ILPC-44

DOUBLER DIPOLE AND QUADRUPOLE DESIGN FIELD SPECIFICATIONS

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INTEGRATED MULTIPOLE STRUCTURE OF E-SERIES DIPOLE(091878 KEYSTONED) ENDEM 011079-1100

ORDER OF POLE	=	1	CALCULATIONAL MODE	=	1	NUMBER OF LAYERS	= 4
HIGHEST MULTIPOLE ORDER	=	19	CONDUCTOR CURRENT(A)	=	4527.0000	REFERENCE RADIUS(IN)	= 1.00
INNER IRON RADIUS(IN)	=	3.7500	HORIZONTAL INCREMENT(IN)	=	.1000	ELLIPTICITY OF ENDS(IN)	= .00

LAYER	TURNS	FRC (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	297.898	.1723	72.9576	.0018206	1.5000	1.8140	252.3110	.0035
2	1.0	0.000	.3070	.0550	.0440	297.898	.1433	2.4179	.0112811	1.8350	2.1490	250.2280	.0035
3	20.0	0.000	.3070	.0550	.0440	297.898	2.4173	36.3939	.0012811	1.8350	2.1490	250.1310	.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	11454.669255	0.000000	9319.814579	0.000000	2134.854576	0.000000	1.000000	0.000000
3	-.295698	0.000000	-7.221141	0.000000	6.925443	0.000000	-.000026	0.000000
5	1.192453	0.000000	1.204958	0.000000	-.012515	0.000000	.000104	0.000000
7	5.027478	0.000000	5.029462	0.000000	-.001985	0.000000	.000439	0.000000
9	-13.813192	0.000000	-13.813165	0.000000	-.000027	0.000000	-.001206	0.000000
11	4.170926	0.000000	4.170926	0.000000	.000000	0.000000	.000364	0.000000
13	-.944631	0.000000	-.944631	0.000000	.000000	0.000000	-.000092	0.000000
15	.080878	0.000000	.080878	0.000000	-.000000	0.000000	.000007	0.000000
17	.035356	0.000000	.035356	0.000000	-.000000	0.000000	.000003	0.000000
19	-.050026	0.000000	-.050026	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	11454.669	0.000	9319.815	0.000	2134.855	0.000	1.000000	0.000000
.100	11454.666	0.000	9319.743	0.000	2134.924	0.000	1.000000	0.000000
.200	11454.660	0.000	9319.529	0.000	2135.132	0.000	.999999	0.000000
.300	11454.655	0.000	9319.177	0.000	2135.478	0.000	.999999	0.000000
.400	11454.664	0.000	9318.702	0.000	2135.962	0.000	1.000000	0.000000
.500	11454.698	0.000	9318.113	0.000	2136.585	0.000	1.000003	0.000000
.600	11454.743	0.000	9317.397	0.000	2137.346	0.000	1.000006	0.000000
.700	11454.711	0.000	9316.456	0.000	2138.245	0.000	1.000004	0.000000
.800	11454.355	0.000	9315.074	0.000	2139.281	0.000	.999973	0.000000
.900	11453.143	0.000	9312.688	0.000	2140.455	0.000	.999867	0.000000
1.000	11450.073	0.000	9309.307	0.000	2141.765	0.000	.999599	0.000000
1.100	11443.399	0.000	9300.137	0.000	2143.212	0.000	.993016	0.000000
1.200	11430.097	0.000	9285.302	0.000	2144.795	0.000	.997855	0.000000
1.300	11404.567	0.000	9258.054	0.000	2146.513	0.000	.995626	0.000000
1.400	11355.095	0.000	9216.730	0.000	2148.365	0.000	.991307	0.000000
1.500	11254.145	0.000	9133.795	0.000	2150.350	0.000	.982494	0.000000

