

ENGINEERING STATEMENT RE
APPLICATION FOR LICENSE FOR CONSTRUCTION PERMIT
FCC FILE NO. BMPDTT-20120117AFU
K20LK-D (K58IH), COLSTRIP, ETC., MONTANA
CHANNEL 20 2.84 KW MAX ERP 1468.7 METERS RC/AMSL

JUNE 2012

COHEN, DIPPELL AND EVERIST, P.C.
CONSULTING ENGINEERS
RADIO AND TELEVISION
WASHINGTON, D.C.

COHEN, DIPPELL AND EVERIST, P. C.

City of Washington)
) ss
District of Columbia)

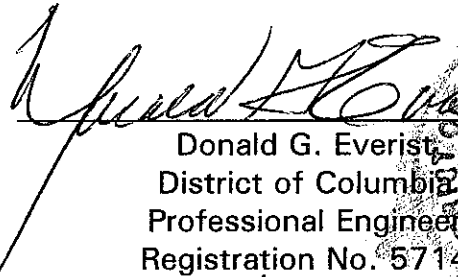
Donald G. Everist, being duly sworn upon his oath, deposes and states that:

He is a graduate electrical engineer, a Registered Professional Engineer in the District of Columbia, and is President, Secretary and Treasurer of Cohen, Dippell and Everist, P.C., Consulting Engineers, Radio - Television, with offices at 1420 N Street, N.W., Suite One, Washington, D.C. 20005;

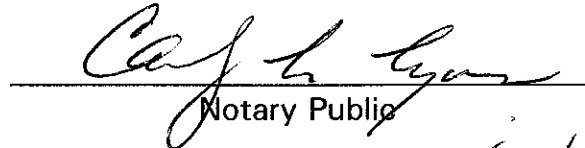
That his qualifications are a matter of record in the Federal Communications Commission;

That the attached engineering report was prepared by him or under his supervision and direction and

That the facts stated herein are true of his own knowledge, except such facts as are stated to be on information and belief, and as to such facts he believes them to be true.


Donald G. Everist
District of Columbia
Professional Engineer
Registration No. 5714

Subscribed and sworn to before me this 5th day of June, 2012.


Notary Public

My Commission Expires: 2/8/2013



INTRODUCTION

This engineering statement has been prepared on behalf of Nexstar Broadcasting, Inc., licensee of TV translator K58IH, Colstrip, Etc., Montana. This statement supports the licensee's request for license of the outstanding construction permit (FCC File No. BMPDTT-20120117AFU) to convert to DTV operation Channel 20 (K20LK-D) with a DTV effective radiated power ("ERP") of 2.84 kW at a radiation center above mean sea level ("RCAMSL") of 1468.7 meters. The transmission by the analog facility K58IH has been terminated.

K58IH TRANSMITTER SITE

The existing antenna site is utilized and no significant alteration of the tower was required. The geographic coordinates of the site follow below.

North Latitude: 45° 50' 20"

West Longitude: 106° 54' 17"

NAD-27

EQUIPMENT DATA

Transmitter:	Type-approved with Simple Mask
Combiner:	2-way Branch Combiner
Transmission Line:	Andrew Heliax, Type LDF-12-50, 2-1/4", 15 meters with 94.6% efficiency [1.46 dB loss/100 m]
Antenna:	ERI, AL8N-205 (or equivalent) diplexed with maximum gain of 32.81 (15.16 dB) and 2.0° electrical beam tilt oriented at N 30°ET. See Exhibit E-1 for the manufacturer antenna data.

POWER DATA

Transmitter:	0.0987 KW	-10.05 dBk
Combiner Efficiency/Loss:	92.3%	-0.35 dB
Transmission Line Efficiency/Loss:	95.0%	-0.222 dB
Input Into Antenna:	0.0866 kW	-10.63 dBk
Antenna Gain:	32.81	15.16 dB
ERP:	2.84	4.53 dBk

ELEVATION DATA

Elevation of site above mean sea level	1458 meters (4783.5 feet)
Center of radiation of antenna above ground level	10.7 meters (35.0 feet)
Center of radiation of antenna above mean sea level	1468.7 meters (4818.5 feet)
Overall height of tower above ground	12.2 meters (40 feet)

COHEN, DIPPELL AND EVERIST, P.C.

EXHIBIT E-1

ANTENNA MANUFACTURER DATA

K20LK-D (K58IH), COLSTRIP, ETC., MONTANA

***PRELIMINARY SPECIFICATION FOR
DUAL CHANNEL AL8 HORIZONTALLY POLARIZED
COAXIAL SLOTTED ARRAY ANTENNA***

*Prepared for
Nexstar Broadcasting Channel 20 and 24
November 21, 2011*

**ANTENNA TYPE:
AL8N-205**

**SPECIFICATION NO :
WAH-2011081501 RevA**



**PRELIMINARY SPECIFICATION FOR
DUAL CHANNEL AL8 HORIZONTALLY POLARIZED
COAXIAL SLOTTED ARRAY ANTENNA**

ELECTRICAL CHARACTERISTICS:

