Dielectric®

Antenna Model: **THV-12A11/VP-R 04**

Proposal Number:	C-70183
Date:	17-Mar-17
Customer:	TEGNA
Location:	Hampton, VA

Electrical Specifications

Polarization:	Elliptical		
Azimuth Pattern:	Omni		
Antenna Input:	3-1/8"	50 Ohm	EIA/DCA
VSWR:	Channel	1.08 : 1	
Bandwidth:	6 MHz		
Rated Input Power:	18 kW	(12.55 dBk)	Maximum Average Power

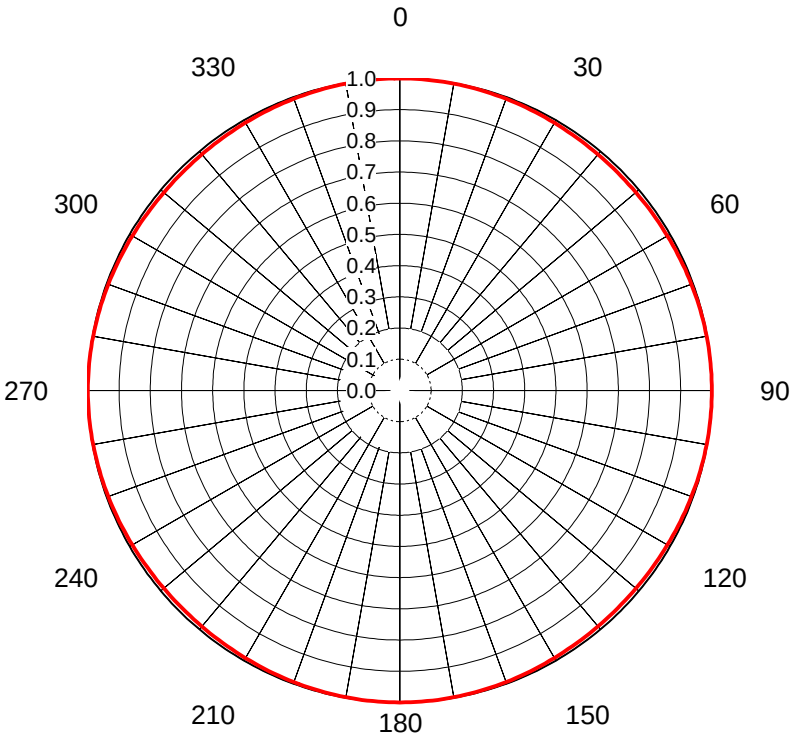
Mechanical Specifications

Mounting:	Bottom of Stack		
Environmental Protection:	Full Radome		
Height:	64.5 ft (19.7m)	less Lightning Protector	
Weight:	29300 lb (13.3t)		
Effective Projected Area:	108.4 ft² (10.1m²) TIA/EIA-222-F	**Basic Wind Speed:**	100 m/h (160.9 km/h)

Channel Specifications

Call	CH	Freq	Hpol ERP	Vpol ERP	TPO	RMS Main Lobe Hpol Gain	RMS Main Lobe Vpol Gain	RMS at Horizontal Hpol Gain	RMS at Horizontal Vpol Gain
WVEC	11	201 MHz	35.0 kW (15.44 dBk)	35.0 kW (15.44 dBk)	7.1 kW (8.50 dBk)	6.00 (7.78dB)	6.00 (7.78dB)	5.54 (7.44dB)	5.54 (7.44dB)

