



Antenna Model: **TFU-32ETT/VP-R 4CT170**

Proposal Number: **C-80070-3**  
Date: **9-Aug-23**  
Customer: **Nexstar**  
Location: **Hagerstown, MD**

### Electrical Specifications

Polarization: **Elliptical**  
Azimuth Pattern: **Directional**  
Antenna Input: **6-1/8"** **75 Ohm** **EIA/DCA**  
VSWR: **Channel** **1.08 : 1**  
Bandwidth: **MHz**  
Rated Input Power: **34 kW** **(15.31 dBk)** **Maximum Average Power**

### Mechanical Specifications

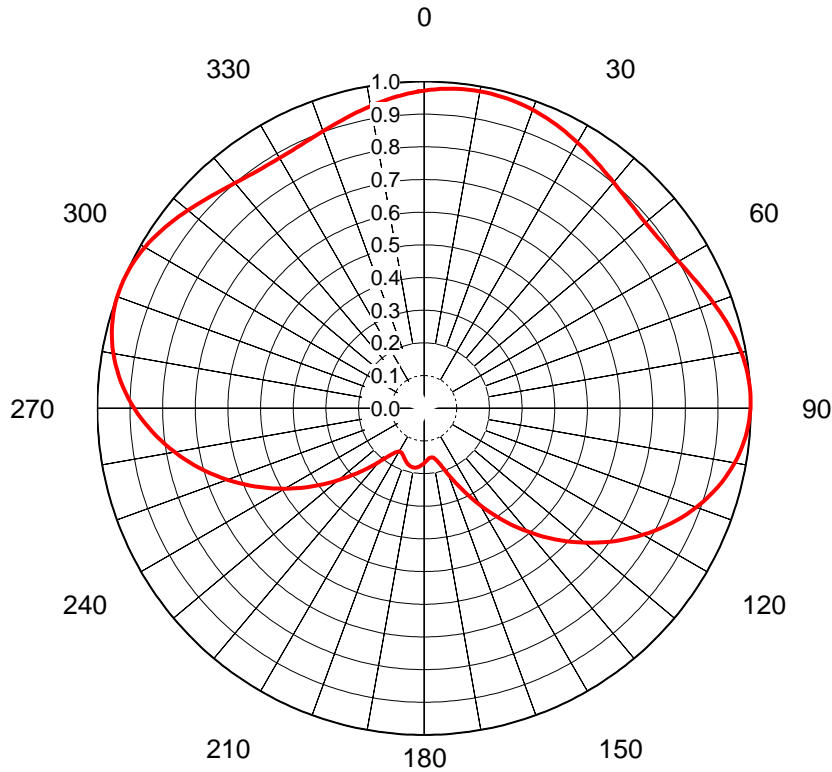
Mounting: **Top Mounted**  
Environmental Protection: **Full Radome**  
Height: **65.4 ft (19.9m)** less Lightning Protector **69.4 ft (21.2m)** with Lightning Protector  
Weight: **11600 lb (5.3t)**  
Effective Projected Area: **74.4 ft² (6.9m²)** **TIA-222-H** Basic Wind Speed: **111 m/h (178.6 km/h)**

### 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
WDVM	23	527 MHz	1,000 kW (30.00 dBk)	300 kW (24.77 dBk)	25.8 kW (14.11 dBk)	40.82 (16.11dB)	12.25 (10.88dB)	3.18 (5.02dB)	0.95 (-0.21dB)

## AZIMUTH PATTERN Horizontal Polarization

Proposal No. **C-80070-3**  
 Date **9-Aug-23**  
 Call Letters **WDVM**  
 Channel **23**  
 Frequency **527 MHz**  
 Antenna Type **TFU-32ETT/VP-R 4CT170**  
 Gain **1.67 (2.23dB)**  
 Calculated

