354	11.732	-1.738	1.500	-10.853	-0.615	1.010	0.047	4.215	0.744	1.471	0.000	0.000	0.000
100	CT	14	62.454	12.087	-1.772	1.501	-10.915	-0.615	1.015	0.047	4.068	0.707	1.475	0.000	0.000	0.000
101	SXF	4	62.554	12.450	-1.825	1.503	-10.977	-0.623	1.019	0.049	3.928	0.675	1.479	0.000	0.000	0.000
102	S2H	8	62.804	13.394	-1.913	1.506	-11.135	-0.623	1.032	0.049	3.611	0.581	1.489	0.000	0.000	0.000
103	QF	15	63.056	13.893	-0.026	1.509	-11.094	0.944	1.026	-0.096	3.463	0.007	1.501	0.000	0.000	0.000
END	HCDF	4	63.056	13.893	-0.026	1.509	-11.094	0.944	1.026	-0.096	3.463	0.007	1.501	0.000	0.000	0.000
BEGIN	HCDFL	2	63.056	13.893	-0.026	1.509	-11.094	0.944	1.026	-0.096	3.463	0.007	1.501	0.000	0.000	0.000
104	QF	16	63.308	13.419	1.865	1.512	-10.657	2.478	0.983	-0.238	3.604	-0.566	1.512	0.000	0.000	0.000
105	S3	12	63.608	12.320	1.764	1.515	-9.906	2.478	0.910	-0.238	3.981	-0.678	1.525	0.000	0.000	0.000
106	BEND	12	66.008	5.552	1.009	1.562	-5.906	0.821	0.532	-0.071	9.378	-1.549	1.590	0.000	0.000	0.000
107	SEH	11	66.558	4.543	0.807	1.580	-5.446	0.821	0.493	-0.071	11.211	-1.750	1.599	0.000	0.000	0.000
108	CT	15	66.658	4.384	0.770	1.584	-5.363	0.821	0.485	-0.071	11.568	-1.787	1.600	0.000	0.000	0.000
109	S3H	7	67.008	3.885	0.642	1.597	-5.073	0.821	0.460	-0.071	12.876	-1.915	1.605	0.000	0.000	0.000
110	QD	16	67.260	3.719	0.018	1.608	-4.957	0.096	0.451	-0.005	13.381	-0.045	1.608	0.000	0.000	0.000
END	HCDFL	2	67.260	3.719	0.018	1.608	-4.957	0.096	0.451	-0.005	13.381	-0.045	1.608	0.000	0.000	0.000
END	BAS	1	67.260	3.719	0.018	1.608	-4.957	0.096	0.451	-0.005	13.381	-0.045	1.608	0.000	0.000	0.000
END	RING	1	201.780	3.713	0.018	4.828	-4.957	0.096	0.451	-0.005	13.408	-0.045	4.819	0.000	0.000	0.000
TOTAL LENGTH =		201.780000			QX,		=		4.827757		QY,		=		4.818567	
					QX,		=		-0.527747		QY,		=		0.932452	
ALFA		0.401953E-01			BETAX(MAX)		=		13.898436		BETAY(MAX)		=		14.248702	
GAMMA(TR)		4.987779			DX(MAX)		=		3.025205		DY(MAX)		=		0.000000	
					XCO(MAX)		=		29.887657		VCO(MAX)		=		0.000000	
					XCO(R.M.S.)		=		16.743038		YCO(R.M.S.)		=		0.000000	

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... SEARCHING FOR CLOSED ORBIT FOR BEAM LINE "RING
      ", DELTA(P)/P = -0.008000, SYMM = F

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ITER.	X	PX	Y	PY	ERROR
1	-0.004048	0.000078	0.000000	0.000000	0.203318E-02
2	-0.004037	0.000085	0.000000	0.000000	0.277075E-04
3	-0.004037	0.000085	0.000000	0.000000	0.621002E-09

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TABLE IV b

AGS BOOSTER LATTICE FOR SURVEY
 LINEAR LATTICE PARAMETERS FOR BEAM LINE: "RING
 DELTA(P)/P = -0.008000 SYMM = F

"MAD" VERSION: 6.01/03 RUN: 19-NOV-8 08:07:18

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POS. NO.	ELEMENT NAME	SEQUENCE NO.	DIST I [M]	H O R I Z O N T A L				I DPX [1]	I BETAY [M]	ALFAY [1]	MUY [2PI]	V E R T I C A L			DPY [1]
				MUX [2PI]	X(CO) [MM]	PX(CO) [.001]	DX [M]					Y(CO) [MM]	PY(CO) [.001]	DY [M]	
BEGIN	RING	1	0.000	3.706	0.016	0.000	-4.037	0.085	0.469-0.007	13.418	-0.035	0.000	0.000	0.000	0.000
BEGIN	B4S	1	33.630	3.706	0.016	0.804	-4.037	0.085	0.469-0.007	13.423	-0.035	0.804	0.000	0.000	0.000
BEGIN	HCDF	3	33.630	3.706	0.016	0.804	-4.037	0.085	0.469-0.007	13.423	-0.035	0.804	0.000	0.000	0.000
55	QD	9	33.882	3.853	-0.603	0.814	-4.090	-0.503	0.476-0.062	12.957	1.847	0.807	0.000	0.000	0.000
56	S3	7	34.182	4.250	-0.710	0.826	-4.242	-0.503	0.495-0.062	11.871	1.744	0.811	0.000	0.000	0.000
57	BEND	7	36.582	9.551	-1.465	0.888	-7.074	-1.834	0.849-0.229	5.407	0.928	0.860	0.000	0.000	0.000
58	S5H	6	37.132	11.277	-1.647	0.897	-8.091	-1.834	0.977-0.229	4.484	0.737	0.878	0.000	0.000	0.000
59	CT	8	37.332	11.612	-1.681	0.898	-8.276	-1.834	1.001-0.229	4.339	0.703	0.882	0.000	0.000	0.000
60	SXF	3	37.332	11.956	-1.727	0.899	-8.461	-1.839	1.024-0.230	4.280	0.673	0.885	0.000	0.000	0.000
61	S2H	5	37.582	12.848	-1.811	0.903	-8.925	-1.839	1.082-0.230	3.883	0.585	0.895	0.000	0.000	0.000
62	QF	9	37.834	13.314	-0.003	0.906	-9.230	-0.559	1.121-0.075	3.742	-0.021	0.906	0.000	0.000	0.000
END	HCDF	3	37.834	13.314	-0.003	0.906	-9.230	-0.559	1.121-0.075	3.742	-0.021	0.906	0.000	0.000	0.000
BEGIN	HCDF	3	37.834	13.314	-0.003	0.906	-9.230	-0.559	1.121-0.075	3.742	-0.021	0.906	0.000	0.000	0.000
63	QF	10	38.086	12.850	1.807	0.909	-9.207	0.741	1.200-0.083	3.905	-0.631	0.917	0.000	0.000	0.000
64	S3	8	38.386	11.788	1.706	0.913	-8.983	0.741	1.095-0.083	4.320	-0.739	0.928	0.000	0.000	0.000
65	BEND	8	40.786	5.304	0.953	0.962	-8.759	-0.556	1.091-0.080	9.947	-1.583	0.988	0.000	0.000	0.000
66	S5H	7	41.336	4.358	0.754	0.980	-9.067	-0.556	1.136-0.080	11.811	-1.779	0.997	0.000	0.000	0.000
67	CT	9	41.436	4.210	0.717	0.984	-9.123	-0.556	1.144-0.080	12.173	-1.814	0.998	0.000	0.000	0.000
68	SXD	3	41.536	4.066	0.711	0.988	-9.178	-0.522	1.152-0.072	12.551	-1.943	0.999	0.000	0.000	0.000
69	S2H	6	41.786	3.731	0.618	0.998	-9.309	-0.522	1.170-0.072	13.555	-2.039	1.002	0.000	0.000	0.000
70	QD	10	42.037	3.572	0.014	1.009	-9.615	-1.889	1.210-0.244	14.097	-0.068	1.005	0.000	0.000	0.000
END	HCDF	3	42.037	3.572	0.014	1.009	-9.615	-1.889	1.210-0.244	14.097	-0.068	1.005	0.000	0.000	0.000
BEGIN	HCDF	3	42.037	3.572	0.014	1.009	-9.615	-1.889	1.210-0.244	14.097	-0.068	1.005	0.000	0.000	0.000
71	QD	2	42.289	3.717	-0.589	1.020	-10.275	-3.326	1.295-0.425	13.623	1.912	1.008	0.000	0.000	0.000
72	S32H	11	45.539	11.461	-1.775	1.104	-21.171	-3.326	2.697-0.425	4.762	0.792	1.075	0.000	0.000	0.000
73	CT	3	45.639	11.822	-1.812	1.106	-21.506	-3.326	2.740-0.425	4.605	0.758	1.078	0.000	0.000	0.000
74	S3H	4	45.989	13.146	-1.939	1.110	-22.680	-3.326	2.891-0.425	4.114	0.637	1.091	0.000	0.000	0.000
75	QF	11	46.241	13.666	-0.088	1.113	-23.116	-0.097	2.947-0.013	3.954	0.002	1.101	0.000	0.000	0.000
END	HCDF	2	46.241	13.666	-0.088	1.113	-23.116	-0.097	2.947-0.013	3.954	0.002	1.101	0.000	0.000	0.000
BEGIN	HCDF	2	46.241	13.666	-0.088	1.113	-23.116	-0.097	2.947-0.013	3.954	0.002	1.101	0.000	0.000	0.000
76	QF	12	46.493	13.233	1.776	1.116	-22.729	3.135	2.898-0.399	4.112	-0.633	1.111	0.000	0.000	0.000
77	S3	9	46.793	12.187	1.681	1.120	-21.781	3.135	2.776-0.399	4.526	-0.736	1.122	0.000	0.000	0.000
78	BEND	9	49.193	5.771	0.964	1.166	-15.556	1.927	1.995-0.243	9.971	-1.513	1.181	0.000	0.000	0.000
79	S5H	8	49.743	4.805	0.778	1.183	-14.588	1.927	1.860-0.243	11.750	-1.696	1.189	0.000	0.000	0.000
80	CT	11	49.843	4.651	0.745	1.186	-14.394	1.927	1.835-0.243	12.095	-1.729	1.190	0.000	0.000	0.000
81	SXD	4	49.943	4.499	0.763	1.190	-14.195	2.010	1.809-0.264	12.461	-1.907	1.192	0.000	0.000	0.000
82	S2H	7	50.193	4.137	0.675	1.199	-13.689	2.010	1.742-0.264	13.446	-2.000	1.195	0.000	0.000	0.000
83	QD	12	50.445	3.963	0.019	1.209	-13.428	0.051	1.707-0.015	13.972	-0.046	1.198	0.000	0.000	0.000
END	HCDF	4	50.445	3.963	0.019	1.209	-13.428	0.051	1.707-0.015	13.972	-0.046	1.198	0.000	0.000	0.000
BEGIN	HCDF	4	50.445	3.963	0.019	1.209	-13.428	0.051	1.707-0.015	13.972	-0.046	1.198	0.000	0.000	0.000
84	QD	13	50.697	4.117	-0.634	1.219	-13.663	-1.907	1.735-0.234	13.492	1.915	1.201	0.000	0.000	0.000
85	S3	10	50.997	4.532	-0.737	1.230	-14.239	-1.907	1.806-0.234	12.365	1.811	1.204	0.000	0.000	0.000
86	BEND	10	53.397	9.920	-1.483	1.289	-20.329	-3.126	2.567-0.391	5.567	0.998	1.251	0.000	0.000	0.000
87	S5H	9	53.947	11.664	-1.662	1.297	-22.062	-3.126	2.786-0.391	4.571	0.799	1.269	0.000	0.000	0.000
88	CT	12	54.047	12.002	-1.695	1.298	-22.377	-3.126	2.825-0.391	4.413	0.763	1.272	0.000	0.000	0.000
89	S3H	5	54.397	13.238	-1.809	1.298	-23.480	-3.126	2.965-0.391	3.520	0.636	1.286	0.000	0.000	0.000
90	QF	13	54.649	13.688	0.056	1.306	-23.852	0.211	3.011-0.030	3.754	0.025	1.297	0.000	0.000	0.000
END	HCDF	1	54.649	13.688	0.056	1.306	-23.852	0.211	3.011-0.030	3.754	0.025	1.297	0.000	0.000	0.000

TABLE IV b

AGS BOOSTER LATTICE FOR SURVEY
 LINEAR LATTICE PARAMETERS FOR BEAM LINE: "RING" ZOHREH PARSA /
 DELTA(P)/P = -0.008000 SYMM = F

"MAD" VERSION: 6.01/03 RUN: 19-NOV-8 08:07:18

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ELEMENT SEQUENCE		H O R I Z O N T A L										V E R T I C A L						
POS. NO.	ELEMENT OCC. NO.	DIST [M]	I	BETAX [M]	ALFAX [1]	MUX [2PI]	X(CO) [MM]	PX(CO) [MM]	DX [M]	DPX [1]	I	BETAY [M]	ALFAY [1]	MUY [2PI]	Y(CO) [MM]	PY(CO) [MM]	DY [M]	DPY [1]
BEGIN	HCFDO	2	54.649	13.688	0.056	1.306	-23.852	0.211	3.011	-0.030		3.754	0.025	1.297	0.000	0.000	0.000	0.000
91	QF	14	54.901	13.182	1.913	1.309	-23.374	3.541	2.949	-0.450		3.894	-0.583	1.307	0.000	0.000	0.000	0.000
92	S32H	4	58.151	4.440	0.755	1.379	-11.774	3.541	1.462	-0.450		11.412	-1.712	1.389	0.000	0.000	0.000	0.000
93	CT	13	58.251	4.291	0.720	1.383	-11.417	3.541	1.417	-0.450		11.761	-1.746	1.390	0.000	0.000	0.000	0.000
94	S3H	6	58.601	3.828	0.595	1.397	-10.168	3.541	1.256	-0.450		13.036	-1.868	1.395	0.000	0.000	0.000	0.000
95	QD	14	58.852	3.684	-0.021	1.408	-9.451	2.124	1.164	-0.275		13.510	0.026	1.398	0.000	0.000	0.000	0.000
END	HCFDO	2	58.852	3.684	-0.021	1.408	-9.451	2.124	1.164	-0.275		13.510	0.026	1.398	0.000	0.000	0.000	0.000
BEGIN	HCDF	4	58.852	3.684	-0.021	1.408	-9.451	2.124	1.164	-0.275		13.510	0.026	1.398	0.000	0.000	0.000	0.000
96	QD	15	59.104	3.850	-0.640	1.418	-9.083	0.785	1.115	-0.111		13.010	1.916	1.401	0.000	0.000	0.000	0.000
97	S3	11	59.404	4.270	-0.751	1.430	-8.845	0.785	1.081	-0.111		11.885	1.807	1.405	0.000	0.000	0.000	0.000
98	BEND	11	61.804	9.857	-1.540	1.491	-8.518	-0.514	1.011	-0.053		5.205	0.950	1.455	0.000	0.000	0.000	0.000
99	S5H	10	62.354	11.669	-1.729	1.499	-8.803	-0.514	1.040	-0.053		4.265	0.747	1.473	0.000	0.000	0.000	0.000
100	CT	14	62.454	12.022	-1.764	1.500	-8.854	-0.514	1.046	-0.054		4.118	0.710	1.477	0.000	0.000	0.000	0.000
101	SXF	4	62.554	12.382	-1.813	1.502	-8.907	-0.520	1.051	-0.054		3.978	0.678	1.481	0.000	0.000	0.000	0.000
102	S2H	8	62.804	13.318	-1.901	1.505	-9.037	-0.520	1.065	-0.054		3.659	0.586	1.492	0.000	0.000	0.000	0.000
103	QF	15	63.056	13.813	-0.024	1.508	-9.008	0.753	1.060	-0.095		3.511	0.006	1.503	0.000	0.000	0.000	0.000
END	HCDF	4	63.056	13.813	-0.024	1.508	-9.008	0.753	1.060	-0.095		3.511	0.006	1.503	0.000	0.000	0.000	0.000
BEGIN	HCFDL	2	63.056	13.813	-0.024	1.508	-9.008	0.753	1.060	-0.095		3.511	0.006	1.503	0.000	0.000	0.000	0.000
104	QF	16	63.308	13.342	1.856	1.511	-8.657	1.998	0.943	-0.242		3.654	-0.574	1.514	0.000	0.000	0.000	0.000
105	S3	12	63.608	12.250	1.755	1.515	-8.053	1.998	0.943	-0.242		4.034	-0.684	1.527	0.000	0.000	0.000	0.000
106	BEND	12	66.008	5.524	1.004	1.562	-4.814	0.675	0.556	-0.075		9.436	-1.549	1.591	0.000	0.000	0.000	0.000
107	S5H	11	66.558	4.522	0.803	1.580	-4.440	0.675	0.514	-0.075		11.265	-1.749	1.599	0.000	0.000	0.000	0.000
108	CT	15	66.658	4.364	0.766	1.583	-4.372	0.675	0.506	-0.075		11.621	-1.786	1.601	0.000	0.000	0.000	0.000
109	S3H	7	67.008	3.869	0.638	1.597	-4.133	0.675	0.479	-0.075		12.926	-1.913	1.605	0.000	0.000	0.000	0.000
110	QD	16	67.260	3.705	0.016	1.608	-4.037	0.085	0.469	-0.007		13.427	-0.035	1.609	0.000	0.000	0.000	0.000
END	HCFDL	2	67.260	3.705	0.016	1.608	-4.037	0.085	0.469	-0.007		13.427	-0.035	1.609	0.000	0.000	0.000	0.000
END	B4S	1	67.260	3.705	0.016	1.608	-4.037	0.085	0.469	-0.007		13.427	-0.035	1.609	0.000	0.000	0.000	0.000
END	RING	1	201.780	3.701	0.016	4.825	-4.037	0.085	0.469	-0.007		13.444	-0.035	4.823	0.000	0.000	0.000	0.000
TOTAL LENGTH =			201.780000			QX			4.824956			QY				4.822669		
ALFA						QX			-0.414831			QY				0.746741		
GAMMA(TR)						BETAX(MAX)			13.815980			BETAY(MAX)				14.114497		
						DX(MAX)			3.010862			DY(MAX)				0.000000		
						XCO(MAX)			23.851559			YCO(MAX)				0.000000		
						XCO(R.M.S.)			13.378647			YCO(R.M.S.)				0.000000		

