Antenna Model: **TFU-24WB-R C160**

Proposal Number:	**C-71262**
Date:	**17-Jan-19**
Customer:	**Nexstar**
Location:	**Dayton, OH**

Electrical Specifications

Polarization:	**Horizontal**				
Azimuth Pattern:	**Directional**				
Antenna Input:	**6-1/8"**	**75 Ohm**	**EIA/DCA**		
VSWR:	Channel	**1.15 : 1**		Band	**1.15 : 1**
Bandwidth:	**470-698 MHz**				
Rated Input Power:	**60 kW**	**(17.78 dBk)**	**Maximum combined average power**		

Mechanical Specifications

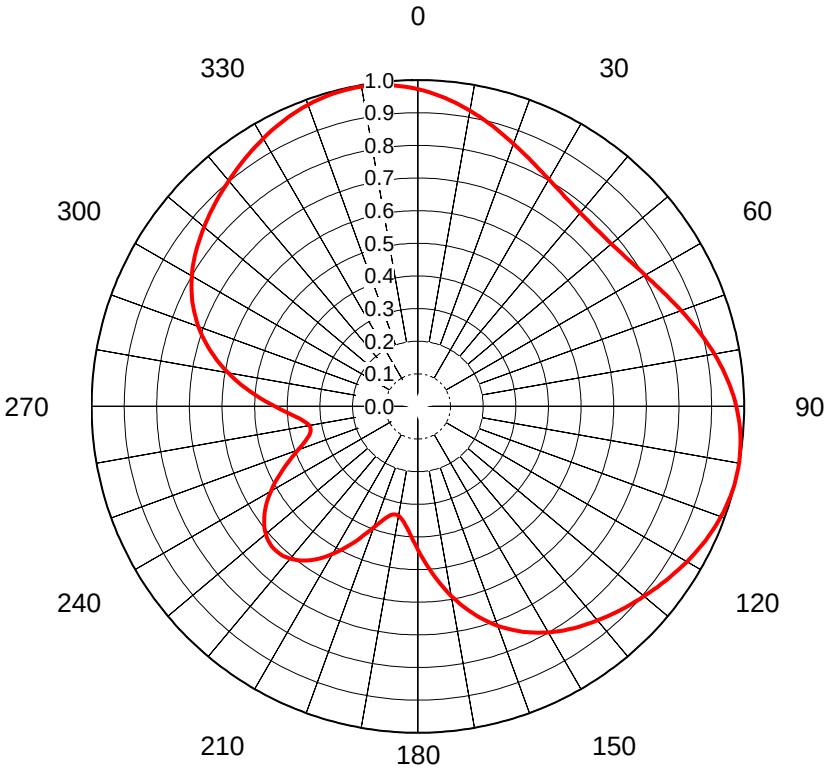
Mounting:	**Side Mounted**			
Environmental Protection:	**Full Radome**			
Height:	**43.5 ft (13.3m)**			
Weight:	**1900 lb (0.9t)**	Excludes Mounts		
Effective Projected Area:	**62.9 ft² (5.8m²)**	**TIA-222-G**	Basic Wind Speed:	**90 m/h (144.8 km/h)**

Channel Specifications

	Call	CH	Freq	Hpol ERP	TPO	Peak Main Lobe Hpol Gain	Peak at Horizontal Hpol Gain
1	WDTN	31	575 MHz	1,000 kW (30.00 dBk)	35.5 kW (15.50 dBk)	35.94 (15.56dB)	29.70 (14.73dB)
2	WDTN	50	689 MHz	1,000 kW (30.00 dBk)	41.9 kW (16.22 dBk)	31.25 (14.95dB)	23.65 (13.74dB)

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AZIMUTH PATTERN
Horizontal Polarization