INTEGRATED MULTIPOLE STRUCTURE OF E-SERIES DIPOLE(091878 KEYSTONED) ENDEM 011079-1100

ORDER OF POLE	= 1	CALCULATIONAL MODE	= 0	NUMBER OF LAYERS	=
HIGHEST MULTIPOLE ORDER	= 19	CONDUCTOR CURRENT(A)	= 4527.0000	REFERENCE RADIUS(IN)	= 1.00
INNER IRON RADIUS(IN)	= 3.7500	HORIZONTAL INCREMENT(IN)	= .1000	ELLIPTICITY OF ENDS(IN)	= .00

YER	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	297.898	.1723	72.9576	.0018206	1.5000	1.8140	1.0000	.0035
2	1.0	0.000	.3070	.0550	.0440	297.898	.1433	2.4179	.0112811	1.8350	2.1490	1.0000	.0035
3	20.0	0.000	.3070	.0550	.0440	297.898	2.4179	36.3939	.0012811	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	45.005338	0.000000	36.616731	0.000000	8.388546	0.000000	1.000000	0.000000
3	.029754	0.000000	.001812	0.000000	.027942	0.000000	.000661	0.000000
5	.014013	0.000000	.014055	0.000000	-.000042	0.000000	.000311	0.000000
7	.020897	0.000000	.020905	0.000000	-.000008	0.000000	.000464	0.000000
9	-.054896	0.000000	-.054896	0.000000	-.000000	0.000000	-.001220	0.000000
11	.016779	0.000000	.016779	0.000000	.000000	0.000000	.000373	0.000000
13	-.003760	0.000000	-.003760	0.000000	.000000	0.000000	-.000084	0.000000
15	.000331	0.000000	.000331	0.000000	-.000000	0.000000	.000007	0.000000
17	.000145	0.000000	.000145	0.000000	-.000000	0.000000	.000003	0.000000
19	-.000199	0.000000	-.000199	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	45.005	0.000	36.617	0.000	8.389	0.000	1.000000	0.000000
.100	45.006	0.000	36.617	0.000	8.389	0.000	1.000007	0.000000
.200	45.007	0.000	36.617	0.000	8.390	0.000	1.000027	0.000000
.300	45.008	0.000	36.617	0.000	8.391	0.000	1.000062	0.000000
.400	45.011	0.000	36.617	0.000	8.393	0.000	1.000115	0.000000
.500	45.014	0.000	36.618	0.000	8.396	0.000	1.000188	0.000000
.600	45.018	0.000	36.619	0.000	8.399	0.000	1.000282	0.000000
.700	45.023	0.000	36.621	0.000	8.402	0.000	1.000392	0.000000
.800	45.028	0.000	36.622	0.000	8.406	0.000	1.000502	0.000000
.900	45.031	0.000	36.620	0.000	8.411	0.000	1.000570	0.000000
1.000	45.028	0.000	36.612	0.000	8.415	0.000	1.000512	0.000000
1.100	45.014	0.000	36.591	0.000	8.422	0.000	1.000187	0.000000
1.200	44.976	0.000	36.547	0.000	8.429	0.000	.999339	0.000000
1.300	44.893	0.000	36.457	0.000	8.436	0.000	.997497	0.000000
1.400	44.720	0.000	36.277	0.000	8.443	0.000	.993662	0.000000
1.500	44.351	0.000	35.900	0.000	8.451	0.000	.985467	0.000000

MAX. FIELD ON IRON(KG) = 15.0088 IRON PERMEABILITY AT 3MAXFE= 432.8202 FLUX IN IRON(KG-IN) = 63.857

INTEGRATED MULTIPOLE STRUCTURE OF 2-SHELL SECTOR QUAD(100577 WIRE) ENDEM 011079-1400

ORDER OF POLE	= 2	CALCULATIONAL MODE	= 0	NUMBER OF LAYERS	=
HIGHEST MULTIPOLE ORDER	= 26	CONDUCTOR CURRENT(A)	= 4527.0000	REFERENCE RADIUS(IN)	= 1.000
INNER IRON RADIUS(IN)	= 4.0000	HORIZONTAL INCREMENT(IN)	= .1000	ELLIPTICITY OF ENDS(IN)	= 0.000

