



Antenna Model: **TFU-23JTH/VP-R O4**

Proposal Number: **C-71485-4**
Date: **20-Mar-23**
Customer: **Alabama Public TV**
Location: **Florence, AL**

Electrical Specifications

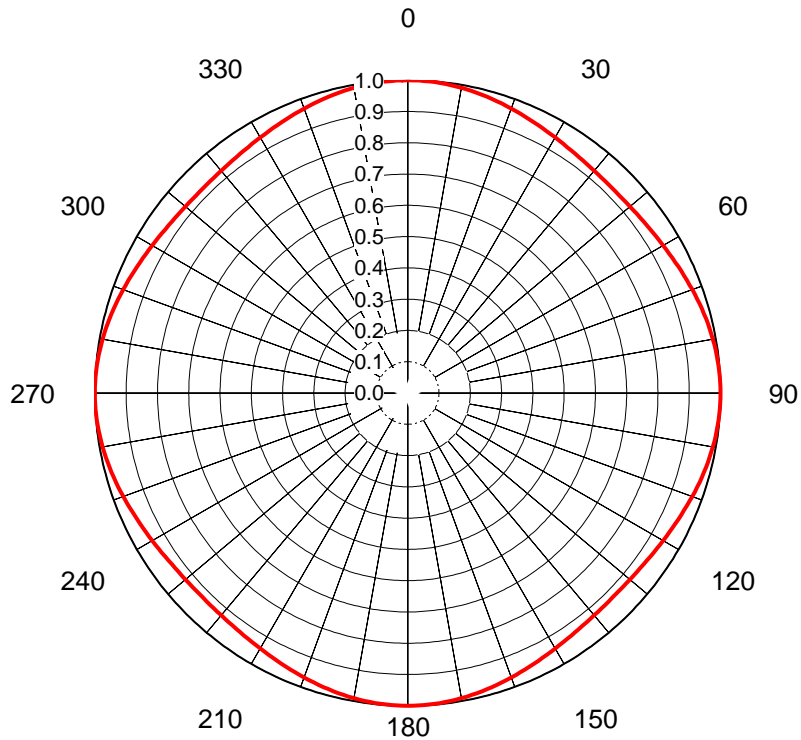
Polarization: **Elliptical**
Azimuth Pattern: **Omni**
Antenna Input: **6-1/8"** **75 Ohm** **EIA/DCA**
VSWR: **Channel** **1.08 : 1**
Bandwidth: **6 MHz**
Rated Input Power: **35 kW** **(15.44 dBk)** **Maximum Average Power**

Mechanical Specifications

Mounting: **Top Mounted**
Environmental Protection: **Full Radome**
Height: **46.9 ft (14.3m)** less Lightning Protector **50.9 ft (15.5m)** with Lightning Protector
Weight: **3700 lb (1.7t)**
Effective Projected Area: **47.1 ft² (4.4m²)** **TIA-222-H** Design Ult. Wind Speed: **106 m/h (170.6 km/h)**

Channel Specifications

Call	CH	Freq	Hpol ERP	Vpol ERP	TPO	RMS Main Lobe Hpol Gain	RMS Main Lobe Vpol Gain	RMS at Horizontal Hpol Gain	RMS at Horizontal Vpol Gain
WFIQ	22	521 MHz	419 kW (26.22 dBk)	105 kW (20.20 dBk)	25.7 kW (14.11 dBk)	18.72 (12.72dB)	4.68 (6.70dB)	13.88 (11.42dB)	3.47 (5.40dB)



