



Antenna Model:

TFU-35ETT/VP-R 04

Proposal Number: C-70250
Date: 7-Mar-17
Customer: SCETV
Location: Sumter, SC

Electrical Specifications

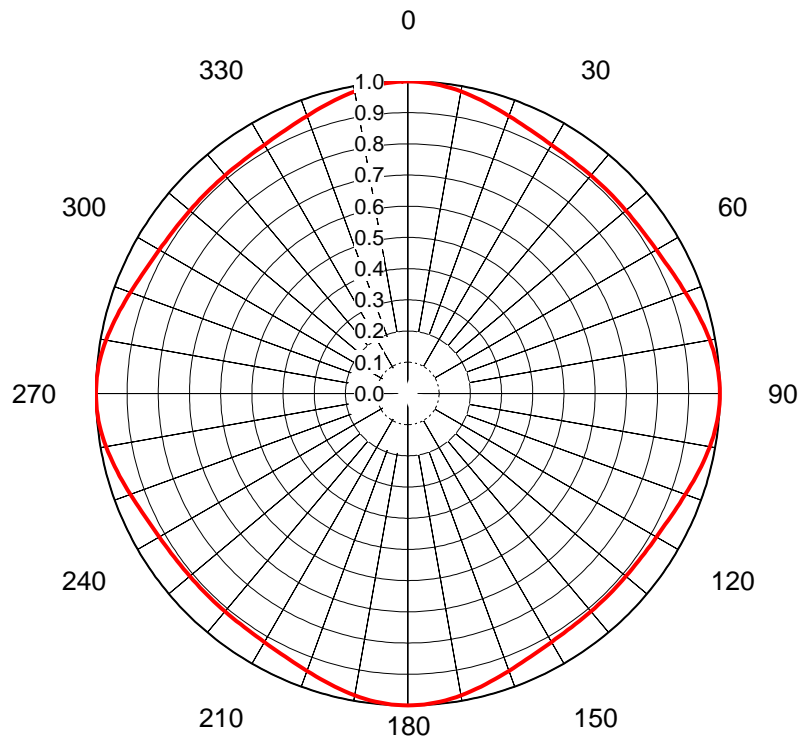
Polarization: Elliptical
Azimuth Pattern: Omni
Antenna Input: 3-1/8" 50 Ohm EIA/DCA
VSWR: Channel 1.08:1
Bandwidth: 6 MHz
Rated Input Power: 20 kW (13.01 dBk) Maximum Average Power

Mechanical Specifications

Mounting: Top Mounted
Environmental Protection: Full Radome
Height: 66.1 ft (20.1m) less Lightning Protector 70.1 ft (21.4m) with Lightning Protector
Weight: 13500 lb (6.1t)
Effective Projected Area: 74.3 ft² (6.9m²) TIA-222-G Basic Wind Speed: 95 m/h (152.9 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
WRJA	29	563 MHz	100.0 kW (20.00 dBk)	33.3 kW (15.23 dBk)	6.0 kW (7.77 dBk)	22.88 (13.59dB)	7.63 (8.82dB)	5.97 (7.76dB)	1.99 (2.99dB)



