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1Proton Optics hp_rev1.mad                                                              "MAD" Version: 8.21/5    Run: 07/05/97  14.34.42
 Linear lattice functions.    TWISS               line: IRP                             range: #S/#E
 Delta(p)/p:      .000000     symm: F             super:   1                                                                   page     1
 -----------------------------------------------------------------------------------------------------------------------------------------
      ELEMENT SEQUENCE       I                H O R I Z O N T A L                  I                  V E R T I C A L
 pos.  element occ.     dist I    betax   alfax    mux    x(co)   px(co) Dx     Dpx  I    betay   alfay    muy    y(co)   py(co) Dy     Dpy
 no.   name    no.      [m]  I    [m]     [1]      [2pi]  [mm]    [.001] [m]    [1]  I    [m]     [1]      [2pi]  [mm]    [.001] [m]    [1]
 -----------------------------------------------------------------------------------------------------------------------------------------
 begin IRP        1      .000     2.450    .000    .000   .000    .000   .000  .000      .180    .000     .000   .000    .000   .000  .000
 begin IR0        1      .000     2.450    .000    .000   .000    .000   .000  .000      .180    .000     .000   .000    .000   .000  .000
     1 DR00       1     1.800     3.772   -.735    .101   .000    .000   .000  .000    18.180-10.000     .234   .000    .000   .000  .000
 begin QG         1     1.800     3.772   -.735    .101   .000    .000   .000  .000    18.180-10.000     .234   .000    .000   .000  .000
     2 QG1        1     2.295     4.603   -.943    .120   .000    .000   .000  .000    29.424-12.710     .238   .000    .000   .000  .000
     3 QG2        1     2.790     5.640 -1.154    .135   .000    .000   .000  .000    43.335-15.386     .240   .000    .000   .000  .000
     4 MQG        1     2.790     5.640 -1.154    .135   .000    .000   .000  .000    43.335-15.386     .240   .000    .000   .000  .000
     5 QG3        1     3.285     6.889 -1.368    .148   .000    .000   .000  .000    59.874-18.019     .241   .000    .000   .000  .000
     6 QG4        1     3.780     8.350 -1.586    .158   .000    .000   .000  .000    78.996-20.604     .242   .000    .000   .000  .000
 end   QG         1     3.780     8.350 -1.586    .158   .000    .000   .000  .000    78.996-20.604     .242   .000    .000   .000  .000
     7 DR03       1     3.900     8.737 -1.636    .161   .000    .000   .000  .000    84.019-21.250     .243   .000    .000   .000  .000
     8 DR03       2     4.020     9.136 -1.687    .163   .000    .000   .000  .000    89.196-21.896     .243   .000    .000   .000  .000
 begin QH         1     4.020     9.136 -1.687    .163   .000    .000   .000  .000    89.196-21.896     .243   .000    .000   .000  .000
     9 QH1        1     4.435    10.612 -1.872    .169   .000    .000   .000  .000   108.255-24.020     .244   .000    .000   .000  .000
    10 QH2        1     4.850    12.245 -2.061    .175   .000    .000   .000  .000   129.059-26.103     .244   .000    .000   .000  .000
    11 MQH        1     4.850    12.245 -2.061    .175   .000    .000   .000  .000   129.059-26.103     .244   .000    .000   .000  .000
    12 QH3        1     5.265    14.035 -2.254    .180   .000    .000   .000  .000   151.573-28.141     .245   .000    .000   .000  .000
    13 QH4        1     5.680    15.987 -2.450    .185   .000    .000  -.001  .000   175.760-30.131     .245   .000    .000   .000  .000
 end   QH         1     5.680    15.987 -2.450    .185   .000    .000  -.001  .000   175.760-30.131     .245   .000    .000   .000  .000
    14 DR05       1     5.800    16.581 -2.502    .186   .000    .000  -.001  .000   183.065-30.751     .245   .000    .000   .000  .000
