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

KDFI (DT), RF Channel 27
Fox Television Stations Inc., Dallas, TX

April 12, 2017

Antenna Model:
ETU12U2-HTP3C-27H

Specification Number
20170321-903

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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:		27	
Frequency:		548 MHz to 554 MHz	
Service:		ATSC	
Azimuth Pattern Number:	Horizontal Polarization	ETU-P3C-H	
Elevation Pattern Number:	Horizontal Polarization	ETU12U2H	
Azimuth Directivity:	Horizontal Polarization	1.90	(2.79 dB)
Elevation Directivity:	Horizontal Polarization	25.78	(14.11 dBd)
Peak Power Gain:	Horizontal Polarization	48.98	(16.90 dBd)
Gain at Horizontal:	Horizontal Polarization	42.23	(16.26 dBd)
Input Power Required:		16.93 kW	(12.29 dBk)
Electrical Beam Tilt:		0.50 Degrees	
RF Input:		6-1/8-inch, 75 ohm, EIA 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:			47.65 feet	(14.52 meters)
Height of Center of Radiation:			23.82 feet	(7.26 meters)
Overall Height (Includes four 3.5 foot lightning spurs):			51.15 feet	(15.59 meters)
Deicing:			Individual unpressurized radomes	
Antenna Dimensions:			40.5 inches	(1029.21 millimeters)
Radome Color:			Aviation Orange	
Climbing Device:			Fiberglass Climbing Step Bolts	
Calculated Weight[1]:		No Ice	11,365 lbs	(5155.1 kg)
Windload Data[3]:	EPA	No Ice	205.50 sq.ft.	(19.09 sq.m.)
Effective Moment Arm[3]:	EPA	No Ice	24.47 feet	(7.46 meters)

MOUNTING FLANGE[2]: Quantity (20), 1.38 inch holes for 1.25 inch bolts, on a 32.00 inch square mounting flange.

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.

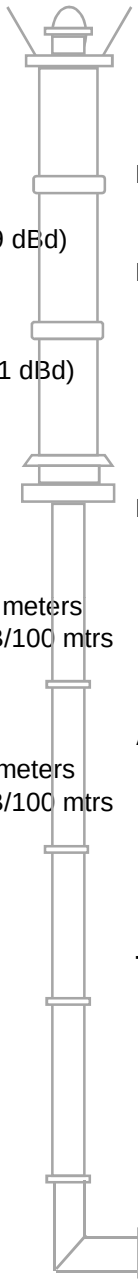
2 The mounting flange specified is the standard ERI mounting flange used for this antenna configuration. In those instances where an existing top mounted antenna is being replaced the antenna supplied will be designed with a mounting flange to match that of the existing antenna unless electrical and /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 ANSI/TIA-222 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

KDFI (DT) **RF Channel: 27**
Fox Television Stations Inc.
Dallas, TX
ETU12U2-HTP3C-27H



Antenna Parameters

Azimuth Directivity:
Horizontal: 1.90 (2.79 dBd)

Elevation Directivity:
Horizontal: 25.78 (14.11 dBd)

Transmission Line

Vertical Run:
Type: 6-1/8-inch, 75 ohm, rigid line
Length: 1,450 feet 442.0 meters
Attenuation: 0.107 dB/100 feet 0.351 dB/100 mtrs

Horizontal Run:
Type: 6-1/8-inch, 75 ohm, rigid line
Length: 150 feet 45.7 meters
Attenuation: 0.107 dB/100 feet 0.351 dB/100 mtrs

Line Efficiency: 67.42%

Frequency:
548 MHz to 554 MHz

Effective Radiated Power:
Horizontal: 829.00 kW (29.19 dBk)

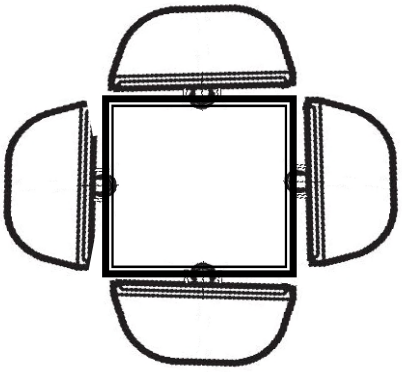
Power Gain:
Horizontal: 48.98 numeric (16.90 dBd)

