



Antenna Model:

TLSV8-BB

Proposal Number: **C-71380**
Date: **30-Jul-19**
Customer: **WVEC**
Location: **Norfolk, VA**

Electrical Specifications

Polarization: **Horizontal**
Azimuth Pattern: **Directional**
Antenna Input: **3-1/8"** **50 Ohm** **EIA/DCA**
VSWR: **Channel** **1.25 : 1** **Band** **1.25 : 1**
Bandwidth: **42 MHz**
Rated Input Power: **15 kW** **(11.76 dBk)** **Maximum combined average power**

Mechanical Specifications

Mounting: **Side Mounted**
Environmental Protection: **Slot Cover**
Height: **43.8 ft (13.4m)**
Weight: **1050 lb (0.5t)** **Excludes Mounts**
Effective Projected Area: **35.8 ft² (3.3m²)** **TIA-222-G** **Basic Wind Speed: 90 m/h (144.8 km/h)**

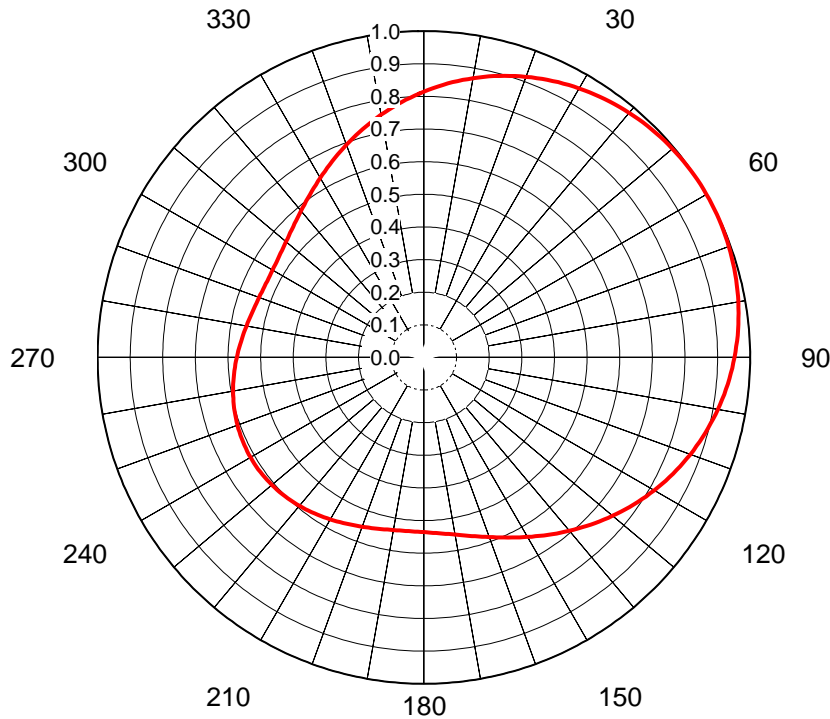
Channel Specifications

	Call	CH	Freq	Hpol ERP	TPO	Peak Main Lobe Hpol Gain	Peak at Horizontal Hpol Gain
1	WVEC	13	213 MHz	35.0 kW (15.44 dBk)	3.30 kW (5.19 dBk)	12.60 (11.00dB)	9.64 (9.84dB)
2	WVEC	11	201 MHz	35.0 kW (15.44 dBk)	3.04 kW (4.83 dBk)	13.62 (11.34dB)	10.05 (10.02dB)

AZIMUTH PATTERN Horizontal Polarization

In Free Space

Proposal No. **C-71380**
Date **30-Jul-19**
Call Letters **WVEC**
Channel **13**
Frequency **213 MHz**
Antenna Type **TLSV8-BB**
Gain **1.83 (2.63dB)**
Calculated