    15 DR05       2     5.920    17.188 -2.555    .187   .000    .000  -.001  .000   190.520-31.372     .245   .000    .000   .000  .000
 begin QI         1     5.920    17.188 -2.555    .187   .000    .000  -.001  .000   190.520-31.372     .245   .000    .000   .000  .000
    16 QIA        1     6.370    19.539 -2.666    .191   .000    .000  -.001  .000   220.217-34.663     .246   .000    .000   .000  .000
    17 QIB        1     6.820    21.981 -2.757    .194   .000    .000  -.001  .000   252.996-38.228     .246   .000    .000   .000  .000
    18 MQI        1     6.820    21.981 -2.757    .194   .000    .000  -.001  .000   252.996-38.228     .246   .000    .000   .000  .000
    19 QIC        1     7.270    24.494 -2.825    .197   .000    .000  -.001  .000   289.118-42.095     .246   .000    .000   .000  .000
    20 QID        1     7.720    27.059 -2.872    .200   .000    .000  -.001  .000   328.867-46.295     .246   .000    .000   .000  .000
 end   QI         1     7.720    27.059 -2.872    .200   .000    .000  -.001  .000   328.867-46.295     .246   .000    .000   .000  .000
    21 DR07       1     7.920    28.222 -2.940    .201   .000    .000  -.001  .000   347.646-47.599     .246   .000    .000   .000  .000
 begin QJ         1     7.920    28.222 -2.940    .201   .000    .000  -.001  .000   347.646-47.599     .246   .000    .000   .000  .000
    22 QJA        1     8.415    31.258 -3.197    .204   .000    .000  -.002  .000   395.835-49.706     .247   .000    .000   .000  .000
    23 QJB        1     8.910    34.558 -3.473    .206   .000    .000  -.002  .000   445.973-51.535     .247   .000    .000   .000  .000
    24 MQJ        1     8.910    34.558 -3.473    .206   .000    .000  -.002  .000   445.973-51.535     .247   .000    .000   .000  .000
    25 QJC        1     9.405    38.141 -3.768    .209   .000    .000  -.002  .000   497.779-53.075     .247   .000    .000   .000  .000
    26 QJD        1     9.900    42.026 -4.084    .211   .000    .000  -.002  .000   550.963-54.317     .247   .000    .000   .000  .000
 end   QJ         1     9.900    42.026 -4.084    .211   .000    .000  -.002  .000   550.963-54.317     .247   .000    .000   .000  .000
    27 DR09       1    11.000    51.519 -4.547    .214   .000    .000  -.002  .000   676.943-60.210     .247   .000    .000   .000  .000
 end   IR0        1    11.000    51.519 -4.547    .214   .000    .000  -.002  .000   676.943-60.210     .247   .000    .000   .000  .000
 begin IR1        1    11.000    51.519 -4.547    .214   .000    .000  -.002  .000   676.943-60.210     .247   .000    .000   .000  .000
 begin QM1        1    11.000    51.519 -4.547    .214   .000    .000  -.002  .000   676.943-60.210     .247   .000    .000   .000  .000
    28 QM1A       1    11.875    60.175 -5.367    .217   .000    .000  -.002  .000   781.475-58.992     .248   .000    .000   .000  .000
    29 QM1B       1    12.750    70.388 -6.330    .219   .000    .000  -.002  .000   882.507-56.219     .248   .000    .000   .000  .000
    30 QM1C       1    13.625    82.429 -7.461    .221   .000    .000  -.002  .000   977.374-51.962     .248   .000    .000   .000  .000
    31 QM1D       1    14.500    96.617 -8.789    .222   .000    .000  -.002  .000  1063.575-46.335     .248   .000    .000   .000  .000
 end   QM1        1    14.500    96.617 -8.789    .222   .000    .000  -.002  .000  1063.575-46.335     .248   .000    .000   .000  .000
    32 DR14       1    14.700   100.165 -8.951    .223   .000    .000  -.002  .000  1082.189-46.739     .248   .000    .000   .000  .000
 begin QM2        1    14.700   100.165 -8.951    .223   .000    .000  -.002  .000  1082.189-46.739     .248   .000    .000   .000  .000
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1Proton Optics hp_rev1.mad "MAD" Version: 8.21/5 Run: 07/05/97 14.34.42
Linear lattice functions. TWISS line: IRP range: #S/#E
Delta(p)/p: .000000 symm: F super: 1 page 2