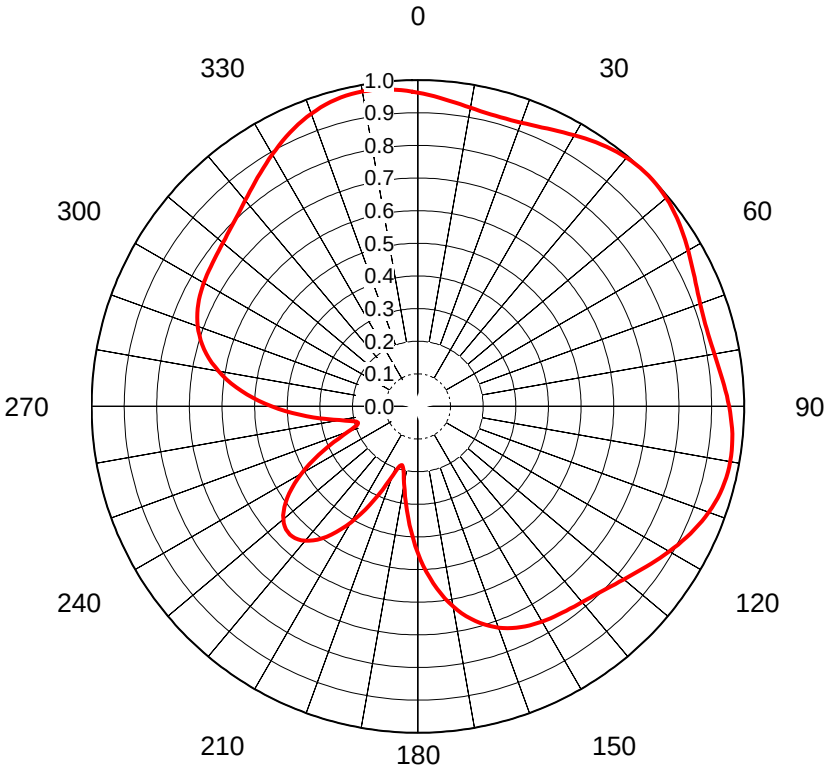
In Free Space

Proposal No.	**C-71262**
Date	**17-Jan-19**
Call Letters	**WDTN**
Channel	**31**
Frequency	**575 MHz**
Antenna Type	**TFU-24WB-R C160**
Gain	**1.67 (2.22dB)**
	Calculated

