Preliminary TRASAR Specifications and Pattern Data

PRELIMINARY SPECIFICATION FOR TRASAR® HORIZONTALLY POLARIZED COAXIAL SLOTTED ARRAY ANTENNA

Prepared for
WTCI-TV, RF Channel 29, Chattanooga, TN
June 19, 2014

ANTENNA TYPE:
ATW18H6-HTO-29H

SPECIFICATION NO :
20140605-818

PRELIMINARY SPECIFICATION FOR TRASAR® HORIZONTALLY POLARIZED COAXIAL SLOTTED ARRAY ANTENNA

ELECTRICAL CHARACTERISTICS:

CHANNEL :	DTV:	29
FREQUENCY RANGE :	DTV:	560 - 566 MHz
AZIMUTH PATTERN NUMBER :		CH29AZH
ELEVATION PATTERN NUMBER :		CH29ELH
AZIMUTH DIRECTIVITY :		1.00 (0.00 dBd)
ELEVATION DIRECTIVITY :		18.00 (12.55 dBd)
PEAK POWER GAIN :		18.00 (12.55 dBd)
GAIN AT HORIZONTAL :		7.44 (8.72 dBd)
ELECTRICAL BEAM TILT :		1.50 Degrees
INPUT POWER REQUIRED :		11.11 kW (10.46 dBk)
INPUT TYPE :		6-1/8" EIA 75 OHM
INPUT POWER (MAXIMUM) :		25 kW Average, 8VSB Digital
ANTENNA VSWR (MAXIMUM) :	DTV:	1.10 Over 6MHz Channel

PRELIMINARY SPECIFICATION FOR TRASAR® HORIZONTALLY POLARIZED COAXIAL SLOTTED ARRAY ANTENNA

MECHANICAL CHARACTERISTICS:

MOUNTING CONFIGURATION:	Top Mount	
HEIGHT OF ANTENNA (D):	35.60 feet	10.85 meters
HEIGHT OF CENTER OF RADIATION (B) :	17.80 feet	5.43 meters
OVERALL HEIGHT (A) :	39.10 feet	11.92 meters
(Includes four 3.5-foot Lightning Spurs)		
DEICING :	Pressurized Fully Enclosed Radome	
RADOME DIAMETER (C):	12.40 inches OD	302.56 mm OD
RADOME COLOR :	Aviation Orange	
CLIMBING DEVICE :	Galvanized Steel Climbing Pole	
CALCULATED WEIGHT[1] :	3650.0 lbs	1655.60 kg

MOUNTING FLANGE BOLT CIRCLE[2]: Qty.(16) 1.38 inch Holes for 1.25 inch Bolts on a 21.50 B.C.

WINDLOAD DATA[3](EIA-222-C):	SHEAR:	No Ice	1758.0 lbs	797.41 kg
		1/2" Ice	2177.0 lbs	987.47 kg
	OVERTURNING MOMENT:	No Ice	36183.0 lbs-ft	49057.64 N-m
		1/2" Ice	46302.0 lbs-ft	62777.18 N-m
WINDLOAD DATA[4](ANSI/TIA-222-G):	EPA:	No Ice	59.92 sq.ft.	5.57 sq.m.
	EPA:	1/2" Ice	72.53 sq.ft.	6.74 sq.m.
	EFFECTIVE MOMENT ARM:	No Ice	19.89 feet	6.06 meters
		1/2" Ice	20.52 feet	6.25 meters

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 translational and three rotational degrees of freedom.

1 Please note, the listed weights and effective wind areas are based on the PRELIMINARY design of the antenna. Final As-Built values for the antenna are typically within +/-10% of the Preliminary design values, and will be provided in the technical manual that accompanies the antenna. Specified loads include the antenna, beacon and lightning spurs only. Custom mounting brackets/adapters and/or antenna input section are NOT included.

2 The mounting flange specified is the standard ERI mounting flange used for this antenna configuration. In those instances where an existing top mounted antenna is being replaced the antenna supplied will be designed with a mounting flange to match that of the existing antenna unless electrical and /or mechanical requirements for the new antenna preclude the matching flange. Customer responsible for supplying verified flange requirements for the flange configuration being matched.