... SEARCHING FOR CLOSED ORBIT FOR BEAM LINE "RING", DELTA(P)/P = -0.006000, SYMM = F
 ... ITER. 1
 ... 2
 ... 3

TABLE IV C

AGS BOOSTER LATTICE FOR SURVEY
 LINEAR LATTICE PARAMETERS FOR BEAM LINE: "RING
 DELTA(P)/P = -0.005000 SYMM = F

"MAD" VERSION: 6.01/03 RUN: 19-NOV-8 08:07:18

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POS. NO.	ELEMENT NAME	SEQUENCE NO.	I DIST [M]	I BETAX [M]	ALFAX [1]	H MUX [2PI]	O R I Z O N T A L X(CO) [MM]	P X(CO) [.001]	D X [M]	D P X [1]	I BETAY [M]	ALFAY [1]	M U Y [2PI]	V E R T I C A L Y(CO) [MM]	P Y(CO) [.001]	D Y [M]	D P Y [1]
BEGIN	RING	1	0.000	3.691	0.015	0.000	-3.082	0.069	0.487	-0.009	13.471	-0.026	0.000	0.000	0.000	0.000	0.000
BEGIN	B4S	1	33.630	3.690	0.015	0.004	-3.082	0.069	0.487	-0.009	13.474	-0.026	0.805	0.000	0.000	0.000	0.000
BEGIN	HCDF	3	33.630	3.690	0.015	0.804	-3.082	0.069	0.487	-0.009	13.474	-0.026	0.805	0.000	0.000	0.000	0.000
55	QD	9	33.882	3.838	-0.003	0.814	-3.121	-0.379	0.494	0.062	13.002	1.863	0.808	0.000	0.000	0.000	0.000
56	S3	7	34.182	4.234	-0.003	0.828	-3.235	-0.379	0.513	0.062	11.909	1.759	0.812	0.000	0.000	0.000	0.000
57	BEND	7	36.582	9.527	-1.464	0.888	-5.358	-1.376	0.867	0.229	5.405	0.935	0.866	0.000	0.000	0.000	0.000
58	S5H	6	37.132	11.248	-1.646	0.897	-6.119	-1.376	0.995	0.229	4.476	0.743	0.878	0.000	0.000	0.000	0.000
59	CT	8	37.232	11.582	-1.680	0.898	-6.258	-1.376	1.018	0.229	4.330	0.708	0.882	0.000	0.000	0.000	0.000
60	SXF	3	37.332	11.925	-1.723	0.899	-6.396	-1.379	1.041	0.230	4.191	0.677	0.885	0.000	0.000	0.000	0.000
61	S2H	5	37.582	12.812	-1.807	0.903	-6.743	-1.379	1.099	0.230	3.872	0.589	0.895	0.000	0.000	0.000	0.000
62	QF	9	37.834	13.276	-0.003	0.906	-6.971	-0.412	1.138	0.072	3.729	-0.016	0.906	0.000	0.000	0.000	0.000
END	HCDF	3	37.834	13.276	-0.003	0.906	-6.971	-0.412	1.138	0.072	3.729	-0.016	0.906	0.000	0.000	0.000	0.000
BEGIN	HCDF	3	37.834	13.276	-0.003	0.906	-6.971	-0.412	1.138	0.072	3.729	-0.016	0.906	0.000	0.000	0.000	0.000
63	QF	10	38.086	12.815	1.801	0.909	-6.951	0.570	1.136	-0.088	3.889	-0.624	0.917	0.000	0.000	0.000	0.000
64	S3	8	38.386	11.758	1.701	0.913	-6.779	0.570	1.109	-0.075	4.298	-0.731	0.929	0.000	0.000	0.000	0.000
65	BEND	8	40.786	5.295	0.954	0.962	-6.575	-0.401	1.093	0.075	9.876	-1.577	0.989	0.000	0.000	0.000	0.000
66	S5H	7	41.336	4.350	0.754	0.980	-6.797	-0.401	1.135	0.075	11.729	-1.772	0.997	0.000	0.000	0.000	0.000
67	CT	9	41.436	4.202	0.718	0.984	-6.837	-0.401	1.142	0.075	12.089	-1.808	0.998	0.000	0.000	0.000	0.000
68	SXD	3	41.536	4.059	0.704	0.988	-6.877	-0.382	1.150	0.068	12.463	-1.912	1.000	0.000	0.000	0.000	0.000
69	S2H	6	41.786	3.728	0.611	0.998	-6.973	-0.382	1.167	0.068	13.449	-2.006	1.003	0.000	0.000	0.000	0.000
70	QD	10	42.037	3.573	0.008	1.009	-7.198	-1.406	1.206	0.240	13.977	-0.051	1.006	0.000	0.000	0.000	0.000
END	HCDF	3	42.037	3.573	0.008	1.009	-7.198	-1.406	1.206	0.240	13.977	-0.051	1.006	0.000	0.000	0.000	0.000
BEGIN	HCDF	3	42.037	3.573	0.008	1.009	-7.198	-1.406	1.206	0.240	13.977	-0.051	1.006	0.000	0.000	0.000	0.000
71	QD	11	42.289	3.721	-0.595	1.020	-7.689	-2.481	1.290	0.420	13.500	1.911	1.076	0.000	0.000	0.000	0.000
72	S32H	3	45.539	11.503	-1.785	1.044	-15.802	-2.481	2.672	0.420	4.688	0.784	1.076	0.000	0.000	0.000	0.000
73	CT	10	45.639	11.865	-1.822	1.055	-16.052	-2.481	2.714	0.420	4.533	0.750	1.080	0.000	0.000	0.000	0.000
74	S3H	4	45.989	13.193	-1.950	1.110	-16.925	-2.481	2.863	0.420	4.048	0.628	1.093	0.000	0.000	0.000	0.000
75	QF	11	46.241	13.717	-0.091	1.112	-17.250	-0.072	2.919	0.013	3.890	0.001	1.103	0.000	0.000	0.000	0.000
END	HCDF	2	46.241	13.717	-0.091	1.112	-17.250	-0.072	2.919	0.013	3.890	0.001	1.103	0.000	0.000	0.000	0.000
BEGIN	HCDF	2	46.241	13.717	-0.091	1.112	-17.250	-0.072	2.919	0.013	3.890	0.001	1.103	0.000	0.000	0.000	0.000
76	QF	12	46.493	13.284	1.780	1.115	-16.962	-0.072	2.919	0.013	3.890	0.001	1.103	0.000	0.000	0.000	0.000
77	S3	9	46.793	12.238	1.685	1.119	-16.255	2.341	2.750	-0.396	4.456	-0.729	1.124	0.000	0.000	0.000	0.000
78	BEND	9	49.193	5.782	0.976	1.155	-11.685	1.442	1.976	-0.242	9.899	-1.524	1.183	0.000	0.000	0.000	0.000
79	S5H	8	49.743	4.806	0.789	1.182	-10.887	1.442	1.842	-0.242	11.689	-1.710	1.192	0.000	0.000	0.000	0.000
80	CT	11	49.843	4.651	0.755	1.185	-10.742	1.442	1.817	-0.242	12.036	-1.744	1.193	0.000	0.000	0.000	0.000
81	SXD	4	49.943	4.498	0.760	1.189	-10.594	1.488	1.792	-0.257	12.401	-1.885	1.194	0.000	0.000	0.000	0.000
82	S2H	7	50.193	4.138	0.672	1.196	-10.220	1.488	1.727	-0.257	13.372	-1.977	1.197	0.000	0.000	0.000	0.000
83	QD	12	50.445	3.966	0.016	1.208	-10.029	0.026	1.693	-0.010	13.888	-0.033	1.200	0.000	0.000	0.000	0.000
END	HCDF	4	50.445	3.966	0.016	1.208	-10.029	0.026	1.693	-0.010	13.888	-0.033	1.200	0.000	0.000	0.000	0.000
BEGIN	HCDF	4	50.445	3.966	0.016	1.208	-10.029	0.026	1.693	-0.010	13.888	-0.033	1.200	0.000	0.000	0.000	0.000
84	QD	13	50.697	4.121	-0.637	1.218	-10.207	-1.436	1.721	0.236	13.281	1.915	1.207	0.000	0.000	0.000	0.000
85	S3	10	50.997	4.537	-0.740	1.229	-10.640	-2.344	1.793	0.236	5.525	0.987	1.254	0.000	0.000	0.000	0.000
86	BEND	10	53.397	9.914	-1.476	1.288	-15.208	-2.344	2.554	0.391	4.542	0.790	1.272	0.000	0.000	0.000	0.000
87	S5H	9	53.947	11.646	-1.654	1.296	-16.505	-2.344	2.772	0.391	4.386	0.754	1.276	0.000	0.000	0.000	0.000
88	CT	12	54.047	11.982	-1.686	1.297	-16.741	-2.344	2.811	0.391	3.900	0.628	1.289	0.000	0.000	0.000	0.000
89	S3H	5	54.397	13.208	-1.799	1.302	-17.566	-2.344	2.950	0.391	3.738	0.019	1.300	0.000	0.000	0.000	0.000
90	QF	13	54.649	13.654	0.062	1.305	-17.844	0.153	2.996	-0.028	3.738	0.019	1.300	0.000	0.000	0.000	0.000
END	HCDF	1	54.649	13.654	0.062	1.305	-17.844	0.153	2.996	-0.028	3.738	0.019	1.300	0.000	0.000	0.000	0.000

TABLE IV C

AGS BOOSTER LATTICE FOR SURVEY
 LINEAR LATTICE PARAMETERS FOR BEAM LINE: "RING"
 DELTA(P)/P = -0.006000 SYMM = F

"MAD" VERSION: 6.01/03

RUN: 19-NOV-8 08:07:18

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POS. NO.		ELEMENT SEQUENCE		I		H		O R I Z O N T A L		I		V E R T I C A L		DY		DPY			
		ELEMENT OCC. NO.		DIST I [M]		MUX [2PI]		X(CO) [MM]		PX(CO) [MM]		DX [M]		DPX [I]		PY(CO) [MM]		PY(CO) [MM]	
BEGIN	HCFO	2	54.649	13.654	0.062	1.305-17.844	0.153	2.996-0.028	3.738	0.019	1.300	0.000	0.000	0.000	0.000	0.000	0.000		
91	QF	14	54.901	13.147	1.914	1.308-17.489	2.644	2.936-0.447	3.880	-0.588	1.310	0.000	0.000	0.000	0.000	0.000	0.000		
92	S32H	4	58.151	4.423	0.754	1.378-8.844	2.644	1.467-0.447	11.430	-1.721	1.392	0.000	0.000	0.000	0.000	0.000	0.000		
93	CT	13	58.251	4.275	0.719	1.382-8.578	2.644	1.422-0.447	11.780	-1.756	1.393	0.000	0.000	0.000	0.000	0.000	0.000		
94	S3H	6	58.601	3.813	0.594	1.396-7.647	2.644	1.264-0.447	13.060	-1.878	1.398	0.000	0.000	0.000	0.000	0.000	0.000		
95	QD	14	58.852	3.670	0.020	1.407-7.114	1.578	1.173-0.270	13.537	0.019	1.401	0.000	0.000	0.000	0.000	0.000	0.000		
END	HCFO	2	58.852	3.670	0.020	1.407-7.114	1.578	1.173-0.270	13.537	0.019	1.401	0.000	0.000	0.000	0.000	0.000	0.000		
BEGIN	HCDF	4	58.852	3.670	0.020	1.407-7.114	1.578	1.173-0.270	13.537	0.019	1.401	0.000	0.000	0.000	0.000	0.000	0.000		
96	QD	15	59.104	3.834	0.638	1.418-6.843	0.569	1.125-0.104	13.041	1.913	1.404	0.000	0.000	0.000	0.000	0.000	0.000		
97	S3	11	59.404	4.252	0.748	1.429-6.671	0.569	1.093-0.104	11.919	1.806	1.408	0.000	0.000	0.000	0.000	0.000	0.000		
98	BEND	11	61.804	9.805	-1.532	1.490-6.469	-0.402	1.038-0.059	5.256	0.951	1.457	0.000	0.000	0.000	0.000	0.000	0.000		
99	S5H	10	62.354	11.605	-1.721	1.498-6.692	-0.402	1.071-0.059	4.315	0.750	1.476	0.000	0.000	0.000	0.000	0.000	0.000		
100	CT	14	62.454	11.955	-1.756	1.500-6.732	-0.402	1.077-0.059	4.168	0.714	1.479	0.000	0.000	0.000	0.000	0.000	0.000		
101	SXF	4	62.554	12.313	-1.801	1.501-6.773	-0.405	1.083-0.060	4.027	0.681	1.483	0.000	0.000	0.000	0.000	0.000	0.000		
102	S2H	8	62.804	13.241	-1.888	1.504-6.875	-0.405	1.098-0.060	3.708	0.590	1.494	0.000	0.000	0.000	0.000	0.000	0.000		
103	QF	15	63.056	13.731	-0.022	1.507-6.855	0.563	1.093-0.095	3.559	0.004	1.505	0.000	0.000	0.000	0.000	0.000	0.000		
END	HCDF	4	63.056	13.731	-0.022	1.507-6.855	0.563	1.093-0.095	3.559	0.004	1.505	0.000	0.000	0.000	0.000	0.000	0.000		
BEGIN	HCDFL	2	63.056	13.731	-0.022	1.507-6.855	0.563	1.093-0.095	3.559	0.004	1.505	0.000	0.000	0.000	0.000	0.000	0.000		
104	QF	16	63.308	13.263	1.846	1.510-6.591	1.511	0.975-0.246	3.703	-0.581	1.516	0.000	0.000	0.000	0.000	0.000	0.000		
105	S3	12	63.608	12.179	1.746	1.514-6.135	1.511	0.975-0.246	4.087	-0.690	1.528	0.000	0.000	0.000	0.000	0.000	0.000		
106	BEND	12	66.008	5.496	1.000	1.561-3.679	0.520	0.579-0.080	9.497	-1.551	1.592	0.000	0.000	0.000	0.000	0.000	0.000		
107	S5H	11	66.558	4.501	0.799	1.579-3.391	0.520	0.534-0.080	11.322	-1.749	1.600	0.000	0.000	0.000	0.000	0.000	0.000		
108	CT	15	66.658	4.344	0.762	1.583-3.339	0.520	0.526-0.080	11.678	-1.785	1.602	0.000	0.000	0.000	0.000	0.000	0.000		
109	S3H	7	67.008	3.852	0.634	1.596-3.156	0.520	0.498-0.080	12.979	-1.911	1.606	0.000	0.000	0.000	0.000	0.000	0.000		
110	QD	16	67.260	3.690	0.015	1.607-3.082	0.069	0.487-0.009	13.476	-0.026	1.609	0.000	0.000	0.000	0.000	0.000	0.000		
END	HCDFL	2	67.260	3.690	0.015	1.607-3.082	0.069	0.487-0.009	13.476	-0.026	1.609	0.000	0.000	0.000	0.000	0.000	0.000		
END	B4S	1	67.260	3.690	0.015	1.607-3.082	0.069	0.487-0.009	13.476	-0.026	1.609	0.000	0.000	0.000	0.000	0.000	0.000		
END	RING	1	201.780	3.688	0.015	4.823-3.082	0.069	0.487-0.009	13.486	-0.026	4.826	0.000	0.000	0.000	0.000	0.000	0.000		
TOTAL LENGTH =		201.780000		QX		=		4.822782		QY		=		4.825870					
				QX'		=		-0.305524		QY'		=		0.560531					
ALFA		0.409349E-01		BETAX(MAX)		=		13.732558		BETAY(MAX)		=		13.986908					
GAMMA(1R)		4.942572		DX(MAX)		=		2.996328		DY(MAX)		=		0.000000					
				XCO(MAX)		=		17.844336		YCO(MAX)		=		0.000000					
				XCO(R.M.S.)		=		10.022115		YCO(R.M.S.)		=		0.000000					

... SEARCHING FOR CLOSED ORBIT FOR BEAM LINE "RING", DELTA(P)/P = -0.004000, SYMM = F
 ... ITER. X
 ... 1 -0.002092 0.000049 0.000000 0.104601E-02 ERROR
 ... 2 -0.002090 0.000050 0.000000 0.669404E-05
 ... 3 -0.002090 0.000050 0.000000 0.454029E-10

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TABLE IV d

AGS BOOSTER LATTICE FOR SURVEY
 LINEAR LATTICE PARAMETERS FOR BEAM LINE: "RING
 DELTA(P)/P = -0.004000 SYMM = F ZOHREH PARSA /

