APPENDIX I. SUMMARY OF ACCELERATOR PARAMETERS

A. Fixed-Target Accelerator

Peak Energy	800 - 1000 GeV
Intensity	$>2\times10^{13}$ ppp
Rep rate	1 - 2 cyc/min
Injection	150 GeV, single turn
Injection phase space	$< 0.2\ \pi$ mm-mr (2σ)
Injection $\Delta p/p$	$< \pm 0.3 \times 10^{-3}$ (<0.3 eV-s)
Ramp Rate	50 - 75 GeV/s
Main Power Supplies	6 @ 2 kV, 4500 A each - Ramping
	1 @150 V, 4500 A - Holding
RF	53 MHz (Main-Ring frequency)
Harmonic number	1113 (same as Main Ring)
RF Voltage	250-380 kV/cavity, 6 cavities
Bend-Field current at 1000 GeV	44 kG @ 4400 A
Number of dipoles	774
Number of quadrupoles	216
Good-field aperture	±0.8 in. horiz., ±0.6 in. vert.
Lattice	Modified Main Ring, -FODO, -antisymmetric long straight section
	High β for extraction, 2 straight sections
	Low β for colliding beams, 1 straight section
Radius	0.7 cm radius increase from Main Ring (1 km)
Amplitude functions	
Normal cell	
β max	99.5 m
β min	28.6 m
η max	6.0 m
Long Straight Sections	
β_{max} - Normal	110.3 m
β_{max} - High-β	243.4 m
Tune	19.4 horiz. and vert.
Flattop time	Variable to dc
Correction magnets	Superconducting, ramped to full excitation.
	Dipole, quadrupole, sextupole at each main quad.
	Skew quadrupole, octopole, skew sextupole as needed.
Extraction	Slow resonant (1 to 10 s)
	Fast resonant (1 ms)
Abort System	Single-turn beam extracted.

Cryogenics

Heat leak/magnet	Dipole dc < 7 w at 4.6 K 22 w at 80 K Dipole ac <500 J/cyc at 4.6 K Quadrupole dc < 7 w at 4.6 K 13 w at 80 K
Heat leak and helium usage for leads	Power leads, correction leads, end boxes etc., total 350 ℓ/h + 550 w
Central Helium Liquefier	> 4000 ℓ/h
Nitrogen Reliquefier	2550 ℓ/h (54 ton/day)
Satellite Refrigerators	24 units each 966 w max. @ 4.6 K with 129 ℓ/h helium input

B. $\bar{p}$ - p Collider

Interaction region	one[1]
β^*	1 -10 m (horiz. and vert.)
Space for detector	12 - 40 m
Number of filled rf buckets	1, possibly going to 12[2]
Spacing between filled buckets	1 μs (approx)
Number of p's/bucket	$2 \times 10^{10} - 10^{11}$
Number of $\bar{p}$'s/bucket	$6 \times 10^{9} - 10^{10}$
Luminosity/bucket	$10^{28} - 8 \times 10^{28}$ cm^{-2} s^{-1}
Injection	Forward and backward single bucket
Abort	Forward and backward dumps
RF	2 sets of orthogonal cavities total of 6 (4p - 2$\bar{p}$)
Vacuum in straight sections	$<10^{-8}$ Torr
Storage time needed	> 3 h
Longitudinal Emittance	p: 2 eV-s $\bar{p}$: 0.08 eV-s
Beam tune shift/crossing	2×10^{-3}

Interaction region (for a β^* of 2 meters) (triplets adjacent to interaction region)

η^*	0.4 m
β max	380 m
η max	9.5 m
$\Delta\nu$	0.3
Space for detector	14 m
Chromaticity	1.1 times normal
Number of separate quad power supplies	5
Number of quads separately powered	10

1) A second interaction region could be developed if the extraction septum and related shielding were removed during colliding-beam operation.

2) More than one bucket will come with development of high-momentum pre-cooler or accumulator.

C. p-p Collider (minimal system)

Main Ring

Energy	150 - 200 GeV
Intensity	2×10^{13} (full ring)
β^*	5 m (approx.)
Storage Time Needed	1/2 h

Superconducting Ring

Energy	800 - 1000 GeV
Intensity	2×10^{13} p (full ring)
β^*	10 m
Storage Time Needed	1/2 hour
Luminosity	2×10^{30} cm^2 sec^{-1}
Injection	Backward injection and acceleration in Main Ring required
Abort	Backward MR abort required.
Radius	Superconducting Ring at 0.7 cm larger radius than Main Ring
Space for Detector	12 m
Interaction Region	Kissing magnets (Beams come together and then apart in one straight section). Main-Ring magnets must be lowered near interaction straight section.

APPENDIX II. LATTICE FUNCTIONS AND GEOMETRY

The ring has two-fold symmetry. Thus the accompanying SYNCH printout covers only three sectors explicitly. Stations are listed at the left of the elements.

The drawings show the relationships between the layout of the two rings. All numbers are in inches. Numbers in square parentheses indicate the radial offset of the superconducting ring relative to the Main Ring. Outside dipoles, the angle is always 0.4298 mrad. Neither the longitudinal nor the radial scale is linear.

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SYNCH RUN                    DOUBLER LATTICE
==========================================================================================

                    DOUBLER LATTICE USING TWO SHELL NORMAL QUADS AND SPECIAL
                    LENGTH MATCHING QUADS. ALL QUADS RUN AT SAME EXCITATION
                    CORRESPONDING TO THE 35 TURN DIPOLE.

                    21 FOOT DIPOLES

                    LATTICE WITH COLLIN'S HIGH BETA IN SECTS. D & A

                    ALL QUANTITIES GIVEN AT THE END OF THE ELEMENT.
                    ALL QUANTITIES IN UNITS OF M.KG.KG/M.KG-M.

                    11 APRIL 79 DE JOHNSON

***  BRHO   =          //  33387.702
***  BZ     =          //  44.27664
***  GF     =          //  760.32056
***  GD     =          //  -760.32056
***  BL     =          //  6.1214          241"                    Bend length
***  QL     =          //  1.67894         66.1                    Normal Quad length
***  QLS    =          //  0.8146          32.07                   48 Location Quad length straight section C, E, F
***  O      DRF        //  0.2794          11                      Bend to Bend drift
***  OO     DRF        //  2.29616         90.4                    Normal Mini straight drift
***  OOO    DRF        //  0.4445          17.5                    Drift just ahead of standard cell quads
                    NORMAL CELL
***  B      MAG        //  BL        0.        BRHO      BZ        $
***  QF     MAG        //  QL        GF        BRHO
***  QD     MAG        //  QL        GD        BRHO
                    HALF CELL
***  .HC    BML        //  OO   B    O    B    O    B    O    B    OOO
***  HC     MMM        //  .HC
                    MEDIUM STRAIGHT
***  MS1    DRF        //  14.67866        577.90    48.158          17 location straight length
***  MS2    DRF        //  0.8636          34                        Drift just ahead of 18 location Quad
                    REGULAR LATTICE
***  QFS    MAG        //  QLS       GF        BRHO
***  QDS    MAG        //  QLS       GD        BRHO
***  .NC    BML        //    2( HC   QD   HC   QF      ) MS1  B    O    B    MS2   12(
  *                    //  QD   HC   QF   HC      )
                    LONG STRAIGHT at C0 E0 F0
***  QL1    =          //  2.1011          82.72"                  Outside Quad of Doublet
***  QL2    =          //  2.5248          99.40                   Inside Quad of Doublet
***  D1     DRF        //  8.1915          322.5     26.875'         48 Location Straight length
***  D2     DRF        //  3.8191          150.35    12.53           Drift Space between doublet
***  D3     DRF        //  1.7907          70.5                      Mini straight length downstream of 11 location doublet
***  LS     DRF        //  26.5970         1047.12   87.26           Long straight half length
***  Q1     MAG        //  QL1       GF        BRHO
***  Q2     MAG        //  QL2       GD        BRHO
***  -Q1    MAG        //  QL1       GD        BRHO
***  -Q2    MAG        //  QL2       GF        BRHO
                    LONG STRAIGHT LATTICE
***  .LSS   BML        //  QFS  D1   B    O    B    O    B    OOO  Q1   D2   Q2   LS
  *                    //  LS   -Q2  D2   -Q1  D3   B    O    B    O    B    O    B
  *                    //  OOO  QDS  HC

                    HIGH BETA LONG STRAIGHT D & A
***  QHL1   =          //  0.6477          25.5                    F48 Quad
***  QHL2   =          //  2.2908          90.19                   Outside Quad of doublet
***  QHL3   =          //  2.5248          99.40                   Inside Quad of doublet
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***  QH1    MAG      //  QHL1      GF        BRHO
***  QH2    MAG      //  QHL2      GD        BRHO
***  QH3    MAG      //  QHL3      GF        BRHO
***  -QH3   MAG      //  QHL3      GD        BRHO
***  -QH2   MAG      //  QHL2      GF        BRHO
***  -QH1   MAG      //  QHL1      GD        BRHO
***  DH1    DRF      //  8.1359          320.31    26.69        48 location straight length
***  DH2    DRF      //  3.8519          151.65    12.637       Drift length between doublet
***  DH3    DRF      //  1.7351           68.31                  Mini straightlength down stream of Sta 11 doublet
***  LSD    DRF      //  26.5970         1047.12    87.26        Long straight half length

***  .LSD   BML      //  QH1  DH1  B    0    B    0    B    000  QH2  DH2  QH3  LSD
  *                  //  LSD  -QH3 DH2  -QH2 DH3  B    0    B    0    B    0    B
  *                  //  000  -QH1 HC

***         PAGE     //
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*** RING CYC 2 // 2(.NC QD HC .LSS QF) .NC QD HC .LSD QF

	POS		S	PSIX	BETAX	ALPHAX	XEQ	DXEQ	PSIY	BETAY	ALPHAY	YEQ	DYEQ
A13	0		0.0000	0.00000	97.994218	1.87497	2.071389	-.03395	0.00000	28.891693	-.57695	0.00000	0.00000
	1	HC	28.0645	.08816	29.047159	.58179	1.544133	-.00148	.08863	97.537839	-1.86792	0.00000	0.00000
A14	2	QD	29.7434	.09746	29.046426	-.58134	1.591447	.05814	.09134	97.543759	1.86447	0.00000	0.00000
	3	HC	57.8079	.18564	97.955299	-1.87406	3.648766	.09061	.17980	28.992169	.57739	0.00000	0.00000
A15	4	QF	59.4868	.18834	97.954846	1.87432	3.682794	-.05030	.18912	29.002981	-.58397	0.00000	0.00000
	5	HC	87.5513	.27653	29.039269	.58132	2.696855	-.01782	.27727	98.124526	-1.87783	0.00000	0.00000
A16	6	QD	89.2302	.28584	29.039652	-.58155	2.753629	.08582	.27996	98.125748	1.87712	0.00000	0.00000
	7	HC	117.2947	.37402	97.975178	-1.87480	5.587604	.11829	.36807	29.029470	.58414	0.00000	0.00000
A17	8	QF	118.9736	.37671	97.975915	1.87437	5.605704	-.09684	.37738	29.019685	-.57819	0.00000	0.00000
	9	MS1	133.6523	.40940	52.874714	1.19820	4.184170	-.09684	.43675	55.900645	-1.25310	0.00000	0.00000
	10	B	139.7737	.43067	39.931670	.91622	3.616204	-.08873	.45203	72.960881	-1.53379	0.00000	0.00000
	11	O	140.0531	.43179	39.423284	.90335	3.591414	-.08873	.45203	73.821547	-1.54662	0.00000	0.00000
	12	B	146.1745	.46022	30.089993	.62137	3.073141	-.08061	.46431	94.472861	-1.82689	0.00000	0.00000
	13	MS2	147.0381	.46487	29.051122	.58159	3.003528	-.08061	.46574	97.662508	-1.86654	0.00000	0.00000
A18	14	QD	148.7170	.47418	29.051319	-.58171	2.963658	.03286	.46845	97.655859	1.87042	0.00000	0.00000
	15	HC	176.7815	.56233	97.985879	-1.87461	4.311409	.06533	.55699	28.908159	.57843	0.00000	0.00000
A19	16	QF	178.4604	.56503	97.985299	1.87495	4.282285	-.09984	.56634	28.910335	-.57975	0.00000	0.00000
	17	HC	206.5249	.65320	29.042179	.58167	1.906000	-.06737	.65482	97.778468	-1.87302	0.00000	0.00000
A21	18	QD	208.2038	.66250	29.041535	-.58128	1.853185	.00412	.65752	97.785911	1.86866	0.00000	0.00000
	19	HC	236.2683	.75069	97.951095	-1.87415	2.394259	.03659	.74579	29.034822	.58028	0.00000	0.00000
A22	20	QF	237.9472	.75339	97.951198	1.87409	2.378595	-.05515	.75509	29.038446	-.58249	0.00000	0.00000
	21	HC	266.0117	.84158	29.043156	.58129	1.256542	-.02267	.84325	97.985377	-1.87309	0.00000	0.00000
A23	22	QD	267.6906	.85088	29.043880	-.58173	1.258610	.02515	.84595	97.979792	1.87635	0.00000	0.00000
	23	HC	295.7551	.93905	97.989614	-1.87499	2.390041	.05762	.93425	28.957659	.58227	0.00000	0.00000
A24	24	QF	297.4340	.94175	97.990046	1.87474	2.409453	-.03462	.94358	28.949850	-.57751	0.00000	0.00000
	25	HC	325.4985	1.02990	29.050703	.58175	1.863387	-.00215	1.03210	97.572277	-1.86651	0.00000	0.00000
A25	26	QD	327.1774	1.03920	29.050313	-.58151	1.919865	.06979	1.03481	97.571309	1.86707	0.00000	0.00000
	27	HC	355.2419	1.12737	97.969347	-1.87425	4.304003	.10226	1.12334	28.941806	.57756	0.00000	0.00000
A26	28	QF	356.9208	1.13007	97.968626	1.87467	4.336456	-.06381	1.13267	28.948971	-.58192	0.00000	0.00000
	29	HC	384.9853	1.21825	29.038940	.58147	2.971333	-.03134	1.22100	97.958619	-1.87589	0.00000	0.00000
A27	30	QD	386.6642	1.22756	29.038774	-.58137	3.014036	.08248	1.22370	97.954048	1.87273	0.00000	0.00000
	31	HC	414.7287	1.31575	97.959793	-1.87446	5.754267	.11495	1.31186	29.041740	.58233	0.00000	0.00000
A28	32	QF	416.4076	1.31845	97.960391	1.87411	5.761497	-.10638	1.32116	29.038829	-.58056	0.00000	0.00000
	33	HC	444.4721	1.40662	29.048205	.58141	3.201568	-.07391	1.40940	97.816896	-1.86900	0.00000	0.00000
A29	34	QD	446.1510	1.41592	29.048832	-.58179	3.179453	.04743	1.41211	97.808521	1.87388	0.00000	0.00000
	35	HC	474.2155	1.50408	97.993714	-1.87490	4.936015	.07990	1.50057	28.914088	.58019	0.00000	0.00000
A32	36	QF	475.8944	1.50677	97.993581	1.87497	4.911148	-.10936	1.50991	28.910664	-.57810	0.00000	0.00000
	37	HC	503.9589	1.59493	29.046727	.58178	2.267570	-.07689	1.59847	97.634081	-1.86951	0.00000	0.00000
A33	38	QD	505.6378	1.60424	29.045996	-.58134	2.210259	.00826	1.60117	97.639134	1.86657	0.00000	0.00000
	39	HC	533.7023	1.69242	97.954789	-1.87406	2.867542	.04073	1.68957	28.997474	.57850	0.00000	0.00000
A34	40	QF	535.3812	1.69511	97.954382	1.87430	2.843646	-.04904	1.69889	29.004864	-.58299	0.00000	0.00000
	41	HC	563.4457	1.78331	29.032575	.58131	1.331677	-.03657	1.78708	98.038343	-1.87567	0.00000	0.00000
A35	42	QD	565.1246	1.79261	29.039991	-.58157	1.312592	.01371	1.78978	98.037917	1.87592	0.00000	0.00000
	43	HC	593.1891	1.88079	97.976499	-1.87482	2.123011	.04618	1.87796	29.005376	.58307	0.00000	0.00000
A36	44	QF	594.8680	1.88349	97.977214	1.87440	2.131948	-.03559	1.88728	28.997749	-.57643	0.00000	0.00000
	45	HC	622.9325	1.97165	29.051274	.58161	1.558584	-.00312	1.97568	97.640600	-1.86632	0.00000	0.00000
A37	46	QD	624.6114	1.98095	29.051409	-.58169	1.603576	.05701	1.97839	97.634615	1.86981	0.00000	0.00000