3 Loads calculated in accordance with the EIA-222-C standard.

4 Loads calculated in accordance with the ANSI/TIA-222-G standard.

NOTE: The purchaser or their representative shall be required to contact the tower owner, state and/or local building officials for specific design requirements and suitable parameters for a particular structure. Any variation from the parameters shown above must be communicated to ERI for comprehensive assessment.

Broadcast Antenna System

Power Analysis

WTCI-TV **Channel 29**
Chattanooga, TN
ATW18H6-HTO-29H



ANTENNA PARAMETERS :

Azimuth Directivity :
Hor. Pol : 1.00
dBd : 0.00

Elevation Directivity :
Hor. Pol : 18.00
dBd : 12.55

ERP :
kW : 200.00
dBk : 23.01

POWER GAIN :
Ratio : 18.00
dBd : 12.55

TRANSMISSION LINE :

VERTICAL RUN :
Type: 6-1/8-inch 75 OHM MACXLine
Length, ft: 425
Length, m: 129.54
Attenuation , dB/100 ft: 0.108
Attenuation , dB/100 m: 0.354

HORIZONTAL RUN :
Type: 6-1/8-inch 75 OHM MACXLine
Length, ft: 60
Length, m: 18.288
Attenuation , dB/100 ft: 0.108
Attenuation , dB/100 m: 0.354