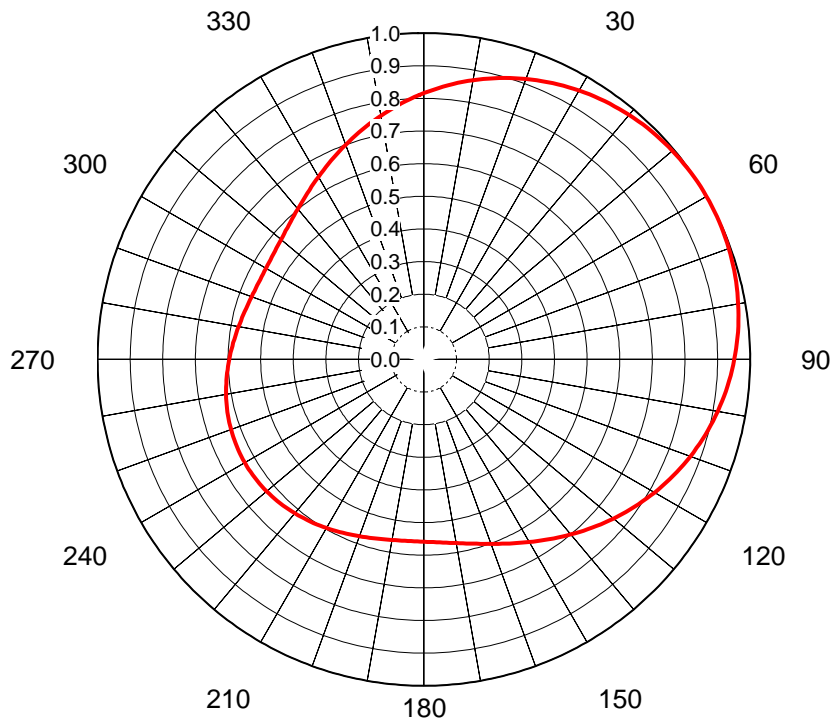
Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.815	36	0.969	72	0.992	108	0.879	144	0.670	180	0.535	216	0.586	252	0.606	288	0.539	324	0.604
1	0.820	37	0.972	73	0.991	109	0.874	145	0.664	181	0.535	217	0.588	253	0.605	289	0.538	325	0.609
2	0.826	38	0.974	74	0.990	110	0.869	146	0.658	182	0.534	218	0.590	254	0.603	290	0.537	326	0.614
3	0.832	39	0.976	75	0.988	111	0.864	147	0.652	183	0.534	219	0.592	255	0.602	291	0.536	327	0.619
4	0.837	40	0.979	76	0.986	112	0.859	148	0.646	184	0.534	220	0.594	256	0.600	292	0.536	328	0.624
5	0.843	41	0.981	77	0.984	113	0.853	149	0.641	185	0.534	221	0.595	257	0.599	293	0.535	329	0.630
6	0.848	42	0.983	78	0.983	114	0.848	150	0.635	186	0.535	222	0.597	258	0.597	294	0.535	330	0.635
7	0.853	43	0.984	79	0.981	115	0.843	151	0.630	187	0.535	223	0.599	259	0.595	295	0.534	331	0.641
8	0.859	44	0.986	80	0.979	116	0.837	152	0.624	188	0.536	224	0.600	260	0.594	296	0.534	332	0.646
9	0.864	45	0.988	81	0.976	117	0.832	153	0.619	189	0.536	225	0.602	261	0.592	297	0.534	333	0.652
10	0.869	46	0.990	82	0.974	118	0.826	154	0.614	190	0.537	226	0.603	262	0.590	298	0.534	334	0.658
11	0.874	47	0.991	83	0.972	119	0.820	155	0.609	191	0.538	227	0.605	263	0.588	299	0.535	335	0.664
12	0.879	48	0.992	84	0.969	120	0.815	156	0.604	192	0.539	228	0.606	264	0.586	300	0.535	336	0.670
13	0.884	49	0.993	85	0.967	121	0.809	157	0.599	193	0.541	229	0.607	265	0.584	301	0.536	337	0.676
14	0.889	50	0.995	86	0.964	122	0.803	158	0.595	194	0.542	230	0.608	266	0.582	302	0.537	338	0.682
15	0.893	51	0.996	87	0.961	123	0.797	159	0.590	195	0.544	231	0.609	267	0.580	303	0.538	339	0.688
16	0.898	52	0.997	88	0.958	124	0.791	160	0.586	196	0.545	232	0.610	268	0.578	304	0.539	340	0.694
17	0.902	53	0.997	89	0.955	125	0.785	161	0.582	197	0.547	233	0.611	269	0.575	305	0.541	341	0.700