CHANNEL :	CH20	20
	CH24	24
FREQUENCY RANGE :	CH20	506 - 512 MHz
	CH24	530 - 536 MHz
AZIMUTH PATTERN NUMBER :		AL-N
ELEVATION PATTERN NUMBER :	CH20	AL8
	CH24	AL8
AZIMUTH DIRECTIVITY :	CH20	3.78 (5.77 dBd)
	CH24	3.78 (5.77 dBd)
ELEVATION DIRECTIVITY :	CH20	8.68 (9.39 dBd)
	CH24	8.68 (9.39 dBd)
PEAK POWER GAIN :	CH20	32.81 (15.16 dBd)
	CH24	32.81 (15.16 dBd)
GAIN AT HORIZONTAL :	CH20	26.27 (14.26 dBd)
	CH24	28.25 (14.51 dBd)
ELECTRICAL BEAM TILT :	CH20	2.00 Degrees
	CH24	1.75 Degrees
INPUT POWER CAPABILITY:		1.0 kW, average power, 8VSB
INPUT TYPE :		7/16 DIN
ANTENNA VSWR (MAXIMUM) :		1.35 Over each 6MHz Channel

PRELIMINARY SPECIFICATION FOR DUAL CHANNEL AL8 HORIZONTALLY POLARIZED COAXIAL SLOTTED ARRAY ANTENNA

MECHANICAL CHARACTERISTICS:

MOUNTING CONFIGURATION:

Side Mount*

*(Tower Interface supplied and installed by others)

HEIGHT OF ANTENNA :	19.18 feet	5.85 meters	
HEIGHT OF CENTER OF RADIATION:	9.59 feet	2.92 meters	
OVERALL HEIGHT:	19.18 feet	5.85 meters	
DEICING :	Unpressurized Radome Slot Covers		
DIAMETER (O.D.):	3.5 inches	9 centimeters	
SLOT COVER COLOR :	GRAY		
CLIMBING DEVICE :	Not Applicable		
CALCULATED WEIGHT :	127 Pounds	57.7 kilograms	
CaAc ² :	Normal Exposure	15.22 sq ft	1.41 sq mtr
	Transverse Exposure	11.56 sq ft	1.07 sq mtr

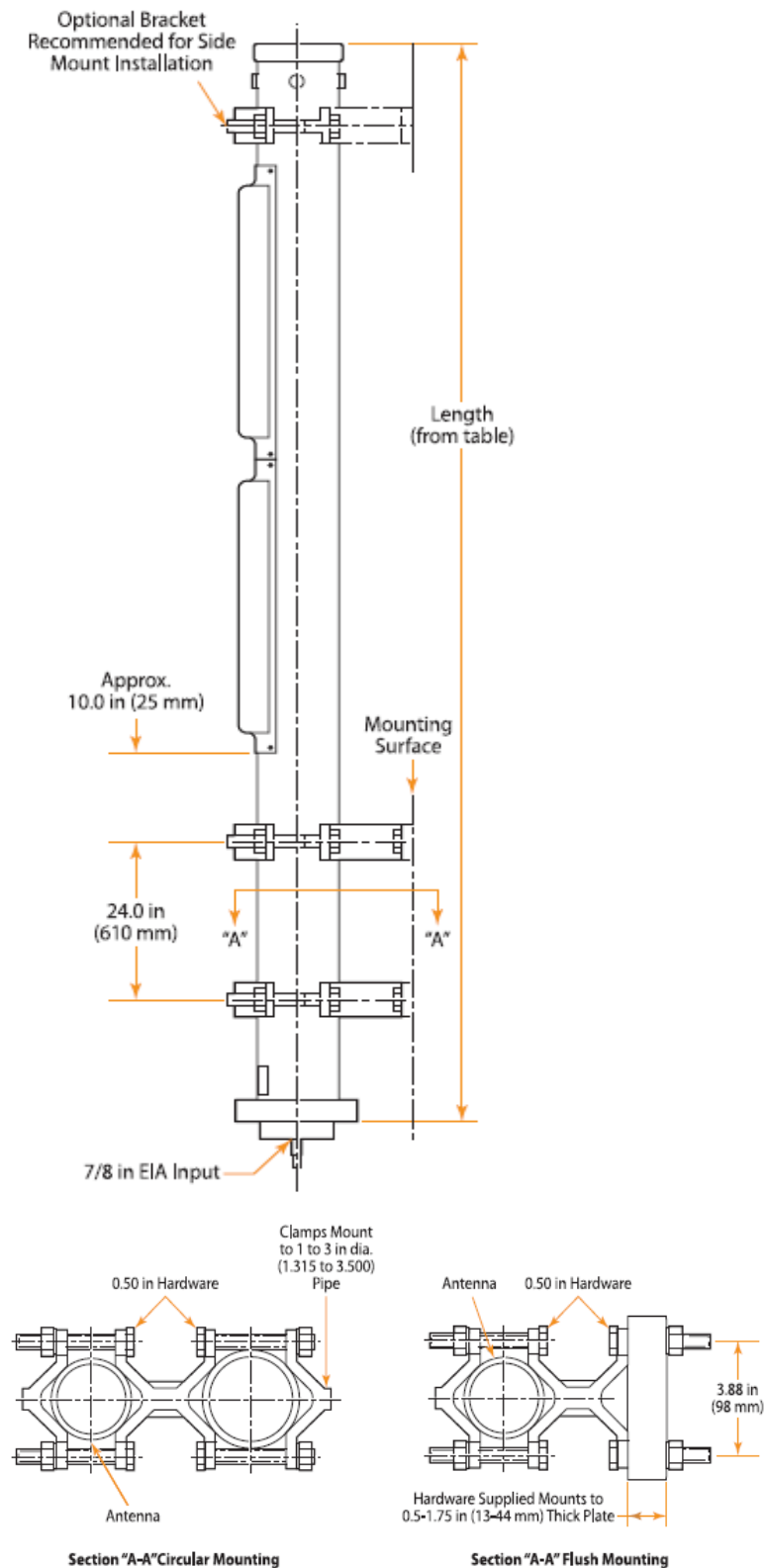
This antenna is designed to be supported by a structure that can resist the antenna base reactions and which provides a support that is rigid in the three translational and three rotational degrees of freedom.

