

***PRELIMINARY SPECIFICATION FOR  
ERI CARINA™ CIRCULARLY POLARIZED  
COAXIAL SLOTTED ARRAY ANTENNA***

*Prepared For  
WTPM-LD  
Channel 45  
PR  
August 21, 2012*

**ANTENNA TYPE:  
ALP8L3-CSW-45**

**SPECIFICATION NO:**



## **PRELIMINARY SPECIFICATION FOR ERI CARINA™ CIRCULARLY POLARIZED COAXIAL SLOTTED ARRAY ANTENNA**

### **ELECTRICAL CHARACTERISTICS:**

CHANNEL:	DTV:	45
FREQUENCY RANGE:	DTV:	656.00 - 662.00 MHz
AZIMUTH PATTERN NUMBER:	Hor Pol:	ALP-W
	Ver Pol:	ALP-W
ELEVATION PATTERN NUMBER:	Hor Pol:	ALP8L3
	Ver Pol:	ALP8L3
AZIMUTH DIRECTIVITY:	Hor Pol:	1.56 (1.93 dB)
	Ver Pol:	1.56 (1.93 dB)
ELEVATION DIRECTIVITY:	Hor Pol:	9.05 (9.57 dBd)
	Ver Pol:	9.05 (9.57 dBd)
ELEVATION GAIN:	Hor Pol:	4.53 (6.56 dBd)
	Ver Pol:	4.53 (6.56 dBd)
PEAK POWER GAIN:	Hor Pol:	7.06 (8.49 dBd)
	Ver Pol:	7.06 (8.49 dBd)
GAIN AT HORIZONTAL:	Hor Pol:	6.67 (8.24 dBd)
	Ver Pol:	6.67 (8.24 dBd)
GAIN RATIO: VER POL/HOR POL		1.00
ELECTRICAL BEAM TILT:		-0.75 Degrees
INPUT POWER REQUIRED:		0.255 kW Average Power, 8VSB Digital
MAXIMUM INPUT POWER:		2.00 kW Average Power
INPUT TYPE:		1-5/8" EIA
ANTENNA VSWR (MAXIMUM):	DTV:	1.10 Over 6 MHz of Channel

*Preliminary, subject to final design and review.*

## PRELIMINARY SPECIFICATION FOR ERI CARINA™ CIRCULARLY POLARIZED COAXIAL SLOTTED ARRAY ANTENNA

### MECHANICAL CHARACTERISTICS:

#### MOUNTING CONFIGURATION:

\*(Tower Interface supplied and  
installed by others.)

Side Mount

HEIGHT OF ANTENNA:

17.8 feet

HEIGHT OF CENTER OF  
RADIATION:

8.9 feet

OVERALL HEIGHT (A):

17.8 feet

DEICING:

Unpressurized Slot Cover Radome Enclosure

RADOME DIAMETER (C):

CONTACT ERI

RADOME COLOR:

WHITE

CLIMBING DEVICE:

NOT APPLICABLE

CALCULATED WEIGHT<sup>1</sup>:

CONTACT ERI

ANTENNA AREA<sup>3</sup>:

FRONT AREA:

$C_A A_C$ : 16.8 square feet

$A_C$ : 14.0 square feet

SIDE AREA:

$C_A A_C$ : 9.2 square feet

$A_C$ : 7.7 square feet

***This antenna is designed to be supported by a structure that can resist the antenna base reactions and which provides a support that is rigid in the three transitional and three rotational degrees of freedom.***

<sup>1</sup> Calculated weight is based on the PRELIMINARY design of the antenna. The actual weight of the antenna will be within  $\pm 10\%$  of the calculated weight. The actual weight will be given in the technical manual that accompanies the antenna.

<sup>3</sup> Antenna Area is calculated per EIA/TIA-RS222-F.

**Note: Localized conditions may require higher wind speed specifications than TIA/EIA specifications. Check with local authorities to verify wind speed requirements.**

Preliminary, subject to final design and review.