18	0.907	54	0.998	90	0.952	126	0.779	162	0.578	198	0.548	234	0.611	270	0.573	306	0.543	342	0.706
19	0.911	55	0.999	91	0.949	127	0.773	163	0.574	199	0.550	235	0.612	271	0.571	307	0.545	343	0.712
20	0.915	56	0.999	92	0.945	128	0.767	164	0.570	200	0.552	236	0.612	272	0.569	308	0.547	344	0.718
21	0.919	57	0.999	93	0.942	129	0.761	165	0.567	201	0.554	237	0.613	273	0.567	309	0.549	345	0.724
22	0.923	58	1.000	94	0.938	130	0.755	166	0.563	202	0.556	238	0.613	274	0.565	310	0.551	346	0.731
23	0.927	59	1.000	95	0.935	131	0.749	167	0.560	203	0.558	239	0.613	275	0.562	311	0.554	347	0.737
24	0.931	60	1.000	96	0.931	132	0.743	168	0.557	204	0.560	240	0.613	276	0.560	312	0.557	348	0.743
25	0.935	61	1.000	97	0.927	133	0.737	169	0.554	205	0.562	241	0.613	277	0.558	313	0.560	349	0.749
26	0.938	62	1.000	98	0.923	134	0.731	170	0.551	206	0.565	242	0.613	278	0.556	314	0.563	350	0.755
27	0.942	63	0.999	99	0.919	135	0.724	171	0.549	207	0.567	243	0.613	279	0.554	315	0.567	351	0.761
28	0.945	64	0.999	100	0.915	136	0.718	172	0.547	208	0.569	244	0.612	280	0.552	316	0.570	352	0.767
29	0.949	65	0.999	101	0.911	137	0.712	173	0.545	209	0.571	245	0.612	281	0.550	317	0.574	353	0.773
30	0.952	66	0.998	102	0.907	138	0.706	174	0.543	210	0.573	246	0.611	282	0.548	318	0.578	354	0.779
31	0.955	67	0.997	103	0.902	139	0.700	175	0.541	211	0.575	247	0.611	283	0.547	319	0.582	355	0.785
32	0.958	68	0.997	104	0.898	140	0.694	176	0.539	212	0.578	248	0.610	284	0.545	320	0.586	356	0.791
33	0.961	69	0.996	105	0.893	141	0.688	177	0.538	213	0.580	249	0.609	285	0.544	321	0.590	357	0.797
34	0.964	70	0.995	106	0.889	142	0.682	178	0.537	214	0.582	250	0.608	286	0.542	322	0.595	358	0.803
35	0.967	71	0.993	107	0.884	143	0.676	179	0.536	215	0.584	251	0.607	287	0.541	323	0.599	359	0.809

