Antenna Model: **TLS-V4-BB-R**

Proposal Number:	**C-71401**
Date:	**24-Sep-19**
Customer:	**Nexstar**
Location:	**Lewisburg, WV**

Electrical Specifications

Polarization:	**Horizontal**				
Azimuth Pattern:	**Directional**				
Antenna Input:	**1-5/8"**	**50 Ohm**	**EIA/DCA**		
VSWR:	Channel	**1.25 : 1**		Band	**1.25 : 1**
Bandwidth:	**174 - 216 MHz**				
Rated Input Power:	**7.5 kW**	**(8.75 dBk)**	**Maximum combined average power**		

Mechanical Specifications

Mounting:	**Side Mounted**			
Environmental Protection:	**Full Radome**			
Height:	**21.2 ft (6.5m)**			
Weight:	**510 lb (0.2t)**	Excludes Mounts		
Effective Projected Area:	**18.3 ft² (1.7m²)**	**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	WVNS	11	201 MHz	12.0 kW (10.79 dBk)	1.69 kW (2.27 dBk)	8.42 (9.25dB)	7.52 (8.76dB)
2	WVNS	8	183 MHz	3.70 kW (5.68 dBk)	0.559 kW -(2.52 dBk)	7.77 (8.90dB)	7.10 (8.51dB)

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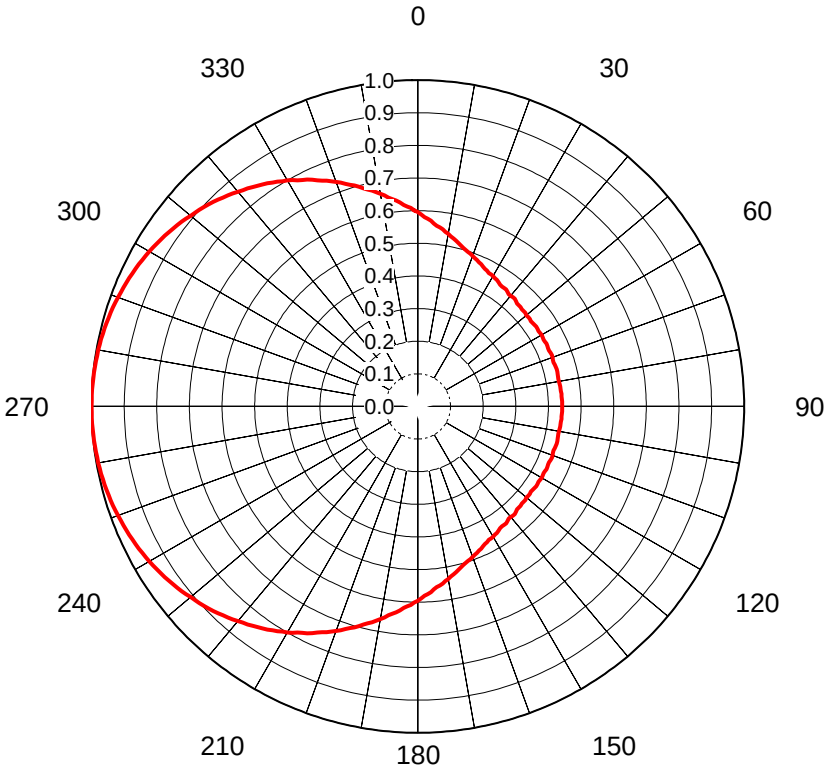

AZIMUTH PATTERN
Horizontal Polarization

In Free Space

Proposal No.	**C-71401**
Date	**24-Sep-19**
Call Letters	**WVNS**
Channel	**11**
Frequency	**201 MHz**
Antenna Type	**TLS-V4-BB-R**
Gain	**2.07 (3.17dB)**
	Calculated

