

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

*Prepared For  
WPXS*

*Mount Vernon, IL  
June 14, 2006*

***ANTENNA TYPE:***  
***ALP24M3-HSBR-21***

***SPECIFICATION NO:***



***Electronics Research, Inc.  
7777 Gardner Road  
Chandler, Indiana U.S.A 47610***

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

## ***ELECTRICAL CHARACTERISTICS:***

<i>CHANNEL:</i>	<i>21</i>
<i>FREQUENCY RANGE:</i>	<i>512.00 - 518.00 MHz</i>
<i>AZIMUTH PATTERN NUMBER:</i>	<i>Hor Pol: ALP-BR</i>
<i>ELEVATION PATTERN NUMBER:</i>	<i>Hor Pol: ALP24M3</i>
<i>AZIMUTH DIRECTIVITY:</i>	<i>Hor Pol: 2.75 (4.39 dB)</i>
<i>ELEVATION DIRECTIVITY:</i>	<i>Hor Pol: 25.21 (14.02 dBd)</i>
<i>PEAK POWER GAIN:</i>	<i>Hor Pol: 69.33 (18.41 dBd)</i>
<i>GAIN AT HORIZONTAL:</i>	<i>Hor Pol: 36.54 (15.63 dBd)</i>
<i>ELECTRICAL BEAM TILT:</i>	<i>-0.75 Degrees</i>
<i>INPUT POWER REQUIRED:</i>	<i>15.78 kW Average Power, 8VSB Digital</i>
<i>MAXIMUM INPUT POWER:</i>	<i>20.00 kW Average Power</i>
<i>INPUT TYPE:</i>	<i>3-1/8" EIA</i>
<i>ANTENNA VSWR (MAXIMUM):</i>	<i>DTV: 1.10 Over 6 MHz of Channel</i>



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

## MECHANICAL CHARACTERISTICS:

MOUNTING CONFIGURATION:

Side Mount

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

HEIGHT OF ANTENNA:

60.8 feet

HEIGHT OF CENTER OF  
RADIATION:

30.4 feet

OVERALL HEIGHT (A):

60.8 feet

DEICING:

Unpressurized Slot Cover Radome Enclosure

RADOME DIAMETER (C):

CONTACT ERI

RADOME COLOR:

GRAY

CLIMBING DEVICE:

NOT APPLICABLE

CALCULATED WEIGHT<sup>1</sup>:

368 lbs.

ANTENNA AREA<sup>3</sup>:

FRONT AREA:

C<sub>A</sub>A<sub>C</sub>: 70.3 square feet

A<sub>C</sub>: 58.6 square feet

SIDE AREA:

C<sub>A</sub>A<sub>C</sub>: 41.4 square feet

A<sub>C</sub>: 34.5 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.**



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# Broadcast Antenna System

## Power Analysis

Type: ALP24L3-HSBR-21



### Transmission Line:

Type:

MACX650

6-1/8" 50 ohm MACXLine® Rigid Line

Vert. Length: 295 ft.

Horz. Length: 50 ft.

Attenuation:

0.112 dB/100 ft.