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.972	36	0.783	72	0.871	108	0.993	144	0.836	180	0.439	216	0.583	252	0.370	288	0.694	324	0.921
1	0.968	37	0.780	73	0.878	109	0.991	145	0.830	181	0.425	217	0.591	253	0.360	289	0.705	325	0.926
2	0.964	38	0.778	74	0.884	110	0.988	146	0.824	182	0.411	218	0.598	254	0.352	290	0.716	326	0.930
3	0.959	39	0.776	75	0.891	111	0.986	147	0.819	183	0.398	219	0.604	255	0.346	291	0.726	327	0.935
4	0.954	40	0.775	76	0.897	112	0.983	148	0.813	184	0.386	220	0.609	256	0.341	292	0.736	328	0.939
5	0.949	41	0.773	77	0.904	113	0.979	149	0.806	185	0.375	221	0.613	257	0.337	293	0.745	329	0.944
6	0.944	42	0.772	78	0.910	114	0.976	150	0.800	186	0.365	222	0.617	258	0.336	294	0.754	330	0.948
7	0.938	43	0.772	79	0.917	115	0.972	151	0.793	187	0.357	223	0.619	259	0.336	295	0.763	331	0.952
8	0.932	44	0.771	80	0.923	116	0.969	152	0.786	188	0.350	224	0.620	260	0.338	296	0.771	332	0.956
9	0.926	45	0.771	81	0.929	117	0.965	153	0.778	189	0.344	225	0.621	261	0.342	297	0.778	333	0.961
10	0.920	46	0.771	82	0.935	118	0.960	154	0.770	190	0.340	226	0.620	262	0.347	298	0.786	334	0.964
11	0.914	47	0.772	83	0.941	119	0.956	155	0.762	191	0.339	227	0.619	263	0.355	299	0.793	335	0.968
12	0.908	48	0.772	84	0.947	120	0.952	156	0.753	192	0.338	228	0.616	264	0.363	300	0.800	336	0.972
13	0.901	49	0.774	85	0.952	121	0.947	157	0.744	193	0.340	229	0.613	265	0.373	301	0.806	337	0.975
14	0.895	50	0.775	86	0.958	122	0.943	158	0.735	194	0.344	230	0.608	266	0.385	302	0.813	338	0.978
15	0.889	51	0.777	87	0.963	123	0.938	159	0.725	195	0.349	231	0.603	267	0.397	303	0.819	339	0.981
16	0.882	52	0.779	88	0.967	124	0.933	160	0.715	196	0.355	232	0.597	268	0.410	304	0.824	340	0.984
17	0.876	53	0.781	89	0.972	125	0.929	161	0.704	197	0.363	233	0.590	269	0.424	305	0.830	341	0.986
18	0.869	54	0.783	90	0.976	126	0.924	162	0.693	198	0.373	234	0.582	270	0.438	306	0.835	342	0.989
19	0.863	55	0.786	91	0.980	127	0.919	163	0.682	199	0.383	235	0.574	271	0.453	307	0.841	343	0.991
20	0.857	56	0.789	92	0.983	128	0.914	164	0.670	200	0.394	236	0.564	272	0.468	308	0.846	344	0.992
21	0.851	57	0.793	93	0.987	129	0.910	165	0.657	201	0.406	237	0.554	273	0.483	309	0.851	345	0.994
22	0.845	58	0.796	94	0.990	130	0.905	166	0.645	202	0.419	238	0.543	274	0.499	310	0.856	346	0.995
23	0.839	59	0.800	95	0.992	131	0.900	167	0.631	203	0.431	239	0.532	275	0.514	311	0.860	347	0.995
24	0.833	60	0.804	96	0.994	132	0.895	168	0.618	204	0.445	240	0.520	276	0.530	312	0.865	348	0.996
25	0.828	61	0.809	97	0.996	133	0.890	169	0.604	205	0.458	241	0.508	277	0.545	313	0.870	349	0.996
26	0.822	62	0.814	98	0.998	134	0.886	170	0.590	206	0.471	242	0.495	278	0.560	314	0.875	350	0.995
27	0.817	63	0.819	99	0.999	135	0.881	171	0.575	207	0.484	243	0.482	279	0.575	315	0.879	351	0.994
28	0.812	64	0.824	100	1.000	136	0.876	172	0.560	208	0.497	244	0.469	280	0.590	316	0.884	352	0.993
29	0.808	65	0.829	101	1.000	137	0.871	173	0.545	209	0.510	245	0.455	281	0.604	317	0.888	353	0.992
30	0.803	66	0.835	102	1.000	138	0.866	174	0.530	210	0.522	246	0.442	282	0.618	318	0.893	354	0.990
31	0.799	67	0.840	103	1.000	139	0.861	175	0.514	211	0.534	247	0.429	283	0.632	319	0.898	355	0.988
32	0.795	68	0.846	104	0.999	140	0.856	176	0.499	212	0.545	248	0.416	284	0.645	320	0.902	356	0.986
33	0.792	69	0.852	105	0.998	141	0.851	177	0.484	213	0.556	249	0.403	285	0.658	321	0.907	357	0.983
34	0.788	70	0.859	106	0.997	142	0.846	178	0.468	214	0.566	250	0.391	286	0.671	322	0.912	358	0.980
35	0.785	71	0.865	107	0.995	143	0.841	179	0.453	215	0.575	251	0.380	287	0.682	323	0.916	359	0.976

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AZIMUTH PATTERN
Horizontal Polarization

In Free Space

Proposal No.	**C-71262**
Date	**17-Jan-19**
Call Letters	**WDTN**
Channel	**50**
Frequency	**689 MHz**
Antenna Type	**TFU-24WB-R C160**
Gain	**1.68 (2.25dB)**
	Calculated