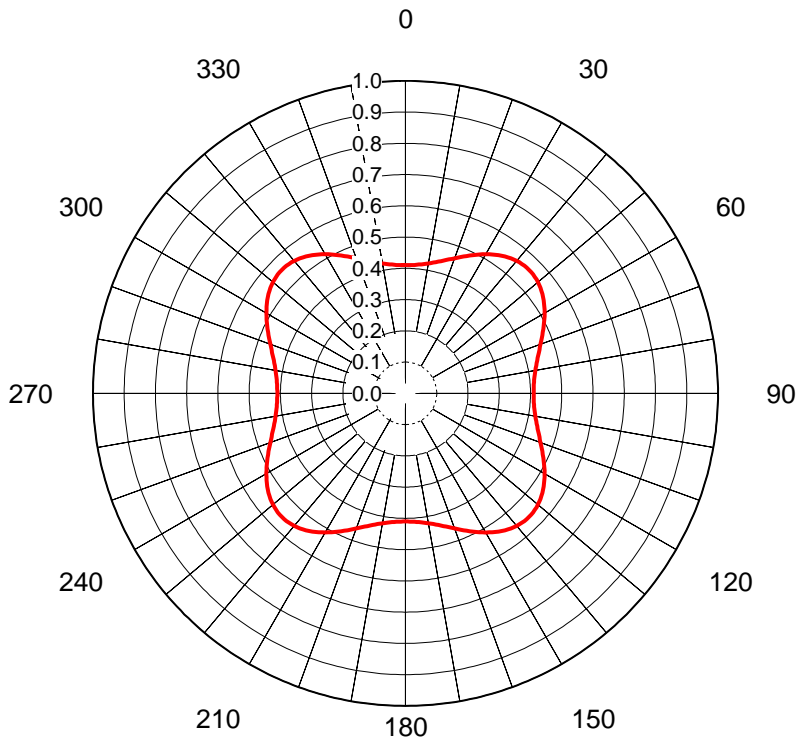
AZIMUTH PATTERN

Proposal No.	C-71485-4
Date	20-Mar-23
Call Letters	WFIQ
Channel	22
Frequency	521 MHz
Antenna Type	TFU-23JTH/VP-R O4
Gain	1.08 (0.33dB)
	Calculated
Circularity	+/- 1.0 dB

	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	1.000	36	0.932	72	0.973	108	0.973	144	0.932	180	1.000	216	0.932	252	0.973	288	0.973	324	0.932
1	1.000	37	0.931	73	0.976	109	0.970	145	0.934	181	1.000	217	0.931	253	0.976	289	0.970	325	0.934
2	1.000	38	0.930	74	0.978	110	0.968	146	0.935	182	1.000	218	0.930	254	0.978	290	0.968	326	0.935
3	0.999	39	0.929	75	0.980	111	0.965	147	0.937	183	0.999	219	0.929	255	0.980	291	0.965	327	0.937
4	0.998	40	0.928	76	0.983	112	0.963	148	0.939	184	0.998	220	0.928	256	0.983	292	0.963	328	0.939
5	0.998	41	0.927	77	0.985	113	0.960	149	0.941	185	0.998	221	0.927	257	0.985	293	0.960	329	0.941
6	0.997	42	0.926	78	0.987	114	0.958	150	0.943	186	0.997	222	0.926	258	0.987	294	0.958	330	0.943
7	0.995	43	0.926	79	0.989	115	0.955	151	0.945	187	0.995	223	0.926	259	0.989	295	0.955	331	0.945
8	0.994	44	0.926	80	0.991	116	0.952	152	0.948	188	0.994	224	0.926	260	0.991	296	0.952	332	0.948
9	0.992	45	0.926	81	0.992	117	0.950	153	0.950	189	0.992	225	0.926	261	0.992	297	0.950	333	0.950
10	0.991	46	0.926	82	0.994	118	0.948	154	0.952	190	0.991	226	0.926	262	0.994	298	0.948	334	0.952
11	0.989	47	0.926	83	0.995	119	0.945	155	0.955	191	0.989	227	0.926	263	0.995	299	0.945	335	0.955
12	0.987	48	0.926	84	0.997	120	0.943	156	0.958	192	0.987	228	0.926	264	0.997	300	0.943	336	0.958
13	0.985	49	0.927	85	0.998	121	0.941	157	0.960	193	0.985	229	0.927	265	0.998	301	0.941	337	0.960
14	0.983	50	0.928	86	0.998	122	0.939	158	0.963	194	0.983	230	0.928	266	0.998	302	0.939	338	0.963
15	0.980	51	0.929	87	0.999	123	0.937	159	0.965	195	0.980	231	0.929	267	0.999	303	0.937	339	0.965
16	0.978	52	0.930	88	1.000	124	0.935	160	0.968	196	0.978	232	0.930	268	1.000	304	0.935	340	0.968
17	0.976	53	0.931	89	1.000	125	0.934	161	0.970	197	0.976	233	0.931	269	1.000	305	0.934	341	0.970
18	0.973	54	0.932	90	1.000	126	0.932	162	0.973	198	0.973	234	0.932	270	1.000	306	0.932	342	0.973
19	0.970	55	0.934	91	1.000	127	0.931	163	0.976	199	0.970	235	0.934	271	1.000	307	0.931	343	0.976
20	0.968	56	0.935	92	1.000	128	0.930	164	0.978	200	0.968	236	0.935	272	1.000	308	0.930	344	0.978
21	0.965	57	0.937	93	0.999	129	0.929	165	0.980	201	0.965	237	0.937	273	0.999	309	0.929	345	0.980