Efficiency: 91.45 %

### ERP: Hor Pol:

kW: 1000.00

dBk: 30.00

### Power Gain:

Ratio: 69.33

dBd: 18.41

### Antenna Input:

kW: 14.42

dBk: 11.59

### Line Loss:

kW: 1.36

dB: 0.39

### Transmitter Power

kW: 15.78

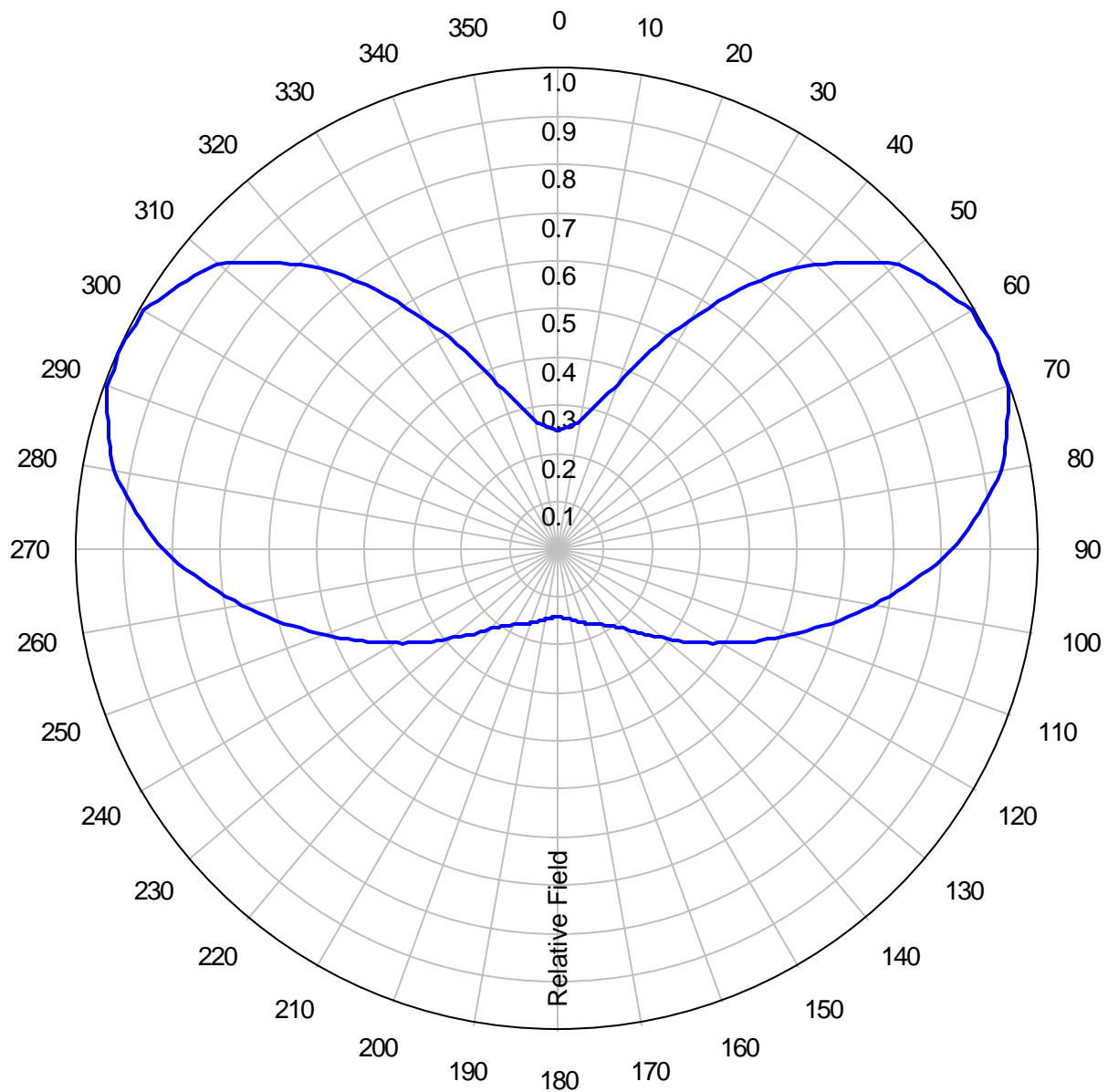
dBk: 11.98



## AZIMUTH PATTERN

Type: ALP-BR

	Numeric	dBd
Directivity:	<u>2.75</u>	<u>4.39</u>
Peak(s) at:		
Polarization:	<u>Horizontal</u>	
Channel:	<u>21</u>	
Location:	<u>Mount Vernon, IL</u>	
Note:		