AZIMUTH PATTERN Horizontal Polarization

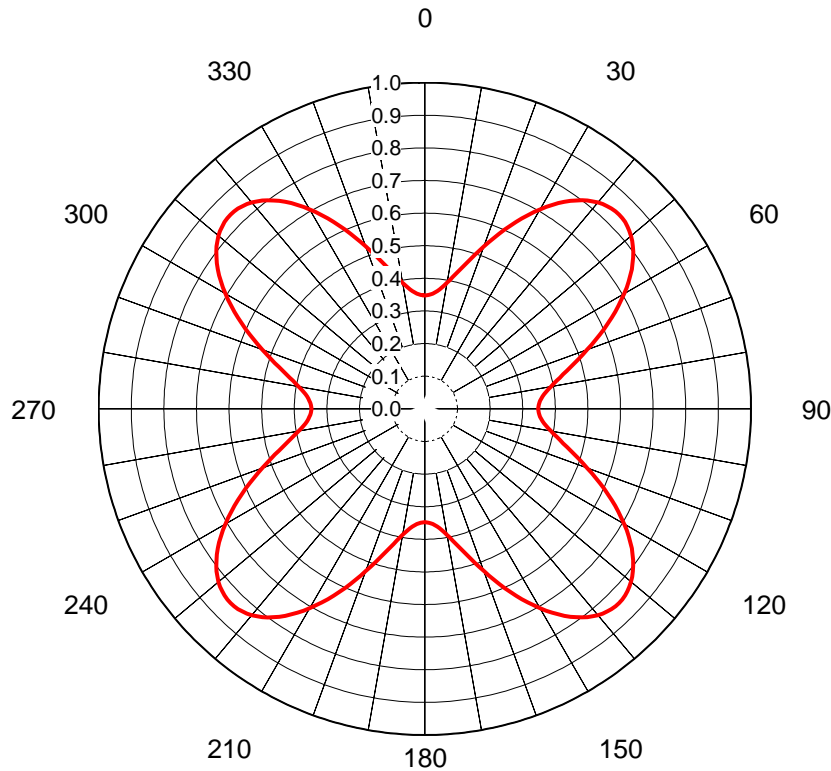
Proposal No. **C-70250**
 Date **7-Mar-17**
 Call Letters **WRJA**
 Channel **29**
 Frequency **563 MHz**
 Antenna Type **TFU-35ETT/VP-R O4**
 Gain **1.11 (0.47dB)**
Calculated
 Circularity **+/- 1.0 dB**
 Drawing # **TFU-04H D29**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	1.000	36	0.914	72	0.954	108	0.954	144	0.914	180	1.000	216	0.914	252	0.954	288	0.954
1	1.000	37	0.913	73	0.957	109	0.950	145	0.914	181	1.000	217	0.913	253	0.957	289	0.950
2	0.999	38	0.913	74	0.961	110	0.946	146	0.915	182	0.999	218	0.913	254	0.961	290	0.946
3	0.998	39	0.912	75	0.965	111	0.943	147	0.916	183	0.998	219	0.912	255	0.965	291	0.943
4	0.997	40	0.912	76	0.969	112	0.940	148	0.917	184	0.997	220	0.912	256	0.969	292	0.940
5	0.995	41	0.912	77	0.972	113	0.937	149	0.919	185	0.995	221	0.912	257	0.972	293	0.937
6	0.993	42	0.912	78	0.976	114	0.934	150	0.920	186	0.993	222	0.912	258	0.976	294	0.934
7	0.991	43	0.912	79	0.979	115	0.931	151	0.922	187	0.991	223	0.912	259	0.979	295	0.931
8	0.989	44	0.912	80	0.983	116	0.928	152	0.924	188	0.989	224	0.912	260	0.983	296	0.928
9	0.986	45	0.912	81	0.986	117	0.926	153	0.926	189	0.986	225	0.912	261	0.986	297	0.926
10	0.983	46	0.912	82	0.989	118	0.924	154	0.928	190	0.983	226	0.912	262	0.989	298	0.924
11	0.979	47	0.912	83	0.991	119	0.922	155	0.931	191	0.979	227	0.912	263	0.991	299	0.922
12	0.976	48	0.912	84	0.993	120	0.920	156	0.934	192	0.976	228	0.912	264	0.993	300	0.920
13	0.972	49	0.912	85	0.995	121	0.919	157	0.937	193	0.972	229	0.912	265	0.995	301	0.919
14	0.969	50	0.912	86	0.997	122	0.917	158	0.940	194	0.969	230	0.912	266	0.997	302	0.917
15	0.965	51	0.912	87	0.998	123	0.916	159	0.943	195	0.965	231	0.912	267	0.998	303	0.916
