



Antenna Model:

**TFU-25ETT/VP-R 4C160**

**Proposal Number:** C-70483-8  
**Date:** 10-May-18  
**Customer:** Nexstar  
**Location:** Youngstown, OH

### Electrical Specifications

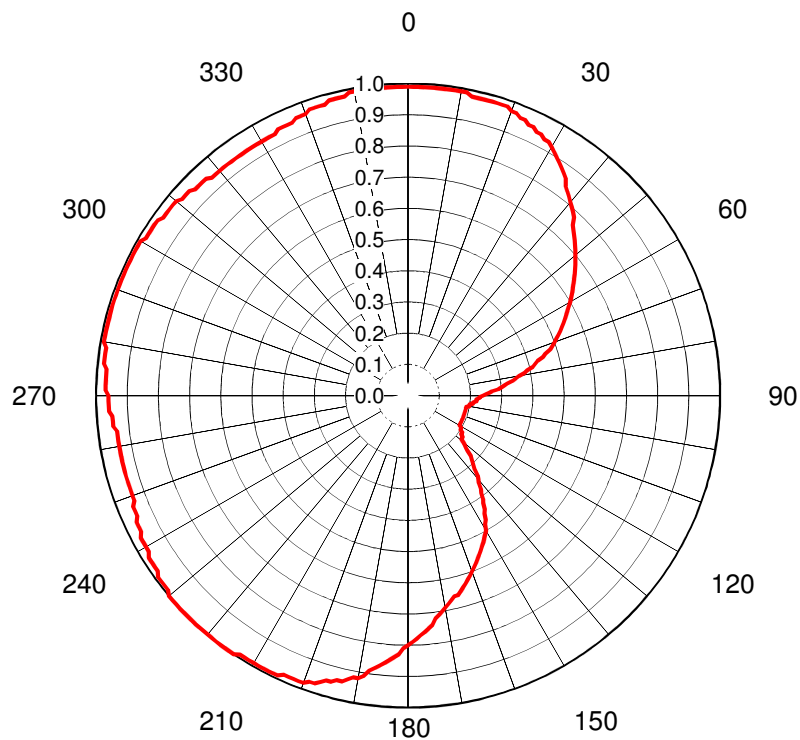
**Polarization:** Elliptical  
**Azimuth Pattern:** Directional  
**Antenna Input:** 6-1/8" 75 Ohm EIA/DCA  
**VSWR:** Channel 1.08 : 1  
**Bandwidth:** 6 MHz  
**Rated Input Power:** 35 kW (15.44 dBk) Maximum Average Power

### Mechanical Specifications

**Mounting:** Top Mounted  
**Environmental Protection:** Full Radome  
**Height:** 49.6 ft (15.1m) less Lightning Protector 53.6 ft (16.3m) with Lightning Protector  
**Weight:** 6650 lb (3t)  
**Effective Projected Area:** 51.3 ft<sup>2</sup> (4.8m<sup>2</sup>) TIA-222-G **Basic Wind Speed:** 89 m/h (143.2 km/h)

### Channel Specifications

Call	CH	Freq	Hpol ERP	Vpol ERP	TPO	Peak Main Lobe Hpol Gain	Peak Main Lobe Vpol Gain	Peak at Horizontal Hpol Gain	Peak at Horizontal Vpol Gain
WYTV	31	575 MHz	703.0 kW (28.47 dBk)	175.8 kW (22.45 dBk)	36.5 kW (15.63 dBk)	29.60 (14.71dB)	7.40 (8.69dB)	5.83 (7.66dB)	1.46 (1.64dB)