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## AZIMUTH TABULATED DATA

Type: ALP-BR

Polarization: Horizontal

Angle	Field	dB	Angle	Field	dB	Angle	Field	dB	Angle	Field	dB
0	0.246	-12.18	92	0.787	-2.08	184	0.141	-17.02	276	0.889	-1.02
2	0.251	-12.01	94	0.756	-2.43	186	0.142	-16.95	278	0.912	-0.80
4	0.255	-11.87	96	0.726	-2.78	188	0.144	-16.83	280	0.936	-0.57
6	0.260	-11.70	98	0.695	-3.16	190	0.146	-16.71	282	0.948	-0.46
8	0.264	-11.57	100	0.664	-3.56	192	0.149	-16.54	284	0.959	-0.36
10	0.269	-11.40	102	0.634	-3.96	194	0.152	-16.36	286	0.971	-0.26
12	0.288	-10.81	104	0.604	-4.38	196	0.155	-16.19	288	0.982	-0.16
14	0.307	-10.26	106	0.573	-4.84	198	0.158	-16.03	290	0.994	-0.05
16	0.326	-9.74	108	0.543	-5.30	200	0.161	-15.86	292	0.994	-0.05
18	0.345	-9.24	110	0.513	-5.80	202	0.164	-15.70	294	1.000	0.00
20	0.364	-8.78	112	0.488	-6.23	204	0.167	-15.55	296	1.000	0.00
22	0.401	-7.94	114	0.462	-6.71	206	0.171	-15.34	298	0.992	-0.07
24	0.438	-7.17	116	0.437	-7.19	208	0.174	-15.19	300	0.992	-0.07
26	0.475	-6.47	118	0.411	-7.72	210	0.177	-15.04	302	0.978	-0.19
28	0.512	-5.81	120	0.386	-8.27	212	0.184	-14.70	304	0.964	-0.32
30	0.549	-5.21	122	0.365	-8.75	214	0.191	-14.38	306	0.951	-0.44
32	0.592	-4.55	124	0.344	-9.27	216	0.197	-14.11	308	0.937	-0.57
34	0.635	-3.94	126	0.324	-9.79	218	0.204	-13.81	310	0.923	-0.70
36	0.679	-3.36	128	0.303	-10.37	220	0.211	-13.51	312	0.891	-1.00
38	0.722	-2.83	130	0.282	-11.00	222	0.225	-12.96	314	0.860	-1.31
40	0.765	-2.33	132	0.268	-11.44	224	0.239	-12.43	316	0.828	-1.64
42	0.797	-1.97	134	0.254	-11.90	226	0.254	-11.90	318	0.797	-1.97
44	0.828	-1.64	136	0.239	-12.43	228	0.268	-11.44	320	0.765	-2.33
46	0.860	-1.31	138	0.225	-12.96	230	0.282	-11.00	322	0.722	-2.83
48	0.891	-1.00	140	0.211	-13.51	232	0.303	-10.37	324	0.679	-3.36
50	0.923	-0.70	142	0.204	-13.81	234	0.324	-9.79	326	0.635	-3.94
52	0.937	-0.57	144	0.197	-14.11	236	0.344	-9.27	328	0.592	-4.55
54	0.951	-0.44	146	0.191	-14.38	238	0.365	-8.75	330	0.549	-5.21
56	0.964	-0.32	148	0.184	-14.70	240	0.386	-8.27	332	0.512	-5.81
58	0.978	-0.19	150	0.177	-15.04	242	0.411	-7.72	334	0.475	-6.47
60	0.992	-0.07	152	0.174	-15.19	244	0.437	-7.19	336	0.438	-7.17
62	0.992	-0.07	154	0.171	-15.34	246	0.462	-6.71	338	0.401	-7.94
64	1.000	0.00	156	0.167	-15.55	248	0.488	-6.23	340	0.364	-8.78
66	1.000	0.00	158	0.164	-15.70	250	0.513	-5.80	342	0.345	-9.24
68	0.994	-0.05	160	0.161	-15.86	252	0.543	-5.30	344	0.326	-9.74
70	0.994	-0.05	162	0.158	-16.03	254	0.573	-4.84	346	0.307	-10.26
72	0.982	-0.16	164	0.155	-16.19	256	0.604	-4.38	348	0.288	-10.81
74	0.971	-0.26	166	0.152	-16.36	258	0.634	-3.96	350	0.269	-11.40
76	0.959	-0.36	168	0.149	-16.54	260	0.664	-3.56	352	0.264	-11.57
78	0.948	-0.46	170	0.146	-16.71	262	0.695	-3.16	354	0.260	-11.70
80	0.936	-0.57	172	0.144	-16.83	264	0.726	-2.78	356	0.255	-11.87
82	0.912	-0.80	174	0.142	-16.95	266	0.756	-2.43	358	0.251	-12.01
84	0.889	-1.02	176	0.141	-17.02	268	0.787	-2.08	360	0.246	-12.18
86	0.865	-1.26	178	0.139	-17.14	270	0.818	-1.74			
88	0.842	-1.49	180	0.137	-17.27	272	0.842	-1.49			
90	0.818	-1.74	182	0.139	-17.14	274	0.865	-1.26			