	47	HC	652.6759	2.06910	97.984397	-1.87457	3.628972	.08948	2.06694	28.910642	.57819	0.00000	0.00000
A38	48	QF	654.3548	2.07180	97.983782	1.87493	3.661743	-.05065	2.07629	28.913766	-.58009	0.00000	0.00000
	49	HC	682.4193	2.15998	29.041705	.58165	2.665912	-.01818	2.16475	97.807534	-1.87359	0.00000	0.00000
A39	50	QD	684.0982	2.16928	29.041095	-.58128	2.721090	.08426	2.16745	97.815011	1.86524	0.00000	0.00000
	51	HC	712.1627	2.25747	97.951400	-1.87417	5.511295	.11673	2.25569	29.038786	.58062	0.00000	0.00000
A42	52	QF	713.8416	2.26017	97.951563	1.87407	5.529240	-.09547	2.26500	29.041488	-.58227	0.00000	0.00000
	53	HC	741.9061	2.34835	29.043681	.58129	3.275617	-.06300	2.35316	97.965544	-1.87250	0.00000	0.00000
A43	54	QD	743.5850	2.35766	29.044418	-.58174	3.274414	.06155	2.35586	97.969247	1.87617	0.00000	0.00000
	55	HC	771.6495	2.44582	97.990661	-1.87499	5.427474	.09403	2.44418	28.949493	.58201	0.00000	0.00000
A44	56	QF	773.3284	2.44852	97.991042	1.87477	5.410385	-.11427	2.45352	28.942051	-.57748	0.00000	0.00000
	57	HC	801.3929	2.53667	29.050426	.58176	2.628937	-.08180	2.54205	97.571693	-1.86680	0.00000	0.00000
A45	58	QD	803.0718	2.54598	29.049983	-.58149	2.574951	.01715	2.54476	97.571714	1.86678	0.00000	0.00000
	59	HC	831.1363	2.63414	97.967546	-1.87422	3.481823	.04962	2.63328	28.949582	.57759	0.00000	0.00000
A46	60	QF	832.8152	2.63684	97.966838	1.87463	3.453090	-.08367	2.64261	28.957130	-.58218	0.00000	0.00000
	61	HC	860.8797	2.72503	29.038811	.58145	1.530649	-.05119	2.73091	97.979290	-1.87608	0.00000	0.00000
A47	62	QD	862.5586	2.73433	29.038707	-.58139	1.493165	.00630	2.73361	97.984011	1.87333	0.00000	0.00000
	63	HC	890.6231	2.82252	97.961320	-1.87450	2.095656	.03878	2.82176	29.038747	.58255	0.00000	0.00000
A48	64	QFS	891.4377	2.82383	99.542135	-.05632	2.111349	-.00029	2.82628	28.551847	.01817	0.00000	0.00000
	65	D1	899.6292	2.83684	101.140996	-.13887	2.108934	-.00029	2.87097	30.605054	-.26882	0.00000	0.00000
	66	B	905.7506	2.84638	103.218748	-.20056	2.131974	.00782	2.90082	35.206904	-.48292	0.00000	0.00000
	67	O	906.0300	2.84681	103.331607	-.20337	2.134160	.00782	2.90208	35.479493	-.49270	0.00000	0.00000
	68	B	912.1514	2.85612	106.199080	-.26506	2.206893	.01594	2.92718	42.821564	-.70067	0.00000	0.00000
	69	O	912.4308	2.85653	106.347985	-.26788	2.211347	.01594	2.92821	43.219183	-.71645	0.00000	0.00000
	70	B	918.5522	2.86555	110.005180	-.32957	2.333772	.02406	2.94856	53.299452	-.93022	0.00000	0.00000
	71	OOO	918.9967	2.86619	110.300159	-.33405	2.344466	.02406	2.94988	54.133333	-.94578	0.00000	0.00000
A49	72	Q1	921.0978	2.86931	100.932680	4.64201	2.277310	-.08745	2.95565	64.156153	-3.98821	0.00000	0.00000
	73	D2	924.9169	2.87661	68.734502	3.78882	1.943343	-.08745	2.96330	98.471704	-4.99442	0.00000	0.00000
	74	G2	927.4417	2.88304	59.660897	-.02279	1.859945	.02059	2.96708	109.304249	.91361	0.00000	0.00000
B0	75	LS	954.0387	2.94918	72.736582	-.46883	2.407480	.02059	3.01534	72.579453	.46718	0.00000	0.00000
	76	LS	980.6357	2.99734	109.538627	-.91486	2.955016	.02059	3.08160	59.602246	.02074	0.00000	0.00000
	77	-Q2	983.1605	3.00111	98.679312	5.00576	2.793842	-.14671	3.08804	68.678404	-3.78783	0.00000	0.00000
B11	78	D2	986.9796	3.00874	64.295840	3.99727	2.233541	-.14671	3.09534	100.870081	-4.64129	0.00000	0.00000
	79	-Q1	989.0807	3.01450	54.238511	.94876	2.033311	-.04548	3.09846	110.241163	.33168	0.00000	0.00000
	80	D3	990.8714	3.01992	50.952944	.88603	1.951873	-.04548	3.10106	109.085568	.31365	0.00000	0.00000
	81	B	996.9928	3.04119	41.418293	.67158	1.698330	-.03736	3.11014	105.615844	.25315	0.00000	0.00000
	82	O	997.2722	3.04227	41.045749	.66179	1.687892	-.03736	3.11056	105.475170	.25033	0.00000	0.00000
	83	B	1003.3936	3.06837	34.256379	.44734	1.484041	-.02924	3.11993	102.781052	.18977	0.00000	0.00000
	84	O	1003.6730	3.06967	34.009139	.43755	1.475871	-.02924	3.12036	102.675798	.18695	0.00000	0.00000
	85	B	1009.7944	3.10038	29.965050	.22310	1.321712	-.02112	3.12994	100.758029	.12633	0.00000	0.00000
	86	O	1010.0738	3.10187	29.843115	.21331	1.315810	-.02112	3.13038	100.688224	.12351	0.00000	0.00000
	87	B	1016.1952	3.13550	28.544306	-.00114	1.211343	-.01301	3.14012	99.547332	.06286	0.00000	0.00000
	88	OOO	1016.6397	3.13798	28.552238	-.01671	1.235561	-.01301	3.14083	99.493443	.05838	0.00000	0.00000
B12	89	QDS	1017.4543	3.14249	29.036736	-.58105	1.204059	.00931	3.14214	97.910043	1.87560	0.00000	0.00000
	90	HC	1045.5187	3.23070	97.932173	-1.87387	1.891046	.04179	3.23052	28.933318	.58140	0.00000	0.00000
B13	91	QF	1047.1977	3.23340	97.932580	1.87363	1.900083	-.03108	3.23986	28.926951	-.57753	0.00000	0.00000
	92	HC	1075.2621	3.32159	29.043157	.58107	1.453471	.00139	3.32841	97.579543	-1.86757	0.00000	0.00000
B14	93	QD	1076.9411	3.33090	29.044601	-.58195	1.502736	.05761	3.33112	97.581624	1.86635	0.00000	0.00000
	94	HC	1105.0055	3.41905	98.009199	-1.87543	3.544976	.09008	3.41960	28.966942	.57775	0.00000	0.00000
B15	95	QF	1106.6845	3.42175	98.009860	1.87505	3.581425	-.04689	3.42893	28.974994	-.58265	0.00000	0.00000
	96	HC	1134.7489	3.50989	29.055021	.58159	2.691067	-.01442	3.51718	98.015975	-1.87628	0.00000	0.00000
B16	97	QD	1136.4279	3.51919	29.054088	-.58142	2.753434	.08911	3.51988	98.019007	1.87451	0.00000	0.00000
	98	HC	1164.4923	3.60735	97.960301	-1.87389	5.679798	.12158	3.60803	29.029999	.58293	0.00000	0.00000

B17	99	QF	1166.1713	3.61005	97.958950	1.87467	5.700422	-.09714	3.61734	29.024363	-.57950	0.00000	0.00000
	100	MS1	1180.8499	3.64275	52.853112	1.19821	4.274480	-.09714	3.67668	55.953388	-1.25507	0.00000	0.00000
	101	B	1186.9713	3.66402	39.910617	.91611	3.704676	-.08903	3.69194	73.039366	-1.53603	0.00000	0.00000
	102	Q	1187.2507	3.66514	39.402291	.90324	3.679802	-.08903	3.69255	73.901288	-1.54688	0.00000	0.00000
	103	B	1193.3721	3.69360	30.071078	.62114	3.159690	-.08091	3.70421	94.581839	-1.82941	0.00000	0.00000
	104	MS2	1194.2357	3.69825	29.032617	.58134	3.089817	-.08091	3.70564	97.775880	-1.86910	0.00000	0.00000
B18	105	QD	1195.9147	3.70756	29.032520	-.58128	3.052222	.03588	3.70834	97.770474	1.87225	0.00000	0.00000
	106	HC	1223.5791	3.79576	97.953263	-1.87454	4.484853	.06836	3.79679	28.932421	.57981	0.00000	0.00000
B19	107	QF	1225.6581	3.79846	97.954554	1.87379	4.455216	-.10347	3.80613	28.931402	-.57919	0.00000	0.00000
	108	HC	1253.7225	3.88663	29.052880	.58135	1.976982	-.07100	3.89460	97.723603	-1.87088	0.00000	0.00000
B21	109	QD	1255.4015	3.89593	29.053974	-.58202	1.920292	.00311	3.89731	97.727455	1.86864	0.00000	0.00000
	110	HC	1283.4059	3.98407	98.012609	-1.87516	2.433107	.03558	3.98566	28.999291	.57951	0.00000	0.00000
B22	111	QF	1285.1449	3.98676	98.012127	1.87544	2.414531	-.05759	3.99498	29.003355	-.58198	0.00000	0.00000
	112	HC	1313.2093	4.07491	29.046375	.58199	1.223880	-.02512	4.08321	97.950231	-1.87359	0.00000	0.00000
B23	113	QD	1314.8883	4.08422	29.044909	-.58110	1.220747	.02137	4.08591	97.948560	1.87457	0.00000	0.00000
	114	HC	1342.9527	4.17241	97.934339	-1.87361	2.245946	.05384	4.17418	28.984254	.58199	0.00000	0.00000
B24	115	QF	1344.6317	4.17511	97.932736	1.87396	2.263671	-.03284	4.18350	28.979010	-.57880	0.00000	0.00000
	116	HC	1372.6961	4.26332	29.035409	.58107	1.767730	-.00036	4.27192	97.677049	-1.86792	0.00000	0.00000
B25	117	QD	1374.3751	4.27262	29.036410	-.58167	1.824152	.06794	4.27462	97.674051	1.86967	0.00000	0.00000
	118	HC	1402.4395	4.36080	97.966856	-1.87521	4.156288	.10041	4.36311	28.938974	.57873	0.00000	0.00000
B26	119	QF	1404.1185	4.36350	97.988198	1.87443	4.190379	-.06001	4.37245	28.942019	-.58058	0.00000	0.00000
	120	HC	1432.1829	4.45164	29.057586	.58175	2.931722	-.02754	4.46084	97.842736	-1.87336	0.00000	0.00000
B27	121	QD	1433.8619	4.46094	29.057621	-.58177	2.979585	.08486	4.46354	97.847166	1.87377	0.00000	0.00000
	122	HC	1461.9263	4.54909	97.990069	-1.87447	5.786759	.11733	4.55180	29.019042	.58094	0.00000	0.00000
B28	123	QF	1463.6053	4.55178	97.988753	1.87524	5.796914	-.10530	4.56111	29.019487	-.58121	0.00000	0.00000
	124	HC	1491.6697	4.63996	29.036857	.58170	3.267298	-.07283	4.64936	97.877976	-1.87122	0.00000	0.00000
B29	125	QD	1493.3487	4.64927	29.035805	-.58106	3.249138	.05108	4.65206	97.873066	1.87409	0.00000	0.00000
	126	HC	1521.4131	4.73748	97.932959	-1.87393	5.108278	.08355	4.74042	28.949347	.58103	0.00000	0.00000
B32	127	QF	1523.0921	4.74018	97.933498	1.87361	5.083983	-.11234	4.74976	28.945226	-.57852	0.00000	0.00000
	128	HC	1551.1565	4.82837	29.044306	.58109	2.356842	-.07987	4.83824	97.661682	-1.86885	0.00000	0.00000
B33	129	QD	1552.8355	4.83767	29.045773	-.58198	2.297359	.00863	4.84094	97.662757	1.86822	0.00000	0.00000
	130	HC	1580.8999	4.92583	98.011366	-1.87544	2.965199	.04110	4.92938	28.969358	.57869	0.00000	0.00000
B34	131	QF	1582.5789	4.92852	98.011912	1.87512	2.938811	-.07237	4.93871	28.974403	-.58175	0.00000	0.00000
	132	HC	1610.6433	5.01666	29.054389	.58201	1.333393	-.03990	5.02700	97.937060	-1.87439	0.00000	0.00000
B35	133	QD	1612.3223	5.02596	29.053344	-.58138	1.308713	.01034	5.02970	97.938881	1.87333	0.00000	0.00000
	134	HC	1640.3867	5.11413	97.956418	-1.87382	2.024530	.04281	5.11793	29.010311	.58196	0.00000	0.00000
B36	135	QF	1642.0657	5.11683	97.955099	1.87459	2.031012	-.03513	5.12724	29.006763	-.57980	0.00000	0.00000
	136	HC	1670.1301	5.20503	29.032529	.58130	1.470609	-.00266	5.21557	97.757685	-1.86881	0.00000	0.00000
B37	137	QD	1671.8091	5.21434	29.032556	-.58132	1.513546	.05408	5.21827	97.752650	1.87186	0.00000	0.00000
	138	HC	1699.8735	5.30254	97.956542	-1.87462	3.456910	.08655	5.30673	28.931492	.57960	0.00000	0.00000
B38	139	QF	1701.5525	5.30524	97.957881	1.87384	3.490319	-.04697	5.31607	28.931114	-.57937	0.00000	0.00000
	140	HC	1729.6169	5.39340	29.053688	.58139	2.597728	-.01450	5.40454	97.739819	-1.87129	0.00000	0.00000
B39	141	QD	1731.2959	5.40270	29.054695	-.58201	2.656948	.08542	5.40724	97.743570	1.86887	0.00000	0.00000
	142	HC	1759.3603	5.49084	98.011313	-1.87510	5.479779	.11789	5.49558	29.003746	.57971	0.00000	0.00000
B42	143	QF	1761.0393	5.49354	98.010718	1.87544	5.500661	-.09315	5.50489	29.007393	-.58193	0.00000	0.00000
	144	HC	1789.1037	5.58169	29.045308	.58197	3.312078	-.06068	5.59312	97.944939	-1.87331	0.00000	0.00000
B43	145	QD	1790.7827	5.59099	29.043842	-.58108	3.315984	.06536	5.59582	97.942666	1.87464	0.00000	0.00000
	146	HC	1818.8471	5.67919	97.932912	-1.87362	5.575725	.09783	5.68410	28.978804	.58191	0.00000	0.00000
B44	147	QF	1820.5261	5.68189	97.932422	1.87390	5.560216	-.11620	5.69343	28.973498	-.57868	0.00000	0.00000
	148	HC	1848.5905	5.77009	29.036126	.58105	2.724668	-.08373	5.78186	97.668433	-1.86792	0.00000	0.00000
B45	149	QD	1850.2695	5.77940	29.037214	-.58172	2.670500	.01886	5.78457	97.666000	1.86934	0.00000	0.00000