ELEMENT SEQUENCE			I	HORIZONTAL							I	VERTICAL					
pos. no.	element name	occ. no.	dist [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]	Dpy [1]
33	QM2A	1	15.575	117.184	-10.542	.224	.000	.000	-.001	.000	1158.030	-39.745	.248	.000	.000	.000	.000
34	QM2B	1	16.450	137.223	-12.411	.225	.000	.000	-.001	.000	1220.683	-31.702	.248	.000	.000	.000	.000
35	QM2C	1	17.325	160.814	-14.609	.226	.000	.000	.000	.001	1268.498	-22.823	.248	.000	.000	.000	.000
36	QM2D	1	18.200	188.581	-17.195	.227	.000	.000	.000	.001	1300.213	-13.342	.249	.000	.000	.000	.000
end	QM2	1	18.200	188.581	-17.195	.227	.000	.000	.000	.001	1300.213	-13.342	.249	.000	.000	.000	.000
37	DR18	1	19.000	217.099	-18.453	.227	.000	.000	.001	.001	1321.648	-13.452	.249	.000	.000	.000	.000
begin	QN1	1	19.000	217.099	-18.453	.227	.000	.000	.001	.001	1321.648	-13.452	.249	.000	.000	.000	.000
38	QN1A	1	19.450	234.521	-20.289	.228	.000	.000	.001	.001	1330.904	-7.101	.249	.000	.000	.000	.000
39	QN1B	1	19.900	253.672	-22.301	.228	.000	.000	.001	.001	1334.412	-.689	.249	.000	.000	.000	.000
40	QN1C	1	20.350	274.720	-24.506	.228	.000	.000	.001	.001	1332.142	5.729	.249	.000	.000	.000	.000
41	QN1D	1	20.800	297.846	-26.923	.229	.000	.000	.002	.001	1324.114	12.098	.249	.000	.000	.000	.000
end	QN1	1	20.800	297.846	-26.923	.229	.000	.000	.002	.001	1324.114	12.098	.249	.000	.000	.000	.000
42	DR20	1	21.000	308.713	-27.411	.229	.000	.000	.002	.001	1319.279	12.076	.249	.000	.000	.000	.000
begin	QN2	1	21.000	308.713	-27.411	.229	.000	.000	.002	.001	1319.279	12.076	.249	.000	.000	.000	.000
43	QN2A	1	21.450	334.582	-30.117	.229	.000	.000	.002	.001	1305.593	18.317	.249	.000	.000	.000	.000
44	QN2B	1	21.900	363.001	-33.084	.229	.000	.000	.002	.001	1286.357	24.399	.249	.000	.000	.000	.000
45	QN2C	1	22.350	394.218	-36.337	.229	.000	.000	.002	.001	1261.738	30.270	.249	.000	.000	.000	.000
46	QN2D	1	22.800	428.503	-39.907	.229	.000	.000	.003	.001	1231.949	35.879	.249	.000	.000	.000	.000
end	QN2	1	22.800	428.503	-39.907	.229	.000	.000	.003	.001	1231.949	35.879	.249	.000	.000	.000	.000
47	DR22	1	23.100	452.782	-41.022	.230	.000	.000	.003	.001	1210.516	35.565	.249	.000	.000	.000	.000
begin	QN3	1	23.100	452.782	-41.022	.230	.000	.000	.003	.001	1210.516	35.565	.249	.000	.000	.000	.000
48	QN3A	1	23.550	491.491	-45.059	.230	.000	.000	.003	.001	1176.145	40.761	.249	.000	.000	.000	.000
49	QN3B	1	24.000	534.006	-49.487	.230	.000	.000	.003	.001	1137.252	45.605	.249	.000	.000	.000	.000
50	QN3C	1	24.450	580.696	-54.344	.230	.000	.000	.004	.001	1094.175	50.053	.249	.000	.000	.000	.000
51	QN3D	1	24.900	631.967	-59.673	.230	.000	.000	.004	.001	1047.287	54.068	.249	.000	.000	.000	.000
end	QN3	1	24.900	631.967	-59.673	.230	.000	.000	.004	.001	1047.287	54.068	.249	.000	.000	.000	.000
52	DBO	1	25.900	756.949	-65.309	.230	.000	.000	.005	.001	941.943	51.275	.250	.000	.000	.000	.000
begin	BO	1	25.900	756.949	-65.309	.230	.000	.000	.005	.001	941.943	51.275	.250	.000	.000	.000	.000
53	BOH	1	26.900	893.202	-70.945	.231	.000	.000	.005	.000	842.185	48.483	.250	.000	.000	.000	.000
54	BOH	2	27.900	1040.729	-76.581	.231	.000	.000	.005	.000	748.011	45.691	.250	.000	.000	.000	.000
end	BO	1	27.900	1040.729	-76.581	.231	.000	.000	.005	.000	748.011	45.691	.250	.000	.000	.000	.000
55	DI1	1	29.500	1300.217	-85.599	.231	.000	.000	.006	.000	608.948	41.223	.250	.000	.000	.000	.000
begin	QR1	1	29.500	1300.217	-85.599	.231	.000	.000	.006	.000	608.948	41.223	.250	.000	.000	.000	.000
56	QR1H	1	31.000	1541.489	-74.217	.231	.000	.000	.006	.000	501.795	30.669	.251	.000	.000	.000	.000
57	QR1H	2	32.500	1739.829	-57.162	.231	.000	.000	.006	.000	422.566	22.489	.251	.000	.000	.000	.000
end	QR1	1	32.500	1739.829	-57.162	.231	.000	.000	.006	.000	422.566	22.489	.251	.000	.000	.000	.000
end	IR1	1	32.500	1739.829	-57.162	.231	.000	.000	.006	.000	422.566	22.489	.251	.000	.000	.000	.000
begin	IR2	1	32.500	1739.829	-57.162	.231	.000	.000	.006	.000	422.566	22.489	.251	.000	.000	.000	.000
58	DI2	1	32.750	1768.528	-57.631	.231	.000	.000	.006	.000	411.396	22.189	.251	.000	.000	.000	.000
begin	QR1	2	32.750	1768.528	-57.631	.231	.000	.000	.006	.000	411.396	22.189	.251	.000	.000	.000	.000
59	QR1H	3	34.250	1909.620	-35.826	.231	.000	.000	.006	.000	354.650	15.884	.252	.000	.000	.000	.000
60	QR1H	4	35.750	1980.739	-11.283	.231	.000	.000	.006	.000	314.867	10.808	.253	.000	.000	.000	.000
end	QR1	2	35.750	1980.739	-11.283	.231	.000	.000	.006	.000	314.867	10.808	.253	.000	.000	.000	.000
61	DI2	2	36.000	1986.385	-11.299	.232	.000	.000	.006	.000	309.487	10.714	.253	.000	.000	.000	.000
begin	QR2	1	36.000	1986.385	-11.299	.232	.000	.000	.006	.000	309.487	10.714	.253	.000	.000	.000	.000
62	QR2H	1	37.500	1999.087	2.861	.232	.000	.000	.005	.000	281.270	8.163	.254	.000	.000	.000	.000
63	QR2H	2	39.000	1969.339	16.900	.232	.000	.000	.005	.000	260.157	5.962	.255	.000	.000	.000	.000

