



TFU-26GBH/VP-R 06

**Proposal Number:** C-70188  
**Date:** 13-Feb-17  
**Customer:** TEGNA  
**Location:** San Antonio, TX

#### Electrical Specifications

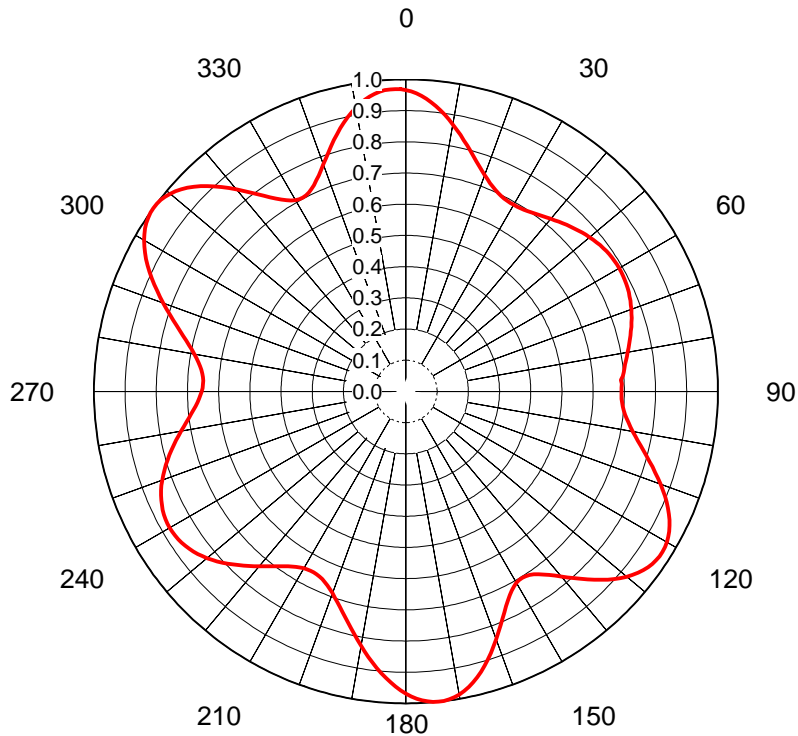
<b>Polarity</b>	Elliptical		
<b>Azimuth Pattern</b>	Omni		
<b>Antenna Input</b>	6-1/8" 75	75 Ohm	EIA/DCA
<b>VSWR</b>	Channel	1.08 : 1	
<b>Bandwidth</b>	6 MHz		
<b>Rated Input Power</b>	47 kW	(16.72 dBk)	Maximum Average Power

#### Mechanical Specifications

<b>Mounting</b>	Bottom of Stack		
<b>Environmental Protection</b>	Full Radome		
<b>Height</b>	48.8 ft (14.9m)		
<b>Weight</b>	16500 lb (7.5t)		
<b>Effective Projected Area</b>	65.2 ft² (6.1m²)	TIA-222-G	<b>Basic Wind Speed</b> 90 m/h (144.8 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
KENS	29	563 MHz	816.0 kW (29.12 dBk)	204.0 kW (23.10 dBk)	53.8 kW (17.31 dBk)	22.26 (13.47dB)	5.56 (7.45dB)	17.27 (12.37dB)	4.32 (6.35dB)

