

Preliminary Specification for TRASAR® Side Mounted UHF Horizontally Polarized Coaxial Slotted Array Television Antenna

**WNEO, RF Channel 29
Western Reserve Public Media, Alliance, OH
August 05, 2019**

**Antenna Model:
ATW29H3-HSO10-29H**

**Specification Number
20190705-011-3b1**

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**Preliminary Specification for
TRASAR® Side Mounted
UHF Horizontally Polarized
Coaxial Slotted Array Television Antenna**

Electrical Characteristics:

Channel:		29	
Frequency:		560 MHz to 566 MHz	
Service:		ATSC	
Azimuth Pattern Number:	Horizontal Polarization	ATW-O10	
Elevation Pattern Number:	Horizontal Polarization	ATW29H3H	
Azimuth Directivity:	Horizontal Polarization	1.12	(0.50 dB)
Elevation Directivity:	Horizontal Polarization	29.00	(14.62 dBd)
RMS Power Gain:	Horizontal Polarization	29.00	(14.62 dBd)
Gain at Horizontal:	Horizontal Polarization	17.19	(12.35 dBd)
Electrical Beam Tilt:		0.75 Degrees	
Input Power Required:		17.17 kW	(12.35 dBk)
RF Input:		6-1/8-inch EIA, 50 Ω , flanged male	
Input Power Rating (maximum):		57 kW Average Power, 8VSB	
Antenna VSWR (maximum):		1.10 Over 6 MHz Channel	

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Antenna Mechanical Characteristics:

Mounting Configuration:	Side Mounted		
(*Tower interface supplied by others)			
Height of Antenna (D):	58.7 feet	(17.9 meters)	
Height of Center of Radiation (B):	29.3 feet	(8.9 meters)	
Overall Height (Includes four 3.0 ft lightning spurs) (A):	61.7 feet	(18.8 meters)	
Deicing:	Fully enclosed pressurized radome		
Radome Diameter (C):	14.40 inches	(365.8 millimeters)	
Radome Color:	Aviation Orange		
Climbing Device:	Not Applicable		
Calculated Weight ¹ :	No Ice	1615.0 lb	732.6 kg
	1/2" (13 mm) ice	2220.0 lb	1007.0 kg
Windload Data ^{1 2} :	EPA	No Ice	43.4 ft ² (4.0 m ²)
		1/2" (13 mm) ice	92.6 ft ² (8.6 m ²)

Estimated Mounting Assembly Loads:

Preliminary Mounting Configuration:	Leg Mount		
Estimated Antenna Offset:	42 inches		
Calculated Weight ¹ :	No Ice	975.0 lb	442.3 kg
	1/2" (13 mm) ice	1325.0 lb	601.0 kg
¹ Effective Projected Area (EPA-ft ²):	Normal Exp.	Transverse Exp.	
	No Ice	25.0 ft ²	27.0 ft ²
	1/2" (13 mm) ice	28.3 ft ²	34.8 ft ²

1) Loads calculated in accordance with the ANSI/TIA-222 standard. 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 for the antenna include the antenna and lightning spurs only. Specified loads for the mounting assembly include typical base mounts, standoff mounts, and tie-back assemblies for multi-level arrays. Custom mounting brackets/adapters and/or antenna input section are NOT included as part of this preliminary specification.

2) 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

WNEO **RF Channel: 29**
Western Reserve Public Media
Alliance, OH
ATW29H3-HSO10-29H

Antenna Parameters

Azimuth Directivity:

Horizontal: 1.12 (0.50 dB)

Effective Radiated Power:

Horizontal: 498.00 kW (26.97 dBk)

Elevation Directivity:

Horizontal: 29.00 (14.62 dB)

RMS Power Gain:

Horizontal: 29.00 numeric (14.62 dBd)

Transmission Line

Vertical Run:

Type: 5-inch HJ9-50 Air HELIAX, 50 Ω
 Length: 630 feet 192.0 meters
 Attenuation: 0.204 dB/100 feet 0.669 dB/100 mtrs

Antenna Input Power:

17.17 kW (12.35 dBk)

Horizontal Run:

Type: 5-inch HJ9-50 Air HELIAX, 50 Ω
 Length: 70 feet 21.3 meters
 Attenuation: 0.204 dB/100 feet 0.669 dB/100 mtrs

Transmission Line Losses:

-6.69 kW (1.428 dB)

RF System/Other Losses:

-1.41 kW (0.250 dB)

Transmission Line Efficiency: 71.98%

Total Losses:

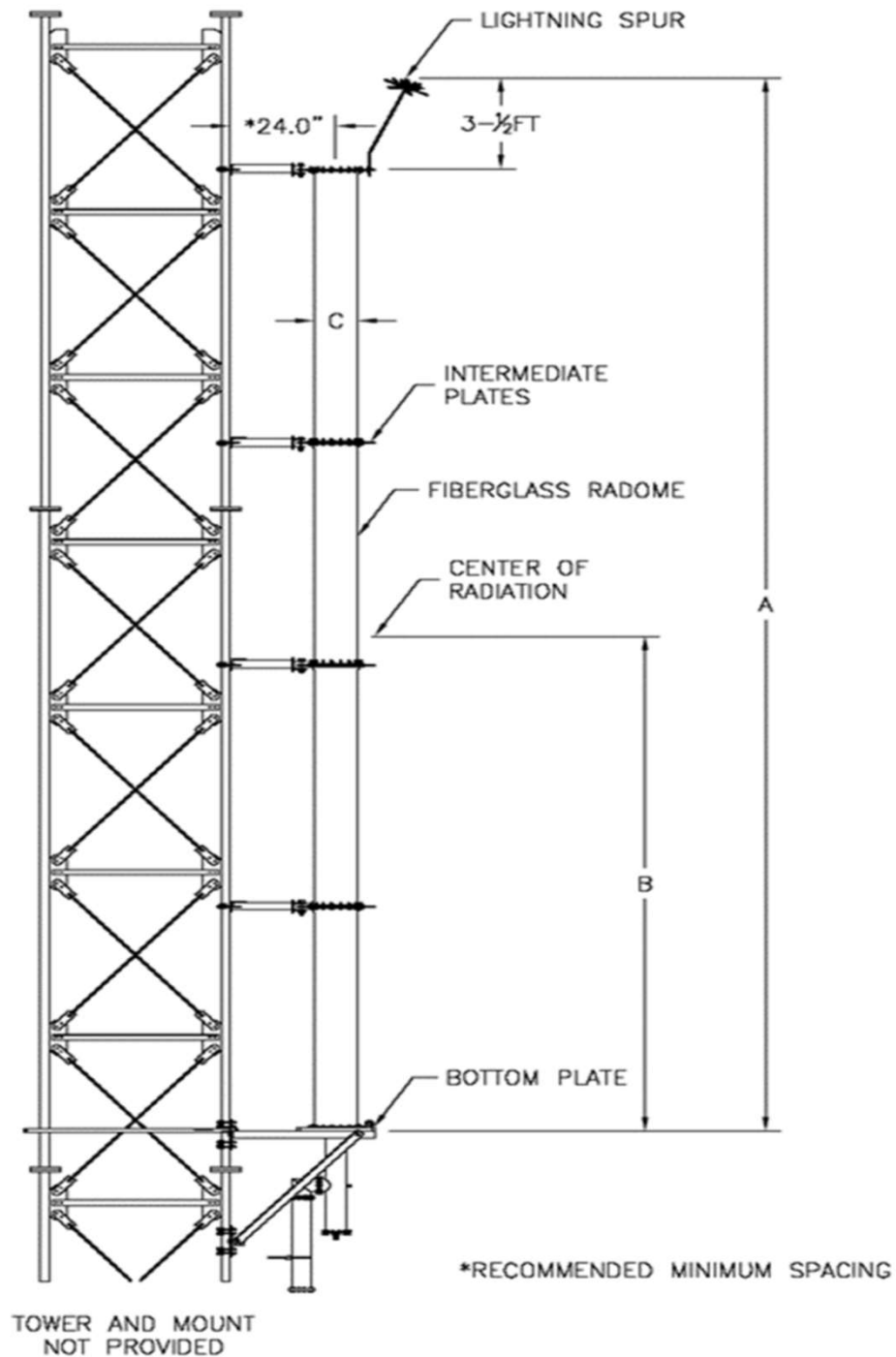
-8.10 kW (1.678 dB)