"MAD" VERSION: 6.01/03 RUN: 19-NOV-8 08:07:18

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ELEMENT SEQUENCE		I		H		O		R		I		Z		O		N		T		A		I		V		E		R		T		I		C		A		L		PY(CO)		DY		DPY	
POS.	ELEMENT	NO.	NAME	NO.	NO.	DIST	I	I	BETAX	[M]	ALFAX	[1]	MUX	[2PI]	X(CO)	[MM]	PX(CO)	[.001]	DX	[M]	DPX	[1]	I	BETAY	[M]	ALFAY	[1]	MUY	[2PI]	Y(CO)	[MM]	Y(CO)	[.001]	[M]	DY	[M]	DPY	[1]	DPY	[1]					
BEGIN	RING	1				0.000			3.675		0.013		0.000		-2.090		0.050		0.505		-0.011			13.527		-0.017		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
BEGIN	B4S	1				33.630			3.675		0.013		0.803		-2.090		0.050		0.505		-0.011			13.528		-0.017		0.805		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
BEGIN	HCDF	3				33.630			3.675		0.013		0.803		-2.090		0.050		0.505		-0.011			13.528		-0.017		0.805		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	55 QD	9				33.882			3.822		-0.603		0.814		-2.116		-0.254		0.511		0.063			13.051		1.879		0.808		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	56 S3	7				34.182			4.218		-0.710		0.826		-2.192		-0.254		0.530		0.063			11.950		1.775		0.812		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	57 BEND	7				36.582			9.501		-1.463		0.888		-3.606		-0.918		0.884		0.229			5.405		0.942		0.860		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	58 S5H	6				37.132			11.217		-1.645		0.897		-4.113		-0.918		1.012		0.229			4.471		0.749		0.878		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	59 CT	8				37.232			11.551		-1.679		0.898		-4.205		-0.918		1.035		0.229			4.324		0.714		0.882		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	60 SXF	3				37.332			11.892		-1.719		0.899		-4.297		-0.919		1.058		0.230			4.184		0.681		0.885		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	61 S2H	5				37.582			12.776		-1.802		0.903		-4.528		-0.919		1.116		0.230			3.864		0.594		0.895		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	62 QF	9				37.834			13.238		-0.004		0.906		-4.679		-0.270		1.154		0.070			3.718		-0.011		0.906		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
END	HCDF	3				37.834			13.238		-0.004		0.906		-4.679		-0.270		1.154		0.070			3.718		-0.011		0.906		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
BEGIN	HCDF	3				37.834			13.238		-0.004		0.906		-4.679		-0.270		1.154		0.070			3.718		-0.011		0.906		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	63 QF	10				38.086			12.780		1.795		0.909		-4.664		0.389		1.151		-0.093			3.875		-0.616		0.917		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	64 S3	8				38.386			11.728		1.696		0.913		-4.546		0.389		1.123		-0.093			4.278		-0.724		0.929		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	65 BEND	8				40.786			5.286		0.954		0.962		-4.387		-0.257		1.095		0.069			9.809		-1.570		0.989		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	66 S5H	7				41.336			4.346		0.754		0.980		-4.529		-0.257		1.134		0.069			11.651		-1.766		0.997		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	67 CT	9				41.436			4.195		0.718		0.984		-4.554		-0.257		1.141		0.069			12.009		-1.801		0.999		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	68 SXD	3				41.536			4.052		0.697		0.988		-4.580		-0.248		1.147		0.065			13.347		-1.982		1.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	69 S2H	6				41.786			3.726		0.605		0.998		-4.642		-0.248		1.164		0.065			13.862		-0.034		1.003		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	70 QD	10				42.037			3.574		0.001		1.009		-4.790		-0.930		1.202		0.236			13.862		-0.034		1.006		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
END	HCDF	3				42.037			3.574		0.001		1.009		-4.790		-0.930		1.202		0.236			13.862		-0.034		1.006		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
BEGIN	HCDF	2				42.037			3.574		0.001		1.009		-4.790		-0.930		1.202		0.236			13.862		-0.034		1.006		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	71 QD	11				42.289			3.724		-0.602		1.020		-5.115		-1.645		1.284		0.416			13.381		1.910		1.009		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	72 S32H	3				45.539			11.544		-1.795		1.103		-10.484		-1.645		2.647		0.416			4.613		0.777		1.077		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	73 CT	10				45.639			11.908		-1.832		1.105		-10.649		-1.645		2.688		0.416			4.461		0.742		1.081		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	74 S3H	4				45.989			13.241		-1.960		1.109		-11.227		-1.645		2.835		0.416			3.983		0.620		1.094		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	75 QF	11				46.241			13.767		-0.095		1.112		-11.442		-0.047		2.890		0.012			3.828		0.001		1.104		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
END	HCDF	2				46.241			13.767		-0.095		1.112		-11.442		-0.047		2.890		0.012			3.828		0.001		1.104		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
BEGIN	HCDF	4				46.241			13.767		-0.095		1.112		-11.442		-0.047		2.890		0.012			3.828		0.001		1.104		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	76 QF	12				46.493			13.334		1.784		1.115		-11.251		1.553		2.841		-0.392			3.982		-0.618		1.115		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	77 S3	9				46.793			12.288		1.689		1.119		-10.783		1.553		2.723		-0.392			4.386		-0.722		1.126		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	78 BEND	9				49.193			5.795		0.988		1.165		-7.751		0.960		1.957		-0.241			9.828		-1.535		1.186		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	79 S5H	8				49.743			4.808		0.800		1.181		-7.222		0.960		1.823		-0.241			11.628		-1.724		1.194		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	80 CT	11				49.843			4.650		0.765		1.185		-7.125		0.960		1.799		-0.241			11.978		-1.758		1.196		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	81 SXD	4				49.943			4.498		0.757		1.188		-7.028		0.980		1.774		-0.251			12.341		-1.864		1.197		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	82 S2H	7				50.193			4.140		0.669		1.197		-6.782		0.980		1.711		-0.251			13.299		-1.954		1.200		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
	83 QD	12				50.445			3.969		0.014		1.207		-6.657		0.009		1.679		-0.006			13.805		-0.022		1.203		0.000		0.000		0.000		0.000		0.000		0.000					

TABLE IV d

AGS BOOSTER LATTICE FOR SURVEY
 LINEAR LATTICE PARAMETERS FOR BEAM LINE: "RING
 DELTA(P)/P = -0.004000 SYMM = F

"MAD" VERSION: 6.01/03 RUN: 19-NOV-8 08:07:18

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ELEMENT SEQUENCE		H O R I Z O N T A L		V E R T I C A L		I		D P X		B E T A Y		M U V		Y (CO)		P Y (CO)		D V		D P Y	
POS. NO.	ELEMENT NAME	DIST I [M]	DIST I [M]	MUX [2PI]	X(CO) [MM]	PX(CO) [MM]	DX [M]	DPX [M]	DPX [M]	BETAY [M]	ALFAY [1]	MUX [2PI]	MUX [2PI]	Y(CO) [MM]	Y(CO) [MM]	PY(CO) [MM]	PY(CO) [MM]	DV [M]	DV [M]	DPY [1]	DPY [1]
BEGIN	HCFO	2	54.649	13.619	0.068	1.304-11.866	0.098	2.982-0.026	3.724	0.013	1.303	1.303	1.303	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
91	QF	14	54.901	13.111	1.914	1.307-11.631	1.755	2.922-0.443	3.869	-0.592	1.313	1.313	1.313	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
92	S32H	4	58.151	4.406	0.753	1.377-5.905	1.755	1.472-0.443	11.452	-1.732	1.395	1.395	1.395	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
93	CT	13	58.251	4.259	0.718	1.381-5.729	1.755	1.427-0.443	11.803	-1.767	1.396	1.396	1.396	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
94	S3H	6	58.601	3.798	0.593	1.395-5.112	1.755	1.271-0.443	13.088	-1.889	1.401	1.401	1.401	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
95	QD	14	58.852	3.655	-0.019	1.406-4.760	1.042	1.181-0.265	13.568	0.012	1.404	1.404	1.404	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
END	HCFO	2	58.852	3.655	-0.019	1.406-4.760	1.042	1.181-0.265	13.568	0.012	1.404	1.404	1.404	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BEGIN	HCDF	4	58.852	3.655	-0.019	1.406-4.760	1.042	1.181-0.265	13.568	0.012	1.404	1.404	1.404	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
96	QD	15	59.104	3.818	-0.635	1.417-4.582	0.367	1.135-0.098	13.076	1.912	1.411	1.411	1.411	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
97	S3	11	59.404	4.234	-0.745	1.429-4.472	0.367	1.106-0.064	11.956	1.805	1.459	1.459	1.459	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
98	BEND	11	61.804	9.753	-1.525	1.489-4.356	-0.279	1.065-0.064	5.308	0.952	1.478	1.478	1.478	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
99	S5H	10	62.354	11.540	-1.713	1.499-4.520	-0.279	1.107-0.064	4.366	0.754	1.481	1.481	1.481	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
100	CT	14	62.454	11.888	-1.747	1.500-4.577	-0.281	1.114-0.065	4.077	0.684	1.485	1.485	1.485	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
101	SXF	4	62.554	12.243	-1.789	1.507-4.647	-0.281	1.130-0.065	3.756	0.594	1.496	1.496	1.496	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
102	S2H	8	62.804	13.162	-1.875	1.507-4.635	0.374	1.126-0.094	3.607	0.003	1.507	1.507	1.507	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
103	QF	15	63.056	13.647	-0.021	1.507-4.635	0.374	1.126-0.094	3.607	0.003	1.507	1.507	1.507	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
END	HCDF	4	63.056	13.647	-0.021	1.507-4.635	0.374	1.126-0.094	3.607	0.003	1.507	1.507	1.507	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BEGIN	HCDFL	2	63.056	13.647	-0.021	1.507-4.635	0.374	1.126-0.094	3.607	0.003	1.507	1.507	1.507	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
104	QF	16	63.308	13.183	1.836	1.513-4.459	1.015	1.082-0.250	3.753	-0.588	1.518	1.518	1.518	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
105	S3	12	63.608	12.107	1.736	1.513-4.459	1.015	1.082-0.250	4.140	-0.696	1.530	1.530	1.530	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
106	BEND	12	66.008	5.467	0.995	1.561-2.498	0.356	0.602-0.084	9.558	-1.552	1.592	1.592	1.592	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
107	S5H	11	66.558	4.478	0.794	1.579-2.302	0.356	0.555-0.084	11.382	-1.749	1.601	1.601	1.601	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
108	CT	15	66.658	4.323	0.758	1.582-2.266	0.356	0.547-0.084	11.737	-1.785	1.602	1.602	1.602	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
109	S3H	7	67.008	3.835	0.630	1.596-2.141	0.356	0.517-0.084	13.035	-1.911	1.607	1.607	1.607	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
110	QD	16	67.260	3.675	0.013	1.607-2.090	0.050	0.505-0.011	13.529	-0.017	1.610	1.610	1.610	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
END	HCDFL	2	67.260	3.675	0.013	1.607-2.090	0.050	0.505-0.011	13.529	-0.017	1.610	1.610	1.610	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
END	B4S	1	67.260	3.675	0.013	1.607-2.090	0.050	0.505-0.011	13.529	-0.017	1.610	1.610	1.610	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
END	RING	1	201.780	3.674	0.013	4.821-2.090	0.050	0.505-0.011	13.533	-0.017	4.828	4.828	4.828	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL LENGTH =			201.780000																		
ALFA																					
GAMMA(1R)																					

... SEARCHING FOR CLOSED ORBIT FOR BEAM LINE "RING", DELTA(P)/P = -0.002000, SYMM = F
 ... ITER: 1
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 ... 3

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TABLE IV

AGS BOOSTER LATTICE FOR SURVEY
 LINEAR LATTICE PARAMETERS FOR BEAM LINE: "RING
 DELTA(P)/P = -0.002000 SYMM = F

"MAD" VERSION: 6.01/03

RUN: 19-NOV-8 08:07:18

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ELEMENT SEQUENCE		H O R I Z O N T A L				V E R T I C A L											
POS. NO.	ELEMENT NAME	ELEMENT OCC. NO.	DIST I [M]	BETAX [M]	ALFAX [1]	MUX [2P]	X(CO) [MM]	PX(CO) [.001]	DX [M]	DPX [1]	BETAY [M]	ALFAY [1]	MUY [2P]	Y(CO) [MM]	PY(CO) [.001]	DY [M]	DPY [1]
BEGIN	RING	1	0.000	3.659	0.011	0.000	-1.063	0.027	0.523-0.013	13.584	-0.008	0.000	0.000	0.000	0.000	0.000	0.000
BEGIN	B4S	1	33.630	3.659	0.011	0.803	-1.063	0.027	0.523-0.013	13.585	-0.008	0.805	0.000	0.000	0.000	0.000	0.000
BEGIN	HCDF	3	33.630	3.659	0.011	0.803	-1.063	0.027	0.523-0.013	13.585	-0.008	0.805	0.000	0.000	0.000	0.000	0.000
55	QD	9	33.882	3.806	-0.602	0.814	-1.075	-0.127	0.529-0.063	13.102	1.895	0.808	0.000	0.000	0.000	0.000	0.000
56	S3	7	34.182	4.201	-0.710	0.826	-1.113	-0.127	0.548-0.063	11.995	1.790	0.812	0.000	0.000	0.000	0.000	0.000
57	BEND	7	36.582	9.474	-1.462	0.888	-1.820	-0.459	0.902-0.229	5.407	0.949	0.860	0.000	0.000	0.000	0.000	0.000
58	S5H	6	37.132	11.186	-1.644	0.897	-2.073	-0.459	1.028-0.229	4.468	0.755	0.878	0.000	0.000	0.000	0.000	0.000
59	CT	8	37.232	11.519	-1.678	0.898	-2.119	-0.459	1.051-0.229	4.320	0.720	0.882	0.000	0.000	0.000	0.000	0.000
60	SXF	3	37.332	11.859	-1.714	0.899	-2.165	-0.459	1.074-0.230	4.179	0.686	0.885	0.000	0.000	0.000	0.000	0.000
61	S2H	5	37.582	12.739	-1.797	0.903	-2.280	-0.459	1.132-0.230	3.858	0.598	0.895	0.000	0.000	0.000	0.000	0.000
62	QF	9	37.834	13.199	-0.004	0.906	-2.355	-0.132	1.170-0.067	3.710	-0.005	0.906	0.000	0.000	0.000	0.000	0.000
END	HCDF	3	37.834	13.199	-0.004	0.906	-2.355	-0.132	1.170-0.067	3.710	-0.005	0.906	0.000	0.000	0.000	0.000	0.000
BEGIN	HCDF	3	37.834	13.199	-0.004	0.906	-2.355	-0.132	1.170-0.067	3.710	-0.005	0.906	0.000	0.000	0.000	0.000	0.000
63	QF	10	38.086	12.743	1.790	0.909	-2.346	0.199	1.166-0.097	3.863	-0.609	0.917	0.000	0.000	0.000	0.000	0.000
64	S3	8	38.386	11.697	1.690	0.913	-2.287	0.199	1.137-0.097	4.261	-0.716	0.928	0.000	0.000	0.000	0.000	0.000
65	BEND	8	40.786	5.276	0.954	0.962	-2.195	-0.123	1.097-0.064	9.746	-1.564	0.989	0.000	0.000	0.000	0.000	0.000
66	S5H	7	41.336	4.334	0.755	0.980	-2.263	-0.123	1.132-0.064	11.578	-1.759	0.997	0.000	0.000	0.000	0.000	0.000
67	CT	9	41.436	4.187	0.718	0.984	-2.275	-0.123	1.139-0.064	11.934	-1.794	0.999	0.000	0.000	0.000	0.000	0.000
68	SXD	3	41.536	4.045	0.690	0.988	-2.287	-0.121	1.145-0.062	12.299	-1.853	1.000	0.000	0.000	0.000	0.000	0.000
69	S2H	6	41.786	3.723	0.598	0.998	-2.318	-0.121	1.161-0.062	13.250	-1.943	1.003	0.000	0.000	0.000	0.000	0.000
70	QD	10	42.037	3.575	-0.005	1.009	-2.391	-0.461	1.198-0.232	13.751	-0.017	1.006	0.000	0.000	0.000	0.000	0.000
END	HCDF	2	42.037	3.575	-0.005	1.009	-2.391	-0.461	1.198-0.232	13.751	-0.017	1.006	0.000	0.000	0.000	0.000	0.000
BEGIN	HCDF	2	42.037	3.575	-0.005	1.009	-2.391	-0.461	1.198-0.232	13.751	-0.017	1.006	0.000	0.000	0.000	0.000	0.000
71	QD	11	42.289	3.728	-0.608	1.020	-2.552	-0.818	1.279-0.411	13.267	1.911	1.009	0.000	0.000	0.000	0.000	0.000
72	S32H	3	45.539	11.586	-1.805	1.103	-5.216	-0.818	2.621-0.411	4.540	0.769	1.078	0.000	0.000	0.000	0.000	0.000
73	CT	10	45.639	11.951	-1.842	1.104	-5.298	-0.818	2.662-0.411	4.389	0.734	1.082	0.000	0.000	0.000	0.000	0.000
74	S3H	4	45.989	13.288	-1.971	1.109	-5.585	-0.818	2.807-0.411	3.918	0.611	1.095	0.000	0.000	0.000	0.000	0.000
75	QF	11	46.241	13.816	-0.099	1.112	-5.692	-0.023	2.860-0.012	3.765	0.000	1.106	0.000	0.000	0.000	0.000	0.000
END	HCDF	2	46.241	13.816	-0.099	1.112	-5.692	-0.023	2.860-0.012	3.765	0.000	1.106	0.000	0.000	0.000	0.000	0.000
BEGIN	HCDF	4	46.241	13.816	-0.099	1.112	-5.692	-0.023	2.860-0.012	3.765	0.000	1.106	0.000	0.000	0.000	0.000	0.000
76	QF	12	46.493	13.385	1.787	1.115	-5.597	0.773	2.813-0.388	3.917	-0.610	1.116	0.000	0.000	0.000	0.000	0.000
77	S3	9	46.793	12.339	1.693	1.118	-5.364	0.773	2.696-0.388	4.316	-0.716	1.128	0.000	0.000	0.000	0.000	0.000
78	BEND	9	49.193	5.807	1.000	1.164	-3.857	0.479	1.938-0.240	9.757	-1.547	1.188	0.000	0.000	0.000	0.000	0.000
79	S5H	8	49.743	4.810	0.810	1.181	-3.593	0.479	1.805-0.240	11.568	-1.738	1.196	0.000	0.000	0.000	0.000	0.000
80	CT	11	49.843	4.651	0.776	1.184	-3.545	0.479	1.781-0.240	11.919	-1.773	1.198	0.000	0.000	0.000	0.000	0.000
81	SXD	4	49.943	4.497	0.754	1.187	-3.497	0.484	1.757-0.245	12.282	-1.843	1.199	0.000	0.000	0.000	0.000	0.000
82	S2H	7	50.193	4.141	0.667	1.197	-3.375	0.484	1.696-0.245	13.227	-1.933	1.202	0.000	0.000	0.000	0.000	0.000
83	QD	12	50.445	3.972	0.011	1.207	-3.314	0.000	1.664-0.002	13.724	-0.010	1.205	0.000	0.000	0.000	0.000	0.000
END	HCDF	4	50.445	3.972	0.011	1.207	-3.314	0.000	1.664-0.002	13.724	-0.010	1.205	0.000	0.000	0.000	0.000	0.000
BEGIN	HCDF	1	50.445	3.972	0.011	1.207	-3.314	0.000	1.664-0.002	13.724	-0.010	1.205	0.000	0.000	0.000	0.000	0.000
84	QD	13	50.697	4.130	-0.643	1.217	-3.375	-0.483	1.694-0.240	13.238	1.913	1.208	0.000	0.000	0.000	0.000	0.000
85	S3	10	50.997	4.548	-0.746	1.228	-3.520	-0.483	1.767-0.240	12.119	1.807	1.212	0.000	0.000	0.000	0.000	0.000
86	BEND	10	53.397	9.901	-1.461	1.286	-5.043	-0.781	2.528-0.391	5.447	0.967	1.260	0.000	0.000	0.000	0.000	0.000
87	S5H	9	53.947	11.608	-1.636	1.294	-5.473	-0.781	2.744-0.391	4.490	0.771	1.278	0.000	0.000	0.000	0.000	0.000
88	CT	12	54.047	11.939	-1.667	1.295	-5.551	-0.781	2.783-0.391	4.339	0.735	1.281	0.000	0.000	0.000	0.000	0.000
89	S3H	5	54.397	13.147	-1.778	1.300	-5.825	-0.781	2.920-0.391	3.867	0.611	1.295	0.000	0.000	0.000	0.000	0.000
90	QF	13	54.649	13.583	0.073	1.303	-5.918	0.047	2.967-0.025	3.713	0.006	1.305	0.000	0.000	0.000	0.000	0.000
END	HCDF	1	54.649	13.583	0.073	1.303	-5.918	0.047	2.967-0.025	3.713	0.006	1.305	0.000	0.000	0.000	0.000	0.000

