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

KVPT, RF Channel 32

GatesAir, Fresno, CA

March 27, 2017
Revised August 2, 2017

Antenna Model:
ATW18H6-ETC3-32H

Specification Number
20170307-752

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ELECTRONICS RESEARCH, INC. ERI®

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

Electrical Characteristics:

Channel:		32	
Frequency:		578 MHz to 584 MHz	
Service:		ATSC	
Azimuth Pattern Number:	Horizontal Polarization	ATW-C3	
	Vertical Polarization	ATW-V10	
Elevation Pattern Number:	Horizontal Polarization	18H6H	
	Vertical Polarization	15H6V	
Azimuth Directivity:	Horizontal Polarization	2.00	(3.01 dB)
	Vertical Polarization	2.83	(4.52 dB)
Elevation Directivity:	Horizontal Polarization	18.00	(12.55 dBd)
	Vertical Polarization	15.00	(11.76 dBd)
Peak Power Gain:	Horizontal Polarization	28.70	(14.58 dBd)
	Vertical Polarization	8.61	(9.35 dBd)
Gain at Horizontal:	Horizontal Polarization	11.87	(10.74 dBd)
	Vertical Polarization	3.72	(5.70 dBd)
Vertical/Horizontal Ratio:		0.30	
Electrical Beam Tilt:		1.50 Degrees	
Input Power Required:		7.94 kW	(9.00 dBk)
RF Input:		6-1/8-inch EIA, 50 Ω, flanged male	
Input Power Rating (maximum):		50 kW Average Power, 8VSB	
Antenna VSWR (maximum):		1.10 Over 6 MHz Channel	

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Mechanical Characteristics:

Mounting Configuration:			Top Mount	
Height of Antenna (D):			34.40 feet	(10.5 meters)
Height of Center of Radiation (B):			17.20 feet	(5.2 meters)
Overall Height (Includes four 3.5 ft lightning spurs) (A):			37.90 feet	(11.6 meters)
Deicing:			Fully enclosed pressurized radome	
Radome Diameter (C):			14.4 inches	(366 millimeters)
Radome Color:			Aviation Orange	
Climbing Device:			Steel Climbing Pole	
Calculated Weight[1]:		No Ice	4,000 lbs	1,814.4 kg
Windload Data[3]:	EPA	No Ice	80.34 sq.ft.	7.5 sq.m.
		0.5inch (13 mm) ice	105.18 sq.ft.	9.8 sq.m.
Effective Moment Arm[3]:	EPA	No Ice	18.72 sq.ft.	(5.7 meters)
		0.5inch (13 mm) ice	19.15 sq.ft.	(5.8 meters)

MOUNTING FLANGE BOLT CIRCLE[2]: Quantity (20), 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, beacon and lightning spurs only. Custom mounting brackets/adapters and/or antenna input section are NOT included.

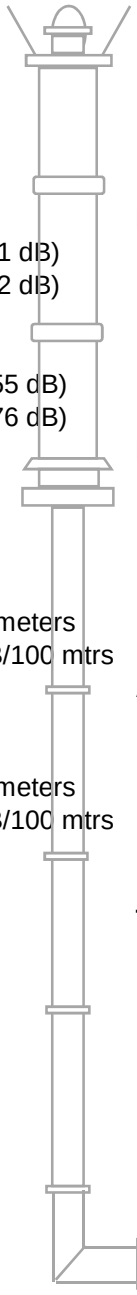
2 The mounting flange specified is the standard ERI mounting flange used for this antenna configuration. In those instances where an existing top mounted antenna is being replaced the antenna supplied will be designed with a mounting flange to match that of the existing antenna unless electrical and /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 Based on a wind speed of 85 miles per hour MPH (fastest mile) no ice and 40 MPH with 0.25-inches in base design ice (0.61-inches actual tiz) with a height above ground level (HAGL) of 220 feet per ANSI/TIA-222-G. Structure Class II, Exposure Category C and Topographic Category I. EPA values include four lightning spurs & a standard beacon.

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

KVPT **RF Channel: 32**
GatesAir
Fresno, CA
ATW18H6-ETC3-32H



Antenna Parameters

Azimuth Directivity:

Horizontal:	2.00	(3.01 dB)
Vertical:	2.83	(4.52 dB)

Elevation Directivity:

Horizontal:	18.00	(12.55 dB)
Vertical:	15.00	(11.76 dB)

Transmission Line

Vertical Run:

Type:	6-1/8-inch EIA, 50 Ω	
Length:	200 feet	61.0 meters
Attenuation:	0.120 dB/100 feet	0.393 dB/100 mtrs

Horizontal Run:

Type:	6-1/8-inch EIA, 50 Ω	
Length:	50 feet	15.2 meters
Attenuation:	0.120 dB/100 feet	0.393 dB/100 mtrs

Total Losses: 0.299 dB

Line Efficiency: 93.34%

Effective Radiated Power:

Horizontal:	228.00 kW	(23.58 dBk)
Vertical:	68.40 kW	(18.35 dBk)

Power Gain:

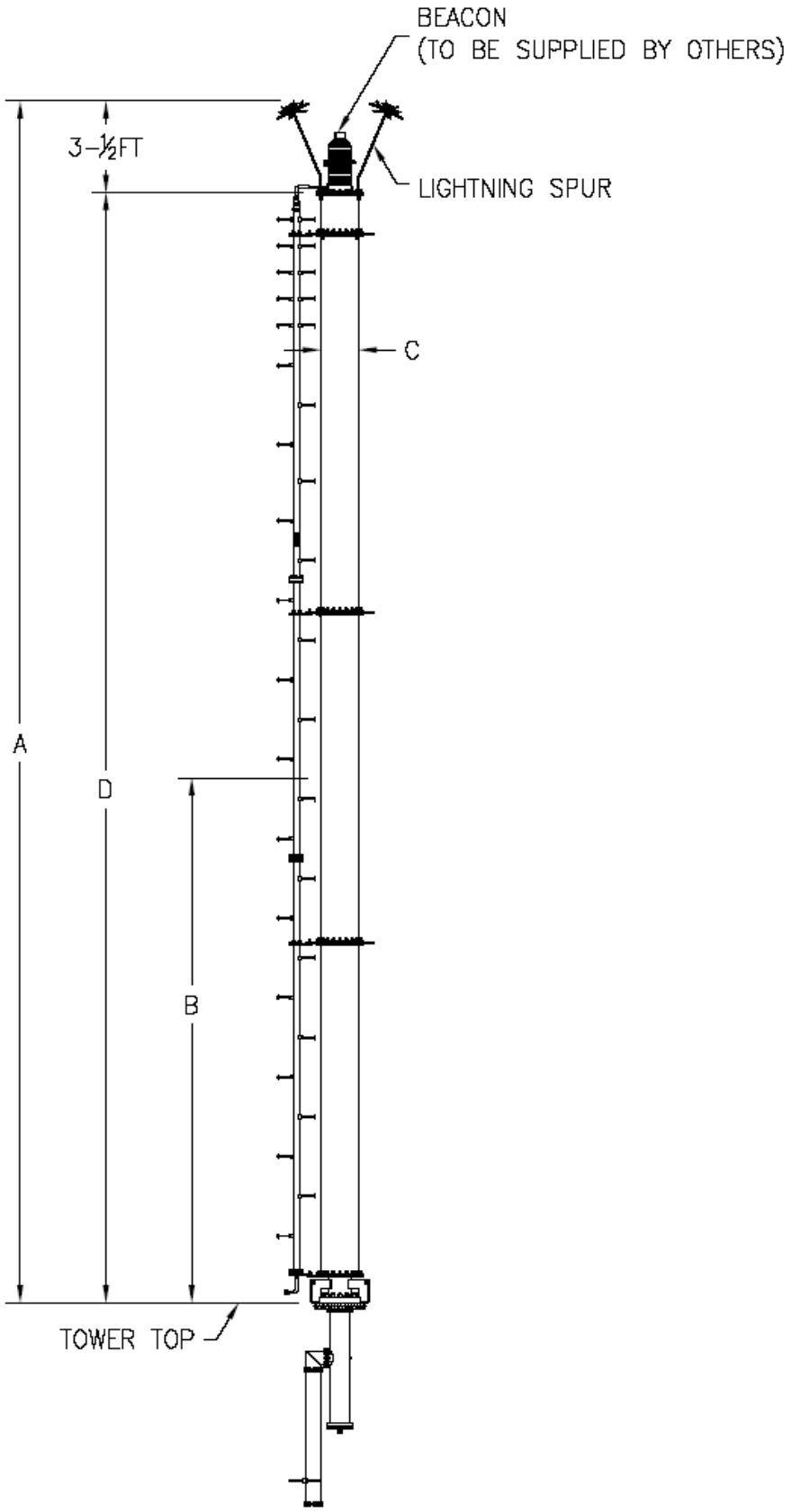
Horizontal:	28.70 numeric	(14.58 dBd)
Vertical:	8.61 numeric	(9.35 dBd)

Antenna Input Power:
7.94 kW (9.00 dBk)

Transmission Line Losses:
-0.57 kW (0.299 dB)

Transmitter Power Output:
8.51 kW
(9.30 dBk)

Typical Mounting Configuration Shown. Actual Configuration May Vary.

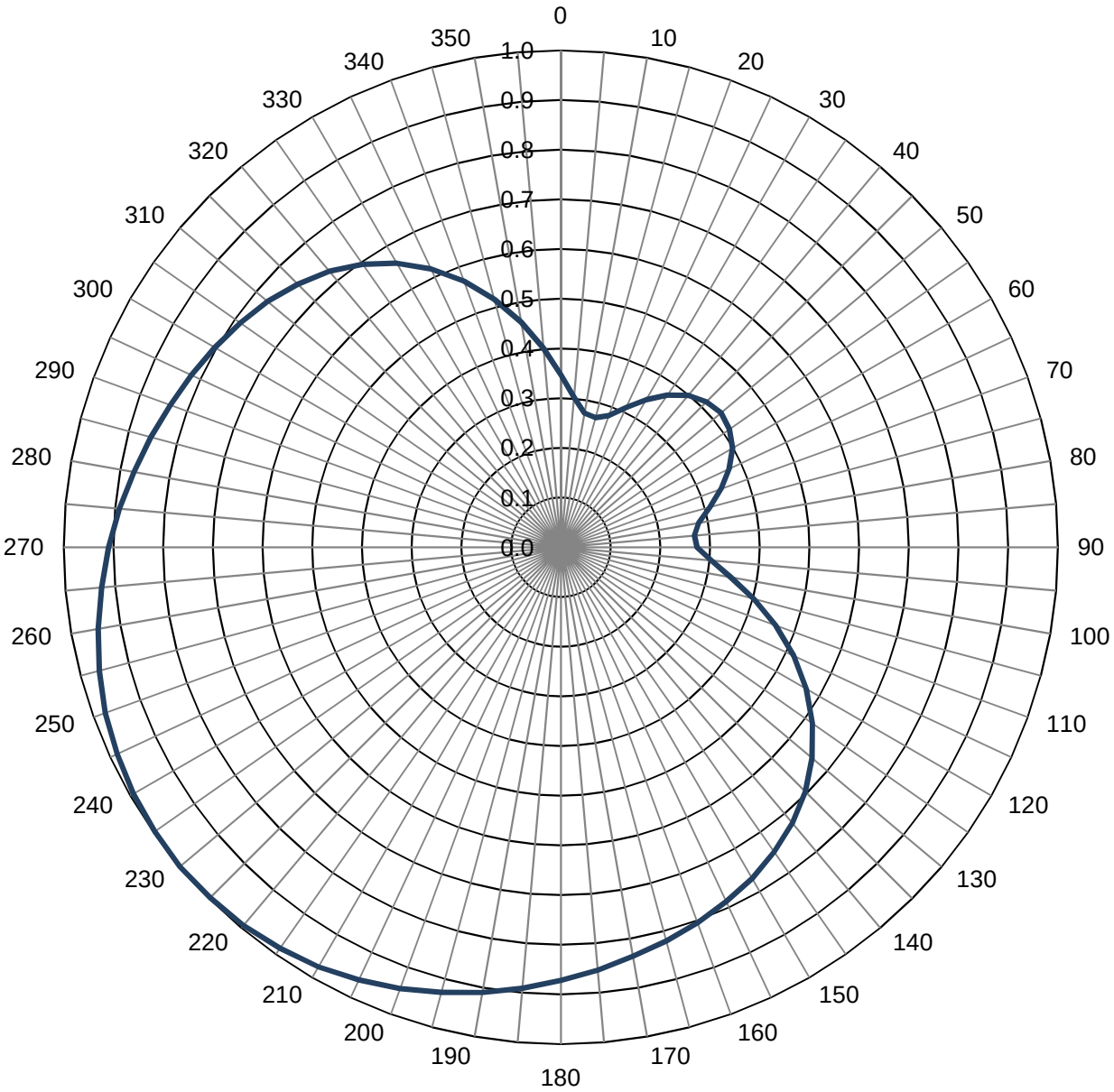


Azimuth Pattern

Type:	ATW-C3		**Polarization:**	Horizontal
Directivity:	2.00 numeric	(3.01 dB)	**Frequency:**	32 (ATSC)
Peak(s) at:			**Location:**	Fresno, CA

