Antenna Model: **TFU-25ETT/VP-R 4C160**

Proposal Number:	C-70483-9
Date:	28-Jun-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

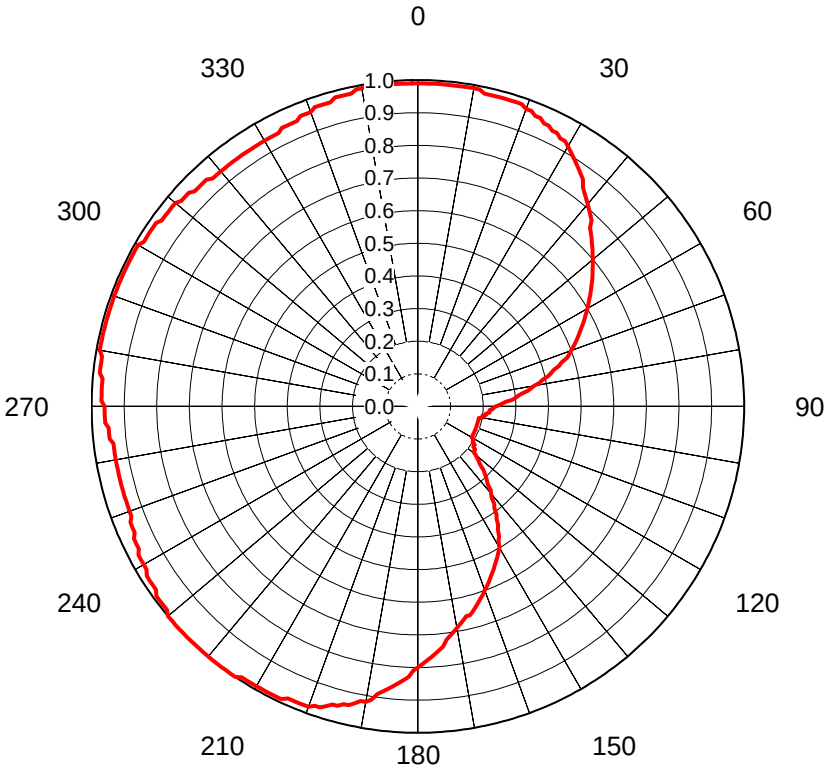
Mounting:	Top Mounted			
Environmental Protection:	Full Radome			
Height:	49.6 ft (15.1m)	less Lightning Protector	53.6 ft (16.3m)	with Lightning Protector
Weight:	6650 lb (3t)			
Effective Projected Area:	51.3 ft² (4.8m²)	TIA-222-G	**Basic Wind Speed:**	89 m/h (143.2 km/h)

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)	246.1 kW (23.91 dBk)	38.2 kW (15.83 dBk)	28.28 (14.51dB)	9.90 (9.96dB)	5.57 (7.46dB)	1.95 (2.90dB)

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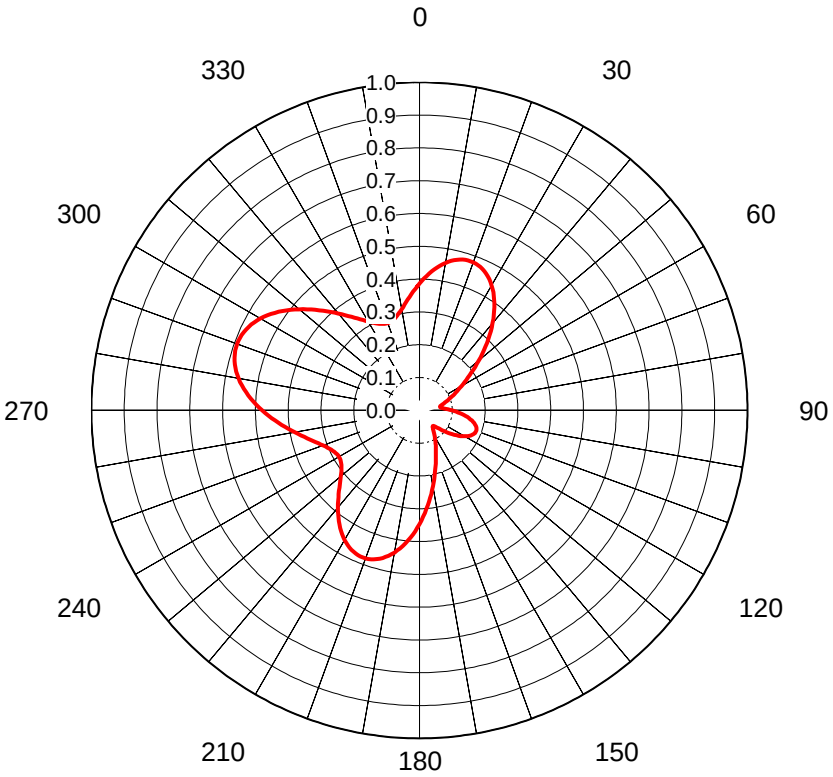
AZIMUTH PATTERN
Horizontal Polarization