1Proton Optics hp_rev1.mad "MAD" Version: 8.21/5 Run: 07/05/97 14.34.42
Linear lattice functions. TWISS line: IRP range: #S/#E
Delta(p)/p: .000000 symm: F super: 1 page 3

pos. no.	element name	occ. no.	dist [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]	Dpy [1]
	ELEMENT SEQUENCE			H O R I Z O N T A L							V E R T I C A L						
end	QR2	1	39.000	1969.339	16.900	.232	.000	.000	.005	.000	260.157	5.962	.255	.000	.000	.000	.000
64	DI3	1	49.250	1638.185	15.408	.233	.000	.000	.003	.000	152.701	4.522	.263	.000	.000	.000	.000
begin	QR3	1	49.250	1638.185	15.408	.233	.000	.000	.003	.000	152.701	4.522	.263	.000	.000	.000	.000
65	QR3H	1	50.750	1586.747	18.845	.233	.000	.000	.002	.000	139.948	3.990	.264	.000	.000	.000	.000
66	QR3H	2	52.250	1525.376	22.022	.233	.000	.000	.002	.000	128.707	3.513	.266	.000	.000	.000	.000
end	QR3	1	52.250	1525.376	22.022	.233	.000	.000	.002	.000	128.707	3.513	.266	.000	.000	.000	.000
67	DR52	1	56.600	1339.816	20.636	.233	.000	.000	.001	.000	100.106	3.062	.272	.000	.000	.000	.000
68	DI4	1	65.330	1003.794	17.855	.235	.000	.000	-.001	.000	54.543	2.157	.291	.000	.000	.000	.000
69	BU00	1	69.500	860.426	16.526	.235	.000	.000	-.002	.000	38.354	1.725	.306	.000	.000	.001	.000
70	D015	1	70.120	840.056	16.329	.235	.000	.000	-.002	.000	36.255	1.661	.308	.000	.000	.001	.000
71	BU00	2	74.290	709.414	15.000	.236	.000	.000	-.003	.000	24.207	1.228	.331	.000	.000	.004	.001
72	D015	2	74.910	690.936	14.803	.236	.000	.000	-.003	.000	22.724	1.164	.335	.000	.000	.005	.001
73	BU00	3	79.080	573.021	13.474	.238	.000	.000	-.004	.000	14.817	.732	.371	.000	.000	.009	.001
74	DR77	1	82.000	497.048	12.544	.238	.000	.000	-.005	.000	11.426	.429	.408	.000	.000	.013	.001
75	DI33	1	89.000	337.042	10.314	.241	.000	.000	-.006	.000	10.495	-.296	.518	.000	.000	.023	.001
76	DI34	1	113.876	21.051	2.389	.289	.000	.000	-.012	.000	89.372	-2.875	.669	.000	.000	.057	.001
end	IR2	1	113.876	21.051	2.389	.289	.000	.000	-.012	.000	89.372	-2.875	.669	.000	.000	.057	.001
end	IRP	1	113.876	21.051	2.389	.289	.000	.000	-.012	.000	89.372	-2.875	.669	.000	.000	.057	.001