16	0.961	52	0.913	88	0.999	124	0.915	160	0.946	196	0.961	232	0.913	268	0.999	304	0.915
17	0.957	53	0.913	89	1.000	125	0.914	161	0.950	197	0.957	233	0.913	269	1.000	305	0.914
18	0.954	54	0.914	90	1.000	126	0.914	162	0.954	198	0.954	234	0.914	270	1.000	306	0.914
19	0.950	55	0.914	91	1.000	127	0.913	163	0.957	199	0.950	235	0.914	271	1.000	307	0.913
20	0.946	56	0.915	92	0.999	128	0.913	164	0.961	200	0.946	236	0.915	272	0.999	308	0.913
21	0.943	57	0.916	93	0.998	129	0.912	165	0.965	201	0.943	237	0.916	273	0.998	309	0.912
22	0.940	58	0.917	94	0.997	130	0.912	166	0.969	202	0.940	238	0.917	274	0.997	310	0.912
23	0.937	59	0.919	95	0.995	131	0.912	167	0.972	203	0.937	239	0.919	275	0.995	311	0.912
24	0.934	60	0.920	96	0.993	132	0.912	168	0.976	204	0.934	240	0.920	276	0.993	312	0.912
25	0.931	61	0.922	97	0.991	133	0.912	169	0.979	205	0.931	241	0.922	277	0.991	313	0.912
26	0.928	62	0.924	98	0.989	134	0.912	170	0.983	206	0.928	242	0.924	278	0.989	314	0.912
27	0.926	63	0.926	99	0.986	135	0.912	171	0.986	207	0.926	243	0.926	279	0.986	315	0.912
28	0.924	64	0.928	100	0.983	136	0.912	172	0.989	208	0.924	244	0.928	280	0.983	316	0.912
29	0.922	65	0.931	101	0.979	137	0.912	173	0.991	209	0.922	245	0.931	281	0.979	317	0.912
30	0.920	66	0.934	102	0.976	138	0.912	174	0.993	210	0.920	246	0.934	282	0.976	318	0.912
31	0.919	67	0.937	103	0.972	139	0.912	175	0.995	211	0.919	247	0.937	283	0.972	319	0.912
32	0.917	68	0.940	104	0.969	140	0.912	176	0.997	212	0.917	248	0.940	284	0.969	320	0.912
33	0.916	69	0.943	105	0.965	141	0.912	177	0.998	213	0.916	249	0.943	285	0.965	321	0.912
34	0.915	70	0.946	106	0.961	142	0.913	178	0.999	214	0.915	250	0.946	286	0.961	322	0.913
35	0.914	71	0.950	107	0.957	143	0.913	179	1.000	215	0.914	251	0.950	287	0.957	323	0.913