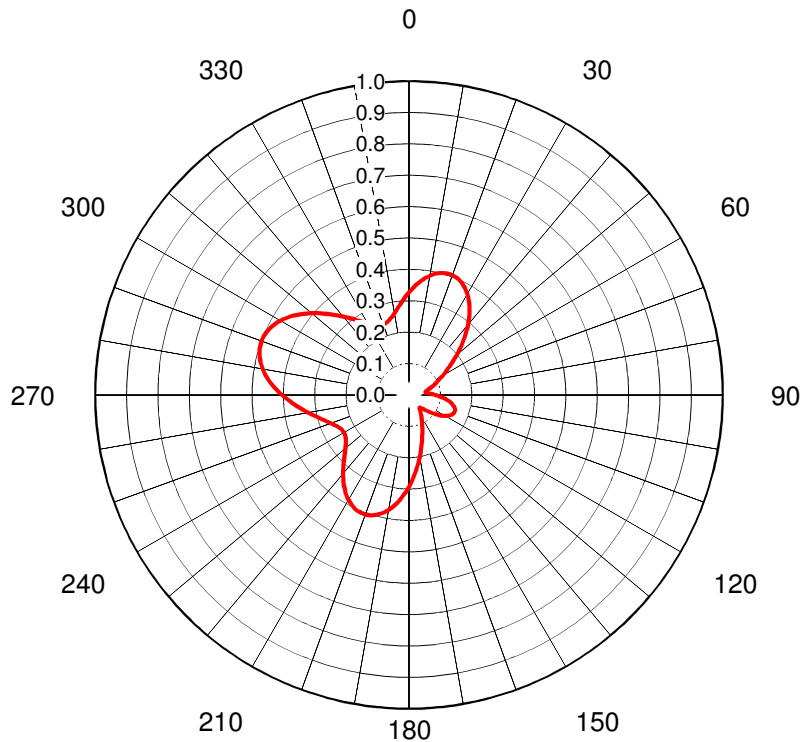
## AZIMUTH PATTERN Horizontal Polarization

Proposal No. **C-70483-8**  
 Date **10-May-18**  
 Call Letters **WYTV**  
 Channel **31**  
 Frequency **575 MHz**  
 Antenna Type **TFU-25ETT/VP-R 4C160**  
 Gain **1.52 (1.83dB)**  
**Calculated**