ANTENNA INPUT :
kW : 11.11
dBk : 10.46

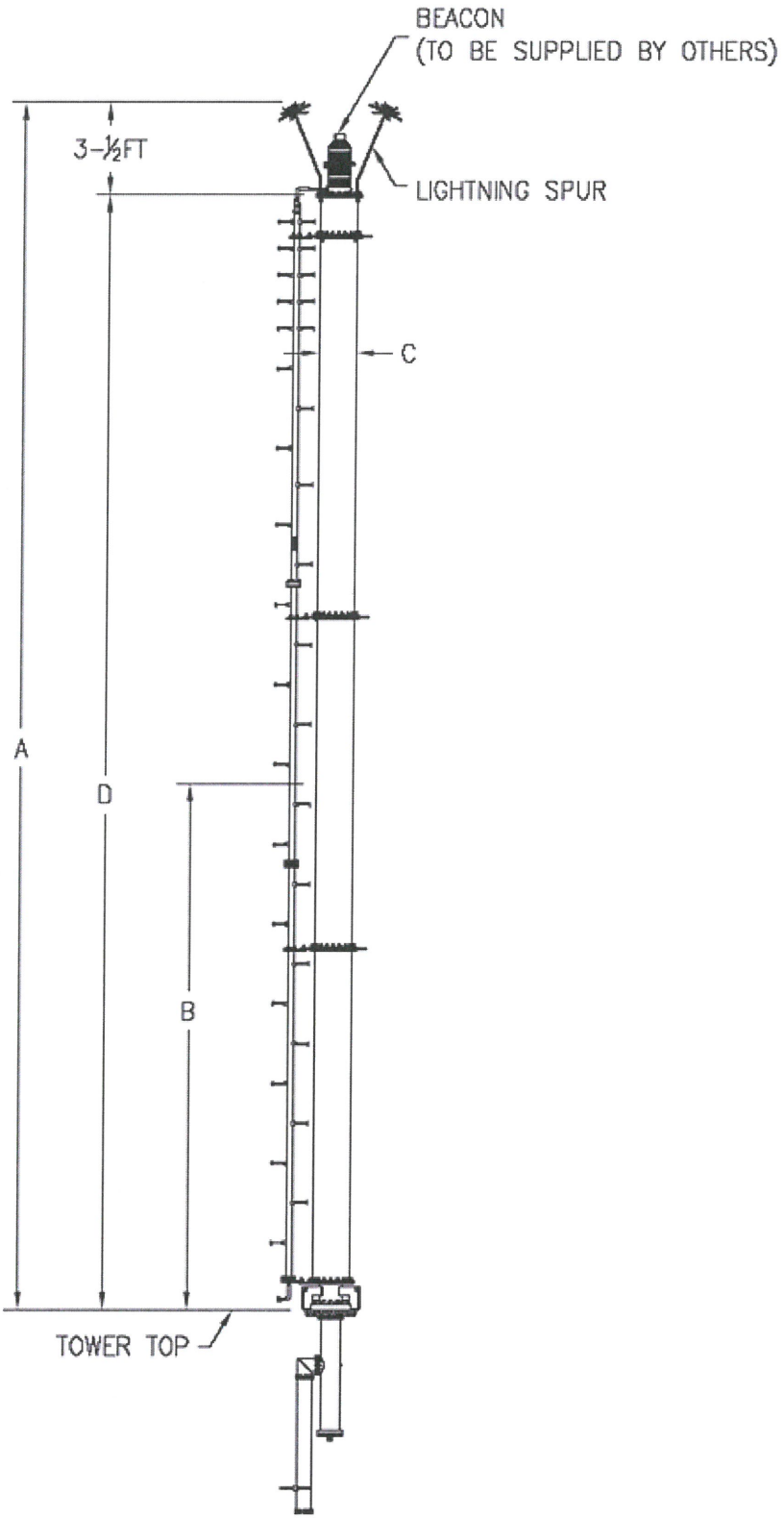
LINE LOSS :
kW : 1.42
dB : 0.52

Line Efficiency : 88.64%

TRANSMITTER POWER :
kW : 12.53
