

**Preliminary Specification for
TRASAR® Top Mounted
UHF Elliptically Polarized
Coaxial Slotted Array Television Antenna**

**WTXF, RF Channel 31
Fox Television Stations Inc., Philadelphia, PA
October 31, 2017**

**Antenna Model:
ATW16HS12-ETO-31H**

**Specification Number
20171030-157**

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**Preliminary Specification for
TRASAR® Top Mounted
UHF Elliptically Polarized
Coaxial Slotted Array Television Antenna**

Electrical Characteristics:

Channel:		31	
Frequency:		572 MHz to 578 MHz	
Service:		ATSC	
Azimuth Pattern Number:	Horizontal Polarization Vertical Polarization	ATW-O ATW-V1	
Elevation Pattern Number:	Horizontal Polarization Vertical Polarization	ATW16HS12H ATW13HS12V	
Azimuth Directivity:	Horizontal Polarization Vertical Polarization	1.00 1.00	(0.00 dB) (0.00 dB)
Elevation Directivity:	Horizontal Polarization Vertical Polarization	16.00 13.00	(12.04 dBd) (11.14 dBd)
Peak Power Gain:	Horizontal Polarization Vertical Polarization	12.24 3.06	(10.88 dBd) (4.86 dBd)
Gain at Horizontal:	Horizontal Polarization Vertical Polarization	0.89 0.71	-(0.53 dBd) -(1.47 dBd)
Vertical/Horizontal Ratio:		0.25	
Electrical Beam Tilt:		3.00 Degrees	
Input Power Required:		81.73 kW	(19.12 dBk)
RF Input:		8-3/16-inch EIA, 75 Ω , flanged male	
Input Power Rating (maximum):		94 kW Average Power, 8VSB	
Antenna VSWR (maximum):		1.10 Over 6 MHz Channel	

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UHF Elliptically Polarized
Coaxial Slotted Array Television Antenna**

Mechanical Characteristics:

Mounting Configuration:	Top Mounted		
Height of Antenna (D):	36.4 feet	(11.1 meters)	
Height of Center of Radiation (B):	18.2 feet	(5.6 meters)	
Overall Height (Includes four 3.5 ft lightning spurs) (A):	39.9 feet	(12.2 meters)	
Deicing:	Fully enclosed pressurized radome		
Radome Diameter (C):	18.40 inches	(467 millimeters)	
Radome Color:	Aviation Orange		
Climbing Device:	Fiberglass Ladder		
Calculated Weight ¹ :	No Ice	4460 lb	2023.0 kg
	0.5inch (13 mm) ice	5190 lb	2354.1 kg
Windload Data ³	EPA	No Ice	52.9 ft ² (4.9 m ²)
		0.5inch (13 mm) ice	94.5 ft ² (8.8 m ²)
Effective Moment Arm ³ :	EPA	No Ice	19.1 feet (5.82 meters)
		0.5inch (13 mm) ice	18.8 feet (5.73 meters)

MOUNTING FLANGE BOLT CIRCLE²: Quantity (16), 1.38 inch holes for 1.25 inch bolts, equally spaced on a 21.50 inch bolt circle.

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, lightning spurs, and beacon only. Custom mounting brackets/adapters and/or antenna input section are NOT included.

2) Preliminary antenna design based on a wind speed of 90 miles per hour (MPH) with no ice and 40 MPH with 0.75-inches of design radial ice (2.88-inches of factored ice at antenna, tiz) with a height above ground level (HAGL) of 1067 feet per ANSI/TIA-222-G. Structure Class II, Exposure Category C and Topographic Category I. Weight and wind area values include four lightning spurs and a standard beacon.

3) 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 bolt pattern unless electrical and/or mechanical requirements for the new antenna preclude the matching flange. Customer shall be responsible for supplying existing flange bolt pattern details when requesting a custom matching flange on the new antenna.

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

WTXF **RF Channel: 31**
Fox Television Stations Inc.
Philadelphia, PA
ATW16HS12-ETO-31H

Antenna Parameters

Azimuth Directivity:

Horizontal: 1.00 (0.00 dB)
 Vertical: 1.00 (0.00 dB)

Elevation Directivity:

Horizontal: 16.00 (12.04 dB)
 Vertical: 13.00 (11.14 dB)

Transmission Line

Vertical Run:

Type: 8-3/16-inch EIA, 75 Ω
 Length: 1,076 feet 328.0 meters
 Attenuation: 0.082 dB/100 feet 0.269 dB/100 mtrs

Horizontal Run:

Type: 8-3/16-inch EIA, 75 Ω
 Length: 100 feet 30.5 meters
 Attenuation: 0.082 dB/100 feet 0.269 dB/100 mtrs

Effective Radiated Power:

Horizontal: 1000.00 kW (30.00 dBk)
 Vertical: 250.00 kW (23.98 dBk)

Power Gain:

Horizontal: 12.24 numeric (10.88 dBd)
 Vertical: 3.06 numeric (4.86 dBd)

Antenna Input Power:

81.73 kW (19.12 dBk)

Transmission Line Losses:

-20.33 kW (0.965 dB)

