



Antenna Model:

TFU-24ETT/VP-R S390

Proposal Number: **C-70453-1**
Date: **12-Sep-17**
Customer: **Nexstar**
Location: **Escanaba, MI**

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: **25 kW** **(13.98 dBk)** **Maximum Average Power**

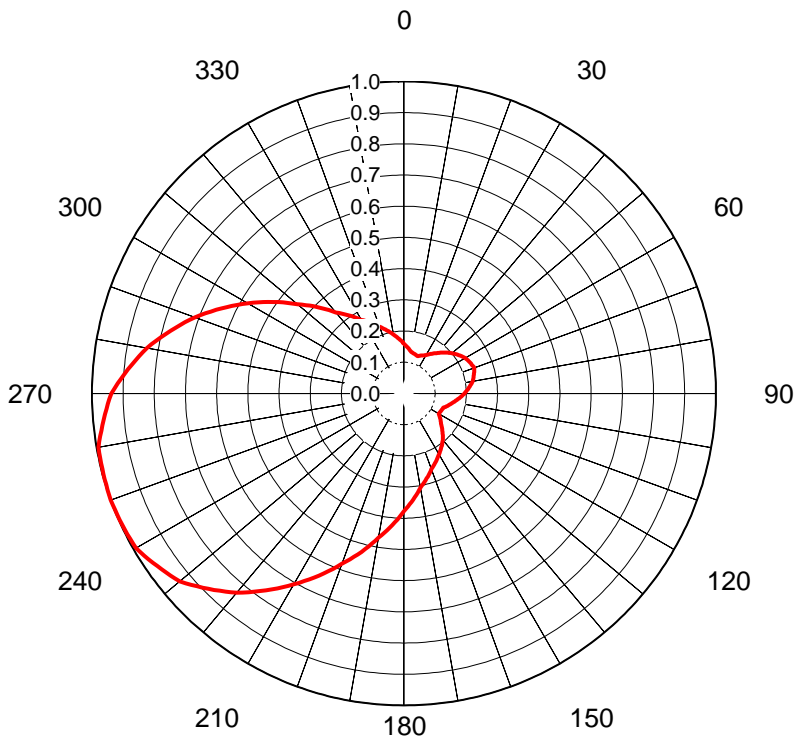
Mechanical Specifications

Mounting: **Top Mounted**
Environmental Protection: **Full Radome**
Height: **45.9 ft (14m)** less Lightning Protector **49.9 ft (15.2m)** with Lightning Protector
Weight: **6650 lb (3t)** Excludes Mounts
Effective Projected Area: **47.5 ft² (4.4m²)** **TIA-222-G** Basic Wind Speed: **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
WJMN	32	581 MHz	736 kW (28.67 dBk)	184 kW (22.65 dBk)	14.8 kW (11.70 dBk)	71.16 (18.52dB)	17.79 (12.50dB)	39.39 (15.95dB)	9.85 (9.93dB)