**AZIMUTH PATTERN  
FCC FILING FORMAT**

Type: ALP-BR

Polarization: Horizontal

<i>Angle</i>	<i>Field</i>	<i>ERP (kW)</i>	<i>ERP (dBk)</i>
0	0.246	60.516	17.819
10	0.269	72.361	18.595
20	0.364	132.496	21.222
30	0.549	301.401	24.791
40	0.765	585.225	27.673
50	0.923	851.929	29.304
60	0.992	984.064	29.930
70	0.994	988.036	29.948
80	0.936	876.096	29.426
90	0.818	669.124	28.255
100	0.664	440.896	26.443
110	0.513	263.169	24.202
120	0.386	148.996	21.732
130	0.282	79.524	19.005
140	0.211	44.521	16.486
150	0.177	31.329	14.959
160	0.161	25.921	14.137
170	0.146	21.316	13.287
180	0.137	18.769	12.734
190	0.146	21.316	13.287
200	0.161	25.921	14.137
210	0.177	31.329	14.959
220	0.211	44.521	16.486
230	0.282	79.524	19.005
240	0.386	148.996	21.732
250	0.513	263.169	24.202
260	0.664	440.896	26.443
270	0.818	669.124	28.255
280	0.936	876.096	29.426
290	0.994	988.036	29.948
300	0.992	984.064	29.930
310	0.923	851.929	29.304
320	0.765	585.225	27.673
330	0.549	301.401	24.791
340	0.364	132.496	21.222
350	0.269	72.361	18.595