Proposal No.	**C-70483-9**
Date	**28-Jun-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	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	324	0.940
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	325	0.940
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	326	0.940
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	327	0.940
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	328	0.940
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	329	0.940
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	330	0.940
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	331	0.940
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	332	0.940
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	333	0.940
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	334	0.950
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	335	0.950
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	336	0.950
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	337	0.950
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	338	0.960
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	339	0.960
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	340	0.960
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	341	0.970
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	342	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	343	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	344	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	345	0.980
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	346	0.980
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	347	0.980
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	348	0.980
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	349	0.990
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	350	0.990
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	351	0.990
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	352	0.990
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	353	0.990
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	354	0.990
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	355	0.990
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	356	0.990
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	357	0.990
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	358	0.990
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	359	0.990

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AZIMUTH PATTERN
Vertical Polarization

Proposal No.	**C-70483-9**
Date	**28-Jun-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**

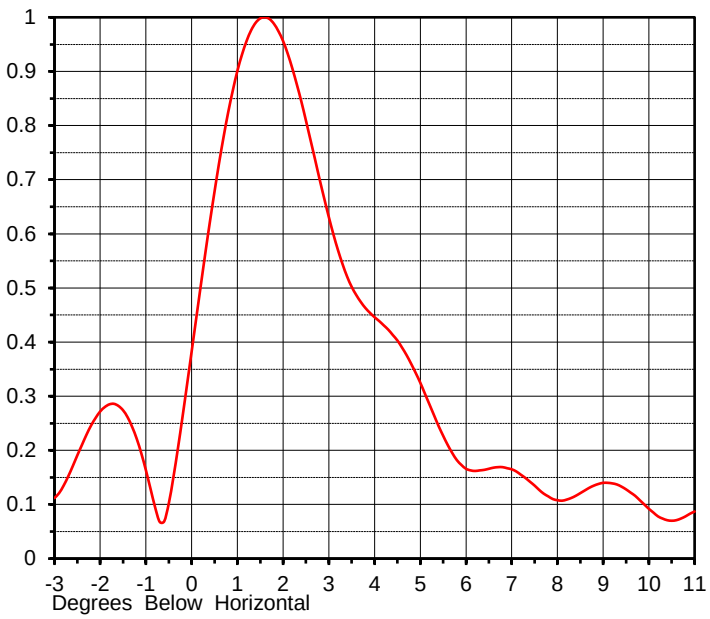
Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.386	36	0.389	72	0.085	108	0.183	144	0.071	180	0.347	216	0.418	252	0.324	288	0.590	324	0.352
1	0.394	37	0.379	73	0.081	109	0.184	145	0.074	181	0.358	217	0.410	253	0.331	289	0.591	325	0.345
2	0.402	38	0.368	74	0.077	110	0.184	146	0.077	182	0.368	218	0.402	254	0.338	290	0.592	326	0.338
3	0.410	39	0.358	75	0.074	111	0.184	147	0.081	183	0.379	219	0.394	255	0.345	291	0.591	327	0.331