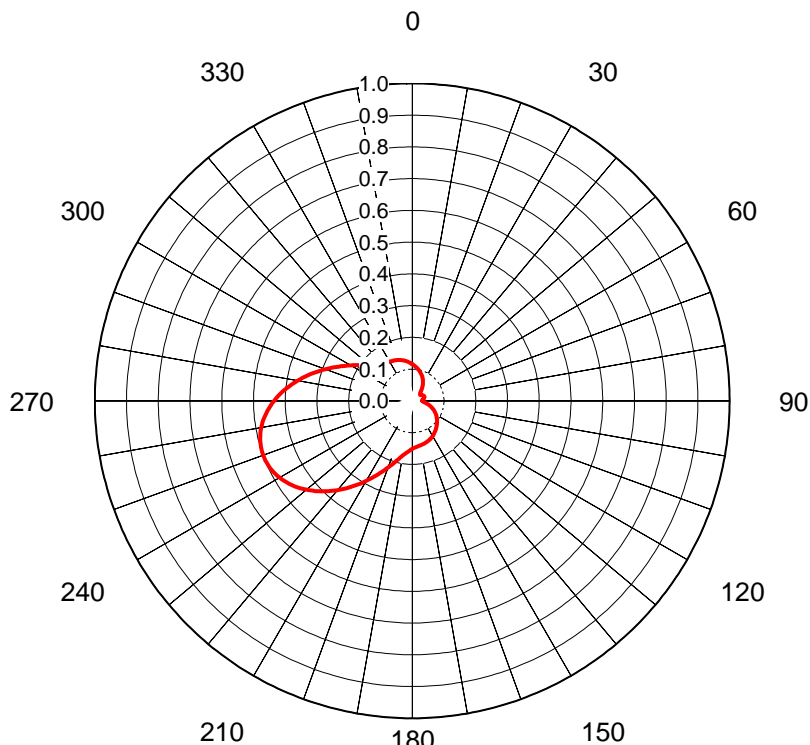
AZIMUTH PATTERN Horizontal Polarization



Proposal No. **C-70453-1**
 Date **12-Sep-17**
 Call Letters **WJMN**
 Channel **32**
 Frequency **581 MHz**
 Antenna Type **TFU-24ETT/VP-R S390**
 Gain **3.87 (5.88dB)**
 Calculated

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.159	36	0.158	72	0.237	108	0.140	144	0.207	180	0.377	216	0.783	252	0.999	288	0.738
1	0.157	37	0.161	73	0.235	109	0.137	145	0.210	181	0.387	217	0.796	253	0.998	289	0.725
2	0.154	38	0.164	74	0.234	110	0.134	146	0.213	182	0.396	218	0.808	254	0.998	290	0.713
3	0.152	39	0.166	75	0.232	111	0.134	147	0.216	183	0.405	219	0.821	255	0.997	291	0.699
4	0.150	40	0.169	76	0.231	112	0.133	148	0.219	184	0.414	220	0.834	256	0.996	292	0.686
5	0.147	41	0.172	77	0.229	113	0.133	149	0.222	185	0.423	221	0.844	257	0.996	293	0.672
6	0.145	42	0.176	78	0.227	114	0.132	150	0.225	186	0.433	222	0.855	258	0.995	294	0.659
7	0.142	43	0.179	79	0.226	115	0.132	151	0.229	187	0.442	223	0.865	259	0.995	295	0.645
8	0.140	44	0.182	80	0.224	116	0.131	152	0.232	188	0.451	224	0.875	260	0.994	296	0.632
9	0.138	45	0.185	81	0.221	117	0.131	153	0.235	189	0.460	225	0.886	261	0.988	297	0.618
10	0.135	46	0.188	82	0.218	118	0.130	154	0.238	190	0.469	226	0.896	262	0.983	298	0.605
11	0.134	47	0.192	83	0.215	119	0.130	155	0.242	191	0.481	227	0.907	263	0.977	299	0.591
12	0.134	48	0.195	84	0.212	120	0.129	156	0.245	192	0.492	228	0.917	264	0.972	300	0.578
13	0.133	49	0.198	85	0.209	121	0.132	157	0.248	193	0.503	229	0.928	265	0.966	301	0.564
14	0.132	50	0.201	86	0.206	122	0.135	158	0.252	194	0.514	230	0.938	266	0.960	302	0.551
15	0.131	51	0.204	87	0.203	123	0.137	159	0.255	195	0.526	231	0.943	267	0.955	303	0.538