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AZIMUTH PATTERN Vertical Polarization



Proposal No. **C-71485-4**
 Date **20-Mar-23**
 Call Letters **WFIQ**
 Channel **22**
 Frequency **521 MHz**
 Antenna Type **TFU-23JTH/VP-R O4**
 Gain **1.35 (1.29dB)**
 Calculated
 Circularity **+/- 2.0 dB**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.410	36	0.541	72	0.450	108	0.450	144	0.541	180	0.410	216	0.541	252	0.450	288	0.450	324	0.541
1	0.410	37	0.545	73	0.446	109	0.455	145	0.537	181	0.410	217	0.545	253	0.446	289	0.455	325	0.537
2	0.410	38	0.548	74	0.442	110	0.460	146	0.533	182	0.410	218	0.548	254	0.442	290	0.460	326	0.533
3	0.411	39	0.551	75	0.438	111	0.465	147	0.529	183	0.411	219	0.551	255	0.438	291	0.465	327	0.529
4	0.412	40	0.553	76	0.434	112	0.470	148	0.524	184	0.412	220	0.553	256	0.434	292	0.470	328	0.524
5	0.413	41	0.555	77	0.431	113	0.476	149	0.519	185	0.413	221	0.555	257	0.431	293	0.476	329	0.519
6	0.414	42	0.557	78	0.428	114	0.481	150	0.514	186	0.414	222	0.557	258	0.428	294	0.481	330	0.514
7	0.416	43	0.558	79	0.425	115	0.487	151	0.509	187	0.416	223	0.558	259	0.425	295	0.487	331	0.509
8	0.418	44	0.559	80	0.422	116	0.492	152	0.503	188	0.418	224	0.559	260	0.422	296	0.492	332	0.503
9	0.420	45	0.559	81	0.420	117	0.498	153	0.498	189	0.420	225	0.559	261	0.420	297	0.498	333	0.498
10	0.422	46	0.559	82	0.418	118	0.503	154	0.492	190	0.422	226	0.559	262	0.418	298	0.503	334	0.492
11	0.425	47	0.558	83	0.416	119	0.509	155	0.487	191	0.425	227	0.558	263	0.416	299	0.509	335	0.487
12	0.428	48	0.557	84	0.414	120	0.514	156	0.481	192	0.428	228	0.557	264	0.414	300	0.514	336	0.481
13	0.431	49	0.555	85	0.413	121	0.519	157	0.476	193	0.431	229	0.555	265	0.413	301	0.519	337	0.476
14	0.434	50	0.553	86	0.412	122	0.524	158	0.470	194	0.434	230	0.553	266	0.412	302	0.524	338	0.470
15	0.438	51	0.551	87	0.411	123	0.529	159	0.465	195	0.438	231	0.551	267	0.411	303	0.529	339	0.465