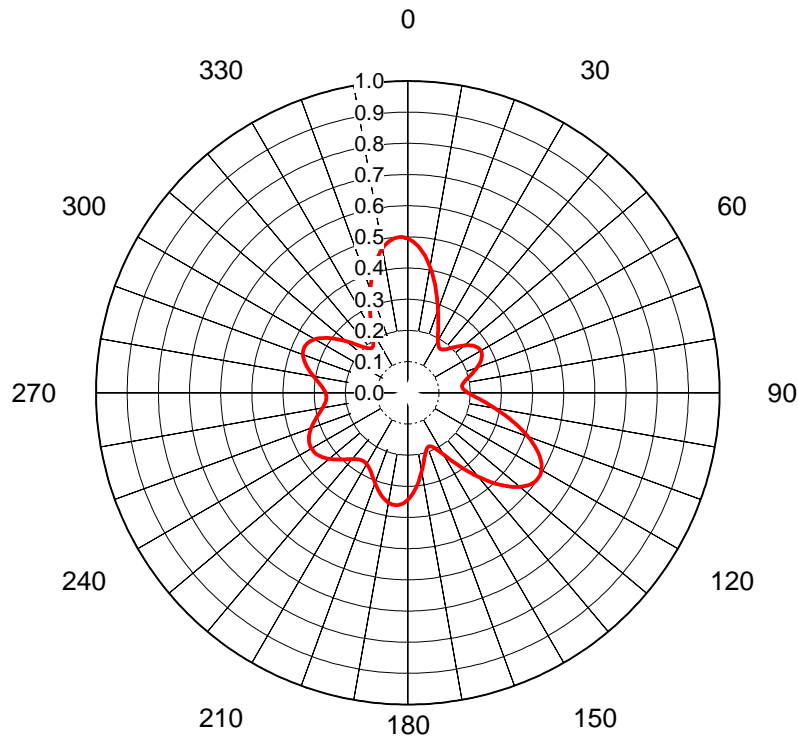


## AZIMUTH PATTERN Horizontal Polarization

Proposal No. **C-70188**  
 Date **13-Feb-17**  
 Call Letters **KENS 29**  
 Frequency **563 MHz**  
 Antenna Type **TFU-26GBH/VP-R 06**  
  
 Gain **1.51 (1.79dB)**  
 Calculated  
 Circularity **+/- 2.0 dB**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.966	36	0.704	72	0.761	108	0.840	144	0.724	180	0.969	216	0.692	252	0.814	288	0.795
1	0.962	37	0.708	73	0.756	109	0.855	145	0.716	181	0.959	217	0.701	253	0.804	289	0.812
2	0.956	38	0.713	74	0.752	110	0.869	146	0.710	182	0.947	218	0.711	254	0.795	290	0.828
3	0.949	39	0.717	75	0.747	111	0.882	147	0.706	183	0.934	219	0.721	255	0.784	291	0.844
4	0.940	40	0.722	76	0.742	112	0.895	148	0.704	184	0.921	220	0.731	256	0.774	292	0.860
5	0.930	41	0.727	77	0.737	113	0.908	149	0.705	185	0.907	221	0.742	257	0.763	293	0.876
6	0.920	42	0.732	78	0.732	114	0.920	150	0.708	186	0.892	222	0.753	258	0.753	294	0.892
7	0.908	43	0.737	79	0.727	115	0.930	151	0.714	187	0.876	223	0.763	259	0.742	295	0.907
8	0.895	44	0.742	80	0.722	116	0.940	152	0.723	188	0.860	224	0.774	260	0.731	296	0.921
9	0.882	45	0.747	81	0.717	117	0.949	153	0.733	189	0.844	225	0.784	261	0.721	297	0.934
10	0.869	46	0.752	82	0.713	118	0.956	154	0.746	190	0.828	226	0.795	262	0.711	298	0.947
11	0.855	47	0.756	83	0.708	119	0.962	155	0.760	191	0.812	227	0.804	263	0.701	299	0.959
12	0.840	48	0.761	84	0.704	120	0.966	156	0.775	192	0.795	228	0.814	264	0.692	300	0.969
13	0.826	49	0.765	85	0.701	121	0.969	157	0.792	193	0.780	229	0.823	265	0.684	301	0.978
14	0.812	50	0.769	86	0.697	122	0.970	158	0.810	194	0.764	230	0.831	266	0.676	302	0.986
15	0.798	51	0.773	87	0.690	123	0.970	159	0.828	195	0.750	231	0.839	267	0.669	303	0.992