16	0.130	52	0.206	88	0.200	124	0.140	160	0.258	196	0.537	232	0.949	268	0.949	304	0.524
17	0.130	53	0.209	89	0.197	125	0.143	161	0.263	197	0.548	233	0.954	269	0.944	305	0.511
18	0.129	54	0.212	90	0.194	126	0.145	162	0.268	198	0.559	234	0.960	270	0.938	306	0.498
19	0.128	55	0.214	91	0.191	127	0.148	163	0.273	199	0.570	235	0.965	271	0.928	307	0.484
20	0.127	56	0.217	92	0.188	128	0.151	164	0.277	200	0.582	236	0.970	272	0.918	308	0.471
21	0.129	57	0.219	93	0.184	129	0.153	165	0.282	201	0.594	237	0.976	273	0.908	309	0.458
22	0.130	58	0.222	94	0.181	130	0.156	166	0.287	202	0.607	238	0.981	274	0.897	310	0.444
23	0.131	59	0.225	95	0.178	131	0.160	167	0.292	203	0.619	239	0.987	275	0.887	311	0.434
24	0.133	60	0.227	96	0.174	132	0.164	168	0.297	204	0.632	240	0.992	276	0.877	312	0.423
25	0.134	61	0.229	97	0.171	133	0.168	169	0.302	205	0.644	241	0.993	277	0.867	313	0.413
26	0.136	62	0.230	98	0.168	134	0.171	170	0.306	206	0.657	242	0.994	278	0.857	314	0.402
27	0.137	63	0.231	99	0.164	135	0.175	171	0.313	207	0.669	243	0.994	279	0.847	315	0.391
28	0.138	64	0.232	100	0.161	136	0.179	172	0.321	208	0.682	244	0.995	280	0.837	316	0.381
29	0.140	65	0.234	101	0.158	137	0.183	173	0.328	209	0.694	245	0.996	281	0.824	317	0.370
30	0.141	66	0.235	102	0.156	138	0.187	174	0.335	210	0.707	246	0.997	282	0.812	318	0.360
31	0.144	67	0.236	103	0.153	139	0.190	175	0.342	211	0.719	247	0.998	283	0.800	319	0.349
32	0.147	68	0.238	104	0.150	140	0.194	176	0.349	212	0.732	248	0.998	284	0.787	320	0.338
33	0.150	69	0.239	105	0.148	141	0.197	177	0.356	213	0.745	249	0.999	285	0.775	321	0.332
34	0.152	70	0.240	106	0.145	142	0.200	178	0.363	214	0.758	250	1.000	286	0.762	322	0.325
35	0.155	71	0.239	107	0.142	143	0.204	179	0.370	215	0.770	251	0.999	287	0.750	323	0.319