1 Calculated weight is based on the **PRELIMINARY** design of the antenna. The actual weight of the antenna will be within $\pm 10\%$ of the calculated weight. The actual weight will be given in the technical manual that accompanies the antenna. This figure is for the antenna only and does not include the antenna input section.

2 Loads are calculated in accordance with EIA/TIA-222-G standards. Listed areas include preliminary design of all aperture components including antenna modules, feed harness and basic mounting brackets.

NOTE: Localized conditions may require higher wind speed specifications than TIA/EIA specifications. Check with local authorities to verify wind speed requirements.

TYPICAL MOUNTING CONFIGURATION SHOWN. ACTUAL CONFIGURATION MAY VARY.
DUAL CHANNEL AL8 HORIZONTALLY POLARIZED



Broadcast Antenna System

Power Analysis

Channel 20

ANTENNA PARAMETERS :

Azimuth Directivity :

Hor. Pol : 3.78

dBd : 5.77

Elevation Directivity :

Hor. Pol : 8.68

dBd : 9.39

TRANSMISSION LINE :

VERTICAL RUN :

Type: 2 1/4" Heliax (LDF12-50)

Length, mtr. : 13

Attenuation , dB/100 mtr: 1.486

HORIZONTAL RUN :

Type: 2 1/4" Heliax (LDF12-50)

Length, m : 2

Attenuation , dB/100 m: 1.486

COMBINER LOSSES:

Type: TEE Combiner

Loss, dB: 0.35

System Efficiency : 87.64%

ERP :

kW : 2.84

dBk : 4.53

POWER GAIN :

Ratio : 32.81

dBd : 15.16

ANTENNA INPUT :

kW : 0.09

dBk : -10.63

SYSTEM LOSS :

kW : 0.01

dB : 0.57

TRANSMITTER POWER :

kW : 0.0988

dBk : -10.05

AZIMUTH PATTERN

Peak Gain: 32.81 (15.16 dBd)

TYPE:

AL8-N

Directivity:

Numeric
3.78

dB
(5.77)

Peak(s) at:

30 degrees

Polarization:

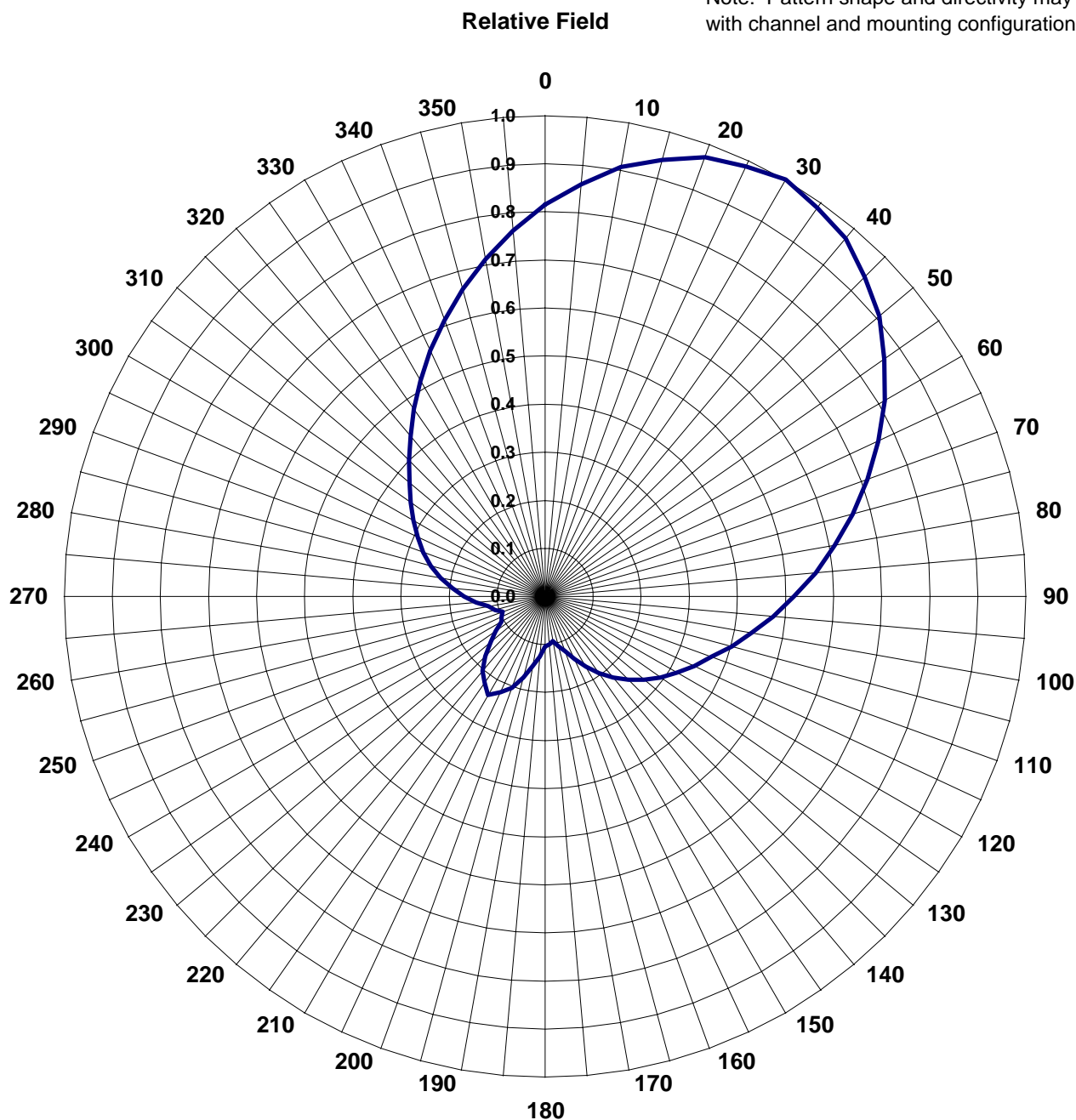
Horizontal

Channel:

20

Location:

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



TABULATED DATA FOR AZIMUTH PATTERN**TYPE: AL8-N**

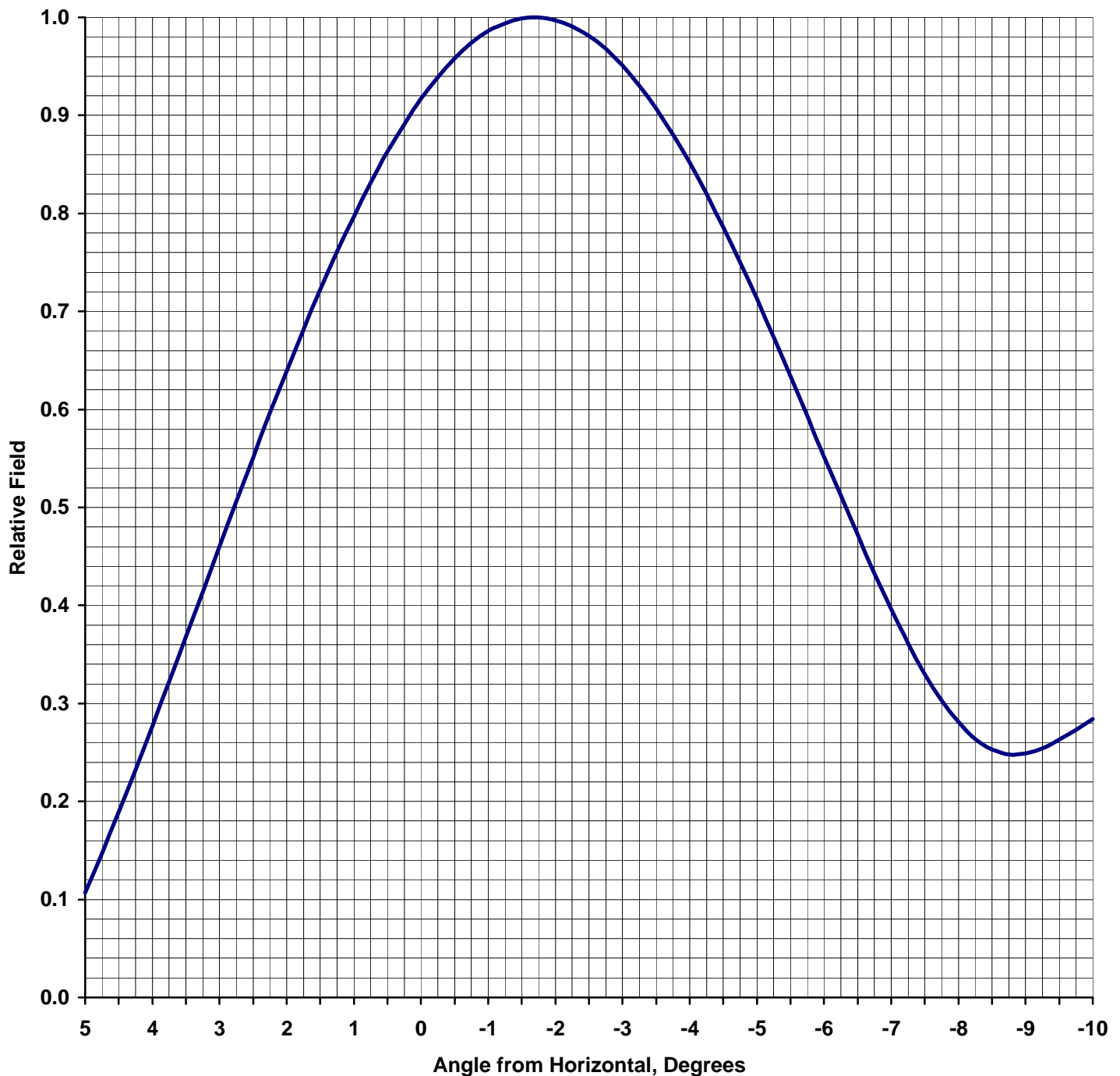
Channel 20

ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB
0	0.815	-0.89	92	0.501	-3.00	184	0.121	-9.17	276	0.200	-6.99
2	0.833	-0.79	94	0.484	-3.15	186	0.130	-8.86	278	0.210	-6.78
4	0.851	-0.70	96	0.468	-3.30	188	0.138	-8.60	280	0.221	-6.56
6	0.870	-0.60	98	0.451	-3.46	190	0.147	-8.33	282	0.231	-6.36
8	0.888	-0.52	100	0.435	-3.62	192	0.158	-8.01	284	0.240	-6.20
10	0.906	-0.43	102	0.422	-3.75	194	0.169	-7.72	286	0.250	-6.02
12	0.919	-0.37	104	0.408	-3.89	196	0.180	-7.45	288	0.259	-5.87
14	0.932	-0.31	106	0.395	-4.03	198	0.191	-7.19	290	0.269	-5.70
16	0.946	-0.24	108	0.381	-4.19	200	0.202	-6.95	292	0.278	-5.56
18	0.959	-0.18	110	0.368	-4.34	202	0.209	-6.80	294	0.288	-5.41
20	0.972	-0.12	112	0.358	-4.46	204	0.216	-6.66	296	0.297	-5.27
22	0.978	-0.10	114	0.347	-4.60	206	0.222	-6.54	298	0.307	-5.13
24	0.983	-0.07	116	0.337	-4.72	208	0.229	-6.40	300	0.316	-5.00
26	0.989	-0.05	118	0.326	-4.87	210	0.236	-6.27	302	0.326	-4.87
28	0.994	-0.03	120	0.316	-5.00	212	0.229	-6.40	304	0.337	-4.72
30	1.000	0.00	122	0.307	-5.13	214	0.222	-6.54	306	0.347	-4.60
32	0.994	-0.03	124	0.297	-5.27	216	0.216	-6.66	308	0.358	-4.46
34	0.989	-0.05	126	0.288	-5.41	218	0.209	-6.80	310	0.368	-4.34
36	0.983	-0.07	128	0.278	-5.56	220	0.202	-6.95	312	0.381	-4.19
38	0.978	-0.10	130	0.269	-5.70	222	0.191	-7.19	314	0.395	-4.03
40	0.972	-0.12	132	0.259	-5.87	224	0.180	-7.45	316	0.408	-3.89
42	0.959	-0.18	134	0.250	-6.02	226	0.169	-7.72	318	0.422	-3.75
44	0.946	-0.24	136	0.240	-6.20	228	0.158	-8.01	320	0.435	-3.62
46	0.932	-0.31	138	0.231	-6.36	230	0.147	-8.33	322	0.451	-3.46
48	0.919	-0.37	140	0.221	-6.56	232	0.138	-8.60	324	0.468	-3.30
50	0.906	-0.43	142	0.210	-6.78	234	0.130	-8.86	326	0.484	-3.15
52	0.888	-0.52	144	0.200	-6.99	236	0.121	-9.17	328	0.501	-3.00
54	0.870	-0.60	146	0.189	-7.24	238	0.113	-9.47	330	0.517	-2.87
56	0.851	-0.70	148	0.179	-7.47	240	0.104	-9.83	332	0.536	-2.71
58	0.833	-0.79	150	0.168	-7.75	242	0.102	-9.91	334	0.555	-2.56
60	0.815	-0.89	152	0.158	-8.01	244	0.100	-10.00	336	0.573	-2.42
62	0.795	-1.00	154	0.149	-8.27	246	0.098	-10.09	338	0.592	-2.28
64	0.774	-1.11	156	0.139	-8.57	248	0.096	-10.18	340	0.611	-2.14
66	0.754	-1.23	158	0.130	-8.86	250	0.094	-10.27	342	0.631	-2.00
68	0.733	-1.35	160	0.120	-9.21	252	0.099	-10.04	344	0.652	-1.86
70	0.713	-1.47	162	0.115	-9.39	254	0.104	-9.83	346	0.672	-1.73
72	0.693	-1.59	164	0.110	-9.59	256	0.110	-9.59	348	0.693	-1.59
74	0.672	-1.73	166	0.104	-9.83	258	0.115	-9.39	350	0.713	-1.47
76	0.652	-1.86	168	0.099	-10.04	260	0.120	-9.21	352	0.733	-1.35
78	0.631	-2.00	170	0.094	-10.27	262	0.130	-8.86	354	0.754	-1.23
80	0.611	-2.14	172	0.096	-10.18	264	0.139	-8.57	356	0.774	-1.11
82	0.592	-2.28	174	0.098	-10.09	266	0.149	-8.27	358	0.795	-1.00
84	0.573	-2.42	176	0.100	-10.00	268	0.158	-8.01	360	0.815	-0.89
86	0.555	-2.56	178	0.102	-9.91	270	0.168	-7.75			
88	0.536	-2.71	180	0.104	-9.83	272	0.179	-7.47			
90	0.517	-2.87	182	0.113	-9.47	274	0.189	-7.24			