	150	HC	1878.3339	5.86758	97.990191	-1.87526	3.625346	.05133	5.87305	28.942367	.57864	0.00000	0.00000
B46	151	QF	1880.0129	5.87027	97.991484	1.87450	3.594870	-.08744	5.88238	28.945896	-.58079	0.00000	0.00000
	152	HC	1908.0773	5.95842	29.057629	.58179	1.566516	-.05497	5.97076	97.860401	-1.87363	0.00000	0.00000
B47	153	QD	1909.7563	5.96772	29.057539	-.58173	1.523785	.00379	5.97346	97.864623	1.87117	0.00000	0.00000
	154	HC	1937.8207	6.05586	97.986730	-1.87439	2.055841	.03627	6.06171	29.019631	.58114	0.00000	0.00000
B48	155	QFS	1938.6353	6.05717	95.566977	-.05573	2.069795	-.00205	6.06623	28.534754	.01709	0.00000	0.00000
	156	D1	1946.8266	6.07017	101.156035	-.13826	2.053011	-.00205	6.11093	30.606978	-.27006	0.00000	0.00000
	157	B	1952.9482	6.07971	103.226183	-.19993	2.065314	.00607	6.14078	35.224760	-.48428	0.00000	0.00000
	158	O	1953.2276	6.08014	103.338690	-.20274	2.067010	.00607	6.14203	35.498111	-.49407	0.00000	0.00000
	159	P	1959.3490	6.08945	106.198311	-.26441	2.129005	.01419	6.16712	42.957649	-.70815	0.00000	0.00000
	160	O	1959.6284	6.08987	106.346852	-.26723	2.132969	.01419	6.16815	43.256101	-.71794	0.00000	0.00000
	161	B	1965.7498	6.09888	109.995946	-.32890	2.244657	.02230	6.18848	53.355367	-.93183	0.00000	0.00000
	162	OOO	1966.1543	6.09952	110.290328	-.33338	2.254571	.02230	6.18980	54.190685	-.94740	0.00000	0.00000
	163	Q1	1968.2954	6.10264	100.921150	4.64211	2.188272	-.08488	6.19556	64.236829	-3.99314	0.00000	0.00000
B49	164	Q2	1972.1145	6.10994	68.722659	3.78880	1.864092	-.08488	6.20320	98.584767	-5.00059	0.00000	0.00000
	165	Q2	1974.6393	6.11637	59.647637	-.02218	1.781501	.01867	6.20698	109.431848	.91430	0.00000	0.00000
C0	166	LS	2001.2363	6.18255	72.692920	-.46830	2.278063	.01867	6.25518	72.664660	.46808	0.00000	0.00000
	167	LS	2027.8333	6.23073	109.469180	-.91442	2.774626	.01867	6.32138	59.633675	.02186	0.00000	0.00000
	168	-Q2	2030.3581	6.23451	98.617469	5.00245	2.621666	-.13837	6.32781	68.708359	-3.78834	0.00000	0.00000
C14	169	D2	2034.1772	6.24215	64.256769	3.99462	2.093229	-.13837	6.33512	100.903295	-4.64164	0.00000	0.00000
	170	-Q1	2036.2783	6.24791	54.206532	.94793	1.903713	-.04354	6.33823	110.272334	.33297	0.00000	0.00000
	171	D3	2038.0690	6.25333	50.523912	.88521	1.825749	-.04354	6.34083	109.112146	.31493	0.00000	0.00000
	172	B	2044.1904	6.27462	41.398932	.67082	1.584080	-.03542	6.34991	105.626958	.25440	0.00000	0.00000
	173	O	2044.4698	6.27570	41.026814	.66103	1.574184	-.03542	6.35033	105.485587	.25158	0.00000	0.00000
	174	B	2050.5912	6.30180	34.246456	.44663	1.382207	-.02730	6.35970	102.776391	.19098	0.00000	0.00000
	175	O	2050.8706	6.30311	33.999613	.43684	1.374579	-.02730	6.36013	102.670457	.18816	0.00000	0.00000
	176	B	2056.9920	6.33382	29.963878	.22245	1.232294	-.01919	6.36971	100.738000	.12751	0.00000	0.00000
	177	O	2057.2714	6.33531	29.842310	.21266	1.226934	-.01919	6.37016	100.667533	.12470	0.00000	0.00000
	178	B	2063.3928	6.36893	28.551198	-.00174	1.134342	-.01107	6.37990	99.512346	.06401	0.00000	0.00000
	179	OOO	2063.8373	6.37141	28.559665	-.01731	1.129422	-.01107	6.38061	99.457434	.05953	0.00000	0.00000
C12	180	QDS	2064.6519	6.37592	29.045256	-.58180	1.128929	.00985	6.38192	97.872724	1.87605	0.00000	0.00000
	181	HC	2092.7164	6.46408	97.995770	-1.87508	1.831028	.04232	6.47037	28.898234	.58367	0.00000	0.00000
C13	182	QF	2094.3953	6.46678	97.996127	1.87488	1.842876	-.02829	6.47972	28.891523	-.57679	0.00000	0.00000
	183	HC	2122.4598	6.55493	29.050892	.58182	1.474607	.00418	6.56836	97.523943	-1.86759	0.00000	0.00000
C14	184	QD	2124.1387	6.56423	29.050277	-.58145	1.529290	.06130	6.57107	97.529660	1.86426	0.00000	0.00000
	185	HC	2152.2032	6.65240	97.963471	-1.87411	3.675323	.09378	6.65955	28.988788	.57722	0.00000	0.00000
C15	186	QF	2153.8821	6.55510	97.962659	1.87458	3.713754	-.04824	6.66887	28.999974	-.59403	0.00000	0.00000
	187	HC	2181.9466	6.74329	29.037462	.58140	2.785505	-.01577	6.75702	98.130210	-1.87808	0.00000	0.00000
C16	188	QD	2183.6255	6.75260	29.037451	-.58139	2.848628	.09137	6.75971	98.131910	1.87709	0.00000	0.00000
	189	HC	2211.6900	6.84079	97.962038	-1.87457	5.838296	.12384	6.84780	29.033993	.58423	0.00000	0.00000
C17	190	QF	2213.3689	6.84349	97.962842	1.87410	5.857607	-.10096	6.85711	29.024202	-.57827	0.00000	0.00000
	191	MS1	2228.0476	6.87618	52.868718	1.19799	4.375715	-.10096	6.91647	55.906635	-1.25313	0.00000	0.00000
	192	B	2234.1690	6.89745	39.928080	.91603	3.782579	-.09284	6.93175	72.966976	-1.53378	0.00000	0.00000
	193	O	2234.4484	6.89857	39.419796	.90317	3.756640	-.09284	6.93236	73.827641	-1.54662	0.00000	0.00000
	194	B	2240.5698	6.92701	30.088577	.62121	3.213195	-.08472	6.94403	94.478747	-1.82686	0.00000	0.00000
	195	MS2	2241.4334	6.93166	29.049972	.58143	3.140031	-.08472	6.94546	97.668341	-1.86651	0.00000	0.00000
C18	196	QD	2243.1123	6.34096	29.050616	-.58183	3.097568	.03389	6.94817	97.661210	1.87065	0.00000	0.00000
	197	HC	2271.1768	7.02911	97.996488	-1.87490	4.474254	.06636	7.03672	28.905073	.57748	0.00000	0.00000
C19	198	QF	2272.8557	7.03181	97.996172	1.87508	4.441644	-.10500	7.04607	28.906885	-.57958	0.00000	0.00000
	199	HC	2300.9202	7.11997	29.045630	.58181	1.920482	-.07253	7.13456	97.764496	-1.87282	0.00000	0.00000
C21	200	QD	2302.5991	7.12927	29.044742	-.58127	1.859374	-.00065	7.13726	97.772154	1.86835	0.00000	0.00000
	201	HC	2330.6636	7.21745	97.949075	-1.87397	2.266602	.03182	7.22553	29.034753	.58012	0.00000	0.00000