Antenna Input Power:
16.93 kW (12.29 dBk)

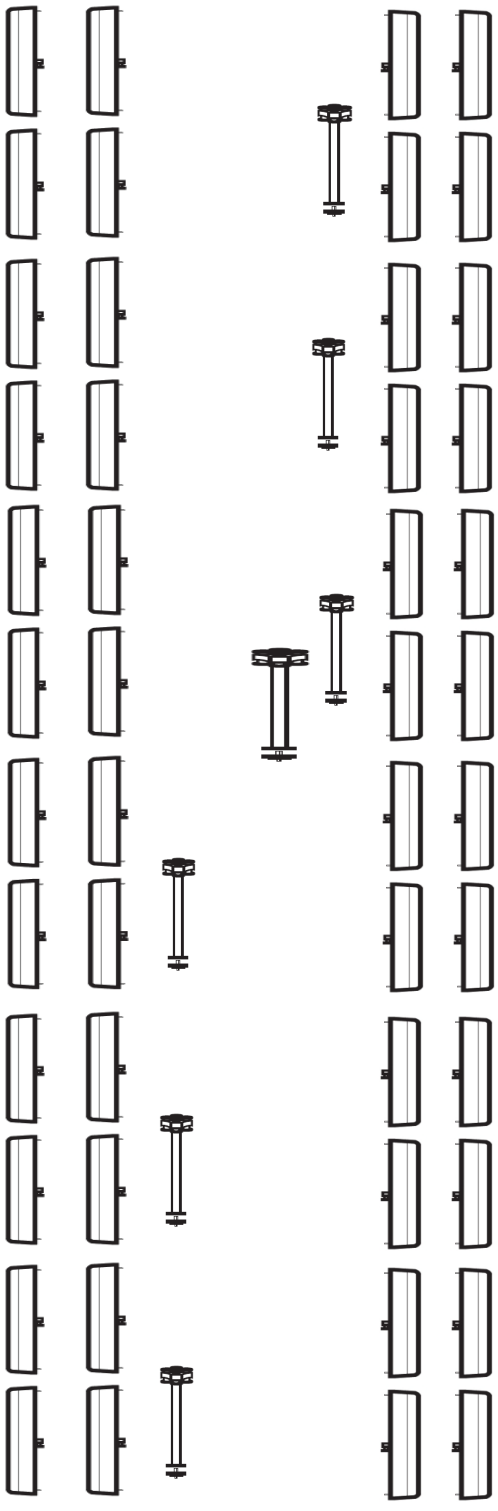
Transmission Line Losses:
-8.18 kW (1.712 dB)

Transmitter Power Output:
25.10 kW
(14.00 dBk)

Typical Mounting Configuration Shown. Actual Configuration May Vary.