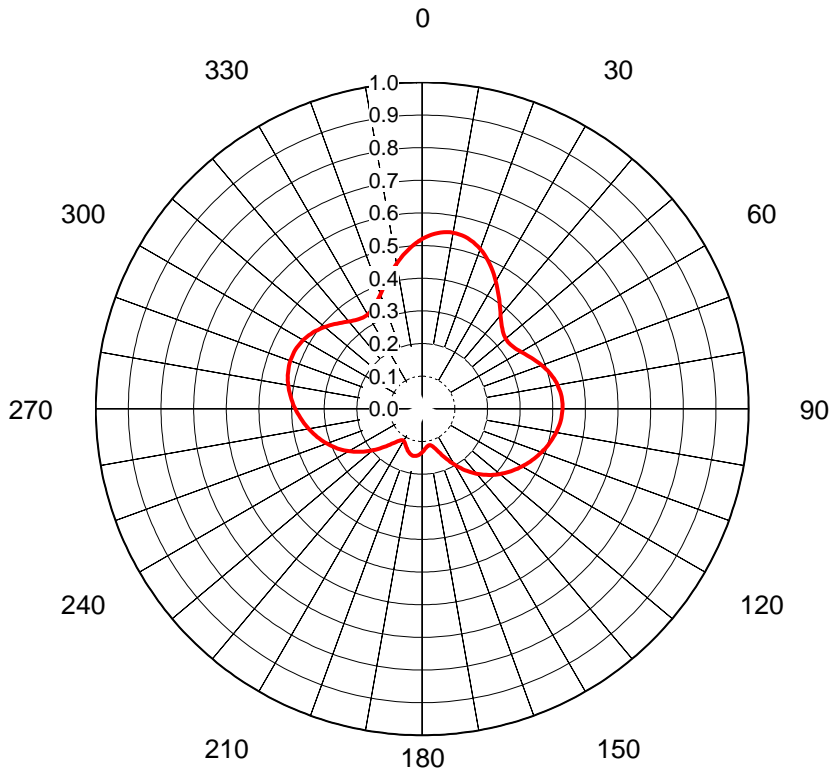


Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.972	36	0.916	72	0.953	108	0.906	144	0.432	180	0.168	216	0.179	252	0.668	288	0.996
1	0.974	37	0.913	73	0.957	109	0.896	145	0.417	181	0.171	217	0.186	253	0.682	289	0.998
2	0.977	38	0.909	74	0.962	110	0.887	146	0.402	182	0.174	218	0.195	254	0.696	290	0.999
3	0.979	39	0.906	75	0.967	111	0.877	147	0.387	183	0.176	219	0.204	255	0.710	291	1.000
4	0.980	40	0.903	76	0.971	112	0.867	148	0.372	184	0.178	220	0.214	256	0.723	292	1.000
5	0.982	41	0.900	77	0.975	113	0.856	149	0.357	185	0.180	221	0.225	257	0.736	293	1.000
6	0.983	42	0.897	78	0.979	114	0.845	150	0.343	186	0.181	222	0.236	258	0.749	294	0.999
7	0.984	43	0.894	79	0.983	115	0.834	151	0.329	187	0.183	223	0.248	259	0.762	295	0.998
8	0.984	44	0.892	80	0.986	116	0.823	152	0.314	188	0.184	224	0.261	260	0.775	296	0.996
9	0.985	45	0.890	81	0.989	117	0.811	153	0.301	189	0.184	225	0.274	261	0.787	297	0.994
10	0.985	46	0.888	82	0.992	118	0.799	154	0.287	190	0.184	226	0.287	262	0.799	298	0.992
11	0.985	47	0.887	83	0.994	119	0.787	155	0.274	191	0.184	227	0.301	263	0.811	299	0.989
12	0.984	48	0.886	84	0.996	120	0.775	156	0.261	192	0.184	228	0.314	264	0.823	300	0.986
13	0.984	49	0.885	85	0.998	121	0.762	157	0.248	193	0.183	229	0.329	265	0.834	301	0.983
14	0.983	50	0.884	86	0.999	122	0.749	158	0.236	194	0.181	230	0.343	266	0.845	302	0.979
15	0.982	51	0.884	87	1.000	123	0.736	159	0.225	195	0.180	231	0.357	267	0.856	303	0.975
16	0.980	52	0.884	88	1.000	124	0.723	160	0.214	196	0.178	232	0.372	268	0.867	304	0.971
17	0.979	53	0.885	89	1.000	125	0.710	161	0.204	197	0.176	233	0.387	269	0.877	305	0.967