C22	202 QF	2332.3425	7.22015	97.948735	1.87417	2.247092	-.05493	7.23484	29.038907	-.58265	0.00000	0.00000
	203 HC	2360.4070	7.30835	29.039376	.58125	1.130980	-.02246	7.32299	97.999676	-1.87342	0.00000	0.00000
C23	204 QD	2362.0859	7.31765	29.040000	-.58163	1.129355	.02052	7.32569	97.994265	1.87658	0.00000	0.00000
	205 HC	2390.1504	7.40583	97.981895	-1.87495	2.130746	.05299	7.41397	28.950873	.58244	0.00000	0.00000
C24	206 QF	2391.8293	7.40853	97.982697	1.87448	2.150740	-.02930	7.42331	28.952659	-.57745	0.00000	0.00000
	207 HC	2419.8938	7.49668	29.052656	.58167	1.754041	.00317	7.51182	97.565780	-1.86624	0.00000	0.00000
C25	208 QD	2421.5727	7.50598	29.052651	-.58167	1.816022	.07106	7.51453	97.564348	1.86708	0.00000	0.00000
	209 HC	2449.6372	7.59414	97.982402	-1.87448	4.235757	.10353	7.60307	28.937292	.57747	0.00000	0.00000
C26	210 QF	2451.3161	7.59684	97.981596	1.87495	4.272496	-.06000	7.61241	28.944497	-.58185	0.00000	0.00000
	211 HC	2479.3806	7.68501	29.039930	.58162	3.014281	-.02753	7.70074	97.953715	-1.87595	0.00000	0.00000
C27	212 QD	2481.0595	7.69432	29.039313	-.58125	3.064834	.08807	7.70344	97.959638	1.87250	0.00000	0.00000
	213 HC	2509.1240	7.78251	97.948857	-1.87418	5.561999	.12054	7.79160	29.045037	.58229	0.00000	0.00000
C28	214 QF	2510.8029	7.78521	97.949207	1.87397	5.971887	-.10883	7.80091	29.042466	-.58073	0.00000	0.00000
	215 HC	2538.8674	7.87339	29.044838	.58127	3.343362	-.07635	7.88913	97.830500	-1.86919	0.00000	0.00000
C29	216 QD	2540.5463	7.88270	29.045725	-.58181	3.321676	.05038	7.89184	97.821882	1.87421	0.00000	0.00000
	217 HC	2568.6108	7.97086	97.996292	-1.87508	5.161208	.08285	7.98029	28.913886	.56034	0.00000	0.00000
C32	218 QF	2570.2897	7.97356	97.996598	1.87490	5.134062	-.11502	7.98964	28.909935	-.57794	0.00000	0.00000
	219 HC	2598.3542	8.06171	29.050550	.58183	2.331752	-.08255	8.07820	97.619514	-1.86919	0.00000	0.00000
C33	220 QD	2600.0331	8.07101	29.049899	-.58143	2.266914	.00490	8.08090	97.624423	1.86633	0.00000	0.00000
	221 HC	2628.0976	8.15918	97.962044	-1.87409	2.829948	.03737	8.16932	28.994486	.57832	0.00000	0.00000
C34	222 QF	2629.7765	8.16188	97.961257	1.87455	2.801675	-.07087	8.17864	29.002292	-.58307	0.00000	0.00000
	223 HC	2657.8410	8.25007	29.037478	.58139	1.238373	-.03840	8.26683	98.045725	-1.87595	0.00000	0.00000
C35	224 QD	2659.5199	8.25937	29.037521	-.58141	1.213174	.00822	8.26952	98.045749	1.87593	0.00000	0.00000
	225 HC	2687.5844	8.34756	97.963556	-1.87460	1.869414	.04069	8.35770	29.009888	.58317	0.00000	0.00000
C36	226 QF	2689.2633	8.35026	97.964375	1.87412	1.877322	-.03132	8.36701	29.002190	-.57849	0.00000	0.00000
	227 HC	2717.3278	8.43843	29.050448	.58146	1.423909	.00115	8.45541	97.544632	-1.86624	0.00000	0.00000
C37	228 QD	2719.0067	8.44773	29.051037	-.58182	1.471808	.05621	8.45811	97.638145	1.87003	0.00000	0.00000
	229 HC	2747.0712	8.53588	97.995643	-1.87486	3.474968	.08868	8.54667	28.907169	.57822	0.00000	0.00000
C38	230 QF	2748.7501	8.53858	97.995260	1.87508	3.511339	-.04559	8.55602	28.909980	-.57993	0.00000	0.00000
	231 HC	2776.8146	8.62674	29.044984	.58180	2.657465	-.01312	8.64449	97.794428	-1.87342	0.00000	0.00000
C39	232 QD	2778.4935	8.63604	29.044099	-.58126	2.720954	.00915	8.64719	97.802176	1.86891	0.00000	0.00000
	233 HC	2806.5580	8.72423	97.948273	-1.87398	5.648537	.12162	8.73548	29.039281	.58048	0.00000	0.00000
C42	234 QF	2808.2369	8.72693	97.948002	1.87414	5.670231	-.09592	8.74475	29.042505	-.58244	0.00000	0.00000
	235 HC	2836.3014	8.81512	29.039823	.58124	3.403911	-.06345	8.83290	97.980401	-1.87282	0.00000	0.00000
C43	236 QD	2837.9803	8.82443	29.040499	-.58165	3.406080	.06605	8.83560	97.974216	1.87642	0.00000	0.00000
	237 HC	2866.0448	8.91260	97.983887	-1.87498	5.685168	.09852	8.92391	28.952275	.58219	0.00000	0.00000
C44	238 QF	2867.7237	8.91530	97.984658	1.87453	5.667311	-.11967	8.93324	28.944397	-.57740	0.00000	0.00000
	239 HC	2895.7882	9.00345	29.052663	.58170	2.734313	-.08723	9.02177	97.563531	-1.86651	0.00000	0.00000
C45	240 QD	2897.4671	9.01276	29.052582	-.58165	2.674563	.01565	9.02448	97.563119	1.86675	0.00000	0.00000
	241 HC	2925.5316	9.10091	97.980359	-1.87443	3.539275	.04812	9.11301	28.945112	.57748	0.00000	0.00000
C46	242 QF	2927.2105	9.10361	97.979528	1.87491	3.506212	-.08729	9.12235	28.952764	-.58213	0.00000	0.00000
	243 HC	2955.2750	9.19179	29.039473	.58160	1.481970	-.05482	9.21065	97.376222	-1.87617	0.00000	0.00000
C47	244 QD	2956.9539	9.20109	29.038913	-.58126	1.436759	.00068	9.21335	97.981452	1.87313	0.00000	0.00000
	245 HC	2985.0184	9.28929	97.949787	-1.87421	1.881369	.03315	9.30151	29.042405	.58253	0.00000	0.00000
C48	246 QH1	2985.6661	9.29033	99.448699	-.43262	1.893826	.00529	9.30509	28.580721	.13254	0.00000	0.00000
	247 DH1	2993.6020	9.30288	107.278369	-.52974	1.936831	.00529	9.35087	28.780754	-.15713	0.00000	0.00000
	248 B	2999.9234	9.31169	114.211116	-.60281	1.994033	.01340	9.38317	32.036558	-.37473	0.00000	0.00000
	249 O	3000.2028	9.31207	114.548900	-.60615	1.997778	.01340	9.38456	32.248736	-.38468	0.00000	0.00000
	250 B	3006.3242	9.32031	122.417086	-.67922	2.104672	.02152	9.41242	38.289854	-.60218	0.00000	0.00000
	251 O	3006.6036	9.32067	122.797567	-.68256	2.110665	.02152	9.41358	38.629129	-.61212	0.00000	0.00000
	252 B	3012.7250	9.32833	131.601192	-.75563	2.267272	.02964	9.43641	47.453897	-.82946	0.00000	0.00000
	253 OOO	3013.1695	9.32887	132.275306	-.76094	2.280446	.02964	9.43789	48.198313	-.84527	0.00000	0.00000

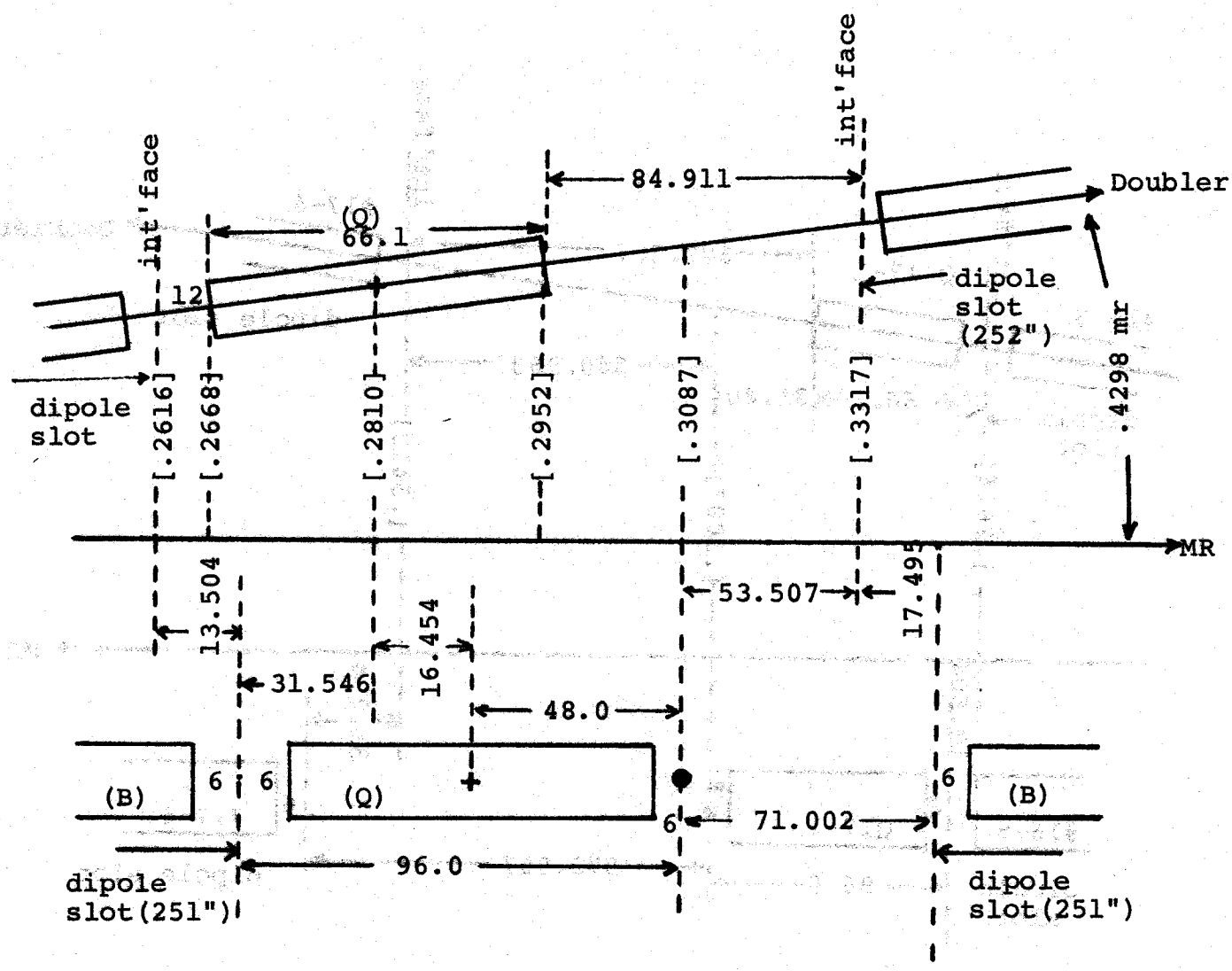
	254 QH2	3015.4603	9.33149	152.558575	-8.44322	2.487329	.15278	9.44545	46.415008	1.59247	0.00000	0.00000
C49	255 DH2	3019.3122	9.33480	224.633856	-10.26840	3.075807	.15278	9.46062	35.277229	1.29903	0.00000	0.00000
	256 QH3	3021.8370	9.33648	243.426535	3.18886	3.231709	-.03078	9.47253	33.947424	-.74709	0.00000	0.00000
	257 LSD	3048.4340	9.36292	106.254923	1.96855	2.413107	-.03078	9.54558	106.156863	-1.96786	0.00000	0.00000
D0	258 LSD	3075.0310	9.43588	33.996956	.74823	1.594506	-.03078	9.57204	243.303822	-3.18863	0.00000	0.00000
	259 -QH3	3077.5558	9.44777	35.327881	-1.30063	1.632045	.06087	9.57372	224.527121	10.26214	0.00000	0.00000
D11	260 DH2	3081.4077	9.46292	46.478128	-1.59411	1.866521	.06087	9.57703	152.494901	8.43030	0.00000	0.00000
	261 -QH2	3083.6985	9.47047	48.261137	.84703	1.892785	-.03817	9.57965	132.226208	.75924	0.00000	0.00000
	262 DH3	3085.4336	9.47637	45.428916	.78528	1.826553	-.03817	9.58176	129.627374	.73856	0.00000	0.00000
	263 B	3091.5550	9.50017	37.148434	.56744	1.617737	-.03005	9.58954	121.023874	.66688	0.00000	0.00000
	264 O	3091.8344	9.50137	36.834125	.55750	1.609340	-.03005	9.58991	120.652156	.66354	0.00000	0.00000
	265 B	3097.9558	9.53020	31.342293	.33966	1.450216	-.02194	9.59826	112.968195	.59168	0.00000	0.00000
	266 O	3098.2352	9.53163	31.155268	.32972	1.444087	-.02194	9.59865	112.638498	.58834	0.00000	0.00000
	267 B	3104.3566	9.56458	28.452086	.11188	1.334656	-.01382	9.60758	105.876195	.51632	0.00000	0.00000
	268 O	3104.6360	9.56615	28.392345	.10194	1.330795	-.01382	9.60800	105.588609	.51298	0.00000	0.00000
	269 B	3110.7574	9.60068	28.477814	-.11590	1.271056	-.00570	9.61750	99.749829	.44082	0.00000	0.00000
	270 COO	3111.2019	9.60316	28.587881	-.13172	1.268522	-.00570	9.61821	99.350305	.43550	0.00000	0.00000
D12	271 -QH1	3111.8496	9.60674	29.048557	-.58179	1.270888	.01301	9.61925	97.858543	1.87572	0.00000	0.00000
	272 HC	3139.9140	9.69490	97.994307	-1.87492	2.061656	.04548	9.70771	28.897875	.58071	0.00000	0.00000
D13	273 GF	3141.5930	9.69760	97.994218	1.87497	2.071389	-.03395	9.71707	28.891693	-.57695	0.00000	0.00000