16	0.442	52	0.548	88	0.410	124	0.533	160	0.460	196	0.442	232	0.548	268	0.410	304	0.533	340	0.460
17	0.446	53	0.545	89	0.410	125	0.537	161	0.455	197	0.446	233	0.545	269	0.410	305	0.537	341	0.455
18	0.450	54	0.541	90	0.410	126	0.541	162	0.450	198	0.450	234	0.541	270	0.410	306	0.541	342	0.450
19	0.455	55	0.537	91	0.410	127	0.545	163	0.446	199	0.455	235	0.537	271	0.410	307	0.545	343	0.446
20	0.460	56	0.533	92	0.410	128	0.548	164	0.442	200	0.460	236	0.533	272	0.410	308	0.548	344	0.442
21	0.465	57	0.529	93	0.411	129	0.551	165	0.438	201	0.465	237	0.529	273	0.411	309	0.551	345	0.438
22	0.470	58	0.524	94	0.412	130	0.553	166	0.434	202	0.470	238	0.524	274	0.412	310	0.553	346	0.434
23	0.476	59	0.519	95	0.413	131	0.555	167	0.431	203	0.476	239	0.519	275	0.413	311	0.555	347	0.431
24	0.481	60	0.514	96	0.414	132	0.557	168	0.428	204	0.481	240	0.514	276	0.414	312	0.557	348	0.428
25	0.487	61	0.509	97	0.416	133	0.558	169	0.425	205	0.487	241	0.509	277	0.416	313	0.558	349	0.425
26	0.492	62	0.503	98	0.418	134	0.559	170	0.422	206	0.492	242	0.503	278	0.418	314	0.559	350	0.422
27	0.498	63	0.498	99	0.420	135	0.559	171	0.420	207	0.498	243	0.498	279	0.420	315	0.559	351	0.420
28	0.503	64	0.492	100	0.422	136	0.559	172	0.418	208	0.503	244	0.492	280	0.422	316	0.559	352	0.418
29	0.509	65	0.487	101	0.425	137	0.558	173	0.416	209	0.509	245	0.487	281	0.425	317	0.558	353	0.416
30	0.514	66	0.481	102	0.428	138	0.557	174	0.414	210	0.514	246	0.481	282	0.428	318	0.557	354	0.414
31	0.519	67	0.476	103	0.431	139	0.555	175	0.413	211	0.519	247	0.476	283	0.431	319	0.555	355	0.413
32	0.524	68	0.470	104	0.434	140	0.553	176	0.412	212	0.524	248	0.470	284	0.434	320	0.553	356	0.412
33	0.529	69	0.465	105	0.438	141	0.551	177	0.411	213	0.529	249	0.465	285	0.438	321	0.551	357	0.411
34	0.533	70	0.460	106	0.442	142	0.548	178	0.410	214	0.533	250	0.460	286	0.442	322	0.548	358	0.410
35	0.537	71	0.455	107	0.446	143	0.545	179	0.410	215	0.537	251	0.455	287	0.446	323	0.545	359	0.410