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.596	36	0.449	72	0.438	108	0.438	144	0.449	180	0.596	216	0.836	252	0.982	288	0.982	324	0.836
1	0.588	37	0.449	73	0.439	109	0.438	145	0.449	181	0.601	217	0.841	253	0.984	289	0.980	325	0.831
2	0.580	38	0.446	74	0.440	110	0.439	146	0.451	182	0.609	218	0.848	254	0.986	290	0.978	326	0.825
3	0.576	39	0.443	75	0.441	111	0.440	147	0.454	183	0.614	219	0.853	255	0.988	291	0.975	327	0.818
4	0.571	40	0.442	76	0.440	112	0.438	148	0.457	184	0.619	220	0.859	256	0.989	292	0.973	328	0.813
5	0.563	41	0.443	77	0.440	113	0.437	149	0.458	185	0.628	221	0.865	257	0.991	293	0.970	329	0.805
6	0.557	42	0.444	78	0.440	114	0.437	150	0.462	186	0.635	222	0.871	258	0.992	294	0.968	330	0.800
7	0.553	43	0.441	79	0.439	115	0.438	151	0.462	187	0.640	223	0.876	259	0.993	295	0.965	331	0.793
8	0.548	44	0.438	80	0.439	116	0.439	152	0.463	188	0.646	224	0.882	260	0.995	296	0.962	332	0.785
9	0.542	45	0.438	81	0.440	117	0.437	153	0.467	189	0.655	225	0.887	261	0.996	297	0.960	333	0.779
10	0.537	46	0.438	82	0.440	118	0.436	154	0.469	190	0.662	226	0.891	262	0.997	298	0.957	334	0.774
11	0.531	47	0.436	83	0.441	119	0.437	155	0.472	191	0.669	227	0.896	263	0.997	299	0.954	335	0.767
12	0.526	48	0.437	84	0.441	120	0.438	156	0.477	192	0.676	228	0.901	264	0.998	300	0.951	336	0.758
13	0.521	49	0.437	85	0.442	121	0.437	157	0.480	193	0.682	229	0.905	265	0.999	301	0.947	337	0.751
14	0.516	50	0.434	86	0.442	122	0.436	158	0.484	194	0.689	230	0.909	266	0.999	302	0.943	338	0.746
15	0.510	51	0.435	87	0.442	123	0.438	159	0.487	195	0.697	231	0.914	267	0.999	303	0.940	339	0.739
16	0.506	52	0.436	88	0.442	124	0.438	160	0.491	196	0.704	232	0.919	268	1.000	304	0.936	340	0.732
17	0.501	53	0.434	89	0.442	125	0.436	161	0.495	197	0.710	233	0.923	269	1.000	305	0.932	341	0.725
18	0.497	54	0.435	90	0.442	126	0.435	162	0.497	198	0.717	234	0.927	270	1.000	306	0.927	342	0.717
19	0.495	55	0.436	91	0.442	127	0.434	163	0.501	199	0.725	235	0.932	271	1.000	307	0.923	343	0.710
20	0.491	56	0.438	92	0.442	128	0.436	164	0.506	200	0.732	236	0.936	272	1.000	308	0.919	344	0.704
21	0.487	57	0.438	93	0.442	129	0.435	165	0.510	201	0.739	237	0.940	273	0.999	309	0.914	345	0.697
22	0.484	58	0.436	94	0.442	130	0.434	166	0.516	202	0.746	238	0.943	274	0.999	310	0.909	346	0.689
23	0.480	59	0.437	95	0.442	131	0.437	167	0.521	203	0.751	239	0.947	275	0.999	311	0.905	347	0.682
24	0.477	60	0.438	96	0.441	132	0.437	168	0.526	204	0.758	240	0.951	276	0.998	312	0.901	348	0.676
25	0.472	61	0.437	97	0.441	133	0.436	169	0.531	205	0.767	241	0.954	277	0.997	313	0.896	349	0.669
26	0.469	62	0.436	98	0.440	134	0.438	170	0.537	206	0.774	242	0.957	278	0.997	314	0.891	350	0.662
27	0.467	63	0.437	99	0.440	135	0.438	171	0.542	207	0.779	243	0.960	279	0.996	315	0.887	351	0.655
28	0.463	64	0.439	100	0.439	136	0.438	172	0.548	208	0.785	244	0.962	280	0.995	316	0.882	352	0.646
29	0.462	65	0.438	101	0.439	137	0.441	173	0.553	209	0.793	245	0.965	281	0.993	317	0.876	353	0.640
30	0.462	66	0.437	102	0.440	138	0.444	174	0.557	210	0.800	246	0.968	282	0.992	318	0.871	354	0.635
31	0.458	67	0.437	103	0.440	139	0.443	175	0.563	211	0.805	247	0.970	283	0.991	319	0.865	355	0.628
32	0.457	68	0.438	104	0.440	140	0.442	176	0.571	212	0.813	248	0.973	284	0.989	320	0.859	356	0.619
33	0.454	69	0.440	105	0.441	141	0.443	177	0.576	213	0.818	249	0.975	285	0.988	321	0.853	357	0.614
34	0.451	70	0.439	106	0.440	142	0.446	178	0.580	214	0.825	250	0.978	286	0.986	322	0.848	358	0.609
35	0.449	71	0.438	107	0.439	143	0.449	179	0.588	215	0.831	251	0.980	287	0.984	323	0.841	359	0.601