TOP VIEW



Single 6-1/8-75 Ohm, EIA

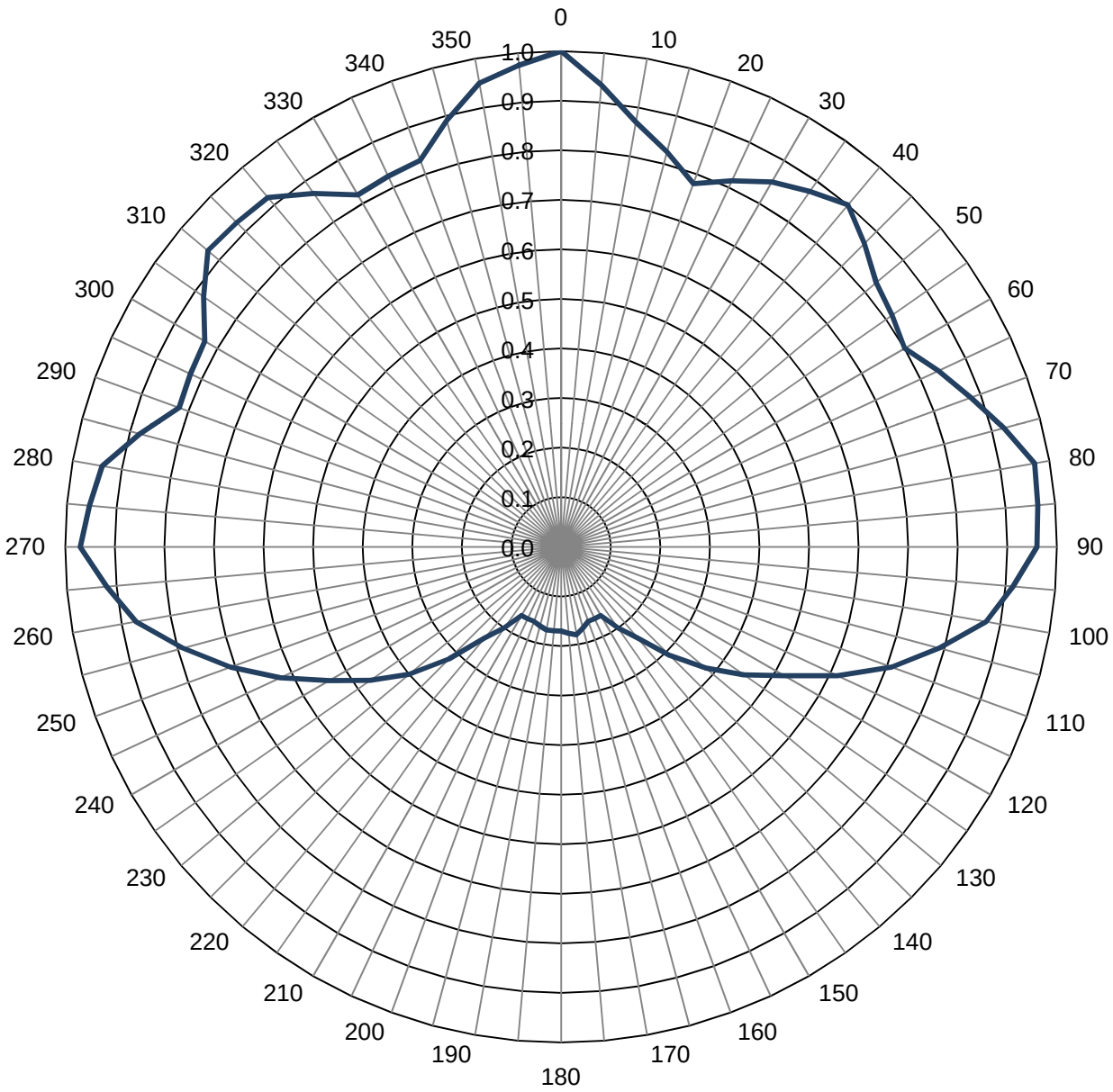
SCHEMATIC DIAGRAM

Azimuth Pattern

Type:	ETU-P3C-H		**Polarization:**	Horizontal
Directivity:	1.90 numeric	(2.79 dB)	**Frequency:**	27 (ATSC)
Peak(s) at:			**Location:**	Dallas, TX