TABLE IV e

AGS BOOSTER LATTICE FOR SURVEY
 LINEAR LATTICE PARAMETERS FOR BEAM LINE: "RING
 DELTA(P)/P = -0.002000 SYMM = F ZOHREH PARSA /

"MAD" VERSION: 6.01/03 RUN: 19-NOV-8 08:07:18

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ELEMENT SEQUENCE		H O R I Z O N T A L				V E R T I C A L												
POS. NO.	ELEMENT NAME	DIST I [M]	I [M]	BETAX [M]	ALFAX [1]	MUX [2PI]	X(CO) [MM]	PX(CO) [.001]	DX [M]	DPX [1]	I [1]	BETAY [M]	ALFAY [1]	MUY [2PI]	V(CO) [MM]	PY(CO) [.001]	DY [M]	DPY [1]
BEGIN	HCFDO	2	54.649	13.583	0.073	1.303	-5.918	0.047	2.967	-0.025		3.713	0.006	1.305	0.000	0.000	0.000	0.000
91	QF	14	54.901	13.075	1.915	1.306	-5.802	0.874	2.908	-0.439		3.860	-0.597	1.316	0.000	0.000	0.000	0.000
92	S32H	4	58.151	4.389	0.753	1.376	-2.957	0.874	1.476	-0.439		11.478	-1.742	1.398	0.000	0.000	0.000	0.000
93	CT	13	58.251	4.242	0.717	1.380	-2.869	0.874	1.432	-0.439		11.830	-1.777	1.399	0.000	0.000	0.000	0.000
94	S3H	6	58.601	3.783	0.592	1.394	-2.563	0.874	1.278	-0.439		13.120	-1.900	1.403	0.000	0.000	0.000	0.000
95	QD	14	58.852	3.640	-0.019	1.405	-2.388	0.516	1.190	-0.260		13.604	0.006	1.406	0.000	0.000	0.000	0.000
END	HCFDO	2	58.852	3.640	-0.019	1.405	-2.388	0.516	1.190	-0.260		13.604	0.006	1.406	0.000	0.000	0.000	0.000
BEGIN	HCDF	4	58.852	3.640	-0.019	1.405	-2.388	0.516	1.190	-0.260		13.604	0.006	1.406	0.000	0.000	0.000	0.000
96	QD	15	59.104	3.802	-0.631	1.416	-2.301	0.177	1.146	-0.092		13.114	1.911	1.409	0.000	0.000	0.000	0.000
97	S3	11	59.404	4.215	-0.742	1.428	-2.248	0.177	1.118	-0.092		11.997	1.805	1.413	0.000	0.000	0.000	0.000
98	BEND	11	61.804	9.699	-1.517	1.489	-2.210	-0.145	1.092	0.070		5.360	0.954	1.462	0.000	0.000	0.000	0.000
99	S5H	10	62.354	11.474	-1.704	1.497	-2.290	-0.145	1.130	0.070		4.416	0.758	1.480	0.000	0.000	0.000	0.000
100	CT	14	62.454	11.819	-1.738	1.499	-2.304	-0.145	1.137	0.070		4.268	0.722	1.483	0.000	0.000	0.000	0.000
101	SXF	4	62.554	12.171	-1.776	1.500	-2.319	-0.146	1.144	0.070		4.127	0.688	1.487	0.000	0.000	0.000	0.000
102	S2H	8	62.804	13.082	-1.862	1.503	-2.355	-0.146	1.162	0.070		3.805	0.598	1.497	0.000	0.000	0.000	0.000
103	QF	15	63.056	13.563	-0.019	1.506	-2.350	0.186	1.159	-0.093		3.655	0.001	1.508	0.000	0.000	0.000	0.000
END	HCDF	4	63.056	13.563	-0.019	1.506	-2.350	0.186	1.159	-0.093		3.655	0.001	1.508	0.000	0.000	0.000	0.000
BEGIN	HCDFL	2	63.056	13.563	-0.019	1.506	-2.350	0.186	1.159	-0.093		3.655	0.001	1.508	0.000	0.000	0.000	0.000
104	QF	16	63.308	13.101	1.826	1.509	-2.262	0.511	1.115	-0.254		3.803	-0.595	1.519	0.000	0.000	0.000	0.000
105	S3	12	63.608	12.033	1.727	1.513	-2.108	0.511	1.038	-0.254		4.194	-0.702	1.531	0.000	0.000	0.000	0.000
106	BEND	12	66.008	5.436	0.991	1.561	-1.272	0.183	0.625	-0.089		9.622	-1.555	1.593	0.000	0.000	0.000	0.000
107	S5H	11	66.558	4.455	0.790	1.578	-1.171	0.183	0.576	-0.089		11.444	-1.751	1.601	0.000	0.000	0.000	0.000
108	CT	15	66.558	4.301	0.753	1.582	-1.153	0.183	0.567	-0.089		11.798	-1.786	1.602	0.000	0.000	0.000	0.000
109	S3H	7	67.008	3.817	0.625	1.596	-1.089	0.183	0.535	-0.089		13.094	-1.911	1.607	0.000	0.000	0.000	0.000
110	QD	16	67.260	3.658	0.011	1.607	-1.063	0.027	0.523	-0.013		13.585	-0.008	1.610	0.000	0.000	0.000	0.000
END	HCDFL	2	67.260	3.658	0.011	1.607	-1.063	0.027	0.523	-0.013		13.585	-0.008	1.610	0.000	0.000	0.000	0.000
END	B4S	1	67.260	3.658	0.011	1.607	-1.063	0.027	0.523	-0.013		13.585	-0.008	1.610	0.000	0.000	0.000	0.000
END	RING	1	201.780	3.658	0.011	4.820	-1.063	0.027	0.523	-0.013		13.586	-0.008	4.830	0.000	0.000	0.000	0.000
TOTAL LENGTH =			201.780000		QX,				4.820307			QV,				4.829541		
					QX'				-0.097612			QV'				0.186378		
ALFA					BETAX(MAX)				13.816597			BETAY(MAX)				13.751647		
GAMMA(1R)					DX(MAX)				2.966634			DY(MAX)				0.000000		
					XCO(MAX)				5.918122			VCO(MAX)				0.000000		
					XCO(R.M.S.)				3.332744			VCO(R.M.S.)				0.000000		

... SEARCHING FOR CLOSED ORBIT FOR BEAM LINE "RING", DELTA(P)/P = 0.000000, SYMM = F
 ... ITER. X 0.000000 PX 0.000000 PY 0.000000 ERROR 0.288847E-19
 ... 1 0.000000

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TABLE IV 4

AGS BOOSTER LATTICE FOR SURVEY
 LINEAR LATTICE PARAMETERS FOR BEAM LINE: "RING
 DELTA(P)/P = 0.000000 SYMM = F

"MAD" VERSION: 6.01/03 RUN: 19-NOV-8 08:07:18

PAGE 2

POS. NO.	ELEMENT NAME	SEQUENCE NO.	DIST I [M]	I	H	Q R I Z O N T A L MUY [2PI]	ALFAX [1]	BETAX [M]	ALFAX [1]	BETAX [M]	ALFAX [1]	MUY [2PI]	Y(CO) [MM]	PY(CO) [.001]	DY [M]	DPY [1]
BEGIN	HCEDO	2	54.649	13.546	0.079	1.302	0.000	0.000	2.951-0.023	3.703	0.000	1.308	0.000	0.000	0.000	0.000
91	QF	14	54.901	13.038	1.915	1.305	0.000	0.000	2.894-0.435	3.853	-0.603	1.319	0.000	0.000	0.000	0.000
92	S32H	4	58.151	4.371	0.752	1.376	0.000	0.000	1.481-0.435	11.508	-1.752	1.400	0.000	0.000	0.000	0.000
93	CT	13	58.251	4.224	0.716	1.379	0.000	0.000	1.437-0.435	11.862	-1.788	1.401	0.000	0.000	0.000	0.000
94	S3H	6	58.601	3.767	0.590	1.393	0.000	0.000	1.285-0.435	13.157	-1.912	1.406	0.000	0.000	0.000	0.000
95	QD	14	58.852	3.624	-0.018	1.404	0.000	0.000	1.198-0.255	13.644	0.000	1.409	0.000	0.000	0.000	0.000
END	HCEDO	2	58.852	3.624	-0.018	1.404	0.000	0.000	1.198-0.255	13.644	0.000	1.409	0.000	0.000	0.000	0.000
BEGIN	HCDF	4	58.852	3.624	-0.018	1.404	0.000	0.000	1.198-0.255	13.644	0.000	1.409	0.000	0.000	0.000	0.000
96	QD	15	59.104	3.785	-0.628	1.415	0.000	0.000	1.156-0.085	13.157	1.912	1.412	0.000	0.000	0.000	0.000
97	S3	11	59.404	4.195	-0.739	1.427	0.000	0.000	1.130-0.085	12.041	1.806	1.416	0.000	0.000	0.000	0.000
98	BEND	11	61.804	9.644	-1.509	1.488	0.000	0.000	1.118 0.075	5.413	0.956	1.464	0.000	0.000	0.000	0.000
99	S5H	10	62.354	11.407	-1.695	1.497	0.000	0.000	1.159 0.075	4.467	0.762	1.481	0.000	0.000	0.000	0.000
100	CT	14	62.454	11.749	-1.729	1.498	0.000	0.000	1.167 0.075	4.319	0.727	1.485	0.000	0.000	0.000	0.000
101	SXF	4	62.554	12.098	-1.763	1.499	0.000	0.000	1.175 0.075	4.177	0.691	1.489	0.000	0.000	0.000	0.000
102	S2H	8	62.804	13.001	-1.848	1.503	0.000	0.000	1.193 0.075	3.853	0.603	1.499	0.000	0.000	0.000	0.000
103	QF	15	63.056	13.477	-0.017	1.506	0.000	0.000	1.191-0.093	3.703	0.000	1.509	0.000	0.000	0.000	0.000
END	HCDF	4	63.056	13.477	-0.017	1.506	0.000	0.000	1.191-0.093	3.703	0.000	1.509	0.000	0.000	0.000	0.000
BEGIN	HCDFL	2	63.056	13.477	-0.017	1.506	0.000	0.000	1.191-0.093	3.703	0.000	1.509	0.000	0.000	0.000	0.000
104	QF	16	63.308	13.018	1.816	1.509	0.000	0.000	1.147-0.258	3.853	-0.603	1.520	0.000	0.000	0.000	0.000
105	S3	12	63.608	11.959	1.717	1.512	0.000	0.000	1.070-0.258	4.247	-0.709	1.532	0.000	0.000	0.000	0.000
106	BEND	12	66.008	5.405	0.986	1.560	0.000	0.000	0.647-0.094	9.687	-1.558	1.593	0.000	0.000	0.000	0.000
107	S5H	11	66.558	4.431	0.785	1.578	0.000	0.000	0.596-0.094	11.508	-1.752	1.601	0.000	0.000	0.000	0.000
108	CT	15	66.658	4.278	0.749	1.582	0.000	0.000	0.586-0.094	11.862	-1.788	1.603	0.000	0.000	0.000	0.000
109	S3H	7	67.008	3.798	0.621	1.596	0.000	0.000	0.554-0.094	13.157	-1.912	1.607	0.000	0.000	0.000	0.000
110	QD	16	67.260	3.642	0.009	1.607	0.000	0.000	0.540-0.015	13.644	0.000	1.610	0.000	0.000	0.000	0.000
END	HCDFL	2	67.260	3.642	0.009	1.607	0.000	0.000	0.540-0.015	13.644	0.000	1.610	0.000	0.000	0.000	0.000
END	B4S	1	67.260	3.642	0.009	1.607	0.000	0.000	0.540-0.015	13.644	0.000	1.610	0.000	0.000	0.000	0.000
END	RING	1	201.780	3.642	0.009	4.820	0.000	0.000	0.540-0.015	13.644	0.000	4.830	0.000	0.000	0.000	0.000
TOTAL LENGTH			201.780000													
ALFA			0.41970:E-01													
GAMMA(1R)			4.881238													

... SEARCHING FOR CLOSED ORBIT FOR BEAM LINE "RING", DELTA(P)/P = 0.002000, SYMM = F
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 ... 2 0.001097 -0.000031 0.000000 0.155487E-05
 ... 3 0.001097 -0.000031 0.000000 0.347445E-11