total length =	113.875900	mux =	.288839	muy =	.668763
delta(s) =	.000000 mm	dmux =	-1.772592	dmuy =	-4.035148
		betax(max) =	1999.086631	betay(max) =	1334.412235
		Dx(max) =	.012171	Dy(max) =	.057393
		Dx(r.m.s.) =	.003161	Dy(r.m.s.) =	.007382

1Proton Optics hp_rev1.mad "MAD" Version: 8.21/5 Run: 07/05/97 14.34.42
Survey. SURVEY line: IRP range: #S/#E
symm: F super: 1 page 1

pos. no.	element name	occ. no.	sum(L) [m]	arc [m]	x [m]	y [m]	z [m]	theta [rad]	phi [rad]	psi [rad]
	E L E M E N T S E Q U E N C E				P O S I T I O N S			A N G L E S		
begin	IRP	1	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
begin	IR0	1	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
1	DR00	1	1.800000	1.800000	.000000	.000000	1.800000	.000000	.000000	.000000
begin	QG	1	1.800000	1.800000	.000000	.000000	1.800000	.000000	.000000	.000000
2	QG1	1	2.295000	2.295000	-.000008	.000000	2.295000	-.000032	.000000	.000000
3	QG2	1	2.790000	2.790000	-.000032	.000000	2.790000	-.000065	.000000	.000000
4	MQG	1	2.790000	2.790000	-.000032	.000000	2.790000	-.000065	.000000	.000000
5	QG3	1	3.285000	3.285000	-.000072	.000000	3.285000	-.000098	.000000	.000000
6	QG4	1	3.780000	3.780000	-.000130	.000000	3.780000	-.000134	.000000	.000000
end	QG	1	3.780000	3.780000	-.000130	.000000	3.780000	-.000134	.000000	.000000
7	DR03	1	3.900000	3.900000	-.000146	.000000	3.900000	-.000134	.000000	.000000
8	DR03	2	4.020000	4.020000	-.000162	.000000	4.020000	-.000134	.000000	.000000
begin	QH	1	4.020000	4.020000	-.000162	.000000	4.020000	-.000134	.000000	.000000
9	QH1	1	4.435000	4.435000	-.000225	.000000	4.435000	-.000170	.000000	.000000