## Broadcast Antenna System Power Analysis

**WTPM-LD Channel 45**  
**PR**  
**ALP8L3-CSW-45**

### ANTENNA PARAMETERS

#### Azimuth Directivity:

Hor. Pol: 1.56 (1.93 dBd)

Ver. Pol: 1.56 (1.93 dBd)

#### Elevation Directivity:

Hor. Pol: 9.05 (9.57 dBd)

Ver. Pol: 9.05 (9.57 dBd)

### TRANSMISSION LINE:

#### VERTICAL RUN:

Type: HJ7-50A

Length, ft: 150 ft.

Attenuation, dB/100 ft: 0.555 dB/100 ft.

#### HORIZONTAL RUN:

Type: HJ7-50A

Length, ft: 50 ft.

Attenuation, dB/100 ft: 0.555 dB/100 ft.

Line Efficiency: 77.45 %

#### ERP:

Hor. Pol: 1.80 kW (2.55 dBk)

Ver. Pol: 1.80 kW (2.55 dBk)

#### POWER GAIN:

Hor. Pol: 7.06 (8.49 dBd)

Ver. Pol: 7.06 (8.49 dBd)

#### ANTENNA INPUT:

kW: 0.25

dBk: -5.94

#### LINE LOSS:

kW: 0.07

dB: 1.11

#### TRANSMITTER POWER:

kW: 0.33

dBk: -4.83

Preliminary, subject to final design and review.

**AZIMUTH PATTERN**

Type: ALP-W

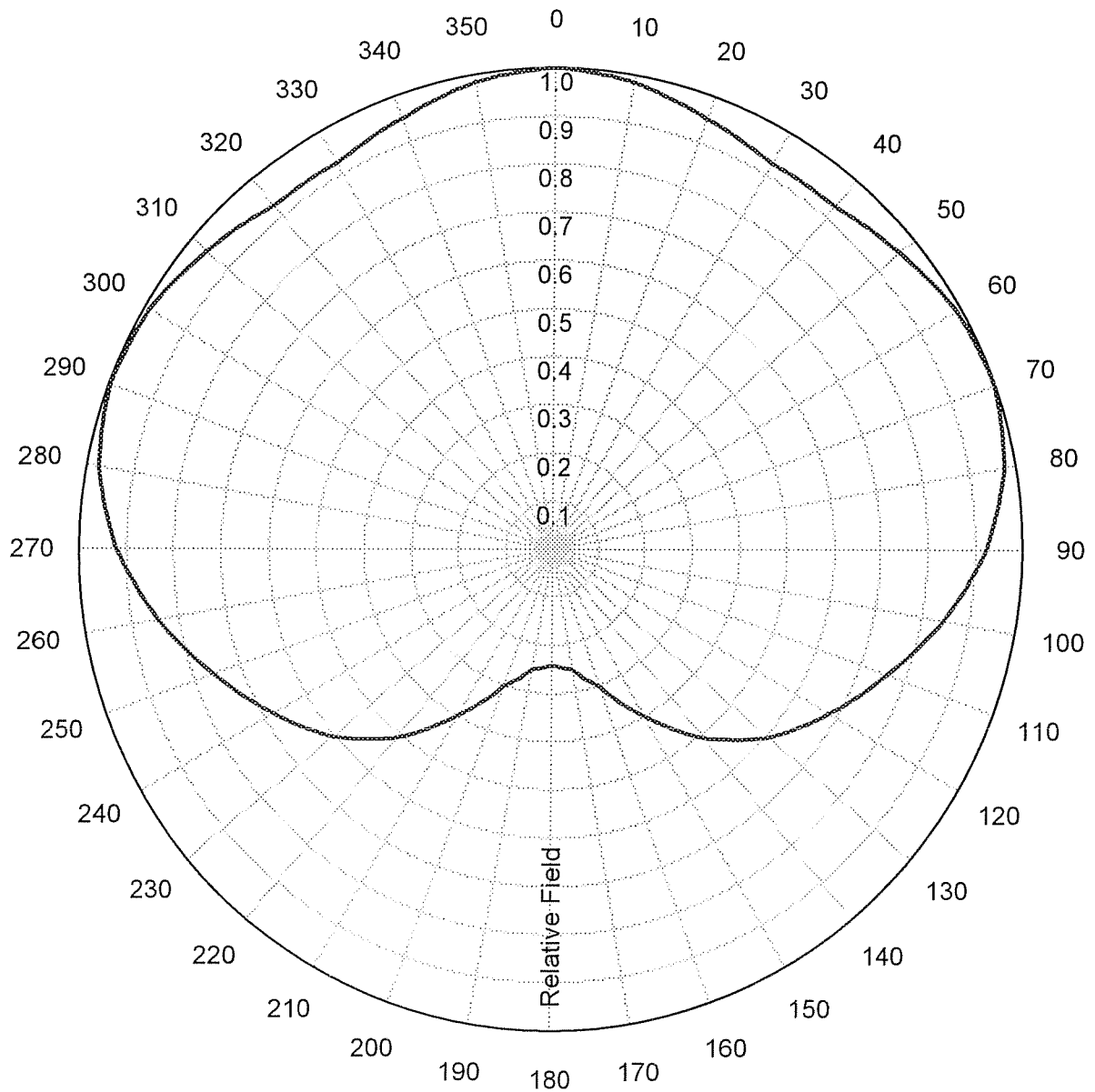
	Numeric	dBd
Directivity:	1.56	1.93
Peak(s) at:		