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

Relative Field



Tabulated Data for Azimuth Pattern

Type: ATW-C3

Angle	Field	dB
0	0.347	-9.19
2	0.329	-9.66
4	0.311	-10.14
6	0.296	-10.57
8	0.285	-10.90
10	0.274	-11.24
12	0.272	-11.31
14	0.269	-11.40
16	0.271	-11.34
18	0.276	-11.18
20	0.282	-11.00
22	0.293	-10.66
24	0.304	-10.34
26	0.317	-9.98
28	0.330	-9.63
30	0.343	-9.29
32	0.355	-9.00
34	0.368	-8.68
36	0.379	-8.43
38	0.389	-8.20
40	0.399	-7.98
42	0.405	-7.85
44	0.412	-7.70
46	0.416	-7.62
48	0.419	-7.56
50	0.421	-7.51
52	0.419	-7.56
54	0.416	-7.62
56	0.412	-7.70
58	0.405	-7.85
60	0.399	-7.98
62	0.389	-8.20
64	0.379	-8.43
66	0.368	-8.68
68	0.355	-9.00
70	0.343	-9.29
72	0.330	-9.63
74	0.317	-9.98
76	0.304	-10.34
78	0.293	-10.66
80	0.282	-11.00
82	0.276	-11.18
84	0.271	-11.34
86	0.269	-11.40
88	0.272	-11.31
90	0.274	-11.24
92	0.285	-10.90
94	0.296	-10.57
96	0.311	-10.14
98	0.329	-9.66

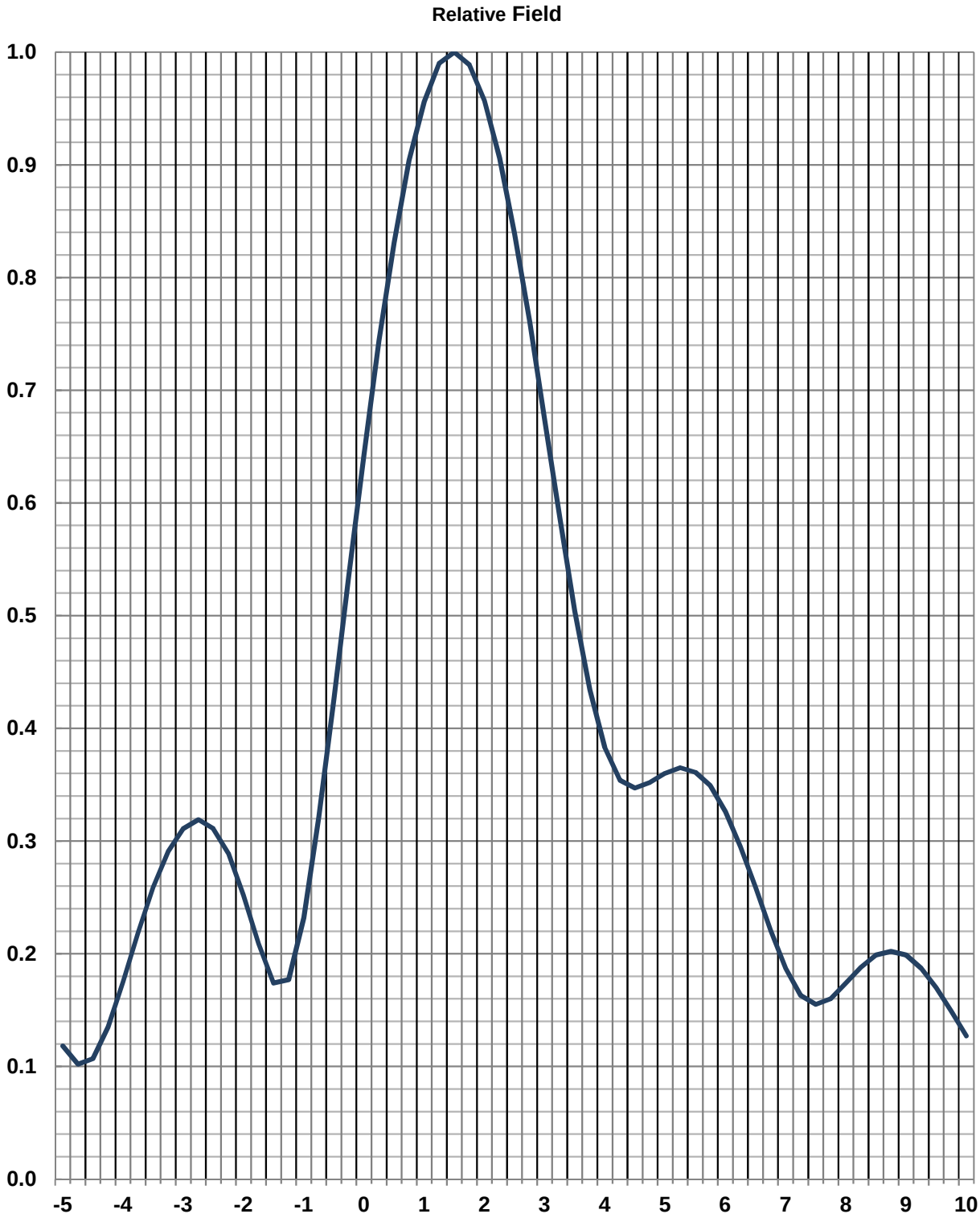
Angle	Field	dB
100	0.347	-9.19
102	0.369	-8.66
104	0.391	-8.16
106	0.414	-7.66
108	0.437	-7.19
110	0.460	-6.74
112	0.483	-6.32
114	0.506	-5.92
116	0.528	-5.55
118	0.549	-5.21
120	0.570	-4.88
122	0.590	-4.58
124	0.609	-4.31
126	0.627	-4.05
128	0.644	-3.82
130	0.660	-3.61
132	0.674	-3.43
134	0.689	-3.24
136	0.702	-3.07
138	0.713	-2.94
140	0.725	-2.79
142	0.735	-2.67
144	0.744	-2.57
146	0.753	-2.46
148	0.762	-2.36
150	0.770	-2.27
152	0.777	-2.19
154	0.784	-2.11
156	0.790	-2.05
158	0.797	-1.97
160	0.804	-1.89
162	0.810	-1.83
164	0.817	-1.76
166	0.823	-1.69
168	0.830	-1.62
170	0.836	-1.56
172	0.843	-1.48
174	0.850	-1.41
176	0.858	-1.33
178	0.865	-1.26
180	0.872	-1.19
182	0.880	-1.11
184	0.887	-1.04
186	0.895	-0.96
188	0.902	-0.90
190	0.910	-0.82
192	0.917	-0.75
194	0.924	-0.69
196	0.931	-0.62
198	0.938	-0.56