POS	S	PSIX	BETAX	ALPHAX	XEQ	DXEQ	PSIY	BETAY	ALPHAY	YEQ	DYEQ

R=1000.00010 TGAM=(18.73603, 0.00000) THETA= 6.28318501 QX= 19.39519 QY= 19.43413

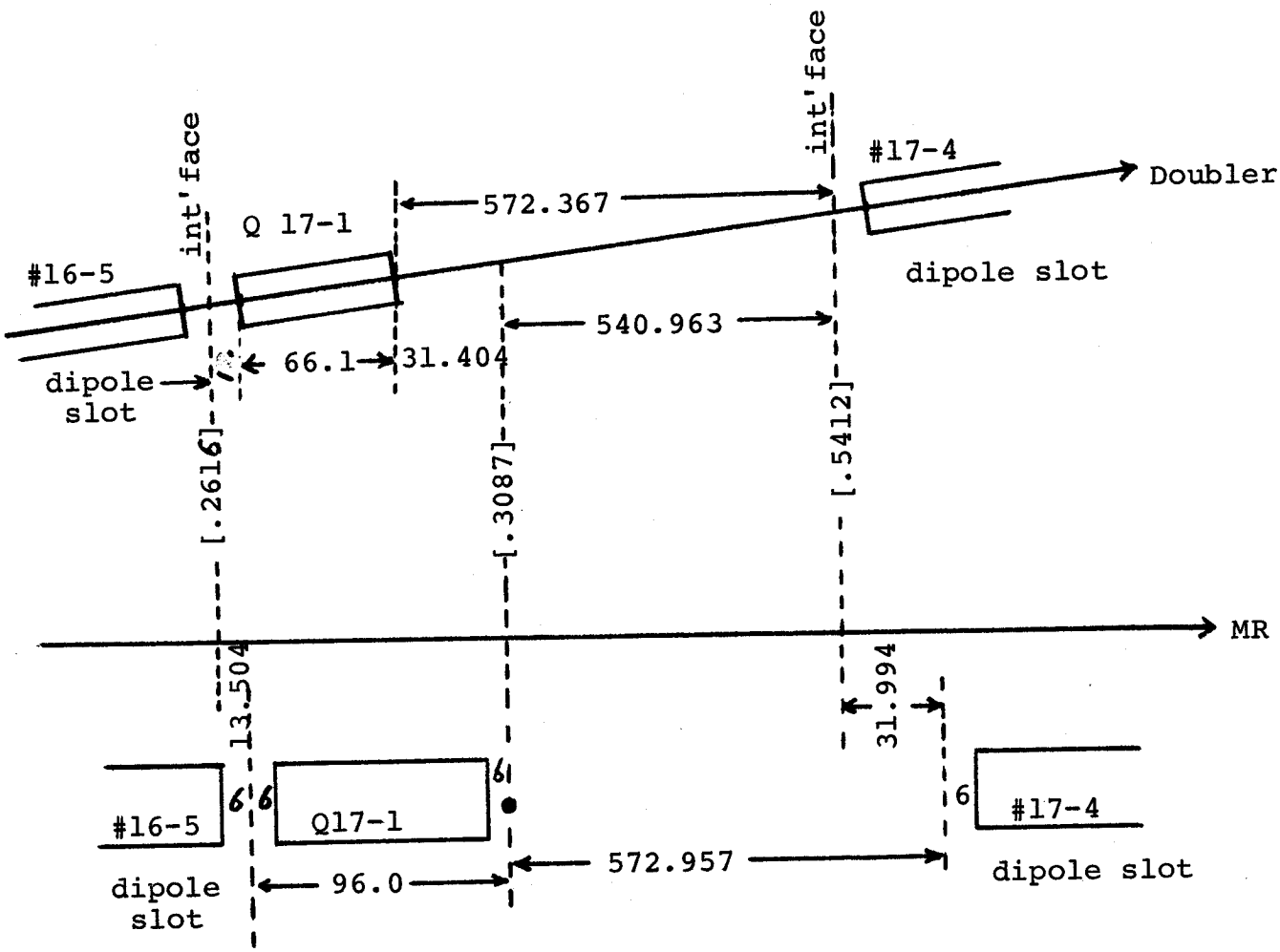
MAXIMA BETAX(256)= 243.42654 XEQ=(214)= 5.97189 BETAY(258)= 243.30382 YEQ(273)= 0.00000
MINIMA BETAX(268)= 28.39235 XEQ=(180)= 1.12893 BETAY(155)= 28.53475 YEQ(273)= 0.00000
CONTRIBUTIONS TO CHROMATICITY (DNU/(DP/P)) FROM MAGNETS EXPLICITLY IN RING CHRX = -22.5125, CHRY = -22.4846

Regular Cell

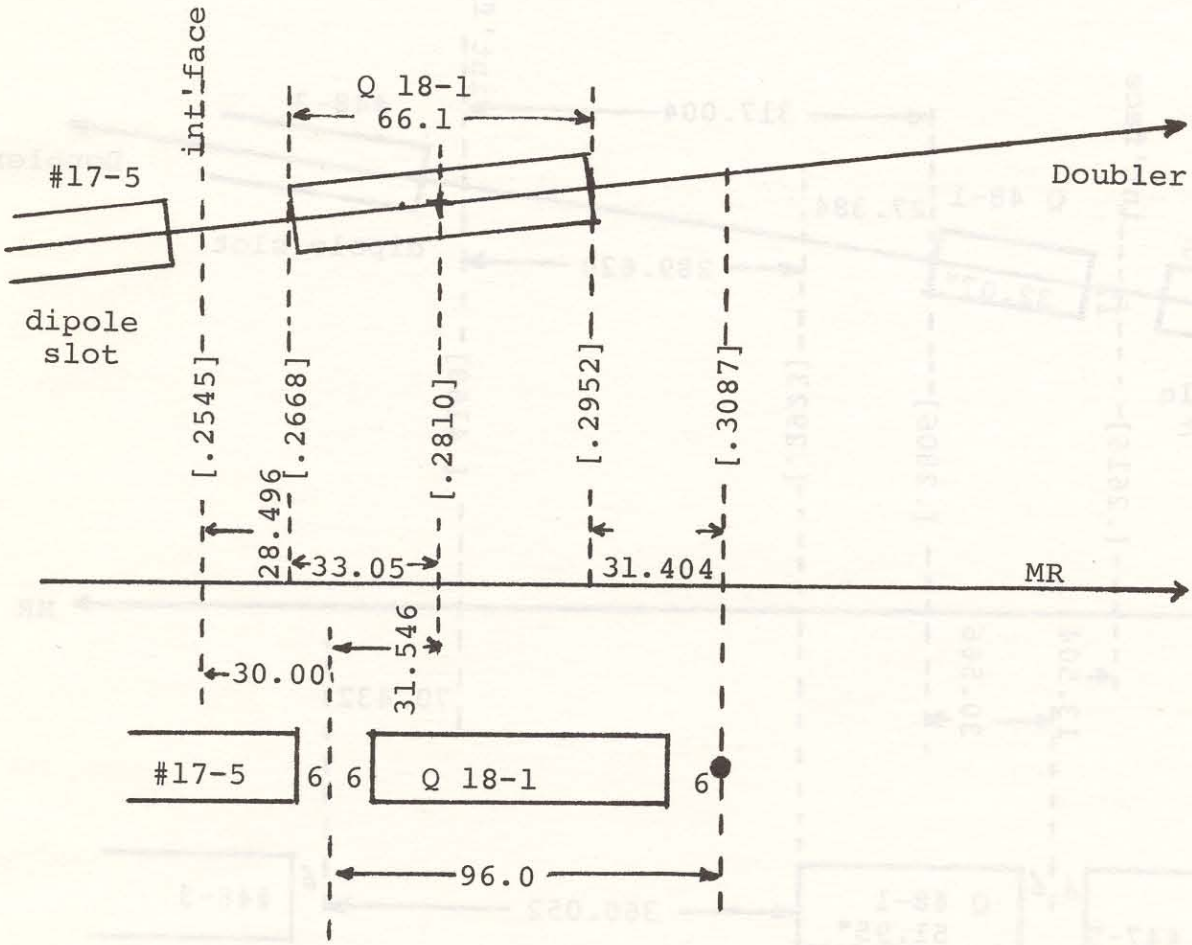


Interface to interface = 163.011" (on MR axis)

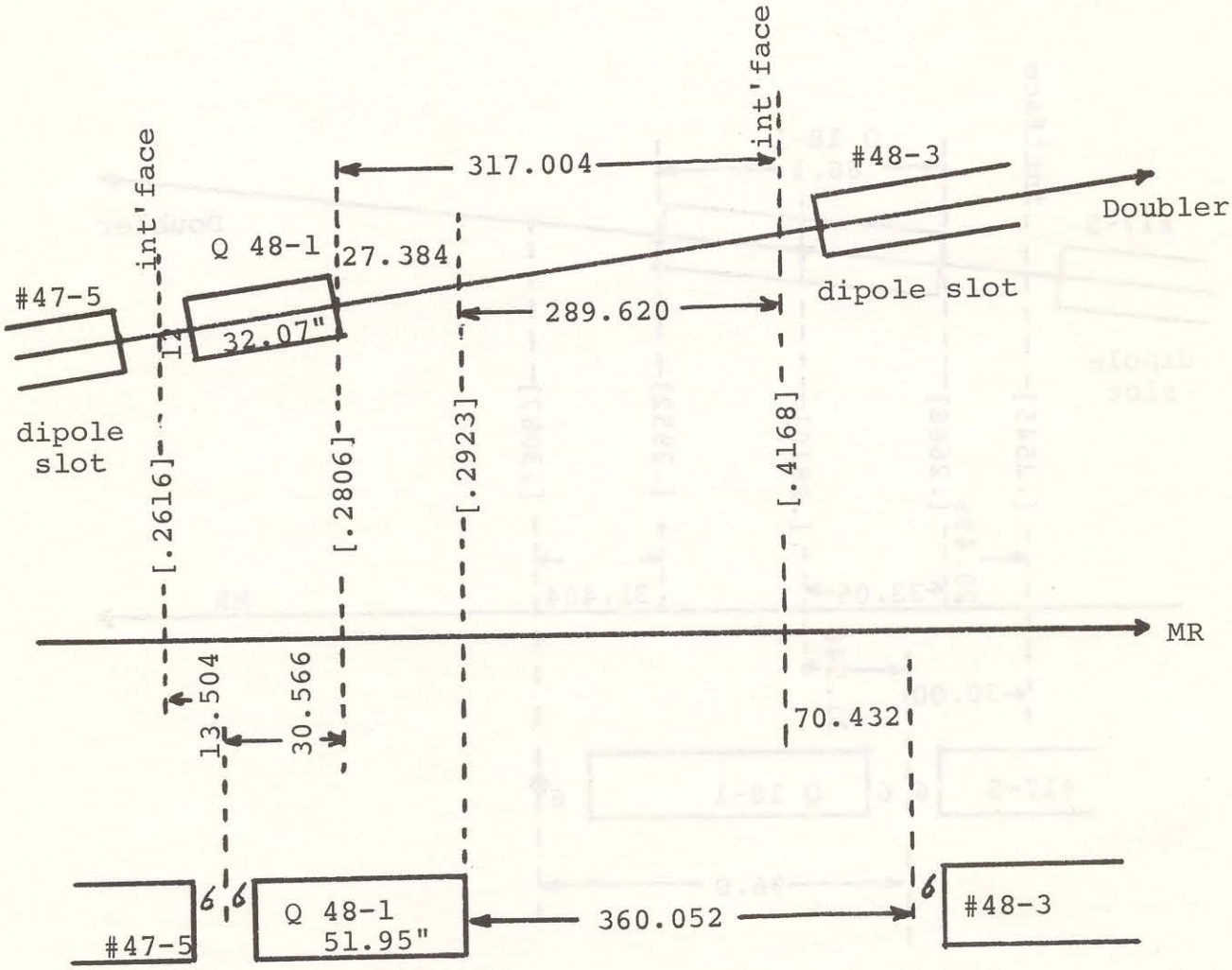
Medium Straight (upstream)



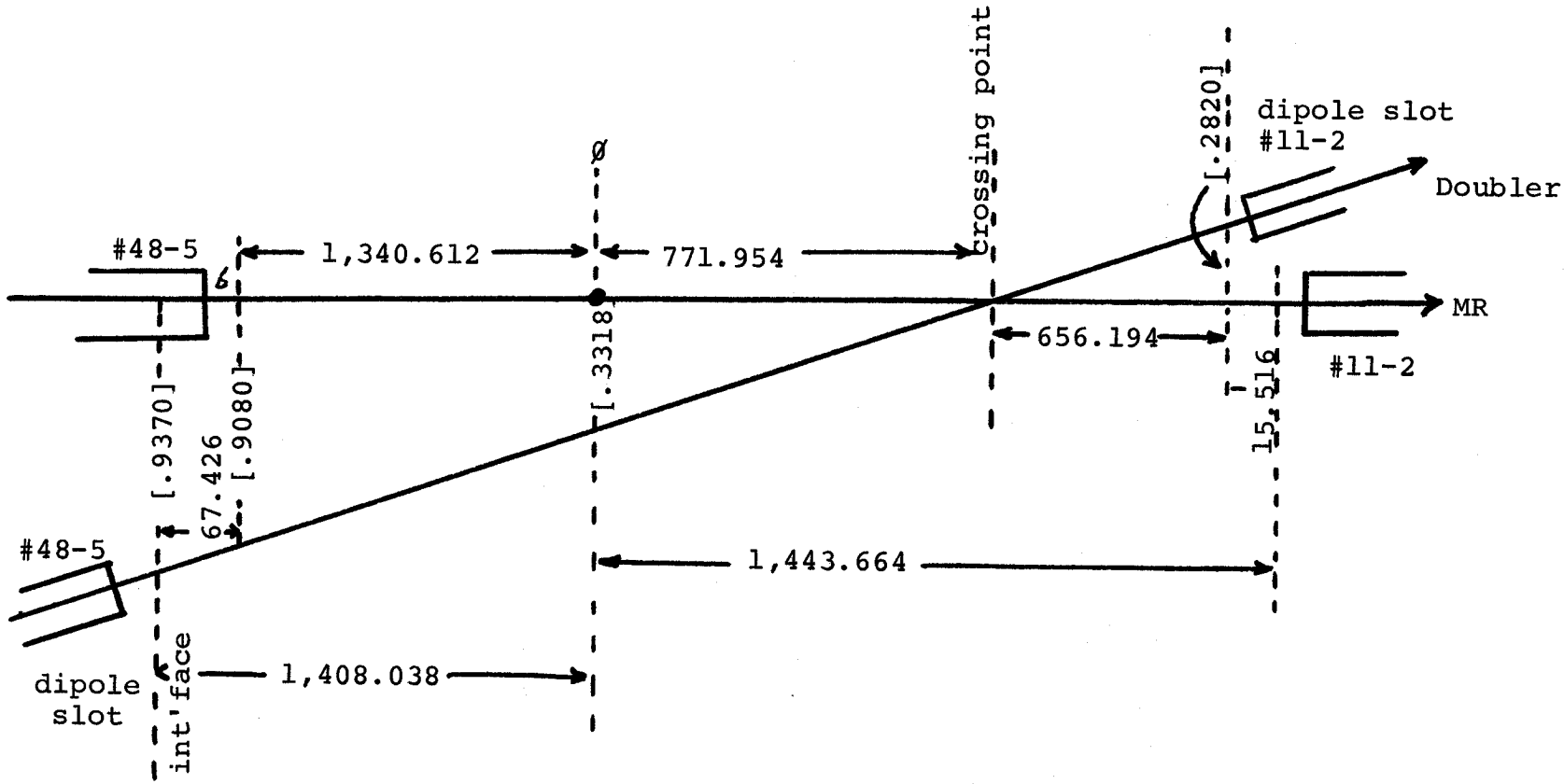
Medium Straight (downstream)