Drawing # **4C160-31H**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.990	36	0.860	72	0.480	108	0.190	144	0.410	180	0.800	216	1.000	252	0.940	288	0.990
1	0.990	37	0.840	73	0.460	109	0.190	145	0.420	181	0.810	217	1.000	253	0.940	289	0.990
2	0.990	38	0.830	74	0.450	110	0.190	146	0.440	182	0.830	218	1.000	254	0.940	290	0.990
3	0.990	39	0.820	75	0.430	111	0.190	147	0.450	183	0.840	219	1.000	255	0.940	291	0.990
4	0.990	40	0.810	76	0.420	112	0.190	148	0.470	184	0.850	220	1.000	256	0.940	292	0.990
5	0.990	41	0.800	77	0.410	113	0.190	149	0.480	185	0.860	221	1.000	257	0.940	293	0.990
6	0.990	42	0.790	78	0.390	114	0.190	150	0.500	186	0.870	222	1.000	258	0.940	294	0.990
7	0.990	43	0.780	79	0.380	115	0.190	151	0.510	187	0.880	223	1.000	259	0.940	295	0.990
8	0.990	44	0.760	80	0.360	116	0.190	152	0.520	188	0.890	224	1.000	260	0.940	296	0.990
9	0.990	45	0.750	81	0.350	117	0.190	153	0.530	189	0.910	225	1.000	261	0.940	297	0.990
10	0.990	46	0.740	82	0.340	118	0.190	154	0.540	190	0.920	226	1.000	262	0.940	298	0.990
11	0.990	47	0.730	83	0.320	119	0.190	155	0.550	191	0.920	227	1.000	263	0.940	299	0.990
12	0.980	48	0.720	84	0.310	120	0.190	156	0.560	192	0.930	228	1.000	264	0.950	300	0.990
13	0.980	49	0.710	85	0.300	121	0.200	157	0.570	193	0.940	229	1.000	265	0.950	301	0.980
14	0.980	50	0.700	86	0.290	122	0.200	158	0.580	194	0.940	230	1.000	266	0.950	302	0.980
15	0.980	51	0.690	87	0.270	123	0.200	159	0.590	195	0.950	231	0.990	267	0.960	303	0.980
16	0.980	52	0.680	88	0.260	124	0.210	160	0.600	196	0.950	232	0.990	268	0.960	304	0.980
17	0.980	53	0.670	89	0.250	125	0.210	161	0.610	197	0.960	233	0.990	269	0.960	305	0.980
18	0.980	54	0.660	90	0.240	126	0.210	162	0.620	198	0.970	234	0.990	270	0.960	306	0.970
19	0.980	55	0.650	91	0.230	127	0.220	163	0.630	199	0.970	235	0.980	271	0.970	307	0.970
20	0.970	56	0.640	92	0.230	128	0.220	164	0.640	200	0.980	236	0.980	272	0.970	308	0.970
21	0.970	57	0.630	93	0.220	129	0.220	165	0.650	201	0.980	237	0.980	273	0.970	309	0.970
22	0.960	58	0.620	94	0.220	130	0.230	166	0.660	202	0.980	238	0.980	274	0.970	310	0.970
23	0.960	59	0.610	95	0.220	131	0.240	167	0.660	203	0.980	239	0.970	275	0.970	311	0.960
24	0.950	60	0.600	96	0.210	132	0.250	168	0.670	204	0.980	240	0.970	276	0.980	312	0.960
25	0.950	61	0.590	97	0.210	133	0.260	169	0.680	205	0.990	241	0.970	277	0.980	313	0.960
26	0.940	62	0.580	98	0.200	134	0.280	170	0.690	206	0.990	242	0.970	278	0.980	314	0.950
27	0.940	63	0.570	99	0.200	135	0.290	171	0.700	207	0.990	243	0.960	279	0.980	315	0.950
28	0.930	64	0.560	100	0.200	136	0.300	172	0.710	208	0.990	244	0.960	280	0.990	316	0.950
29	0.930	65	0.550	101	0.190	137	0.310	173	0.720	209	0.990	245	0.960	281	0.990	317	0.950
30	0.920	66	0.540	102	0.190	138	0.320	174	0.740	210	0.990	246	0.950	282	0.990	318	0.940
31	0.910	67	0.530	103	0.190	139	0.340	175	0.750	211	0.990	247	0.950	283	0.990	319	0.940
32	0.900	68	0.520	104	0.190	140	0.350	176	0.760	212	0.990	248	0.950	284	0.990	320	0.940
33	0.890	69	0.510	105	0.190	141	0.360	177	0.770	213	0.990	249	0.940	285	0.990	321	0.940
34	0.880	70	0.500	106	0.190	142	0.380	178	0.780	214	1.000	250	0.940	286	0.990	322	0.940
35	0.870	71	0.490	107	0.190	143	0.390	179	0.790	215	1.000	251	0.940	287	0.990	323	0.940

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## AZIMUTH PATTERN Vertical Polarization

Proposal No. **C-70483-8**  
 Date **10-May-18**  
 Call Letters **WYTV**  
 Channel **31**  
 Frequency **575 MHz**  
 Antenna Type **TFU-25ETT/VP-R 4C160**  
 Gain **2.88 (4.6dB)**  
**Calculated**