16	0.785	52	0.776	88	0.693	124	0.968	160	0.846	196	0.736	232	0.846	268	0.663	304	0.996
17	0.772	53	0.779	89	0.691	125	0.964	161	0.864	197	0.722	233	0.853	269	0.658	305	0.999
18	0.760	54	0.782	90	0.691	126	0.959	162	0.882	198	0.710	234	0.858	270	0.655	306	1.000
19	0.749	55	0.784	91	0.691	127	0.952	163	0.899	199	0.699	235	0.863	271	0.652	307	0.999
20	0.738	56	0.786	92	0.692	128	0.944	164	0.915	200	0.688	236	0.867	272	0.651	308	0.997
21	0.729	57	0.788	93	0.694	129	0.935	165	0.931	201	0.679	237	0.870	273	0.651	309	0.992
22	0.720	58	0.789	94	0.697	130	0.924	166	0.945	202	0.671	238	0.872	274	0.652	310	0.986
23	0.713	59	0.789	95	0.701	131	0.912	167	0.958	203	0.664	239	0.874	275	0.655	311	0.978
24	0.706	60	0.790	96	0.707	132	0.898	168	0.969	204	0.659	240	0.874	276	0.659	312	0.969
25	0.701	61	0.789	97	0.713	133	0.884	169	0.978	205	0.655	241	0.874	277	0.664	313	0.958
26	0.697	62	0.789	98	0.720	134	0.869	170	0.986	206	0.652	242	0.872	278	0.671	314	0.945
27	0.694	63	0.788	99	0.729	135	0.854	171	0.992	207	0.651	243	0.870	279	0.679	315	0.931
28	0.692	64	0.786	100	0.738	136	0.838	172	0.997	208	0.651	244	0.867	280	0.688	316	0.915
29	0.691	65	0.784	101	0.749	137	0.822	173	0.999	209	0.652	245	0.863	281	0.698	317	0.899
30	0.691	66	0.782	102	0.760	138	0.806	174	1.000	210	0.655	246	0.858	282	0.710	318	0.882
31	0.691	67	0.779	103	0.772	139	0.790	175	0.999	211	0.658	247	0.853	283	0.722	319	0.864
32	0.693	68	0.776	104	0.785	140	0.774	176	0.996	212	0.663	248	0.846	284	0.736	320	0.846
33	0.695	69	0.773	105	0.798	141	0.760	177	0.992	213	0.669	249	0.839	285	0.750	321	0.828
34	0.697	70	0.769	106	0.812	142	0.747	178	0.986	214	0.676	250	0.831	286	0.764	322	0.810
35	0.701	71	0.765	107	0.826	143	0.735	179	0.978	215	0.684	251	0.823	287	0.780	323	0.792