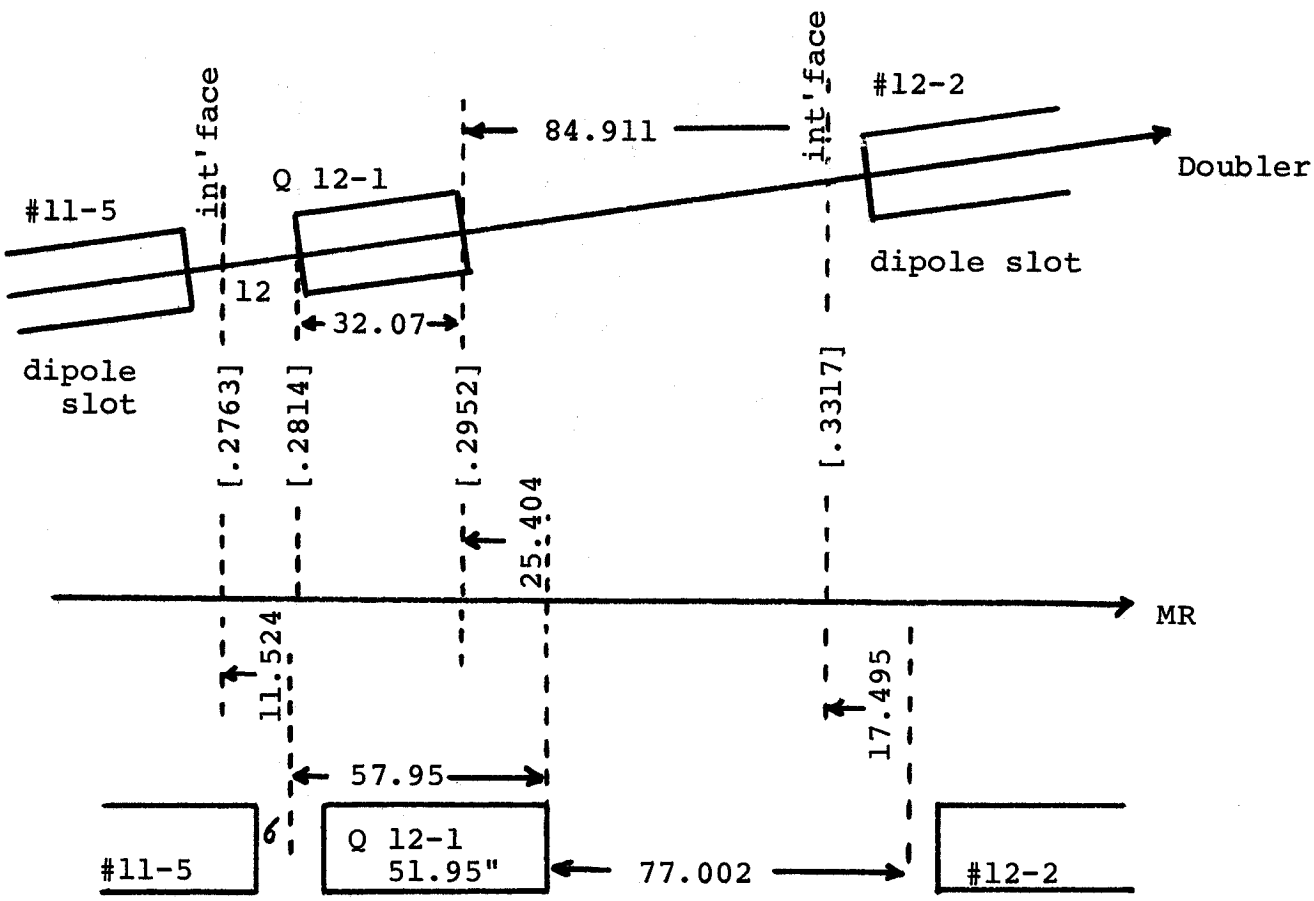
Long Straight, upstream of BØ, CØ, EØ and FØ



Long Straight, BØ, CØ, EØ and FØ

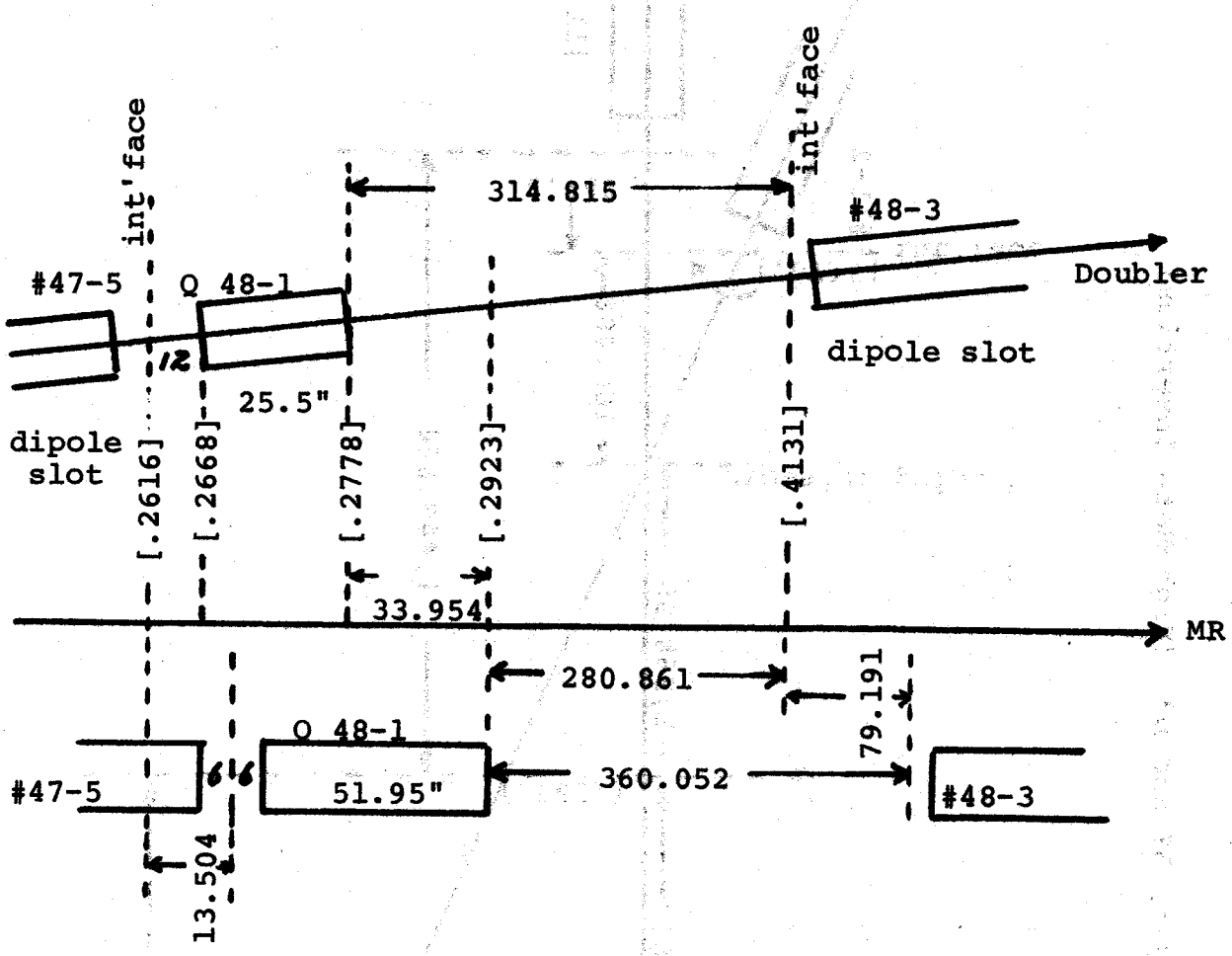


Long Straight, downstream of BØ, CØ, EØ and FØ

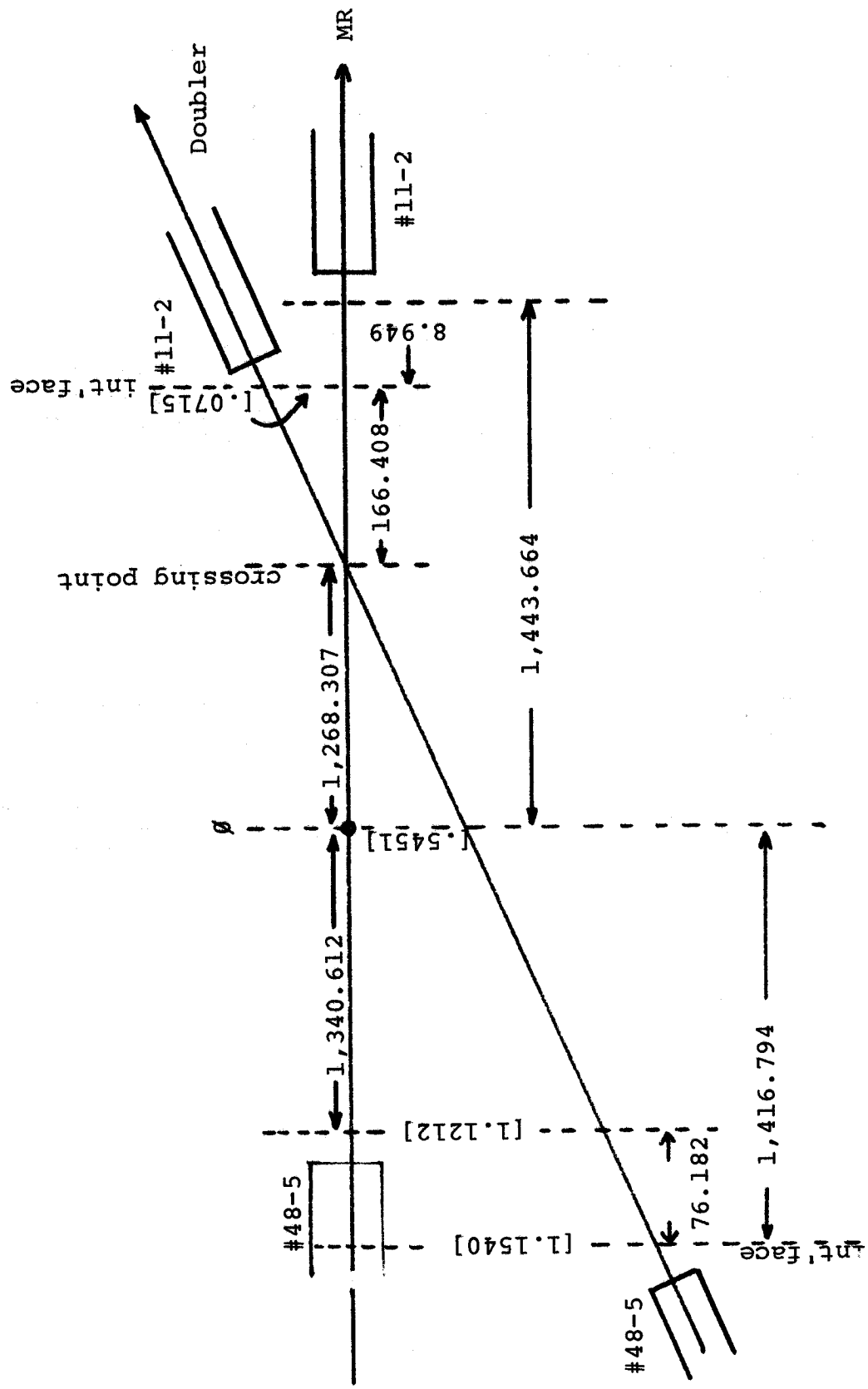


Long Straight, upstream of AØ and DØ

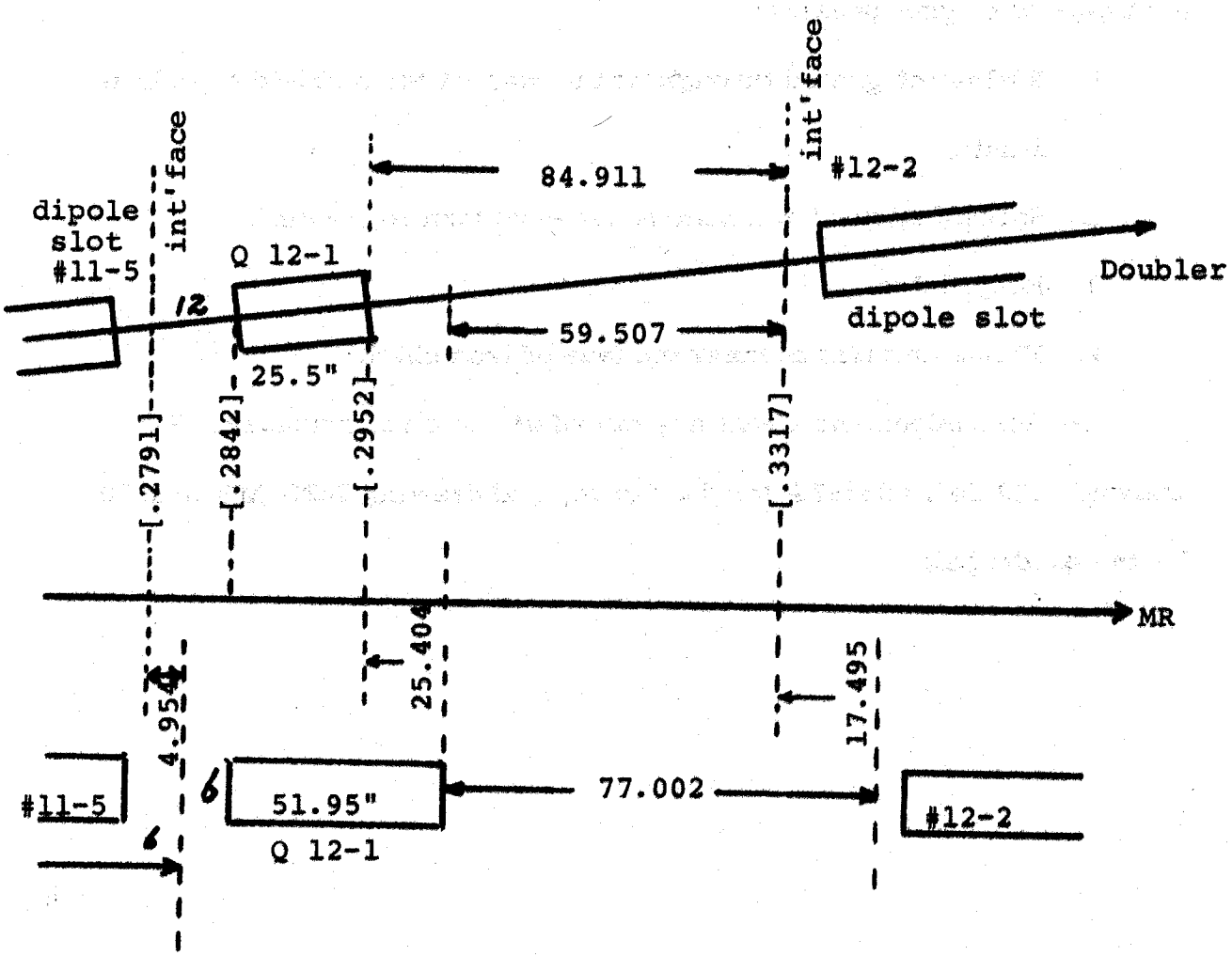
(High-Beta Insertion)



Long Straight, AØ and DØ (High-Beta Insertion)



Long Straight, downstream of AØ and DØ
(High-Beta Insertion)



APPENDIX III. COMPUTED MAGNET DATA

The computer output reproduced on the following pages shows a variety of data on the dipole and quadrupole designs. The four pages for each type of magnet present:

1. Fields integrated throughout the magnet for a shield of infinite length.
2. Specification of dimensions for each turn in the coil.
3. Body fields.
4. Fields and flux at inner surface of iron shield.