10	QH2	1	4.850000	4.850000	-.000303	.000000	4.850000	-.000208	.000000	.000000
11	MQH	1	4.850000	4.850000	-.000303	.000000	4.850000	-.000208	.000000	.000000
12	QH3	1	5.265000	5.265000	-.000398	.000000	5.265000	-.000249	.000000	.000000
13	QH4	1	5.680000	5.680000	-.000511	.000000	5.680000	-.000293	.000000	.000000
end	QH	1	5.680000	5.680000	-.000511	.000000	5.680000	-.000293	.000000	.000000
14	DR05	1	5.800000	5.800000	-.000546	.000000	5.800000	-.000293	.000000	.000000
15	DR05	2	5.920000	5.920000	-.000581	.000000	5.920000	-.000293	.000000	.000000
begin	QI	1	5.920000	5.920000	-.000581	.000000	5.920000	-.000293	.000000	.000000
16	QIA	1	6.370000	6.370000	-.000720	.000000	6.370000	-.000326	.000000	.000000
17	QIB	1	6.820000	6.820000	-.000876	.000000	6.820000	-.000367	.000000	.000000
18	MQI	1	6.820000	6.820000	-.000876	.000000	6.820000	-.000367	.000000	.000000
19	QIC	1	7.270000	7.270000	-.001053	.000000	7.270000	-.000416	.000000	.000000
20	QID	1	7.720000	7.720000	-.001252	.000000	7.720000	-.000472	.000000	.000000
end	QI	1	7.720000	7.720000	-.001252	.000000	7.720000	-.000472	.000000	.000000
21	DR07	1	7.920000	7.920000	-.001347	.000000	7.920000	-.000472	.000000	.000000
begin	QJ	1	7.920000	7.920000	-.001347	.000000	7.920000	-.000472	.000000	.000000
22	QJA	1	8.415000	8.415000	-.001558	.000000	8.415000	-.000381	.000000	.000000
23	QJB	1	8.910000	8.910000	-.001721	.000000	8.910000	-.000278	.000000	.000000
24	MQJ	1	8.910000	8.910000	-.001721	.000000	8.910000	-.000278	.000000	.000000
25	QJC	1	9.405000	9.405000	-.001831	.000000	9.405000	-.000165	.000000	.000000
26	QJD	1	9.900000	9.900000	-.001881	.000000	9.900000	-.000041	.000000	.000000
end	QJ	1	9.900000	9.900000	-.001881	.000000	9.900000	-.000041	.000000	.000000
27	DR09	1	11.000000	11.000000	-.001926	.000000	11.000000	-.000041	.000000	.000000
end	IR0	1	11.000000	11.000000	-.001926	.000000	11.000000	-.000041	.000000	.000000
begin	IR1	1	11.000000	11.000000	-.001926	.000000	11.000000	-.000041	.000000	.000000
begin	QM1	1	11.000000	11.000000	-.001926	.000000	11.000000	-.000041	.000000	.000000
28	QM1A	1	11.875000	11.875000	-.001924	.000000	11.875000	.000044	.000000	.000000
29	QM1B	1	12.750000	12.750000	-.001848	.000000	12.750000	.000131	.000000	.000000
30	QM1C	1	13.625000	13.625000	-.001694	.000000	13.625000	.000220	.000000	.000000
31	QM1D	1	14.500000	14.500000	-.001461	.000000	14.500000	.000313	.000000	.000000
end	QM1	1	14.500000	14.500000	-.001461	.000000	14.500000	.000313	.000000	.000000
32	DR14	1	14.700000	14.700000	-.001398	.000000	14.700000	.000313	.000000	.000000
begin	QM2	1	14.700000	14.700000	-.001398	.000000	14.700000	.000313	.000000	.000000