TABLE IV 9

ELEMENT SEQUENCE		H O R I Z O N T A L										I		V E R T I C A L		P Y (C O)		D Y		D P Y	
POS. NO.	ELEMENT OCC. NO.	ELEMENT NAME	DIST I [M]	BETAX [M]	ALFAX [1]	MUX [2PI]	X(CO) [MM]	PX(CO) [MM]	DX [M]	DPX [1]	BETAY [M]	ALFAY [1]	MUY [2PI]	Y(CO) [MM]	PY(CO) [MM]	DV [M]	DPV [1]				
BEGIN RING	1		0.000	3.624	0.007	0.000	1.097	-0.031	0.557	-0.017	13.706	0.008	0.000	0.000	0.000	0.000	0.000				
BEGIN B4S	1		33.630	3.624	0.007	0.803	1.097	-0.031	0.557	-0.017	13.706	0.008	0.805	0.000	0.000	0.000	0.000				
BEGIN HCDF	3		33.630	3.624	0.007	0.803	1.097	-0.031	0.557	-0.017	13.706	0.008	0.805	0.000	0.000	0.000	0.000				
55 QD	9		33.882	3.772	-0.602	0.814	1.110	0.128	0.563	0.064	13.213	1.928	0.808	0.000	0.000	0.000	0.000				
56 S3	7		34.182	4.165	-0.710	0.826	1.148	0.128	0.583	0.064	12.091	1.821	0.812	0.000	0.000	0.000	0.000				
57 BEND	7		36.582	9.419	-1.460	0.888	1.853	0.459	0.935	0.229	5.420	0.964	0.860	0.000	0.000	0.000	0.000				
58 S5H	6		37.132	11.121	-1.642	0.897	2.105	0.459	1.060	0.229	4.469	0.769	0.877	0.000	0.000	0.000	0.000				
59 CT	8		37.232	11.452	-1.675	0.898	2.151	0.459	1.083	0.229	4.319	0.733	0.881	0.000	0.000	0.000	0.000				
60 SXF	3		37.332	11.790	-1.705	0.900	2.197	0.459	1.106	0.229	4.177	0.696	0.885	0.000	0.000	0.000	0.000				
61 S2H	5		37.582	12.661	-1.788	0.903	2.311	0.459	1.163	0.229	3.851	0.608	0.895	0.000	0.000	0.000	0.000				
62 QF	9		37.834	13.117	-0.006	0.906	2.385	0.127	1.200	0.062	3.699	0.005	0.905	0.000	0.000	0.000	0.000				
END HCDF	3		37.834	13.117	-0.006	0.906	2.385	0.127	1.200	0.062	3.699	0.005	0.905	0.000	0.000	0.000	0.000				
BEGIN HCDF	3		37.834	13.117	-0.006	0.906	2.385	0.127	1.200	0.062	3.699	0.005	0.905	0.000	0.000	0.000	0.000				
63 QF	10		38.086	12.667	1.777	0.909	2.375	-0.208	1.194	0.106	3.846	-0.596	0.916	0.000	0.000	0.000	0.000				
64 S3	8		38.386	11.632	1.679	0.913	2.313	-0.208	1.163	0.106	4.235	-0.702	0.928	0.000	0.000	0.000	0.000				
65 BEND	8		40.786	5.255	0.954	0.962	2.198	0.112	1.099	0.054	9.632	-1.552	0.989	0.000	0.000	0.000	0.000				
66 S5H	7		41.336	4.317	0.755	0.981	2.259	0.112	1.129	0.054	11.442	-1.746	0.997	0.000	0.000	0.000	0.000				
67 CT	9		41.436	4.170	0.719	0.984	2.271	0.112	1.134	0.054	11.794	-1.781	0.999	0.000	0.000	0.000	0.000				
68 SXD	3		41.536	4.031	0.675	0.988	2.282	0.115	1.140	0.056	12.151	-1.794	1.000	0.000	0.000	0.000	0.000				
69 S2H	6		41.786	3.717	0.585	0.999	2.310	0.115	1.153	0.056	13.068	-1.881	1.003	0.000	0.000	0.000	0.000				
70 QD	10		42.037	3.576	-0.017	1.010	2.382	0.454	1.188	0.225	13.542	0.017	1.006	0.000	0.000	0.000	0.000				
END HCDF	3		42.037	3.576	-0.017	1.010	2.382	0.454	1.188	0.225	13.542	0.017	1.006	0.000	0.000	0.000	0.000				
BEGIN HCDF	2		42.289	3.734	-0.621	1.021	2.540	0.809	1.267	0.402	13.051	1.913	1.006	0.000	0.000	0.000	0.000				
71 QD	11		42.289	3.734	-0.621	1.021	2.540	0.809	1.267	0.402	13.051	1.913	1.006	0.000	0.000	0.000	0.000				
72 S32H	3		45.539	11.667	-1.825	1.102	5.164	0.809	2.569	0.402	4.396	0.755	1.089	0.000	0.000	0.000	0.000				
73 CT	10		45.639	12.035	-1.862	1.104	5.245	0.809	2.609	0.402	4.248	0.719	1.083	0.000	0.000	0.000	0.000				
74 S3H	4		45.989	13.381	-1.991	1.108	5.528	0.809	2.749	0.402	3.789	0.595	1.097	0.000	0.000	0.000	0.000				
75 QF	11		46.241	13.915	-0.106	1.111	5.633	0.022	2.801	0.011	3.642	0.000	1.108	0.000	0.000	0.000	0.000				
END HCDF	2		46.241	13.915	-0.106	1.111	5.633	0.022	2.801	0.011	3.642	0.000	1.108	0.000	0.000	0.000	0.000				
BEGIN HCDF	4		46.493	13.485	1.794	1.114	5.539	-0.765	2.755	0.381	3.642	-0.595	1.108	0.000	0.000	0.000	0.000				
76 QF	12		46.493	13.485	1.794	1.114	5.539	-0.765	2.755	0.381	3.642	-0.595	1.108	0.000	0.000	0.000	0.000				
77 S3	9		46.793	12.439	1.700	1.118	5.310	-0.765	2.641	0.381	4.178	-0.702	1.131	0.000	0.000	0.000	0.000				
78 BEND	9		49.193	5.833	1.024	1.163	3.818	-0.476	1.899	0.238	9.617	-1.569	1.192	0.000	0.000	0.000	0.000				
79 S5H	8		49.743	4.815	0.831	1.179	3.557	-0.476	1.769	0.238	11.448	-1.767	1.201	0.000	0.000	0.000	0.000				
80 CT	11		49.843	4.652	0.796	1.183	3.509	-0.476	1.746	0.238	11.805	-1.803	1.202	0.000	0.000	0.000	0.000				
81 SXD	4		49.943	4.498	0.749	1.186	3.462	-0.471	1.722	0.233	12.165	-1.804	1.203	0.000	0.000	0.000	0.000				
82 S2H	7		50.193	4.146	0.662	1.195	3.344	-0.471	1.654	0.233	13.087	-1.892	1.207	0.000	0.000	0.000	0.000				
83 QD	12		50.445	3.980	0.006	1.205	3.286	0.008	1.636	0.006	13.566	0.010	1.210	0.000	0.000	0.000	0.000				
END HCDF	4		50.445	3.980	0.006	1.205	3.286	0.008	1.636	0.006	13.566	0.010	1.210	0.000	0.000	0.000	0.000				
BEGIN HCDF	1		50.445	3.980	0.006	1.205	3.286	0.008	1.636	0.006	13.566	0.010	1.210	0.000	0.000	0.000	0.000				
84 QD	13		50.697	4.140	-0.752	1.215	3.348	0.487	1.667	0.244	13.077	1.910	1.213	0.000	0.000	0.000	0.000				
85 S3	10		50.997	4.559	-0.752	1.226	3.494	0.487	1.740	0.244	11.965	1.803	1.216	0.000	0.000	0.000	0.000				
86 BEND	10		53.397	9.887	-1.446	1.284	5.016	0.780	2.501	0.390	5.380	0.946	1.265	0.000	0.000	0.000	0.000				
87 S5H	9		53.947	11.568	-1.617	1.292	5.444	0.780	2.715	0.390	4.447	0.753	1.283	0.000	0.000	0.000	0.000				
88 CT	12		54.047	11.894	-1.648	1.293	5.522	0.780	2.754	0.390	4.301	0.718	1.286	0.000	0.000	0.000	0.000				
89 S3H	5		54.397	13.083	-1.757	1.298	5.795	0.780	2.890	0.390	3.842	0.595	1.300	0.000	0.000	0.000	0.000				
90 QF	13		54.649	13.509	0.085	1.301	5.888	-0.043	2.936	0.021	3.696	-0.006	1.311	0.000	0.000	0.000	0.000				
END HCDF	1		54.649	13.509	0.085	1.301	5.888	-0.043	2.936	0.021	3.696	-0.006	1.311	0.000	0.000	0.000	0.000				

TABLE IV b

AGS BOOSTER LATTICE FOR SURVEY
 LINEAR LATTICE PARAMETERS FOR BEAM LINE: "RING
 DELTA(P)/P = 0.004000 SYMM = F ZOHREH PARSA /

"MAD" VERSION: 6.01/03 RUN: 19-NOV-8 08:07:18

PAGE 1

ELEMENT SEQUENCE		I		H		O R I Z O N T A L		I		V E R T I C A L		P Y (C O)		D Y			
POS. NO.	ELEMENT OCC. NO.	DIST I [M]	I	BETAX [M]	ALFAX [1]	MUX [2PI]	X(CO) [MM]	PX(CO) [MM]	DX [M]	DPX [1]	BETAY [M]	ALFAY [1]	MUY [2PI]	Y(CO) [MM]	PY(CO) [MM]	DV [M]	DPY [1]
BEGIN RING	1	0.000		3.607	0.005	0.000	2.229	-0.066	0.575	-0.019	13.769	0.016	0.000	0.000	0.000	0.000	0.000
BEGIN B4S	1	33.630		3.606	0.005	0.803	2.229	-0.066	0.575	-0.019	13.770	0.016	0.805	0.000	0.000	0.000	0.000
BEGIN HCDF	1	33.630		3.606	0.005	0.803	2.229	-0.066	0.575	-0.019	13.770	0.016	0.805	0.000	0.000	0.000	0.000
55 QD	9	33.882		3.754	-0.602	0.814	2.263	0.258	0.580	0.065	13.273	1.944	0.808	0.000	0.000	0.000	0.000
56 S3	7	34.182		4.146	-0.710	0.826	2.330	0.258	0.600	0.065	12.143	1.837	0.812	0.000	0.000	0.000	0.000
57 BEND	7	36.582		9.389	-1.459	0.889	3.739	0.918	0.951	0.229	5.430	0.972	0.859	0.000	0.000	0.000	0.000
58 S5H	6	37.132		11.087	-1.641	0.897	4.242	0.918	1.076	0.229	4.473	0.775	0.877	0.000	0.000	0.000	0.000
59 CT	8	37.232		11.418	-1.674	0.899	4.333	0.918	1.099	0.229	4.322	0.740	0.880	0.000	0.000	0.000	0.000
60 SXF	3	37.332		11.754	-1.700	0.900	4.424	0.916	1.122	0.229	4.179	0.702	0.884	0.000	0.000	0.000	0.000
61 S2H	5	37.582		12.621	-1.783	0.903	4.653	0.916	1.178	0.229	3.851	0.613	0.894	0.000	0.000	0.000	0.000
62 QF	9	37.834		13.075	-0.006	0.906	4.799	0.250	1.214	0.060	3.697	0.010	0.905	0.000	0.000	0.000	0.000
END HCDF	3	37.834		13.075	-0.006	0.906	4.799	0.250	1.214	0.060	3.697	0.010	0.905	0.000	0.000	0.000	0.000
BEGIN HCDF	3	37.834		13.075	-0.006	0.906	4.799	0.250	1.214	0.060	3.697	0.010	0.905	0.000	0.000	0.000	0.000
63 QF	10	38.086		12.627	1.771	0.909	4.777	-0.425	1.208	-0.111	3.841	-0.591	0.915	0.000	0.000	0.000	0.000
64 S3	8	38.386		11.598	1.673	0.913	4.650	-0.425	1.175	-0.111	4.225	-0.595	0.927	0.000	0.000	0.000	0.000
65 BEND	8	40.786		5.245	0.955	0.963	4.397	0.214	1.100	0.048	9.580	-1.546	0.989	0.000	0.000	0.000	0.000
66 S5H	7	41.336		4.308	0.755	0.981	4.515	0.214	1.127	0.048	11.380	-1.740	0.997	0.000	0.000	0.000	0.000
67 CT	9	41.436		4.162	0.719	0.985	4.536	0.214	1.132	0.048	11.730	-1.775	0.998	0.000	0.000	0.000	0.000
68 SXD	3	41.536		4.024	0.668	0.989	4.558	0.223	1.137	0.053	12.083	-1.766	1.000	0.000	0.000	0.000	0.000
69 S2H	6	41.786		3.713	0.578	0.999	4.613	0.223	1.150	0.053	12.984	-1.851	1.003	0.000	0.000	0.000	0.000
70 QD	10	42.037		3.576	-0.023	1.010	4.754	0.900	1.184	0.221	13.445	0.035	1.006	0.000	0.000	0.000	0.000
END HCDF	3	42.037		3.576	-0.023	1.010	4.754	0.900	1.184	0.221	13.445	0.035	1.006	0.000	0.000	0.000	0.000
BEGIN HCDF	2	42.037		3.576	-0.023	1.010	4.754	0.900	1.184	0.221	13.445	0.035	1.006	0.000	0.000	0.000	0.000
71 QD	11	42.289		3.737	-0.628	1.021	5.068	1.609	1.261	0.398	12.949	1.916	1.009	0.000	0.000	0.000	0.000
72 S32H	3	45.539		11.707	-1.835	1.102	10.276	1.609	2.543	0.398	4.324	0.748	1.080	0.000	0.000	0.000	0.000
73 CT	10	45.639		12.077	-1.872	1.104	10.437	1.609	2.582	0.398	4.179	0.712	1.084	0.000	0.000	0.000	0.000
74 S3H	4	45.989		13.427	-2.002	1.108	10.998	1.609	2.720	0.398	3.726	0.587	1.098	0.000	0.000	0.000	0.000
75 QF	11	46.241		13.963	-0.110	1.111	11.206	0.044	2.772	0.010	3.581	0.000	1.109	0.000	0.000	0.000	0.000
END HCDF	2	46.241		13.963	-0.110	1.111	11.206	0.044	2.772	0.010	3.581	0.000	1.109	0.000	0.000	0.000	0.000
BEGIN HCDF	4	46.241		13.963	-0.110	1.111	11.206	0.044	2.772	0.010	3.581	0.000	1.109	0.000	0.000	0.000	0.000
76 QF	12	46.493		13.535	1.797	1.114	11.019	-1.523	2.726	-0.377	3.727	-0.588	1.120	0.000	0.000	0.000	0.000
77 S3	9	46.793		12.489	1.704	1.117	10.564	-1.523	2.613	-0.377	4.110	-0.696	1.132	0.000	0.000	0.000	0.000
78 BEND	9	49.193		5.847	1.036	1.162	7.597	-0.950	1.880	-0.236	9.549	-1.580	1.194	0.000	0.000	0.000	0.000
79 S5H	8	49.743		4.818	0.842	1.179	7.077	-0.950	1.751	-0.236	11.390	-1.781	1.203	0.000	0.000	0.000	0.000
80 CT	11	49.843		4.654	0.807	1.182	6.982	-0.950	1.728	-0.236	11.748	-1.818	1.204	0.000	0.000	0.000	0.000
81 SXD	4	49.943		4.499	0.746	1.186	6.888	-0.931	1.705	-0.227	12.107	-1.872	1.205	0.000	0.000	0.000	0.000
82 S2H	7	50.193		4.149	0.660	1.195	6.657	-0.931	1.648	-0.227	13.018	-1.872	1.209	0.000	0.000	0.000	0.000
83 QD	12	50.445		3.984	0.004	1.205	6.543	0.023	1.621	0.010	13.489	0.019	1.212	0.000	0.000	0.000	0.000
END HCDF	4	50.445		3.984	0.004	1.205	6.543	0.023	1.621	0.010	13.489	0.019	1.212	0.000	0.000	0.000	0.000
BEGIN HCDF	1	50.445		3.984	0.004	1.205	6.543	0.023	1.621	0.010	13.489	0.019	1.212	0.000	0.000	0.000	0.000
84 QD	13	50.697		4.145	-0.652	1.215	6.668	0.978	1.653	0.246	13.000	1.907	1.215	0.000	0.000	0.000	0.000
85 S3	10	50.997		4.566	-0.755	1.225	6.961	0.978	1.727	0.246	11.892	1.801	1.218	0.000	0.000	0.000	0.000
86 BEND	10	53.397		9.879	-1.438	1.283	10.004	1.560	2.487	0.390	5.350	0.936	1.267	0.000	0.000	0.000	0.000
87 S5H	9	53.947		11.547	-1.608	1.291	10.859	1.560	2.700	0.390	4.430	0.744	1.285	0.000	0.000	0.000	0.000
88 CT	12	54.047		11.870	-1.639	1.293	11.014	1.560	2.739	0.390	4.285	0.709	1.289	0.000	0.000	0.000	0.000
89 S3H	5	54.397		13.051	-1.747	1.297	11.558	1.560	2.874	0.390	3.833	0.587	1.302	0.000	0.000	0.000	0.000
90 QF	13	54.649		13.471	0.091	1.300	11.744	-0.083	2.920	-0.019	3.691	-0.013	1.313	0.000	0.000	0.000	0.000
END HCDF	1	54.649		13.471	0.091	1.300	11.744	-0.083	2.920	-0.019	3.691	-0.013	1.313	0.000	0.000	0.000	0.000