Drawing # **4C160-31VH**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.327	36	0.328	72	0.072	108	0.154	144	0.060	180	0.293	216	0.353	252	0.274	288	0.499	324	0.298
1	0.333	37	0.320	73	0.069	109	0.155	145	0.062	181	0.302	217	0.347	253	0.280	289	0.500	325	0.291
2	0.340	38	0.311	74	0.065	110	0.155	146	0.065	182	0.311	218	0.340	254	0.285	290	0.500	326	0.285
3	0.347	39	0.302	75	0.062	111	0.155	147	0.069	183	0.320	219	0.333	255	0.291	291	0.500	327	0.280
4	0.353	40	0.293	76	0.060	112	0.154	148	0.072	184	0.328	220	0.327	256	0.298	292	0.499	328	0.274
5	0.359	41	0.284	77	0.057	113	0.153	149	0.075	185	0.337	221	0.320	257	0.304	293	0.497	329	0.269
6	0.365	42	0.274	78	0.055	114	0.152	150	0.079	186	0.344	222	0.313	258	0.311	294	0.496	330	0.264
7	0.371	43	0.265	79	0.054	115	0.150	151	0.083	187	0.352	223	0.306	259	0.318	295	0.493	331	0.260
8	0.376	44	0.255	80	0.053	116	0.147	152	0.087	188	0.359	224	0.300	260	0.326	296	0.490	332	0.256
9	0.381	45	0.246	81	0.053	117	0.144	153	0.091	189	0.366	225	0.293	261	0.333	297	0.487	333	0.252
10	0.386	46	0.236	82	0.054	118	0.141	154	0.095	190	0.372	226	0.287	262	0.341	298	0.483	334	0.249
11	0.390	47	0.227	83	0.056	119	0.138	155	0.099	191	0.378	227	0.281	263	0.349	299	0.478	335	0.246
12	0.394	48	0.218	84	0.058	120	0.134	156	0.104	192	0.383	228	0.275	264	0.357	300	0.473	336	0.244
13	0.397	49	0.208	85	0.061	121	0.129	157	0.108	193	0.388	229	0.269	265	0.365	301	0.468	337	0.242
14	0.400	50	0.199	86	0.065	122	0.125	158	0.114	194	0.392	230	0.264	266	0.373	302	0.462	338	0.241
15	0.402	51	0.191	87	0.069	123	0.120	159	0.119	195	0.396	231	0.260	267	0.381	303	0.456	339	0.240
16	0.404	52	0.182	88	0.073	124	0.115	160	0.125	196	0.399	232	0.255	268	0.389	304	0.449	340	0.239
17	0.405	53	0.174	89	0.078	125	0.110	161	0.131	197	0.401	233	0.252	269	0.397	305	0.443	341	0.239
18	0.406	54	0.166	90	0.083	126	0.105	162	0.137	198	0.403	234	0.248	270	0.405	306	0.436	342	0.240
19	0.406	55	0.158	91	0.089	127	0.099	163	0.144	199	0.405	235	0.245	271	0.413	307	0.428	343	0.241
20	0.406	56	0.151	92	0.094	128	0.094	164	0.151	200	0.406	236	0.243	272	0.421	308	0.421	344	0.243
21	0.405	57	0.144	93	0.099	129	0.089	165	0.158	201	0.406	237	0.241	273	0.428	309	0.413	345	0.245
22	0.403	58	0.137	94	0.105	130	0.083	166	0.166	202	0.406	238	0.240	274	0.436	310	0.405	346	0.248
23	0.401	59	0.131	95	0.110	131	0.078	167	0.174	203	0.405	239	0.239	275	0.443	311	0.397	347	0.252
24	0.399	60	0.125	96	0.115	132	0.073	168	0.182	204	0.404	240	0.239	276	0.449	312	0.389	348	0.255
25	0.396	61	0.119	97	0.120	133	0.069	169	0.191	205	0.402	241	0.240	277	0.456	313	0.381	349	0.260
26	0.392	62	0.114	98	0.125	134	0.065	170	0.199	206	0.400	242	0.241	278	0.462	314	0.373	350	0.264
27	0.388	63	0.108	99	0.129	135	0.061	171	0.208	207	0.397	243	0.242	279	0.468	315	0.365	351	0.269
28	0.383	64	0.104	100	0.134	136	0.058	172	0.218	208	0.394	244	0.244	280	0.473	316	0.357	352	0.275
29	0.378	65	0.099	101	0.138	137	0.056	173	0.227	209	0.390	245	0.246	281	0.478	317	0.349	353	0.281
30	0.372	66	0.095	102	0.141	138	0.054	174	0.236	210	0.386	246	0.249	282	0.483	318	0.341	354	0.287
31	0.366	67	0.091	103	0.144	139	0.053	175	0.246	211	0.381	247	0.252	283	0.487	319	0.333	355	0.293
32	0.359	68	0.087	104	0.147	140	0.053	176	0.255	212	0.376	248	0.256	284	0.490	320	0.326	356	0.300
33	0.352	69	0.083	105	0.150	141	0.054	177	0.265	213	0.371	249	0.260	285	0.493	321	0.318	357	0.306
34	0.344	70	0.079	106	0.152	142	0.055	178	0.274	214	0.365	250	0.264	286	0.496	322	0.311	358	0.313
35	0.337	71	0.075	107	0.153	143	0.057	179	0.284	215	0.359	251	0.269	287	0.497	323	0.304	359	0.320