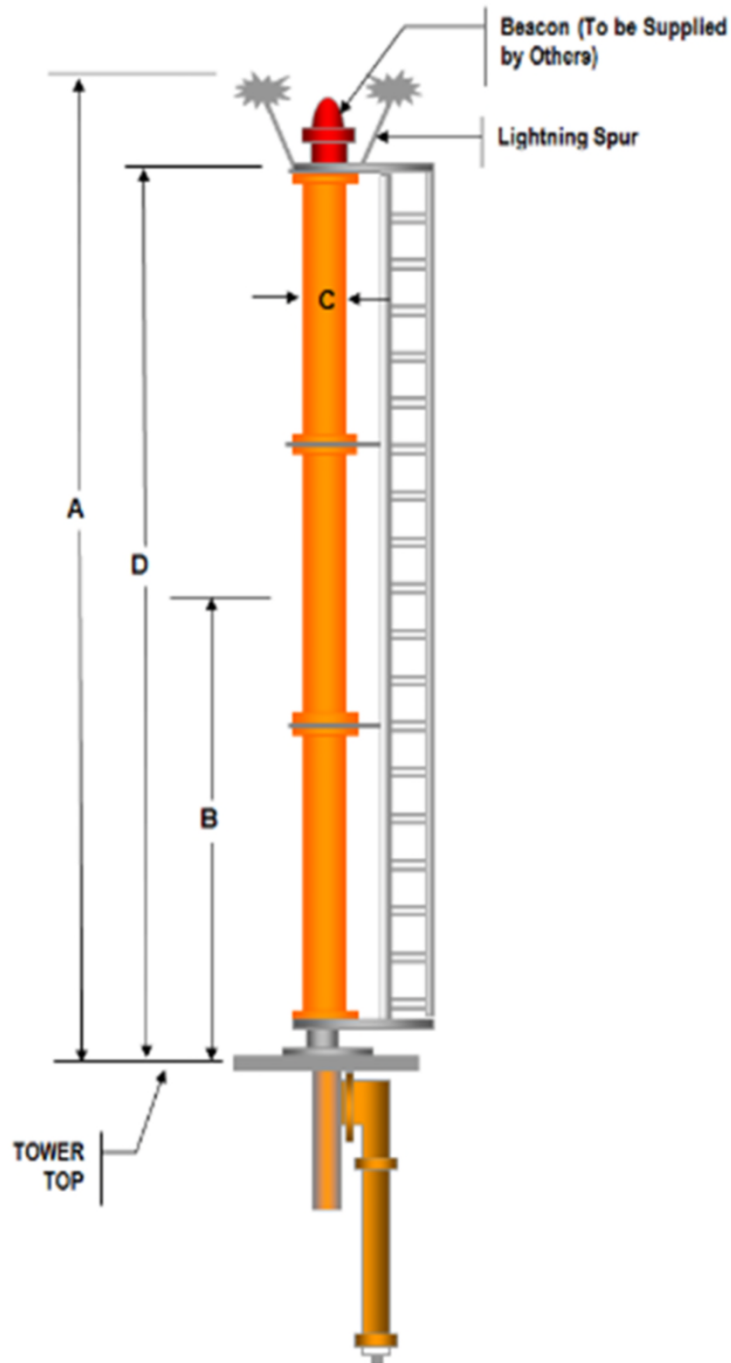
Total Losses: 0.965 dB

Line Efficiency: 80.08%

Transmitter Power Output:

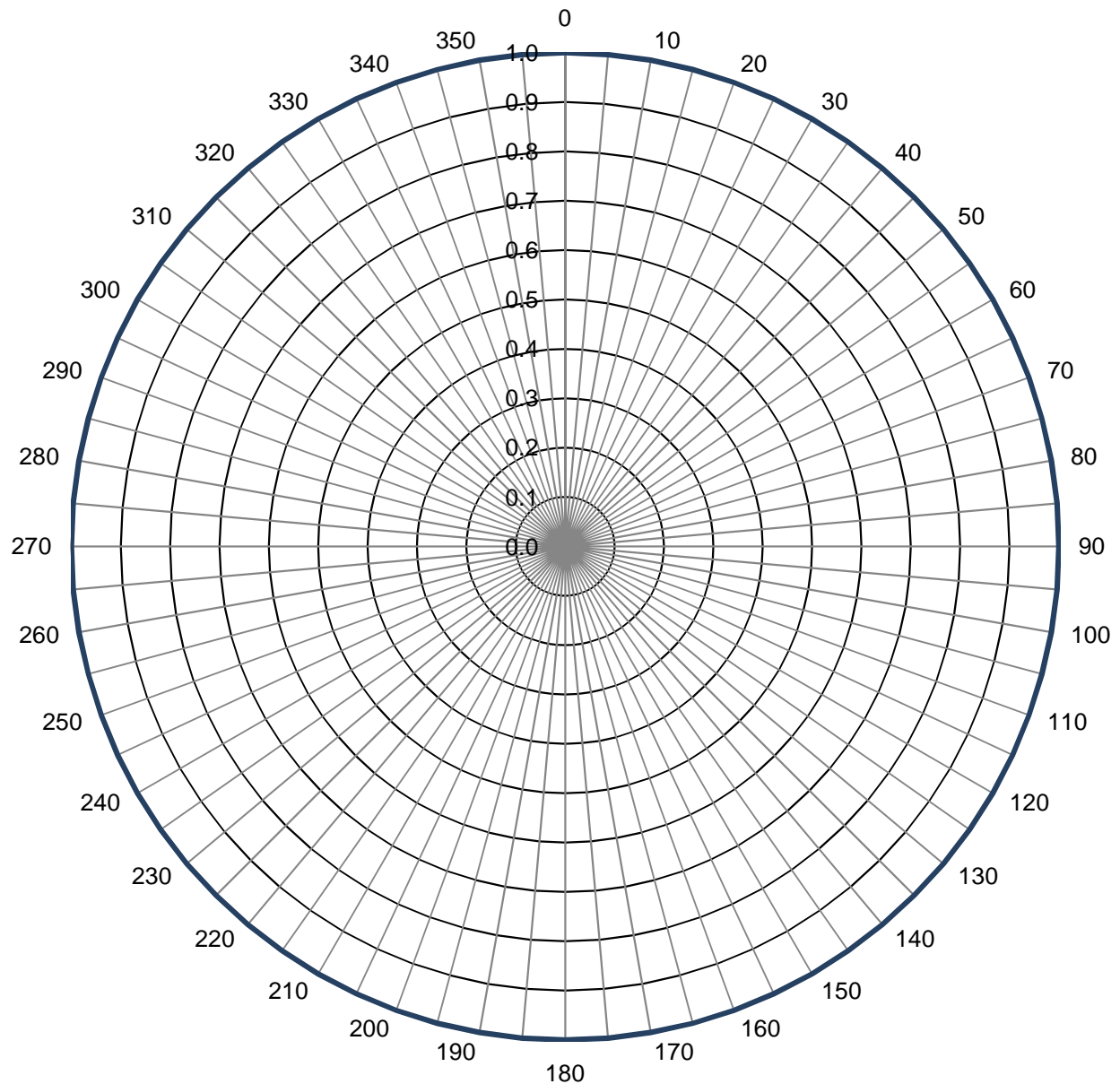
102.06 kW
 (20.09 dBk)

Typical Mounting Configuration Shown. Actual Configuration May Vary.



Azimuth Pattern

Type:	ATW-O	Polarization:	Horizontal
Directivity:	1.00 numeric (0.00 dB)	Frequency:	31 (ATSC)