4	0.418	40	0.347	76	0.071	112	0.183	148	0.085	184	0.389	220	0.386	256	0.352	292	0.590	328	0.324
5	0.425	41	0.336	77	0.068	113	0.181	149	0.089	185	0.398	221	0.378	257	0.360	293	0.589	329	0.318
6	0.432	42	0.325	78	0.066	114	0.180	150	0.093	186	0.408	222	0.370	258	0.368	294	0.586	330	0.313
7	0.439	43	0.314	79	0.064	115	0.177	151	0.098	187	0.416	223	0.362	259	0.377	295	0.583	331	0.307
8	0.445	44	0.302	80	0.063	116	0.174	152	0.102	188	0.425	224	0.354	260	0.385	296	0.580	332	0.303
9	0.451	45	0.291	81	0.063	117	0.171	153	0.107	189	0.433	225	0.347	261	0.394	297	0.576	333	0.298
10	0.456	46	0.280	82	0.064	118	0.167	154	0.112	190	0.440	226	0.339	262	0.403	298	0.571	334	0.295
11	0.461	47	0.268	83	0.066	119	0.163	155	0.117	191	0.447	227	0.332	263	0.413	299	0.566	335	0.291
12	0.466	48	0.257	84	0.069	120	0.158	156	0.123	192	0.453	228	0.325	264	0.422	300	0.560	336	0.288
13	0.470	49	0.247	85	0.072	121	0.153	157	0.128	193	0.459	229	0.319	265	0.432	301	0.553	337	0.286
14	0.473	50	0.236	86	0.077	122	0.148	158	0.134	194	0.464	230	0.313	266	0.441	302	0.547	338	0.285
15	0.476	51	0.225	87	0.081	123	0.142	159	0.141	195	0.468	231	0.307	267	0.451	303	0.539	339	0.284
16	0.478	52	0.215	88	0.087	124	0.136	160	0.147	196	0.472	232	0.302	268	0.460	304	0.532	340	0.283
17	0.480	53	0.205	89	0.093	125	0.130	161	0.154	197	0.475	233	0.298	269	0.470	305	0.524	341	0.283
18	0.480	54	0.196	90	0.099	126	0.124	162	0.162	198	0.477	234	0.294	270	0.479	306	0.515	342	0.284
19	0.481	55	0.187	91	0.105	127	0.118	163	0.170	199	0.479	235	0.290	271	0.489	307	0.507	343	0.286
20	0.480	56	0.178	92	0.111	128	0.111	164	0.178	200	0.480	236	0.288	272	0.498	308	0.498	344	0.288
21	0.479	57	0.170	93	0.118	129	0.105	165	0.187	201	0.481	237	0.286	273	0.507	309	0.489	345	0.290
22	0.477	58	0.162	94	0.124	130	0.099	166	0.196	202	0.480	238	0.284	274	0.515	310	0.479	346	0.294
23	0.475	59	0.154	95	0.130	131	0.093	167	0.205	203	0.480	239	0.283	275	0.524	311	0.470	347	0.298
24	0.472	60	0.147	96	0.136	132	0.087	168	0.215	204	0.478	240	0.283	276	0.532	312	0.460	348	0.302
25	0.468	61	0.141	97	0.142	133	0.081	169	0.225	205	0.476	241	0.284	277	0.539	313	0.451	349	0.307
26	0.464	62	0.134	98	0.148	134	0.077	170	0.236	206	0.473	242	0.285	278	0.547	314	0.441	350	0.313
27	0.459	63	0.128	99	0.153	135	0.072	171	0.247	207	0.470	243	0.286	279	0.553	315	0.432	351	0.319
28	0.453	64	0.123	100	0.158	136	0.069	172	0.257	208	0.466	244	0.288	280	0.560	316	0.422	352	0.325
29	0.447	65	0.117	101	0.163	137	0.066	173	0.268	209	0.461	245	0.291	281	0.566	317	0.413	353	0.332
30	0.440	66	0.112	102	0.167	138	0.064	174	0.280	210	0.456	246	0.295	282	0.571	318	0.403	354	0.339
31	0.433	67	0.107	103	0.171	139	0.063	175	0.291	211	0.451	247	0.298	283	0.576	319	0.394	355	0.347
32	0.425	68	0.102	104	0.174	140	0.063	176	0.302	212	0.445	248	0.303	284	0.580	320	0.385	356	0.354
33	0.416	69	0.098	105	0.177	141	0.064	177	0.314	213	0.439	249	0.307	285	0.583	321	0.377	357	0.362
34	0.408	70	0.093	106	0.180	142	0.066	178	0.325	214	0.432	250	0.313	286	0.586	322	0.368	358	0.370
35	0.398	71	0.089	107	0.181	143	0.068	179	0.336	215	0.425	251	0.318	287	0.589	323	0.360	359	0.378