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AZIMUTH PATTERN Vertical Polarization

Proposal No. **C-70250**
 Date **7-Mar-17**
 Call Letters **WRJA**
 Channel **29**
 Frequency **563 MHz**
 Antenna Type **TFU-35ETT/VP-R O4**
 Gain **1.91 (2.8dB)**
Calculated
 Circularity **+/- 4.0 dB**
 Drawing # **TFU-04V D29**



Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.348	36	0.790	72	0.496	108	0.496	144	0.790	180	0.348	216	0.790	252	0.496	288	0.496	324	0.790
1	0.348	37	0.800	73	0.481	109	0.513	145	0.778	181	0.348	217	0.800	253	0.481	289	0.513	325	0.778
2	0.349	38	0.810	74	0.465	110	0.530	146	0.765	182	0.349	218	0.810	254	0.465	290	0.530	326	0.765
3	0.351	39	0.818	75	0.451	111	0.547	147	0.752	183	0.351	219	0.818	255	0.451	291	0.547	327	0.752
4	0.354	40	0.826	76	0.437	112	0.565	148	0.737	184	0.354	220	0.826	256	0.437	292	0.565	328	0.737
5	0.358	41	0.831	77	0.425	113	0.583	149	0.722	185	0.358	221	0.831	257	0.425	293	0.583	329	0.722
6	0.363	42	0.836	78	0.413	114	0.601	150	0.706	186	0.363	222	0.836	258	0.413	294	0.601	330	0.706
7	0.369	43	0.839	79	0.402	115	0.619	151	0.689	187	0.369	223	0.839	259	0.402	295	0.619	331	0.689
8	0.376	44	0.841	80	0.392	116	0.637	152	0.672	188	0.376	224	0.841	260	0.392	296	0.637	332	0.672
9	0.384	45	0.842	81	0.384	117	0.655	153	0.655	189	0.384	225	0.842	261	0.384	297	0.655	333	0.655
10	0.392	46	0.841	82	0.376	118	0.672	154	0.637	190	0.392	226	0.841	262	0.376	298	0.672	334	0.637
11	0.402	47	0.839	83	0.369	119	0.689	155	0.619	191	0.402	227	0.839	263	0.369	299	0.689	335	0.619
12	0.413	48	0.836	84	0.363	120	0.706	156	0.601	192	0.413	228	0.836	264	0.363	300	0.706	336	0.601
13	0.425	49	0.831	85	0.358	121	0.722	157	0.583	193	0.425	229	0.831	265	0.358	301	0.722	337	0.583
14	0.437	50	0.826	86	0.354	122	0.737	158	0.565	194	0.437	230	0.826	266	0.354	302	0.737	338	0.565
15	0.451	51	0.818	87	0.351	123	0.752	159	0.547	195	0.451	231	0.818	267	0.351	303	0.752	339	0.547
16	0.465	52	0.810	88	0.349	124	0.765	160	0.530	196	0.465	232	0.810	268	0.349	304	0.765	340	0.530
17	0.481	53	0.800	89	0.348	125	0.778	161	0.513	197	0.481	233	0.800	269	0.348	305	0.778	341	0.513
18	0.496	54	0.790	90	0.348	126	0.790	162	0.496	198	0.496	234	0.790	270	0.348	306	0.790	342	0.496
19	0.513	55	0.778	91	0.348	127	0.800	163	0.481	199	0.513	235	0.778	271	0.348	307	0.800	343	0.481
20	0.530	56	0.765	92	0.349	128	0.810	164	0.465	200	0.530	236	0.765	272	0.349	308	0.810	344	0.465
21	0.547	57	0.752	93	0.351	129	0.818	165	0.451	201	0.547	237	0.752	273	0.351	309	0.818	345	0.451
22	0.565	58	0.737	94	0.354	130	0.826	166	0.437	202	0.565	238	0.737	274	0.354	310	0.826	346	0.437
23	0.583	59	0.722	95	0.358	131	0.831	167	0.425	203	0.583	239	0.722	275	0.358	311	0.831	347	0.425
24	0.601	60	0.706	96	0.363	132	0.836	168	0.413	204	0.601	240	0.706	276	0.363	312	0.836	348	0.413
25	0.619	61	0.689	97	0.369	133	0.839	169	0.402	205	0.619	241	0.689	277	0.369	313	0.839	349	0.402
26	0.637	62	0.672	98	0.376	134	0.841	170	0.392	206	0.637	242	0.672	278	0.376	314	0.841	350	0.392
27	0.655	63	0.655	99	0.384	135	0.842	171	0.384	207	0.655	243	0.655	279	0.384	315	0.842	351	0.384
28	0.672	64	0.637	100	0.392	136	0.841	172	0.376	208	0.672	244	0.637	280	0.392	316	0.841	352	0.376
29	0.689	65	0.619	101	0.402	137	0.839	173	0.369	209	0.689	245	0.619	281	0.402	317	0.839	353	0.369
30	0.706	66	0.601	102	0.413	138	0.836	174	0.363	210	0.706	246	0.601	282	0.413	318	0.836	354	0.363
31	0.722	67	0.583	103	0.425	139	0.831	175	0.358	211	0.722	247	0.583	283	0.425	319	0.831	355	0.358
32	0.737	68	0.565	104	0.437	140	0.826	176	0.354	212	0.737	248	0.565	284	0.437	320	0.826	356	0.354
33	0.752	69	0.547	105	0.451	141	0.818	177	0.351	213	0.752	249	0.547	285	0.451	321	0.818	357	0.351
34	0.765	70	0.530	106	0.465	142	0.810	178	0.349	214	0.765	250	0.530	286	0.465	322	0.810	358	0.349
35	0.778	71	0.513	107	0.481	143	0.800	179	0.348	215	0.778	251	0.513	287	0.481	323	0.800	359	0.348