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AZIMUTH PATTERN Vertical Polarization

Proposal No. **C-70453-1**
 Date **12-Sep-17**
 Call Letters **WJMN**
 Channel **32**
 Frequency **581 MHz**
 Antenna Type **TFU-24ETT/VP-R S390**
 Gain **4.65 (6.67dB)**
 Calculated

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.116	36	0.054	72	0.040	108	0.063	144	0.121	180	0.151	216	0.337	252	0.499	288	0.307
1	0.115	37	0.052	73	0.040	109	0.065	145	0.122	181	0.153	217	0.344	253	0.498	289	0.299
2	0.113	38	0.050	74	0.040	110	0.067	146	0.124	182	0.154	218	0.352	254	0.497	290	0.292
3	0.112	39	0.047	75	0.039	111	0.069	147	0.125	183	0.156	219	0.360	255	0.496	291	0.284
4	0.110	40	0.045	76	0.039	112	0.072	148	0.126	184	0.158	220	0.367	256	0.494	292	0.277
5	0.109	41	0.043	77	0.038	113	0.074	149	0.127	185	0.161	221	0.374	257	0.492	293	0.270
6	0.108	42	0.041	78	0.037	114	0.076	150	0.128	186	0.163	222	0.382	258	0.489	294	0.263
7	0.106	43	0.040	79	0.037	115	0.077	151	0.129	187	0.166	223	0.389	259	0.486	295	0.256
8	0.105	44	0.038	80	0.036	116	0.079	152	0.130	188	0.169	224	0.396	260	0.483	296	0.249
9	0.103	45	0.036	81	0.035	117	0.081	153	0.131	189	0.172	225	0.403	261	0.479	297	0.242
10	0.102	46	0.035	82	0.034	118	0.083	154	0.132	190	0.176	226	0.410	262	0.476	298	0.236
11	0.101	47	0.034	83	0.033	119	0.085	155	0.133	191	0.179	227	0.417	263	0.472	299	0.230
12	0.099	48	0.033	84	0.033	120	0.086	156	0.134	192	0.183	228	0.423	264	0.467	300	0.224
13	0.098	49	0.032	85	0.032	121	0.088	157	0.135	193	0.187	229	0.429	265	0.463	301	0.218
14	0.096	50	0.031	86	0.032	122	0.090	158	0.136	194	0.192	230	0.435	266	0.458	302	0.212
15	0.095	51	0.031	87	0.031	123	0.091	159	0.136	195	0.197	231	0.441	267	0.452	303	0.207
16	0.093	52	0.031	88	0.031	124	0.093	160	0.137	196	0.202	232	0.447	268	0.447	304	0.202
17	0.091	53	0.031	89	0.031	125	0.095	161	0.138	197	0.207	233	0.452	269	0.441	305	0.197
18	0.090	54	0.032	90	0.031	126	0.096	162	0.138	198	0.212	234	0.458	270	0.435	306	0.192
19	0.088	55	0.032	91	0.032	127	0.098	163	0.139	199	0.218	235	0.463	271	0.429	307	0.187
20	0.086	56	0.033	92	0.033	128	0.099	164	0.139	200	0.224	236	0.467	272	0.423	308	0.183
21	0.085	57	0.033	93	0.034	129	0.101	165	0.140	201	0.230	237	0.472	273	0.417	309	0.179
22	0.083	58	0.034	94	0.035	130	0.102	166	0.140	202	0.236	238	0.476	274	0.410	310	0.176
23	0.081	59	0.035	95	0.036	131	0.103	167	0.141	203	0.242	239	0.479	275	0.403	311	0.172
24	0.079	60	0.036	96	0.038	132	0.105	168	0.141	204	0.249	240	0.483	276	0.396	312	0.169
25	0.077	61	0.037	97	0.040	133	0.106	169	0.142	205	0.256	241	0.486	277	0.389	313	0.166
26	0.076	62	0.037	98	0.041	134	0.108	170	0.142	206	0.263	242	0.489	278	0.382	314	0.163
27	0.074	63	0.038	99	0.043	135	0.109	171	0.143	207	0.270	243	0.492	279	0.374	315	0.161
28	0.072	64	0.039	100	0.045	136	0.110	172	0.144	208	0.277	244	0.494	280	0.367	316	0.158
29	0.069	65	0.039	101	0.047	137	0.112	173	0.144	209	0.284	245	0.496	281	0.360	317	0.156
30	0.067	66	0.040	102	0.050	138	0.113	174	0.145	210	0.292	246	0.497	282	0.352	318	0.154
31	0.065	67	0.040	103	0.052	139	0.115	175	0.146	211	0.299	247	0.498	283	0.344	319	0.153
32	0.063	68	0.040	104	0.054	140	0.116	176	0.147	212	0.307	248	0.499	284	0.337	320	0.151
33	0.061	69	0.041	105	0.056	141	0.117	177	0.148	213	0.314	249	0.500	285	0.329	321	0.150
34	0.059	70	0.041	106	0.059	142	0.118	178	0.149	214	0.322	250	0.500	286	0.322	322	0.149
35	0.056	71	0.041	107	0.061	143	0.120	179	0.150	215	0.329	251	0.500	287	0.314	323	0.148