LAYER	TURNS	FRC (IN)	WIDTH (IN)	HGTMAX (IN)	HGTMIN (IN)	DURDEN (KA/IN/IN)	THETAS (DEG)	THETAF (DEG)	SPACER (IN)	RINNER (IN)	ROUTER (IN)	LENGTH (IN)	WPAP (IN)
1	8.0	0.000	.3070	.0550	.0440	297.898	.1501	14.4403	0.0000000	1.7500	2.0670	1.0000	.0050
2	6.0	0.000	.3070	.0550	.0440	297.898	19.4855	30.2032	0.0000000	1.7500	2.0670	1.0000	.0050
3	1.0	0.000	.3070	.0550	.0440	297.898	.1273	1.9511	.0060000	2.0880	2.4050	1.0000	.0050
4	19.0	0.000	.3070	.0550	.0440	297.898	1.9511	30.7839	0.0000000	2.0880	2.4050	1.0000	.0050

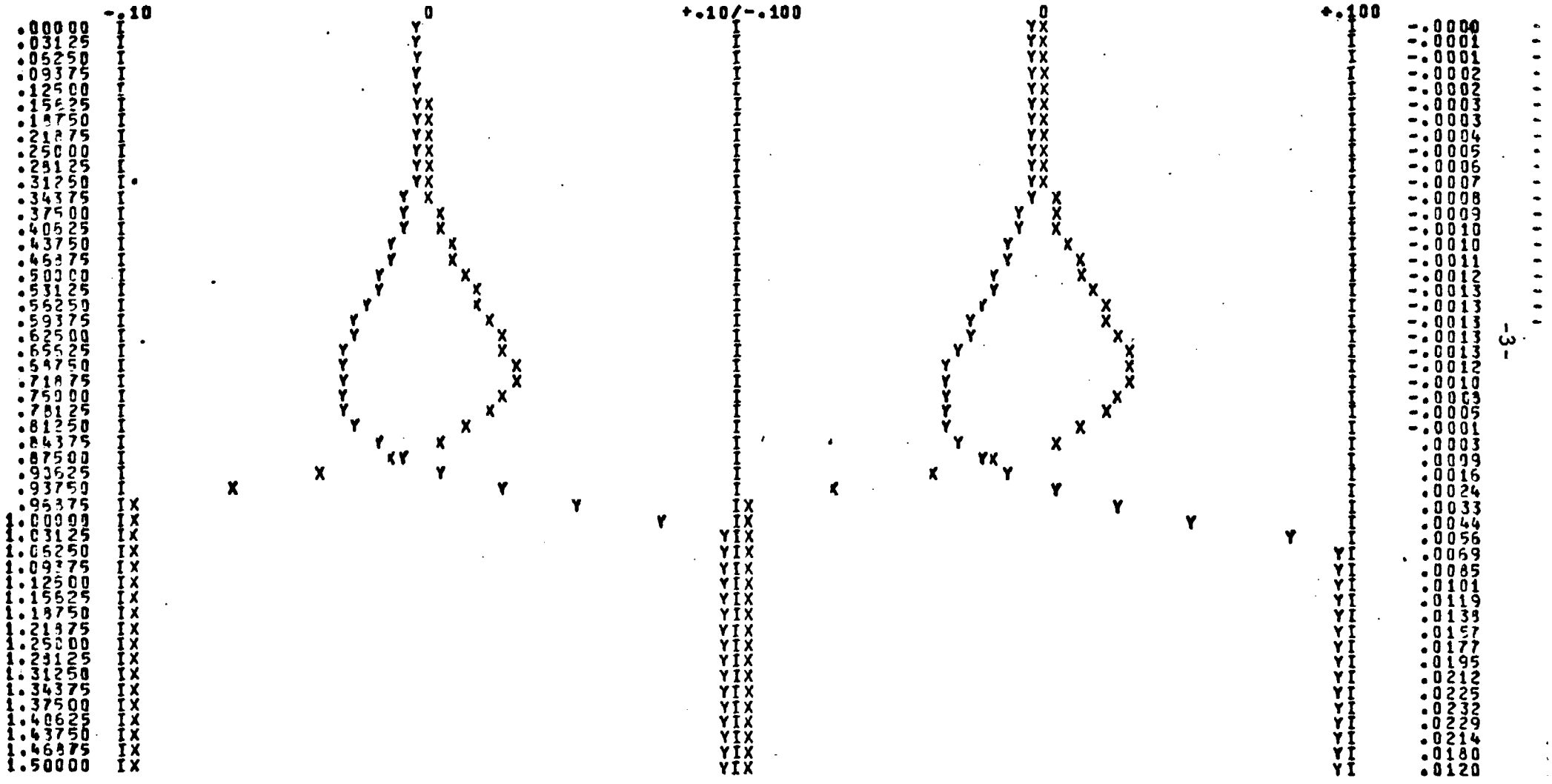
MULTIPOLE COEFFICIENTS OF FIELD AT REFERENCE RADIUS

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	19.665733	0.000000	18.273705	0.000000	1.392028	0.000000	1.000000	0.000000
6	.004507	0.000000	.004522	0.000000	-.000015	0.000000	.000229	0.000000
10	-.003508	0.000000	-.003508	0.000000	-.000000	0.000000	-.000183	0.000000
14	.001466	0.000000	.001466	0.000000	.000000	0.000000	.000075	0.000000
18	-.000059	0.000000	-.000059	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	1.827	0.000	.139	0.000	1.000000	0.000000
.200	3.933	0.000	3.655	0.000	.278	0.000	1.000000	0.000000
.300	5.900	0.000	5.482	0.000	.418	0.000	1.000002	0.000000
.400	7.865	0.000	7.310	0.000	.557	0.000	1.000006	0.000000