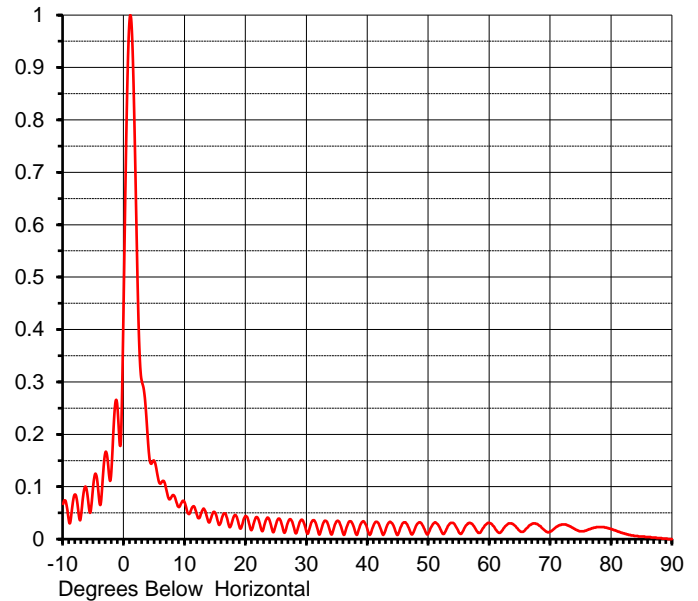
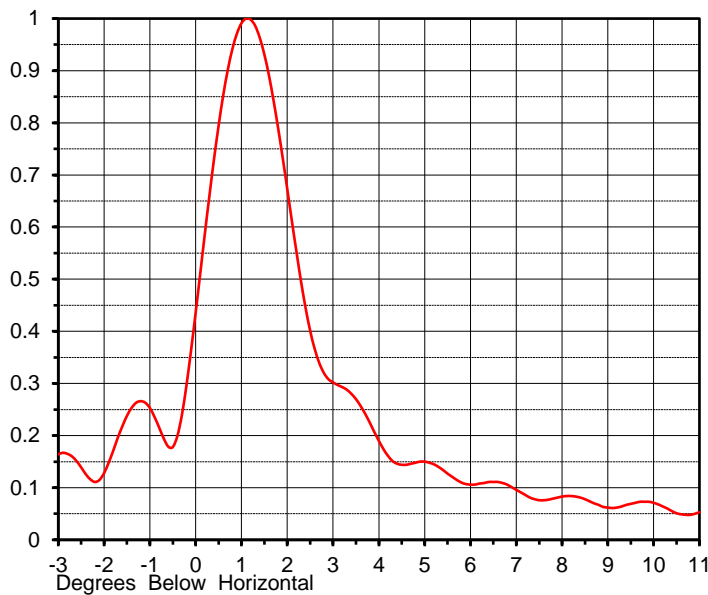
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ELEVATION PATTERN

Proposal No. **C-70250**
 Date **7-Mar-17**
 Call Letters **WRJA**
 Channel **29**
 Frequency **563 MHz**
 Antenna Type **TFU-35ETT/VP-R 04**

RMS Directivity at Main Lobe **30.5 (14.84 dB)**
 RMS Directivity at Horizontal **5.8 (7.63 dB)**
Calculated