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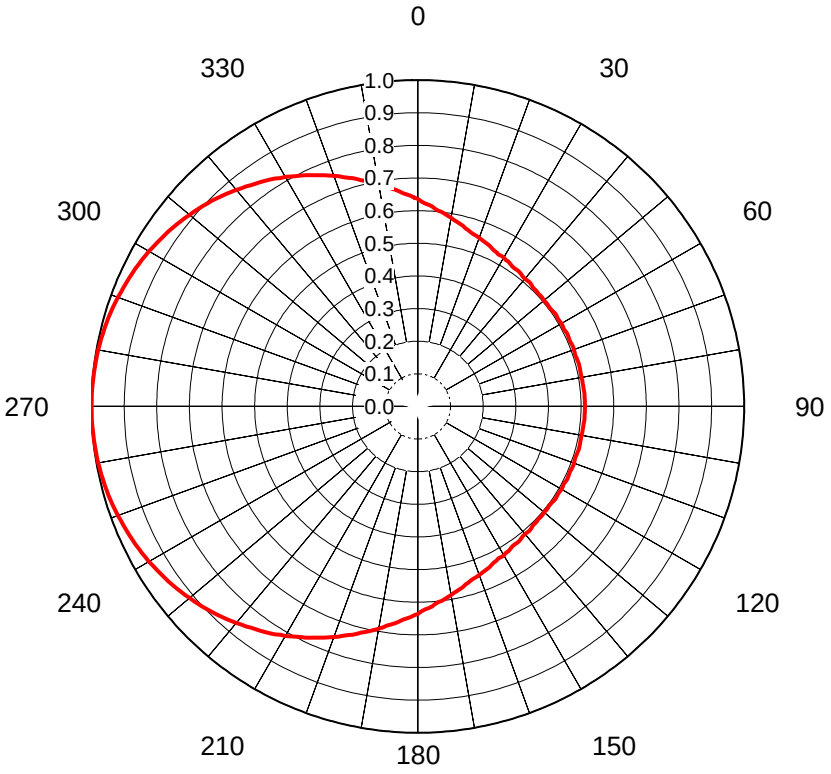


AZIMUTH PATTERN
Horizontal Polarization

In Free Space

Proposal No.	**C-71401**
Date	**24-Sep-19**
Call Letters	**WVNS**
Channel	**8**
Frequency	**183 MHz**
Antenna Type	**TLS-V4-BB-R**
Gain	**1.92 (2.83dB)**
	Calculated