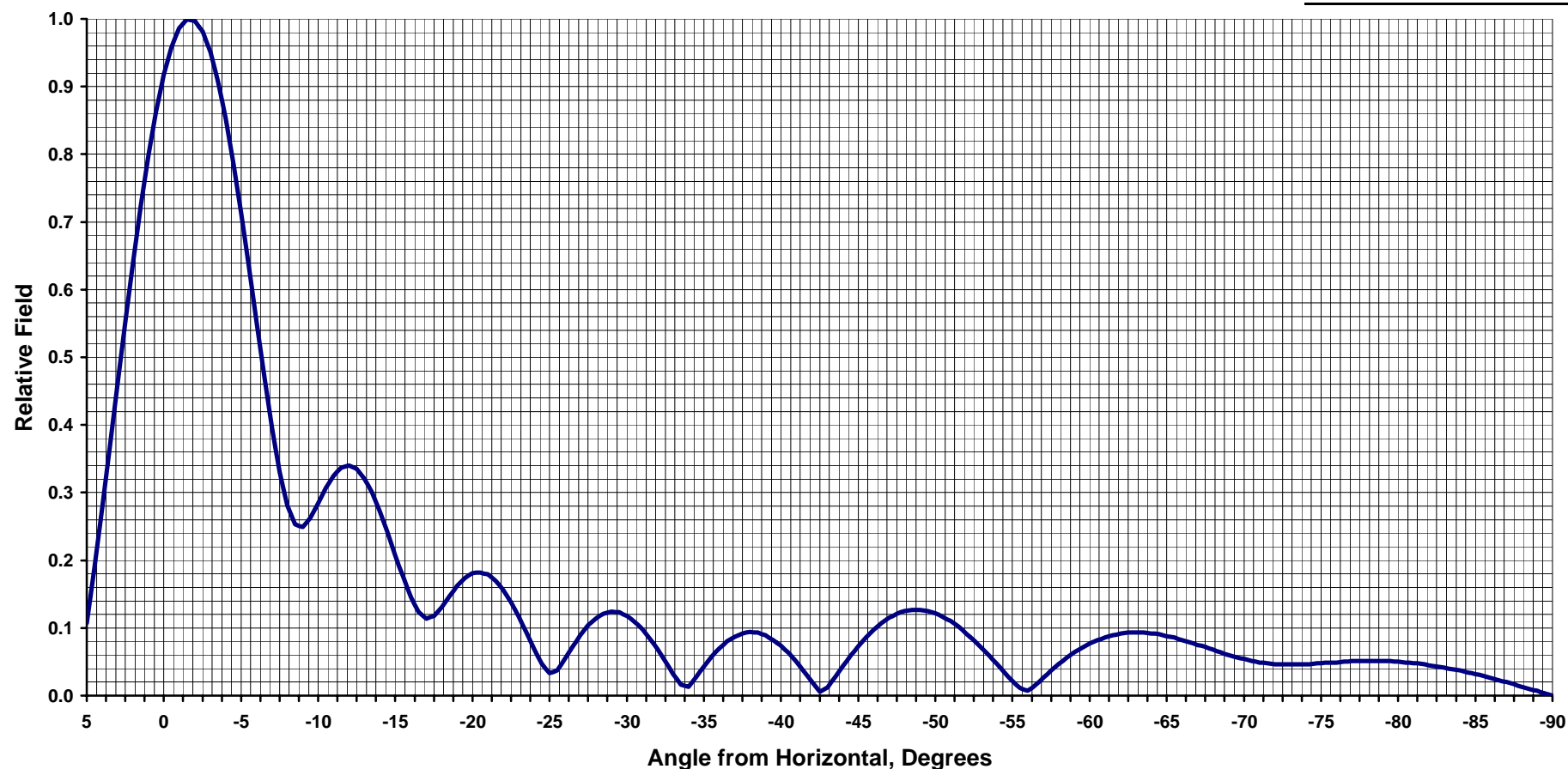
ELEVATION PATTERN

TYPE:	AL8	
Directivity:	Numeric	dBd
Main Lobe:	8.68	(9.39)
Horizontal:	6.90	(8.39)
Beam Tilt:	-2.00	
Polarization:	Horizontal	
Channel:	Channel 20	
Location:		



ELEVATION PATTERN

TYPE:	AL8	
Directivity:	Numeric	dBd
Main Lobe:	8.68	(9.39)
Horizontal:	6.90	(8.39)
Beam Tilt:	-2.00	
Polarization:	Horizontal	
Frequency:		
Location:		