Angle	Field	dB
200	0.945	-0.49
202	0.951	-0.44
204	0.958	-0.37
206	0.964	-0.32
208	0.969	-0.27
210	0.975	-0.22
212	0.979	-0.18
214	0.983	-0.15
216	0.987	-0.11
218	0.990	-0.09
220	0.993	-0.06
222	0.995	-0.04
224	0.997	-0.03
226	0.998	-0.02
228	0.999	-0.01
230	1.000	0.00
232	0.999	-0.01
234	0.998	-0.02
236	0.997	-0.03
238	0.995	-0.04
240	0.993	-0.06
242	0.990	-0.09
244	0.987	-0.11
246	0.983	-0.15
248	0.979	-0.18
250	0.975	-0.22
252	0.969	-0.27
254	0.964	-0.32
256	0.958	-0.37
258	0.951	-0.44
260	0.945	-0.49
262	0.938	-0.56
264	0.931	-0.62
266	0.924	-0.69
268	0.917	-0.75
270	0.910	-0.82
272	0.902	-0.90
274	0.895	-0.96
276	0.887	-1.04
278	0.880	-1.11
280	0.872	-1.19
282	0.865	-1.26
284	0.858	-1.33
286	0.850	-1.41
288	0.843	-1.48
290	0.836	-1.56
292	0.830	-1.62
294	0.823	-1.69
296	0.817	-1.76
298	0.810	-1.83

Angle	Field	dB
300	0.804	-1.89
302	0.797	-1.97
304	0.790	-2.05
306	0.784	-2.11
308	0.777	-2.19
310	0.770	-2.27
312	0.762	-2.36
314	0.753	-2.46
316	0.744	-2.57
318	0.735	-2.67
320	0.725	-2.79
322	0.713	-2.94
324	0.702	-3.07
326	0.689	-3.24
328	0.674	-3.43
330	0.660	-3.61
332	0.644	-3.82
334	0.627	-4.05
336	0.609	-4.31
338	0.590	-4.58
340	0.570	-4.88
342	0.549	-5.21
344	0.528	-5.55
346	0.506	-5.92
348	0.483	-6.32
350	0.460	-6.74
352	0.437	-7.19
354	0.414	-7.66
356	0.391	-8.16
358	0.369	-8.66
360	0.347	-9.19

Elevation Pattern

Type:	18H6H		**Polarization:**	Horizontal
Directivity:			**Frequency:**	32 (ATSC)
Main Lobe:	18.00 numeric	(12.55 dB)	**Location:**	Fresno, CA
Horizontal:	7.44 numeric	(8.72 dB)	**Beam Tilt:**	1.50 degrees



Tabulated Data for Elevation Pattern

Type: 18H6H

-5 to 10 degrees in 0.25 degree increments.
10 to 90 degrees in 0.50 degree increments.