18	0.977	54	0.886	90	0.999	126	0.696	162	0.195	198	0.174	234	0.402	270	0.887	306	0.962
19	0.974	55	0.888	91	0.998	127	0.682	163	0.186	199	0.171	235	0.417	271	0.896	307	0.957
20	0.972	56	0.889	92	0.996	128	0.668	164	0.179	200	0.168	236	0.432	272	0.906	308	0.953
21	0.970	57	0.891	93	0.994	129	0.654	165	0.172	201	0.166	237	0.447	273	0.915	309	0.948
22	0.967	58	0.894	94	0.991	130	0.640	166	0.166	202	0.163	238	0.462	274	0.923	310	0.943
23	0.964	59	0.897	95	0.988	131	0.626	167	0.161	203	0.160	239	0.478	275	0.931	311	0.938
24	0.961	60	0.900	96	0.985	132	0.612	168	0.158	204	0.158	240	0.493	276	0.939	312	0.933
25	0.957	61	0.903	97	0.981	133	0.597	169	0.155	205	0.156	241	0.508	277	0.946	313	0.928
26	0.954	62	0.907	98	0.976	134	0.582	170	0.153	206	0.154	242	0.523	278	0.953	314	0.924
27	0.951	63	0.911	99	0.971	135	0.568	171	0.152	207	0.153	243	0.538	279	0.960	315	0.919
28	0.947	64	0.915	100	0.965	136	0.553	172	0.152	208	0.152	244	0.553	280	0.966	316	0.915
29	0.943	65	0.919	101	0.960	137	0.538	173	0.153	209	0.152	245	0.568	281	0.971	317	0.911
30	0.939	66	0.924	102	0.953	138	0.523	174	0.154	210	0.153	246	0.582	282	0.976	318	0.907
31	0.936	67	0.928	103	0.946	139	0.508	175	0.156	211	0.155	247	0.597	283	0.981	319	0.903
32	0.932	68	0.933	104	0.939	140	0.493	176	0.158	212	0.158	248	0.612	284	0.985	320	0.900
33	0.928	69	0.938	105	0.931	141	0.478	177	0.160	213	0.161	249	0.626	285	0.988	321	0.897
34	0.924	70	0.943	106	0.923	142	0.462	178	0.163	214	0.166	250	0.640	286	0.992	322	0.894
35	0.920	71	0.948	107	0.915	143	0.447	179	0.166	215	0.172	251	0.654	287	0.994	323	0.891

