



Antenna Model: **TFU-36JTH/VP-R O6**

Proposal Number: **C-71686-4**  
Date: **22-Nov-22**  
Customer: **Alabama ETV**  
Location: **Montgomery, AL**

### Electrical Specifications

Polarization: **Elliptical**  
Azimuth Pattern: **Omni**  
Antenna Input: **6-1/8"** **75 Ohm** **EIA/DCA**  
VSWR: **Channel** **1.08 : 1**  
Bandwidth: **MHz**  
Rated Input Power: **50 kW** **(16.99 dBk)** **Maximum Average Power**

### Mechanical Specifications

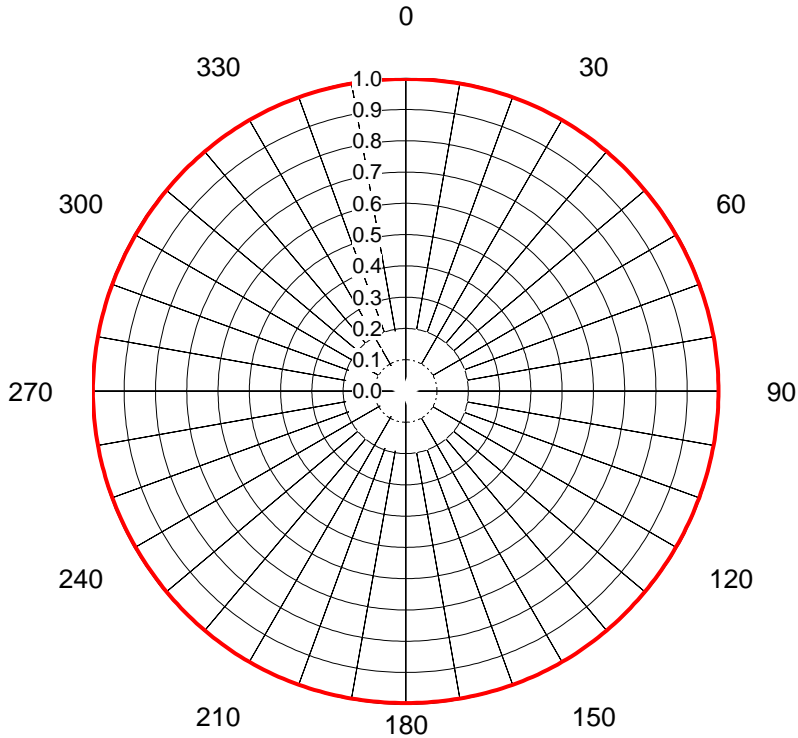
Mounting: **Top Mounted**  
Environmental Protection: **Full Radome**  
Height: **67.9 ft (20.7m)** less Lightning Protector **70.9 ft (21.6m)** with Lightning Protector  
Weight: **12750 lb (5.8t)**  
Effective Projected Area: **79.8 ft² (7.4m²)** **TIA-222-H** Design Ult. Wind Speed: **112 m/h (180.2 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
WAIQ	27	551 MHz	600 kW (27.78 dBk)	150 kW (21.76 dBk)	29.9 kW (14.75 dBk)	23.12 (13.64dB)	5.78 (7.62dB)	10.29 (10.12dB)	2.57 (4.10dB)

## AZIMUTH PATTERN Horizontal Polarization

Proposal No. **C-71686-4**  
 Date **22-Nov-22**  
 Call Letters **WAIQ**  
 Channel **27**  
 Frequency **551 MHz**  
 Antenna Type **TFU-36JTH/VP-R O6**  
 Gain **1 (0.01dB)**  
 Calculated  
 Circularity **+/- 1.0 dB**