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AZIMUTH PATTERN Horizontal Polarization

In Free Space

Proposal No. **C-71380**
Date **30-Jul-19**
Call Letters **WVEC**
Channel **11**
Frequency **201 MHz**
Antenna Type **TLSV8-BB**
Gain **1.79 (2.52dB)**
Calculated



Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.816	36	0.969	72	0.992	108	0.879	144	0.678	180	0.559	216	0.608	252	0.627	288	0.564	324	0.618
1	0.822	37	0.971	73	0.991	109	0.874	145	0.672	181	0.558	217	0.610	253	0.626	289	0.563	325	0.622
2	0.827	38	0.974	74	0.989	110	0.869	146	0.667	182	0.558	218	0.612	254	0.624	290	0.562	326	0.627
3	0.833	39	0.976	75	0.988	111	0.864	147	0.662	183	0.558	219	0.614	255	0.623	291	0.561	327	0.631
4	0.838	40	0.978	76	0.986	112	0.859	148	0.656	184	0.558	220	0.616	256	0.622	292	0.560	328	0.636
5	0.843	41	0.980	77	0.984	113	0.854	149	0.651	185	0.559	221	0.617	257	0.620	293	0.560	329	0.641
6	0.849	42	0.982	78	0.982	114	0.849	150	0.646	186	0.559	222	0.619	258	0.619	294	0.559	330	0.646
7	0.854	43	0.984	79	0.980	115	0.843	151	0.641	187	0.560	223	0.620	259	0.617	295	0.559	331	0.651
8	0.859	44	0.986	80	0.978	116	0.838	152	0.636	188	0.560	224	0.622	260	0.616	296	0.558	332	0.656
9	0.864	45	0.988	81	0.976	117	0.833	153	0.631	189	0.561	225	0.623	261	0.614	297	0.558	333	0.662
10	0.869	46	0.989	82	0.974	118	0.827	154	0.627	190	0.562	226	0.624	262	0.612	298	0.558	334	0.667
11	0.874	47	0.991	83	0.971	119	0.822	155	0.622	191	0.563	227	0.626	263	0.610	299	0.558	335	0.672
12	0.879	48	0.992	84	0.969	120	0.816	156	0.618	192	0.564	228	0.627	264	0.608	300	0.559	336	0.678
13	0.884	49	0.993	85	0.966	121	0.810	157	0.614	193	0.565	229	0.628	265	0.606	301	0.559	337	0.683
14	0.888	50	0.995	86	0.963	122	0.805	158	0.609	194	0.567	230	0.629	266	0.605	302	0.560	338	0.689
15	0.893	51	0.996	87	0.961	123	0.799	159	0.605	195	0.568	231	0.630	267	0.603	303	0.561	339	0.695
16	0.897	52	0.997	88	0.958	124	0.793	160	0.601	196	0.570	232	0.630	268	0.601	304	0.562	340	0.700
17	0.902	53	0.997	89	0.955	125	0.788	161	0.598	197	0.571	233	0.631	269	0.599	305	0.563	341	0.706
18	0.906	54	0.998	90	0.952	126	0.782	162	0.594	198	0.573	234	0.632	270	0.597	306	0.564	342	0.712
19	0.911	55	0.999	91	0.948	127	0.776	163	0.591	199	0.575	235	0.632	271	0.595	307	0.566	343	0.718
20	0.915	56	0.999	92	0.945	128	0.770	164	0.587	200	0.577	236	0.633	272	0.592	308	0.567	344	0.723
21	0.919	57	0.999	93	0.941	129	0.764	165	0.584	201	0.579	237	0.633	273	0.590	309	0.569	345	0.729
22	0.923	58	1.000	94	0.938	130	0.759	166	0.581	202	0.580	238	0.633	274	0.588	310	0.571	346	0.735
23	0.927	59	1.000	95	0.934	131	0.753	167	0.579	203	0.582	239	0.633	275	0.586	311	0.574	347	0.741
24	0.931	60	1.000	96	0.931	132	0.747	168	0.576	204	0.584	240	0.634	276	0.584	312	0.576	348	0.747
25	0.934	61	1.000	97	0.927	133	0.741	169	0.574	205	0.586	241	0.633	277	0.582	313	0.579	349	0.753
26	0.938	62	1.000	98	0.923	134	0.735	170	0.571	206	0.588	242	0.633	278	0.580	314	0.581	350	0.759
27	0.941	63	0.999	99	0.919	135	0.729	171	0.569	207	0.590	243	0.633	279	0.579	315	0.584	351	0.764
28	0.945	64	0.999	100	0.915	136	0.723	172	0.567	208	0.592	244	0.633	280	0.577	316	0.587	352	0.770
29	0.948	65	0.999	101	0.911	137	0.718	173	0.566	209	0.595	245	0.632	281	0.575	317	0.591	353	0.776
30	0.952	66	0.998	102	0.906	138	0.712	174	0.564	210	0.597	246	0.632	282	0.573	318	0.594	354	0.782
31	0.955	67	0.997	103	0.902	139	0.706	175	0.563	211	0.599	247	0.631	283	0.571	319	0.598	355	0.788
32	0.958	68	0.997	104	0.897	140	0.700	176	0.562	212	0.601	248	0.630	284	0.570	320	0.601	356	0.793
33	0.961	69	0.996	105	0.893	141	0.695	177	0.561	213	0.603	249	0.630	285	0.568	321	0.605	357	0.799
34	0.963	70	0.995	106	0.888	142	0.689	178	0.560	214	0.605	250	0.629	286	0.567	322	0.609	358	0.805
35	0.966	71	0.993	107	0.884	143	0.683	179	0.559	215	0.606	251	0.628	287	0.565	323	0.614	359	0.810