Andre J Skalina
I have reviewed this document
'00'04- 13:30:22 2017.05.23

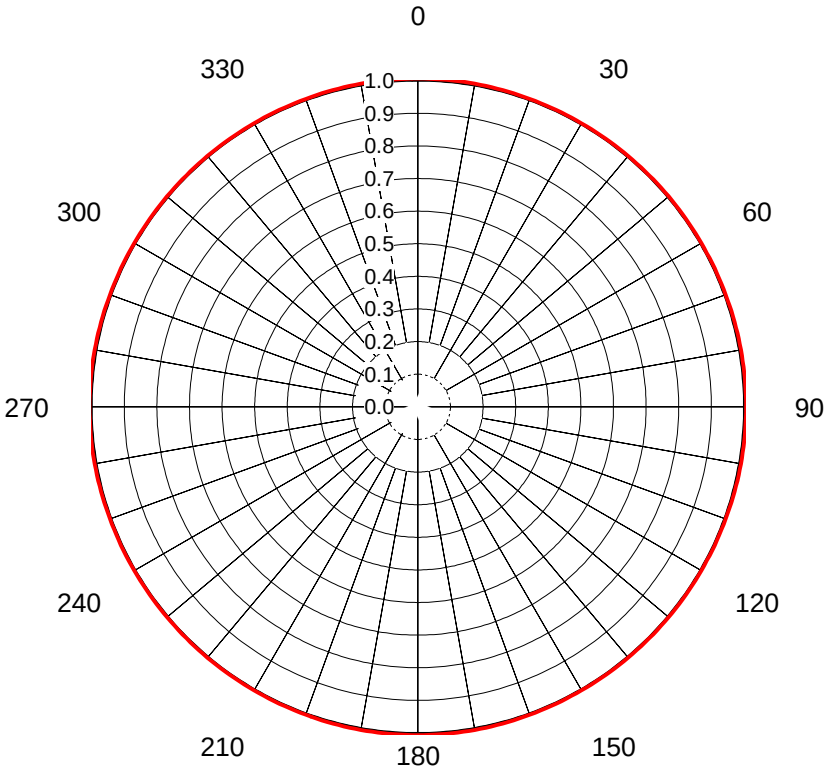


AZIMUTH PATTERN
Horizontal Polarization

Proposal No.	**C-70183**
Date	**17-Mar-17**
Call Letters	**WVEC**
Channel	**11**
Frequency	**201 MHz**
Antenna Type	**THV-12A11/VP-R 04**
Gain	**1.01 (0.06dB)**
	Calculated
Circularity	**+/- 1.0 dB**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	1.000	36	0.988	72	0.996	108	0.996	144	0.988	180	1.000	216	0.988	252	0.996	288	0.996	324	0.988
1	1.000	37	0.988	73	0.996	109	0.995	145	0.989	181	1.000	217	0.988	253	0.996	289	0.995	325	0.989
2	1.000	38	0.988	74	0.996	110	0.995	146	0.989	182	1.000	218	0.988	254	0.996	290	0.995	326	0.989
3	1.000	39	0.988	75	0.997	111	0.994	147	0.989	183	1.000	219	0.988	255	0.997	291	0.994	327	0.989
4	1.000	40	0.987	76	0.997	112	0.994	148	0.990	184	1.000	220	0.987	256	0.997	292	0.994	328	0.990
5	1.000	41	0.987	77	0.998	113	0.993	149	0.990	185	1.000	221	0.987	257	0.998	293	0.993	329	0.990
6	0.999	42	0.987	78	0.998	114	0.993	150	0.990	186	0.999	222	0.987	258	0.998	294	0.993	330	0.990
7	0.999	43	0.987	79	0.998	115	0.992	151	0.991	187	0.999	223	0.987	259	0.998	295	0.992	331	0.991
8	0.999	44	0.987	80	0.998	116	0.992	152	0.991	188	0.999	224	0.987	260	0.998	296	0.992	332	0.991
9	0.999	45	0.987	81	0.999	117	0.992	153	0.992	189	0.999	225	0.987	261	0.999	297	0.992	333	0.992
10	0.998	46	0.987	82	0.999	118	0.991	154	0.992	190	0.998	226	0.987	262	0.999	298	0.991	334	0.992
11	0.998	47	0.987	83	0.999	119	0.991	155	0.992	191	0.998	227	0.987	263	0.999	299	0.991	335	0.992
12	0.998	48	0.987	84	0.999	120	0.990	156	0.993	192	0.998	228	0.987	264	0.999	300	0.990	336	0.993
13	0.998	49	0.987	85	1.000	121	0.990	157	0.993	193	0.998	229	0.987	265	1.000	301	0.990	337	0.993
14	0.997	50	0.987	86	1.000	122	0.990	158	0.994	194	0.997	230	0.987	266	1.000	302	0.990	338	0.994
15	0.997	51	0.988	87	1.000	123	0.989	159	0.994	195	0.997	231	0.988	267	1.000	303	0.989	339	0.994