dBk : 10.98

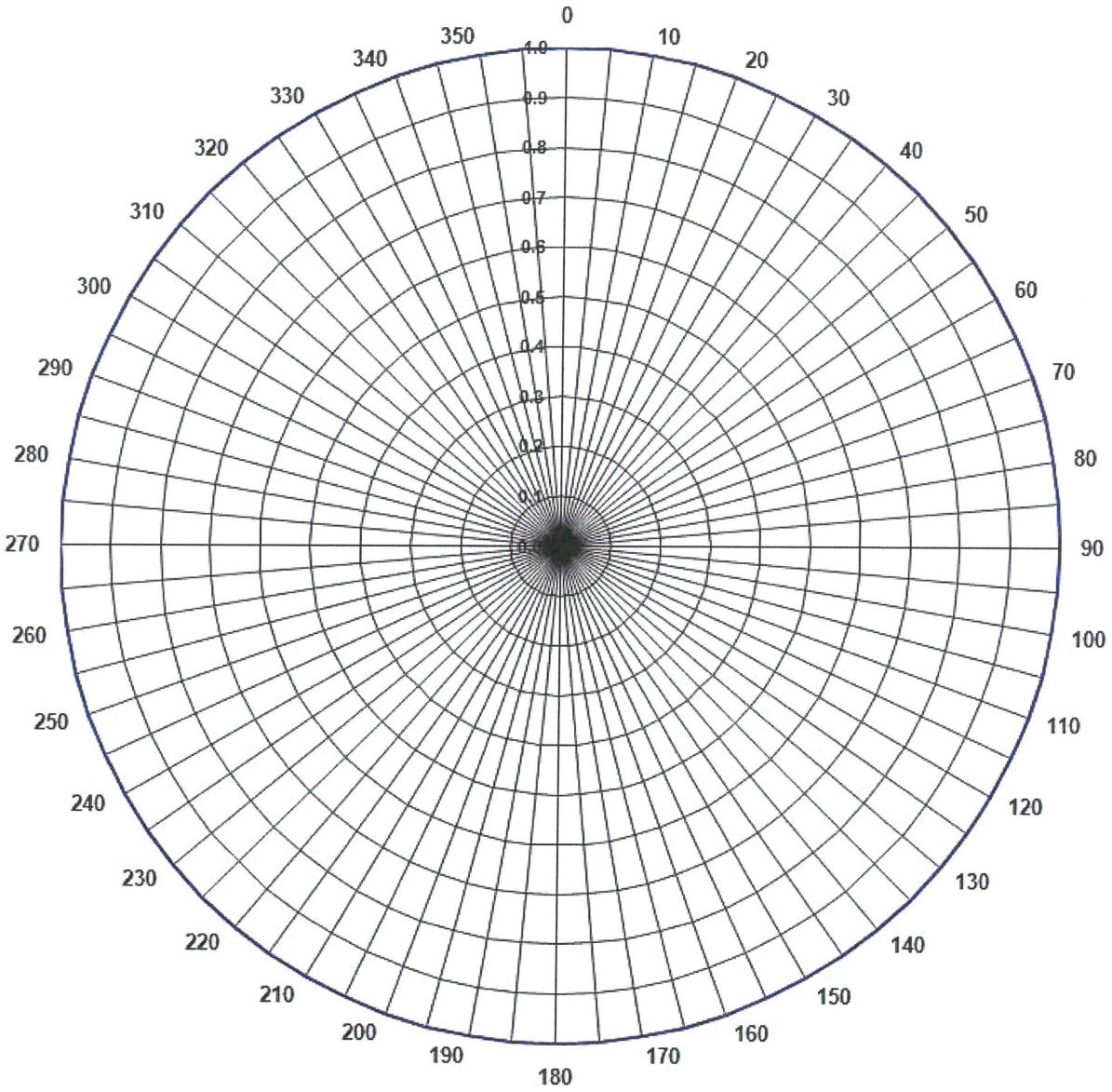
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TYPICAL MOUNTING CONFIGURATION SHOWN. ACTUAL CONFIGURATION MAY VARY.