1Proton Optics hp_rev1.mad "MAD" Version: 8.21/5 Run: 07/05/97 14.34.42

Survey. SURVEY line: IRP range: #S/#E

symm: F super: 1 page 2

ELEMENT SEQUENCE pos. no.	element name	occ. no.	sum(L) [m]	arc [m]	POSITIONS x [m]	y [m]	z [m]	ANGLES theta [rad]	phi [rad]	psi [rad]
33	QM2A	1	15.575000	15.575000	-.001082	.000000	15.575000	.000410	.000000	.000000
34	QM2B	1	16.450000	16.450000	-.000679	.000000	16.449999	.000510	.000000	.000000
35	QM2C	1	17.325000	17.325000	-.000187	.000000	17.324999	.000615	.000000	.000000
36	QM2D	1	18.200000	18.200000	.000399	.000000	18.199999	.000724	.000000	.000000
end	QM2	1	18.200000	18.200000	.000399	.000000	18.199999	.000724	.000000	.000000
37	DR18	1	19.000000	19.000000	.000978	.000000	18.999999	.000724	.000000	.000000
begin	QN1	1	19.000000	19.000000	.000978	.000000	18.999999	.000724	.000000	.000000
38	QN1A	1	19.450000	19.450000	.001294	.000000	19.449999	.000682	.000000	.000000
39	QN1B	1	19.900000	19.900000	.001594	.000000	19.899999	.000650	.000000	.000000
40	QN1C	1	20.350000	20.350000	.001880	.000000	20.349999	.000625	.000000	.000000
41	QN1D	1	20.800000	20.800000	.002158	.000000	20.799999	.000610	.000000	.000000
end	QN1	1	20.800000	20.800000	.002158	.000000	20.799999	.000610	.000000	.000000
42	DR20	1	21.000000	21.000000	.002280	.000000	20.999999	.000610	.000000	.000000
begin	QN2	1	21.000000	21.000000	.002280	.000000	20.999999	.000610	.000000	.000000

43	QN2A	1	21.450000	21.450000	.002553	.000000	21.449998	.000602	.000000	.000000
44	QN2B	1	21.900000	21.900000	.002823	.000000	21.899998	.000596	.000000	.000000
45	QN2C	1	22.350000	22.350000	.003090	.000000	22.349998	.000591	.000000	.000000
46	QN2D	1	22.800000	22.800000	.003355	.000000	22.799998	.000587	.000000	.000000
end	QN2	1	22.800000	22.800000	.003355	.000000	22.799998	.000587	.000000	.000000
47	DR22	1	23.100000	23.100000	.003531	.000000	23.099998	.000587	.000000	.000000
begin	QN3	1	23.100000	23.100000	.003531	.000000	23.099998	.000587	.000000	.000000
48	QN3A	1	23.550000	23.550000	.003795	.000000	23.549998	.000585	.000000	.000000
49	QN3B	1	24.000000	24.000000	.004058	.000000	23.999998	.000585	.000000	.000000
50	QN3C	1	24.450000	24.450000	.004322	.000000	24.449998	.000586	.000000	.000000
51	QN3D	1	24.900000	24.900000	.004586	.000000	24.899998	.000588	.000000	.000000
end	QN3	1	24.900000	24.900000	.004586	.000000	24.899998	.000588	.000000	.000000
52	DBO	1	25.900000	25.900000	.005174	.000000	25.899998	.000588	.000000	.000000
begin	BO	1	25.900000	25.900000	.005174	.000000	25.899998	.000588	.000000	.000000
53	BOH	1	26.900000	26.900000	.005642	.000000	26.899998	.000347	.000000	.000000
54	BOH	2	27.900000	27.900000	.005868	.000000	27.899998	.000106	.000000	.000000
end	BO	1	27.900000	27.900000	.005868	.000000	27.899998	.000106	.000000	.000000
55	DI1	1	29.500000	29.500000	.006038	.000000	29.499998	.000106	.000000	.000000
begin	QR1	1	29.500000	29.500000	.006038	.000000	29.499998	.000106	.000000	.000000
56	QR1H	1	31.000000	31.000000	.006198	.000000	30.999998	.000106	.000000	.000000
57	QR1H	2	32.500000	32.500000	.006357	.000000	32.499998	.000106	.000000	.000000
end	QR1	1	32.500000	32.500000	.006357	.000000	32.499998	.000106	.000000	.000000
end	IR1	1	32.500000	32.500000	.006357	.000000	32.499998	.000106	.000000	.000000
begin	IR2	1	32.500000	32.500000	.006357	.000000	32.499998	.000106	.000000	.000000
58	DI2	1	32.750000	32.750000	.006384	.000000	32.749998	.000106	.000000	.000000
begin	QR1	2	32.750000	32.750000	.006384	.000000	32.749998	.000106	.000000	.000000
59	QR1H	3	34.250000	34.250000	.006543	.000000	34.249998	.000106	.000000	.000000
60	QR1H	4	35.750000	35.750000	.006702	.000000	35.749997	.000106	.000000	.000000
end	QR1	2	35.750000	35.750000	.006702	.000000	35.749997	.000106	.000000	.000000
61	DI2	2	36.000000	36.000000	.006729	.000000	35.999997	.000106	.000000	.000000
begin	QR2	1	36.000000	36.000000	.006729	.000000	35.999997	.000106	.000000	.000000
62	QR2H	1	37.500000	37.500000	.006888	.000000	37.499997	.000106	.000000	.000000
63	QR2H	2	39.000000	39.000000	.007048	.000000	38.999997	.000106	.000000	.000000