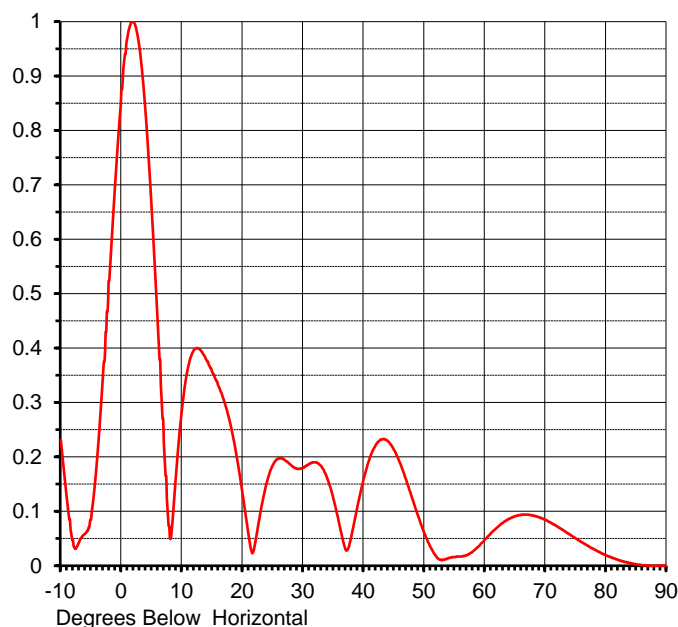
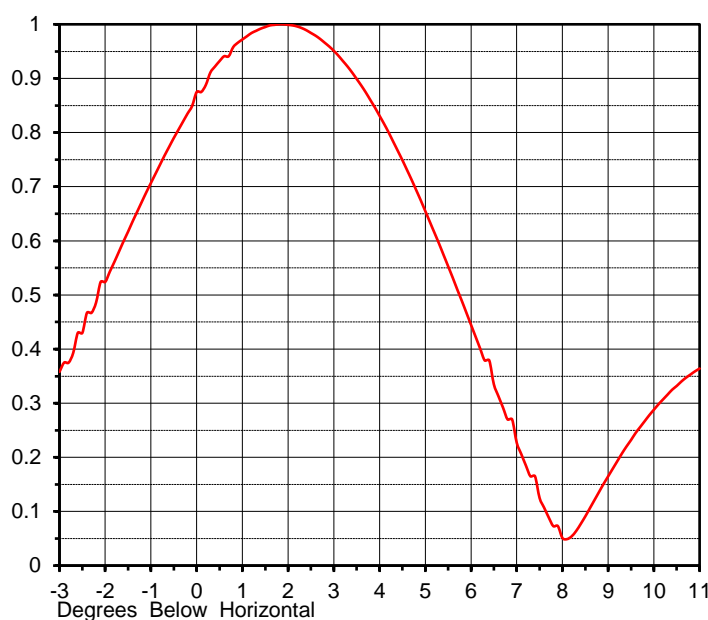
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ELEVATION PATTERN