.500	9.833	0.000	9.137	0.000	.696	0.000	1.000014	0.000000
.600	11.800	0.000	10.965	0.000	.835	0.000	1.000027	0.000000
.700	13.767	0.000	12.792	0.000	.974	0.000	1.000045	0.000000
.800	15.734	0.000	14.620	0.000	1.114	0.000	1.000068	0.000000
.900	17.701	0.000	16.448	0.000	1.253	0.000	1.000092	0.000000
1.000	19.668	0.000	18.276	0.000	1.392	0.000	1.000117	0.000000
1.100	21.636	0.000	20.105	0.000	1.531	0.000	1.000159	0.000000
1.200	23.605	0.000	21.935	0.000	1.670	0.000	1.000274	0.000000
1.300	25.581	0.000	23.771	0.000	1.810	0.000	1.000531	0.000000
1.400	27.568	0.000	25.619	0.000	1.949	0.000	1.001297	0.000000
1.500	29.570	0.000	27.482	0.000	2.088	0.000	1.002420	0.000000
1.600	31.557	0.000	29.330	0.000	2.227	0.000	1.002929	0.000000
1.700	33.366	0.000	31.000	0.000	2.366	0.000	.998040	0.000000

MAX. FIELD ON IRON(KG) = 11.1433 IRON PERMEABILITY AT 3MAXFE= 916.2841 FLUX IN IRON(KG-IN) = 22.246


X(IN)
DELTA TUNE (EMX=17.0MUIN EMY=17.0MUIN)
DELTA TUNE (EMX=00.0MUIN EMY=00.0MUIN)
DTX
-.10
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.00000 -.0000
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1.31250 .0212
1.34375 .0225
1.37500 .0232
1.40625 .0229
1.43750 .0214
1.46875 .0180
1.50000 .0120

