



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

Proposal Number: C-70183-3
Date: 18-Jan-18
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

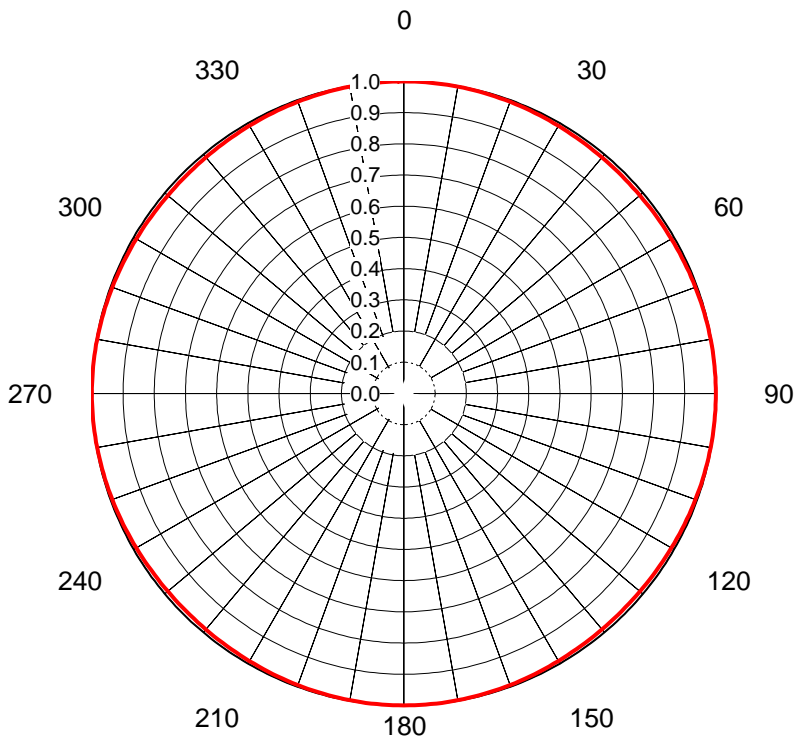
Mounting: Top of Stack
Environmental Protection: Full Radome
Height: 64.5 ft (19.7m) less Lightning Protector 68.5 ft (20.9m) with Lightning Protector
Weight: 9350 lb (4.2t)
Effective Projected Area: 91 ft² (8.5m²) TIA-222-G Basic Wind Speed: 90 m/h (144.8 km/h)

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	41.0 kW (16.13 dBk)	41.0 kW (16.13 dBk)	8.3 kW (9.19 dBk)	6.00 (7.78dB)	6.00 (7.78dB)	5.54 (7.44dB)	5.54 (7.44dB)

AZIMUTH PATTERN Horizontal Polarization

Proposal No. **C-70183-3**
 Date **18-Jan-18**
 Call Letters **WVEC**
 Channel **11**
 Frequency **201 MHz**
 Antenna Type **THV-12A11/VP-R 04 (SP)**
 Gain **1.01 (0.06dB)**
 Calculated
 Circularity **+/- 1.0 dB**
 04H D11