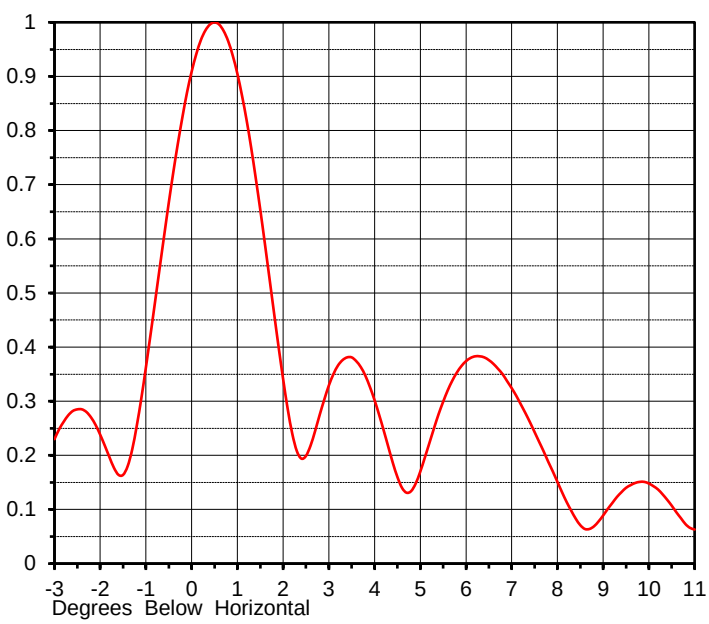
Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.962	36	0.984	72	0.918	108	0.957	144	0.774	180	0.449	216	0.500	252	0.203	288	0.704	324	0.849
1	0.959	37	0.987	73	0.917	109	0.953	145	0.772	181	0.428	217	0.511	253	0.195	289	0.711	325	0.856
2	0.955	38	0.990	74	0.916	110	0.949	146	0.770	182	0.407	218	0.521	254	0.190	290	0.718	326	0.863
3	0.952	39	0.993	75	0.917	111	0.944	147	0.768	183	0.385	219	0.530	255	0.190	291	0.724	327	0.870
4	0.948	40	0.995	76	0.917	112	0.939	148	0.766	184	0.364	220	0.537	256	0.194	292	0.729	328	0.877
5	0.945	41	0.997	77	0.918	113	0.934	149	0.764	185	0.342	221	0.544	257	0.201	293	0.734	329	0.885
6	0.941	42	0.998	78	0.919	114	0.928	150	0.761	186	0.321	222	0.548	258	0.213	294	0.739	330	0.892
7	0.938	43	0.999	79	0.921	115	0.922	151	0.759	187	0.300	223	0.552	259	0.227	295	0.743	331	0.899
8	0.935	44	1.000	80	0.923	116	0.916	152	0.756	188	0.279	224	0.554	260	0.243	296	0.746	332	0.906
9	0.932	45	1.000	81	0.925	117	0.909	153	0.753	189	0.259	225	0.555	261	0.261	297	0.749	333	0.913
10	0.930	46	1.000	82	0.928	118	0.903	154	0.750	190	0.241	226	0.554	262	0.280	298	0.752	334	0.920
11	0.927	47	0.999	83	0.931	119	0.896	155	0.747	191	0.224	227	0.552	263	0.300	299	0.755	335	0.926
12	0.925	48	0.998	84	0.934	120	0.889	156	0.743	192	0.210	228	0.549	264	0.321	300	0.757	336	0.933
13	0.924	49	0.996	85	0.937	121	0.882	157	0.738	193	0.199	229	0.544	265	0.343	301	0.760	337	0.939
14	0.923	50	0.994	86	0.941	122	0.875	158	0.733	194	0.191	230	0.538	266	0.364	302	0.762	338	0.944
15	0.922	51	0.991	87	0.944	123	0.869	159	0.727	195	0.187	231	0.531	267	0.385	303	0.764	339	0.950
16	0.922	52	0.988	88	0.947	124	0.862	160	0.721	196	0.187	232	0.522	268	0.406	304	0.766	340	0.955
17	0.922	53	0.985	89	0.951	125	0.855	161	0.715	197	0.191	233	0.512	269	0.427	305	0.768	341	0.959
18	0.923	54	0.982	90	0.954	126	0.849	162	0.707	198	0.199	234	0.501	270	0.448	306	0.770	342	0.964
19	0.924	55	0.978	91	0.957	127	0.842	163	0.699	199	0.211	235	0.489	271	0.468	307	0.772	343	0.967
20	0.926	56	0.974	92	0.960	128	0.836	164	0.690	200	0.225	236	0.476	272	0.487	308	0.774	344	0.971
21	0.928	57	0.970	93	0.963	129	0.830	165	0.681	201	0.241	237	0.461	273	0.506	309	0.777	345	0.973
22	0.930	58	0.965	94	0.965	130	0.824	166	0.671	202	0.259	238	0.446	274	0.525	310	0.780	346	0.976
23	0.933	59	0.961	95	0.967	131	0.819	167	0.660	203	0.277	239	0.430	275	0.542	311	0.783	347	0.977
24	0.936	60	0.957	96	0.969	132	0.814	168	0.648	204	0.296	240	0.412	276	0.559	312	0.786	348	0.979
25	0.939	61	0.952	97	0.970	133	0.809	169	0.636	205	0.316	241	0.395	277	0.576	313	0.790	349	0.980
26	0.943	62	0.948	98	0.971	134	0.804	170	0.622	206	0.335	242	0.376	278	0.591	314	0.794	350	0.980
27	0.947	63	0.943	99	0.972	135	0.800	171	0.608	207	0.355	243	0.357	279	0.606	315	0.798	351	0.980
28	0.951	64	0.939	100	0.972	136	0.796	172	0.593	208	0.374	244	0.338	280	0.620	316	0.802	352	0.979
29	0.955	65	0.936	101	0.972	137	0.793	173	0.578	209	0.392	245	0.319	281	0.633	317	0.807	353	0.979
30	0.960	66	0.932	102	0.971	138	0.789	174	0.561	210	0.410	246	0.299	282	0.645	318	0.812	354	0.977
31	0.964	67	0.929	103	0.970	139	0.786	175	0.544	211	0.428	247	0.280	283	0.657	319	0.818	355	0.975
32	0.968	68	0.926	104	0.968	140	0.783	176	0.526	212	0.444	248	0.262	284	0.668	320	0.823	356	0.973
33	0.972	69	0.923	105	0.966	141	0.781	177	0.508	213	0.460	249	0.244	285	0.678	321	0.830	357	0.971
34	0.976	70	0.921	106	0.964	142	0.778	178	0.489	214	0.474	250	0.228	286	0.687	322	0.836	358	0.968
35	0.980	71	0.919	107	0.960	143	0.776	179	0.469	215	0.488	251	0.215	287	0.696	323	0.842	359	0.965