INTEGRATED MULTIPOLE STRUCTURE OF 2-SHELL SECTOR QUAD(100577 WIRE) ENDEM 011079-1400

ORDER OF POLE	=	2	CALCULATIONAL MODE	=	1	NUMBER OF LAYERS	=
HIGHEST MULTIPOLE ORDER	=	26	CONDUCTOR CURRENT(A)	=	4527.0000	REFERENCE RADIUS(IN)	= 1.000
INNER IRON RADIUS(IN)	=	4.0000	HORIZONTAL INCREMENT(IN)	=	.1000	ELLIPTICITY OF ENDS(IN)	= 0.000

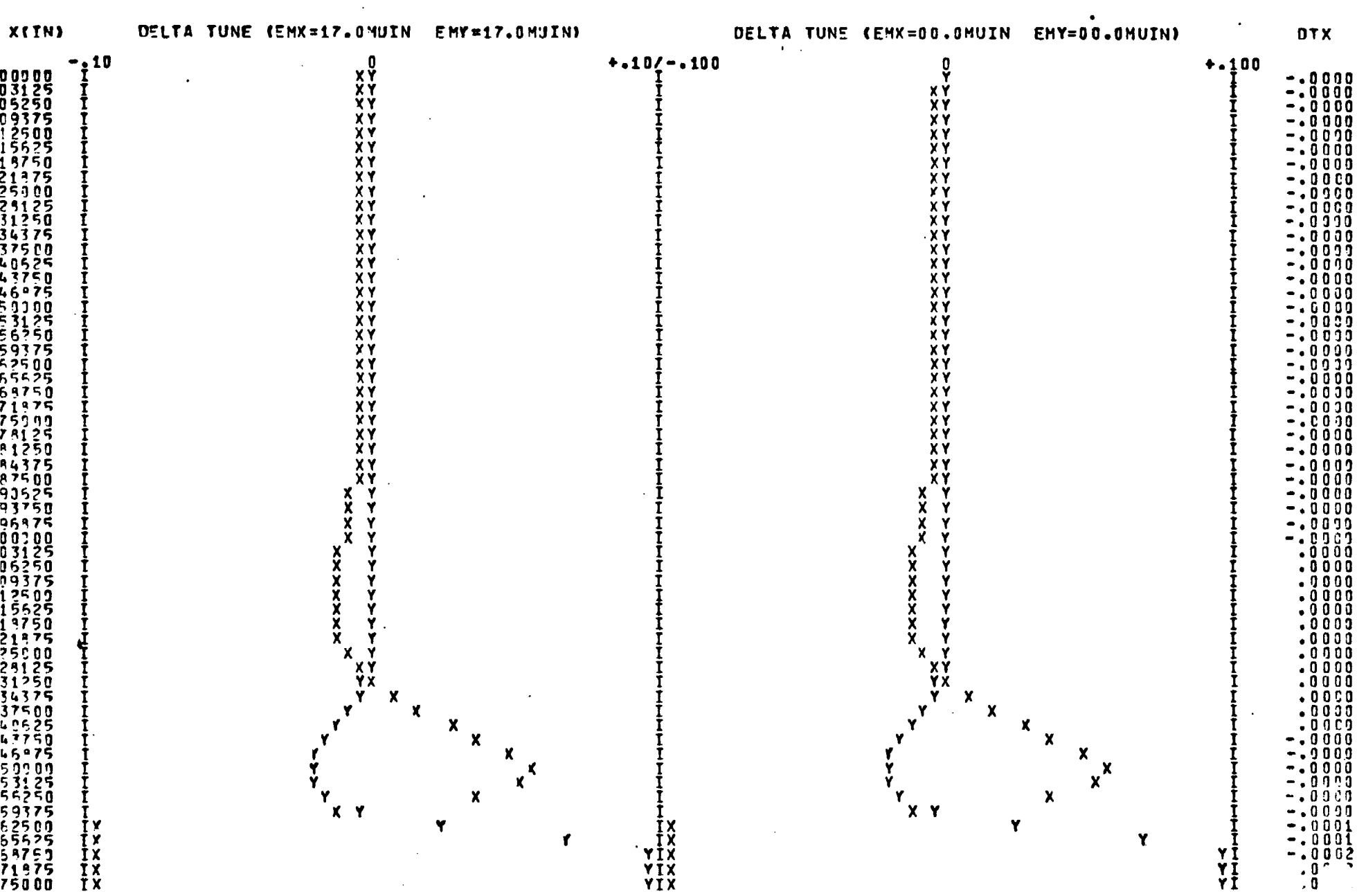
VER	TURNS	FRC (IN)	WIDTH (IN)	HGTMAX (IN)	HGTMIN (IN)	JUPDEN (KA/IN/IN)	THETAS (DEG)	THETAF (DEG)	SPACER (IN)	RINNER (IN)	ROUTER (IN)	LENGTH (IN)	WRAP (IN)
1	8.0	0.000	.3070	.0550	.0440	297.898	.1501	14.4403	0.0000000	1.7500	2.0670	67.4580	.0050
2	6.0	0.000	.3070	.0550	.0440	297.898	19.4855	30.2032	0.0000000	1.7500	2.0670	67.4580	.0050
3	1.0	0.000	.3070	.0550	.0440	297.898	.1275	1.9511	.0050000	2.0880	2.4050	66.9530	.0050
4	19.0	0.000	.3070	.0550	.0440	297.898	1.9511	30.7839	0.0000000	2.0880	2.4050	66.9530	.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	1354.907878	0.000000	1259.072897	0.000000	95.834980	0.000000	1.000000	0.000000
6	-.033884	0.000000	-.032705	0.000000	-.001179	0.000000	-.000025	0.000000
10	-.252705	0.000000	-.252703	0.000000	-.000002	0.000000	-.000187	0.000000
14	.097905	0.000000	.097835	0.000000	.000000	0.000000	.000072	0.000000
18	-.004081	0.000000	-.004031	0.000000	-.000000	0.000000	-.000003	0.000000
22	-.000759	0.000000	-.000759	0.000000	-.000000	0.000000	-.000001	0.000000