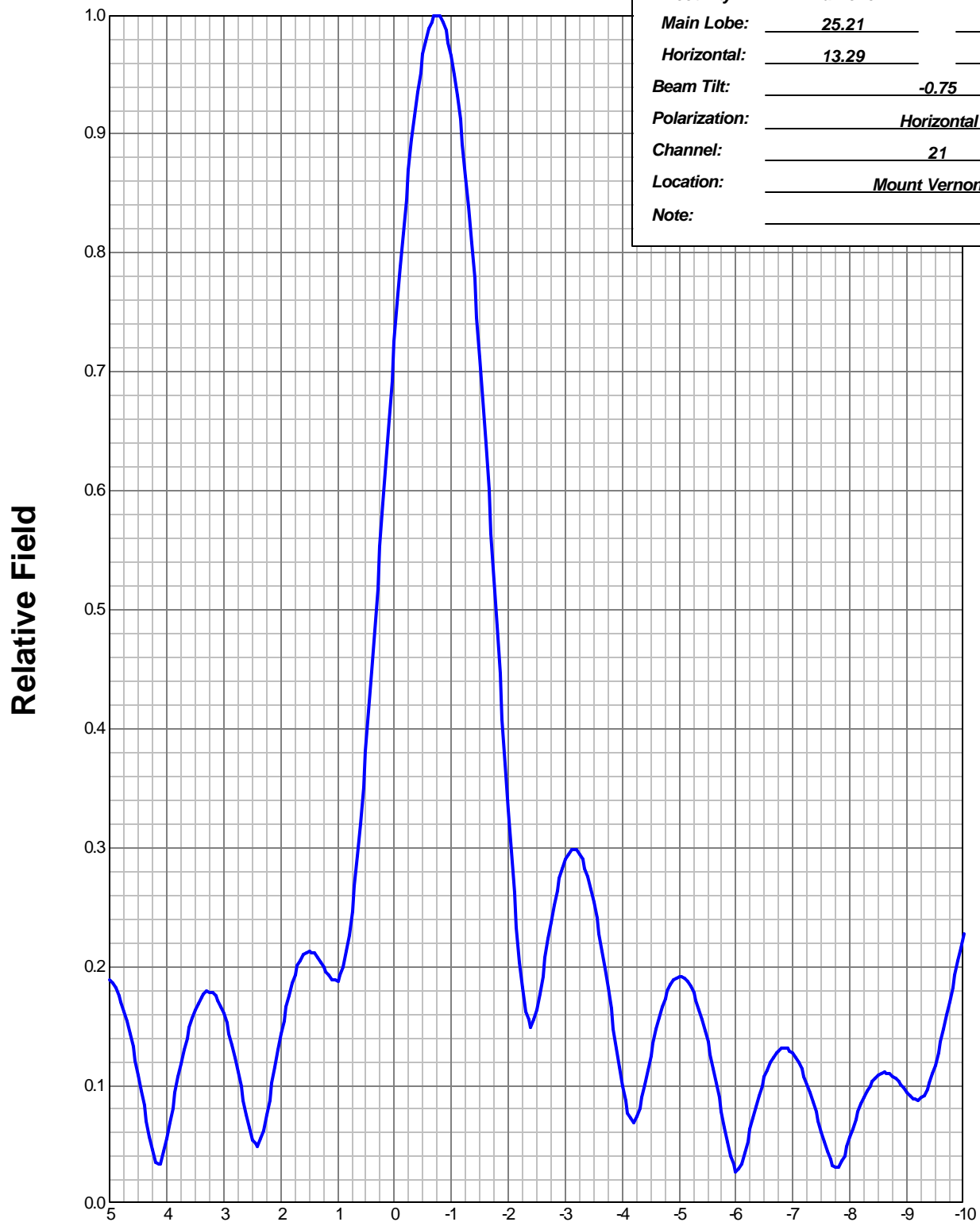


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## ELEVATION PATTERN

Type:	ALP24L3	
Directivity:	Numeric	dBd
Main Lobe:	25.21	14.02
Horizontal:	13.29	11.23
Beam Tilt:	-0.75	
Polarization:	Horizontal	
Channel:	21	
Location:	Mount Vernon, IL	
Note:		