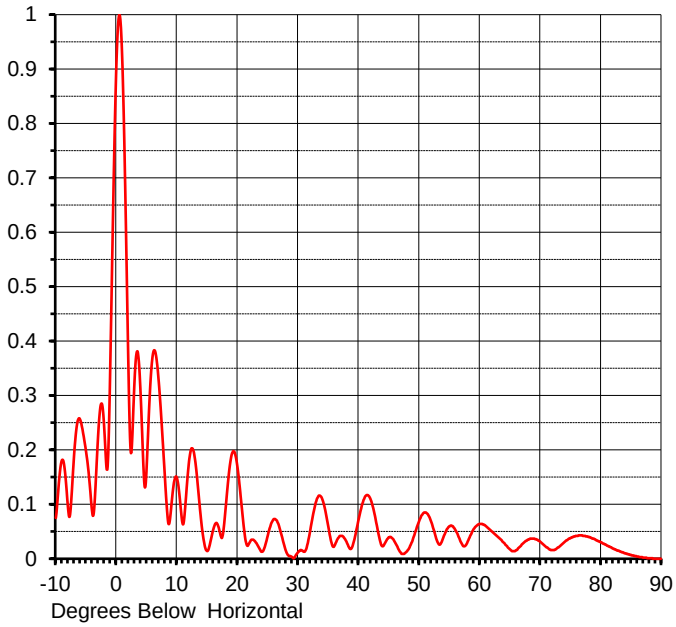
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ELEVATION PATTERN