Peak(s) at:		Location:	Philadelphia, PA
		NOTE: Pattern shape and directivity may vary with channel and mounting configuration.	

Relative Field

Tabulated Data for Azimuth Pattern

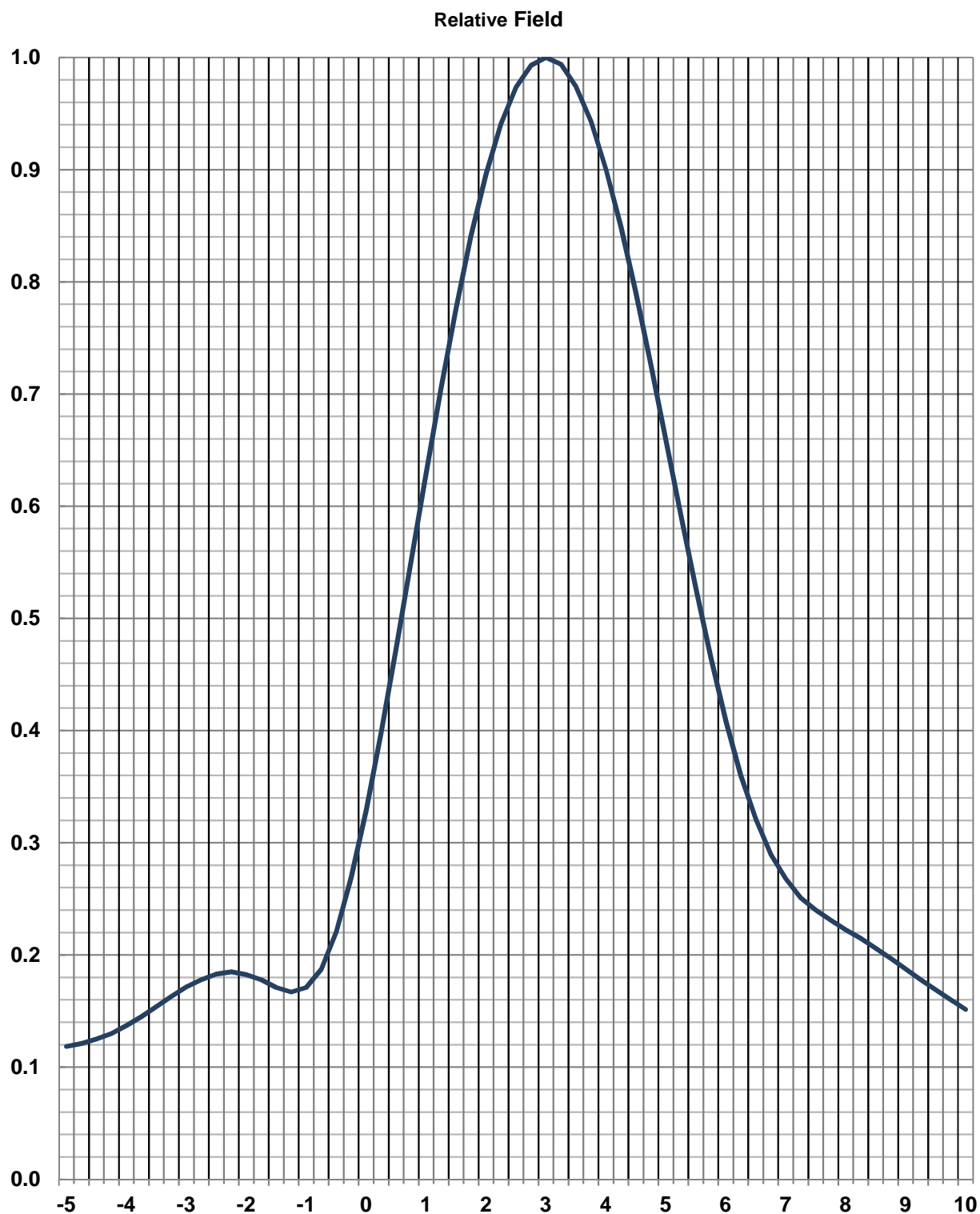
Type:

ATW-O

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

Elevation Pattern

Type:	ATW16HS12H	Polarization:	Horizontal
Directivity:		Frequency:	31 (ATSC)
Main Lobe:	16.00 numeric (12.04 dB)	Location:	Philadelphia, PA
Horizontal:	1.16 numeric (0.64 dB)	Beam Tilt:	3.00 degrees



Tabulated Data for Elevation PatternType: ATW16HS12H

-5 to 10 degrees in 0.25 degree increments.

10 to 90 degrees in 0.50 degree increments.

Angle	Field	dB	Angle	Field	dB	Angle	Field	dB	Angle	Field	dB	Angle	Field	dB
-5.00	0.119	-18.53	7.25	0.251	-12.01	29.00	0.044	-27.23	53.50	0.042	-27.54	78.00	0.033	-29.63
-4.75	0.121	-18.34	7.50	0.240	-12.40	29.50	0.048	-26.47	54.00	0.043	-27.33	78.50	0.033	-29.63
-4.50	0.125	-18.06	7.75	0.231	-12.73	30.00	0.049	-26.20	54.50	0.045	-26.94	79.00	0.033	-29.63
-4.25	0.130	-17.72	8.00	0.223	-13.05	30.50	0.047	-26.65	55.00	0.046	-26.74	79.50	0.034	-29.37
-4.00	0.137	-17.27	8.25	0.215	-13.35	31.00	0.042	-27.64	55.50	0.046	-26.74	80.00	0.036	-29.00
-3.75	0.145	-16.77	8.50	0.206	-13.72	31.50	0.038	-28.40	56.00	0.046	-26.74	80.50	0.037	-28.64
-3.50	0.154	-16.25	8.75	0.197	-14.11	32.00	0.037	-28.64	56.50	0.045	-26.94	81.00	0.039	-28.18
-3.25	0.163	-15.76	9.00	0.188	-14.54	32.50	0.041	-27.85	57.00	0.044	-27.13	81.50	0.040	-27.96
-3.00	0.172	-15.31	9.25	0.178	-14.99	33.00	0.044	-27.13	57.50	0.044	-27.23	82.00	0.042	-27.64
-2.75	0.178	-14.99	9.50	0.169	-15.44	33.50	0.046	-26.74	58.00	0.043	-27.33	82.50	0.043	-27.43
-2.50	0.183	-14.75	9.75	0.160	-15.92	34.00	0.046	-26.84	58.50	0.043	-27.33	83.00	0.043	-27.33
-2.25	0.185	-14.66	10.00	0.152	-16.39	34.50	0.043	-27.43	59.00	0.044	-27.23	83.50	0.043	-27.33
-2.00	0.183	-14.77	10.50	0.138	-17.20	35.00	0.039	-28.29	59.50	0.044	-27.13	84.00	0.043	-27.33
-1.75	0.178	-14.99	11.00	0.128	-17.86	35.50	0.037	-28.64	60.00	0.045	-26.94	84.50	0.043	-27.33
-1.50	0.171	-15.34	11.50	0.121	-18.38	36.00	0.038	-28.40	60.50	0.046	-26.84	85.00	0.042	-27.54
-1.25	0.167	-15.55	12.00	0.117	-18.67	36.50	0.042	-27.64	61.00	0.046	-26.74	85.50	0.041	-27.74
-1.00	0.171	-15.34	12.50	0.113	-18.98	37.00	0.045	-26.94	61.50	0.046	-26.74	86.00	0.040	-28.07
-0.75	0.187	-14.56	13.00	0.108	-19.37	37.50	0.046	-26.74	62.00	0.046	-26.74	86.50	0.038	-28.52
-0.50	0.221	-13.13	13.50	0.101	-19.96	38.00	0.044	-27.13	62.50	0.046	-26.74	87.00	0.036	-29.00
-0.25	0.269	-11.40	14.00	0.092	-20.72	38.50	0.041	-27.85	63.00	0.046	-26.74	87.50	0.033	-29.63
0.00	0.329	-9.66	14.50	0.086	-21.36	39.00	0.038	-28.52	63.50	0.046	-26.74	88.00	0.030	-30.46
0.25	0.398	-8.00	15.00	0.083	-21.62	39.50	0.037	-28.64	64.00	0.046	-26.74	88.50	0.028	-31.21
0.50	0.474	-6.49	15.50	0.083	-21.62	40.00	0.039	-28.29	64.50	0.046	-26.74	89.00	0.024	-32.40
0.75	0.551	-5.18	16.00	0.083	-21.62	40.50	0.042	-27.64	65.00	0.046	-26.74	89.50	0.021	-33.76
1.00	0.630	-4.02	16.50	0.081	-21.88	41.00	0.045	-27.03	65.50	0.046	-26.74	90.00	0.017	-35.39
1.25	0.705	-3.04	17.00	0.075	-22.56	41.50	0.045	-26.94	66.00	0.045	-26.94			
1.50	0.777	-2.20	17.50	0.068	-23.41	42.00	0.044	-27.13	66.50	0.045	-26.94			
1.75	0.841	-1.50	18.00	0.063	-24.01	42.50	0.041	-27.74	67.00	0.045	-26.94			
2.00	0.896	-0.95	18.50	0.063	-24.01	43.00	0.039	-28.29	67.50	0.045	-26.94			
2.25	0.941	-0.53	19.00	0.066	-23.61	43.50	0.037	-28.64	68.00	0.045	-26.94			
2.50	0.974	-0.23	19.50	0.067	-23.48	44.00	0.038	-28.40	68.50	0.046	-26.74			
2.75	0.993	-0.06	20.00	0.065	-23.81	44.50	0.041	-27.85	69.00	0.047	-26.56			
3.00	1.000	0.00	20.50	0.059	-24.66	45.00	0.043	-27.33	69.50	0.048	-26.38			
3.25	0.994	-0.05	21.00	0.053	-25.60	45.50	0.045	-26.94	70.00	0.049	-26.20			
3.50	0.974	-0.23	21.50	0.051	-25.85	46.00	0.045	-26.94	70.50	0.050	-26.02			
3.75	0.943	-0.51	22.00	0.054	-25.43	46.50	0.043	-27.33	71.00	0.051	-25.85			
4.00	0.901	-0.91	22.50	0.057	-24.96	47.00	0.041	-27.74	71.50	0.052	-25.68			
4.25	0.849	-1.42	23.00	0.058	-24.73	47.50	0.039	-28.18	72.00	0.052	-25.68			
4.50	0.791	-2.04	23.50	0.055	-25.27	48.00	0.038	-28.40	72.50	0.052	-25.68			
4.75	0.726	-2.78	24.00	0.050	-26.11	48.50	0.040	-28.07	73.00	0.051	-25.85			
5.00	0.660	-3.62	24.50	0.045	-26.94	49.00	0.042	-27.64	73.50	0.050	-26.11			
5.25	0.592	-4.55	25.00	0.045	-27.03	49.50	0.044	-27.13	74.00	0.048	-26.38			
5.50	0.527	-5.57	25.50	0.048	-26.47	50.00	0.045	-26.94	74.50	0.046	-26.74			
5.75	0.465	-6.65	26.00	0.052	-25.76	50.50	0.046	-26.74	75.00	0.044	-27.23			
6.00	0.409	-7.78	26.50	0.053	-25.60	51.00	0.045	-26.94	75.50	0.041	-27.74			
6.25	0.360	-8.87	27.00	0.050	-26.11	51.50	0.043	-27.33	76.00	0.039	-28.29			
6.50	0.321	-9.87	27.50	0.045	-27.03	52.00	0.042	-27.64	76.50	0.037	-28.75			
6.75	0.290	-10.75	28.00	0.041	-27.85	52.50	0.041	-27.74	77.00	0.035	-29.24			
7.00	0.268	-11.44	28.50	0.040	-27.96	53.00	0.041	-27.74	77.50	0.033	-29.63			

Azimuth Pattern**Type:**

ATW-V1

Polarization:

Vertical

Directivity:

1.00 numeric

(0.00 dB)