TABLE IV h

AGS BOOSTER LATTICE FOR SURVEY
 LINEAR LATTICE PARAMETERS FOR BEAM LINE: "RING"
 DELTA(P)/P = 0.004000 SYMM = F

"MAD" VERSION: 6.01/03 RUN: 19-NOV-8 08:07:18

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POS. NO.	ELEMENT NAME	SEQUENCE NO.	DIST I [M]	I	H	O R I Z O N T A L	MUX [2PI]	X(CO) [MM]	PX(CO) [.001]	DX [M]	DPX [1]	I	BETAY [1]	ALFAY [1]	MUY [2PI]	V E R T I C A L	Y(CO) [MM]	PY(CO) [.001]	DY [M]	DPY [1]
BEGIN	HCEDO	2	54.649	13.471	0.091	1.300	11.744	-0.083	2.920	-0.019	3.691	-0.013	1.313	0.000	0.000	0.000	0.000	0.000	0.000	0.000
91	QF	14	54.901	12.961	1.916	1.303	11.517	-1.723	2.865	-0.427	3.846	-0.615	1.324	0.000	0.000	0.000	0.000	0.000	0.000	0.000
92	S32H	4	58.151	4.333	0.749	1.374	5.939	-1.723	1.489	-0.427	11.580	-1.774	1.404	0.000	0.000	0.000	0.000	0.000	0.000	0.000
93	CT	13	58.251	4.187	0.714	1.378	5.768	-1.723	1.447	-0.427	11.937	-1.810	1.406	0.000	0.000	0.000	0.000	0.000	0.000	0.000
94	S3H	6	58.601	3.733	0.588	1.392	5.167	-1.723	1.298	-0.427	13.243	-1.935	1.410	0.000	0.000	0.000	0.000	0.000	0.000	0.000
95	QD	14	58.852	3.591	-0.016	1.403	4.826	-1.001	1.215	-0.245	13.737	-0.011	1.413	0.000	0.000	0.000	0.000	0.000	0.000	0.000
END	HCEDO	2	58.852	3.591	-0.016	1.403	4.826	-1.001	1.215	-0.245	13.737	-0.011	1.413	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BEGIN	HCDF	4	58.852	3.591	-0.016	1.403	4.826	-1.001	1.215	-0.245	13.737	-0.011	1.413	0.000	0.000	0.000	0.000	0.000	0.000	0.000
96	QD	15	59.104	3.749	-0.622	1.414	4.662	-0.316	1.175	-0.072	13.253	1.915	1.416	0.000	0.000	0.000	0.000	0.000	0.000	0.000
97	S3	11	59.404	4.154	-0.732	1.426	4.567	-0.316	1.154	-0.072	12.140	1.810	1.420	0.000	0.000	0.000	0.000	0.000	0.000	0.000
98	BEND	11	61.804	9.532	-1.492	1.488	4.577	0.323	1.170	0.086	5.519	0.962	1.467	0.000	0.000	0.000	0.000	0.000	0.000	0.000
99	S5H	10	62.354	11.269	-1.678	1.496	4.754	0.323	1.217	0.086	4.570	0.771	1.484	0.000	0.000	0.000	0.000	0.000	0.000	0.000
100	CT	14	62.454	11.606	-1.711	1.497	4.786	0.323	1.226	0.086	4.420	0.736	1.488	0.000	0.000	0.000	0.000	0.000	0.000	0.000
101	SXF	4	62.554	11.950	-1.737	1.499	4.818	0.322	1.234	0.086	4.277	0.698	1.491	0.000	0.000	0.000	0.000	0.000	0.000	0.000
102	S2H	8	62.804	12.836	-1.821	1.502	4.898	0.322	1.256	0.086	3.951	0.612	1.501	0.000	0.000	0.000	0.000	0.000	0.000	0.000
103	QF	15	63.056	13.302	-0.014	1.505	4.893	-0.368	1.255	-0.091	3.800	-0.003	1.511	0.000	0.000	0.000	0.000	0.000	0.000	0.000
END	HCDF	4	63.056	13.302	-0.014	1.505	4.893	-0.368	1.255	-0.091	3.800	-0.003	1.511	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BEGIN	HCDFDL	2	63.056	13.302	-0.014	1.505	4.893	-0.368	1.255	-0.091	3.800	-0.003	1.511	0.000	0.000	0.000	0.000	0.000	0.000	0.000
104	QF	16	63.308	12.849	1.795	1.508	4.715	-1.046	1.210	-0.265	3.953	-0.617	1.522	0.000	0.000	0.000	0.000	0.000	0.000	0.000
105	S3	12	63.608	11.806	1.697	1.512	4.402	-1.046	1.131	-0.265	4.354	-0.722	1.533	0.000	0.000	0.000	0.000	0.000	0.000	0.000
106	BEND	12	66.008	5.340	0.976	1.560	2.678	-0.393	0.692	-0.103	9.821	-1.556	1.593	0.000	0.000	0.000	0.000	0.000	0.000	0.000
107	S5H	11	66.558	4.381	0.776	1.578	2.463	-0.393	0.636	-0.103	11.642	-1.758	1.601	0.000	0.000	0.000	0.000	0.000	0.000	0.000
108	CT	15	66.658	4.230	0.739	1.582	2.424	-0.393	0.625	-0.103	11.996	-1.793	1.602	0.000	0.000	0.000	0.000	0.000	0.000	0.000
109	S3H	7	67.008	3.759	0.612	1.596	2.287	-0.393	0.590	-0.103	13.289	-1.916	1.607	0.000	0.000	0.000	0.000	0.000	0.000	0.000
110	QD	16	67.260	3.606	0.005	1.607	2.229	-0.066	0.575	-0.019	13.772	0.016	1.610	0.000	0.000	0.000	0.000	0.000	0.000	0.000
END	HCDFDL	2	67.260	3.606	0.005	1.607	2.229	-0.066	0.575	-0.019	13.772	0.016	1.610	0.000	0.000	0.000	0.000	0.000	0.000	0.000
END	B4S	1	67.260	3.606	0.005	1.607	2.229	-0.066	0.575	-0.019	13.772	0.016	1.610	0.000	0.000	0.000	0.000	0.000	0.000	0.000
END	RING	1	201.780	3.605	0.005	4.821	2.229	-0.066	0.575	-0.019	13.776	0.016	4.828	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	LENGTH	=	201.780000	QX	=	4.821236	QV	=	4.828138											
ALFA		=	0.426119E-01	QX	=	0.187891	QV	=	-0.380013											
GAMMA(1R)		=	4.844341	BETAX(MAX)	=	13.963957	BETAY(MAX)	=	13.775956											
				DX(MAX)	=	2.920346	DY(MAX)	=	0.000000											
				XCO(MAX)	=	11.743923	YCO(MAX)	=	0.000000											
				XCO(R.M.S.)	=	6.641259	YCO(R.M.S.)	=	0.000000											

... SEARCHING FOR CLOSED ORBIT FOR BEAM LINE "RING"
 ... ITER: X
 ... 1 0.003394 -0.000109 0.000000 0.161451E-02
 ... 2 0.003396 -0.000106 0.000000 0.131262E-04
 ... 3 0.003396 -0.000106 0.000000 0.317276E-09

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TABLE IV

LINEAR/LATITUDE PARAMETERS FOR BEAM LINE: ZUCKER PARKS																		PAGE
DELTA(P)/P = 0.006000 SYMM = F																		
ELEMENT SEQUENCE		H O R I Z O N T A L										V E R T I C A L				PAGE		
POS. NO.	ELEMENT OCC. NO.	ELEMENT NAME	DIST I [M]	BETAX [M]	ALFAX [I]	MUX [2PI]	X(CO) [MM]	PX(CO) [MM]	DX [M]	DPX [I]	BETAY [M]	ALFAY [I]	MUY [2PI]	Y(CO) [MM]	PY(CO) [MM]	DY [M]	DPY [I]	
BEGIN RING	1		0.000	3.588	0.003	0.000	3.396	-0.106	0.592-0.021	0.592-0.021	13.834	0.023	0.000	0.000	0.000	0.000	0.000	
BEGIN BAS	1		33.630	3.588	0.003	0.804	3.396	-0.106	0.592-0.021	0.592-0.021	13.837	0.023	0.805	0.000	0.000	0.000	0.000	
BEGIN HCDF	3		33.630	3.588	0.003	0.804	3.396	-0.106	0.592-0.021	0.592-0.021	13.837	0.023	0.805	0.000	0.000	0.000	0.000	
55 QD	9		33.882	3.736	-0.601	0.814	3.431	0.388	0.597-0.065	0.597-0.065	13.334	1.961	0.808	0.000	0.000	0.000	0.000	
56 S3	7		34.182	4.127	-0.710	0.827	3.546	0.388	0.616-0.065	0.616-0.065	12.197	1.852	0.811	0.000	0.000	0.000	0.000	
57 BEND	7		36.582	9.360	-1.457	0.889	5.657	1.376	0.967-0.229	0.967-0.229	5.442	0.979	0.859	0.000	0.000	0.000	0.000	
58 S5H	6		37.132	11.053	-1.640	0.898	6.409	1.376	1.091-0.229	1.091-0.229	4.479	0.782	0.876	0.000	0.000	0.000	0.000	
59 CT	8		37.232	11.382	-1.673	0.899	6.546	1.376	1.114-0.229	1.114-0.229	4.327	0.747	0.880	0.000	0.000	0.000	0.000	
60 SXF	3		37.332	11.717	-1.696	0.900	6.683	1.373	1.137-0.228	1.137-0.228	4.183	0.707	0.884	0.000	0.000	0.000	0.000	
61 S2H	5		37.582	12.580	-1.778	0.904	7.024	1.373	1.193-0.228	1.193-0.228	3.854	0.618	0.893	0.000	0.000	0.000	0.000	
62 QF	9		37.834	13.032	-0.007	0.907	7.242	0.367	1.229-0.057	1.229-0.057	3.697	0.015	0.904	0.000	0.000	0.000	0.000	
END HCDF	3		37.834	13.032	-0.007	0.907	7.242	0.367	1.229-0.057	1.229-0.057	3.697	0.015	0.904	0.000	0.000	0.000	0.000	
BEGIN HCDF	3		37.834	13.032	-0.007	0.907	7.242	0.367	1.229-0.057	1.229-0.057	3.697	0.015	0.904	0.000	0.000	0.000	0.000	
63 QF	10		38.086	12.587	1.764	0.910	7.202	-0.651	1.221-0.115	1.221-0.115	3.838	-0.585	0.915	0.000	0.000	0.000	0.000	
64 S3	8		38.386	11.564	1.667	0.914	7.012	-0.651	1.187-0.115	1.187-0.115	4.218	-0.689	0.927	0.000	0.000	0.000	0.000	
65 BEND	8		40.786	5.234	0.954	0.963	6.599	0.306	1.101-0.043	1.101-0.043	9.533	-1.540	0.988	0.000	0.000	0.000	0.000	
66 S5H	7		41.336	4.299	0.755	0.981	6.766	0.306	1.125-0.043	1.125-0.043	11.323	-1.734	0.996	0.000	0.000	0.000	0.000	
67 CT	9		41.436	4.153	0.719	0.985	6.797	0.306	1.129-0.043	1.129-0.043	11.671	-1.769	0.998	0.000	0.000	0.000	0.000	
68 S2H	3		41.536	4.016	0.660	0.989	6.828	0.325	1.133-0.049	1.133-0.049	12.020	-1.738	0.999	0.000	0.000	0.000	0.000	
69 S2H	6		41.786	3.710	0.571	0.999	6.909	0.325	1.146-0.049	1.146-0.049	12.904	-1.821	1.002	0.000	0.000	0.000	0.000	
70 QD	10		42.037	3.576	-0.029	1.010	7.116	1.338	1.179-0.217	1.179-0.217	13.352	0.053	1.005	0.000	0.000	0.000	0.000	
END HCDF	3		42.037	3.576	-0.029	1.010	7.116	1.338	1.179-0.217	1.179-0.217	13.352	0.053	1.005	0.000	0.000	0.000	0.000	
BEGIN HCDF	2		42.037	3.576	-0.029	1.010	7.116	1.338	1.179-0.217	1.179-0.217	13.352	0.053	1.005	0.000	0.000	0.000	0.000	
71 QD	11		42.289	3.740	-0.634	1.021	7.583	2.400	1.254-0.393	1.254-0.393	12.852	1.920	1.008	0.000	0.000	0.000	0.000	
72 S32H	3		45.539	11.747	-1.845	1.102	15.336	2.400	2.516-0.393	2.516-0.393	4.254	0.742	1.088	0.000	0.000	0.000	0.000	
73 CT	10		45.639	12.118	-1.882	1.104	15.574	2.400	2.555-0.393	2.555-0.393	4.110	0.706	1.084	0.000	0.000	0.000	0.000	
74 S3H	4		45.989	13.472	-2.012	1.108	16.409	2.400	2.691-0.393	2.691-0.393	3.663	0.579	1.098	0.000	0.000	0.000	0.000	
75 QF	11		46.241	14.011	-0.114	1.111	16.719	0.064	2.741-0.010	2.741-0.010	3.520	-0.001	1.110	0.000	0.000	0.000	0.000	
END HCDF	2		46.241	14.011	-0.114	1.111	16.719	0.064	2.741-0.010	2.741-0.010	3.520	-0.001	1.110	0.000	0.000	0.000	0.000	
BEGIN HCDF	4		46.241	14.011	-0.114	1.111	16.719	0.064	2.741-0.010	2.741-0.010	3.520	-0.001	1.110	0.000	0.000	0.000	0.000	
76 QF	12		46.493	13.584	1.800	1.114	16.441	-2.274	2.696-0.373	2.696-0.373	3.664	-0.580	1.121	0.000	0.000	0.000	0.000	
77 S3	9		46.793	12.538	1.707	1.117	15.763	-2.274	2.585-0.373	2.585-0.373	4.042	-0.689	1.133	0.000	0.000	0.000	0.000	
78 BEND	9		49.193	5.860	1.048	1.162	11.337	-1.421	1.860-0.235	1.860-0.235	9.481	-1.592	1.196	0.000	0.000	0.000	0.000	
79 S5H	8		49.743	4.821	0.852	1.178	10.560	-1.421	1.733-0.235	1.733-0.235	11.332	-1.796	1.205	0.000	0.000	0.000	0.000	
80 CT	11		49.843	4.655	0.817	1.182	10.419	-1.421	1.710-0.235	1.710-0.235	11.693	-1.833	1.206	0.000	0.000	0.000	0.000	
81 S2H	4		49.943	4.500	0.744	1.185	10.280	-1.377	1.687-0.220	1.687-0.220	12.051	-1.769	1.207	0.000	0.000	0.000	0.000	
82 S2H	7		50.193	4.152	0.658	1.194	9.938	-1.377	1.633-0.220	1.633-0.220	12.951	-1.854	1.213	0.000	0.000	0.000	0.000	
83 QD	12		50.445	3.989	0.001	1.204	9.772	0.046	1.607-0.014	1.607-0.014	13.414	0.027	1.213	0.000	0.000	0.000	0.000	
END HCDF	4		50.445	3.989	0.001	1.204	9.772	0.046	1.607-0.014	1.607-0.014	13.414	0.027	1.213	0.000	0.000	0.000	0.000	
BEGIN HCDF	1		50.445	3.989	0.001	1.204	9.772	0.046	1.607-0.014	1.607-0.014	13.414	0.027	1.213	0.000	0.000	0.000	0.000	
84 QD	13		50.697	4.151	-0.655	1.224	9.961	1.472	1.639-0.248	1.639-0.248	12.924	1.905	1.216	0.000	0.000	0.000	0.000	
85 S3	10		50.997	4.572	-0.758	1.225	10.400	1.472	1.713-0.248	1.713-0.248	11.820	1.798	1.220	0.000	0.000	0.000	0.000	
86 BEND	10		53.397	9.871	-1.429	1.282	14.965	2.339	2.473-0.389	2.473-0.389	5.323	0.927	1.269	0.000	0.000	0.000	0.000	
87 S5H	9		53.947	11.526	-1.598	1.291	16.244	2.339	2.685-0.389	2.685-0.389	4.414	0.736	1.287	0.000	0.000	0.000	0.000	
88 CT	12		54.047	11.847	-1.629	1.292	16.476	2.339	2.723-0.389	2.723-0.389	4.272	0.701	1.291	0.000	0.000	0.000	0.000	
89 S3H	5		54.397	13.017	-1.736	1.296	17.290	2.339	2.858-0.389	2.858-0.389	3.826	0.579	1.304	0.000	0.000	0.000	0.000	
90 QF	13		54.649	13.432	0.097	1.299	17.569	-0.119	2.904-0.017	2.904-0.017	3.688	-0.020	1.315	0.000	0.000	0.000	0.000	
END HCDF	1		54.649	13.432	0.097	1.299	17.569	-0.119	2.904-0.017	2.904-0.017	3.688	-0.020	1.315	0.000	0.000	0.000	0.000	

TABLE IV (

ELEMENT SEQUENCE		H O R I Z O N T A L										V E R T I C A L		I		D P X		B E T A Y		M U Y		P Y (C O)		D P Y	
POS. NO.	ELEMENT NAME	ELEMENT OCC. NO.	DIST [M]	I	BETAX [M]	ALFAX [I]	MUX [2PI]	X(CO) [MM]	PX(CO) [MM]	DX [MM]	DPX [I]	I	BETAY [M]	ALFAY [I]	MUY [2PI]	V(CO) [MM]	Y(CO) [MM]	DY [M]	DPY [I]						
BEGIN	HCFDO	2	54.649	13.432	0.097	1.299	17.569	-0.119	2.904	-0.017	3.688	-0.020	1.315	0.000	0.000	0.000	0.000	0.000	0.000						
91	QF	14	54.901	12.922	1.917	1.302	17.231	-2.572	2.850	-0.423	3.846	-0.621	1.326	0.000	0.000	0.000	0.000	0.000	0.000						
92	S32H	4	58.151	4.313	0.748	1.374	8.921	-2.572	1.493	-0.423	11.622	-1.786	1.406	0.000	0.000	0.000	0.000	0.000	0.000						
93	CT	13	58.251	4.168	0.712	1.377	8.665	-2.572	1.451	-0.423	11.981	-1.822	1.407	0.000	0.000	0.000	0.000	0.000	0.000						
94	S3H	6	58.601	3.716	0.587	1.391	7.770	-2.572	1.305	-0.423	13.292	-1.947	1.412	0.000	0.000	0.000	0.000	0.000	0.000						
95	QD	14	58.852	3.574	-0.015	1.402	7.264	-1.486	1.223	-0.240	13.789	-0.015	1.415	0.000	0.000	0.000	0.000	0.000	0.000						
END	HCFDO	2	58.852	3.574	-0.015	1.402	7.264	-1.486	1.223	-0.240	13.789	-0.015	1.415	0.000	0.000	0.000	0.000	0.000	0.000						
BEGIN	HCDF	4	58.852	3.574	-0.015	1.402	7.264	-1.486	1.223	-0.240	13.789	-0.015	1.415	0.000	0.000	0.000	0.000	0.000	0.000						
96	QD	15	59.104	3.731	-0.618	1.413	7.021	-0.454	1.185	-0.066	13.307	1.918	1.418	0.000	0.000	0.000	0.000	0.000	0.000						
97	S3	11	59.404	4.133	-0.729	1.425	6.886	-0.454	1.165	-0.066	12.194	1.814	1.421	0.000	0.000	0.000	0.000	0.000	0.000						
98	BEND	11	61.804	9.475	-1.484	1.487	6.943	0.502	1.196	0.092	5.573	0.965	1.468	0.000	0.000	0.000	0.000	0.000	0.000						
99	S5H	10	62.354	11.198	-1.669	1.496	7.217	0.502	1.246	0.092	4.621	0.775	1.485	0.000	0.000	0.000	0.000	0.000	0.000						
100	CT	14	62.454	11.533	-1.702	1.497	7.267	0.502	1.255	0.092	4.471	0.741	1.489	0.000	0.000	0.000	0.000	0.000	0.000						
101	SXF	4	62.554	11.874	-1.724	1.499	7.317	0.498	1.264	0.091	4.327	0.702	1.492	0.000	0.000	0.000	0.000	0.000	0.000						
102	S2H	8	62.804	12.751	-1.807	1.502	7.440	0.498	1.286	0.091	4.000	0.616	1.502	0.000	0.000	0.000	0.000	0.000	0.000						
103	QF	15	63.056	13.212	-0.012	1.505	7.434	-0.551	1.286	-0.091	3.848	-0.004	1.512	0.000	0.000	0.000	0.000	0.000	0.000						
END	HCDF	4	63.056	13.212	-0.012	1.505	7.434	-0.551	1.286	-0.091	3.848	-0.004	1.512	0.000	0.000	0.000	0.000	0.000	0.000						
BEGIN	HCFDL	2	63.056	13.212	-0.012	1.505	7.434	-0.551	1.286	-0.091	3.848	-0.004	1.512	0.000	0.000	0.000	0.000	0.000	0.000						
104	QF	16	63.308	12.763	1.785	1.508	7.166	-1.580	1.241	-0.269	4.003	-0.625	1.522	0.000	0.000	0.000	0.000	0.000	0.000						
105	S3	12	63.608	11.728	1.687	1.512	6.695	-1.580	1.162	-0.269	4.407	-0.728	1.534	0.000	0.000	0.000	0.000	0.000	0.000						
106	BEND	12	66.008	5.307	0.971	1.560	4.083	-0.603	0.714	-0.107	9.891	-1.570	1.592	0.000	0.000	0.000	0.000	0.000	0.000						
107	S5H	11	66.558	4.355	0.771	1.579	3.754	-0.603	0.655	-0.107	11.713	-1.762	1.601	0.000	0.000	0.000	0.000	0.000	0.000						
108	CT	15	66.658	4.205	0.734	1.582	3.694	-0.603	0.645	-0.107	12.066	-1.797	1.602	0.000	0.000	0.000	0.000	0.000	0.000						
109	S3H	7	67.008	3.738	0.607	1.596	3.484	-0.603	0.607	-0.107	13.359	-1.919	1.606	0.000	0.000	0.000	0.000	0.000	0.000						
110	QD	16	67.260	3.587	0.003	1.607	3.396	-0.106	0.592	-0.021	13.840	0.023	1.609	0.000	0.000	0.000	0.000	0.000	0.000						
END	HCFDL	2	67.260	3.587	0.003	1.607	3.396	-0.106	0.592	-0.021	13.840	0.023	1.609	0.000	0.000	0.000	0.000	0.000	0.000						
END	B4S	1	67.260	3.587	0.003	1.607	3.396	-0.106	0.592	-0.021	13.840	0.023	1.609	0.000	0.000	0.000	0.000	0.000	0.000						
END	RING	1	201.780	3.585	0.003	4.823	3.396	-0.106	0.592	-0.021	13.850	0.023	4.826	0.000	0.000	0.000	0.000	0.000	0.000						
TOTAL LENGTH =			201.780000			QX			4.822774		QY			4.825811											
						QX			0.276111		QY			-0.570392											
ALFA			0.429182E-01		BETAX(MAX)				14.013023		BETAY(MAX)			13.849585											
GAMMA(1R)			4.827019		DX(MAX)				2.904409		DY(MAX)			0.000000											
					XCO(MAX)				17.568722		YCO(MAX)			0.000000											
					XCO(R.M.S.)				9.949599		YCO(R.M.S.)			0.000000											