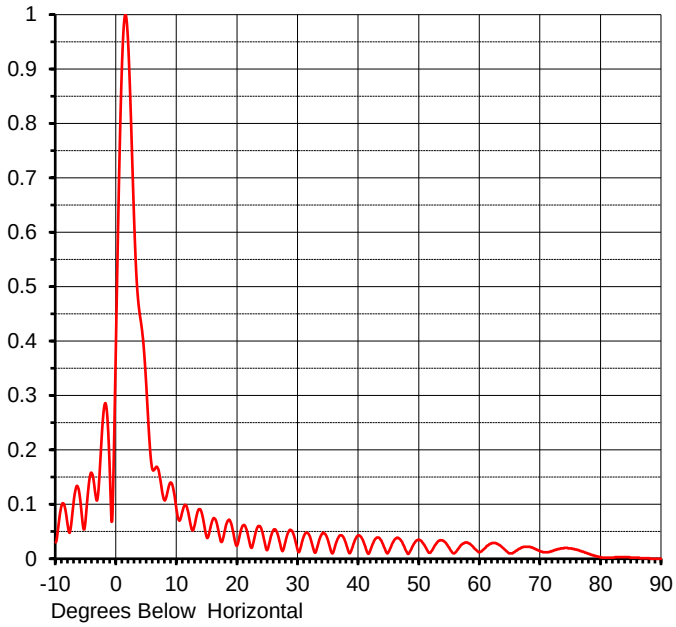
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ELEVATION PATTERN

Proposal No.	**C-70483-9**
Date	**28-Jun-18**
Call Letters	**WYTV**
Channel	**31**
Frequency	**575 MHz**
Antenna Type	**TFU-25ETT/VP-R 4C160**

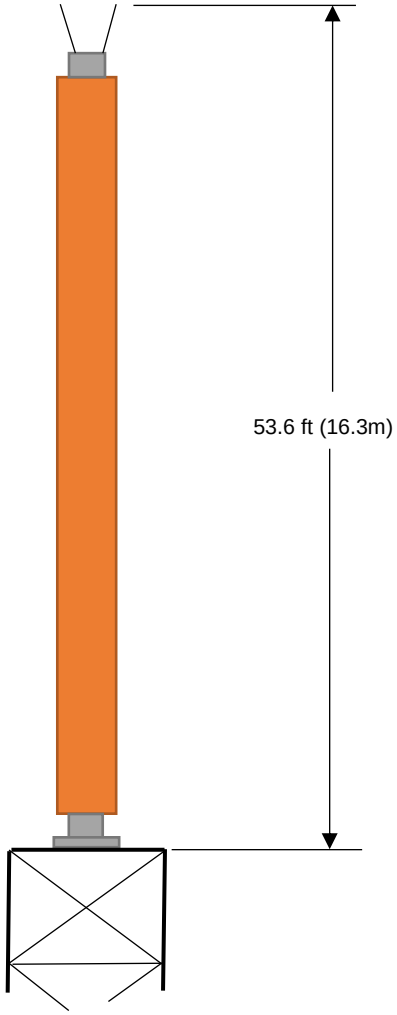
RMS Directivity at Main Lobe	**22.0 (13.42 dB)**	Beam Tilt	**1.50 deg**
RMS Directivity at Horizontal	**3.2 (5.05 dB)**	Drawing Number	**25E220150**
	Calculated		





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-70483-9**
Date	**28-Jun-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	$(EPA)_S$	51.3 ft² (4.8m²)	136.7 ft² (12.7m²)
Moment Arm	D1	26.5 ft (8.1m)	27.5 ft (8.4m)
Weight	W	6650 lb (3t)	9950 lb (4.5t)

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

Prepared by:	KLP	**Date:**	28-Jun-18	**ME:**	**EE:**
Rev. No.9 by:	JBC	**Date:**	28-Jun-18		

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Summary

Proposal No.	**C-70483-9**
Date	**28-Jun-18**
Call Letters	**WYTV**
Channel	**31**
Frequency	**575 MHz**
Antenna Type	**TFU-25ETT/VP-R 4C160**

Antenna

	Hpol		Vpol	
ERP:	**703.0 kW**	**(28.47 dBk)**	**246.1 kW**	**(23.91 dBk)**
Peak Gain*	28.28	(14.51 dB)	9.90	(9.96 dB)

Antenna Input Power

24.9 kW **(13.96 dBk)**

Transmission Line

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

Transmitter Output

38.2 kW **(15.83 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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