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## AZIMUTH PATTERN Vertical Polarization

Proposal No. **C-70188**  
Date **13-Feb-17**  
Call Letters **KENS 29**  
Frequency **563 MHz**  
Antenna Type **TFU-26GBH/VP-R 06**

Gain **2.48 (3.95dB)**  
Calculated  
Circularity **+/- 5.0 dB**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.495	36	0.175	72	0.224	108	0.385	144	0.298	180	0.343	216	0.265	252	0.319	288	0.351
1	0.491	37	0.175	73	0.218	109	0.398	145	0.285	181	0.349	217	0.267	253	0.313	289	0.355
2	0.486	38	0.176	74	0.211	110	0.410	146	0.273	182	0.353	218	0.270	254	0.308	290	0.358
3	0.479	39	0.178	75	0.205	111	0.422	147	0.261	183	0.357	219	0.274	255	0.302	291	0.360
4	0.472	40	0.181	76	0.199	112	0.433	148	0.250	184	0.360	220	0.278	256	0.297	292	0.362
5	0.463	41	0.185	77	0.194	113	0.444	149	0.239	185	0.362	221	0.282	257	0.292	293	0.363
6	0.454	42	0.189	78	0.189	114	0.454	150	0.229	186	0.363	222	0.287	258	0.287	294	0.363
7	0.444	43	0.194	79	0.185	115	0.463	151	0.220	187	0.363	223	0.292	259	0.282	295	0.362
8	0.433	44	0.199	80	0.181	116	0.472	152	0.212	188	0.362	224	0.297	260	0.278	296	0.360
9	0.422	45	0.205	81	0.178	117	0.479	153	0.205	189	0.360	225	0.302	261	0.274	297	0.357
10	0.410	46	0.211	82	0.176	118	0.486	154	0.198	190	0.358	226	0.308	262	0.270	298	0.353
11	0.398	47	0.218	83	0.175	119	0.491	155	0.193	191	0.355	227	0.313	263	0.267	299	0.349
12	0.385	48	0.224	84	0.175	120	0.495	156	0.189	192	0.351	228	0.319	264	0.265	300	0.343
13	0.372	49	0.230	85	0.176	121	0.498	157	0.186	193	0.347	229	0.324	265	0.263	301	0.337
14	0.359	50	0.236	86	0.178	122	0.500	158	0.185	194	0.342	230	0.329	266	0.262	302	0.330
15	0.346	51	0.242	87	0.180	123	0.500	159	0.185	195	0.337	231	0.334	267	0.261	303	0.323
16	0.333	52	0.248	88	0.184	124	0.499	160	0.186	196	0.331	232	0.339	268	0.262	304	0.314
17	0.320	53	0.253	89	0.188	125	0.497	161	0.189	197	0.326	233	0.343	269	0.262	305	0.305
18	0.307	54	0.257	90	0.194	126	0.494	162	0.192	198	0.320	234	0.347	270	0.264	306	0.296
19	0.295	55	0.261	91	0.200	127	0.490	163	0.197	199	0.314	235	0.350	271	0.266	307	0.286
20	0.283	56	0.264	92	0.206	128	0.484	164	0.204	200	0.307	236	0.352	272	0.269	308	0.276
21	0.272	57	0.267	93	0.214	129	0.477	165	0.211	201	0.302	237	0.355	273	0.272	309	0.266
22	0.261	58	0.269	94	0.222	130	0.470	166	0.219	202	0.296	238	0.356	274	0.276	310	0.256
23	0.250	59	0.270	95	0.231	131	0.461	167	0.227	203	0.290	239	0.355	275	0.280	311	0.246
24	0.240	60	0.270	96	0.240	132	0.451	168	0.237	204	0.285	240	0.357	276	0.285	312	0.237
25	0.231	61	0.270	97	0.250	133	0.441	169	0.246	205	0.280	241	0.357	277	0.290	313	0.227
26	0.222	62	0.269	98	0.261	134	0.429	170	0.256	206	0.276	242	0.356	278	0.296	314	0.219
27	0.214	63	0.267	99	0.272	135	0.418	171	0.266	207	0.272	243	0.355	279	0.302	315	0.211
28	0.206	64	0.264	100	0.283	136	0.405	172	0.276	208	0.269	244	0.352	280	0.307	316	0.204
29	0.200	65	0.261	101	0.295	137	0.392	173	0.286	209	0.266	245	0.350	281	0.314	317	0.197
30	0.194	66	0.257	102	0.307	138	0.379	174	0.296	210	0.264	246	0.347	282	0.320	318	0.192
31	0.188	67	0.253	103	0.320	139	0.366	175	0.305	211	0.262	247	0.343	283	0.326	319	0.189
32	0.184	68	0.248	104	0.333	140	0.352	176	0.314	212	0.262	248	0.339	284	0.331	320	0.186
33	0.180	69	0.242	105	0.346	141	0.338	177	0.323	213	0.261	249	0.334	285	0.337	321	0.185
34	0.178	70	0.236	106	0.359	142	0.325	178	0.330	214	0.262	250	0.329	286	0.342	322	0.185
35	0.176	71	0.230	107	0.372	143	0.311	179	0.337	215	0.263	251	0.324	287	0.347	323	0.186

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## MECHANICALS

Proposal No. **C-70188**  
 Date **13-Feb-17**  
 Call Letters **KENS** **29**  
 Frequency **563 MHz**  
 Antenna Type **TFU-26GBH/VP-R 06**

## Preliminary Specifications

### Bottom of Stack

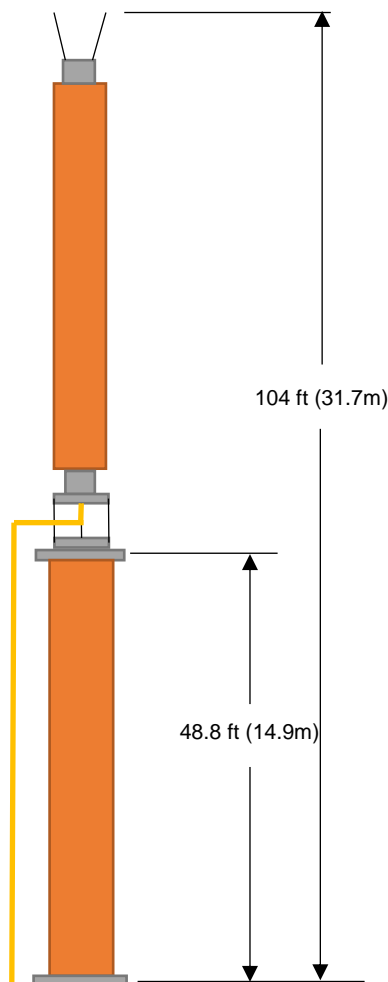
#### Mechanical Specification without ice TIA-222-G