Proposal No.	**C-71262**
Date	**17-Jan-19**
Call Letters	**WDTN**
Channel	**31**
Frequency	**575 MHz**
Antenna Type	**TFU-24WB-R C160**

RMS Directivity at Main Lobe	**21.6 (13.34 dB)**	Beam Tilt	**0.50 deg**
RMS Directivity at Horizontal	**17.8 (12.50 dB)**	Pattern Number	**24W216050**
	Calculated		





Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.075	10.0	0.148	30.0	0.012	50.0	0.070	70.0	0.031
-9.0	0.181	11.0	0.063	31.0	0.013	51.0	0.085	71.0	0.021
-8.0	0.095	12.0	0.180	32.0	0.052	52.0	0.067	72.0	0.016
-7.0	0.188	13.0	0.181	33.0	0.106	53.0	0.031	73.0	0.021
-6.0	0.256	14.0	0.069	34.0	0.109	54.0	0.040	74.0	0.031
-5.0	0.196	15.0	0.014	35.0	0.058	55.0	0.060	75.0	0.038
-4.0	0.086	16.0	0.054	36.0	0.024	56.0	0.052	76.0	0.042
-3.0	0.230	17.0	0.052	37.0	0.042	57.0	0.028	77.0	0.042
-2.0	0.238	18.0	0.089	38.0	0.031	58.0	0.032	78.0	0.040
-1.0	0.363	19.0	0.190	39.0	0.024	59.0	0.055	79.0	0.036
0.0	0.909	20.0	0.167	40.0	0.073	60.0	0.064	80.0	0.030
1.0	0.905	21.0	0.061	41.0	0.113	61.0	0.060	81.0	0.024
2.0	0.341	22.0	0.030	42.0	0.108	62.0	0.050	82.0	0.019
3.0	0.329	23.0	0.030	43.0	0.061	63.0	0.040	83.0	0.014
4.0	0.302	24.0	0.013	44.0	0.023	64.0	0.029	84.0	0.010
5.0	0.170	25.0	0.043	45.0	0.039	65.0	0.017	85.0	0.007
6.0	0.374	26.0	0.073	46.0	0.030	66.0	0.016	86.0	0.004
7.0	0.324	27.0	0.054	47.0	0.010	67.0	0.027	87.0	0.002
8.0	0.151	28.0	0.014	48.0	0.014	68.0	0.035	88.0	0.001
9.0	0.089	29.0	0.003	49.0	0.038	69.0	0.037	89.0	0.000
								90.0	0.000