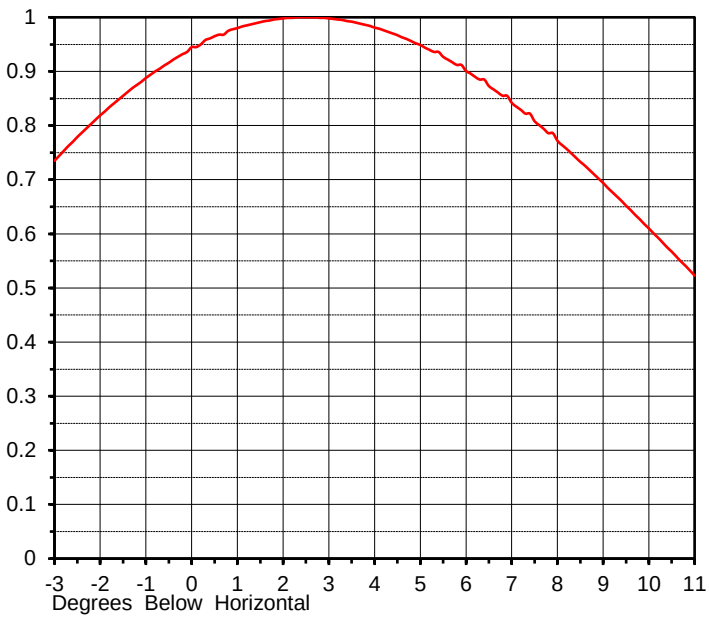
Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.636	36	0.517	72	0.508	108	0.508	144	0.517	180	0.636	216	0.845	252	0.983	288	0.983	324	0.845
1	0.629	37	0.517	73	0.508	109	0.508	145	0.516	181	0.640	217	0.850	253	0.984	289	0.980	325	0.840
2	0.622	38	0.514	74	0.510	110	0.509	146	0.517	182	0.646	218	0.856	254	0.986	290	0.978	326	0.835
3	0.619	39	0.511	75	0.510	111	0.510	147	0.521	183	0.650	219	0.860	255	0.988	291	0.975	327	0.829
4	0.615	40	0.511	76	0.510	112	0.509	148	0.523	184	0.655	220	0.866	256	0.989	292	0.973	328	0.824
5	0.608	41	0.512	77	0.510	113	0.507	149	0.524	185	0.662	221	0.872	257	0.991	293	0.971	329	0.817
6	0.603	42	0.512	78	0.510	114	0.507	150	0.527	186	0.669	222	0.877	258	0.992	294	0.968	330	0.812
7	0.600	43	0.510	79	0.509	115	0.508	151	0.527	187	0.673	223	0.881	259	0.993	295	0.966	331	0.805
8	0.596	44	0.507	80	0.509	116	0.509	152	0.527	188	0.678	224	0.887	260	0.995	296	0.963	332	0.799
9	0.591	45	0.507	81	0.510	117	0.508	153	0.530	189	0.685	225	0.892	261	0.996	297	0.960	333	0.794
10	0.587	46	0.508	82	0.510	118	0.507	154	0.532	190	0.692	226	0.896	262	0.997	298	0.957	334	0.789
11	0.582	47	0.506	83	0.511	119	0.508	155	0.535	191	0.697	227	0.901	263	0.997	299	0.955	335	0.782
12	0.578	48	0.506	84	0.511	120	0.508	156	0.539	192	0.704	228	0.905	264	0.998	300	0.951	336	0.775
13	0.575	49	0.506	85	0.511	121	0.507	157	0.541	193	0.709	229	0.909	265	0.999	301	0.948	337	0.770
14	0.570	50	0.505	86	0.512	122	0.506	158	0.544	194	0.715	230	0.913	266	0.999	302	0.944	338	0.764
15	0.565	51	0.506	87	0.512	123	0.508	159	0.547	195	0.722	231	0.918	267	0.999	303	0.941	339	0.758
16	0.561	52	0.506	88	0.512	124	0.508	160	0.550	196	0.728	232	0.922	268	1.000	304	0.938	340	0.752
17	0.558	53	0.504	89	0.512	125	0.507	161	0.553	197	0.733	233	0.926	269	1.000	305	0.934	341	0.746
18	0.554	54	0.505	90	0.512	126	0.505	162	0.554	198	0.739	234	0.930	270	1.000	306	0.930	342	0.739
19	0.553	55	0.507	91	0.512	127	0.504	163	0.558	199	0.746	235	0.934	271	1.000	307	0.926	343	0.733
20	0.550	56	0.508	92	0.512	128	0.506	164	0.561	200	0.752	236	0.938	272	1.000	308	0.922	344	0.728
21	0.547	57	0.508	93	0.512	129	0.506	165	0.565	201	0.758	237	0.941	273	0.999	309	0.918	345	0.722
22	0.544	58	0.506	94	0.512	130	0.505	166	0.570	202	0.764	238	0.944	274	0.999	310	0.913	346	0.715
23	0.541	59	0.507	95	0.511	131	0.506	167	0.575	203	0.770	239	0.948	275	0.999	311	0.909	347	0.709
24	0.539	60	0.508	96	0.511	132	0.506	168	0.578	204	0.775	240	0.951	276	0.998	312	0.905	348	0.704
25	0.535	61	0.508	97	0.511	133	0.506	169	0.582	205	0.782	241	0.955	277	0.997	313	0.901	349	0.697
26	0.532	62	0.507	98	0.510	134	0.508	170	0.587	206	0.789	242	0.957	278	0.997	314	0.896	350	0.692
27	0.530	63	0.508	99	0.510	135	0.507	171	0.591	207	0.794	243	0.960	279	0.996	315	0.892	351	0.685
28	0.527	64	0.509	100	0.509	136	0.507	172	0.596	208	0.799	244	0.963	280	0.995	316	0.887	352	0.678
29	0.527	65	0.508	101	0.509	137	0.510	173	0.600	209	0.805	245	0.966	281	0.993	317	0.881	353	0.673
30	0.527	66	0.507	102	0.510	138	0.512	174	0.603	210	0.812	246	0.968	282	0.992	318	0.877	354	0.669
31	0.524	67	0.507	103	0.510	139	0.512	175	0.608	211	0.817	247	0.971	283	0.991	319	0.872	355	0.662
32	0.523	68	0.509	104	0.510	140	0.511	176	0.615	212	0.824	248	0.973	284	0.989	320	0.866	356	0.655
33	0.521	69	0.510	105	0.510	141	0.511	177	0.619	213	0.829	249	0.975	285	0.988	321	0.860	357	0.650
34	0.517	70	0.509	106	0.510	142	0.514	178	0.622	214	0.835	250	0.978	286	0.986	322	0.856	358	0.646
35	0.516	71	0.508	107	0.508	143	0.517	179	0.629	215	0.840	251	0.980	287	0.984	323	0.850	359	0.640