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## AZIMUTH PATTERN Vertical Polarization

Proposal No. **C-80070-3**  
 Date **9-Aug-23**  
 Call Letters **WDVM**  
 Channel **23**  
 Frequency **527 MHz**  
 Antenna Type **TFU-32ETT/VP-R 4CT170**  
 Gain **2.43 (3.85dB)**  
 Calculated



Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.521	36	0.403	72	0.397	108	0.395	144	0.235	180	0.133	216	0.121	252	0.320	288	0.429	324	0.338
1	0.526	37	0.395	73	0.401	109	0.392	145	0.229	181	0.135	217	0.124	253	0.324	289	0.429	325	0.336
2	0.530	38	0.388	74	0.405	110	0.389	146	0.223	182	0.137	218	0.128	254	0.329	290	0.430	326	0.335
3	0.534	39	0.381	75	0.408	111	0.385	147	0.217	183	0.139	219	0.132	255	0.333	291	0.430	327	0.334
4	0.538	40	0.374	76	0.411	112	0.382	148	0.210	184	0.141	220	0.137	256	0.337	292	0.430	328	0.333
5	0.541	41	0.368	77	0.414	113	0.379	149	0.204	185	0.143	221	0.142	257	0.341	293	0.430	329	0.333
6	0.543	42	0.362	78	0.416	114	0.375	150	0.197	186	0.144	222	0.147	258	0.345	294	0.429	330	0.334
7	0.545	43	0.356	79	0.419	115	0.372	151	0.191	187	0.145	223	0.153	259	0.349	295	0.428	331	0.335
8	0.547	44	0.351	80	0.421	116	0.368	152	0.184	188	0.146	224	0.159	260	0.353	296	0.427	332	0.337
9	0.547	45	0.347	81	0.423	117	0.364	153	0.178	189	0.146	225	0.165	261	0.357	297	0.426	333	0.340
10	0.548	46	0.343	82	0.425	118	0.361	154	0.171	190	0.147	226	0.171	262	0.361	298	0.425	334	0.343
11	0.547	47	0.340	83	0.426	119	0.357	155	0.165	191	0.146	227	0.178	263	0.364	299	0.423	335	0.347
12	0.547	48	0.337	84	0.427	120	0.353	156	0.159	192	0.146	228	0.184	264	0.368	300	0.421	336	0.351
13	0.545	49	0.335	85	0.428	121	0.349	157	0.153	193	0.145	229	0.191	265	0.372	301	0.419	337	0.356
14	0.543	50	0.334	86	0.429	122	0.345	158	0.147	194	0.144	230	0.197	266	0.375	302	0.416	338	0.362
15	0.541	51	0.333	87	0.430	123	0.341	159	0.142	195	0.143	231	0.204	267	0.379	303	0.414	339	0.368
16	0.538	52	0.333	88	0.430	124	0.337	160	0.137	196	0.141	232	0.210	268	0.382	304	0.411	340	0.374
17	0.534	53	0.334	89	0.430	125	0.333	161	0.132	197	0.139	233	0.217	269	0.385	305	0.408	341	0.381
18	0.530	54	0.335	90	0.430	126	0.329	162	0.128	198	0.137	234	0.223	270	0.389	306	0.405	342	0.388
19	0.526	55	0.336	91	0.429	127	0.324	163	0.124	199	0.135	235	0.229	271	0.392	307	0.401	343	0.395
20	0.521	56	0.338	92	0.429	128	0.320	164	0.121	200	0.133	236	0.235	272	0.395	308	0.397	344	0.403
21	0.515	57	0.340	93	0.428	129	0.315	165	0.118	201	0.131	237	0.242	273	0.398	309	0.394	345	0.411
22	0.509	58	0.343	94	0.427	130	0.311	166	0.116	202	0.128	238	0.248	274	0.401	310	0.390	346	0.419
23	0.503	59	0.346	95	0.426	131	0.306	167	0.115	203	0.126	239	0.254	275	0.404	311	0.386	347	0.427
24	0.497	60	0.350	96	0.424	132	0.301	168	0.114	204	0.123	240	0.259	276	0.407	312	0.382	348	0.435
25	0.490	61	0.353	97	0.423	133	0.297	169	0.113	205	0.121	241	0.265	277	0.410	313	0.378	349	0.443
26	0.482	62	0.357	98	0.421	134	0.292	170	0.114	206	0.119	242	0.271	278	0.412	314	0.373	350	0.451
27	0.475	63	0.361	99	0.419	135	0.287	171	0.114	207	0.117	243	0.276	279	0.414	315	0.369	351	0.459
28	0.467	64	0.365	100	0.417	136	0.281	172	0.115	208	0.115	244	0.281	280	0.417	316	0.365	352	0.467
29	0.459	65	0.369	101	0.414	137	0.276	173	0.117	209	0.114	245	0.287	281	0.419	317	0.361	353	0.475
30	0.451	66	0.373	102	0.412	138	0.271	174	0.119	210	0.114	246	0.292	282	0.421	318	0.357	354	0.482
31	0.443	67	0.378	103	0.410	139	0.265	175	0.121	211	0.113	247	0.297	283	0.423	319	0.353	355	0.490
32	0.435	68	0.382	104	0.407	140	0.259	176	0.123	212	0.114	248	0.301	284	0.424	320	0.350	356	0.497
33	0.427	69	0.386	105	0.404	141	0.254	177	0.126	213	0.115	249	0.306	285	0.426	321	0.346	357	0.503
34	0.419	70	0.390	106	0.401	142	0.248	178	0.128	214	0.116	250	0.311	286	0.427	322	0.343	358	0.509
35	0.411	71	0.394	107	0.398	143	0.242	179	0.131	215	0.118	251	0.315	287	0.428	323	0.340	359	0.515