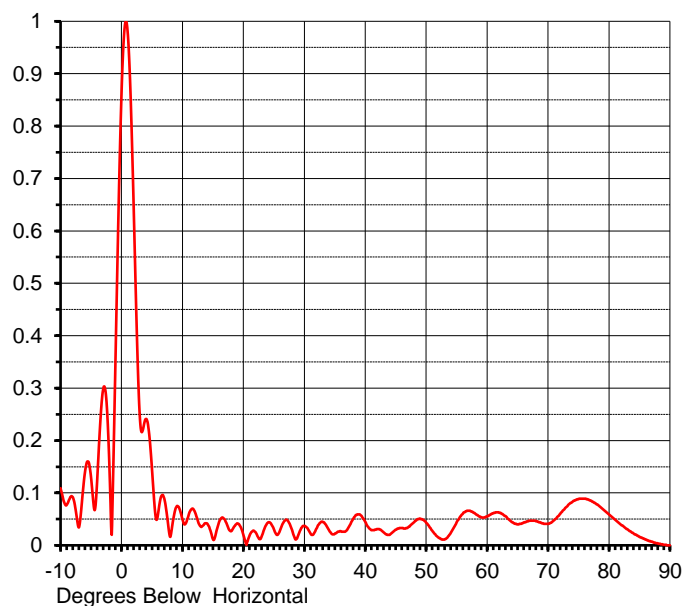
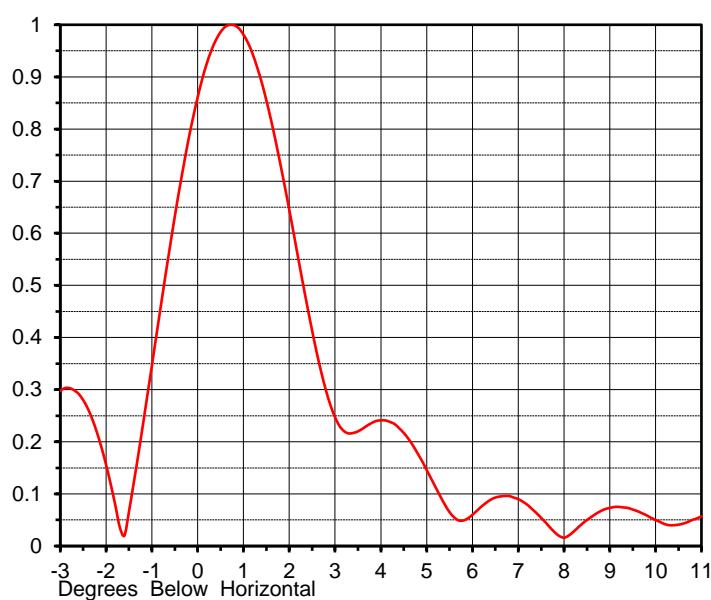
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ELEVATION PATTERN

Proposal No. **C-71485-4**
 Date **20-Mar-23**
 Call Letters **WFIQ**
 Channel **22**
 Frequency **521 MHz**
 Antenna Type **TFU-23JTH/VP-R 04**

RMS Directivity at Main Lobe **23.4 (13.69 dB)**
 RMS Directivity at Horizontal **17.3 (12.38 dB)**
Calculated