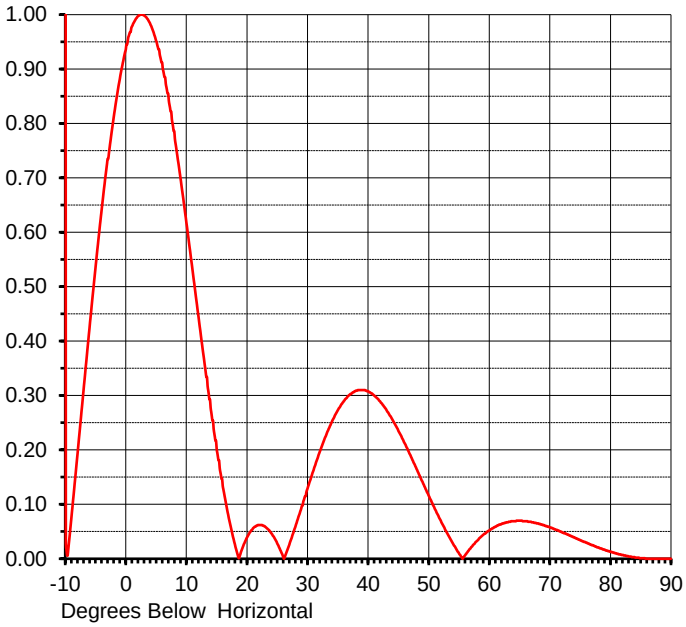
ELEVATION PATTERN

Proposal No.	**C-71401**
Date	**24-Sep-19**
Call Letters	**WVNS**
Channel	**11**
Frequency	**201 MHz**
Antenna Type	**TLS-V4-BB-R**

RMS Directivity at Main Lobe	**4.06 (6.09 dB)**	Beam Tilt	**2.50 deg**
RMS Directivity at Horizontal	**3.6 (5.56 dB)**	Pattern Number	**04T041250**