Channel: 45

Location: PR

Polarization: Horizontal

Note: Pattern shape and directivity may vary with channel and mouting configuration.



Preliminary, subject to final design and review.

# TABULATED DATA FOR AZIMUTH PATTERN

Type: ALP-W

Polarization Horizontal

ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB
0	1.000	0.00	92	0.907	-0.85	184	0.246	-12.18	276	0.954	-0.41
2	0.997	-0.03	94	0.891	-1.00	186	0.248	-12.11	278	0.964	-0.32
4	0.994	-0.05	96	0.876	-1.15	188	0.251	-12.01	280	0.975	-0.22
6	0.991	-0.08	98	0.860	-1.31	190	0.253	-11.94	282	0.979	-0.18
8	0.988	-0.10	100	0.845	-1.46	192	0.263	-11.60	284	0.984	-0.14
10	0.985	-0.13	102	0.828	-1.64	194	0.273	-11.28	286	0.988	-0.10
12	0.978	-0.19	104	0.810	-1.83	196	0.282	-11.00	288	0.993	-0.06
14	0.971	-0.26	106	0.793	-2.01	198	0.292	-10.69	290	0.997	-0.03
16	0.965	-0.31	108	0.775	-2.21	200	0.302	-10.40	292	0.996	-0.03
18	0.958	-0.37	110	0.758	-2.41	202	0.321	-9.87	294	0.994	-0.05
20	0.951	-0.44	112	0.742	-2.59	204	0.340	-9.37	296	0.993	-0.06
22	0.946	-0.48	114	0.727	-2.77	206	0.359	-8.90	298	0.991	-0.08
24	0.941	-0.53	116	0.711	-2.96	208	0.378	-8.45	300	0.990	-0.09
26	0.935	-0.58	118	0.696	-3.15	210	0.397	-8.02	302	0.984	-0.14
28	0.930	-0.63	120	0.680	-3.35	212	0.420	-7.54	304	0.978	-0.19
30	0.925	-0.68	122	0.665	-3.54	214	0.442	-7.09	306	0.971	-0.26
32	0.926	-0.67	124	0.650	-3.74	216	0.465	-6.65	308	0.965	-0.31
34	0.927	-0.66	126	0.635	-3.94	218	0.487	-6.25	310	0.959	-0.36
36	0.927	-0.66	128	0.620	-4.15	220	0.510	-5.85	312	0.953	-0.42
38	0.928	-0.65	130	0.605	-4.36	222	0.529	-5.53	314	0.947	-0.47
40	0.929	-0.64	132	0.586	-4.64	224	0.548	-5.22	316	0.941	-0.53
42	0.935	-0.58	134	0.567	-4.93	226	0.567	-4.93	318	0.935	-0.58
44	0.941	-0.53	136	0.548	-5.22	228	0.586	-4.64	320	0.929	-0.64
46	0.947	-0.47	138	0.529	-5.53	230	0.605	-4.36	322	0.928	-0.65
48	0.953	-0.42	140	0.510	-5.85	232	0.620	-4.15	324	0.927	-0.66
50	0.959	-0.36	142	0.487	-6.25	234	0.635	-3.94	326	0.927	-0.66
52	0.965	-0.31	144	0.465	-6.65	236	0.650	-3.74	328	0.926	-0.67
54	0.971	-0.26	146	0.442	-7.09	238	0.665	-3.54	330	0.925	-0.68
56	0.978	-0.19	148	0.420	-7.54	240	0.680	-3.35	332	0.930	-0.63
58	0.984	-0.14	150	0.397	-8.02	242	0.696	-3.15	334	0.935	-0.58
60	0.990	-0.09	152	0.378	-8.45	244	0.711	-2.96	336	0.941	-0.53
62	0.991	-0.08	154	0.359	-8.90	246	0.727	-2.77	338	0.946	-0.48
64	0.993	-0.06	156	0.340	-9.37	248	0.742	-2.59	340	0.951	-0.44
66	0.994	-0.05	158	0.321	-9.87	250	0.758	-2.41	342	0.958	-0.37
68	0.996	-0.03	160	0.302	-10.40	252	0.775	-2.21	344	0.965	-0.31
70	0.997	-0.03	162	0.292	-10.69	254	0.793	-2.01	346	0.971	-0.26
72	0.993	-0.06	164	0.282	-11.00	256	0.810	-1.83	348	0.978	-0.19
74	0.988	-0.10	166	0.273	-11.28	258	0.828	-1.64	350	0.985	-0.13
76	0.984	-0.14	168	0.263	-11.60	260	0.845	-1.46	352	0.988	-0.10
78	0.979	-0.18	170	0.253	-11.94	262	0.860	-1.31	354	0.991	-0.08
80	0.975	-0.22	172	0.251	-12.01	264	0.876	-1.15	356	0.994	-0.05
82	0.964	-0.32	174	0.248	-12.11	266	0.891	-1.00	358	0.997	-0.03
84	0.954	-0.41	176	0.246	-12.18	268	0.907	-0.85	360	1.000	0.00
86	0.943	-0.51	178	0.243	-12.29	270	0.922	-0.71			
88	0.933	-0.60	180	0.241	-12.36	272	0.933	-0.60			
90	0.922	-0.71	182	0.243	-12.29	274	0.943	-0.51			

Preliminary, subject to final design and review.