16	0.996	52	0.988	88	1.000	124	0.989	160	0.995	196	0.996	232	0.988	268	1.000	304	0.989	340	0.995
17	0.996	53	0.988	89	1.000	125	0.989	161	0.995	197	0.996	233	0.988	269	1.000	305	0.989	341	0.995
18	0.996	54	0.988	90	1.000	126	0.988	162	0.996	198	0.996	234	0.988	270	1.000	306	0.988	342	0.996
19	0.995	55	0.989	91	1.000	127	0.988	163	0.996	199	0.995	235	0.989	271	1.000	307	0.988	343	0.996
20	0.995	56	0.989	92	1.000	128	0.988	164	0.996	200	0.995	236	0.989	272	1.000	308	0.988	344	0.996
21	0.994	57	0.989	93	1.000	129	0.988	165	0.997	201	0.994	237	0.989	273	1.000	309	0.988	345	0.997
22	0.994	58	0.990	94	1.000	130	0.987	166	0.997	202	0.994	238	0.990	274	1.000	310	0.987	346	0.997
23	0.993	59	0.990	95	1.000	131	0.987	167	0.998	203	0.993	239	0.990	275	1.000	311	0.987	347	0.998
24	0.993	60	0.990	96	0.999	132	0.987	168	0.998	204	0.993	240	0.990	276	0.999	312	0.987	348	0.998
25	0.992	61	0.991	97	0.999	133	0.987	169	0.998	205	0.992	241	0.991	277	0.999	313	0.987	349	0.998
26	0.992	62	0.991	98	0.999	134	0.987	170	0.998	206	0.992	242	0.991	278	0.999	314	0.987	350	0.998
27	0.992	63	0.992	99	0.999	135	0.987	171	0.999	207	0.992	243	0.992	279	0.999	315	0.987	351	0.999
28	0.991	64	0.992	100	0.998	136	0.987	172	0.999	208	0.991	244	0.992	280	0.998	316	0.987	352	0.999
29	0.991	65	0.992	101	0.998	137	0.987	173	0.999	209	0.991	245	0.992	281	0.998	317	0.987	353	0.999
30	0.990	66	0.993	102	0.998	138	0.987	174	0.999	210	0.990	246	0.993	282	0.998	318	0.987	354	0.999
31	0.990	67	0.993	103	0.998	139	0.987	175	1.000	211	0.990	247	0.993	283	0.998	319	0.987	355	1.000
32	0.990	68	0.994	104	0.997	140	0.987	176	1.000	212	0.990	248	0.994	284	0.997	320	0.987	356	1.000
33	0.989	69	0.994	105	0.997	141	0.988	177	1.000	213	0.989	249	0.994	285	0.997	321	0.988	357	1.000
34	0.989	70	0.995	106	0.996	142	0.988	178	1.000	214	0.989	250	0.995	286	0.996	322	0.988	358	1.000
35	0.989	71	0.995	107	0.996	143	0.988	179	1.000	215	0.989	251	0.995	287	0.996	323	0.988	359	1.000