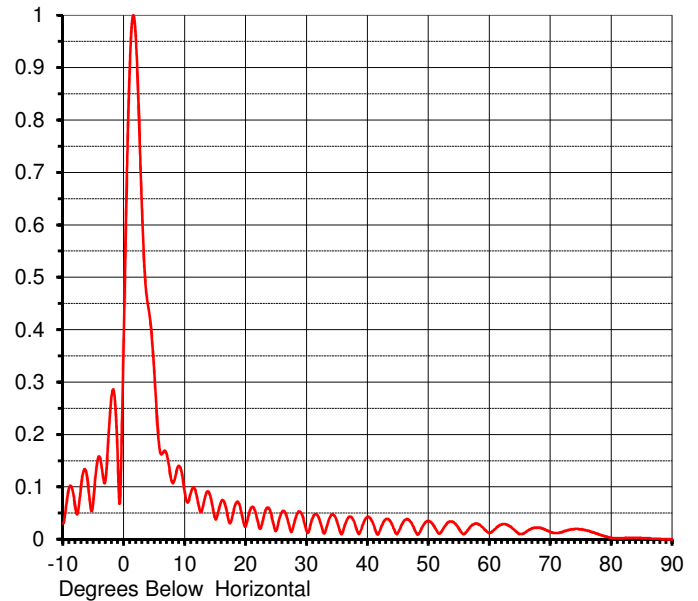
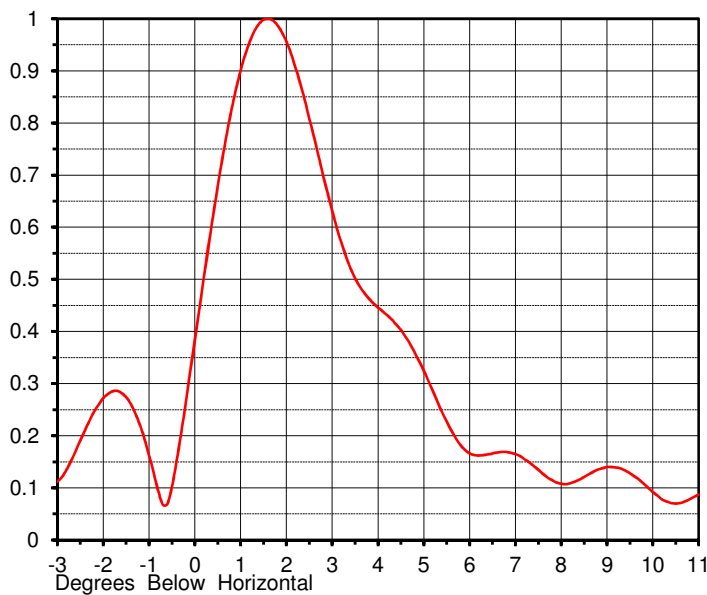
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## ELEVATION PATTERN

Proposal No. **C-70483-8**  
 Date **10-May-18**  
 Call Letters **WYTV**  
 Channel **31**  
 Frequency **575 MHz**  
 Antenna Type **TFU-25ETT/VP-R 4C160**

RMS Directivity at Main Lobe **22.0 ( 13.42 dB )**  
 RMS Directivity at Horizontal **3.2 ( 5.05 dB )**  
**Calculated**