TABULATED DATA FOR ELEVATION PATTERN**TYPE: AL8****-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	0.060	-24.44	-6.75	0.472	-6.52	-27.00	0.072	-22.85	-50.50	0.122	-18.27	-74.00	0.046	-26.74
4.75	0.107	-19.41	-7.00	0.433	-7.27	-27.50	0.089	-21.01	-51.00	0.116	-18.71	-74.50	0.046	-26.74
4.50	0.147	-16.65	-7.25	0.396	-8.05	-28.00	0.104	-19.66	-51.50	0.110	-19.17	-75.00	0.047	-26.56
4.25	0.189	-14.47	-7.50	0.361	-8.85	-28.50	0.114	-18.86	-52.00	0.102	-19.83	-75.50	0.048	-26.38
4.00	0.232	-12.69	-7.75	0.330	-9.63	-29.00	0.121	-18.34	-52.50	0.092	-20.72	-76.00	0.049	-26.20
3.75	0.277	-11.15	-8.00	0.303	-10.37	-29.50	0.124	-18.13	-53.00	0.082	-21.72	-76.50	0.049	-26.20
3.50	0.322	-9.84	-8.25	0.281	-11.03	-30.00	0.123	-18.20	-53.50	0.071	-22.97	-77.00	0.050	-26.02
3.25	0.368	-8.68	-8.50	0.264	-11.57	-30.50	0.118	-18.56	-54.00	0.059	-24.58	-77.50	0.051	-25.85
3.00	0.414	-7.66	-8.75	0.253	-11.94	-31.00	0.109	-19.25	-54.50	0.047	-26.56	-78.00	0.051	-25.85
2.75	0.460	-6.74	-9.00	0.248	-12.11	-31.50	0.098	-20.18	-55.00	0.034	-29.37	-78.50	0.051	-25.85
2.50	0.506	-5.92	-9.25	0.249	-12.08	-32.00	0.084	-21.51	-55.50	0.022	-33.15	-79.00	0.051	-25.85
2.25	0.551	-5.18	-9.50	0.254	-11.90	-32.50	0.068	-23.35	-56.00	0.011	-39.17	-79.50	0.051	-25.85
2.00	0.596	-4.50	-9.75	0.263	-11.60	-33.00	0.050	-26.02	-56.50	0.007	-43.10	-80.00	0.051	-25.85
1.75	0.639	-3.89	-10.00	0.273	-11.28	-33.50	0.032	-29.90	-57.00	0.016	-35.92	-80.50	0.050	-26.02
1.50	0.682	-3.32	-10.50	0.284	-10.93	-34.00	0.016	-35.92	-57.50	0.027	-31.37	-81.00	0.049	-26.20
1.25	0.722	-2.83	-11.00	0.307	-10.26	-34.50	0.013	-37.72	-58.00	0.037	-28.64	-81.50	0.048	-26.38
1.00	0.761	-2.37	-11.50	0.325	-9.76	-35.00	0.028	-31.06	-58.50	0.047	-26.56	-82.00	0.047	-26.56
0.75	0.797	-1.97	-12.00	0.337	-9.45	-35.50	0.043	-27.33	-59.00	0.056	-25.04	-82.50	0.045	-26.94
0.50	0.831	-1.61	-12.50	0.340	-9.37	-36.00	0.058	-24.73	-59.50	0.064	-23.88	-83.00	0.043	-27.33
0.25	0.863	-1.28	-13.00	0.335	-9.50	-36.50	0.070	-23.10	-60.00	0.071	-22.97	-83.50	0.041	-27.74
0.00	0.891	-1.00	-13.50	0.321	-9.87	-37.00	0.080	-21.94	-60.50	0.077	-22.27	-84.00	0.039	-28.18
-0.25	0.917	-0.75	-14.00	0.300	-10.46	-37.50	0.087	-21.21	-61.00	0.082	-21.72	-84.50	0.037	-28.64
-0.50	0.939	-0.55	-14.50	0.273	-11.28	-38.00	0.092	-20.72	-61.50	0.086	-21.31	-85.00	0.034	-29.37
-0.75	0.958	-0.37	-15.00	0.242	-12.32	-38.50	0.094	-20.54	-62.00	0.089	-21.01	-85.50	0.032	-29.90
-1.00	0.974	-0.23	-15.50	0.208	-13.64	-39.00	0.093	-20.63	-62.50	0.092	-20.72	-86.00	0.029	-30.75
-1.25	0.986	-0.12	-16.00	0.175	-15.14	-39.50	0.089	-21.01	-63.00	0.093	-20.63	-86.50	0.026	-31.70
-1.50	0.994	-0.05	-16.50	0.145	-16.77	-40.00	0.082	-21.72	-63.50	0.093	-20.63	-87.00	0.023	-32.77
-1.75	0.999	-0.01	-17.00	0.123	-18.20	-40.50	0.074	-22.62	-64.00	0.093	-20.63	-87.50	0.020	-33.98
-2.00	1.000	0.00	-17.50	0.114	-18.86	-41.00	0.063	-24.01	-64.50	0.092	-20.72	-88.00	0.017	-35.39
-2.25	0.997	-0.03	-18.00	0.118	-18.56	-41.50	0.050	-26.02	-65.00	0.091	-20.82	-88.50	0.013	-37.72
-2.50	0.991	-0.08	-18.50	0.131	-17.65	-42.00	0.036	-28.87	-65.50	0.088	-21.11	-89.00	0.010	-40.00
-2.75	0.981	-0.17	-19.00	0.147	-16.65	-42.50	0.021	-33.56	-66.00	0.086	-21.31	-89.50	0.007	-43.10
-3.00	0.968	-0.28	-19.50	0.162	-15.81	-43.00	0.006	-44.44	-66.50	0.082	-21.72	-90.00	0.003	-50.46
-3.25	0.951	-0.44	-20.00	0.174	-15.19	-43.50	0.012	-38.42	-67.00	0.079	-22.05			
-3.50	0.930	-0.63	-20.50	0.181	-14.85	-44.00	0.028	-31.06	-67.50	0.075	-22.50			
-3.75	0.907	-0.85	-21.00	0.182	-14.80	-44.50	0.044	-27.13	-68.00	0.072	-22.85			
-4.00	0.881	-1.10	-21.50	0.179	-14.94	-45.00	0.059	-24.58	-68.50	0.068	-23.35			
-4.25	0.852	-1.39	-22.00	0.170	-15.39	-45.50	0.073	-22.73	-69.00	0.064	-23.88			
-4.50	0.820	-1.72	-22.50	0.156	-16.14	-46.00	0.086	-21.31	-69.50	0.060	-24.44			
-4.75	0.786	-2.09	-23.00	0.138	-17.20	-46.50	0.097	-20.26	-70.00	0.057	-24.88			
-5.00	0.750	-2.50	-23.50	0.117	-18.64	-47.00	0.107	-19.41	-70.50	0.054	-25.35			
-5.25	0.713	-2.94	-24.00	0.093	-20.63	-47.50	0.115	-18.79	-71.00	0.051	-25.85			
-5.50	0.674	-3.43	-24.50	0.069	-23.22	-48.00	0.121	-18.34	-71.50	0.049	-26.20			
-5.75	0.634	-3.96	-25.00	0.047	-26.56	-48.50	0.125	-18.06	-72.00	0.048	-26.38			
-6.00	0.593	-4.54	-25.50	0.033	-29.63	-49.00	0.127	-17.92	-72.50	0.046	-26.74			
-6.25	0.552	-5.16	-26.00	0.037	-28.64	-49.50	0.127	-17.92	-73.00	0.046	-26.74			
-6.50	0.512	-5.81	-26.50	0.054	-25.35	-50.00	0.125	-18.06	-73.50	0.046	-26.74			