Dielectric®



AZIMUTH PATTERN
Vertical Polarization

Proposal No.	**C-70183**
Date	**17-Mar-17**
Call Letters	**WVEC**
Channel	**11**
Frequency	**201 MHz**
Antenna Type	**THV-12A11/VP-R 04**
Gain	**1 (0.02dB)**
	Calculated
Circularity	**+/- 1.0 dB**

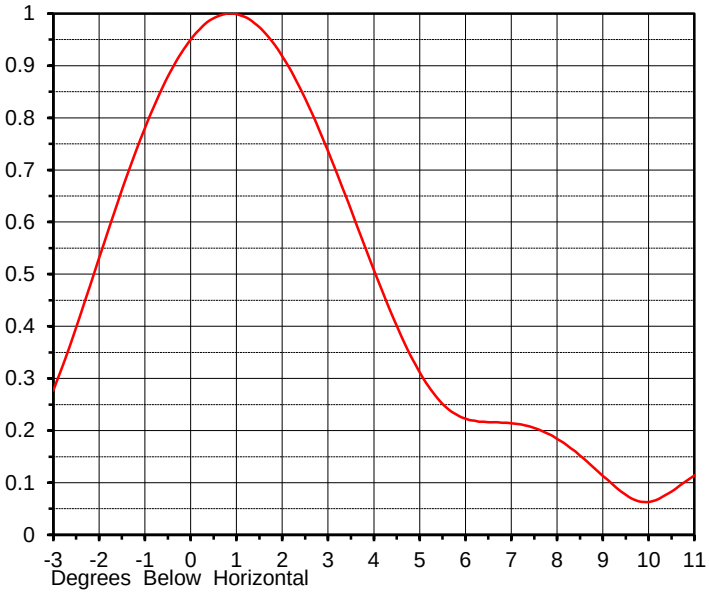
Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	1.006	36	1.004	72	1.005	108	1.005	144	1.004	180	1.006	216	1.004	252	1.005	288	1.005	324	1.004
1	1.006	37	1.004	73	1.005	109	1.005	145	1.004	181	1.006	217	1.004	253	1.005	289	1.005	325	1.004
2	1.006	38	1.004	74	1.005	110	1.005	146	1.004	182	1.006	218	1.004	254	1.005	290	1.005	326	1.004
3	1.006	39	1.004	75	1.005	111	1.005	147	1.004	183	1.006	219	1.004	255	1.005	291	1.005	327	1.004
4	1.006	40	1.004	76	1.005	112	1.004	148	1.004	184	1.006	220	1.004	256	1.005	292	1.004	328	1.004
5	1.006	41	1.004	77	1.006	113	1.004	149	1.004	185	1.006	221	1.004	257	1.006	293	1.004	329	1.004
6	1.006	42	1.004	78	1.006	114	1.004	150	1.004	186	1.006	222	1.004	258	1.006	294	1.004	330	1.004
7	1.006	43	1.004	79	1.006	115	1.004	151	1.004	187	1.006	223	1.004	259	1.006	295	1.004	331	1.004
8	1.006	44	1.004	80	1.006	116	1.004	152	1.004	188	1.006	224	1.004	260	1.006	296	1.004	332	1.004
9	1.006	45	1.004	81	1.006	117	1.004	153	1.004	189	1.006	225	1.004	261	1.006	297	1.004	333	1.004
10	1.006	46	1.004	82	1.006	118	1.004	154	1.004	190	1.006	226	1.004	262	1.006	298	1.004	334	1.004
11	1.006	47	1.004	83	1.006	119	1.004	155	1.004	191	1.006	227	1.004	263	1.006	299	1.004	335	1.004
12	1.006	48	1.004	84	1.006	120	1.004	156	1.004	192	1.006	228	1.004	264	1.006	300	1.004	336	1.004
13	1.006	49	1.004	85	1.006	121	1.004	157	1.004	193	1.006	229	1.004	265	1.006	301	1.004	337	1.004
14	1.005	50	1.004	86	1.006	122	1.004	158	1.004	194	1.005	230	1.004	266	1.006	302	1.004	338	1.004
15	1.005	51	1.004	87	1.006	123	1.004	159	1.005	195	1.005	231	1.004	267	1.006	303	1.004	339	1.005
16	1.005	52	1.004	88	1.006	124	1.004	160	1.005	196	1.005	232	1.004	268	1.006	304	1.004	340	1.005
17	1.005	53	1.004	89	1.006	125	1.004	161	1.005	197	1.005	233	1.004	269	1.006	305	1.004	341	1.005
18	1.005	54	1.004	90	1.006	126	1.004	162	1.005	198	1.005	234	1.004	270	1.006	306	1.004	342	1.005
19	1.005	55	1.004	91	1.006	127	1.004	163	1.005	199	1.005	235	1.004	271	1.006	307	1.004	343	1.005
20	1.005	56	1.004	92	1.006	128	1.004	164	1.005	200	1.005	236	1.004	272	1.006	308	1.004	344	1.005
21	1.005	57	1.004	93	1.006	129	1.004	165	1.005	201	1.005	237	1.004	273	1.006	309	1.004	345	1.005
22	1.004	58	1.004	94	1.006	130	1.004	166	1.005	202	1.004	238	1.004	274	1.006	310	1.004	346	1.005
23	1.004	59	1.004	95	1.006	131	1.004	167	1.006	203	1.004	239	1.004	275	1.006	311	1.004	347	1.006
24	1.004	60	1.004	96	1.006	132	1.004	168	1.006	204	1.004	240	1.004	276	1.006	312	1.004	348	1.006
25	1.004	61	1.004	97	1.006	133	1.004	169	1.006	205	1.004	241	1.004	277	1.006	313	1.004	349	1.006
26	1.004	62	1.004	98	1.006	134	1.004	170	1.006	206	1.004	242	1.004	278	1.006	314	1.004	350	1.006
27	1.004	63	1.004	99	1.006	135	1.004	171	1.006	207	1.004	243	1.004	279	1.006	315	1.004	351	1.006
28	1.004	64	1.004	100	1.006	136	1.004	172	1.006	208	1.004	244	1.004	280	1.006	316	1.004	352	1.006
29	1.004	65	1.004	101	1.006	137	1.004	173	1.006	209	1.004	245	1.004	281	1.006	317	1.004	353	1.006
30	1.004	66	1.004	102	1.006	138	1.004	174	1.006	210	1.004	246	1.004	282	1.006	318	1.004	354	1.006
31	1.004	67	1.004	103	1.006	139	1.004	175	1.006	211	1.004	247	1.004	283	1.006	319	1.004	355	1.006
32	1.004	68	1.004	104	1.005	140	1.004	176	1.006	212	1.004	248	1.004	284	1.005	320	1.004	356	1.006
33	1.004	69	1.005	105	1.005	141	1.004	177	1.006	213	1.004	249	1.005	285	1.005	321	1.004	357	1.006
34	1.004	70	1.005	106	1.005	142	1.004	178	1.006	214	1.004	250	1.005	286	1.005	322	1.004	358	1.006
35	1.004	71	1.005	107	1.005	143	1.004	179	1.006	215	1.004	251	1.005	287	1.005	323	1.004	359	1.006