RF System/Other Efficiency: 94.41%

Transmitter Power Output:

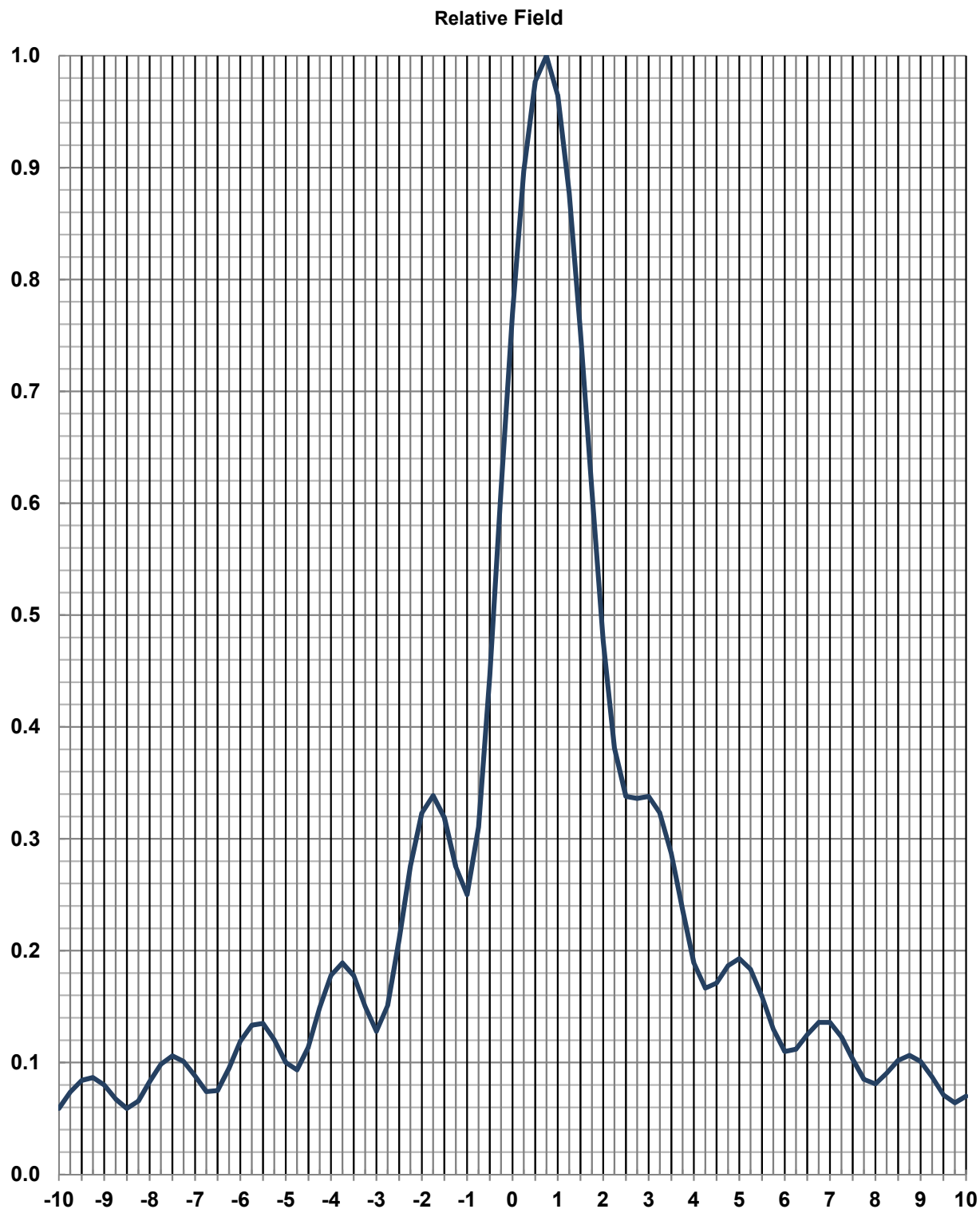
25.27 kW
(14.03 dBk)

Typical Mounting Configuration Shown. Actual Configuration May Vary.