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## ELEVATION TABULATED DATA

Type: ALP24L3

Polarization: Horizontal

Angle	Field	dB	Angle	Field	dB	Angle	Field	dB	Angle	Field	dB
5.00	0.189	-14.47	-6.50	0.107	-19.41	-42.00	0.012	-38.42	-88.00	0.004	-47.96
4.75	0.162	-15.81	-6.75	0.129	-17.79	-43.00	0.032	-29.90	-89.00	0.002	-53.98
4.50	0.109	-19.25	-7.00	0.127	-17.92	-44.00	0.029	-30.75	-90.00	0.000	-40.00
4.25	0.045	-26.84	-7.25	0.101	-19.91	-45.00	0.068	-23.35			
4.00	0.055	-25.19	-7.50	0.061	-24.29	-46.00	0.074	-22.62			
3.75	0.118	-18.53	-7.75	0.032	-30.03	-47.00	0.040	-27.96			
3.50	0.164	-15.70	-8.00	0.056	-25.04	-48.00	0.006	-44.44			
3.25	0.178	-14.97	-8.25	0.090	-20.87	-49.00	0.003	-50.46			
3.00	0.161	-15.86	-8.50	0.109	-19.25	-50.00	0.013	-37.72			
2.75	0.112	-19.02	-8.75	0.108	-19.33	-51.00	0.010	-40.00			
2.50	0.054	-25.35	-9.00	0.094	-20.54	-52.00	0.016	-35.92			
2.25	0.075	-22.50	-9.25	0.089	-20.96	-53.00	0.029	-30.75			
2.00	0.143	-16.89	-9.50	0.117	-18.64	-54.00	0.015	-36.48			
1.75	0.194	-14.27	-9.75	0.170	-15.37	-55.00	0.020	-33.98			
1.50	0.213	-13.43	-10.00	0.227	-12.88	-56.00	0.038	-28.40			
1.25	0.200	-13.98	-11.00	0.294	-10.63	-57.00	0.022	-33.15			
1.00	0.188	-14.52	-12.00	0.106	-19.49	-58.00	0.024	-32.40			
0.75	0.246	-12.16	-13.00	0.029	-30.75	-59.00	0.051	-25.85			
0.50	0.381	-8.38	-14.00	0.008	-41.94	-60.00	0.049	-26.20			
0.25	0.553	-5.14	-15.00	0.007	-43.10	-61.00	0.079	-22.05			
0.00	0.726	-2.78	-16.00	0.013	-37.72	-62.00	0.166	-15.60			
-0.25	0.870	-1.21	-17.00	0.026	-31.70	-63.00	0.245	-12.22			
-0.50	0.968	-0.28	-18.00	0.015	-36.48	-64.00	0.278	-11.12			
-0.75	1.000	0.00	-19.00	0.046	-26.74	-65.00	0.251	-12.01			
-1.00	0.966	-0.30	-20.00	0.063	-24.01	-66.00	0.181	-14.85			
-1.25	0.865	-1.26	-21.00	0.212	-13.47	-67.00	0.094	-20.54			
-1.50	0.712	-2.95	-22.00	0.223	-13.03	-68.00	0.041	-27.74			
-1.75	0.525	-5.60	-23.00	0.065	-23.74	-69.00	0.065	-23.74			
-2.00	0.332	-9.58	-24.00	0.066	-23.61	-70.00	0.081	-21.83			
-2.25	0.182	-14.77	-25.00	0.026	-31.70	-71.00	0.072	-22.85			
-2.50	0.163	-15.76	-26.00	0.034	-29.37	-72.00	0.048	-26.38			
-2.75	0.237	-12.49	-27.00	0.013	-37.72	-73.00	0.022	-33.15			
-3.00	0.290	-10.75	-28.00	0.014	-37.08	-74.00	0.021	-33.56			
-3.25	0.294	-10.63	-29.00	0.004	-47.96	-75.00	0.035	-29.12			
-3.50	0.254	-11.90	-30.00	0.000	-40.00	-76.00	0.042	-27.54			
-3.75	0.181	-14.82	-31.00	0.007	-43.10	-77.00	0.041	-27.74			
-4.00	0.100	-20.00	-32.00	0.049	-26.20	-78.00	0.035	-29.12			
-4.25	0.074	-22.62	-33.00	0.106	-19.49	-79.00	0.026	-31.70			
-4.50	0.125	-18.06	-34.00	0.088	-21.11	-80.00	0.017	-35.39			
-4.75	0.173	-15.24	-35.00	0.024	-32.40	-81.00	0.009	-40.92			
-5.00	0.192	-14.33	-36.00	0.056	-25.04	-82.00	0.004	-47.96			
-5.25	0.178	-14.99	-37.00	0.019	-34.42	-83.00	0.005	-46.02			
-5.50	0.137	-17.27	-38.00	0.042	-27.54	-84.00	0.007	-43.10			
-5.75	0.077	-22.21	-39.00	0.027	-31.37	-85.00	0.008	-41.94			
-6.00	0.027	-31.37	-40.00	0.024	-32.40	-86.00	0.007	-43.10			
-6.25	0.063	-24.01	-41.00	0.031	-30.17	-87.00	0.006	-44.44			



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