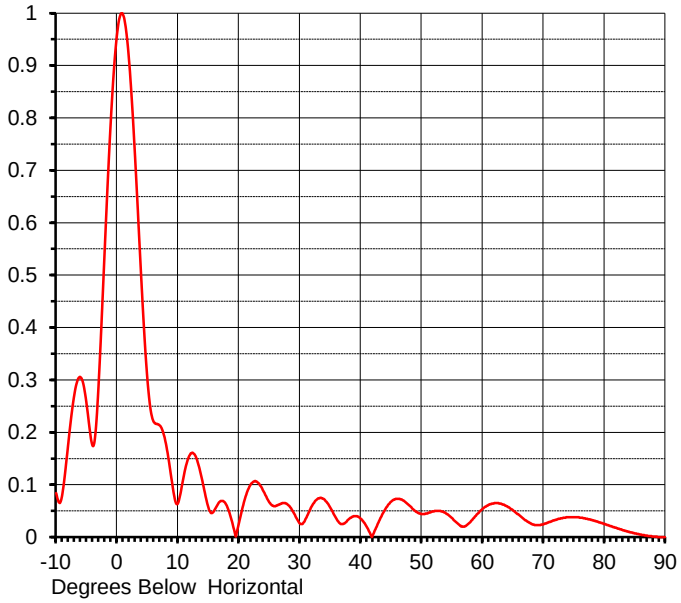
ELEVATION PATTERN

Proposal No.	**C-70183**
Date	**17-Mar-17**
Call Letters	**WVEC**
Channel	**11**
Frequency	**201 MHz**
Antenna Type	**THV-12A11/VP-R 04**

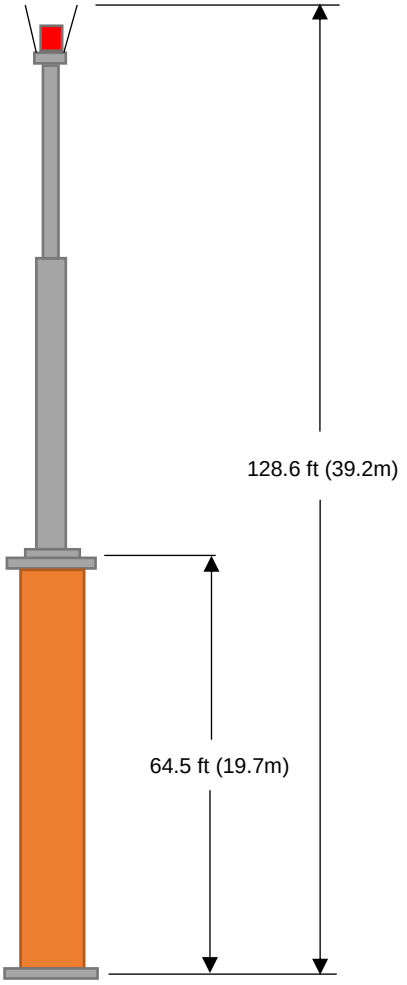
RMS Directivity at Main Lobe	**12.0 (10.79 dB)**	Beam Tilt	**0.75 deg**
RMS Directivity at Horizontal	**10.8 (10.33 dB)**	Pattern Number	**12V120075**