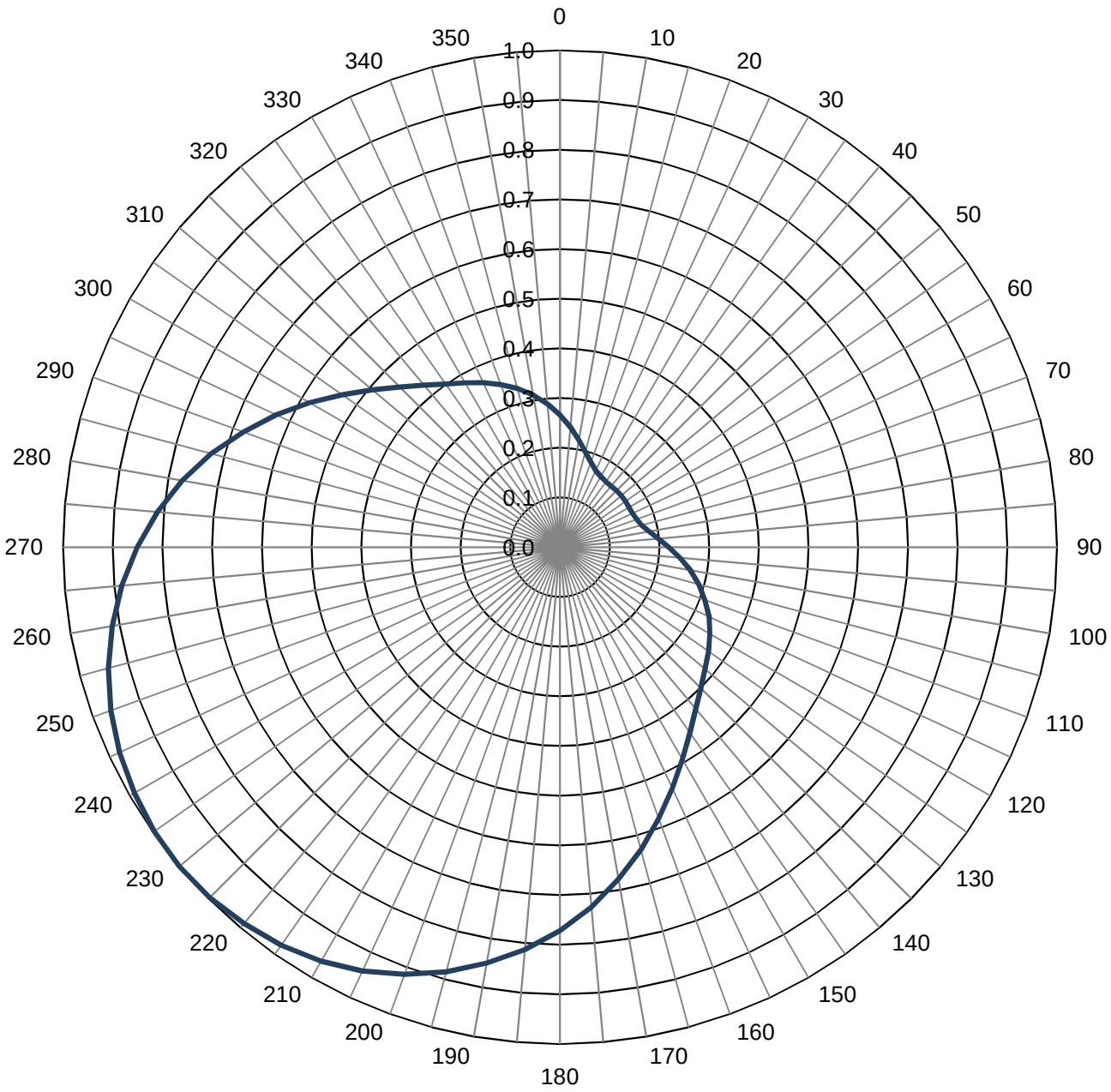
Angle	Field	dB	Angle	Field	dB	Angle	Field	dB	Angle	Field	dB	Angle	Field	dB
-5.00	0.118	-18.56	7.25	0.163	-15.76	29.00	0.057	-24.88	53.50	0.049	-26.20	78.00	0.015	-36.48
-4.75	0.102	-19.83	7.50	0.155	-16.19	29.50	0.044	-27.13	54.00	0.039	-28.18	78.50	0.009	-40.92
-4.50	0.107	-19.41	7.75	0.160	-15.92	30.00	0.035	-29.12	54.50	0.029	-30.75	79.00	0.007	-43.10
-4.25	0.135	-17.39	8.00	0.174	-15.19	30.50	0.037	-28.64	55.00	0.024	-32.40	79.50	0.010	-40.00
-4.00	0.175	-15.14	8.25	0.188	-14.52	31.00	0.049	-26.20	55.50	0.029	-30.75	80.00	0.014	-37.08
-3.75	0.219	-13.19	8.50	0.199	-14.02	31.50	0.058	-24.73	56.00	0.040	-27.96	80.50	0.018	-34.89
-3.50	0.259	-11.73	8.75	0.202	-13.89	32.00	0.060	-24.44	56.50	0.050	-26.02	81.00	0.022	-33.15
-3.25	0.291	-10.72	9.00	0.199	-14.02	32.50	0.054	-25.35	57.00	0.058	-24.73	81.50	0.026	-31.70
-3.00	0.311	-10.14	9.25	0.187	-14.56	33.00	0.042	-27.54	57.50	0.061	-24.29	82.00	0.029	-30.75
-2.75	0.319	-9.92	9.50	0.170	-15.39	33.50	0.033	-29.63	58.00	0.061	-24.29	82.50	0.031	-30.17
-2.50	0.311	-10.14	9.75	0.149	-16.54	34.00	0.033	-29.63	58.50	0.058	-24.73	83.00	0.033	-29.63
-2.25	0.289	-10.78	10.00	0.127	-17.92	34.50	0.044	-27.13	59.00	0.050	-26.02	83.50	0.034	-29.37
-2.00	0.252	-11.97	10.50	0.098	-20.18	35.00	0.053	-25.51	59.50	0.040	-27.96	84.00	0.034	-29.37
-1.75	0.209	-13.60	11.00	0.108	-19.33	35.50	0.058	-24.73	60.00	0.030	-30.46	84.50	0.034	-29.37
-1.50	0.174	-15.19	11.50	0.132	-17.59	36.00	0.054	-25.35	60.50	0.022	-33.15	85.00	0.033	-29.63
-1.25	0.177	-15.04	12.00	0.141	-17.02	36.50	0.045	-26.94	61.00	0.025	-32.04	85.50	0.032	-29.90
-1.00	0.232	-12.69	12.50	0.129	-17.79	37.00	0.034	-29.37	61.50	0.034	-29.37	86.00	0.030	-30.46
-0.75	0.321	-9.87	13.00	0.100	-20.00	37.50	0.029	-30.75	62.00	0.044	-27.13	86.50	0.028	-31.06
-0.50	0.426	-7.41	13.50	0.074	-22.62	38.00	0.036	-28.87	62.50	0.054	-25.35	87.00	0.026	-31.70
-0.25	0.536	-5.42	14.00	0.076	-22.38	38.50	0.047	-26.56	63.00	0.062	-24.15	87.50	0.022	-33.15
0.00	0.643	-3.84	14.50	0.096	-20.35	39.00	0.054	-25.35	63.50	0.067	-23.48	88.00	0.020	-33.98
0.25	0.744	-2.57	15.00	0.110	-19.17	39.50	0.056	-25.04	64.00	0.068	-23.35	88.50	0.017	-35.39
0.50	0.831	-1.61	15.50	0.106	-19.49	40.00	0.051	-25.85	64.50	0.067	-23.48	89.00	0.013	-37.72
0.75	0.904	-0.88	16.00	0.087	-21.21	40.50	0.041	-27.74	65.00	0.063	-24.01	89.50	0.009	-40.92
1.00	0.956	-0.39	16.50	0.065	-23.74	41.00	0.030	-30.46	65.50	0.056	-25.04	90.00	0.000	---
1.25	0.990	-0.09	17.00	0.058	-24.73	41.50	0.028	-31.06	66.00	0.046	-26.74			
1.50	1.000	0.00	17.50	0.072	-22.85	42.00	0.036	-28.87	66.50	0.036	-28.87			
1.75	0.989	-0.10	18.00	0.087	-21.21	42.50	0.046	-26.74	67.00	0.025	-32.04			
2.00	0.957	-0.38	18.50	0.090	-20.92	43.00	0.053	-25.51	67.50	0.018	-34.89			
2.25	0.906	-0.86	19.00	0.080	-21.94	43.50	0.056	-25.04	68.00	0.019	-34.42			
2.50	0.839	-1.52	19.50	0.061	-24.29	44.00	0.051	-25.85	68.50	0.028	-31.06			
2.75	0.761	-2.37	20.00	0.048	-26.38	44.50	0.043	-27.33	69.00	0.038	-28.40			
3.00	0.674	-3.43	20.50	0.054	-25.35	45.00	0.032	-29.90	69.50	0.049	-26.20			
3.25	0.587	-4.63	21.00	0.070	-23.10	45.50	0.026	-31.70	70.00	0.058	-24.73			
3.50	0.504	-5.95	21.50	0.079	-22.05	46.00	0.031	-30.17	70.50	0.066	-23.61			
3.75	0.434	-7.25	22.00	0.075	-22.50	46.50	0.041	-27.74	71.00	0.071	-22.97			
4.00	0.383	-8.34	22.50	0.062	-24.15	47.00	0.051	-25.85	71.50	0.076	-22.38			
4.25	0.354	-9.02	23.00	0.046	-26.74	47.50	0.056	-25.04	72.00	0.079	-22.05			
4.50	0.347	-9.19	23.50	0.042	-27.54	48.00	0.056	-25.04	72.50	0.079	-22.05			
4.75	0.352	-9.07	24.00	0.053	-25.51	48.50	0.050	-26.02	73.00	0.078	-22.16			
5.00	0.360	-8.87	24.50	0.066	-23.61	49.00	0.041	-27.74	73.50	0.075	-22.50			
5.25	0.365	-8.75	25.00	0.070	-23.10	49.50	0.031	-30.17	74.00	0.071	-22.97			
5.50	0.361	-8.85	25.50	0.064	-23.88	50.00	0.026	-31.70	74.50	0.066	-23.61			
5.75	0.349	-9.14	26.00	0.051	-25.85	50.50	0.030	-30.46	75.00	0.059	-24.58			
6.00	0.326	-9.74	26.50	0.038	-28.40	51.00	0.040	-27.96	75.50	0.052	-25.68			
6.25	0.295	-10.60	27.00	0.040	-27.96	51.50	0.050	-26.02	76.00	0.045	-26.94			
6.50	0.259	-11.73	27.50	0.052	-25.68	52.00	0.057	-24.88	76.50	0.037	-28.64			
6.75	0.221	-13.11	28.00	0.063	-24.01	52.50	0.058	-24.73	77.00	0.030	-30.46			
7.00	0.187	-14.56	28.50	0.064	-23.88	53.00	0.056	-25.04	77.50	0.022	-33.15			