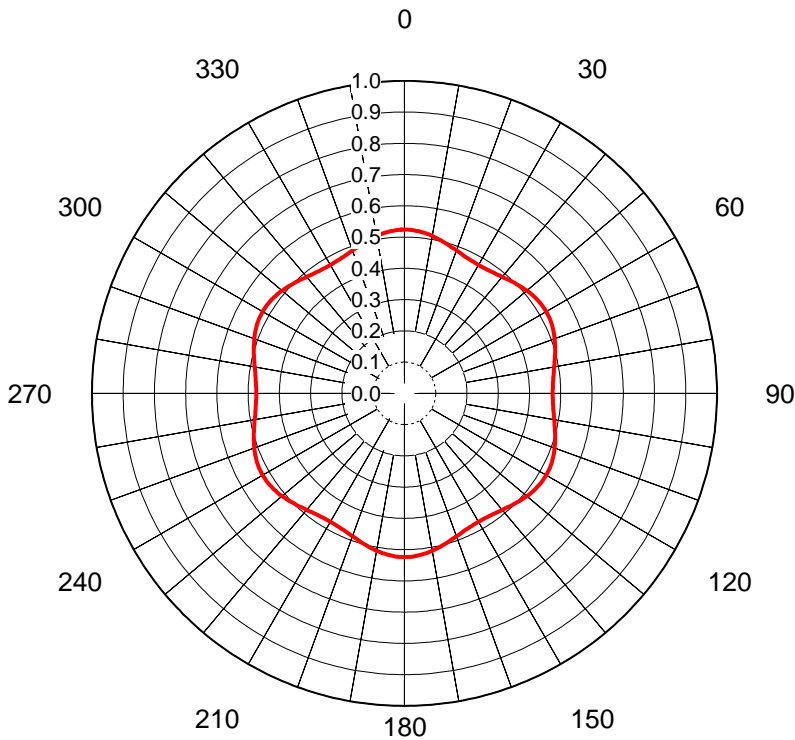


Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.998	36	1.000	72	0.998	108	0.998	144	1.000	180	0.998	216	1.000	252	0.998	288	0.998
1	0.998	37	1.000	73	0.999	109	0.998	145	1.000	181	0.998	217	1.000	253	0.999	289	0.998
2	0.998	38	1.000	74	0.999	110	0.998	146	1.000	182	0.998	218	1.000	254	0.999	290	0.998
3	0.998	39	0.999	75	0.999	111	0.998	147	1.000	183	0.998	219	0.999	255	0.999	291	0.998
4	0.998	40	0.999	76	0.999	112	0.998	148	1.000	184	0.998	220	0.999	256	0.999	292	0.998
5	0.998	41	0.999	77	0.999	113	0.998	149	1.000	185	0.998	221	0.999	257	0.999	293	0.998
6	0.998	42	0.999	78	0.999	114	0.998	150	1.000	186	0.998	222	0.999	258	0.999	294	0.998
7	0.998	43	0.999	79	0.999	115	0.998	151	1.000	187	0.998	223	0.999	259	0.999	295	0.998
8	0.998	44	0.999	80	0.999	116	0.998	152	1.000	188	0.998	224	0.999	260	0.999	296	0.998
9	0.998	45	0.999	81	0.999	117	0.998	153	1.000	189	0.998	225	0.999	261	0.999	297	0.998
10	0.998	46	0.999	82	1.000	118	0.998	154	1.000	190	0.998	226	0.999	262	1.000	298	0.998
11	0.998	47	0.999	83	1.000	119	0.998	155	1.000	191	0.998	227	0.999	263	1.000	299	0.998
12	0.998	48	0.998	84	1.000	120	0.998	156	1.000	192	0.998	228	0.998	264	1.000	300	0.998
13	0.999	49	0.998	85	1.000	121	0.998	157	1.000	193	0.999	229	0.998	265	1.000	301	0.998
14	0.999	50	0.998	86	1.000	122	0.998	158	1.000	194	0.999	230	0.998	266	1.000	302	0.998
15	0.999	51	0.998	87	1.000	123	0.998	159	0.999	195	0.999	231	0.998	267	1.000	303	0.998
16	0.999	52	0.998	88	1.000	124	0.998	160	0.999	196	0.999	232	0.998	268	1.000	304	0.998
17	0.999	53	0.998	89	1.000	125	0.998	161	0.999	197	0.999	233	0.998	269	1.000	305	0.998
18	0.999	54	0.998	90	1.000	126	0.998	162	0.999	198	0.999	234	0.998	270	1.000	306	0.998
19	0.999	55	0.998	91	1.000	127	0.998	163	0.999	199	0.999	235	0.998	271	1.000	307	0.998
20	0.999	56	0.998	92	1.000	128	0.998	164	0.999	200	0.999	236	0.998	272	1.000	308	0.998
21	0.999	57	0.998	93	1.000	129	0.998	165	0.999	201	0.999	237	0.998	273	1.000	309	0.998
22	1.000	58	0.998	94	1.000	130	0.998	166	0.999	202	1.000	238	0.998	274	1.000	310	0.998
23	1.000	59	0.998	95	1.000	131	0.998	167	0.999	203	1.000	239	0.998	275	1.000	311	0.998
24	1.000	60	0.998	96	1.000	132	0.998	168	0.998	204	1.000	240	0.998	276	1.000	312	0.998
25	1.000	61	0.998	97	1.000	133	0.999	169	0.998	205	1.000	241	0.998	277	1.000	313	0.999
26	1.000	62	0.998	98	1.000	134	0.999	170	0.998	206	1.000	242	0.998	278	1.000	314	0.999
27	1.000	63	0.998	99	0.999	135	0.999	171	0.998	207	1.000	243	0.998	279	0.999	315	0.999
28	1.000	64	0.998	100	0.999	136	0.999	172	0.998	208	1.000	244	0.998	280	0.999	316	0.999
29	1.000	65	0.998	101	0.999	137	0.999	173	0.998	209	1.000	245	0.998	281	0.999	317	0.999
30	1.000	66	0.998	102	0.999	138	0.999	174	0.998	210	1.000	246	0.998	282	0.999	318	0.999
31	1.000	67	0.998	103	0.999	139	0.999	175	0.998	211	1.000	247	0.998	283	0.999	319	0.999
32	1.000	68	0.998	104	0.999	140	0.999	176	0.998	212	1.000	248	0.998	284	0.999	320	0.999
33	1.000	69	0.998	105	0.999	141	0.999	177	0.998	213	1.000	249	0.998	285	0.999	321	0.999
34	1.000	70	0.998	106	0.999	142	1.000	178	0.998	214	1.000	250	0.998	286	0.999	322	1.000
35	1.000	71	0.998	107	0.999	143	1.000	179	0.998	215	1.000	251	0.998	287	0.999	323	1.000