Calculated





Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.084	10.0	0.065	30.0	0.026	50.0	0.044	70.0	0.025
-9.0	0.081	11.0	0.120	31.0	0.036	51.0	0.046	71.0	0.029
-8.0	0.180	12.0	0.158	32.0	0.060	52.0	0.049	72.0	0.033
-7.0	0.273	13.0	0.151	33.0	0.074	53.0	0.050	73.0	0.036
-6.0	0.305	14.0	0.107	34.0	0.072	54.0	0.045	74.0	0.038
-5.0	0.253	15.0	0.056	35.0	0.056	55.0	0.036	75.0	0.038
-4.0	0.174	16.0	0.052	36.0	0.035	56.0	0.025	76.0	0.037
-3.0	0.300	17.0	0.069	37.0	0.025	57.0	0.020	77.0	0.035
-2.0	0.557	18.0	0.060	38.0	0.034	58.0	0.029	78.0	0.032
-1.0	0.802	19.0	0.023	39.0	0.040	59.0	0.043	79.0	0.029
0.0	0.961	20.0	0.027	40.0	0.035	60.0	0.054	80.0	0.025
1.0	0.996	21.0	0.074	41.0	0.019	61.0	0.062	81.0	0.021
2.0	0.904	22.0	0.102	42.0	0.005	62.0	0.065	82.0	0.017
3.0	0.714	23.0	0.105	43.0	0.031	63.0	0.064	83.0	0.013
4.0	0.486	24.0	0.088	44.0	0.053	64.0	0.059	84.0	0.010
5.0	0.297	25.0	0.066	45.0	0.068	65.0	0.051	85.0	0.007
6.0	0.220	26.0	0.059	46.0	0.073	66.0	0.042	86.0	0.005
7.0	0.213	27.0	0.064	47.0	0.070	67.0	0.032	87.0	0.003
8.0	0.179	28.0	0.062	48.0	0.060	68.0	0.025	88.0	0.001
9.0	0.106	29.0	0.046	49.0	0.049	69.0	0.023	89.0	0.000
								90.0	0.000



MECHANICAL SPECIFICATIONS

Proposal No.	**C-70183**
Date	**17-Mar-17**
Call Letters	**WVEC**
Channel	**11**
Frequency	**201 MHz**
Antenna Type	**THV-12A11/VP-R 04**

Preliminary Specifications

Bottom of Stack

Without ice TIA/EIA-222-F

Height AGL	1094 ft (333.5 m)
Basic Wind Speed	100 m/h (160.9 km/h)

Mechanical Specifications		**antenna only**	**full stack**
Height with Lightning Protector	H4		128.6 ft (39.2m)
Height less Lightning Protector	H2	64.5 ft (19.7m)	124.6 ft (38m)
Height of Center of Radiation	H3	32.3 ft (9.8m)	32.3 ft (9.8m)
Force Coeff. x Projected Area	CaAc	108.4 ft² (10.1m²)	138.4 ft² (12.9m²)
Moment Arm	D1	32.3 ft (9.8m)	47.4 ft (14.4m)
Weight	W	29300 lb (13.3t)	34000 lb (15.4t)

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

Prepared by: KLP **Date:** 17-Mar-17 **ME:** **EE:**

Summary

Proposal No.	**C-70183**
Date	**17-Mar-17**
Call Letters	**WVEC**
Channel	**11**
Frequency	**201 MHz**
Antenna Type	**THV-12A11/VP-R 04**

Antenna

	Hpol		Vpol	
ERP:	35.0 kW	**(15.44 dBk)**	35.0 kW	**(15.44 dBk)**
RMS Gain*	6.00	(7.78 dB)	6.00	(7.78 dB)

Antenna Input Power

5.8 kW **(7.66 dBk)**

Transmission Line

Type:	**Rigid**	Attenuation:	**(0.85 dB)**
Size:	**6-1/8"**	Efficiency:	**82.3%**
Impedance:	**75 Ohm**		
Length:	**1284 ft**	**391.4 m**	

Transmitter Output

7.1 kW **(8.50 dBk)**

Transmitter filter losses not included

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