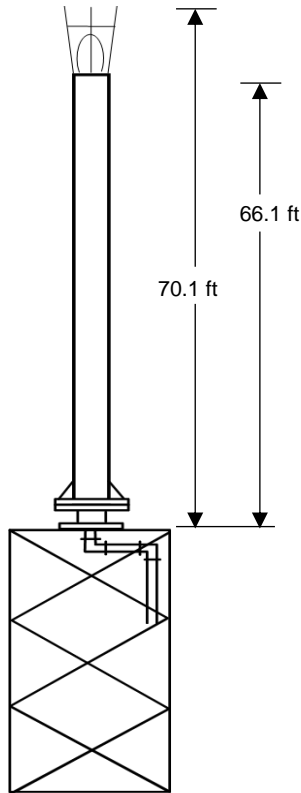
Beam Tilt **1.05 deg**
 Drawing Number **35E305105**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.067	10.0	0.068	30.0	0.012	50.0	0.013	70.0	0.015
-9.0	0.031	11.0	0.056	31.0	0.036	51.0	0.032	71.0	0.024
-8.0	0.085	12.0	0.045	32.0	0.009	52.0	0.017	72.0	0.028
-7.0	0.052	13.0	0.058	33.0	0.035	53.0	0.021	73.0	0.025
-6.0	0.083	14.0	0.032	34.0	0.009	54.0	0.031	74.0	0.019
-5.0	0.109	15.0	0.049	35.0	0.035	55.0	0.012	75.0	0.015
-4.0	0.067	16.0	0.038	36.0	0.009	56.0	0.024	76.0	0.017
-3.0	0.167	17.0	0.035	37.0	0.034	57.0	0.030	77.0	0.021
-2.0	0.148	18.0	0.043	38.0	0.011	58.0	0.014	78.0	0.023
-1.0	0.236	19.0	0.021	39.0	0.032	59.0	0.022	79.0	0.022
0.0	0.511	20.0	0.044	40.0	0.016	60.0	0.031	80.0	0.019
1.0	1.000	21.0	0.019	41.0	0.028	61.0	0.018	81.0	0.015
2.0	0.612	22.0	0.039	42.0	0.023	62.0	0.016	82.0	0.011
3.0	0.297	23.0	0.026	43.0	0.021	63.0	0.029	83.0	0.008
4.0	0.174	24.0	0.031	44.0	0.030	64.0	0.027	84.0	0.006
5.0	0.148	25.0	0.031	45.0	0.010	65.0	0.015	85.0	0.005
6.0	0.106	26.0	0.023	46.0	0.032	66.0	0.020	86.0	0.004
7.0	0.091	27.0	0.035	47.0	0.013	67.0	0.029	87.0	0.003
8.0	0.084	28.0	0.016	48.0	0.027	68.0	0.027	88.0	0.002
9.0	0.061	29.0	0.036	49.0	0.026	69.0	0.017	89.0	0.001
								90.0	0.000

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MECHANICAL SPECIFICATIONS



Proposal No. **C-70250**
 Date **7-Mar-17**
 Call Letters **WRJA**
 Channel **29**
 Frequency **563 MHz**
 Antenna Type **TFU-35ETT/VP-R 04**

Preliminary Specifications

Top Mounted

With ice TIA-222-G

Height AGL(z) 1195 ft (364.2 m)
 Basic Wind Speed 95 m/h (152.9 km/h)

Structure Class II
 Exposure Category D
 Topography Category 1

Design Ice 0.5 in $t_{iz} = 0.00$ in
 Wind Speed w/Ice 30 m/h (48.3 km/h)

Mechanical Specifications

		without ice	with ice
Height with Lightning Protector	H4	70.1 ft (21.4m)	
Height less Lightning Protector	H2	66.1 ft (20.1m)	
Height of Center of Radiation	H3	33.05 ft (10.1m)	
Effective Projected Area	(EPA) _S	74.3 ft² (6.9m²)	177 ft² (16.4m²)
Moment Arm	D1	34.6 ft (10.5m)	35.3 ft (10.8m)

Weight W 13500 lb (6.1t) 16500 lb (7.5t)

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

Prepared by: NJS

Date: 7-Mar-17

ME:

EE:

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Summary

Proposal No. **C-70250**
Date **7-Mar-17**
Call Letters **WRJA**
Channel **29**
Frequency **563 MHz**
Antenna Type **TFU-35ETT/VP-R O4**

Antenna

	Hpol	Vpol
ERP:	100.0 kW (20.00 dBk)	33.3 kW (15.23 dBk)
RMS Gain*	22.88 (13.59 dB)	7.63 (8.82 dB)

Antenna Input Power **4.4 kW (6.40 dBk)**

Transmission Line

Type:	Rigid	Attenuation:	(1.36 dB)
Size:	6-1/8"	Efficiency:	73.1%
Impedance:	75 Ohm		
Length:	1180 ft	359.7 m	

Transmitter Output

6.0 kW (7.77 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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