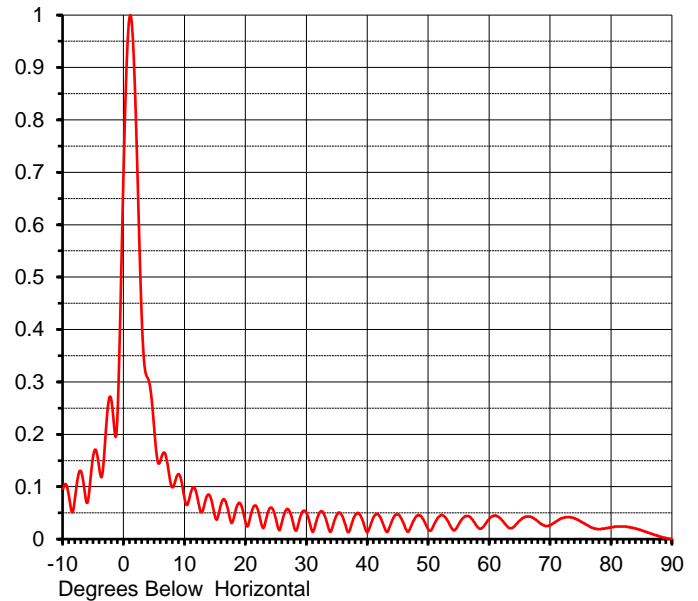
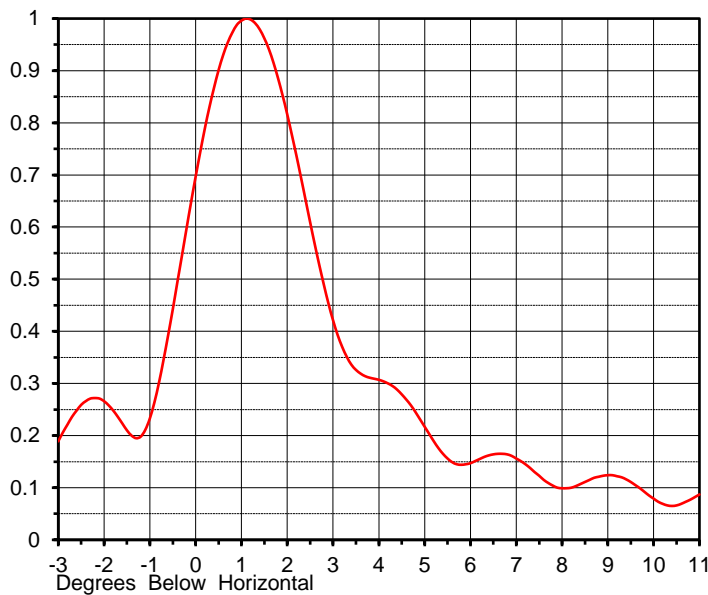
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ELEVATION PATTERN

Proposal No. **C-70453-1**
 Date **12-Sep-17**
 Call Letters **WJMN**
 Channel **32**
 Frequency **581 MHz**
 Antenna Type **TFU-24ETT/VP-R S390**

RMS Directivity at Main Lobe **22.2 (13.46 dB)**
 RMS Directivity at Horizontal **12.3 (10.90 dB)**
Calculated

Beam Tilt **1.00 deg**
 Pattern Number **24E221100**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.096	10.0	0.073	30.0	0.048	50.0	0.017	70.0	0.027
-9.0	0.078	11.0	0.091	31.0	0.014	51.0	0.031	71.0	0.034
-8.0	0.084	12.0	0.081	32.0	0.049	52.0	0.046	72.0	0.040
-7.0	0.127	13.0	0.058	33.0	0.042	53.0	0.037	73.0	0.042
-6.0	0.070	14.0	0.084	34.0	0.016	54.0	0.017	74.0	0.039
-5.0	0.163	15.0	0.040	35.0	0.048	55.0	0.030	75.0	0.033
-4.0	0.129	16.0	0.070	36.0	0.038	56.0	0.044	76.0	0.027
-3.0	0.206	17.0	0.059	37.0	0.016	57.0	0.039	77.0	0.021
-2.0	0.258	18.0	0.040	38.0	0.047	58.0	0.023	78.0	0.019
-1.0	0.264	19.0	0.069	39.0	0.040	59.0	0.024	79.0	0.021
0.0	0.744	20.0	0.029	40.0	0.014	60.0	0.040	80.0	0.023
1.0	1.000	21.0	0.055	41.0	0.043	61.0	0.045	81.0	0.024
2.0	0.777	22.0	0.054	42.0	0.043	62.0	0.036	82.0	0.024
3.0	0.393	23.0	0.024	43.0	0.015	63.0	0.023	83.0	0.023
4.0	0.304	24.0	0.060	44.0	0.036	64.0	0.024	84.0	0.020
5.0	0.203	25.0	0.034	45.0	0.047	65.0	0.036	85.0	0.016
6.0	0.151	26.0	0.037	46.0	0.026	66.0	0.043	86.0	0.012
7.0	0.151	27.0	0.056	47.0	0.022	67.0	0.041	87.0	0.008
8.0	0.099	28.0	0.019	48.0	0.044	68.0	0.033	88.0	0.005
9.0	0.124	29.0	0.045	49.0	0.039	69.0	0.026	89.0	0.002
								90.0	0.000