... SEARCHING FOR CLOSED ORBIT FOR BEAM LINE "RING" , DELTA(P)/P = 0.008000, SYMM = F

ITER: 1 0.004595 -0.000156 0.000000 0.214977E-02 ERROR
 2 0.004596 -0.000149 0.000000 0.224955E-04
 3 0.004596 -0.000149 0.000000 0.106091E-08

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TABLE IV 9

AGS BOOSTER LATTICE FOR SURVEY
 LINEAR LATTICE PARAMETERS FOR BEAM LINE: "RING
 DELTA(P)/P = 0.008000 SYMM = F
 "MAD" VERSION: 6.01/03 RUN: 19-NOV-8 08:07:18
 PAGE 1

ELEMENT SEQUENCE		H O R I Z O N T A L										I		V E R T I C A L		D Y					
POS. NO.	ELEMENT NAME	OC.	NO.	DIST [M]	I	BETAX [M]	ALFAX [1]	MUX [2PI]	X(CO) [MM]	PX(CO) [MM]	DX [M]	DPX [1]	I	BETAY [M]	ALFAY [1]	MUY [2PI]	V(CO) [MM]	PY(CO) [MM]	DY [M]	DPY [1]	
BEGIN	RING	1		0.000		3.570	0.001	0.000	4.596	-0.149	0.608-0.023			13.901	0.030	0.000	0.000	0.000	0.000	0.000	0.000
BEGIN	B4S	1		33.630		3.569	0.001	0.004	4.596	-0.149	0.608-0.023			13.906	0.030	0.000	0.004	0.000	0.000	0.000	0.000
BEGIN	HCDF	3		33.630		3.569	0.001	0.004	4.596	-0.149	0.608-0.023			13.906	0.030	0.000	0.004	0.000	0.000	0.000	0.000
55	QD	9		33.882		3.717	-0.501	0.815	4.642	0.518	0.614 0.066			13.398	1.977	0.807	0.000	0.000	0.000	0.000	0.000
56	S3	7		34.182		4.107	-0.709	0.827	4.796	0.518	0.633 0.066			12.254	1.868	0.811	0.000	0.000	0.000	0.000	0.000
57	BEND	7		36.582		9.329	-1.456	0.889	7.606	1.834	0.982 0.229			5.457	0.987	0.858	0.000	0.000	0.000	0.000	0.000
58	S5H	6		37.132		11.017	-1.638	0.898	8.607	1.834	1.106 0.229			4.488	0.790	0.876	0.000	0.000	0.000	0.000	0.000
59	CT	8		37.232		11.346	-1.672	0.899	8.789	1.834	1.129 0.229			4.335	0.754	0.879	0.000	0.000	0.000	0.000	0.000
60	SXF	3		37.332		11.679	-1.691	0.901	8.970	1.829	1.151 0.228			4.189	0.713	0.883	0.000	0.000	0.000	0.000	0.000
61	S2H	5		37.582		12.538	-1.773	0.904	9.424	1.829	1.207 0.228			3.858	0.623	0.893	0.000	0.000	0.000	0.000	0.000
62	QF	9		37.834		12.988	-0.008	0.907	9.713	0.480	1.242 0.055			3.699	0.020	0.903	0.000	0.000	0.000	0.000	0.000
END	HCDF	3		37.834		12.988	-0.008	0.907	9.713	0.480	1.242 0.055			3.699	0.020	0.903	0.000	0.000	0.000	0.000	0.000
BEGIN	HCDF	3		37.834		12.988	-0.008	0.907	9.713	0.480	1.242 0.055			3.699	0.020	0.903	0.000	0.000	0.000	0.000	0.000
63	QF	10		38.086		12.546	1.757	0.910	9.662	-0.886	1.234-0.120			3.837	-0.580	0.914	0.000	0.000	0.000	0.000	0.000
64	S3	8		38.386		11.529	1.660	0.914	9.398	-0.886	1.199-0.120			4.213	-0.683	0.926	0.000	0.000	0.000	0.000	0.000
65	BEND	8		40.786		5.223	0.954	0.963	8.802	0.387	1.102 0.038			9.489	-1.535	0.987	0.000	0.000	0.000	0.000	0.000
66	S5H	7		41.336		4.290	0.755	0.982	9.013	0.387	1.122 0.038			11.269	-1.728	0.996	0.000	0.000	0.000	0.000	0.000
67	CT	9		41.436		4.144	0.718	0.986	9.051	0.387	1.126 0.038			11.960	-1.763	0.997	0.000	0.000	0.000	0.000	0.000
68	SXD	3		41.536		4.008	0.653	0.989	9.091	0.420	1.130 0.046			12.829	-1.792	1.002	0.000	0.000	0.000	0.000	0.000
69	S2H	6		41.786		3.706	0.565	1.000	9.195	0.420	1.141 0.046			12.829	-1.792	1.002	0.000	0.000	0.000	0.000	0.000
70	QD	10		42.037		3.576	-0.035	1.011	9.468	1.769	1.173 0.213			13.264	0.071	1.005	0.000	0.000	0.000	0.000	0.000
END	HCDF	3		42.037		3.576	-0.035	1.011	9.468	1.769	1.173 0.213			13.264	0.071	1.005	0.000	0.000	0.000	0.000	0.000
BEGIN	HCDF	2		42.037		3.576	-0.035	1.011	9.468	1.769	1.173 0.213			13.264	0.071	1.005	0.000	0.000	0.000	0.000	0.000
71	QD	11		42.289		3.743	-0.640	1.022	10.085	3.181	1.248 0.388			12.759	1.924	1.008	0.000	0.000	0.000	0.000	0.000
72	S32H	3		45.539		11.786	-1.855	1.102	20.342	3.181	2.490 0.388			4.185	0.736	1.080	0.000	0.000	0.000	0.000	0.000
73	CT	10		45.639		12.158	-1.892	1.104	20.657	3.181	2.528 0.388			4.042	0.699	1.084	0.000	0.000	0.000	0.000	0.000
74	S3H	4		45.989		13.517	-2.023	1.108	21.762	3.181	2.662 0.388			3.601	0.571	1.099	0.000	0.000	0.000	0.000	0.000
75	QF	11		46.241		14.058	-0.118	1.111	22.171	0.084	2.711 0.010			3.460	-0.001	1.110	0.000	0.000	0.000	0.000	0.000
END	HCDF	2		46.241		14.058	-0.118	1.111	22.171	0.084	2.711 0.010			3.460	-0.001	1.110	0.000	0.000	0.000	0.000	0.000
BEGIN	HCDF	4		46.241		14.058	-0.118	1.111	22.171	0.084	2.711 0.010			3.460	-0.001	1.110	0.000	0.000	0.000	0.000	0.000
76	QF	12		46.493		13.632	1.803	1.114	21.804	-3.017	2.666-0.370			3.602	-0.573	1.121	0.000	0.000	0.000	0.000	0.000
77	S3	9		46.793		12.587	1.711	1.117	20.906	-3.017	2.557-0.370			3.975	-0.682	1.134	0.000	0.000	0.000	0.000	0.000
78	BEND	9		49.193		5.874	1.060	1.162	15.038	-1.889	1.841-0.233			9.413	-1.603	1.198	0.000	0.000	0.000	0.000	0.000
79	S5H	8		49.743		4.825	0.863	1.178	14.008	-1.889	1.714-0.233			11.276	-1.810	1.206	0.000	0.000	0.000	0.000	0.000
80	CT	11		49.843		4.657	0.827	1.181	13.820	-1.889	1.691-0.233			11.639	-1.848	1.208	0.000	0.000	0.000	0.000	0.000
81	SXD	4		49.943		4.502	0.741	1.185	13.637	-1.812	1.669-0.214			11.996	-1.752	1.209	0.000	0.000	0.000	0.000	0.000
82	S2H	7		50.193		4.155	0.656	1.194	13.187	-1.812	1.617-0.214			12.885	-1.836	1.212	0.000	0.000	0.000	0.000	0.000
83	QD	12		50.445		3.994	-0.001	1.204	12.971	0.078	1.592 0.017			13.341	0.035	1.215	0.000	0.000	0.000	0.000	0.000
END	HCDF	4		50.445		3.994	-0.001	1.204	12.971	0.078	1.592 0.017			13.341	0.035	1.215	0.000	0.000	0.000	0.000	0.000
BEGIN	HCDF	1		50.445		3.994	-0.001	1.204	12.971	0.078	1.592 0.017			13.341	0.035	1.215	0.000	0.000	0.000	0.000	0.000
84	QD	13		50.697		4.156	-0.658	1.214	13.226	1.970	1.626 0.250			12.851	1.902	1.218	0.000	0.000	0.000	0.000	0.000
85	S3	10		50.997		4.578	-0.761	1.224	13.813	1.970	1.699 0.250			11.751	1.795	1.222	0.000	0.000	0.000	0.000	0.000
86	BEND	10		53.397		9.863	-1.421	1.282	19.897	3.117	2.459 0.389			5.298	0.917	1.271	0.000	0.000	0.000	0.000	0.000
87	S5H	9		53.947		11.505	-1.588	1.290	21.598	3.117	2.669 0.389			4.401	0.727	1.289	0.000	0.000	0.000	0.000	0.000
88	CT	12		54.047		11.823	-1.619	1.291	21.907	3.117	2.708 0.389			4.261	0.693	1.293	0.000	0.000	0.000	0.000	0.000
89	S3H	5		54.397		12.984	-1.725	1.296	22.990	3.117	2.842 0.389			3.821	0.572	1.306	0.000	0.000	0.000	0.000	0.000
90	QF	13		54.649		13.394	0.103	1.299	23.361	-0.151	2.888-0.015			3.687	-0.026	1.317	0.000	0.000	0.000	0.000	0.000
END	HCDF	1		54.649		13.394	0.103	1.299	23.361	-0.151	2.888-0.015			3.687	-0.026	1.317	0.000	0.000	0.000	0.000	0.000

TABLE IV

AGS BOOSTER LATTICE FOR SURVEY
 LINEAR LATTICE PARAMETERS FOR BEAM LINE: "RING
 DELTA(P)/P = 0.008000 SYMM = F

"MAD" VERSION: 6.01/03 RUN: 19-NOV-8 08:07:18

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ELEMENT SEQUENCE		H O R I Z O N T A L				V E R T I C A L													
POS. NO.	ELEMENT NAME	NO.	DIST [M]	I	BETAX [M]	ALFAX [1]	MUX [2P]	X(CO) [MM]	PX(CO) [.001]	DX [M]	DPX [1]	I	BETAY [M]	ALFAY [1]	MUY [2P]	Y(CO) [MM]	PY(CO) [.001]	DY [M]	DPY [1]
BEGIN	HCFDO	2	54.649	13.394	0.103	1.299	23.361	-0.151	2.888	-0.015	3.687	-0.026	1.317	0.000	0.000	0.000	0.000	0.000	0.000
91	QF	14	54.901	12.883	1.917	1.302	22.915	-3.413	2.834	-0.418	3.848	-0.628	1.328	0.000	0.000	0.000	0.000	0.000	0.000
92	S32H	4	58.151	4.293	0.747	1.373	11.910	-3.413	1.496	-0.418	11.668	-1.797	1.408	0.000	0.000	0.000	0.000	0.000	0.000
93	CT	13	58.251	4.148	0.711	1.377	11.571	-3.413	1.455	-0.418	12.028	-1.833	1.409	0.000	0.000	0.000	0.000	0.000	0.000
94	S3H	6	58.601	3.698	0.585	1.391	10.386	-3.413	1.311	-0.418	13.345	-1.959	1.413	0.000	0.000	0.000	0.000	0.000	0.000
95	QD	14	58.852	3.557	-0.014	1.402	9.717	-1.961	1.230	-0.235	13.845	-0.020	1.416	0.000	0.000	0.000	0.000	0.000	0.000
END	HCFDO	2	58.852	3.557	-0.014	1.402	9.717	-1.961	1.230	-0.235	13.845	-0.020	1.416	0.000	0.000	0.000	0.000	0.000	0.000
BEGIN	HCDF	4	58.852	3.557	-0.014	1.402	9.717	-1.961	1.230	-0.235	13.845	-0.020	1.416	0.000	0.000	0.000	0.000	0.000	0.000
96	QD	15	59.104	3.712	-0.615	1.413	9.400	-0.580	1.194	-0.060	13.364	-1.923	1.419	0.000	0.000	0.000	0.000	0.000	0.000
97	S3	11	59.404	4.111	-0.725	1.425	9.228	-0.580	1.177	-0.060	12.251	-1.818	1.423	0.000	0.000	0.000	0.000	0.000	0.000
98	BEND	11	61.804	9.417	-1.475	1.487	9.360	0.691	1.221	0.097	5.627	0.968	1.469	0.000	0.000	0.000	0.000	0.000	0.000
99	S5H	10	62.354	11.127	-1.659	1.496	9.737	0.691	1.274	0.097	4.673	0.780	1.486	0.000	0.000	0.000	0.000	0.000	0.000
100	CT	14	62.454	11.460	-1.693	1.497	9.805	0.691	1.284	0.097	4.521	0.746	1.489	0.000	0.000	0.000	0.000	0.000	0.000
101	SXF	4	62.554	11.797	-1.710	1.498	9.873	0.684	1.293	0.096	4.377	0.706	1.493	0.000	0.000	0.000	0.000	0.000	0.000
102	S2H	8	62.804	12.666	-1.793	1.502	10.043	0.684	1.317	0.096	4.048	0.621	1.502	0.000	0.000	0.000	0.000	0.000	0.000
103	QF	15	63.056	13.122	-0.010	1.505	10.037	-0.732	1.317	-0.090	3.896	-0.005	1.512	0.000	0.000	0.000	0.000	0.000	0.000
END	HCDF	4	63.056	13.122	-0.010	1.505	10.037	-0.732	1.317	-0.090	3.896	-0.005	1.512	0.000	0.000	0.000	0.000	0.000	0.000
BEGIN	HCFDL	2	63.056	13.122	-0.010	1.505	10.037	-0.732	1.317	-0.090	3.896	-0.005	1.512	0.000	0.000	0.000	0.000	0.000	0.000
104	QF	16	63.308	12.676	1.774	1.508	9.680	-2.122	1.272	-0.273	4.054	-0.632	1.523	0.000	0.000	0.000	0.000	0.000	0.000
105	S3	12	63.608	11.649	1.677	1.512	9.048	-2.122	1.192	-0.273	4.460	-0.735	1.534	0.000	0.000	0.000	0.000	0.000	0.000
106	BEND	12	66.008	5.273	0.966	1.561	5.532	-0.822	0.735	-0.112	9.961	-1.576	1.592	0.000	0.000	0.000	0.000	0.000	0.000
107	S5H	11	66.558	4.328	0.766	1.579	5.083	-0.822	0.675	-0.112	11.785	-1.766	1.600	0.000	0.000	0.000	0.000	0.000	0.000
108	CT	15	66.658	4.179	0.730	1.583	5.002	-0.822	0.664	-0.112	12.139	-1.801	1.601	0.000	0.000	0.000	0.000	0.000	0.000
109	S3H	7	67.008	3.717	0.602	1.597	4.717	-0.822	0.625	-0.112	13.431	-1.923	1.606	0.000	0.000	0.000	0.000	0.000	0.000
110	QD	16	67.260	3.568	0.001	1.608	4.596	-0.149	0.608	-0.023	13.910	0.030	1.608	0.000	0.000	0.000	0.000	0.000	0.000
END	HCFDL	2	67.260	3.568	0.001	1.608	4.596	-0.149	0.608	-0.023	13.910	0.030	1.608	0.000	0.000	0.000	0.000	0.000	0.000
END	B4S	1	67.260	3.568	0.001	1.608	4.596	-0.149	0.608	-0.023	13.910	0.030	1.608	0.000	0.000	0.000	0.000	0.000	0.000
END	RING	1	201.780	3.565	0.001	4.825	4.596	-0.149	0.608	-0.023	13.928	0.030	4.823	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL LENGTH =		201.780000		QX,		4.824923		QY,		4.822551									
				QX,		0.360883		QY,		-0.761640									
ALFA		=		BETAX(MAX)		14.062001		BETAY(MAX)		13.928248									
GAMMA(1R)		=		DX(MAX)		2.888203		DY(MAX)		0.000000									
				XCO(MAX)		23.361379		YCO(MAX)		0.000000									
				XCO(R.M.S.)		13.249608		YCO(R.M.S.)		0.000000									