Height AGL(z) 1425 ft (434.3 m)  
 Basic Wind Speed 90 m/h (144.8 km/h)

Structure Class II  
 Exposure Category C  
 Topography Category 1

#### Mechanical Specifications with ice TIA-222-G

Design Ice 0.5 in  $t_{iz} = 1.40$  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			104 ft (31.7m)	
Height less Lightning Protector	H2	48.8 ft (14.9m)		100 ft (30.5m)	
Height of Center of Radiation	H3	24.4 ft (7.4m)		24.4 ft (7.4m)	
Effective Projected Area	(EPA) <sub>S</sub>	65.2 ft <sup>2</sup> (6.1m <sup>2</sup> )	148 ft <sup>2</sup> (13.7m <sup>2</sup> )	192.3 ft <sup>2</sup> (17.9m <sup>2</sup> )	318.1 ft <sup>2</sup> (29.6m <sup>2</sup> )
Moment Arm	D1	24.4 ft (7.4m)	24.4 ft (7.4m)	38.9 ft (11.9m)	45.8 ft (14m)

Weight W 16500 lb (7.5t) 19000 lb (8.6t) 22600 lb (10.3t) 28400 lb (12.9t)

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

Prepared by: KLP

Date: 13-Feb-17

ME:

RS

EE:

Date: 13-Feb-17

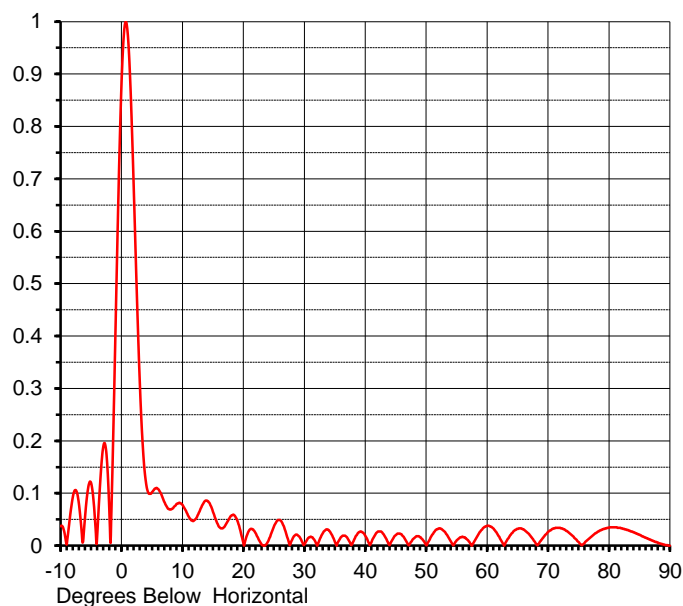
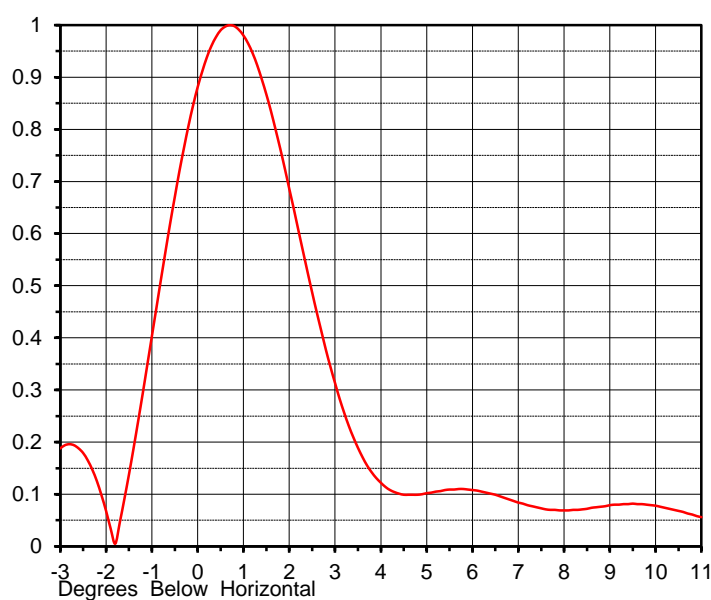
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## ELEVATION PATTERN