Beam Tilt **1.50 deg**  
 Drawing Number **25E220150**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.030	10.0	0.085	30.0	0.013	50.0	0.035	70.0	0.014
-9.0	0.099	11.0	0.091	31.0	0.043	51.0	0.022	71.0	0.012
-8.0	0.059	12.0	0.077	32.0	0.039	52.0	0.014	72.0	0.014
-7.0	0.110	13.0	0.066	33.0	0.015	53.0	0.031	73.0	0.018
-6.0	0.111	14.0	0.087	34.0	0.047	54.0	0.033	74.0	0.020
-5.0	0.083	15.0	0.038	35.0	0.031	55.0	0.019	75.0	0.019
-4.0	0.156	16.0	0.074	36.0	0.019	56.0	0.012	76.0	0.017
-3.0	0.121	17.0	0.043	37.0	0.043	57.0	0.026	77.0	0.013
-2.0	0.280	18.0	0.057	38.0	0.024	58.0	0.029	78.0	0.009
-1.0	0.129	19.0	0.063	39.0	0.022	59.0	0.020	79.0	0.005
0.0	0.444	20.0	0.026	40.0	0.043	60.0	0.012	80.0	0.003
1.0	0.931	21.0	0.062	41.0	0.025	61.0	0.021	81.0	0.002
2.0	0.933	22.0	0.029	42.0	0.018	62.0	0.029	82.0	0.002
3.0	0.599	23.0	0.049	43.0	0.039	63.0	0.027	83.0	0.003
4.0	0.439	24.0	0.052	44.0	0.027	64.0	0.018	84.0	0.003
5.0	0.305	25.0	0.018	45.0	0.014	65.0	0.010	85.0	0.002
6.0	0.163	26.0	0.054	46.0	0.036	66.0	0.015	86.0	0.002
7.0	0.161	27.0	0.029	47.0	0.033	67.0	0.021	87.0	0.001
8.0	0.107	28.0	0.036	48.0	0.011	68.0	0.022	88.0	0.001
9.0	0.140	29.0	0.051	49.0	0.025	69.0	0.019	89.0	0.000
								90.0	0.000

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## MECHANICAL SPECIFICATIONS

Proposal No. **C-70483-8**  
 Date **10-May-18**  
 Call Letters **WYTV**  
 Channel **31**  
 Frequency **575 MHz**  
 Antenna Type **TFU-25ETT/VP-R 4C160**

### Preliminary Specifications

#### Top Mounted

##### With ice TIA-222-G

Height AGL(z) 622 ft (189.6 m)  
 Basic Wind Speed 89 m/h (143.2 km/h)

Structure Class II  
 Exposure Category B  
 Topography Category 1

Design Ice 0.75 in  $t_{iz} = 2.01$  in  
 Wind Speed w/Ice 40 m/h (64.4 km/h)

#### Mechanical Specifications

		without ice	with ice
Height with Lightning Protector	H4	53.6 ft (16.3m)	
Height less Lightning Protector	H2	49.6 ft (15.1m)	
Height of Center of Radiation	H3	24.8 ft (7.6m)	
Effective Projected Area	(EPA) <sub>S</sub>	51.3 ft <sup>2</sup> (4.8m <sup>2</sup> )	136.7 ft <sup>2</sup> (12.7m <sup>2</sup> )
Moment Arm	D1	26.5 ft (8.1m)	27.5 ft (8.4m)

Weight	W	6650 lb (3t)	9950 lb (4.5t)
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Antenna designed in accordance with AISC specifications for design of structural steel as prescribed by TIA-222-G

<b>Prepared by:</b> KLP	<b>Date:</b> 10-May-18	<b>ME:</b>	<b>EE:</b>
<b>Rev. No.8 by:</b> JBC	<b>Date:</b> 10-May-18		

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## Summary

Proposal No.	<b>C-70483-8</b>
Date	<b>10-May-18</b>
Call Letters	<b>WYTV</b>
Channel	<b>31</b>
Frequency	<b>575 MHz</b>
Antenna Type	<b>TFU-25ETT/VP-R 4C160</b>

## Antenna

	Hpol	Vpol
ERP:	<b>703.0 kW ( 28.47 dBk )</b>	<b>175.8 kW ( 22.45 dBk )</b>
Peak Gain*	29.60 ( 14.71 dB )	7.40 ( 8.69 dB )

<b>Antenna Input Power</b>	<b>23.8 kW ( 13.76 dBk )</b>
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## Transmission Line

Type:	<b>Rigid</b>	Attenuation:	<b>( 1.87 dB )</b>
Size:	<b>6-1/8"</b>	Efficiency:	<b>65.0%</b>
Impedance:	<b>75 Ohm</b>		
Length:	<b>1600 ft</b>	<b>487.7 m</b>	

## Transmitter Output

<b>36.5 kW ( 15.63 dBk )</b>
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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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