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

Relative Field



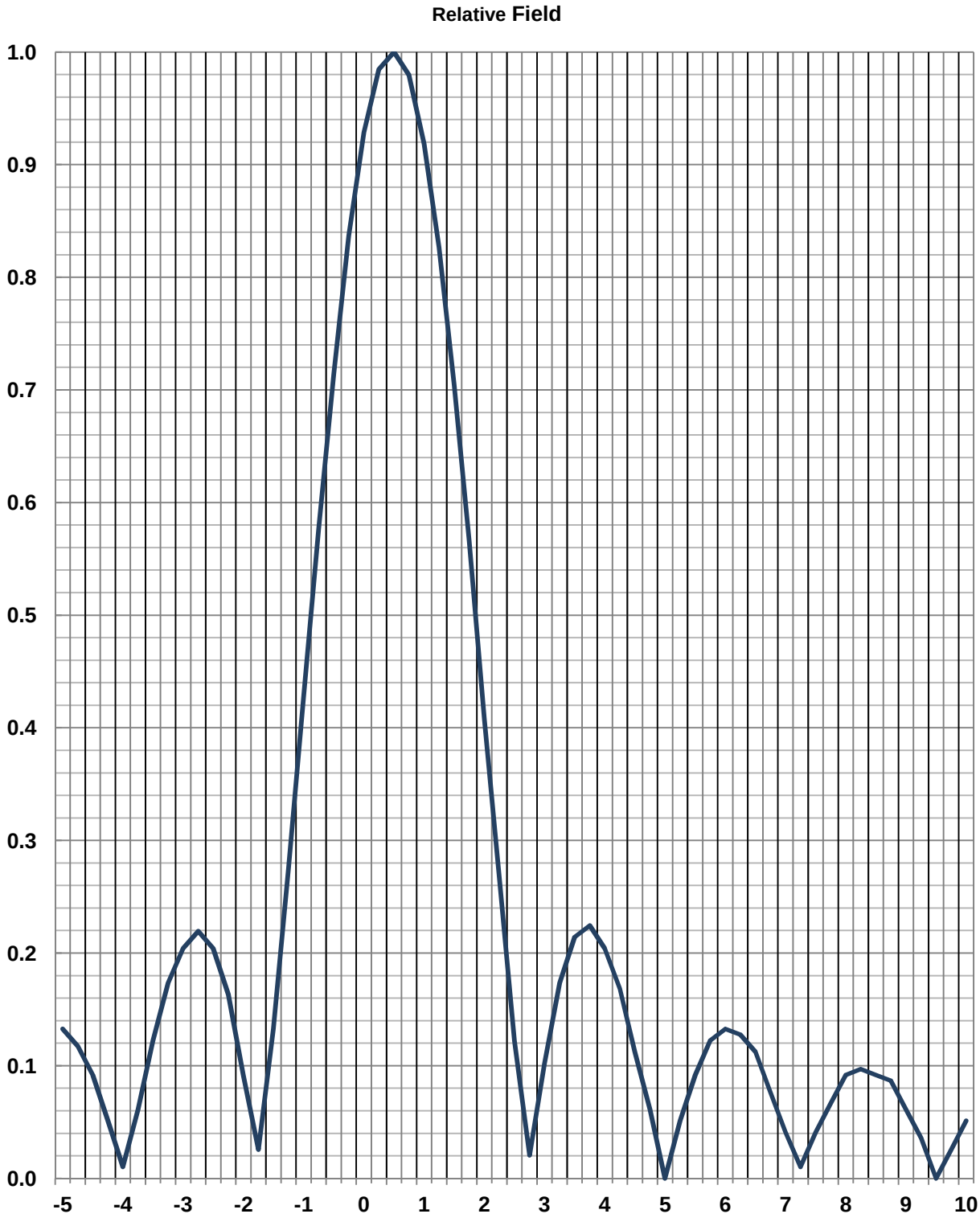
Tabulated Data for Azimuth Pattern

Type: ETU-P3C-H

Angle	Field	dB
0	1.000	0.00
2	0.974	-0.23
4	0.948	-0.46
6	0.922	-0.71
8	0.896	-0.95
10	0.870	-1.21
12	0.852	-1.39
14	0.834	-1.58
16	0.816	-1.77
18	0.798	-1.96
20	0.780	-2.16
22	0.794	-2.00
24	0.808	-1.85
26	0.822	-1.70
28	0.836	-1.56
30	0.850	-1.41
32	0.860	-1.31
34	0.870	-1.21
36	0.880	-1.11
38	0.890	-1.01
40	0.900	-0.92
42	0.886	-1.05
44	0.872	-1.19
46	0.858	-1.33
48	0.844	-1.47
50	0.830	-1.62
52	0.824	-1.68
54	0.818	-1.74
56	0.812	-1.81
58	0.806	-1.87
60	0.800	-1.94
62	0.816	-1.77
64	0.832	-1.60
66	0.848	-1.43
68	0.864	-1.27
70	0.880	-1.11
72	0.898	-0.93
74	0.916	-0.76
76	0.934	-0.59
78	0.952	-0.43
80	0.970	-0.26
82	0.968	-0.28
84	0.966	-0.30
86	0.964	-0.32
88	0.962	-0.34
90	0.960	-0.35
92	0.942	-0.52
94	0.924	-0.69
96	0.906	-0.86
98	0.888	-1.03
100	0.870	-1.21
102	0.838	-1.54
104	0.806	-1.87
106	0.774	-2.23
108	0.742	-2.59
110	0.710	-2.97
112	0.672	-3.45
114	0.634	-3.96
116	0.596	-4.50
118	0.558	-5.07
120	0.520	-5.68
122	0.492	-6.16
124	0.464	-6.67
126	0.436	-7.21
128	0.408	-7.79
130	0.380	-8.40
132	0.352	-9.07
134	0.324	-9.79
136	0.296	-10.57
138	0.268	-11.44
140	0.240	-12.40
142	0.224	-13.00
144	0.208	-13.64
146	0.192	-14.33
148	0.176	-15.09
150	0.160	-15.92
152	0.160	-15.92
154	0.160	-15.92
156	0.160	-15.92
158	0.160	-15.92
160	0.160	-15.92
162	0.164	-15.70
164	0.168	-15.49
166	0.172	-15.29
168	0.176	-15.09
170	0.180	-14.89
172	0.178	-14.99