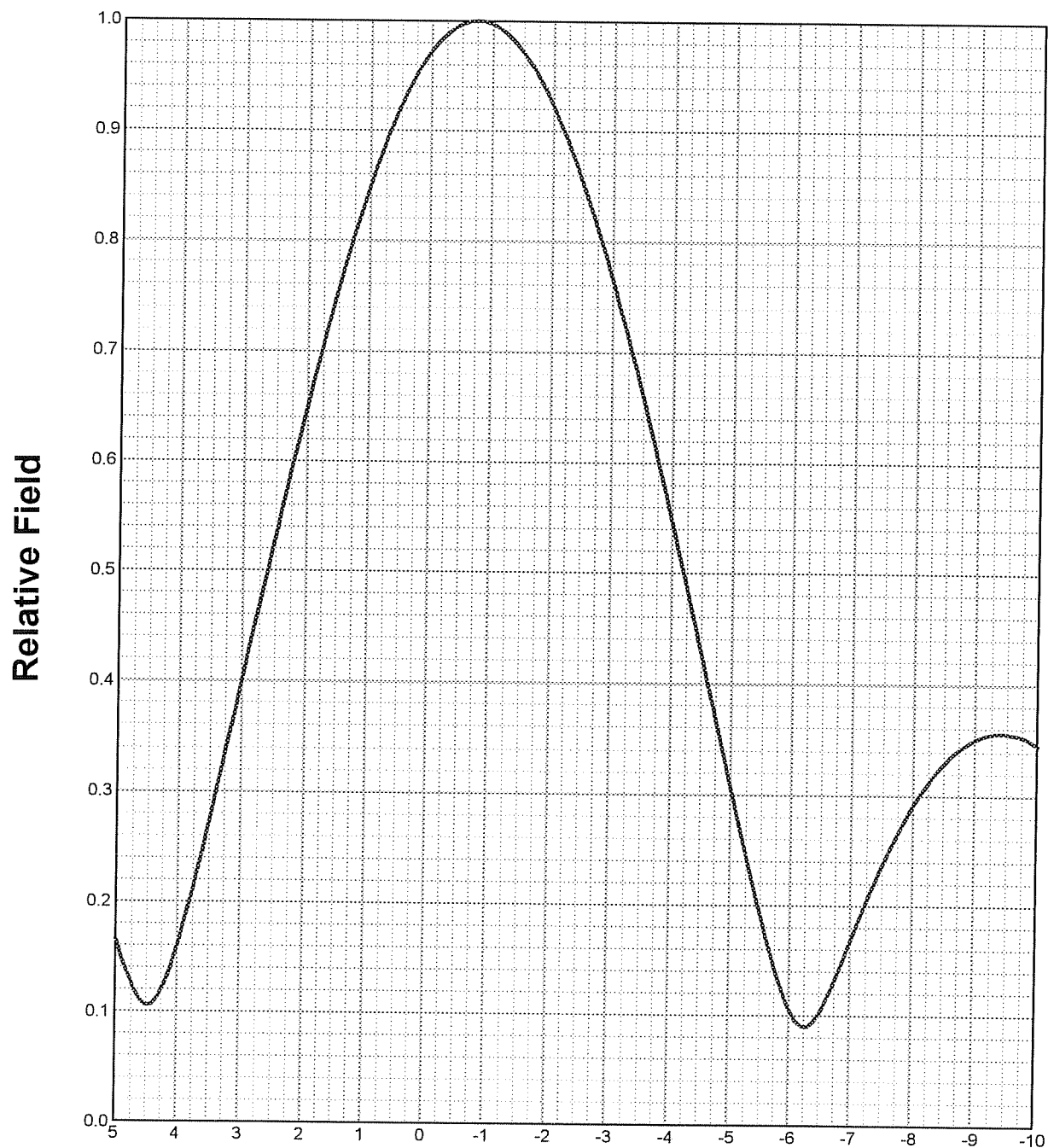
## TABULATED DATA FOR AZIMUTH PATTERN FCC FILING FORMAT

Type: ALP-W

Polarization: Horizontal

ANGLE	FIELD	ERP (kW)	ERP (dBk)
0	1.000	1.799	2.550
10	0.985	1.745	2.418
20	0.951	1.627	2.113
30	0.925	1.539	1.872
40	0.929	1.552	1.910
50	0.959	1.654	2.186
60	0.990	1.763	2.462
70	0.997	1.788	2.523
80	0.975	1.710	2.330
90	0.922	1.529	1.844
100	0.845	1.284	1.087
110	0.758	1.033	0.143
120	0.680	0.832	-0.800
130	0.605	0.658	-1.815
140	0.510	0.468	-3.299
150	0.397	0.283	-5.475
160	0.302	0.164	-7.850
170	0.253	0.115	-9.388
180	0.241	0.104	-9.810
190	0.253	0.115	-9.388
200	0.302	0.164	-7.850
210	0.397	0.283	-5.475
220	0.510	0.468	-3.299
230	0.605	0.658	-1.815
240	0.680	0.832	-0.800
250	0.758	1.033	0.143
260	0.845	1.284	1.087
270	0.922	1.529	1.844
280	0.975	1.710	2.330
290	0.997	1.788	2.523
300	0.990	1.763	2.462
310	0.959	1.654	2.186
320	0.929	1.552	1.910
330	0.925	1.539	1.872
340	0.951	1.627	2.113
350	0.985	1.745	2.418

Preliminary, subject to final design and review.