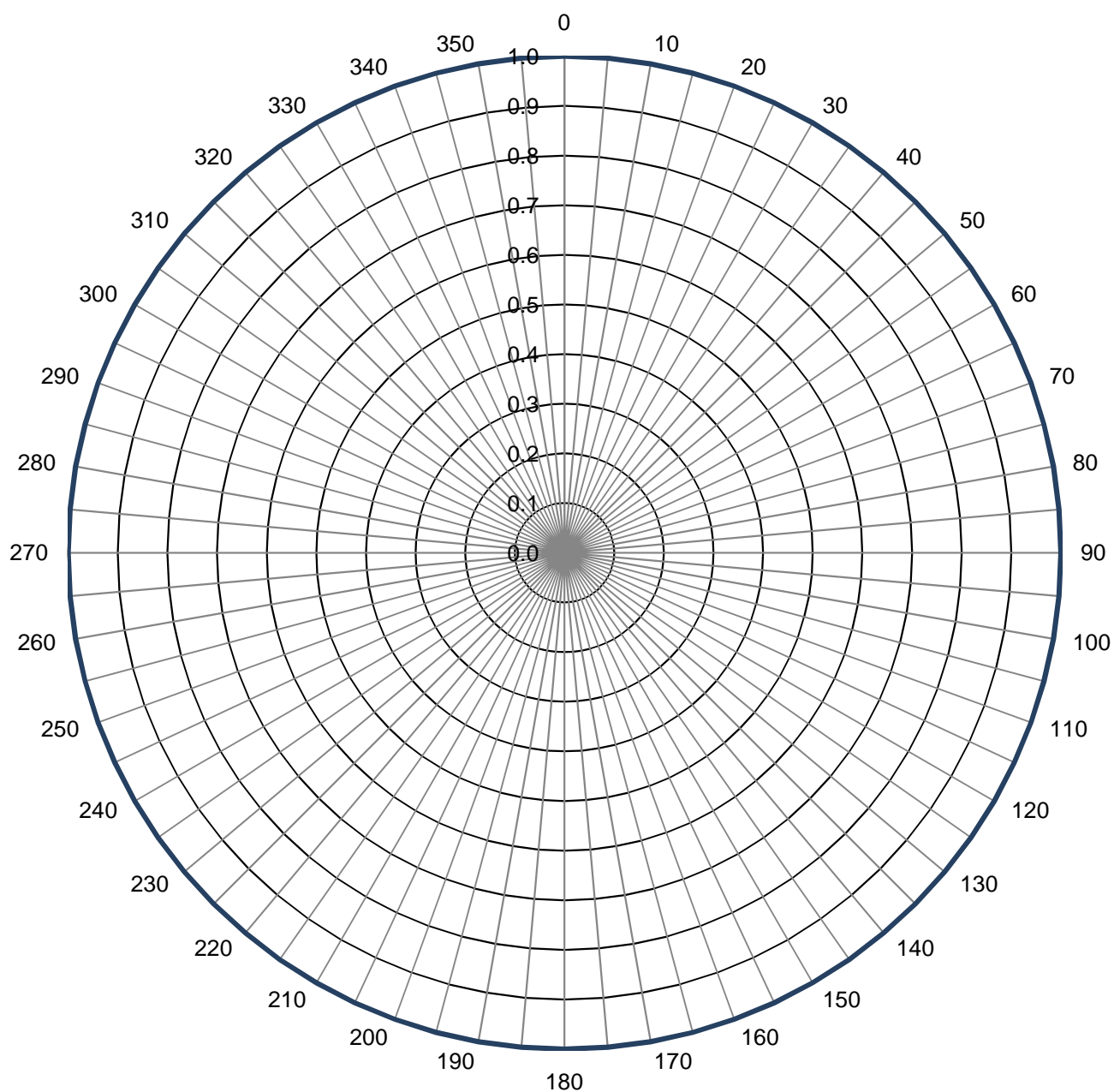
Frequency:

31 (ATSC)