174	0.176	-15.09
176	0.174	-15.19
178	0.172	-15.29
180	0.170	-15.39
182	0.170	-15.39
184	0.170	-15.39
186	0.170	-15.39
188	0.170	-15.39
190	0.170	-15.39
192	0.168	-15.49
194	0.166	-15.60
196	0.164	-15.70
198	0.162	-15.81
200	0.160	-15.92
202	0.160	-15.92
204	0.160	-15.92
206	0.160	-15.92
208	0.160	-15.92
210	0.160	-15.92
212	0.176	-15.09
214	0.192	-14.33
216	0.208	-13.64
218	0.224	-13.00
220	0.240	-12.40
222	0.272	-11.31
224	0.304	-10.34
226	0.336	-9.47
228	0.368	-8.68
230	0.400	-7.96
232	0.428	-7.37
234	0.456	-6.82
236	0.484	-6.30
238	0.512	-5.81
240	0.540	-5.35
242	0.574	-4.82
244	0.608	-4.32
246	0.642	-3.85
248	0.676	-3.40
250	0.710	-2.97
252	0.742	-2.59
254	0.774	-2.23
256	0.806	-1.87
258	0.838	-1.54
260	0.870	-1.21
262	0.890	-1.01
264	0.910	-0.82
266	0.930	-0.63
268	0.950	-0.45
270	0.970	-0.26
272	0.964	-0.32
274	0.958	-0.37
276	0.952	-0.43
278	0.946	-0.48
280	0.940	-0.54
282	0.916	-0.76
284	0.892	-0.99
286	0.868	-1.23
288	0.844	-1.47
290	0.820	-1.72
292	0.822	-1.70
294	0.824	-1.68
296	0.826	-1.66
298	0.828	-1.64
300	0.830	-1.62
302	0.850	-1.41
304	0.870	-1.21
306	0.890	-1.01
308	0.910	-0.82
310	0.930	-0.63
312	0.928	-0.65
314	0.926	-0.67
316	0.924	-0.69
318	0.922	-0.71
320	0.920	-0.72
322	0.900	-0.92
324	0.880	-1.11
326	0.860	-1.31
328	0.840	-1.51
330	0.820	-1.72
332	0.822	-1.70
334	0.824	-1.68
336	0.826	-1.66
338	0.828	-1.64
340	0.830	-1.62
342	0.854	-1.37
344	0.878	-1.13
346	0.902	-0.90
348	0.926	-0.67
350	0.950	-0.45
352	0.960	-0.35
354	0.970	-0.26
356	0.980	-0.18
358	0.990	-0.09
360	1.000	0.00