**ELEVATION PATTERN****Type:****ALP8L3****Directivity:****Numeric****dBd****Main Lobe:****9.05****9.57****Horizontal:****8.55****9.32****Channel:****45****Location:****PR****Beam Tilt:****-0.75****Polarization:****Horizontal***Preliminary, subject to final design and review.*



# TABULATED DATA FOR ELEVATION PATTERN

Type: ALP8L3

Polarization: Horizontal

ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB
5.00	0.166	-15.60	-6.75	0.133	-17.52	-27.00	0.053	-25.51	-50.50	0.056	-25.04	-74.00	0.207	-13.68
4.75	0.128	-17.89	-7.00	0.168	-15.49	-27.50	0.034	-29.37	-51.00	0.068	-23.35	-74.50	0.199	-14.02
4.50	0.106	-19.49	-7.25	0.203	-13.85	-28.00	0.018	-34.89	-51.50	0.079	-22.05	-75.00	0.191	-14.38
4.25	0.119	-18.45	-7.50	0.236	-12.54	-28.50	0.008	-41.94	-52.00	0.089	-21.01	-75.50	0.183	-14.75
4.00	0.159	-15.97	-7.75	0.265	-11.55	-29.00	0.006	-44.44	-52.50	0.096	-20.35	-76.00	0.175	-15.14
3.75	0.214	-13.41	-8.00	0.291	-10.72	-29.50	0.004	-47.96	-53.00	0.101	-19.91	-76.50	0.166	-15.60
3.50	0.274	-11.24	-8.25	0.312	-10.12	-30.00	0.000	-40.00	-53.50	0.104	-19.66	-77.00	0.158	-16.03
3.25	0.337	-9.45	-8.50	0.329	-9.66	-30.50	0.009	-40.92	-54.00	0.104	-19.66	-77.50	0.150	-16.48
3.00	0.401	-7.94	-8.75	0.342	-9.32	-31.00	0.021	-33.56	-54.50	0.101	-19.91	-78.00	0.141	-17.02
2.75	0.466	-6.64	-9.00	0.351	-9.09	-31.50	0.037	-28.64	-55.00	0.097	-20.26	-78.50	0.133	-17.52
2.50	0.528	-5.55	-9.25	0.355	-8.98	-32.00	0.054	-25.35	-55.50	0.090	-20.92	-79.00	0.125	-18.06
2.25	0.590	-4.58	-9.50	0.356	-8.97	-32.50	0.074	-22.62	-56.00	0.081	-21.83	-79.50	0.118	-18.56
2.00	0.649	-3.76	-9.75	0.353	-9.04	-33.00	0.093	-20.63	-56.50	0.070	-23.10	-80.00	0.110	-19.17
1.75	0.705	-3.04	-10.00	0.346	-9.22	-33.50	0.112	-19.02	-57.00	0.058	-24.73	-80.50	0.103	-19.74
1.50	0.757	-2.42	-10.50	0.323	-9.82	-34.00	0.129	-17.79	-57.50	0.046	-26.74	-81.00	0.096	-20.35
1.25	0.806	-1.87	-11.00	0.289	-10.78	-34.50	0.144	-16.83	-58.00	0.035	-29.12	-81.50	0.089	-21.01
1.00	0.850	-1.41	-11.50	0.247	-12.15	-35.00	0.156	-16.14	-58.50	0.029	-30.75	-82.00	0.082	-21.72
0.75	0.889	-1.03	-12.00	0.201	-13.94	-35.50	0.165	-15.65	-59.00	0.034	-29.37	-82.50	0.075	-22.50
0.50	0.922	-0.71	-12.50	0.153	-16.31	-36.00	0.169	-15.44	-59.50	0.046	-26.74	-83.00	0.069	-23.22
0.25	0.950	-0.45	-13.00	0.107	-19.41	-36.50	0.170	-15.39	-60.00	0.062	-24.15	-83.50	0.063	-24.01
0.00	0.972	-0.25	-13.50	0.064	-23.88	-37.00	0.166	-15.60	-60.50	0.080	-21.94	-84.00	0.057	-24.88