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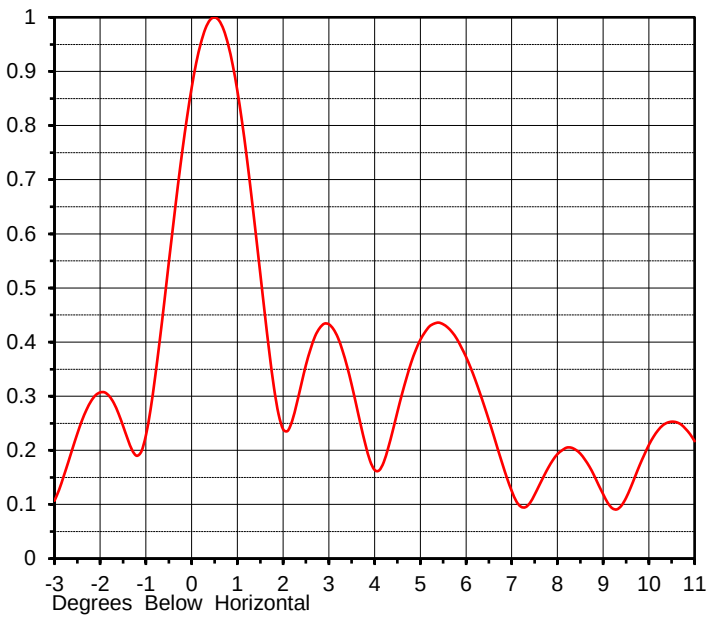
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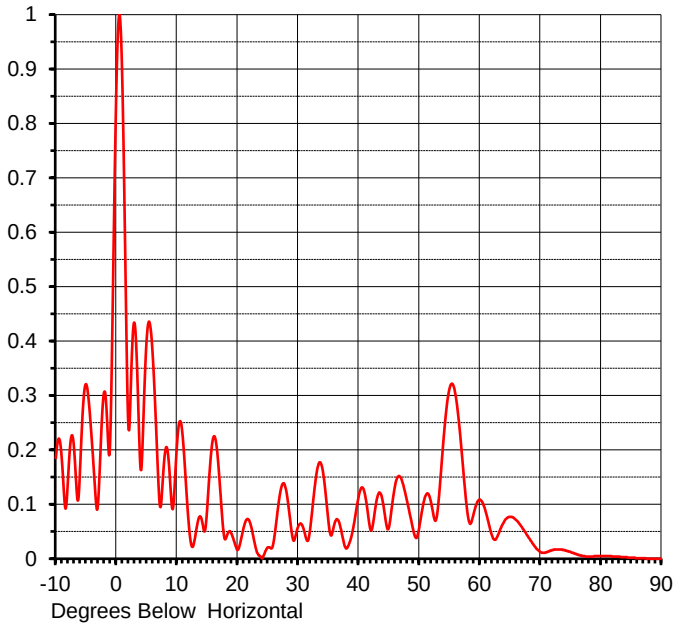
ELEVATION PATTERN

Proposal No.	**C-71262**
Date	**17-Jan-19**
Call Letters	**WDTN**
Channel	**50**
Frequency	**689 MHz**
Antenna Type	**TFU-24WB-R C160**

RMS Directivity at Main Lobe	**18.6 (12.70 dB)**	Beam Tilt	**0.50 deg**
RMS Directivity at Horizontal	**14.1 (11.49 dB)**	Pattern Number	**24W186050**