Elevation Pattern

Type:	ETU12U2H		**Polarization:**	Horizontal
Directivity:			**Frequency:**	27 (ATSC)
Main Lobe:	25.78 numeric	(14.11 dB)	**Location:**	Dallas, TX
Horizontal:	22.23 numeric	(13.47 dB)	**Beam Tilt:**	0.50 degrees



Tabulated Data for Elevation Pattern

Type: ETU12U2H

-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	0.133	-17.55	7.25	0.010	-39.82	29.00	0.296	-10.58	53.50	0.031	-30.28	78.00	0.020	-33.80
-4.75	0.117	-18.61	7.50	0.041	-27.78	29.50	0.235	-12.59	54.00	0.031	-30.28	78.50	0.010	-39.82
-4.50	0.092	-20.74	7.75	0.066	-23.57	30.00	0.163	-15.74	54.50	0.031	-30.28	79.00	0.000	---
-4.25	0.051	-25.85	8.00	0.092	-20.74	30.50	0.082	-21.76	55.00	0.020	-33.80	79.50	0.010	-39.82
-4.00	0.010	-39.82	8.25	0.097	-20.27	31.00	0.020	-33.80	55.50	0.010	-39.82	80.00	0.010	-39.82
-3.75	0.061	-24.26	8.50	0.092	-20.74	31.50	0.031	-30.28	56.00	0.000	---	80.50	0.020	-33.80
-3.50	0.122	-18.24	8.75	0.087	-21.24	32.00	0.051	-25.85	56.50	0.010	-39.82	81.00	0.020	-33.80
-3.25	0.173	-15.22	9.00	0.061	-24.26	32.50	0.051	-25.85	57.00	0.020	-33.80	81.50	0.020	-33.80
-3.00	0.204	-13.80	9.25	0.036	-28.94	33.00	0.041	-27.78	57.50	0.031	-30.28	82.00	0.031	-30.28
-2.75	0.219	-13.18	9.50	0.000	-244.9	33.50	0.010	-39.82	58.00	0.041	-27.78	82.50	0.031	-30.28
-2.50	0.204	-13.80	9.75	0.026	-31.87	34.00	0.010	-39.82	58.50	0.031	-30.28	83.00	0.031	-30.28
-2.25	0.163	-15.74	10.00	0.051	-25.85	34.50	0.031	-30.28	59.00	0.031	-30.28	83.50	0.041	-27.78
-2.00	0.092	-20.74	10.50	0.082	-21.76	35.00	0.031	-30.28	59.50	0.020	-33.80	84.00	0.041	-27.78
-1.75	0.026	-31.87	11.00	0.071	-22.92	35.50	0.031	-30.28	60.00	0.000	---	84.50	0.041	-27.78
-1.50	0.133	-17.55	11.50	0.031	-30.28	36.00	0.020	-33.80	60.50	0.010	-39.82	85.00	0.041	-27.78
-1.25	0.276	-11.20	12.00	0.020	-33.80	36.50	0.000	---	61.00	0.020	-33.80	85.50	0.041	-27.78
-1.00	0.429	-7.36	12.50	0.061	-24.26	37.00	0.010	-39.82	61.50	0.041	-27.78	86.00	0.041	-27.78
-0.75	0.577	-4.78	13.00	0.071	-22.92	37.50	0.031	-30.28	62.00	0.041	-27.78	86.50	0.041	-27.78
-0.50	0.714	-2.92	13.50	0.051	-25.85	38.00	0.031	-30.28	62.50	0.051	-25.85	87.00	0.041	-27.78
-0.25	0.837	-1.55	14.00	0.010	-39.82	38.50	0.020	-33.80	63.00	0.051	-25.85	87.50	0.041	-27.78
0.00	0.929	-0.64	14.50	0.031	-30.28	39.00	0.010	-39.82	63.50	0.041	-27.78	88.00	0.041	-27.78