Calculated



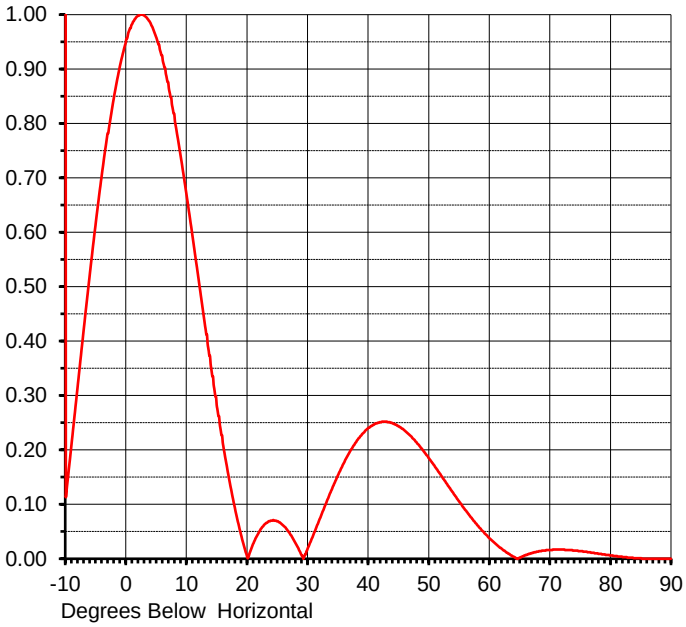


Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.028	10.0	0.610	30.0	0.133	50.0	0.114	70.0	0.057
-9.0	0.085	11.0	0.523	31.0	0.167	51.0	0.090	71.0	0.053
-8.0	0.201	12.0	0.436	32.0	0.199	52.0	0.067	72.0	0.048
-7.0	0.319	13.0	0.351	33.0	0.228	53.0	0.046	73.0	0.044
-6.0	0.435	14.0	0.270	34.0	0.254	54.0	0.026	74.0	0.039
-5.0	0.546	15.0	0.195	35.0	0.275	55.0	0.008	75.0	0.034
-4.0	0.650	16.0	0.128	36.0	0.291	56.0	0.008	76.0	0.029
-3.0	0.735	17.0	0.070	37.0	0.303	57.0	0.022	77.0	0.025
-2.0	0.819	18.0	0.022	38.0	0.309	58.0	0.034	78.0	0.020
-1.0	0.888	19.0	0.015	39.0	0.310	59.0	0.045	79.0	0.016
0.0	0.945	20.0	0.041	40.0	0.307	60.0	0.053	80.0	0.013
1.0	0.980	21.0	0.057	41.0	0.299	61.0	0.059	81.0	0.009
2.0	0.998	22.0	0.062	42.0	0.287	62.0	0.064	82.0	0.007
3.0	0.998	23.0	0.058	43.0	0.272	63.0	0.067	83.0	0.004
4.0	0.981	24.0	0.046	44.0	0.254	64.0	0.069	84.0	0.002
5.0	0.949	25.0	0.026	45.0	0.233	65.0	0.070	85.0	0.001
6.0	0.901	26.0	0.000	46.0	0.211	66.0	0.069	86.0	0.000
7.0	0.842	27.0	0.030	47.0	0.187	67.0	0.067	87.0	0.000
8.0	0.772	28.0	0.063	48.0	0.163	68.0	0.065	88.0	0.000
9.0	0.694	29.0	0.098	49.0	0.138	69.0	0.061	89.0	0.000
								90.0	0.000

ELEVATION PATTERN

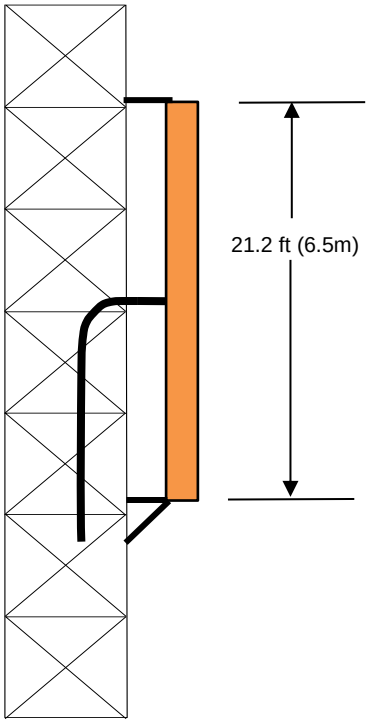
Proposal No.	**C-71401**
Date	**24-Sep-19**
Call Letters	**WVNS**
Channel	**8**
Frequency	**183 MHz**
Antenna Type	**TLS-V4-BB-R**

RMS Directivity at Main Lobe	**4.05 (6.07 dB)**	Beam Tilt	**2.45 deg**
RMS Directivity at Horizontal	**3.7 (5.68 dB)**	Pattern Number	**04T041245**
	Calculated		