TYPE:	*CH29AZH*		*Frequency:*	*29 (DTV)*
	Numeric	*dB*	*Location:*	*Chattanooga, TN*
Directivity:	*1.00*	*0.00*	*Polarization:*	*Horizontal*
Peak(s) at:				

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

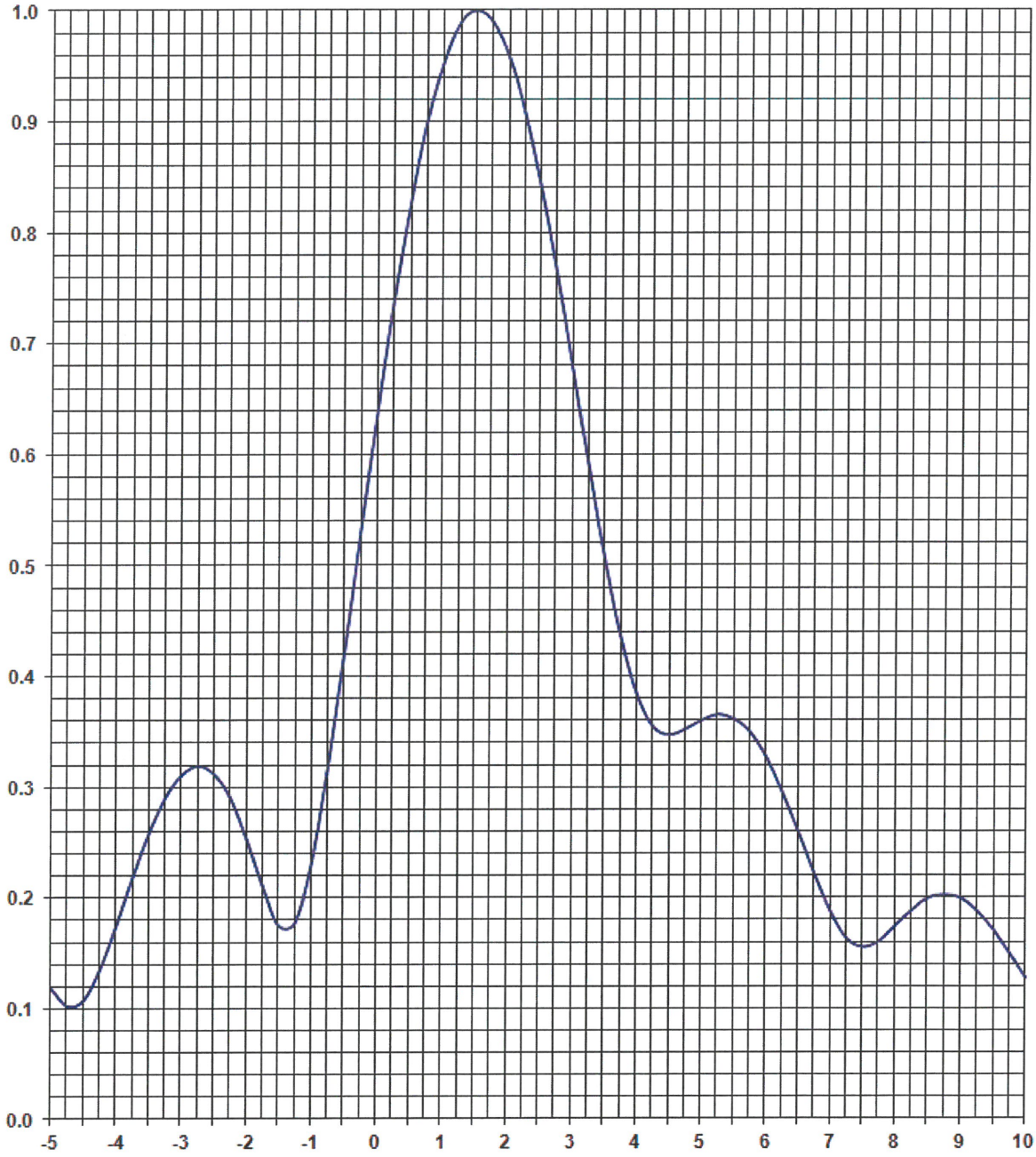


TABULATED DATA FOR AZIMUTH PATTERN

TYPE: CH29AZH

ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB
0	1.000	0.00	92	1.000	0.00	184	1.000	0.00	276	1.000	0.00
2	1.000	0.00	94	1.000	0.00	186	1.000	0.00	278	1.000	0.00
4	1.000	0.00	96	1.000	0.00	188	1.000	0.00	280	1.000	0.00
6	1.000	0.00	98	1.000	0.00	190	1.000	0.00	282	1.000	0.00
8	1.000	0.00	100	1.000	0.00	192	1.000	0.00	284	1.000	0.00
10	1.000	0.00	102	1.000	0.00	194	1.000	0.00	286	1.000	0.00
12	1.000	0.00	104	1.000	0.00	196	1.000	0.00	288	1.000	0.00
14	1.000	0.00	106	1.000	0.00	198	1.000	0.00	290	1.000	0.00
16	1.000	0.00	108	1.000	0.00	200	1.000	0.00	292	1.000	0.00
18	1.000	0.00	110	1.000	0.00	202	1.000	0.00	294	1.000	0.00
20	1.000	0.00	112	1.000	0.00	204	1.000	0.00	296	1.000	0.00
22	1.000	0.00	114	1.000	0.00	206	1.000	0.00	298	1.000	0.00
24	1.000	0.00	116	1.000	0.00	208	1.000	0.00	300	1.000	0.00
26	1.000	0.00	118	1.000	0.00	210	1.000	0.00	302	1.000	0.00
28	1.000	0.00	120	1.000	0.00	212	1.000	0.00	304	1.000	0.00
30	1.000	0.00	122	1.000	0.00	214	1.000	0.00	306	1.000	0.00
32	1.000	0.00	124	1.000	0.00	216	1.000	0.00	308	1.000	0.00
34	1.000	0.00	126	1.000	0.00	218	1.000	0.00	310	1.000	0.00
36	1.000	0.00	128	1.000	0.00	220	1.000	0.00	312	1.000	0.00
38	1.000	0.00	130	1.000	0.00	222	1.000	0.00	314	1.000	0.00