Peak(s) at:**Location:**

Philadelphia, PA

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

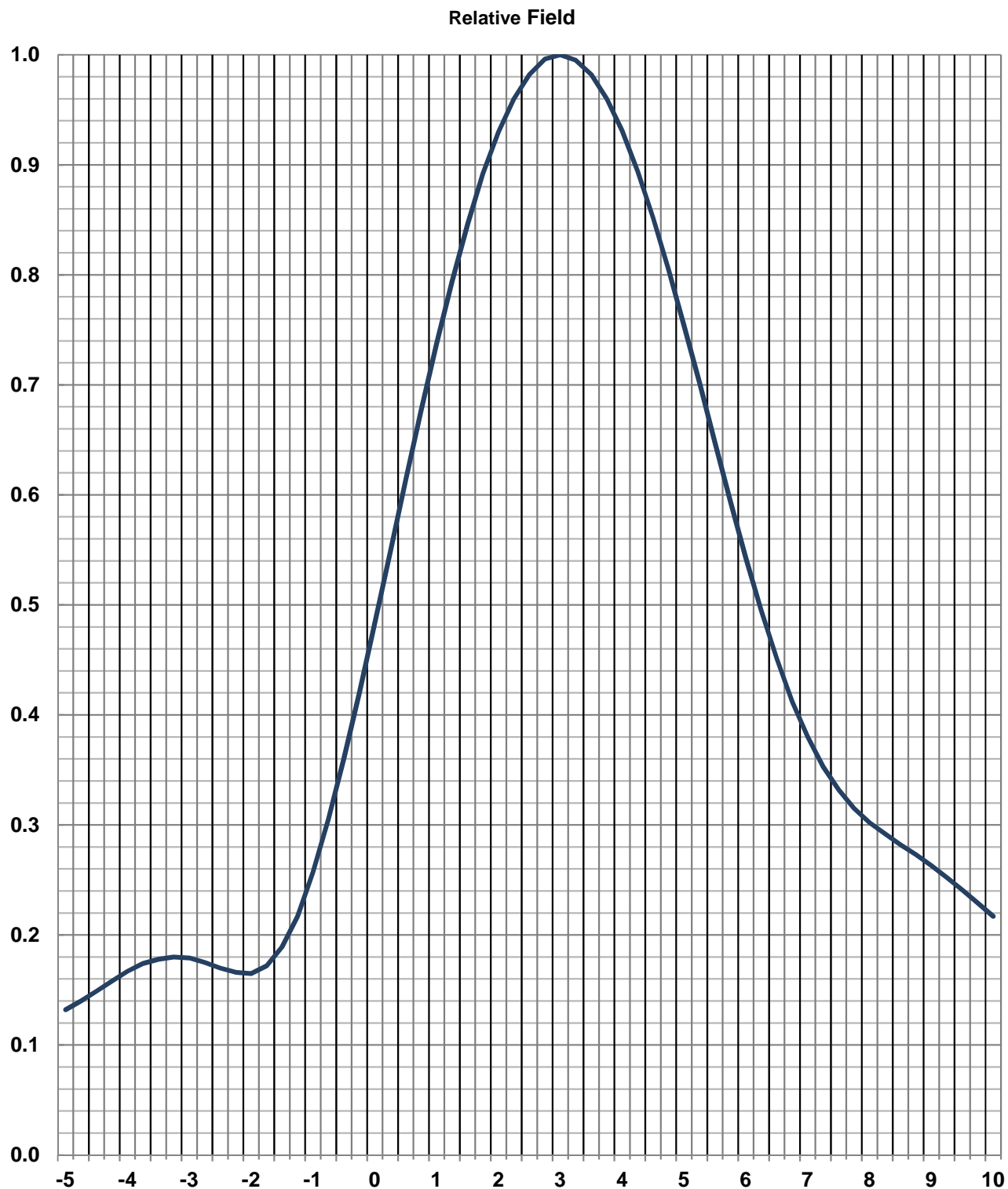
Relative Field

Tabulated Data for Azimuth PatternType: ATW-V1

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

Elevation Pattern

Type:	ATW13HS12V	Polarization:	Vertical
Directivity:		Frequency:	31 (ATSC)
Main Lobe:	13.00 numeric (11.14 dB)	Location:	Philadelphia, PA
Horizontal:	3.03 numeric (4.82 dB)	Beam Tilt:	3.00 degrees



Tabulated Data for Elevation Pattern

Type:

ATW13HS12V

-5 to 10 degrees in 0.25 degree increments.

10 to 90 degrees in 0.50 degree increments.