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## AZIMUTH PATTERN Vertical Polarization

Proposal No. **C-71686-4**  
 Date **22-Nov-22**  
 Call Letters **WAIQ**  
 Channel **27**  
 Frequency **551 MHz**  
 Antenna Type **TFU-36JTH/VP-R O6**  
 Gain **1.1 (0.42dB)**  
 Calculated  
 Circularity **+/- 1.0 dB**



Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.524	36	0.479	72	0.507	108	0.507	144	0.479	180	0.524	216	0.479	252	0.507	288	0.507	324	0.479
1	0.524	37	0.481	73	0.504	109	0.509	145	0.478	181	0.524	217	0.481	253	0.504	289	0.509	325	0.478
2	0.523	38	0.482	74	0.502	110	0.511	146	0.476	182	0.523	218	0.482	254	0.502	290	0.511	326	0.476
3	0.523	39	0.484	75	0.499	111	0.514	147	0.475	183	0.523	219	0.484	255	0.499	291	0.514	327	0.475
4	0.522	40	0.487	76	0.496	112	0.516	148	0.475	184	0.522	220	0.487	256	0.496	292	0.516	328	0.475
5	0.520	41	0.489	77	0.494	113	0.517	149	0.474	185	0.520	221	0.489	257	0.494	293	0.517	329	0.474
6	0.519	42	0.491	78	0.491	114	0.519	150	0.474	186	0.519	222	0.491	258	0.491	294	0.519	330	0.474
7	0.517	43	0.494	79	0.489	115	0.520	151	0.474	187	0.517	223	0.494	259	0.489	295	0.520	331	0.474
8	0.516	44	0.496	80	0.487	116	0.522	152	0.475	188	0.516	224	0.496	260	0.487	296	0.522	332	0.475
9	0.514	45	0.499	81	0.484	117	0.523	153	0.475	189	0.514	225	0.499	261	0.484	297	0.523	333	0.475
10	0.511	46	0.502	82	0.482	118	0.523	154	0.476	190	0.511	226	0.502	262	0.482	298	0.523	334	0.476
11	0.509	47	0.504	83	0.481	119	0.524	155	0.478	191	0.509	227	0.504	263	0.481	299	0.524	335	0.478
12	0.507	48	0.507	84	0.479	120	0.524	156	0.479	192	0.507	228	0.507	264	0.479	300	0.524	336	0.479
13	0.504	49	0.509	85	0.478	121	0.524	157	0.481	193	0.504	229	0.509	265	0.478	301	0.524	337	0.481
14	0.502	50	0.511	86	0.476	122	0.523	158	0.482	194	0.502	230	0.511	266	0.476	302	0.523	338	0.482
15	0.499	51	0.514	87	0.475	123	0.523	159	0.484	195	0.499	231	0.514	267	0.475	303	0.523	339	0.484
16	0.496	52	0.516	88	0.475	124	0.522	160	0.487	196	0.496	232	0.516	268	0.475	304	0.522	340	0.487