-0.25	0.988	-0.11	-14.00	0.028	-31.06	-37.50	0.159	-15.97	-61.00	0.098	-20.18	-84.50	0.052	-25.68
-0.50	0.997	-0.03	-14.50	0.001	-60.00	-38.00	0.148	-16.59	-61.50	0.116	-18.71	-85.00	0.046	-26.74
-0.75	1.000	0.00	-15.00	0.021	-33.56	-38.50	0.134	-17.46	-62.00	0.133	-17.52	-85.50	0.041	-27.74
-1.00	0.997	-0.03	-15.50	0.032	-29.90	-39.00	0.117	-18.64	-62.50	0.150	-16.48	-86.00	0.036	-28.87
-1.25	0.988	-0.11	-16.00	0.033	-29.63	-39.50	0.098	-20.18	-63.00	0.166	-15.60	-86.50	0.031	-30.17
-1.50	0.972	-0.25	-16.50	0.027	-31.37	-40.00	0.079	-22.05	-63.50	0.180	-14.89	-87.00	0.027	-31.37
-1.75	0.951	-0.44	-17.00	0.020	-33.98	-40.50	0.059	-24.58	-64.00	0.194	-14.24	-87.50	0.022	-33.15
-2.00	0.924	-0.69	-17.50	0.027	-31.37	-41.00	0.040	-27.96	-64.50	0.206	-13.72	-88.00	0.017	-35.39
-2.25	0.891	-1.00	-18.00	0.051	-25.85	-41.50	0.025	-32.04	-65.00	0.217	-13.27	-88.50	0.013	-37.72
-2.50	0.853	-1.38	-18.50	0.081	-21.83	-42.00	0.021	-33.56	-65.50	0.227	-12.88	-89.00	0.009	-40.92
-2.75	0.811	-1.82	-19.00	0.112	-19.02	-42.50	0.029	-30.75	-66.00	0.235	-12.58	-89.50	0.004	-47.96
-3.00	0.765	-2.33	-19.50	0.143	-16.89	-43.00	0.041	-27.74	-66.50	0.242	-12.32	-90.00	0.000	-40.00
-3.25	0.714	-2.92	-20.00	0.172	-15.29	-43.50	0.051	-25.85	-67.00	0.247	-12.15			
-3.50	0.661	-3.60	-20.50	0.197	-14.11	-44.00	0.058	-24.73	-67.50	0.251	-12.01			
-3.75	0.605	-4.37	-21.00	0.217	-13.27	-44.50	0.063	-24.01	-68.00	0.254	-11.90			
-4.00	0.547	-5.24	-21.50	0.231	-12.73	-45.00	0.064	-23.88	-68.50	0.255	-11.87			
-4.25	0.487	-6.25	-22.00	0.238	-12.47	-45.50	0.063	-24.01	-69.00	0.255	-11.87			
-4.50	0.427	-7.39	-22.50	0.238	-12.47	-46.00	0.058	-24.73	-69.50	0.254	-11.90			
-4.75	0.366	-8.73	-23.00	0.232	-12.69	-46.50	0.051	-25.85	-70.00	0.252	-11.97			
-5.00	0.306	-10.29	-23.50	0.220	-13.15	-47.00	0.042	-27.54	-70.50	0.249	-12.08			
-5.25	0.248	-12.11	-24.00	0.202	-13.89	-47.50	0.030	-30.46	-71.00	0.245	-12.22			
-5.50	0.193	-14.29	-24.50	0.180	-14.89	-48.00	0.017	-35.39	-71.50	0.240	-12.40			
-5.75	0.144	-16.83	-25.00	0.155	-16.19	-48.50	0.003	-50.46	-72.00	0.235	-12.58			
-6.00	0.106	-19.49	-25.50	0.129	-17.79	-49.00	0.012	-38.42	-72.50	0.228	-12.84			
-6.25	0.090	-20.87	-26.00	0.102	-19.83	-49.50	0.027	-31.37	-73.00	0.222	-13.07			
-6.50	0.103	-19.74	-26.50	0.077	-22.27	-50.00	0.042	-27.54	-73.50	0.215	-13.35			

Preliminary, subject to final design and review.