Elevation Pattern

Type:	ATW29H3H		Polarization:	Horizontal
Directivity:			Frequency:	29 (ATSC)
Main Lobe:	29.00 numeric	(14.62 dB)	Location:	Alliance, OH
Horizontal:	17.19 numeric	(12.35 dB)	Beam Tilt:	0.75 degrees



Tabulated Data for Elevation PatternType: ATW29H3H

-10 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
-10.00	0.059	-24.58	2.25	0.381	-8.38	19.00	0.034	-29.37	43.50	0.033	-29.63	68.00	0.027	-31.37
-9.75	0.074	-22.67	2.50	0.338	-9.42	19.50	0.040	-27.96	44.00	0.033	-29.63	68.50	0.024	-32.40
-9.50	0.084	-21.51	2.75	0.336	-9.47	20.00	0.049	-26.20	44.50	0.027	-31.37	69.00	0.028	-31.06
-9.25	0.087	-21.26	3.00	0.338	-9.42	20.50	0.042	-27.54	45.00	0.021	-33.56	69.50	0.034	-29.37
-9.00	0.080	-21.94	3.25	0.323	-9.82	21.00	0.030	-30.46	45.50	0.026	-31.70	70.00	0.041	-27.74
-8.75	0.068	-23.41	3.50	0.287	-10.84	21.50	0.038	-28.40	46.00	0.033	-29.63	70.50	0.046	-26.74
-8.50	0.059	-24.58	3.75	0.237	-12.52	22.00	0.046	-26.74	46.50	0.034	-29.37	71.00	0.048	-26.38
-8.25	0.066	-23.68	4.00	0.189	-14.47	22.50	0.038	-28.40	47.00	0.029	-30.75	71.50	0.048	-26.38
-8.00	0.083	-21.62	4.25	0.167	-15.57	23.00	0.028	-31.06	47.50	0.022	-33.15	72.00	0.045	-26.94
-7.75	0.099	-20.13	4.50	0.171	-15.34	23.50	0.037	-28.64	48.00	0.023	-32.77	72.50	0.040	-27.96
-7.50	0.106	-19.49	4.75	0.187	-14.59	24.00	0.043	-27.33	48.50	0.031	-30.17	73.00	0.033	-29.63
-7.25	0.101	-19.91	5.00	0.193	-14.29	24.50	0.036	-28.87	49.00	0.035	-29.12	73.50	0.027	-31.37
-7.00	0.088	-21.11	5.25	0.184	-14.73	25.00	0.027	-31.37	49.50	0.032	-29.90	74.00	0.023	-32.77
-6.75	0.074	-22.62	5.50	0.159	-15.97	25.50	0.035	-29.12	50.00	0.025	-32.04	74.50	0.024	-32.40
-6.50	0.075	-22.50	5.75	0.130	-17.72	26.00	0.041	-27.74	50.50	0.021	-33.56	75.00	0.027	-31.37
-6.25	0.095	-20.45	6.00	0.110	-19.17	26.50	0.034	-29.37	51.00	0.027	-31.37	75.50	0.033	-29.63
-6.00	0.119	-18.49	6.25	0.112	-19.02	27.00	0.025	-32.04	51.50	0.034	-29.37	76.00	0.039	-28.18
-5.75	0.134	-17.49	6.50	0.125	-18.06	27.50	0.033	-29.63	52.00	0.036	-28.87	76.50	0.044	-27.13
-5.50	0.135	-17.39	6.75	0.136	-17.33	28.00	0.039	-28.18	52.50	0.032	-29.90	77.00	0.047	-26.56
-5.25	0.121	-18.38	7.00	0.136	-17.33	28.50	0.034	-29.37	53.00	0.025	-32.04	77.50	0.050	-26.02
-5.00	0.100	-20.00	7.25	0.123	-18.20	29.00	0.025	-32.04	53.50	0.022	-33.15	78.00	0.051	-25.85
-4.75	0.094	-20.58	7.50	0.103	-19.74	29.50	0.029	-30.75	54.00	0.028	-31.06	78.50	0.051	-25.85