17	0.494	53	0.517	89	0.474	125	0.520	161	0.489	197	0.494	233	0.517	269	0.474	305	0.520	341	0.489
18	0.491	54	0.519	90	0.474	126	0.519	162	0.491	198	0.491	234	0.519	270	0.474	306	0.519	342	0.491
19	0.489	55	0.520	91	0.474	127	0.517	163	0.494	199	0.489	235	0.520	271	0.474	307	0.517	343	0.494
20	0.487	56	0.522	92	0.475	128	0.516	164	0.496	200	0.487	236	0.522	272	0.475	308	0.516	344	0.496
21	0.484	57	0.523	93	0.475	129	0.514	165	0.499	201	0.484	237	0.523	273	0.475	309	0.514	345	0.499
22	0.482	58	0.523	94	0.476	130	0.511	166	0.502	202	0.482	238	0.523	274	0.476	310	0.511	346	0.502
23	0.481	59	0.524	95	0.478	131	0.509	167	0.504	203	0.481	239	0.524	275	0.478	311	0.509	347	0.504
24	0.479	60	0.524	96	0.479	132	0.507	168	0.507	204	0.479	240	0.524	276	0.479	312	0.507	348	0.507
25	0.478	61	0.524	97	0.481	133	0.504	169	0.509	205	0.478	241	0.524	277	0.481	313	0.504	349	0.509
26	0.476	62	0.523	98	0.482	134	0.502	170	0.511	206	0.476	242	0.523	278	0.482	314	0.502	350	0.511
27	0.475	63	0.523	99	0.484	135	0.499	171	0.514	207	0.475	243	0.523	279	0.484	315	0.499	351	0.514
28	0.475	64	0.522	100	0.487	136	0.496	172	0.516	208	0.475	244	0.522	280	0.487	316	0.496	352	0.516
29	0.474	65	0.520	101	0.489	137	0.494	173	0.517	209	0.474	245	0.520	281	0.489	317	0.494	353	0.517
30	0.474	66	0.519	102	0.491	138	0.491	174	0.519	210	0.474	246	0.519	282	0.491	318	0.491	354	0.519
31	0.474	67	0.517	103	0.494	139	0.489	175	0.520	211	0.474	247	0.517	283	0.494	319	0.489	355	0.520
32	0.475	68	0.516	104	0.496	140	0.487	176	0.522	212	0.475	248	0.516	284	0.496	320	0.487	356	0.522
33	0.475	69	0.514	105	0.499	141	0.484	177	0.523	213	0.475	249	0.514	285	0.499	321	0.484	357	0.523
34	0.476	70	0.511	106	0.502	142	0.482	178	0.523	214	0.476	250	0.511	286	0.502	322	0.482	358	0.523
35	0.478	71	0.509	107	0.504	143	0.481	179	0.524	215	0.478	251	0.509	287	0.504	323	0.481	359	0.524

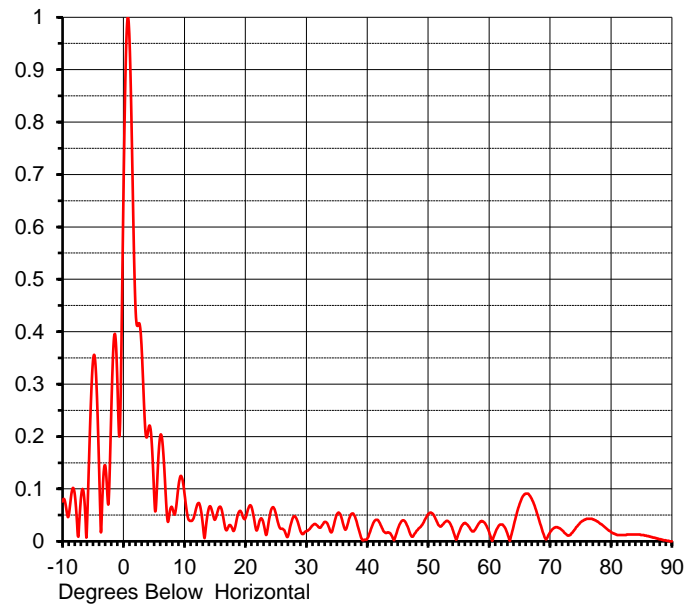
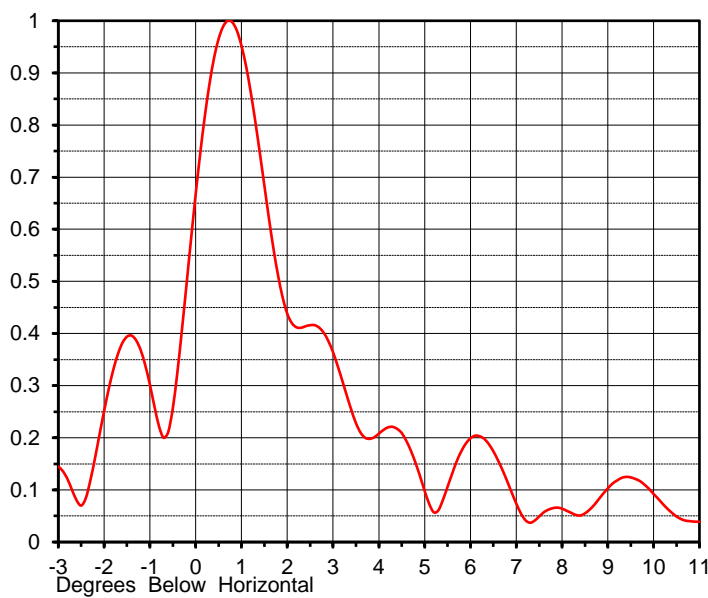
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## ELEVATION PATTERN