1Proton Optics hp_rev1.mad "MAD" Version: 8.21/5 Run: 07/05/97 14.34.42

Survey. SURVEY line: IRP range: #S/#E

symm: F super: 1 page 3

pos. no.	ELEMENT SEQUENCE element name	occ. no.	sum(L) [m]	arc [m]	POSITIONS x [m]	y [m]	z [m]	ANGLES theta [rad]	phi [rad]	psi [rad]
end	QR2	1	39.000000	39.000000	.007048	.000000	38.999997	.000106	.000000	.000000
64	DI3	1	49.250000	49.250000	.008137	.000000	49.249997	.000106	.000000	.000000
begin	QR3	1	49.250000	49.250000	.008137	.000000	49.249997	.000106	.000000	.000000
65	QR3H	1	50.750000	50.750000	.008296	.000000	50.749997	.000106	.000000	.000000
66	QR3H	2	52.250000	52.250000	.008455	.000000	52.249997	.000106	.000000	.000000
end	QR3	1	52.250000	52.250000	.008455	.000000	52.249997	.000106	.000000	.000000
67	DR52	1	56.600000	56.600000	.008917	.000000	56.599997	.000106	.000000	.000000
68	DI4	1	65.330000	65.330000	.009845	.000000	65.329997	.000106	.000000	.000000
69	BU00	1	69.500000	69.500000	.010288	.000957	69.499997	.000106	.000459	.000000
70	D015	1	70.120000	70.120000	.010354	.001242	70.119997	.000106	.000459	.000000
71	BU00	2	74.290000	74.290000	.010797	.004114	74.289996	.000106	.000918	.000000
72	D015	2	74.910000	74.910000	.010863	.004683	74.909996	.000106	.000918	.000000
73	BU00	3	79.080000	79.080000	.011306	.009469	79.079993	.000106	.001377	.000000
74	DR77	1	82.000000	82.000000	.011616	.013491	81.999990	.000106	.001377	.000000

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   75 DI33       1    89.000000    89.000000        .012359       .023132     88.999984        .000106       .001377       .000000
   76 DI34       1   113.875900   113.875900        .015002       .057393    113.875860        .000106       .001377       .000000
end   IR2        1   113.875900   113.875900        .015002       .057393    113.875860        .000106       .001377       .000000
end   IRP        1   113.875900   113.875900        .015002       .057393    113.875860        .000106       .001377       .000000
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total length =        113.875900          arc length   =        113.875900
error(x)     =           .150020E-01      error(y)     =           .573933E-01      error(z)     =           .113876E+03
error(theta) =           .106234E-03      error(phi)   =           .137730E-02      error(psi)   =           .541764E-20
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