40	1.000	0.00	132	1.000	0.00	224	1.000	0.00	316	1.000	0.00
42	1.000	0.00	134	1.000	0.00	226	1.000	0.00	318	1.000	0.00
44	1.000	0.00	136	1.000	0.00	228	1.000	0.00	320	1.000	0.00
46	1.000	0.00	138	1.000	0.00	230	1.000	0.00	322	1.000	0.00
48	1.000	0.00	140	1.000	0.00	232	1.000	0.00	324	1.000	0.00
50	1.000	0.00	142	1.000	0.00	234	1.000	0.00	326	1.000	0.00
52	1.000	0.00	144	1.000	0.00	236	1.000	0.00	328	1.000	0.00
54	1.000	0.00	146	1.000	0.00	238	1.000	0.00	330	1.000	0.00
56	1.000	0.00	148	1.000	0.00	240	1.000	0.00	332	1.000	0.00
58	1.000	0.00	150	1.000	0.00	242	1.000	0.00	334	1.000	0.00
60	1.000	0.00	152	1.000	0.00	244	1.000	0.00	336	1.000	0.00
62	1.000	0.00	154	1.000	0.00	246	1.000	0.00	338	1.000	0.00
64	1.000	0.00	156	1.000	0.00	248	1.000	0.00	340	1.000	0.00
66	1.000	0.00	158	1.000	0.00	250	1.000	0.00	342	1.000	0.00
68	1.000	0.00	160	1.000	0.00	252	1.000	0.00	344	1.000	0.00
70	1.000	0.00	162	1.000	0.00	254	1.000	0.00	346	1.000	0.00
72	1.000	0.00	164	1.000	0.00	256	1.000	0.00	348	1.000	0.00
74	1.000	0.00	166	1.000	0.00	258	1.000	0.00	350	1.000	0.00
76	1.000	0.00	168	1.000	0.00	260	1.000	0.00	352	1.000	0.00
78	1.000	0.00	170	1.000	0.00	262	1.000	0.00	354	1.000	0.00
80	1.000	0.00	172	1.000	0.00	264	1.000	0.00	356	1.000	0.00
82	1.000	0.00	174	1.000	0.00	266	1.000	0.00	358	1.000	0.00
84	1.000	0.00	176	1.000	0.00	268	1.000	0.00	360	1.000	0.00
86	1.000	0.00	178	1.000	0.00	270	1.000	0.00			
88	1.000	0.00	180	1.000	0.00	272	1.000	0.00			
90	1.000	0.00	182	1.000	0.00	274	1.000	0.00			