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.113	10.0	0.663	30.0	0.021	50.0	0.184	70.0	0.016
-9.0	0.217	11.0	0.586	31.0	0.048	51.0	0.168	71.0	0.017
-8.0	0.322	12.0	0.507	32.0	0.075	52.0	0.152	72.0	0.017
-7.0	0.426	13.0	0.427	33.0	0.103	53.0	0.136	73.0	0.016
-6.0	0.527	14.0	0.350	34.0	0.130	54.0	0.120	74.0	0.015
-5.0	0.623	15.0	0.276	35.0	0.155	55.0	0.104	75.0	0.014
-4.0	0.711	16.0	0.207	36.0	0.178	56.0	0.089	76.0	0.013
-3.0	0.782	17.0	0.144	37.0	0.199	57.0	0.075	77.0	0.011
-2.0	0.852	18.0	0.088	38.0	0.216	58.0	0.061	78.0	0.009
-1.0	0.909	19.0	0.041	39.0	0.230	59.0	0.049	79.0	0.008
0.0	0.956	20.0	0.001	40.0	0.241	60.0	0.037	80.0	0.006
1.0	0.984	21.0	0.029	41.0	0.248	61.0	0.027	81.0	0.005
2.0	0.998	22.0	0.051	42.0	0.251	62.0	0.018	82.0	0.003
3.0	0.998	23.0	0.065	43.0	0.252	63.0	0.010	83.0	0.002
4.0	0.984	24.0	0.070	44.0	0.249	64.0	0.003	84.0	0.001
5.0	0.956	25.0	0.069	45.0	0.243	65.0	0.002	85.0	0.001
6.0	0.916	26.0	0.060	46.0	0.235	66.0	0.007	86.0	0.000
7.0	0.865	27.0	0.046	47.0	0.225	67.0	0.011	87.0	0.000
8.0	0.805	28.0	0.027	48.0	0.212	68.0	0.013	88.0	0.000
9.0	0.737	29.0	0.005	49.0	0.199	69.0	0.015	89.0	0.000
								90.0	0.000

MECHANICAL SPECIFICATIONS



Proposal No.	**C-71401**
Date	**24-Sep-19**
Call Letters	**WVNS**
Channel	**11**
Frequency	**201 MHz**
Antenna Type	**TLS-V4-BB-R**

Preliminary Specifications

Side Mounted

With ice TIA-222-G

Height AGL(z)	160 ft (48.8 m)
Basic Wind Speed	90 m/h (144.8 km/h)
Structure Class	II
Exposure Category	C
Topography Category	1
Design Ice	0.5 in t_{iz} = 1.17 in
Wind Speed w/Ice	40 m/h (64.4 km/h)

Mechanical Specifications		**without ice**	**with ice**	
Height	H2	21.2 ft (6.5m)		
Height of Center of Radiation	H3	10.6 ft (3.2m)		
Effective Projected Area	$(EPA)_A$	18.3 ft² (1.7m²)	32.9 ft² (3.1m²)	Mounts Excluded
Weight	W	510 lb (0.2t)	1100 lb (0.5t)	Mounts Excluded

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

Prepared by: JBC **Date:** 24-Sep-19 **ME:** **EE:**

Summary

Proposal No.	**C-71401**
Date	**24-Sep-19**
Call Letters	**WVNS**
Channel	**11**
Frequency	**201 MHz**
Antenna Type	**TLS-V4-BB-R**

Antenna

	Hpol	
ERP:	**12.0 kW**	**(10.79 dBk)**
Peak Gain*	8.42	(9.25 dB)

Antenna Input Power **1.43 kW** **(1.54 dBk)**

Transmission Line

Type:	**Flexline Air**	Attenuation:	**(0.73 dB)**
Size:	**1-5/8"**	Efficiency:	**84.5%**
Impedance:	**50 Ohm**		
Length:	**250 ft**	**76.2 m**	

Transmitter Output

1.69 kW **(2.27 dBk)**

Transmitter filter losses not included

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

Summary

Proposal No.	**C-71401**
Date	**24-Sep-19**
Call Letters	**WVNS**
Channel	**8**
Frequency	**183 MHz**
Antenna Type	**TLS-V4-BB-R**

Antenna

	Hpol	
ERP:	**3.70 kW**	**(5.68 dBk)**
Peak Gain*	7.77	(8.90 dB)

Antenna Input Power **0.476 kW** **-(3.22 dBk)**

Transmission Line

Type:	**Flexline Air**	Attenuation:	**(0.70 dB)**
Size:	**1-5/8"**	Efficiency:	**85.2%**
Impedance:	**50 Ohm**		
Length:	**250 ft**	**76.2 m**	

Transmitter Output

0.559 kW **-(2.52 dBk)**

Transmitter filter losses not included

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