Proposal No. **C-71380**
 Date **30-Jul-19**
 Call Letters **WVEC**
 Channel **13**
 Frequency **213 MHz**
 Antenna Type **TLSV8-BB**

RMS Directivity at Main Lobe **6.9 (8.38 dB)**
 RMS Directivity at Horizontal **5.3 (7.24 dB)**
Calculated

Beam Tilt **1.85 deg**
 Pattern Number **08T069185**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.231	10.0	0.288	30.0	0.180	50.0	0.060	70.0	0.084
-9.0	0.123	11.0	0.364	31.0	0.187	51.0	0.035	71.0	0.078
-8.0	0.047	12.0	0.397	32.0	0.190	52.0	0.017	72.0	0.072
-7.0	0.043	13.0	0.397	33.0	0.183	53.0	0.011	73.0	0.065
-6.0	0.059	14.0	0.379	34.0	0.160	54.0	0.014	74.0	0.058
-5.0	0.085	15.0	0.356	35.0	0.123	55.0	0.016	75.0	0.050
-4.0	0.198	16.0	0.331	36.0	0.075	56.0	0.017	76.0	0.043
-3.0	0.358	17.0	0.301	37.0	0.030	57.0	0.019	77.0	0.037
-2.0	0.524	18.0	0.260	38.0	0.056	58.0	0.026	78.0	0.030
-1.0	0.707	19.0	0.203	39.0	0.111	59.0	0.036	79.0	0.025
0.0	0.875	20.0	0.132	40.0	0.160	60.0	0.048	80.0	0.019
1.0	0.972	21.0	0.056	41.0	0.198	61.0	0.060	81.0	0.015
2.0	0.999	22.0	0.037	42.0	0.222	62.0	0.070	82.0	0.011
3.0	0.951	23.0	0.101	43.0	0.232	63.0	0.079	83.0	0.007
4.0	0.831	24.0	0.153	44.0	0.229	64.0	0.086	84.0	0.005
5.0	0.655	25.0	0.185	45.0	0.213	65.0	0.091	85.0	0.003
6.0	0.445	26.0	0.197	46.0	0.189	66.0	0.094	86.0	0.001
7.0	0.227	27.0	0.194	47.0	0.158	67.0	0.094	87.0	0.000
8.0	0.051	28.0	0.185	48.0	0.124	68.0	0.092	88.0	0.000
9.0	0.165	29.0	0.178	49.0	0.091	69.0	0.089	89.0	0.000
								90.0	0.000