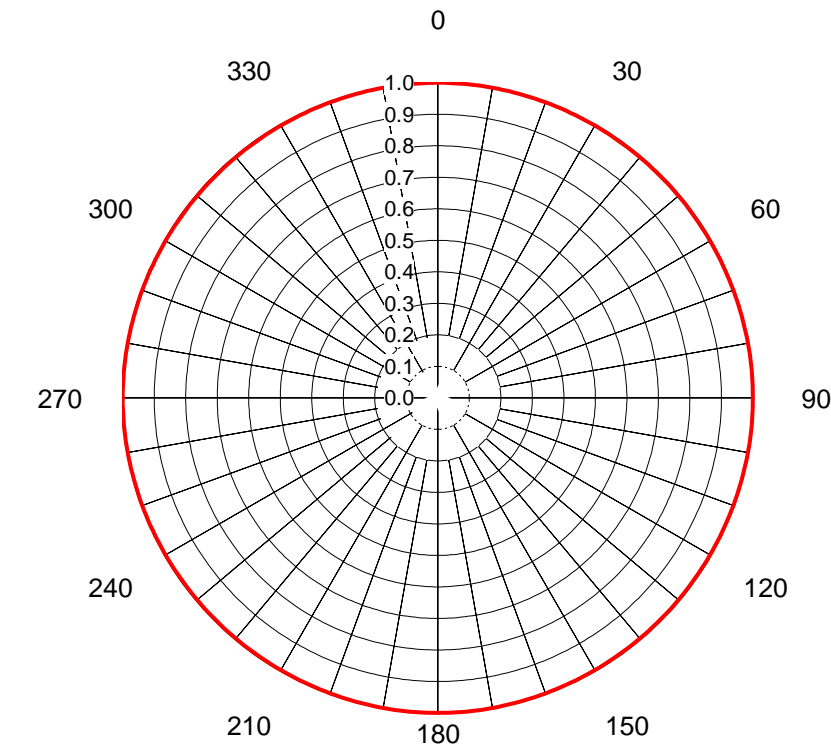


Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	1.000	36	0.988	72	0.996	108	0.996	144	0.988	180	1.000	216	0.988	252	0.996	288	0.996
1	1.000	37	0.988	73	0.996	109	0.995	145	0.989	181	1.000	217	0.988	253	0.996	289	0.995
2	1.000	38	0.988	74	0.996	110	0.995	146	0.989	182	1.000	218	0.988	254	0.996	290	0.995
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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

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AZIMUTH PATTERN Vertical Polarization

Proposal No. **C-70183-3**
 Date **18-Jan-18**
 Call Letters **WVEC**
 Channel **11**
 Frequency **201 MHz**
 Antenna Type **THV-12A11/VP-R 04 (SP)**
 Gain **1 (0.02dB)**
 Calculated
 Circularity **+/- 1.0 dB**
 04V D11



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

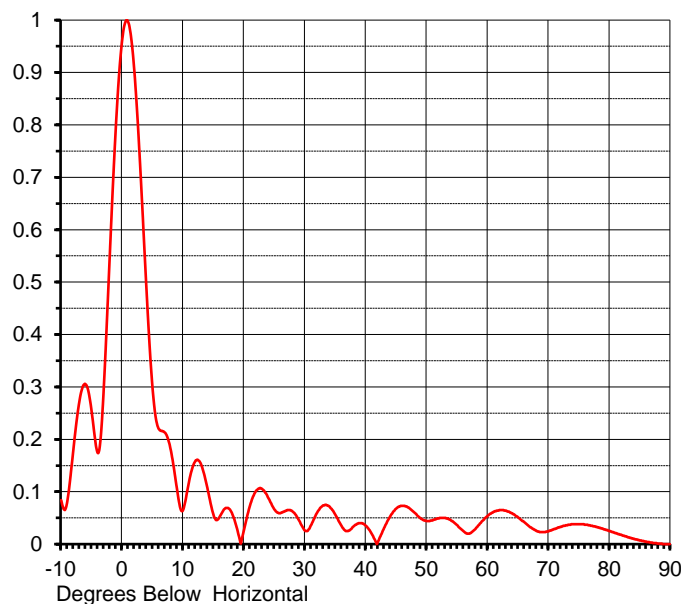
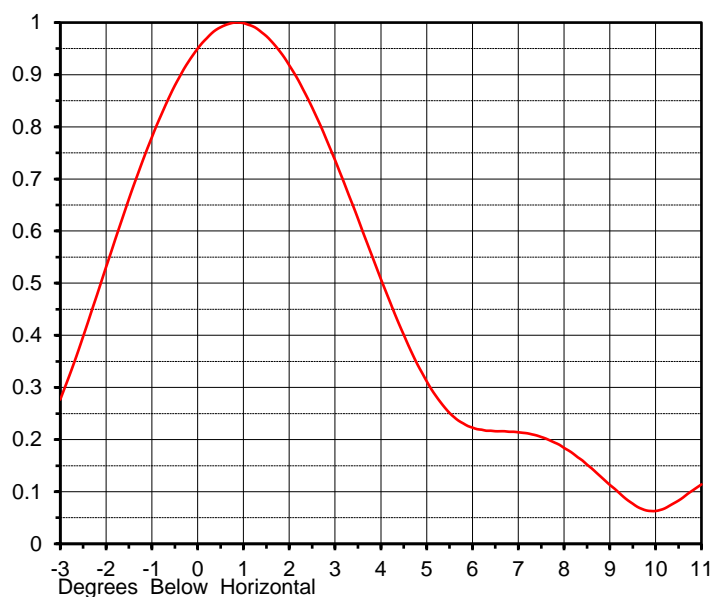
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ELEVATION PATTERN