26	.000013	0.000000	.000013	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	135.491	0.000	125.907	0.000	9.583	0.000	1.000000	0.000000
.200	270.982	0.000	251.815	0.000	19.167	0.000	1.000000	0.000000
.300	406.472	0.000	377.722	0.000	28.750	0.000	1.000000	0.000000
.400	541.963	0.000	503.629	0.000	38.334	0.000	.999999	0.000000
.500	677.452	0.000	629.535	0.000	47.917	0.000	.999998	0.000000
.600	812.940	0.000	755.439	0.000	57.501	0.000	.999994	0.000000
.700	948.421	0.000	881.336	0.000	67.084	0.000	.999984	0.000000
.800	1083.887	0.000	1007.219	0.000	76.668	0.000	.999963	0.000000
.900	1219.323	0.000	1133.073	0.000	86.251	0.000	.999923	0.000000
1.000	1354.714	0.000	1258.830	0.000	95.884	0.000	.999857	0.000000
1.100	1490.060	0.000	1384.543	0.000	105.417	0.000	.999773	0.000000
1.200	1625.423	0.000	1510.424	0.000	114.999	0.000	.999713	0.000000
1.300	1761.005	0.000	1636.424	0.000	124.581	0.000	.999787	0.000000
1.400	1897.155	0.000	1762.992	0.000	134.163	0.000	1.000150	0.000000
1.500	2033.942	0.000	1890.198	0.000	143.743	0.000	1.000777	0.000000
1.600	2169.076	0.000	2015.752	0.000	153.323	0.000	1.000564	0.000000
1.700	2290.943	0.000	2128.041	0.000	162.902	0.000	.994616	0.000000


X(IN)
DELTA TUNE (EMX=17.0MUIN EMY=17.0MUIN)
DELTA TUNE (EMX=00.0MUIN EMY=00.0MUIN)
DTX
-.10
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