Azimuth Pattern

Type:	ATW-V10		**Polarization:**	Vertical
Directivity:	2.83 numeric	(4.52 dB)	**Frequency:**	32 (ATSC)
Peak(s) at:			**Location:**	Fresno, CA

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

Relative Field



Tabulated Data for Azimuth Pattern

Type: ATW-V10

Angle	Field	dB
0	0.266	-11.50
2	0.256	-11.84
4	0.247	-12.15
6	0.237	-12.51
8	0.228	-12.84
10	0.219	-13.19
12	0.211	-13.51
14	0.202	-13.89
16	0.194	-14.24
18	0.188	-14.52
20	0.182	-14.80
22	0.176	-15.09
24	0.172	-15.29
26	0.169	-15.44
28	0.166	-15.60
30	0.164	-15.70
32	0.162	-15.81
34	0.161	-15.86
36	0.161	-15.86
38	0.161	-15.86
40	0.160	-15.92
42	0.160	-15.92
44	0.160	-15.92
46	0.161	-15.86
48	0.161	-15.86
50	0.161	-15.86
52	0.161	-15.86
54	0.161	-15.86
56	0.160	-15.92
58	0.160	-15.92
60	0.160	-15.92
62	0.161	-15.86
64	0.161	-15.86
66	0.161	-15.86
68	0.162	-15.81
70	0.164	-15.70
72	0.166	-15.60
74	0.169	-15.44
76	0.172	-15.29
78	0.176	-15.09
80	0.182	-14.80
82	0.188	-14.52
84	0.194	-14.24
86	0.202	-13.89
88	0.211	-13.51
90	0.219	-13.19
92	0.228	-12.84
94	0.237	-12.51
96	0.247	-12.15
98	0.256	-11.84