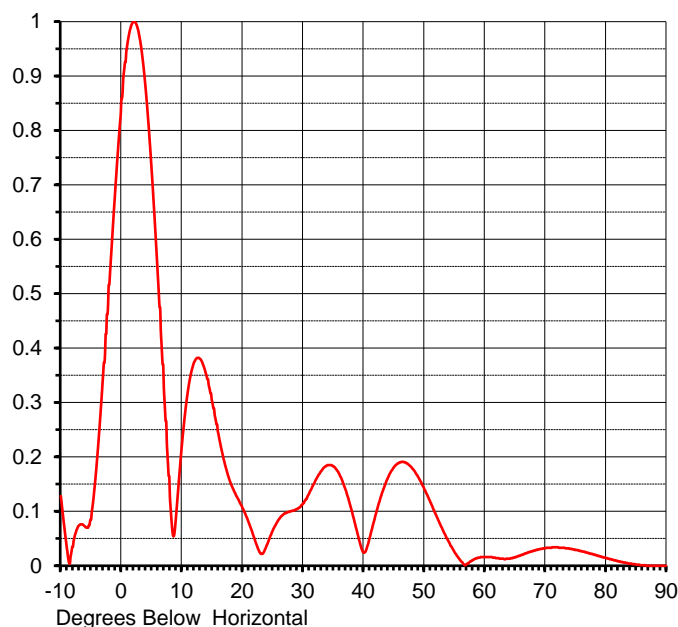
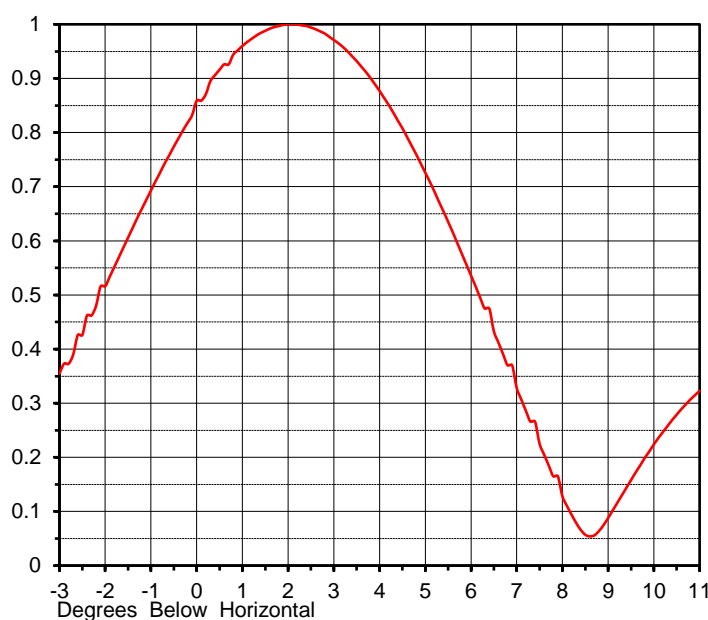
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ELEVATION PATTERN

Proposal No. **C-71380**
 Date **30-Jul-19**
 Call Letters **WVEC**
 Channel **11**
 Frequency **201 MHz**
 Antenna Type **TLSV8-BB**

RMS Directivity at Main Lobe **7.6 (8.82 dB)**
 RMS Directivity at Horizontal **5.6 (7.48 dB)**
Calculated

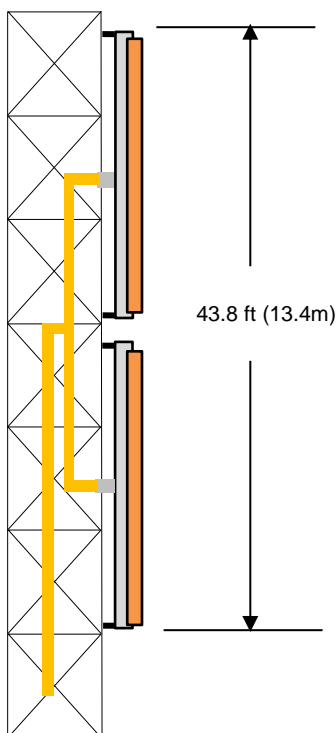
Beam Tilt **2.10 deg**
 Pattern Number **08T076210**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.128	10.0	0.224	30.0	0.115	50.0	0.141	70.0	0.032
-9.0	0.032	11.0	0.323	31.0	0.133	51.0	0.117	71.0	0.033
-8.0	0.035	12.0	0.374	32.0	0.156	52.0	0.092	72.0	0.034
-7.0	0.074	13.0	0.380	33.0	0.174	53.0	0.067	73.0	0.033
-6.0	0.072	14.0	0.351	34.0	0.185	54.0	0.045	74.0	0.031
-5.0	0.085	15.0	0.301	35.0	0.183	55.0	0.025	75.0	0.029
-4.0	0.198	16.0	0.243	36.0	0.168	56.0	0.009	76.0	0.027
-3.0	0.355	17.0	0.191	37.0	0.140	57.0	0.003	77.0	0.024
-2.0	0.516	18.0	0.153	38.0	0.102	58.0	0.010	78.0	0.021
-1.0	0.693	19.0	0.128	39.0	0.058	59.0	0.015	79.0	0.017
0.0	0.859	20.0	0.106	40.0	0.024	60.0	0.016	80.0	0.014
1.0	0.960	21.0	0.080	41.0	0.052	61.0	0.016	81.0	0.011
2.0	1.000	22.0	0.049	42.0	0.095	62.0	0.014	82.0	0.008
3.0	0.971	23.0	0.022	43.0	0.133	63.0	0.013	83.0	0.006
4.0	0.877	24.0	0.038	44.0	0.162	64.0	0.013	84.0	0.004
5.0	0.726	25.0	0.065	45.0	0.181	65.0	0.016	85.0	0.002
6.0	0.536	26.0	0.085	46.0	0.190	66.0	0.020	86.0	0.001
7.0	0.328	27.0	0.096	47.0	0.189	67.0	0.024	87.0	0.000
8.0	0.128	28.0	0.100	48.0	0.179	68.0	0.027	88.0	0.000
9.0	0.088	29.0	0.104	49.0	0.163	69.0	0.030	89.0	0.000
								90.0	0.000