All dimensions and fields are stated at room temperature. See drawing 1620-MB-103657A for the dipole, and drawing 1620-MB-103690A for the quadrupole.

INTEGRATED MULTIPOLE STRUCTURE OF E-SERIES DIPOLE(091878 KEYSTONED) ENDEM 041979-1030

ORDER OF POLE	= 1	CALCULATIONAL MODE	= 1	NUMBER OF LAYERS	= 3
HIGHEST MULTIPOLE ORDER	= 19	CONDUCTOR CURRENT(A)	= 4526.0000	REFERENCE RADIUS(IN)	= 1.0000
INNER IRON RADIUS(IN)	= 3.7500	HORIZONTAL INCREMENT(IN)	= .1000		

LAYER	TURNS	FBC (IN)	WIDTH (IN)	HGTMAX (IN)	HGTMIN (IN)	CURDEN (KA/IN/IN)	THETAS (DEG)	THETAF (DEG)	SPACER (IN)	RINNER (IN)	ROUTER (IN)	LENGTH (IN)	WRAP (IN)
1	35.0	0.000	.3070	.0550	.0440	297.832	.1729	72.9436	.0018148	1.5000	1.8140	239.9190	.0035
2	1.0	0.000	.3070	.0550	.0440	297.832	.1438	2.4157	.0112433	1.8350	2.1490	238.3870	.0035
3	20.0	0.000	.3070	.0550	.0440	297.832	2.4157	36.3483	.0012433	1.8350	2.1490	238.3870	.0035

MULTIPOLE COEFFICIENTS OF FIELD AT REFERENCE RADIUS

N	NET FIELD HY(KG-IN)	NET FIELD HX(KG-IN)	AIR FIELD HY(KG-IN)	AIR FIELD HX(KG-IN)	IRON CONTR. HY(KG-IN)	IRON CONTR. HX(KG-IN)	NORMALIZED FIELD HY/HYO	NORMALIZED FIELD HX/HYO
1	10907.358440	0.000000	8874.741362	0.000000	2033.127078	0.000000	1.000000	0.000000
3	.042123	0.000000	-5.568589	0.000000	6.610712	0.000000	.000004	0.000000
5	1.131406	0.000000	1.142892	0.000000	-.011486	0.000000	.000104	0.000000
7	4.838068	0.000000	4.839956	0.000000	-.001889	0.000000	.000444	0.000000
9	-13.186246	0.000000	-13.186220	0.000000	-.000026	0.000000	-.001209	0.000000
11	3.963744	0.000000	3.963744	0.000000	.000000	0.000000	.000363	0.000000
13	-.896261	0.000000	-.896261	0.000000	.000000	0.000000	-.000082	0.000000
15	.075775	0.000000	.075775	0.000000	-.000000	0.000000	.000007	0.000000
17	.034208	0.000000	.034208	0.000000	-.000000	0.000000	.000003	0.000000
19	-.047799	0.000000	-.047799	0.000000	-.000000	0.000000	-.000004	0.000000

MEDIAN PLANE FIELD VERSUS DISTANCE

X(IN)	NET FIELD HY(KG-IN)	NET FIELD HX(KG-IN)	AIR FIELD HY(KG-IN)	AIR FIELD HX(KG-IN)	IRON CONTR. HY(KG-IN)	IRON CONTR. HX(KG-IN)	NORMALIZED FIELD HY/HYO	NORMALIZED FIELD HX/HYO
.000	10907.868	0.000	8874.741	0.000	2033.127	0.000	1.000000	0.000000
.100	10907.869	0.000	8874.676	0.000	2033.193	0.000	1.000000	0.000000
.200	10907.872	0.000	8874.481	0.000	2033.391	0.000	1.000000	0.000000
.300	10907.884	0.000	8874.162	0.000	2033.722	0.000	1.000001	0.000000
.400	10907.916	0.000	8873.731	0.000	2034.184	0.000	1.000004	0.000000
.500	10907.977	0.000	8873.198	0.000	2034.779	0.000	1.000010	0.000000
.600	10908.057	0.000	8872.551	0.000	2035.505	0.000	1.000017	0.000000
.700	10908.070	0.000	8871.737	0.000	2036.363	0.000	1.000018	0.000000
.800	10907.782	0.000	8870.430	0.000	2037.353	0.000	.999992	0.000000
.900	10906.685	0.000	8868.212	0.000	2038.473	0.000	.999892	0.000000
1.000	10903.823	0.000	8864.099	0.000	2039.724	0.000	.999629	0.000000
1.100	10897.528	0.000	8856.422	0.000	2041.106	0.000	.999052	0.000000
1.200	10884.907	0.000	8842.290	0.000	2042.617	0.000	.997895	0.000000
1.300	10860.606	0.000	8816.349	0.000	2044.257	0.000	.995657	0.000000
1.400	10813.431	0.000	8767.406	0.000	2046.025	0.000	.991342	0.000000
1.500	10717.082	0.000	8669.161	0.000	2047.921	0.000	.982509	0.000000

END TO END COIL LENGTH

1 OUTSIDE LENGTH(IN)=

245.115	244.974	244.834	244.694	244.554	244.414	244.273	244.133	243.993	243.853
243.713	243.572	243.432	243.292	243.152	243.012	242.871	242.731	242.591	242.451
242.311	242.170	242.030	241.890	241.750	241.437	241.124	240.811	240.498	240.185
239.872	239.559	239.246	238.933	238.620					

1 INSIDE LENGTH(IN) =

244.994	244.854	244.714	244.574	244.434	244.293	244.153	244.013	243.873	243.733
243.592	243.452	243.312	243.172	243.032	242.891	242.751	242.611	242.471	242.331
242.190	242.050	241.910	241.770	241.630	241.317	241.004	240.691	240.378	240.065
239.752	239.439	239.126	238.813	238.500					

2 OUTSIDE LENGTH(IN)=

244.635

2 INSIDE LENGTH(IN) =

244.477

3 OUTSIDE LENGTH(IN)=

244.477	244.325	244.173	244.022	243.870	243.718	243.566	243.414	243.262	243.110
242.959	242.807	242.655	242.503	242.351	242.199	242.047	241.895	241.744	241.592

3 INSIDE LENGTH(IN) =

244.359	244.207	244.055	243.904	243.752	243.600	243.448	243.295	243.144	242.992
242.841	242.689	242.537	242.385	242.233	242.081	241.929	241.778	241.626	241.474

RADIAL DISTANCES IN DEVELOPED COIL

1 OUTSIDE RADIUS(IN)=

2.5978	2.5377	2.4776	2.4174	2.3573	2.2972	2.2370	2.1769	2.1168	2.0566
1.9965	1.9364	1.8763	1.8161	1.7560	1.6959	1.6357	1.5756	1.5155	1.4553
1.3952	1.3351	1.2750	1.2148	1.1547	1.0946	1.0344	.9743	.9142	.8541
.7939	.7338	.6737	.6135	.5534					

1 INSIDE RADIUS(IN) =

2.5377	2.4776	2.4174	2.3573	2.2972	2.2370	2.1769	2.1168	2.0566	1.9965
1.9364	1.8763	1.8161	1.7560	1.6959	1.6357	1.5756	1.5155	1.4553	1.3952
1.3351	1.2750	1.2148	1.1547	1.0946	1.0344	.9743	.9142	.8541	.7939
.7338	.6737	.6135	.5534	.4933					

2 OUTSIDE RADIUS(IN)=

3.1240

2 INSIDE RADIUS(IN) =

3.0450

3 OUTSIDE RADIUS(IN)=

3.0450	2.9861	2.9271	2.8681	2.8091	2.7501	2.6911	2.6321	2.5731	2.5142
2.4552	2.3962	2.3372	2.2782	2.2192	2.1602	2.1013	2.0423	1.9833	1.9243

3 INSIDE RADIUS(IN) =

2.9861	2.9271	2.8681	2.8091	2.7501	2.6911	2.6321	2.5731	2.5142	2.4552
2.3962	2.3372	2.2782	2.2192	2.1602	2.1013	2.0423	1.9833	1.9243	1.8653

INTEGRATED MULTIPOLE STRUCTURE OF E-SERIES DIPOLE(091878 KEYSTONED) ENDEM 041979-1030

ORDER OF POLE	= 1	CALCULATIONAL MODE	= 0	NUMBER OF LAYERS	= 3
HIGHEST MULTIPOLE ORDER	= 19	CONDUCTOR CURRENT(A)	= 4526.0000	REFERENCE RADIUS(IN)	= 1.0000
INNER IRON RADIUS(IN)	= 3.7500	HORIZONTAL INCREMENT(IN)	= .1000		

LAYER	TURNS	FBC (IN)	WIDTH (IN)	HGTMAX (IN)	HGTMIN (IN)	CURDEN (KA/IN/IN)	THETAS (DEG)	THETAF (DEG)	SPACER (IN)	RINNER (IN)	ROUTER (IN)	LENGTH (IN)	WRAP (IN)
1	35.0	0.000	.3070	.0550	.0440	297.832	.1729	72.9435	.0018148	1.5000	1.8140	1.0000	.0035
2	1.0	0.000	.3070	.0550	.0440	297.832	.1438	2.4157	.0112433	1.8350	2.1490	1.0000	.0035
3	20.0	0.000	.3070	.0550	.0440	297.832	2.4157	36.3483	.0012433	1.8350	2.1490	1.0000	.0035

MULTIPOLE COEFFICIENTS OF FIELD AT REFERENCE RADIUS

N	NET FIELD HY(KG-IN)	NET FIELD HX(KG-IN)	AIR FIELD HY(KG-IN)	AIR FIELD HX(KG-IN)	IRON CONTR. HY(KG-IN)	IRON CONTR. HX(KG-IN)	NORMALIZED FIELD HY/HYO	NORMALIZED FIELD HX/HYO
1	45.001719	0.000000	36.613812	0.000000	8.387907	0.000000	1.000000	0.000000
3	.035119	0.000000	.007033	0.000000	.028035	0.000000	.000780	0.000000
5	.014433	0.000000	.014478	0.000000	-.000040	0.000000	.000321	0.000000
7	.021176	0.000000	.021194	0.000000	-.000003	0.000000	.000471	0.000000
9	-.055024	0.000000	-.055023	0.000000	-.000000	0.000000	-.001223	0.000000
11	.016757	0.000000	.016757	0.000000	.000000	0.000000	.000372	0.000000
13	-.003746	0.000000	-.003746	0.000000	.000000	0.000000	-.000083	0.000000
15	.000326	0.000000	.000326	0.000000	-.000000	0.000000	.000007	0.000000
17	.000147	0.000000	.000147	0.000000	-.000000	0.000000	.000003	0.000000
19	-.000200	0.000000	-.000200	0.000000	-.000000	0.000000	-.000004	0.000000

MEDIAN PLANE FIELD VERSUS DISTANCE

X(IN)	NET FIELD HY(KG-IN)	NET FIELD HX(KG-IN)	AIR FIELD HY(KG-IN)	AIR FIELD HX(KG-IN)	IRON CONTR. HY(KG-IN)	IRON CONTR. HX(KG-IN)	NORMALIZED FIELD HY/HYO	NORMALIZED FIELD HX/HYO
.000	45.002	0.000	36.614	0.000	8.388	0.000	1.000000	0.000000
.100	45.002	0.000	36.614	0.000	8.388	0.000	1.000008	0.000000
.200	45.003	0.000	36.614	0.000	8.389	0.000	1.000032	0.000000
.300	45.005	0.000	36.615	0.000	8.390	0.000	1.000073	0.000000
.400	45.008	0.000	36.615	0.000	8.392	0.000	1.000134	0.000000
.500	45.012	0.000	36.617	0.000	8.395	0.000	1.000218	0.000000
.600	45.016	0.000	36.618	0.000	8.398	0.000	1.000326	0.000000
.700	45.022	0.000	36.621	0.000	8.402	0.000	1.000454	0.000000
.800	45.028	0.000	36.622	0.000	8.406	0.000	1.000584	0.000000
.900	45.032	0.000	36.621	0.000	8.411	0.000	1.000674	0.000000
1.000	45.031	0.000	36.615	0.000	8.416	0.000	1.000544	0.000000
1.100	45.017	0.000	36.596	0.000	8.422	0.000	1.000349	0.000000
1.200	44.981	0.000	36.553	0.000	8.428	0.000	.999535	0.000000
1.300	44.900	0.000	36.464	0.000	8.435	0.000	.997730	0.000000
1.400	44.729	0.000	36.286	0.000	8.443	0.000	.993933	0.000000
1.500	44.362	0.000	35.911	0.000	8.451	0.000	.985774	0.000000

MAX. FIELD ON IRON(KG) = 16.0056 FLUX IN IRON(KG-IN) = 63.8569

FIELD AND FLUX ON INNER IRON SURFACE

ANGLE(RAD)	BN(KG)	FLUX(KG-IN)
0.00000	0.00000	0.00000
.03491	.65274	.04273
.06981	1.30472	.17085
.10472	1.95514	.38423
.13963	2.60312	.63260
.17453	3.24770	1.06558
.20944	3.88775	1.53265
.24435	4.52203	2.08314
.27925	5.14914	2.71620
.31416	5.76756	3.43090
.34907	6.37551	4.22559
.38397	6.97154	5.09940
.41888	7.55355	6.05023
.45379	8.11990	7.07623
.48869	8.66853	8.17522
.52360	9.19808	9.34431
.55851	9.70598	10.58237
.59341	10.19401	11.88513
.62832	10.65323	13.25016
.66323	11.09903	14.67443
.69813	11.51617	16.15495
.73304	11.90970	17.68832
.76794	12.28000	19.27179
.80285	12.62768	20.90223
.83776	12.95334	22.57675
.87266	13.25851	24.29255
.90757	13.54356	26.04695
.94248	13.80953	27.83742
.97738	14.05780	29.66153
1.01229	14.28876	31.51699
1.04720	14.50331	33.40160
1.08210	14.70209	35.31326
1.11701	14.88563	37.24994
1.15192	15.05437	39.20957
1.18682	15.20855	41.19053
1.22173	15.34874	43.19056
1.25664	15.47497	45.20822
1.29154	15.58723	47.24137
1.32645	15.68596	49.28835
1.36136	15.77121	51.34736
1.39626	15.84310	53.41666
1.43117	15.90174	55.49450
1.46608	15.94724	57.57915
1.50098	15.97967	59.66390
1.53589	15.99910	61.76205
1.57080	16.00557	63.85689