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MECHANICAL SPECIFICATIONS

Proposal No. **C-70453-1**
 Date **12-Sep-17**
 Call Letters **WJMN**
 Channel **32**
 Frequency **581 MHz**
 Antenna Type **TFU-24ETT/VP-R S390**

Preliminary Specifications

Top Mounted

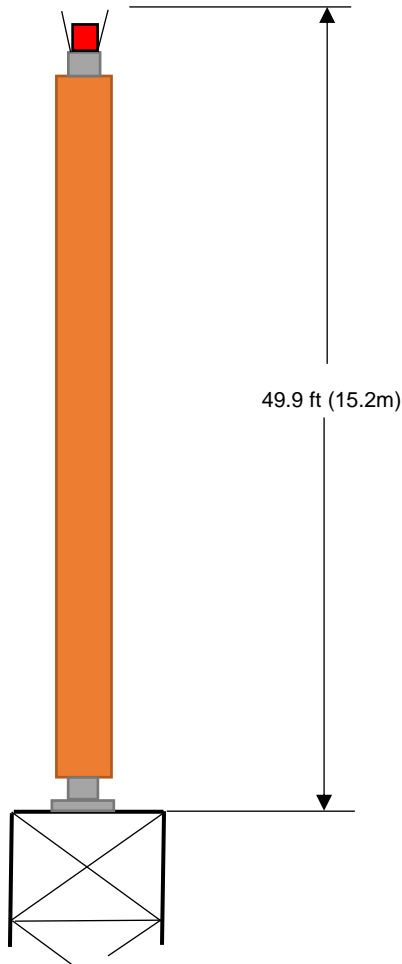
Without ice TIA-222-G

Basic Wind Speed 90 m/h (144.8 km/h)

Structure Class I

Exposure Category C

Topography Category 1



Mechanical Specifications

Height with Lightning Protector	H4	49.9 ft (15.2m)
Height less Lightning Protector	H2	45.9 ft (14m)
Height of Center of Radiation	H3	22.95 ft (7m)
Effective Projected Area	(EPA) _S	47.5 ft ² (4.4m ²)
Moment Arm	D1	24.6 ft (7.5m)

Weight	W	6650 lb (3t)
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Antenna designed in accordance with AISC specifications for design of structural steel as prescribed by TIA-222-G

Prepared by: KLP

Date: 12-Sep-17

ME: *SPJC*

EE:

Rev. No.1 by: KLP

Date: 12-Sep-17

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Summary

Proposal No.	C-70453-1
Date	12-Sep-17
Call Letters	WJMN
Channel	32
Frequency	581 MHz
Antenna Type	TFU-24ETT/VP-R S390

Antenna

	Hpol		Vpol	
ERP:	736 kW	(28.67 dBk)	184 kW	(22.65 dBk)
Peak Gain*	71.16	(18.52 dB)	17.79	(12.50 dB)

Antenna Input Power	10.3 kW	(10.15 dBk)
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Transmission Line

Type:	Rigid	Attenuation:	(1.55 dB)	
Size:	6-1/8"	Efficiency:	69.9%	
Impedance:	75 Ohm			
Length:	1320 ft	402.3 m		

Transmitter Output

14.8 kW	(11.70 dBk)
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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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