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MECHANICAL SPECIFICATIONS



Proposal No. **C-71380**
 Date **30-Jul-19**
 Call Letters **WVEC**
 Channel **13**
 Frequency **213 MHz**
 Antenna Type **TLSV8-BB**

Preliminary Specifications

Side Mounted

With ice TIA-222-G

Height AGL(z) 960 ft (292.6 m)
 Basic Wind Speed 90 m/h (144.8 km/h)

Structure Class II
 Exposure Category C
 Topography Category 1

Design Ice 0.75 in $t_{iz} = 2.34$ in
 Wind Speed w/Ice 30 m/h (48.3 km/h)

Mechanical Specifications

		without ice	with ice	
Height	H2	43.8 ft (13.4m)		
Height of Center of Radiation	H3	21.9 ft (6.7m)		
Effective Projected Area	(EPA) _A	35.8 ft ² (3.3m ²)	97.1 ft ² (9m ²)	Mounts Excluded
Weight	W	1050 lb (0.5t)	2650 lb (1.2t)	Mounts Excluded

Antenna designed in accordance with AISC specifications for design of structural steel as prescribed by TIA-222-G

Prepared by: JBC

Date: 30-Jul-19

ME:

EE:

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Summary

Proposal No.	C-71380
Date	30-Jul-19
Call Letters	WVEC
Channel	13
Frequency	213 MHz
Antenna Type	TLSV8-BB

Antenna

		Hpol
ERP:	35.0 kW	(15.44 dBk)
Peak Gain*	12.60	(11.00 dB)

Antenna Input Power	2.78 kW	(4.44 dBk)
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Transmission Line

Type:	Rigid	Attenuation:	(0.75 dB)
Size:	6-1/8"	Efficiency:	84.2%
Impedance:	75 Ohm		
Length:	1100 ft	335.3 m	

Transmitter Output

3.30 kW	(5.19 dBk)
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Transmitter filter losses not included

* Directivity and Gain are with respect to half wave dipole. The gain includes feed system losses

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Summary

Proposal No.	C-71380
Date	30-Jul-19
Call Letters	WVEC
Channel	11
Frequency	201 MHz
Antenna Type	TLSV8-BB

Antenna

		Hpol
ERP:	35.0 kW	(15.44 dBk)
Peak Gain*	13.62	(11.34 dB)

Antenna Input Power	2.57 kW	(4.10 dBk)
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Transmission Line

Type:	Rigid	Attenuation:	(0.73 dB)
Size:	6-1/8"	Efficiency:	84.6%
Impedance:	75 Ohm		
Length:	1100 ft	335.3 m	

Transmitter Output

3.04 kW	(4.83 dBk)
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Transmitter filter losses not included

* Directivity and Gain are with respect to half wave dipole. The gain includes feed system losses

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