INTEGRATED MULTIPOLE STRUCTURE OF 2-SHELL SECTOR QUAD(100577 WIRE) ENDEM 042179-1345

ORDER OF POLE	=	2	CALCULATIONAL MODE	=	1	NUMBER OF LAYERS	= 4
HIGHEST MULTIPOLE ORDER	=	26	CONDUCTOR CURRENT(A)	=	4526.0000	REFERENCE RADIUS(IN)	= 1.0000
INNER IRON RADIUS(IN)	=	4.0000	HORIZONTAL INCREMENT(IN)	=	.1000		

LAYER	TURNS	FBC (IN)	WIDTH (IN)	HGTMAX (IN)	HGTMIN (IN)	CURDEN (KA/IN/IN)	THETAS (DEG)	THETAF (DEG)	SPACER (IN)	RINNER (IN)	ROUTER (IN)	LENGTH (IN)	WRAP (IN)
1	8.0	0.000	.3070	.0550	.0440	297.832	.1501	14.4403	0.0000000	1.7500	2.0670	64.8390	.0050
2	6.0	0.000	.3070	.0550	.0440	297.832	19.4018	30.1194	0.0000000	1.7500	2.0670	65.1440	.0050
3	1.0	0.000	.3070	.0550	.0440	297.832	.1275	1.9511	.0060000	2.0880	2.4050	64.5770	.0050
4	19.0	0.000	.3070	.0550	.0440	297.832	1.9511	30.7839	0.0000000	2.0880	2.4050	64.5770	.0050

MULTIPOLE COEFFICIENTS OF FIELD AT REFERENCE RADIUS

N	NET FIELD HY(KG-IN)	NET FIELD HX(KG-IN)	AIR FIELD HY(KG-IN)	AIR FIELD HX(KG-IN)	IRON CONTR. HY(KG-IN)	IRON CONTR. HX(KG-IN)	NORMALIZED FIELD HY/XGYO	NORMALIZED FIELD HX/XGYO
2	1307.840989	0.000000	1215.330666	0.000000	92.510322	0.000000	1.000000	0.000000
6	-.034810	0.000000	-.033659	0.000000	-.001151	0.000000	-.000027	0.000000
10	-.270267	0.000000	-.270265	0.000000	-.000002	0.000000	-.000207	0.000000
14	.093808	0.000000	.093808	0.000000	.000000	0.000000	.000072	0.000000
18	-.003726	0.000000	-.003726	0.000000	-.000000	0.000000	-.000003	0.000000
22	-.000734	0.000000	-.000734	0.000000	-.000000	0.000000	-.000001	0.000000
26	.000011	0.000000	.000011	0.000000	.000000	0.000000	.000000	0.000000

MEDIAN PLANE FIELD VERSUS DISTANCE

X(IN)	NET FIELD HY(KG-IN)	NET FIELD HX(KG-IN)	AIR FIELD HY(KG-IN)	AIR FIELD HX(KG-IN)	IRON CONTR. HY(KG-IN)	IRON CONTR. HX(KG-IN)	NORMALIZED FIELD HY/XGYO	NORMALIZED FIELD HX/XGYO
.000	.000	0.000	.000	0.000	.000	0.000	1.000000	0.000000
.100	130.784	0.000	121.533	0.000	9.251	0.000	1.000000	0.000000
.200	261.568	0.000	243.066	0.000	18.502	0.000	1.000000	0.000000
.300	392.352	0.000	364.599	0.000	27.753	0.000	1.000000	0.000000
.400	523.136	0.000	486.132	0.000	37.004	0.000	.999999	0.000000
.500	653.919	0.000	607.664	0.000	46.255	0.000	.999998	0.000000
.600	784.699	0.000	729.193	0.000	55.506	0.000	.999993	0.000000
.700	915.473	0.000	850.716	0.000	64.757	0.000	.999983	0.000000
.800	1046.230	0.000	972.222	0.000	74.008	0.000	.999959	0.000000
.900	1176.955	0.000	1093.696	0.000	83.259	0.000	.999913	0.000000
1.000	1307.625	0.000	1215.116	0.000	92.509	0.000	.999835	0.000000
1.100	1438.231	0.000	1336.472	0.000	101.759	0.000	.999726	0.000000
1.200	1568.916	0.000	1457.807	0.000	111.010	0.000	.999622	0.000000
1.300	1699.544	0.000	1579.284	0.000	120.259	0.000	.999618	0.000000
1.400	1830.707	0.000	1701.199	0.000	129.508	0.000	.999852	0.000000
1.500	1962.318	0.000	1823.561	0.000	138.757	0.000	1.000283	0.000000
1.600	2092.092	0.000	1944.087	0.000	148.004	0.000	.999783	0.000000
1.700	2228.667	0.000	2051.416	0.000	157.251	0.000	.993405	0.000000

END TO END COIL LENGTH

1 OUTSIDE LENGTH(IN)=	67.827	67.703	67.580	67.457	67.333	67.210	67.086	66.963		
1 INSIDE LENGTH(IN) =	67.708	67.584	67.461	67.338	67.214	67.091	66.967	66.844		
2 OUTSIDE LENGTH(IN)=	66.849	66.550	66.251	65.952	65.653	65.354				
2 INSIDE LENGTH(IN) =	66.730	66.431	65.132	65.833	65.534	65.235				
3 OUTSIDE LENGTH(IN)=	68.096									
3 INSIDE LENGTH(IN) =	67.953									
4 OUTSIDE LENGTH(IN)=	67.953	67.809	67.664	67.520	67.376	67.232	67.088	66.943	66.799	66.655
	66.511	66.367	66.222	66.078	65.779	65.480	65.181	64.882	64.583	
4 INSIDE LENGTH(IN) =	67.834	67.690	67.545	67.401	67.257	67.113	66.969	66.824	66.680	66.536
	66.392	66.248	66.103	65.959	65.660	65.361	65.062	64.763	64.464	

RADIAL DISTANCES IN DEVELOPED COIL

1 OUTSIDE RADIUS(IN)=	1.4939	1.4344	1.3749	1.3154	1.2559	1.1964	1.1369	1.0774		
1 INSIDE RADIUS(IN) =	1.4344	1.3749	1.3154	1.2559	1.1964	1.1369	1.0774	1.0179		
2 OUTSIDE RADIUS(IN)=	.8527	.7932	.7337	.6742	.6147	.5552				
2 INSIDE RADIUS(IN) =	.7932	.7337	.6742	.6147	.5552	.4957				
3 OUTSIDE RADIUS(IN)=	1.7594									
3 INSIDE RADIUS(IN) =	1.6879									
4 OUTSIDE RADIUS(IN)=	1.6879	1.6284	1.5689	1.5094	1.4499	1.3904	1.3309	1.2714	1.2119	1.1524
	1.0929	1.0334	.9739	.9144	.8549	.7954	.7359	.6764	.6169	
4 INSIDE RADIUS(IN) =	1.6284	1.5689	1.5094	1.4499	1.3904	1.3309	1.2714	1.2119	1.1524	1.0929
	1.0334	.9739	.9144	.8549	.7954	.7359	.6764	.6169	.5574	

INTEGRATED MULTIPOLE STRUCTURE OF 2-SHELL SECTOR QUAD(100577 WIRE) ENDEM 042179-1345

ORDER OF POLE	= 2	CALCULATIONAL MODE	= 0	NUMBER OF LAYERS	= 4
HIGHEST MULTIPOLE ORDER	= 26	CONDUCTOR CURRENT(A)	= 4526.0000	REFERENCE RADIUS(IN)	= 1.0000
INNER IRON RADIUS(IN)	= 4.0000	HORIZONTAL INCREMENT(IN)	= .1000		

LAYER	TURNS	FBC (IN)	WIDTH (IN)	HGTMAX (IN)	HGTMIN (IN)	CURDEN (KA/IN/IN)	THETAS (DEG)	THETAF (DEG)	SPACER (IN)	RINNER (IN)	ROUTER (IN)	LENGTH (IN)	WRAP (IN)
1	8.0	0.000	.3070	.0550	.0440	297.832	.1501	14.4403	0.0000000	1.7500	2.0670	1.0000	.0050
2	6.0	0.000	.3070	.0550	.0440	297.832	19.4018	30.1194	0.0000000	1.7500	2.0670	1.0000	.0050
3	1.0	0.000	.3070	.0550	.0440	297.832	.1275	1.9511	.0060000	2.0880	2.4050	1.0000	.0050
4	19.0	0.000	.3070	.0550	.0440	297.832	1.9511	30.7839	0.0000000	2.0880	2.4050	1.0000	.0050

MULTIPOLE COEFFICIENTS OF FIELD AT REFERENCE RADIUS

N	NET FIELD HY(KG-IN)	NET FIELD HX(KG-IN)	AIR FIELD HY(KG-IN)	AIR FIELD HX(KG-IN)	IRON CONTR. HY(KG-IN)	IRON CONTR. HX(KG-IN)	NORMALIZED FIELD HY/XGYO	NORMALIZED FIELD HX/XGYO
2	19.672351	0.000000	18.280039	0.000000	1.392263	0.000000	1.000000	0.000000
6	.005082	0.000000	.006097	0.000000	-.000015	0.000000	.000309	0.000000
10	-.003950	0.000000	-.003950	0.000000	-.000000	0.000000	-.000201	0.000000
14	.001458	0.000000	.001458	0.000000	.000000	0.000000	.000074	0.000000
18	-.000056	0.000000	-.000056	0.000000	-.000000	0.000000	-.000003	0.000000
22	-.000011	0.000000	-.000011	0.000000	-.000000	0.000000	-.000001	0.000000
26	.000000	0.000000	.000000	0.000000	.000000	0.000000	.000000	0.000000

MEDIAN PLANE FIELD VERSUS DISTANCE

X(IN)	NET FIELD HY(KG-IN)	NET FIELD HX(KG-IN)	AIR FIELD HY(KG-IN)	AIR FIELD HX(KG-IN)	IRON CONTR. HY(KG-IN)	IRON CONTR. HX(KG-IN)	NORMALIZED FIELD HY/XGYO	NORMALIZED FIELD HX/XGYO
.000	.000	0.000	.000	0.000	.000	0.000	1.000000	0.000000
.100	1.967	0.000	1.828	0.000	.139	0.000	1.000000	0.000000
.200	3.934	0.000	3.656	0.000	.278	0.000	1.000000	0.000000
.300	5.902	0.000	5.484	0.000	.418	0.000	1.000002	0.000000
.400	7.869	0.000	7.312	0.000	.557	0.000	1.000008	0.000000
.500	9.836	0.000	9.140	0.000	.696	0.000	1.000019	0.000000
.600	11.804	0.000	10.968	0.000	.835	0.000	1.000037	0.000000
.700	13.772	0.000	12.797	0.000	.975	0.000	1.000064	0.000000
.800	15.739	0.000	14.626	0.000	1.114	0.000	1.000098	0.000000
.900	17.708	0.000	16.455	0.000	1.253	0.000	1.000137	0.000000
1.000	19.676	0.000	18.284	0.000	1.392	0.000	1.000179	0.000000
1.100	21.645	0.000	20.113	0.000	1.531	0.000	1.000238	0.000000
1.200	23.615	0.000	21.945	0.000	1.671	0.000	1.000354	0.000000
1.300	25.591	0.000	23.782	0.000	1.810	0.000	1.000678	0.000000
1.400	27.579	0.000	25.630	0.000	1.949	0.000	1.001355	0.000000
1.500	29.580	0.000	27.491	0.000	2.088	0.000	1.002413	0.000000
1.600	31.564	0.000	29.337	0.000	2.227	0.000	1.002810	0.000000
1.700	33.367	0.000	31.000	0.000	2.367	0.000	.997721	0.000000

MAX. FIELD ON IRON(KG) = 11.1507 FLUX IN IRON(KG-IN) = 22.2502

FIELD AND FLUX ON INNER IRON SURFACE

ANGLE(RAD)	BN(KG)	FLUX(KG-IN)
0.00000	0.00000	0.00000
.01745	.38312	.01337
.03491	.76537	.05349
.05235	1.14787	.12029
.06981	1.52875	.21373
.08727	1.99812	.33371
.10472	2.28560	.48011
.12217	2.66030	.65279
.13963	3.03331	.85157
.15708	3.40274	1.07625
.17453	3.76866	1.32660
.19199	4.13064	1.60236
.20944	4.48826	1.90324
.22689	4.84108	2.22893
.24435	5.18863	2.57906
.26180	5.53047	2.95325
.27925	5.86613	3.35112
.29671	6.19514	3.77218
.31416	6.51704	4.21595
.33161	6.83134	4.68195
.34907	7.13759	5.16960
.36652	7.43532	5.67835
.38397	7.72406	6.20755
.40143	8.00338	6.75661
.41888	8.27284	7.32432
.43633	8.53203	7.91148
.45379	8.78054	8.51536
.47124	9.01802	9.13722
.48869	9.24411	9.77475
.50615	9.45851	10.42766
.52360	9.66091	11.09513
.54105	9.85107	11.77630
.55851	10.02876	12.47031
.57596	10.19379	13.17628
.59341	10.34599	13.89333
.61087	10.48524	14.62055
.62832	10.61142	15.35704
.64577	10.72445	16.10188
.66323	10.82426	16.85415
.68068	10.91082	17.61292
.69813	10.98410	18.37728
.71558	11.04406	19.14628
.73304	11.09070	19.91901
.75049	11.12402	20.69453
.76794	11.14402	21.47191
.78540	11.15068	22.25022

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