... SEARCHING FOR CLOSED ORBIT FOR BEAM LINE "RING", DELTA(P)/P = 0.010000, SYMM = F
 ... ITER, X PX PY ERROR
 ... 1 0.005831 -0.000207 0.000000 0.267735E-02
 ... 2 0.005829 -0.000197 0.000000 0.337740E-04
 ... 3 0.005829 -0.000197 0.000000 0.273442E-08

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TABLE IV A

AGS BOOSTER LATTICE FOR SURVEY
 LINEAR LATTICE PARAMETERS FOR BEAM LINE: "RING
 DELTA(P)/P = 0.010000 SYMM = F

"MAD" VERSION: 6.01/03 RUN: 19-NOV-8 08:07:18

DELTA(P)/P = 0.010000																		
SYMM = F																		
ELEMENT SEQUENCE																		
I																		
DIST I																		
I																		
H O R I Z O N T A L																		
MUX [2PI]																		
ALFAX [1]																		
BETAX [M]																		
SYMM = F																		
ELEMENT SEQUENCE																		
I																		
DIST I																		
I																		
H O R I Z O N T A L																		
PX(CO) [MM]																		
DX [M]																		
DPX [1]																		
I																		
BETAY [M]																		
ALFAY [1]																		
MUY [2PI]																		
V E R T I C A L																		
PY(CO) [MM]																		
DY [M]																		
DPY [1]																		
PAGE																		
POS. NO.	ELEMENT NAME	ELEMENT OCC. NO.																PAGE
BEGIN RING		1	0.000	3.551	-0.001	0.000	5.829	-0.197	0.625-0.025	13.969	0.036	0.000	0.000	0.000	0.000	0.000	0.000	
BEGIN B4S		1	33.630	3.550	-0.001	0.804	5.829	-0.197	0.625-0.025	13.976	0.036	0.804	0.000	0.000	0.000	0.000	0.000	
BEGIN HCDF		3	33.630	3.550	-0.001	0.804	5.829	-0.197	0.625-0.025	13.976	0.036	0.804	0.000	0.000	0.000	0.000	0.000	
55 QD		9	33.882	3.698	-0.600	0.815	5.886	0.650	0.630 0.066	13.464	1.993	0.807	0.000	0.000	0.000	0.000	0.000	
56 S3		7	34.182	4.087	-0.709	0.827	6.079	0.650	0.650 0.066	12.313	1.884	0.811	0.000	0.000	0.000	0.000	0.000	
57 BEND		7	36.582	9.298	-1.455	0.890	9.586	2.292	0.997 0.229	5.474	0.995	0.857	0.000	0.000	0.000	0.000	0.000	
58 S5H		6	37.132	10.981	-1.637	0.898	10.834	2.292	1.121 0.229	4.498	0.797	0.875	0.000	0.000	0.000	0.000	0.000	
59 CT		8	37.232	11.309	-1.670	0.900	11.060	2.292	1.143 0.229	4.344	0.761	0.878	0.000	0.000	0.000	0.000	0.000	
60 SXF		3	37.332	11.641	-1.686	0.901	11.287	2.283	1.165 0.227	4.198	0.718	0.882	0.000	0.000	0.000	0.000	0.000	
61 S2H		5	37.582	12.496	-1.767	0.904	11.852	2.283	1.221 0.227	3.864	0.629	0.892	0.000	0.000	0.000	0.000	0.000	
62 QF		9	37.834	12.944	-0.009	0.907	12.211	0.587	1.256 0.052	3.703	0.025	0.902	0.000	0.000	0.000	0.000	0.000	
BEGIN HCDF		3	37.834	12.944	-0.009	0.907	12.211	0.587	1.256 0.052	3.703	0.025	0.902	0.000	0.000	0.000	0.000	0.000	
BEGIN HCDF		3	37.834	12.944	-0.009	0.907	12.211	0.587	1.256 0.052	3.703	0.025	0.902	0.000	0.000	0.000	0.000	0.000	
63 QF		10	38.086	12.505	-1.750	0.911	12.143	-1.130	1.247-0.124	3.839	-0.575	0.913	0.000	0.000	0.000	0.000	0.000	
64 S3		8	38.386	11.494	1.654	0.914	11.807	-1.130	1.210-0.124	4.211	-0.678	0.925	0.000	0.000	0.000	0.000	0.000	
65 BEND		8	40.786	5.212	0.954	0.964	11.005	0.458	1.102 0.033	9.450	-1.530	0.986	0.000	0.000	0.000	0.000	0.000	
66 S5H		7	41.336	4.281	0.755	0.982	11.254	0.458	1.119 0.033	11.565	-1.723	0.995	0.000	0.000	0.000	0.000	0.000	
67 CT		9	41.436	4.136	0.718	0.986	11.300	0.458	1.123 0.033	11.565	-1.758	0.996	0.000	0.000	0.000	0.000	0.000	
68 SXD		3	41.536	4.001	0.645	0.990	11.348	0.510	1.126 0.043	11.906	-1.683	0.998	0.000	0.000	0.000	0.000	0.000	
69 S2H		6	41.786	3.703	0.558	1.000	11.474	0.510	1.137 0.043	12.759	-1.763	1.004	0.000	0.000	0.000	0.000	0.000	
70 QD		10	42.037	3.576	-0.041	1.011	11.809	2.192	1.168 0.210	13.181	0.089	1.004	0.000	0.000	0.000	0.000	0.000	
BEGIN HCDF		3	42.037	3.576	-0.041	1.011	11.809	2.192	1.168 0.210	13.181	0.089	1.004	0.000	0.000	0.000	0.000	0.000	
BEGIN HCDF		2	42.037	3.576	-0.041	1.011	11.809	2.192	1.168 0.210	13.181	0.089	1.004	0.000	0.000	0.000	0.000	0.000	
71 QD		11	42.289	3.745	-0.647	1.022	12.573	3.954	1.241 0.384	12.671	1.929	1.007	0.000	0.000	0.000	0.000	0.000	
72 S32H		3	45.539	11.825	-1.864	1.102	25.294	3.954	2.463 0.384	4.116	0.730	1.084	0.000	0.000	0.000	0.000	0.000	
73 CT		10	45.639	12.198	-1.902	1.104	25.685	3.954	2.500 0.384	3.975	0.693	1.084	0.000	0.000	0.000	0.000	0.000	
74 S3H		4	45.989	13.562	-2.033	1.108	27.055	3.954	2.632 0.384	3.540	0.564	1.099	0.000	0.000	0.000	0.000	0.000	
75 QF		11	46.241	14.105	-0.122	1.111	27.562	0.103	2.680 0.009	3.401	-0.001	1.110	0.000	0.000	0.000	0.000	0.000	
BEGIN HCDF		2	46.241	14.105	-0.122	1.111	27.562	0.103	2.680 0.009	3.401	-0.001	1.110	0.000	0.000	0.000	0.000	0.000	
BEGIN HCDF		4	46.241	14.105	-0.122	1.111	27.562	0.103	2.680 0.009	3.401	-0.001	1.110	0.000	0.000	0.000	0.000	0.000	
76 QF		12	46.493	13.680	1.806	1.114	27.106	-3.752	2.636-0.366	3.540	-0.565	1.122	0.000	0.000	0.000	0.000	0.000	
77 S3		9	46.793	12.635	1.714	1.117	25.992	-3.752	2.529-0.366	3.909	-0.676	1.135	0.000	0.000	0.000	0.000	0.000	
78 BEND		8	49.193	5.888	1.072	1.161	18.699	-2.353	1.821-0.231	9.347	-1.615	1.199	0.000	0.000	0.000	0.000	0.000	
79 S5H		9	49.743	4.829	0.873	1.178	17.418	-2.353	1.696-0.231	11.220	-1.825	1.208	0.000	0.000	0.000	0.000	0.000	
80 CT		11	49.843	4.659	0.837	1.181	17.185	-2.353	1.673-0.231	11.585	-1.863	1.209	0.000	0.000	0.000	0.000	0.000	
81 S2H		4	49.943	4.503	0.739	1.184	16.958	-2.235	1.652-0.208	11.941	-1.736	1.210	0.000	0.000	0.000	0.000	0.000	
82 S2H		7	50.193	4.159	0.654	1.194	16.405	-2.235	1.601-0.208	12.821	-1.819	1.214	0.000	0.000	0.000	0.000	0.000	
83 QD		12	50.445	3.998	-0.003	1.203	16.142	0.116	1.578 0.021	13.270	0.043	1.217	0.000	0.000	0.000	0.000	0.000	
BEGIN HCDF		4	50.445	3.998	-0.003	1.203	16.142	0.116	1.578 0.021	13.270	0.043	1.217	0.000	0.000	0.000	0.000	0.000	
BEGIN HCDF		1	50.445	3.998	-0.003	1.203	16.142	0.116	1.578 0.021	13.270	0.043	1.217	0.000	0.000	0.000	0.000	0.000	
84 QD		13	50.697	4.162	-0.661	1.213	16.463	2.472	1.611 0.252	12.780	1.898	1.224	0.000	0.000	0.000	0.000	0.000	
85 S3		10	50.997	4.585	-0.763	1.224	17.197	2.472	1.685 0.252	11.684	1.791	1.224	0.000	0.000	0.000	0.000	0.000	
86 BEND		10	53.397	9.854	-1.413	1.281	24.801	3.895	2.444 0.389	5.276	0.907	1.273	0.000	0.000	0.000	0.000	0.000	
87 S5H		9	53.947	11.483	-1.578	1.289	26.921	3.895	2.654 0.389	4.391	0.719	1.291	0.000	0.000	0.000	0.000	0.000	
88 CT		12	54.047	11.798	-1.608	1.291	27.307	3.895	2.692 0.389	4.252	0.685	1.294	0.000	0.000	0.000	0.000	0.000	
89 S3H		5	54.397	12.950	-1.714	1.295	28.657	3.895	2.825 0.389	3.819	0.565	1.308	0.000	0.000	0.000	0.000	0.000	
90 QF		13	54.649	13.354	0.109	1.298	29.121	-0.179	2.872-0.013	3.688	-0.033	1.319	0.000	0.000	0.000	0.000	0.000	
BEGIN HCDF		1	54.649	13.354	0.109	1.298	29.121	-0.179	2.872-0.013	3.688	-0.033	1.319	0.000	0.000	0.000	0.000	0.000	

TABLE IV

AGS BOOSTER LATTICE FOR SURVEY
 LINEAR LATTICE PARAMETERS FOR BEAM LINE: "RING
 DELTA(P)/P = 0.010000 SYMM = F

"MAD" VERSION: 6.01/03 RUN: 19-NOV-8 08:07:18

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ELEMENT SEQUENCE		H O R I Z O N T A L										V E R T I C A L		P Y (C O) D Y		D P Y			
POS. NO.	ELEMENT OCC. NO.	DIST I [M]	I	BETAX [M]	ALFAX [I]	MUX [2PI]	X(CO) [MM]	PX(CO) [MM]	DX [M]	DPX [I]	I	BETAY [M]	ALFAY [I]	MUY [2PI]	Y(CO) [MM]	PY(CO) [MM]	DY [M]	DPY [I]	
BEGIN	HCDO	2	54.649	13.354	0.109	1.298	29.121	-0.179	2.872	-0.013		3.688	-0.033	1.319	0.000	0.000	0.000	0.000	
91	QF	14	54.901	12.843	1.917	1.301	28.568	-4.246	2.819	-0.414		3.852	-0.635	1.329	0.000	0.000	0.000	0.000	
92	S32H	4	58.151	4.273	0.746	1.373	14.906	-4.246	1.500	-0.414		11.718	-1.809	1.409	0.000	0.000	0.000	0.000	
93	CT	13	58.251	4.129	0.710	1.376	14.486	-4.246	1.459	-0.414		12.079	-1.845	1.415	0.000	0.000	0.000	0.000	
94	S3H	6	58.601	3.680	0.584	1.390	13.015	-4.246	1.317	-0.414		13.402	-1.972	1.415	0.000	0.000	0.000	0.000	
95	QD	14	58.852	3.539	-0.013	1.402	12.185	-2.425	1.238	-0.230		13.906	-0.024	1.417	0.000	0.000	0.000	0.000	
END	HCDO	2	58.852	3.539	-0.013	1.402	12.185	-2.425	1.238	-0.230		13.906	-0.024	1.417	0.000	0.000	0.000	0.000	
BEGIN	HCDF	4	58.852	3.539	-0.013	1.402	12.185	-2.425	1.238	-0.230		13.906	-0.024	1.417	0.000	0.000	0.000	0.000	
96	QD	15	59.104	3.693	-0.611	1.413	11.798	-0.693	1.203	-0.053		12.311	1.928	1.420	0.000	0.000	0.000	0.000	
97	S3	11	59.404	4.089	-0.721	1.425	11.592	-0.693	1.188	-0.053		12.311	1.823	1.424	0.000	0.000	0.000	0.000	
98	BEND	11	61.804	9.358	1.467	1.487	11.828	0.891	1.247	0.103		5.681	0.972	1.470	0.000	0.000	0.000	0.000	
99	S5H	10	62.354	11.055	-1.650	1.496	12.313	0.891	1.302	0.103		4.725	0.785	1.487	0.000	0.000	0.000	0.000	
100	CT	14	62.454	11.385	-1.683	1.497	12.401	0.891	1.312	0.103		4.572	0.751	1.490	0.000	0.000	0.000	0.000	
101	SXF	4	62.554	11.719	-1.697	1.498	12.489	0.880	1.322	0.100		4.428	0.710	1.494	0.000	0.000	0.000	0.000	
102	S2H	8	62.804	12.580	-1.779	1.502	12.706	0.880	1.347	0.100		4.097	0.626	1.503	0.000	0.000	0.000	0.000	
103	QF	15	63.056	13.030	-0.008	1.505	12.702	-0.911	1.348	-0.090		3.944	-0.006	1.513	0.000	0.000	0.000	0.000	
END	HCDF	4	63.056	13.030	-0.008	1.505	12.702	-0.911	1.348	-0.090		3.944	-0.006	1.513	0.000	0.000	0.000	0.000	
BEGIN	HCDFL	2	63.056	13.030	-0.008	1.505	12.702	-0.911	1.348	-0.090		3.944	-0.006	1.513	0.000	0.000	0.000	0.000	
104	QF	16	63.308	12.588	1.763	1.508	12.254	-2.671	1.303	-0.276		4.104	-0.639	1.523	0.000	0.000	0.000	0.000	
105	S3	12	63.608	11.569	1.666	1.512	11.461	-2.671	1.221	-0.276		4.514	-0.741	1.534	0.000	0.000	0.000	0.000	
106	BEND	12	66.008	5.237	0.961	1.561	7.024	-1.050	0.757	-0.116		10.033	-1.581	1.591	0.000	0.000	0.000	0.000	
107	S5H	11	66.558	4.300	0.761	1.579	6.452	-1.050	0.694	-0.116		11.859	-1.771	1.599	0.000	0.000	0.000	0.000	
108	CT	15	66.658	4.153	0.724	1.583	6.348	-1.050	0.683	-0.116		12.213	-1.806	1.600	0.000	0.000	0.000	0.000	
109	S3H	7	67.008	3.695	0.597	1.597	5.984	-1.050	0.643	-0.116		13.506	-1.927	1.605	0.000	0.000	0.000	0.000	
110	QD	16	67.260	3.548	-0.001	1.608	5.829	-0.197	0.625	-0.025		13.983	0.036	1.608	0.000	0.000	0.000	0.000	
END	HCDFL	2	67.260	3.548	-0.001	1.608	5.829	-0.197	0.625	-0.025		13.983	0.036	1.608	0.000	0.000	0.000	0.000	
END	B4S	1	67.260	3.548	-0.001	1.608	5.829	-0.197	0.625	-0.025		13.983	0.036	1.608	0.000	0.000	0.000	0.000	
END	RING	1	201.780	3.543	-0.001	4.828	5.829	-0.197	0.625	-0.025		14.012	0.036	4.818	0.000	0.000	0.000	0.000	
TOTAL LENGTH =			201.780000	QX		QY		QV		4.818355		-0.953803		14.011904		0.000000		0.000000	
ALFA		=		BETAX(MAX)		BETAY(MAX)		DY(MAX)		YCO(MAX)		YCO(R.M.S.)		0.000000		0.000000		0.000000	
GAMMA(1R)		=		DX(MAX)		XCO(MAX)		XCO(R.M.S.)		16.541174		19-NOV-8 08:10:13		ZOHREH PARSA					

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