Calculated

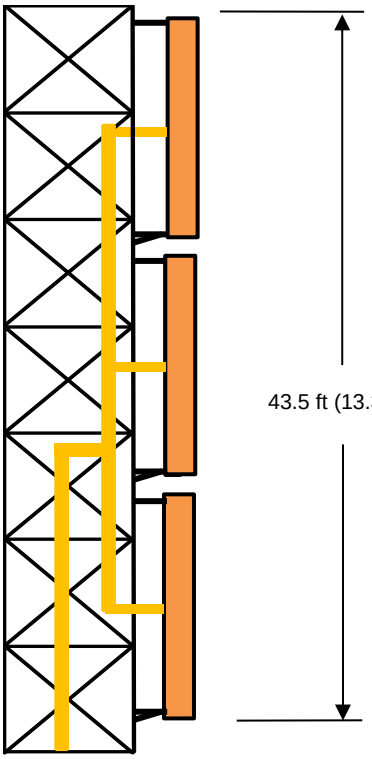




Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.185	10.0	0.210	30.0	0.059	50.0	0.058	70.0	0.012
-9.0	0.181	11.0	0.217	31.0	0.051	51.0	0.115	71.0	0.012
-8.0	0.145	12.0	0.057	32.0	0.056	52.0	0.100	72.0	0.016
-7.0	0.204	13.0	0.040	33.0	0.154	53.0	0.086	73.0	0.017
-6.0	0.165	14.0	0.075	34.0	0.166	54.0	0.219	74.0	0.016
-5.0	0.321	15.0	0.095	35.0	0.069	55.0	0.313	75.0	0.012
-4.0	0.208	16.0	0.223	36.0	0.064	56.0	0.300	76.0	0.008
-3.0	0.107	17.0	0.148	37.0	0.057	57.0	0.197	77.0	0.005
-2.0	0.307	18.0	0.036	38.0	0.019	58.0	0.081	78.0	0.004
-1.0	0.228	19.0	0.046	39.0	0.051	59.0	0.084	79.0	0.005
0.0	0.870	20.0	0.016	40.0	0.115	60.0	0.109	80.0	0.005
1.0	0.864	21.0	0.057	41.0	0.120	61.0	0.085	81.0	0.005
2.0	0.239	22.0	0.068	42.0	0.052	62.0	0.043	82.0	0.004
3.0	0.433	23.0	0.020	43.0	0.110	63.0	0.044	83.0	0.004
4.0	0.164	24.0	0.001	44.0	0.103	64.0	0.068	84.0	0.003
5.0	0.404	25.0	0.021	45.0	0.058	65.0	0.077	85.0	0.002
6.0	0.373	26.0	0.034	46.0	0.134	66.0	0.071	86.0	0.001
7.0	0.125	27.0	0.119	47.0	0.148	67.0	0.057	87.0	0.001
8.0	0.193	28.0	0.127	48.0	0.105	68.0	0.040	88.0	0.000
9.0	0.119	29.0	0.044	49.0	0.053	69.0	0.024	89.0	0.000
								90.0	0.000

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MECHANICAL SPECIFICATIONS



Proposal No.	**C-71262**
Date	**17-Jan-19**
Call Letters	**WDTN**
Channel	**31**
Frequency	**575 MHz**
Antenna Type	**TFU-24WB-R C160**

Preliminary Specifications

Side Mounted

With ice TIA-222-G

Height AGL(z)	800 ft (243.8 m)
Basic Wind Speed	90 m/h (144.8 km/h)
Structure Class	II
Exposure Category	C
Topography Category	1
Design Ice	0.75 in t_{iz} = 2.06 in
Wind Speed w/Ice	40 m/h (64.4 km/h)

Mechanical Specifications		**without ice**	**with ice**	
Height	H2	43.5 ft (13.3m)		
Height of Center of Radiation	H3	21.8 ft (6.6m)		
Effective Projected Area	$(EPA)_A$	62.9 ft² (5.8m²)	134 ft² (12.4m²)	Mounts Excluded
Weight	W	1900 lb (0.9t)	4200 lb (1.9t)	Mounts Excluded

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

Prepared by: JBC **Date:** 17-Jan-19 **ME:** **EE:**

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Summary

Proposal No.	**C-71262**
Date	**17-Jan-19**
Call Letters	**WDTN**
Channel	**31**
Frequency	**575 MHz**
Antenna Type	**TFU-24WB-R C160**

Antenna

	Hpol	
ERP:	**1,000 kW**	**(30.00 dBk)**
Peak Gain*	35.94	(15.56 dB)

Antenna Input Power

27.8 kW **(14.44 dBk)**

Transmission Line

Type:	**Rigid**	Attenuation:		**(1.05 dB)**
Size:	**6-1/8"**	Efficiency:	**78.5%**	
Impedance:	**75 Ohm**			
Length:	**900 ft**	**274.3 m**		

Transmitter Output

35.5 kW **(15.50 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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Summary

Proposal No.	**C-71262**
Date	**17-Jan-19**
Call Letters	**WDTN**
Channel	**50**
Frequency	**689 MHz**
Antenna Type	**TFU-24WB-R C160**

Antenna

	Hpol	
ERP:	**1,000 kW**	**(30.00 dBk)**
Peak Gain*	31.25	(14.95 dB)

Antenna Input Power

32.0 kW **(15.05 dBk)**

Transmission Line

Type:	**Rigid**	Attenuation:		**(1.17 dB)**
Size:	**6-1/8"**	Efficiency:	**76.5%**	
Impedance:	**75 Ohm**			
Length:	**900 ft**	**274.3 m**		

Transmitter Output

41.9 kW **(16.22 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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