SECTION III - Engineering

TECHNICAL SPECIFICATIONS

Ensure that the specifications below are accurate. Contradicting data found elsewhere in this application will be disregarded. All items must be completed. The response "on file" is not acceptable.

TECH BOX

1. Channel: _____
2. Frequency Offset
☐ No offset ☐ Zero offset ☐ Plus offset ☐ Minus offset
3. Antenna Location Coordinates: (NAD 27)
____° ____' ____" ☐ N ☐ S Latitude
____° ____' ____" ☐ E ☐ W Longitude
4. Maximum Effective Radiated Power (ERP) Toward Radio Horizon: _____ kW
5. Maximum ERP in any horizontal and vertical angle: _____ kW

NOTE: In addition to the information called for in this section, an explanatory exhibit providing full particulars must be submitted for each question for which a "No" response is provided.

CERTIFICATION

All applicants must complete this section.

6. **Constructed Facility.** The facility was constructed as authorized in the underlying construction permit. ☐ Yes ☐ No

See Explanation in Exhibit No.
7. **Special Operating Conditions.** The facility was constructed in compliance with all special operating conditions, terms, and obligations described in the construction permit. ☐ Yes ☐ No

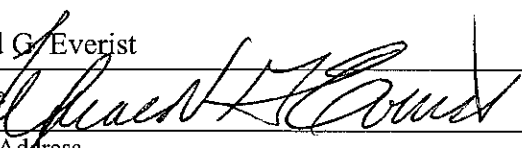
See Explanation in Exhibit No.

Exhibit No.
9

PREPARER'S CERTIFICATION ON PAGE 4 MUST BE COMPLETED AND SIGNED.

SECTION III PREPARER'S CERTIFICATION

I certify that I have prepared Section III (Engineering Data) on behalf of the applicant, and that after such preparation, I have examined and found it to be accurate and true to the best of my knowledge and belief.

Name Donald G. Everist		Relationship to Applicant (e.g., Consulting Engineer) Consulting Engineer	
Signature 		Date June 5, 2012	
Mailing Address Cohen, Dippell and Everist, P.C., 1420 N Street, NW, Suite One			
City Washington	State or Country (if foreign address) DC		ZIP Code 20005
Telephone Number (include area code) (202) 898-0111		E-Mail Address (if available) cde@attglobal.net	

WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001),
AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT (U.S. CODE, TITLE 47, SECTION 312(a)(1)),
AND/OR FORFEITURE (U.S. CODE, TITLE 47, SECTION 503).