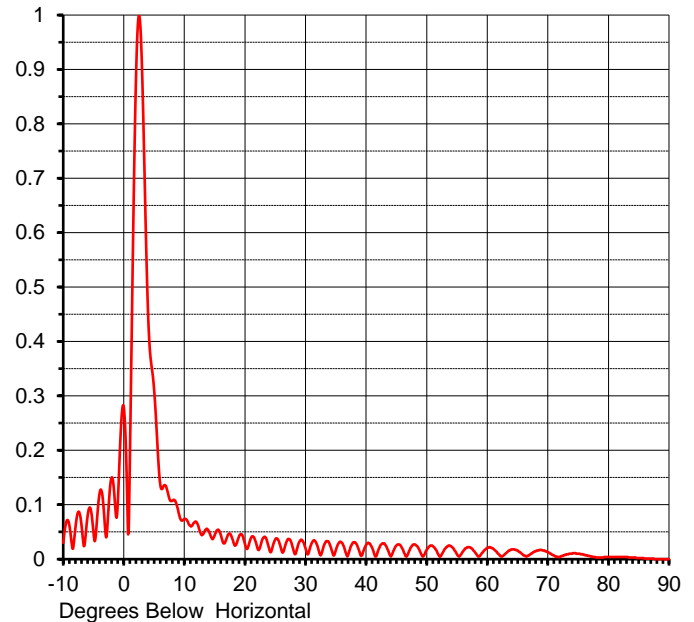
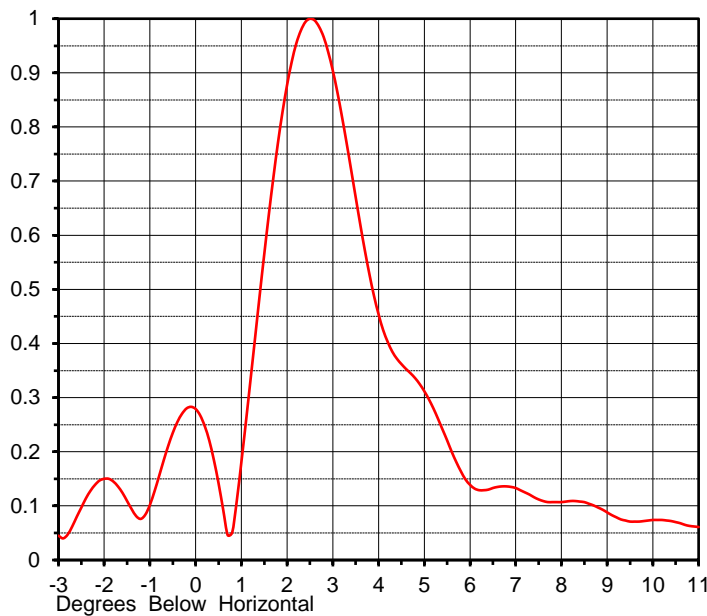
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## ELEVATION PATTERN

Proposal No. **C-80070-3**  
 Date **9-Aug-23**  
 Call Letters **WDVM**  
 Channel **23**  
 Frequency **527 MHz**  
 Antenna Type **TFU-32ETT/VP-R 4CT170**

RMS Directivity at Main Lobe **29.5 ( 14.70 dB )**  
 RMS Directivity at Horizontal **2.3 ( 3.62 dB )**  
**Calculated**

Beam Tilt **2.50 deg**  
 Pattern Number **250**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.030	10.0	0.074	30.0	0.020	50.0	0.017	70.0	0.013
-9.0	0.063	11.0	0.061	31.0	0.029	51.0	0.024	71.0	0.007
-8.0	0.056	12.0	0.068	32.0	0.023	52.0	0.007	72.0	0.004
-7.0	0.064	13.0	0.045	33.0	0.024	53.0	0.019	73.0	0.008
-6.0	0.077	14.0	0.052	34.0	0.027	54.0	0.024	74.0	0.010
-5.0	0.049	15.0	0.044	35.0	0.016	55.0	0.009	75.0	0.010
-4.0	0.121	16.0	0.045	36.0	0.030	56.0	0.014	76.0	0.008
-3.0	0.045	17.0	0.039	37.0	0.007	57.0	0.022	77.0	0.005
-2.0	0.150	18.0	0.035	38.0	0.031	58.0	0.012	78.0	0.003
-1.0	0.102	19.0	0.041	39.0	0.010	59.0	0.009	79.0	0.003
0.0	0.279	20.0	0.028	40.0	0.026	60.0	0.021	80.0	0.004
1.0	0.181	21.0	0.039	41.0	0.021	61.0	0.019	81.0	0.004
2.0	0.878	22.0	0.023	42.0	0.016	62.0	0.008	82.0	0.004
3.0	0.904	23.0	0.039	43.0	0.029	63.0	0.010	83.0	0.004
4.0	0.454	24.0	0.019	44.0	0.006	64.0	0.018	84.0	0.003
5.0	0.312	25.0	0.036	45.0	0.025	65.0	0.016	85.0	0.002
6.0	0.139	26.0	0.018	46.0	0.019	66.0	0.007	86.0	0.001
7.0	0.133	27.0	0.035	47.0	0.012	67.0	0.008	87.0	0.001
8.0	0.107	28.0	0.017	48.0	0.027	68.0	0.015	88.0	0.000
9.0	0.088	29.0	0.032	49.0	0.012	69.0	0.017	89.0	0.000
								90.0	0.000