Proposal No. **C-70188**  
 Date **13-Feb-17**  
 Call Letters **KENS 29**  
 Frequency **563 MHz**  
 Antenna Type **TFU-26GBH/VP-R 06**

RMS Directivity at Main Lobe **24.50 ( 13.89 dB )**  
 RMS Directivity at Horizontal **19.00 ( 12.79 dB )**  
**Calculated**

Beam Tilt **0.70 deg**  
 Drawing Number **26G245070**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.037	10.0	0.078	30.0	0.002	50.0	0.001	70.0	0.026
-9.0	0.002	11.0	0.056	31.0	0.017	51.0	0.021	71.0	0.033
-8.0	0.092	12.0	0.049	32.0	0.003	52.0	0.032	72.0	0.034
-7.0	0.081	13.0	0.071	33.0	0.023	53.0	0.027	73.0	0.028
-6.0	0.052	14.0	0.086	34.0	0.030	54.0	0.009	74.0	0.019
-5.0	0.120	15.0	0.065	35.0	0.008	55.0	0.010	75.0	0.007
-4.0	0.017	16.0	0.036	36.0	0.016	56.0	0.017	76.0	0.005
-3.0	0.188	17.0	0.038	37.0	0.016	57.0	0.008	77.0	0.016
-2.0	0.068	18.0	0.057	38.0	0.007	58.0	0.010	78.0	0.025
-1.0	0.403	19.0	0.048	39.0	0.026	59.0	0.029	79.0	0.031
0.0	0.881	20.0	0.005	40.0	0.019	60.0	0.038	80.0	0.034
1.0	0.980	21.0	0.030	41.0	0.006	61.0	0.033	81.0	0.035
2.0	0.686	22.0	0.024	42.0	0.026	62.0	0.017	82.0	0.033
3.0	0.313	23.0	0.002	43.0	0.022	63.0	0.005	83.0	0.030
4.0	0.122	24.0	0.007	44.0	0.001	64.0	0.023	84.0	0.026
5.0	0.102	25.0	0.036	45.0	0.020	65.0	0.032	85.0	0.021
6.0	0.108	26.0	0.049	46.0	0.021	66.0	0.031	86.0	0.015
7.0	0.084	27.0	0.024	47.0	0.003	67.0	0.020	87.0	0.010
8.0	0.069	28.0	0.011	48.0	0.014	68.0	0.004	88.0	0.006
9.0	0.079	29.0	0.019	49.0	0.016	69.0	0.012	89.0	0.002
								90.0	0.000

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## Summary

Proposal No.	<b>C-70188</b>	
Date	<b>13-Feb-17</b>	
Call Letters	<b>KENS</b>	<b>29</b>
Frequency	<b>563 MHz</b>	
Antenna Type	<b>TFU-26GBH/VP-R 06</b>	

## Antenna

	Hpol	Vpol
ERP:	<b>816.0 kW ( 29.12 dBk )</b>	<b>204.0 kW ( 23.10 dBk )</b>
Peak Gain*	22.26 ( 13.47 dB )	5.56 ( 7.45 dB )

<b>Antenna Input Power</b>	<b>36.7 kW ( 15.64 dBk )</b>
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## Transmission Line

Type	Rigid	Attenuation	( 1.66 dB )
Size	7-3/16"	Efficiency	68.2%
Impedence	75 Ohm		
Length	1675 ft	510.5 m	

## Transmitter Output

<b>53.8 kW ( 17.31 dBk )</b>
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Transmitter filter losses not included

\* Directivity and Gain are with respect to half wave dipole.

\*\*Antenna Gain includes feed system losses

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