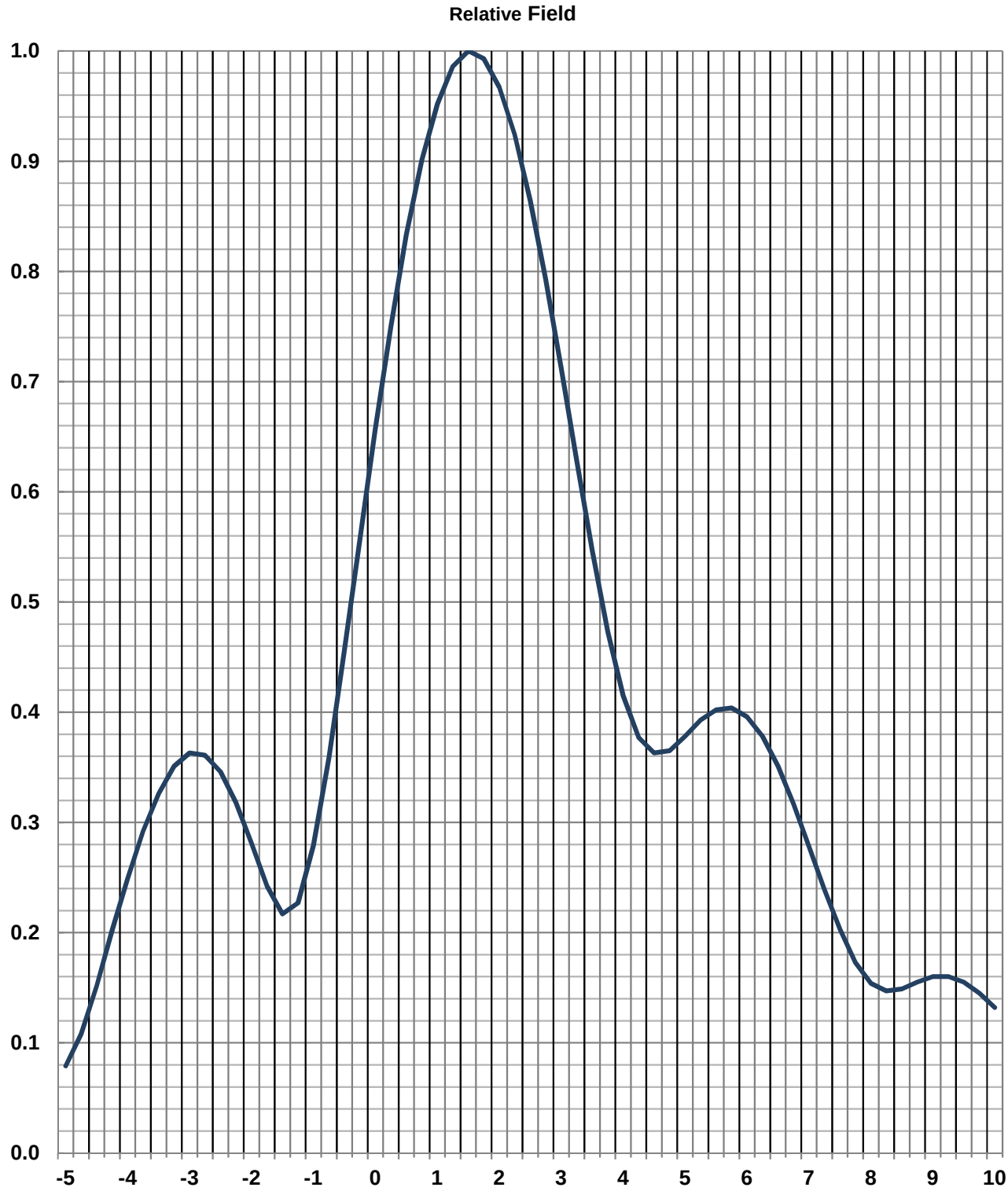
Angle	Field	dB
100	0.266	-11.50
102	0.275	-11.21
104	0.285	-10.90
106	0.293	-10.66
108	0.302	-10.40
110	0.310	-10.17
112	0.318	-9.95
114	0.327	-9.71
116	0.334	-9.53
118	0.341	-9.34
120	0.348	-9.17
122	0.355	-9.00
124	0.361	-8.85
126	0.368	-8.68
128	0.375	-8.52
130	0.381	-8.38
132	0.389	-8.20
134	0.396	-8.05
136	0.406	-7.83
138	0.415	-7.64
140	0.425	-7.43
142	0.436	-7.21
144	0.450	-6.94
146	0.463	-6.69
148	0.477	-6.43
150	0.493	-6.14
152	0.509	-5.87
154	0.526	-5.58
156	0.544	-5.29
158	0.563	-4.99
160	0.581	-4.72
162	0.601	-4.42
164	0.620	-4.15
166	0.639	-3.89
168	0.659	-3.62
170	0.678	-3.38
172	0.698	-3.12
174	0.717	-2.89
176	0.736	-2.66
178	0.754	-2.45
180	0.772	-2.25
182	0.788	-2.07
184	0.805	-1.88
186	0.821	-1.71
188	0.836	-1.56
190	0.850	-1.41
192	0.864	-1.27
194	0.878	-1.13
196	0.891	-1.00
198	0.903	-0.89

Angle	Field	dB
200	0.915	-0.77
202	0.926	-0.67
204	0.936	-0.57
206	0.946	-0.48
208	0.954	-0.41
210	0.962	-0.34
212	0.968	-0.28
214	0.975	-0.22
216	0.980	-0.18
218	0.985	-0.13
220	0.989	-0.10
222	0.994	-0.05
224	0.997	-0.03
226	0.998	-0.02
228	0.999	-0.01
230	1.000	0.00
232	0.999	-0.01
234	0.998	-0.02
236	0.997	-0.03
238	0.994	-0.05
240	0.989	-0.10
242	0.985	-0.13
244	0.980	-0.18
246	0.975	-0.22
248	0.968	-0.28
250	0.962	-0.34
252	0.954	-0.41
254	0.946	-0.48
256	0.936	-0.57
258	0.926	-0.67
260	0.915	-0.77
262	0.904	-0.88
264	0.892	-0.99
266	0.879	-1.12
268	0.865	-1.26
270	0.851	-1.40
272	0.836	-1.56
274	0.821	-1.71
276	0.805	-1.88
278	0.789	-2.06
280	0.772	-2.25
282	0.754	-2.45
284	0.736	-2.66
286	0.718	-2.88
288	0.698	-3.12
290	0.678	-3.38
292	0.659	-3.62
294	0.639	-3.89
296	0.620	-4.15
298	0.601	-4.42

Angle	Field	dB
300	0.582	-4.70
302	0.563	-4.99
304	0.544	-5.29
306	0.526	-5.58
308	0.509	-5.87
310	0.493	-6.14
312	0.477	-6.43
314	0.463	-6.69
316	0.449	-6.96
318	0.436	-7.21
320	0.426	-7.41
322	0.415	-7.64
324	0.406	-7.83
326	0.396	-8.05
328	0.390	-8.18
330	0.382	-8.36
332	0.375	-8.52
334	0.368	-8.68
336	0.361	-8.85
338	0.355	-9.00
340	0.348	-9.17
342	0.341	-9.34
344	0.334	-9.53
346	0.327	-9.71
348	0.318	-9.95
350	0.311	-10.14
352	0.303	-10.37
354	0.294	-10.63
356	0.285	-10.90
358	0.275	-11.21
360	0.266	-11.50

Elevation Pattern

Type:	15H6V		**Polarization:**	Vertical
Directivity:			**Frequency:**	32 (ATSC)
Main Lobe:	15.00 numeric	(11.76 dB)	**Location:**	Fresno, CA
Horizontal:	6.47 numeric	(8.11 dB)	**Beam Tilt:**	1.50 degrees