0.25	0.985	-0.13	15.00	0.061	-24.26	39.50	0.000	-242.9	64.00	0.031	-30.28	88.50	0.051	-25.85
0.50	1.000	0.00	15.50	0.061	-24.26	40.00	0.020	-33.80	64.50	0.020	-33.80	89.00	0.051	-25.85
0.75	0.980	-0.18	16.00	0.031	-30.28	40.50	0.020	-33.80	65.00	0.000	-240.7	89.50	0.051	-25.85
1.00	0.918	-0.74	16.50	0.000	-244.3	41.00	0.031	-30.28	65.50	0.020	-33.80	90.00	0.051	-25.85
1.25	0.827	-1.65	17.00	0.041	-27.78	41.50	0.020	-33.80	66.00	0.051	-25.85			
1.50	0.704	-3.05	17.50	0.061	-24.26	42.00	0.010	-39.82	66.50	0.071	-22.92			
1.75	0.566	-4.94	18.00	0.051	-25.85	42.50	0.010	-39.82	67.00	0.092	-20.74			
2.00	0.408	-7.78	18.50	0.020	-33.80	43.00	0.020	-33.80	67.50	0.112	-19.00			
2.25	0.265	-11.53	19.00	0.020	-33.80	43.50	0.020	-33.80	68.00	0.133	-17.55			
2.50	0.122	-18.24	19.50	0.051	-25.85	44.00	0.031	-30.28	68.50	0.153	-16.30			
2.75	0.020	-33.80	20.00	0.061	-24.26	44.50	0.020	-33.80	69.00	0.163	-15.74			
3.00	0.102	-19.82	20.50	0.051	-25.85	45.00	0.010	-39.82	69.50	0.173	-15.22			
3.25	0.173	-15.22	21.00	0.010	-39.82	45.50	0.000	-241.8	70.00	0.173	-15.22			
3.50	0.214	-13.38	21.50	0.031	-30.28	46.00	0.010	-39.82	70.50	0.173	-15.22			
3.75	0.224	-12.98	22.00	0.061	-24.26	46.50	0.020	-33.80	71.00	0.173	-15.22			
4.00	0.204	-13.80	22.50	0.071	-22.92	47.00	0.031	-30.28	71.50	0.173	-15.22			
4.25	0.168	-15.47	23.00	0.051	-25.85	47.50	0.020	-33.80	72.00	0.163	-15.74			
4.50	0.112	-19.00	23.50	0.010	-39.82	48.00	0.020	-33.80	72.50	0.153	-16.30			
4.75	0.061	-24.26	24.00	0.041	-27.78	48.50	0.000	---	73.00	0.143	-16.90			
5.00	0.000	-239.2	24.50	0.082	-21.76	49.00	0.010	-39.82	73.50	0.133	-17.55			
5.25	0.051	-25.85	25.00	0.092	-20.74	49.50	0.020	-33.80	74.00	0.112	-19.00			
5.50	0.092	-20.74	25.50	0.061	-24.26	50.00	0.031	-30.28	74.50	0.102	-19.82			
5.75	0.122	-18.24	26.00	0.010	-39.82	50.50	0.031	-30.28	75.00	0.092	-20.74			
6.00	0.133	-17.55	26.50	0.071	-22.92	51.00	0.020	-33.80	75.50	0.082	-21.76			
6.25	0.128	-17.89	27.00	0.163	-15.74	51.50	0.020	-33.80	76.00	0.061	-24.26			
6.50	0.112	-19.00	27.50	0.245	-12.22	52.00	0.000	---	76.50	0.051	-25.85			
6.75	0.077	-22.32	28.00	0.306	-10.28	52.50	0.010	-39.82	77.00	0.041	-27.78			
7.00	0.041	-27.78	28.50	0.316	-10.00	53.00	0.020	-33.80	77.50	0.031	-30.28			