Proposal No. **C-70183-3**
 Date **18-Jan-18**
 Call Letters **WVEC**
 Channel **11**
 Frequency **201 MHz**
 Antenna Type **THV-12A11/VP-R 04 (SP)**

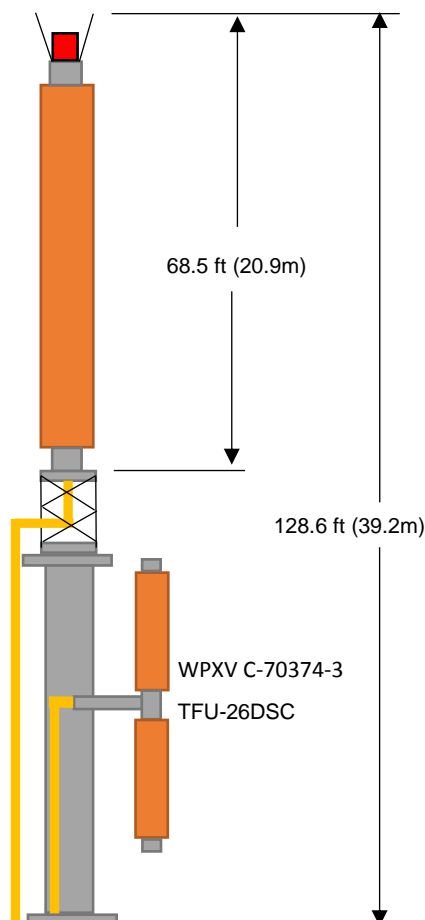
RMS Directivity at Main Lobe **12.0 (10.79 dB)**
 RMS Directivity at Horizontal **10.8 (10.33 dB)**
Calculated

Beam Tilt **0.75 deg**
 Pattern Number **12V120075**



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

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MECHANICAL SPECIFICATIONS

Proposal No. **C-70183-3**
 Date **18-Jan-18**
 Call Letters **WVEC**
 Channel **11**
 Frequency **201 MHz**
 Antenna Type **THV-12A11/VP-R 04 (SP)**

Preliminary Specifications

Top of Stack

With ice TIA-222-G

Height AGL(z) 1150 ft (350.5 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 $t_{iz} = 2.10$ in
 Wind Speed w/Ice 30 m/h (48.3 km/h)

Mechanical Specifications		without ice	with ice	full stack	full stack with ice
Height with Lightning Protector	H4	68.5 ft (20.9m)		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)		92.3 ft (28.1m)	
Effective Projected Area	(EPA) _S	91 ft ² (8.5m ²)	209 ft ² (19.4m ²)	286.3 ft ² (26.6m ²)	593.1 ft ² (55.1m ²)
Moment Arm	D1	32.3 ft (9.8m)	32.3 ft (9.8m)	51.6 ft (15.7m)	56.4 ft (17.2m)

Weight W 9350 lb (4.2t) 15000 lb (6.8t) 39050 lb (17.7t) 51700 lb (23.5t)

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

Prepared by: KLP Date: 18-Jan-18 ME: EE:
 Rev. No.3 by: SPJC Date: 26-Jun-18

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Summary

Proposal No.	C-70183-3
Date	18-Jan-18
Call Letters	WVEC
Channel	11
Frequency	201 MHz
Antenna Type	THV-12A11/VP-R 04 (SP)

Antenna

	Hpol	Vpol
ERP:	41.0 kW (16.13 dBk)	41.0 kW (16.13 dBk)
RMS Gain*	6.00 (7.78 dB)	6.00 (7.78 dB)

Antenna Input Power	6.8 kW (8.34 dBk)
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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

8.3 kW (9.19 dBk)

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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