-4.50	0.114	-18.86	7.75	0.085	-21.41	30.00	0.037	-28.64	54.50	0.035	-29.12	79.00	0.049	-26.20
-4.25	0.149	-16.54	8.00	0.081	-21.83	30.50	0.033	-29.63	55.00	0.038	-28.40	79.50	0.047	-26.56
-4.00	0.178	-14.99	8.25	0.091	-20.87	31.00	0.024	-32.40	55.50	0.034	-29.37	80.00	0.044	-27.13
-3.75	0.189	-14.47	8.50	0.102	-19.83	31.50	0.027	-31.37	56.00	0.027	-31.37	80.50	0.040	-27.96
-3.50	0.178	-14.99	8.75	0.107	-19.45	32.00	0.035	-29.12	56.50	0.022	-33.15	81.00	0.037	-28.64
-3.25	0.150	-16.48	9.00	0.101	-19.91	32.50	0.034	-29.37	57.00	0.025	-32.04	81.50	0.033	-29.63
-3.00	0.128	-17.86	9.25	0.087	-21.21	33.00	0.026	-31.70	57.50	0.033	-29.63	82.00	0.029	-30.75
-2.75	0.151	-16.42	9.50	0.071	-22.97	33.50	0.024	-32.40	58.00	0.038	-28.40	82.50	0.025	-32.04
-2.50	0.210	-13.56	9.75	0.064	-23.88	34.00	0.033	-29.63	58.50	0.038	-28.40	83.00	0.022	-33.15
-2.25	0.276	-11.20	10.00	0.070	-23.10	34.50	0.036	-28.87	59.00	0.034	-29.37	83.50	0.019	-34.42
-2.00	0.323	-9.82	10.50	0.087	-21.21	35.00	0.029	-30.75	59.50	0.027	-31.37	84.00	0.017	-35.39
-1.75	0.339	-9.41	11.00	0.077	-22.27	35.50	0.022	-33.15	60.00	0.023	-32.77	84.50	0.015	-36.48
-1.50	0.319	-9.92	11.50	0.054	-25.35	36.00	0.028	-31.06	60.50	0.027	-31.37	85.00	0.013	-37.72
-1.25	0.275	-11.21	12.00	0.064	-23.88	36.50	0.035	-29.12	61.00	0.034	-29.37	85.50	0.012	-38.42
-1.00	0.250	-12.04	12.50	0.075	-22.50	37.00	0.032	-29.90	61.50	0.040	-27.96	86.00	0.011	-39.17
-0.75	0.311	-10.16	13.00	0.060	-24.44	37.50	0.024	-32.40	62.00	0.041	-27.74	86.50	0.010	-40.00
-0.50	0.446	-7.01	13.50	0.046	-26.74	38.00	0.023	-32.77	62.50	0.039	-28.18	87.00	0.009	-40.92
-0.25	0.612	-4.26	14.00	0.060	-24.44	38.50	0.032	-29.90	63.00	0.033	-29.63	87.50	0.007	-43.10
0.00	0.770	-2.27	14.50	0.064	-23.88	39.00	0.035	-29.12	63.50	0.026	-31.70	88.00	0.006	-44.44
0.25	0.897	-0.94	15.00	0.048	-26.38	39.50	0.029	-30.75	64.00	0.024	-32.40	88.50	0.005	-46.02
0.50	0.977	-0.20	15.50	0.043	-27.33	40.00	0.022	-33.15	64.50	0.029	-30.75	89.00	0.003	-50.46
0.75	1.000	0.00	16.00	0.056	-25.04	40.50	0.025	-32.04	65.00	0.036	-28.87	89.50	0.002	-53.98
1.00	0.965	-0.31	16.50	0.055	-25.19	41.00	0.032	-29.90	65.50	0.042	-27.54	90.00	0.000	---
1.25	0.877	-1.14	17.00	0.039	-28.18	41.50	0.033	-29.63	66.00	0.045	-26.94			
1.50	0.753	-2.46	17.50	0.041	-27.74	42.00	0.027	-31.37	66.50	0.044	-27.13			
1.75	0.611	-4.29	18.00	0.053	-25.51	42.50	0.021	-33.56	67.00	0.039	-28.18			
2.00	0.477	-6.43	18.50	0.048	-26.38	43.00	0.026	-31.70	67.50	0.033	-29.63			