Angle	Field	dB	Angle	Field	dB	Angle	Field	dB	Angle	Field	dB	Angle	Field	dB
-5.00	0.132	-17.59	7.25	0.353	-9.04	29.00	0.061	-24.29	53.50	0.045	-26.94	78.00	0.024	-32.40
-4.75	0.140	-17.08	7.50	0.332	-9.58	29.50	0.061	-24.29	54.00	0.046	-26.74	78.50	0.025	-32.04
-4.50	0.149	-16.54	7.75	0.315	-10.03	30.00	0.059	-24.58	54.50	0.047	-26.56	79.00	0.027	-31.37
-4.25	0.158	-16.03	8.00	0.302	-10.40	30.50	0.057	-24.88	55.00	0.047	-26.56	79.50	0.028	-31.06
-4.00	0.167	-15.55	8.25	0.292	-10.69	31.00	0.055	-25.19	55.50	0.047	-26.56	80.00	0.030	-30.46
-3.75	0.174	-15.19	8.50	0.282	-11.00	31.50	0.053	-25.51	56.00	0.046	-26.74	80.50	0.032	-29.90
-3.50	0.178	-14.99	8.75	0.273	-11.28	32.00	0.052	-25.68	56.50	0.045	-26.94	81.00	0.034	-29.37
-3.25	0.180	-14.89	9.00	0.263	-11.60	32.50	0.053	-25.51	57.00	0.044	-27.13	81.50	0.035	-29.12
-3.00	0.179	-14.94	9.25	0.252	-11.97	33.00	0.054	-25.35	57.50	0.042	-27.54	82.00	0.036	-28.87
-2.75	0.175	-15.14	9.50	0.241	-12.36	33.50	0.055	-25.19	58.00	0.042	-27.54	82.50	0.037	-28.64
-2.50	0.170	-15.39	9.75	0.229	-12.80	34.00	0.055	-25.19	58.50	0.042	-27.54	83.00	0.037	-28.64
-2.25	0.166	-15.60	10.00	0.217	-13.27	34.50	0.054	-25.35	59.00	0.042	-27.54	83.50	0.037	-28.64
-2.00	0.165	-15.65	10.50	0.194	-14.24	35.00	0.052	-25.68	59.50	0.043	-27.33	84.00	0.037	-28.64
-1.75	0.172	-15.29	11.00	0.176	-15.09	35.50	0.050	-26.02	60.00	0.045	-26.94	84.50	0.037	-28.64
-1.50	0.189	-14.47	11.50	0.165	-15.65	36.00	0.048	-26.38	60.50	0.046	-26.74	85.00	0.036	-28.87
-1.25	0.217	-13.27	12.00	0.159	-15.97	36.50	0.048	-26.38	61.00	0.047	-26.56	85.50	0.035	-29.12
-1.00	0.257	-11.80	12.50	0.155	-16.19	37.00	0.048	-26.38	61.50	0.048	-26.38	86.00	0.033	-29.63
-0.75	0.305	-10.31	13.00	0.149	-16.54	37.50	0.049	-26.20	62.00	0.048	-26.38	86.50	0.031	-30.17
-0.50	0.360	-8.87	13.50	0.141	-17.02	38.00	0.050	-26.02	62.50	0.048	-26.38	87.00	0.029	-30.75
-0.25	0.420	-7.54	14.00	0.131	-17.65	38.50	0.050	-26.02	63.00	0.047	-26.56	87.50	0.027	-31.37
0.00	0.483	-6.32	14.50	0.121	-18.34	39.00	0.050	-26.02	63.50	0.046	-26.74	88.00	0.025	-32.04
0.25	0.548	-5.22	15.00	0.114	-18.86	39.50	0.049	-26.20	64.00	0.044	-27.13	88.50	0.022	-33.15
0.50	0.613	-4.25	15.50	0.110	-19.17	40.00	0.047	-26.56	64.50	0.043	-27.33	89.00	0.019	-34.42
0.75	0.677	-3.39	16.00	0.109	-19.25	40.50	0.046	-26.74	65.00	0.041	-27.74	89.50	0.016	-35.92
1.00	0.738	-2.64	16.50	0.108	-19.33	41.00	0.045	-26.94	65.50	0.040	-27.96	90.00	0.013	-37.72
1.25	0.794	-2.00	17.00	0.105	-19.58	41.50	0.045	-26.94	66.00	0.040	-27.96			
1.50	0.846	-1.45	17.50	0.101	-19.91	42.00	0.046	-26.74	66.50	0.040	-27.96			
1.75	0.892	-0.99	18.00	0.095	-20.45	42.50	0.047	-26.56	67.00	0.041	-27.74			
2.00	0.930	-0.63	18.50	0.089	-21.01	43.00	0.048	-26.38	67.50	0.042	-27.54			
2.25	0.960	-0.35	19.00	0.085	-21.41	43.50	0.048	-26.38	68.00	0.044	-27.13			
2.50	0.982	-0.16	19.50	0.084	-21.51	44.00	0.048	-26.38	68.50	0.046	-26.74			
2.75	0.996	-0.03	20.00	0.083	-21.62	44.50	0.047	-26.56	69.00	0.047	-26.56			
3.00	1.000	0.00	20.50	0.084	-21.51	45.00	0.046	-26.74	69.50	0.048	-26.38			
3.25	0.995	-0.04	21.00	0.083	-21.62	45.50	0.044	-27.13	70.00	0.049	-26.20			
3.50	0.982	-0.16	21.50	0.080	-21.94	46.00	0.043	-27.33	70.50	0.050	-26.02			
3.75	0.960	-0.35	22.00	0.076	-22.38	46.50	0.043	-27.33	71.00	0.049	-26.20			
4.00	0.931	-0.62	22.50	0.072	-22.85	47.00	0.044	-27.13	71.50	0.049	-26.20			
4.25	0.894	-0.97	23.00	0.070	-23.10	47.50	0.045	-26.94	72.00	0.047	-26.56			
4.50	0.852	-1.39	23.50	0.068	-23.35	48.00	0.046	-26.74	72.50	0.045	-26.94			
4.75	0.805	-1.88	24.00	0.069	-23.22	48.50	0.047	-26.56	73.00	0.043	-27.33			
5.00	0.754	-2.45	24.50	0.069	-23.22	49.00	0.047	-26.56	73.50	0.041	-27.74			
5.25	0.702	-3.07	25.00	0.069	-23.22	49.50	0.047	-26.56	74.00	0.038	-28.40			
5.50	0.648	-3.77	25.50	0.068	-23.35	50.00	0.046	-26.74	74.50	0.035	-29.12			
5.75	0.594	-4.52	26.00	0.065	-23.74	50.50	0.045	-26.94	75.00	0.032	-29.90			
6.00	0.543	-5.30	26.50	0.062	-24.15	51.00	0.044	-27.13	75.50	0.029	-30.75			
6.25	0.495	-6.11	27.00	0.060	-24.44	51.50	0.043	-27.33	76.00	0.027	-31.37			
6.50	0.451	-6.92	27.50	0.059	-24.58	52.00	0.042	-27.54	76.50	0.025	-32.04			
6.75	0.412	-7.70	28.00	0.059	-24.58	52.50	0.043	-27.33	77.00	0.024	-32.40			
7.00	0.380	-8.40	28.50	0.060	-24.44	53.00	0.044	-27.13	77.50	0.023	-32.77			