Tabulated Data for Elevation Pattern

Type: 15H6V

-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	0.079	-22.05	7.25	0.239	-12.43	29.00	0.013	-37.72	53.50	0.021	-33.56	78.00	0.024	-32.40
-4.75	0.108	-19.33	7.50	0.203	-13.85	29.50	0.030	-30.46	54.00	0.006	-44.44	78.50	0.020	-33.98
-4.50	0.152	-16.36	7.75	0.173	-15.24	30.00	0.045	-26.94	54.50	0.016	-35.92	79.00	0.018	-34.89
-4.25	0.202	-13.89	8.00	0.154	-16.25	30.50	0.051	-25.85	55.00	0.033	-29.63	79.50	0.018	-34.89
-4.00	0.249	-12.08	8.25	0.147	-16.65	31.00	0.054	-25.35	55.50	0.046	-26.74	80.00	0.021	-33.56
-3.75	0.292	-10.69	8.50	0.149	-16.54	31.50	0.058	-24.73	56.00	0.058	-24.73	80.50	0.024	-32.40
-3.50	0.326	-9.74	8.75	0.155	-16.19	32.00	0.065	-23.74	56.50	0.066	-23.61	81.00	0.026	-31.70
-3.25	0.351	-9.09	9.00	0.160	-15.92	32.50	0.075	-22.50	57.00	0.069	-23.22	81.50	0.029	-30.75
-3.00	0.363	-8.80	9.25	0.160	-15.92	33.00	0.085	-21.41	57.50	0.069	-23.22	82.00	0.031	-30.17
-2.75	0.361	-8.85	9.50	0.155	-16.19	33.50	0.090	-20.92	58.00	0.066	-23.61	82.50	0.033	-29.63
-2.50	0.346	-9.22	9.75	0.145	-16.77	34.00	0.088	-21.11	58.50	0.059	-24.58	83.00	0.034	-29.37
-2.25	0.318	-9.95	10.00	0.132	-17.59	34.50	0.079	-22.05	59.00	0.052	-25.68	83.50	0.034	-29.37
-2.00	0.281	-11.03	10.50	0.104	-19.66	35.00	0.061	-24.29	59.50	0.048	-26.38	84.00	0.034	-29.37
-1.75	0.242	-12.32	11.00	0.104	-19.66	35.50	0.040	-27.96	60.00	0.045	-26.94	84.50	0.034	-29.37
-1.50	0.217	-13.27	11.50	0.135	-17.39	36.00	0.015	-36.48	60.50	0.046	-26.74	85.00	0.033	-29.63
-1.25	0.227	-12.88	12.00	0.168	-15.49	36.50	0.010	-40.00	61.00	0.051	-25.85	85.50	0.032	-29.90
-1.00	0.279	-11.09	12.50	0.185	-14.66	37.00	0.029	-30.75	61.50	0.058	-24.73	86.00	0.030	-30.46
-0.75	0.359	-8.90	13.00	0.179	-14.94	37.50	0.044	-27.13	62.00	0.064	-23.88	86.50	0.028	-31.06
-0.50	0.456	-6.82	13.50	0.152	-16.36	38.00	0.053	-25.51	62.50	0.068	-23.35	87.00	0.025	-32.04
-0.25	0.557	-5.08	14.00	0.113	-18.94	38.50	0.057	-24.88	63.00	0.070	-23.10	87.50	0.022	-33.15
0.00	0.657	-3.65	14.50	0.075	-22.50	39.00	0.057	-24.88	63.50	0.069	-23.22	88.00	0.020	-33.98
0.25	0.750	-2.50	15.00	0.057	-24.88	39.50	0.057	-24.88	64.00	0.066	-23.61	88.50	0.016	-35.92
0.50	0.833	-1.59	15.50	0.063	-24.01	40.00	0.060	-24.44	64.50	0.059	-24.58	89.00	0.013	-37.72
0.75	0.901	-0.91	16.00	0.071	-22.97	40.50	0.068	-23.35	65.00	0.050	-26.02	89.50	0.009	-40.92
1.00	0.952	-0.43	16.50	0.069	-23.22	41.00	0.074	-22.62	65.50	0.040	-27.96	90.00	0.000	---
1.25	0.986	-0.12	17.00	0.063	-24.01	41.50	0.078	-22.16	66.00	0.028	-31.06			
1.50	1.000	0.00	17.50	0.069	-23.22	42.00	0.077	-22.27	66.50	0.015	-36.48			
1.75	0.993	-0.06	18.00	0.089	-21.01	42.50	0.071	-22.97	67.00	0.008	-41.94			
2.00	0.967	-0.29	18.50	0.114	-18.86	43.00	0.058	-24.73	67.50	0.017	-35.39			
2.25	0.924	-0.69	19.00	0.130	-17.72	43.50	0.041	-27.74	68.00	0.029	-30.75			
2.50	0.864	-1.27	19.50	0.133	-17.52	44.00	0.021	-33.56	68.50	0.042	-27.54			
2.75	0.793	-2.01	20.00	0.120	-18.42	44.50	0.003	-50.46	69.00	0.053	-25.51			
3.00	0.712	-2.95	20.50	0.096	-20.35	45.00	0.020	-33.98	69.50	0.063	-24.01			
3.25	0.629	-4.03	21.00	0.064	-23.88	45.50	0.037	-28.64	70.00	0.071	-22.97			
3.50	0.547	-5.24	21.50	0.034	-29.37	46.00	0.050	-26.02	70.50	0.079	-22.05			
3.75	0.473	-6.50	22.00	0.026	-31.70	46.50	0.058	-24.73	71.00	0.083	-21.62			
4.00	0.415	-7.64	22.50	0.040	-27.96	47.00	0.061	-24.29	71.50	0.085	-21.41			
4.25	0.377	-8.47	23.00	0.050	-26.02	47.50	0.060	-24.44	72.00	0.087	-21.21			
4.50	0.363	-8.80	23.50	0.053	-25.51	48.00	0.057	-24.88	72.50	0.086	-21.31			
4.75	0.365	-8.75	24.00	0.056	-25.04	48.50	0.054	-25.35	73.00	0.084	-21.51			
5.00	0.378	-8.45	24.50	0.065	-23.74	49.00	0.054	-25.35	73.50	0.080	-21.94			
5.25	0.393	-8.11	25.00	0.080	-21.94	49.50	0.058	-24.73	74.00	0.075	-22.50			
5.50	0.402	-7.92	25.50	0.096	-20.35	50.00	0.064	-23.88	74.50	0.070	-23.10			
5.75	0.404	-7.87	26.00	0.106	-19.49	50.50	0.069	-23.22	75.00	0.063	-24.01			
6.00	0.396	-8.05	26.50	0.106	-19.49	51.00	0.070	-23.10	75.50	0.056	-25.04			
6.25	0.378	-8.45	27.00	0.097	-20.26	51.50	0.069	-23.22	76.00	0.049	-26.20			
6.50	0.351	-9.09	27.50	0.076	-22.38	52.00	0.062	-24.15	76.50	0.042	-27.54			
6.75	0.317	-9.98	28.00	0.050	-26.02	52.50	0.052	-25.68	77.00	0.035	-29.12			
7.00	0.278	-11.12	28.50	0.022	-33.15	53.00	0.037	-28.64	77.50	0.029	-30.75			