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## MECHANICAL SPECIFICATIONS

Proposal No. **C-80070-3**  
 Date **9-Aug-23**  
 Call Letters **WDVM**  
 Channel **23**  
 Frequency **527 MHz**  
 Antenna Type **TFU-32ETT/VP-R 4CT170**

### Preliminary Specifications

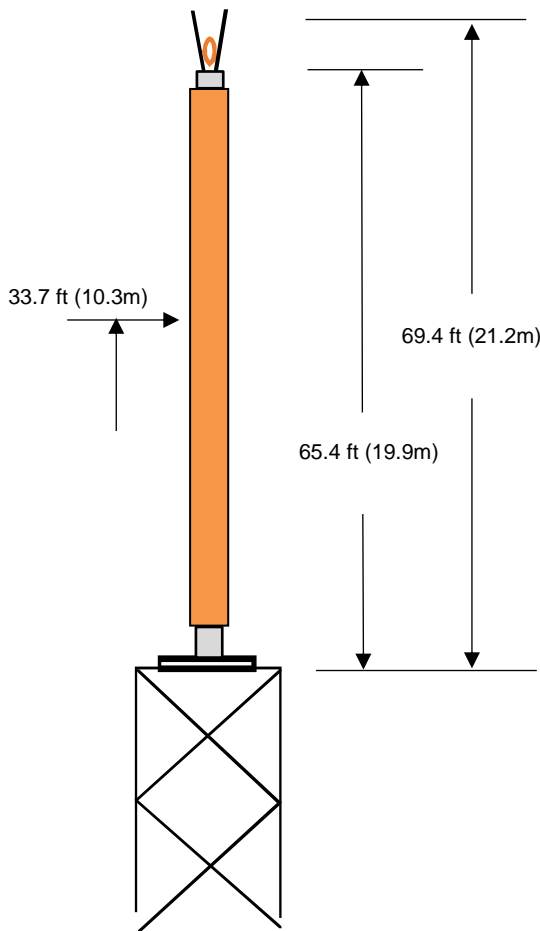
#### Top Mounted

#### With ice TIA-222-H

Design Ult. Wind Speed 111 m/h (178.6 km/h)

Risk Category II  
 Exposure Category B  
 Topography Category 4  
 93 ft (28.3 m)

Design Ice 1 in  $t_{iz} = 1.30$  in  
 Wind Speed w/Ice 30 m/h (48.3 km/h)



#### Mechanical Specifications

		without ice	with ice
Height with Lightning Protector	H4	69.4 ft (21.2m)	
Height less Lightning Protector	H2	65.4 ft (19.9m)	
Height of Center of Radiation	H3	32.7 ft (10m)	
Force Coeff. x Projected Area	CaAc	74.4 ft² (6.9m²)	171.5 ft² (15.9m²)
Moment Arm	D1	33.7 ft (10.3m)	33.9 ft (10.3m)

Weight W 11600 lb (5.3t) 14000 lb (6.4t)

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

Prepared by: CAB Date: 19-Jul-23 ME: EE:  
 Rev. No.3 by: CAB Date: 9-Aug-23

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## Summary

Proposal No. **C-80070-3**  
Date **9-Aug-23**  
Call Letters **WDVM**  
Channel **23**  
Frequency **527 MHz**  
Antenna Type **TFU-32ETT/VP-R 4CT170**

## Antenna

	Hpol		Vpol	
ERP:	<b>1,000 kW</b>	<b>( 30.00 dBk )</b>	<b>300 kW</b>	<b>( 24.77 dBk )</b>
Peak Gain*	40.82	( 16.11 dB )	12.25	( 10.88 dB )

**Antenna Input Power** **24.5 kW ( 13.89 dBk )**

## Transmission Line

Type:	<b>Rigid</b>	Attenuation:	<b>( 0.22 dB )</b>
Size:	<b>6-1/8"</b>	Efficiency:	<b>95.0%</b>
Impedance:	<b>75 Ohm</b>		
Length:	<b>200 ft</b>	<b>61.0 m</b>	

## Transmitter Output

**25.8 kW ( 14.11 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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