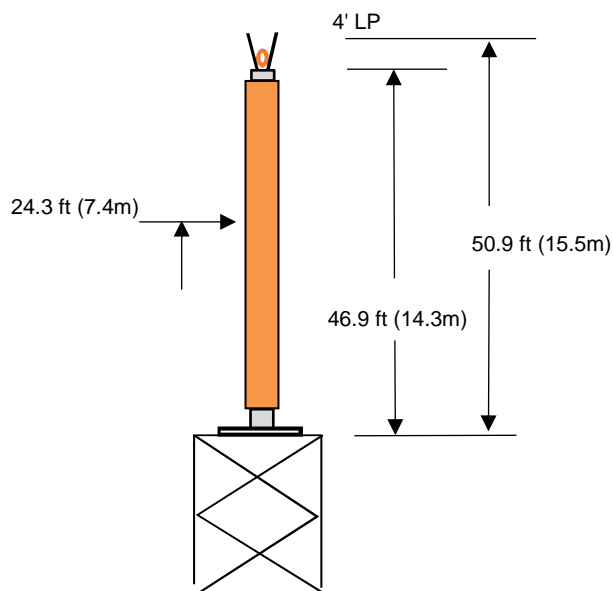
Beam Tilt **0.75 deg**
 Pattern Number **23J234075**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.109	10.0	0.050	30.0	0.037	50.0	0.043	70.0	0.041
-9.0	0.077	11.0	0.057	31.0	0.023	51.0	0.028	71.0	0.048
-8.0	0.092	12.0	0.065	32.0	0.032	52.0	0.015	72.0	0.060
-7.0	0.034	13.0	0.036	33.0	0.045	53.0	0.011	73.0	0.073
-6.0	0.139	14.0	0.042	34.0	0.030	54.0	0.023	74.0	0.083
-5.0	0.130	15.0	0.012	35.0	0.022	55.0	0.044	75.0	0.088
-4.0	0.122	16.0	0.044	36.0	0.027	56.0	0.060	76.0	0.089
-3.0	0.298	17.0	0.048	37.0	0.029	57.0	0.066	77.0	0.085
-2.0	0.156	18.0	0.027	38.0	0.050	58.0	0.061	78.0	0.078
-1.0	0.346	19.0	0.042	39.0	0.059	59.0	0.054	79.0	0.069
0.0	0.861	20.0	0.020	40.0	0.045	60.0	0.055	80.0	0.059
1.0	0.981	21.0	0.018	41.0	0.029	61.0	0.061	81.0	0.049
2.0	0.645	22.0	0.025	42.0	0.031	62.0	0.062	82.0	0.039
3.0	0.247	23.0	0.017	43.0	0.025	63.0	0.056	83.0	0.031
4.0	0.241	24.0	0.043	44.0	0.020	64.0	0.045	84.0	0.023
5.0	0.146	25.0	0.031	45.0	0.030	65.0	0.040	85.0	0.016
6.0	0.060	26.0	0.028	46.0	0.033	66.0	0.043	86.0	0.011
7.0	0.090	27.0	0.049	47.0	0.034	67.0	0.047	87.0	0.007
8.0	0.016	28.0	0.029	48.0	0.044	68.0	0.046	88.0	0.004
9.0	0.073	29.0	0.019	49.0	0.051	69.0	0.042	89.0	0.001
								90.0	0.000

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MECHANICAL SPECIFICATIONS



*Tower top plate hole patten requires confirmation

Proposal No. **C-71485-4**
 Date **20-Mar-23**
 Call Letters **WFIQ**
 Channel **22**
 Frequency **521 MHz**
 Antenna Type **TFU-23JTH/VP-R O4**

Preliminary Specifications

Top Mounted

With ice TIA-222-H

Design Ult. Wind Speed 106 m/h (170.6 km/h)

Risk Category II

Exposure Category C

Topography Category 1

Design Ice 1 in $t_{iz} = 1.32$ in
 Wind Speed w/Ice 30 m/h (48.3 km/h)

Mechanical Specifications

		without ice	with ice
Height with Lightning Protector	H4	50.9 ft (15.5m)	
Height less Lightning Protector	H2	46.9 ft (14.3m)	
Height of Center of Radiation	H3	24.45 ft (7.5m)	
Effective Projected Area	(EPA) _S	47.1 ft ² (4.4m ²)	111.2 ft ² (10.3m ²)
Moment Arm	D1	24.3 ft (7.4m)	24.7 ft (7.5m)

Weight W 3700 lb (1.7t) 5350 lb (2.4t)

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

Prepared by: CAB

Date: 29-Apr-20

ME:

EE:

Rev. No.4 by: SPJC

Date: 20-Mar-23

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Summary

Proposal No.	C-71485-4
Date	20-Mar-23
Call Letters	WFIQ
Channel	22
Frequency	521 MHz
Antenna Type	TFU-23JTH/VP-R 04

Antenna

	Hpol		Vpol	
ERP:	419 kW	(26.22 dBk)	105 kW	(20.20 dBk)
RMS Gain*	18.72	(12.72 dB)	4.68	(6.70 dB)

Antenna Input Power	22.4 kW	(13.50 dBk)
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Transmission Line

Type:	Rigid Digitline	Attenuation:	(0.61 dB)
Size:	6-1/8"	Efficiency:	86.9%
Impedance:	75 Ohm		
Length:	550 ft	167.6 m	

Transmitter Output

25.7 kW	(14.11 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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