TYPE:	CH29ELH		Frequency:	29 (DTV)
Directivity:	Numeric	dBd	Location:	Chattanooga, TN
Main Lobe:	18.00	12.55	Beam Tilt:	1.50
Horizontal:	7.44	8.72	Polarization:	Horizontal



TABULATED DATA FOR ELEVATION PATTERN

CH29ELH — *-5 to 10 degrees in 0.25 increments* — *10 to 90 degrees in 0.50 increments*

ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB
-5.00	0.118	-18.53	6.75	0.221	-13.11	27.00	0.040	-27.96	50.50	0.030	-30.46	74.00	0.071	-22.98
-4.75	0.102	-19.83	7.00	0.187	-14.56	27.50	0.052	-25.68	51.00	0.040	-27.96	74.50	0.066	-23.68
-4.50	0.107	-19.37	7.25	0.163	-15.76	28.00	0.063	-24.08	51.50	0.050	-26.02	75.00	0.059	-24.51
-4.25	0.135	-17.39	7.50	0.155	-16.19	28.50	0.064	-23.88	52.00	0.057	-24.96	75.50	0.052	-25.60
-4.00	0.175	-15.11	7.75	0.160	-15.92	29.00	0.057	-24.88	52.50	0.058	-24.73	76.00	0.045	-26.84
-3.75	0.219	-13.19	8.00	0.174	-15.19	29.50	0.044	-27.03	53.00	0.056	-25.11	76.50	0.037	-28.52
-3.50	0.259	-11.75	8.25	0.188	-14.52	30.00	0.035	-29.24	53.50	0.049	-26.29	77.00	0.030	-30.46
-3.25	0.291	-10.72	8.50	0.199	-14.05	30.50	0.037	-28.64	54.00	0.039	-28.18	77.50	0.022	-32.96
-3.00	0.311	-10.13	8.75	0.202	-13.89	31.00	0.049	-26.20	54.50	0.029	-30.75	78.00	0.015	-36.19
-2.75	0.319	-9.92	9.00	0.199	-14.05	31.50	0.058	-24.73	55.00	0.024	-32.40	78.50	0.009	-40.45
-2.50	0.311	-10.15	9.25	0.187	-14.56	32.00	0.060	-24.44	55.50	0.029	-30.60	79.00	0.007	-43.10
-2.25	0.289	-10.78	9.50	0.170	-15.39	32.50	0.054	-25.35	56.00	0.040	-27.96	79.50	0.010	-40.00
-2.00	0.252	-11.97	9.75	0.149	-16.54	33.00	0.042	-27.43	56.50	0.050	-26.02	80.00	0.014	-36.77
-1.75	0.209	-13.60	10.00	0.127	-17.92	33.50	0.033	-29.76	57.00	0.058	-24.81	80.50	0.018	-34.66
-1.50	0.174	-15.16	10.50	0.098	-20.18	34.00	0.033	-29.63	57.50	0.061	-24.29	81.00	0.022	-32.96
-1.25	0.177	-15.04	11.00	0.108	-19.29	34.50	0.044	-27.13	58.00	0.061	-24.29	81.50	0.026	-31.54
-1.00	0.232	-12.67	11.50	0.132	-17.59	35.00	0.053	-25.43	58.50	0.058	-24.81	82.00	0.029	-30.75
-0.75	0.321	-9.87	12.00	0.141	-17.02	35.50	0.058	-24.73	59.00	0.050	-26.02	82.50	0.031	-30.17
-0.50	0.426	-7.40	12.50	0.129	-17.82	36.00	0.054	-25.27	59.50	0.040	-27.96	83.00	0.033	-29.63
-0.25	0.536	-5.42	13.00	0.100	-20.00	36.50	0.045	-26.94	60.00	0.030	-30.46	83.50	0.034	-29.37
0.00	0.643	-3.83	13.50	0.074	-22.56	37.00	0.034	-29.37	60.50	0.022	-32.96	84.00	0.034	-29.37
0.25	0.744	-2.57	14.00	0.076	-22.38	37.50	0.029	-30.75	61.00	0.025	-32.22	84.50	0.034	-29.37
0.50	0.831	-1.61	14.50	0.096	-20.36	38.00	0.036	-28.87	61.50	0.034	-29.50	85.00	0.033	-29.63
0.75	0.904	-0.88	15.00	0.110	-19.21	38.50	0.047	-26.56	62.00	0.044	-27.13	85.50	0.032	-30.03
1.00	0.956	-0.39	15.50	0.106	-19.49	39.00	0.054	-25.27	62.50	0.054	-25.35	86.00	0.030	-30.46
1.25	0.990	-0.09	16.00	0.087	-21.16	39.50	0.056	-25.04	63.00	0.062	-24.15	86.50	0.028	-31.06
1.50	1.000	0.00	16.50	0.065	-23.81	40.00	0.051	-25.85	63.50	0.067	-23.54	87.00	0.026	-31.87
1.75	0.989	-0.10	17.00	0.058	-24.81	40.50	0.041	-27.74	64.00	0.068	-23.35	87.50	0.022	-32.96
2.00	0.957	-0.38	17.50	0.072	-22.85	41.00	0.030	-30.31	64.50	0.067	-23.48	88.00	0.020	-34.20
2.25	0.906	-0.86	18.00	0.087	-21.21	41.50	0.028	-31.06	65.00	0.063	-24.08	88.50	0.017	-35.65
2.50	0.839	-1.52	18.50	0.090	-20.87	42.00	0.036	-28.87	65.50	0.056	-25.11	89.00	0.013	-38.06
2.75	0.761	-2.37	19.00	0.080	-21.94	42.50	0.046	-26.75	66.00	0.046	-26.75	89.50	0.009	-40.45
3.00	0.674	-3.42	19.50	0.061	-24.29	43.00	0.053	-25.43	66.50	0.036	-28.87	90.00	0.005	-45.19
3.25	0.587	-4.63	20.00	0.048	-26.47	43.50	0.056	-25.04	67.00	0.025	-32.04			
3.50	0.504	-5.94	20.50	0.054	-25.27	44.00	0.051	-25.76	67.50	0.018	-35.14			
3.75	0.434	-7.25	21.00	0.070	-23.10	44.50	0.043	-27.33	68.00	0.019	-34.43			
4.00	0.383	-8.34	21.50	0.079	-22.10	45.00	0.032	-29.90	68.50	0.028	-31.06			
4.25	0.354	-9.02	22.00	0.075	-22.44	45.50	0.026	-31.70	69.00	0.038	-28.40			
4.50	0.347	-9.19	22.50	0.062	-24.15	46.00	0.031	-30.17	69.50	0.049	-26.20			
4.75	0.352	-9.07	23.00	0.046	-26.75	46.50	0.041	-27.74	70.00	0.058	-24.73			
5.00	0.360	-8.87	23.50	0.042	-27.64	47.00	0.051	-25.93	70.50	0.066	-23.61			
5.25	0.365	-8.75	24.00	0.053	-25.43	47.50	0.056	-25.11	71.00	0.071	-22.91			
5.50	0.361	-8.84	24.50	0.066	-23.61	48.00	0.056	-25.11	71.50	0.076	-22.38			
5.75	0.349	-9.14	25.00	0.070	-23.10	48.50	0.050	-26.02	72.00	0.079	-22.10			
6.00	0.326	-9.74	25.50	0.064	-23.88	49.00	0.041	-27.74	72.50	0.079	-22.05			
6.25	0.295	-10.60	26.00	0.051	-25.93	49.50	0.031	-30.17	73.00	0.078	-22.16			
6.50	0.259	-11.75	26.50	0.038	-28.40	50.00	0.026	-31.87	73.50	0.075	-22.50			