Proposal No. **C-71686-4**  
 Date **22-Nov-22**  
 Call Letters **WAIQ**  
 Channel **27**  
 Frequency **551 MHz**  
 Antenna Type **TFU-36JTH/VP-R 06**

RMS Directivity at Main Lobe **28.9 ( 14.61 dB )**  
 RMS Directivity at Horizontal **12.9 ( 11.11 dB )**  
**Calculated**

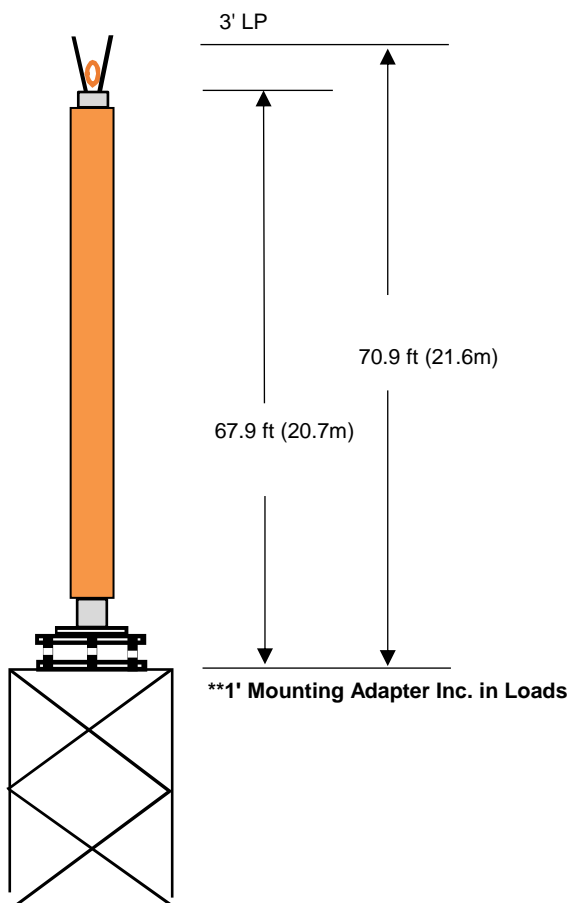
Beam Tilt **0.75 deg**  
 Pattern Number **36J289075**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.076	10.0	0.092	30.0	0.019	50.0	0.052	70.0	0.017
-9.0	0.049	11.0	0.039	31.0	0.030	51.0	0.048	71.0	0.027
-8.0	0.090	12.0	0.066	32.0	0.027	52.0	0.028	72.0	0.021
-7.0	0.080	13.0	0.034	33.0	0.037	53.0	0.039	73.0	0.011
-6.0	0.027	14.0	0.063	34.0	0.018	54.0	0.023	74.0	0.022
-5.0	0.345	15.0	0.041	35.0	0.051	55.0	0.015	75.0	0.036
-4.0	0.137	16.0	0.064	36.0	0.035	56.0	0.035	76.0	0.043
-3.0	0.145	17.0	0.022	37.0	0.042	57.0	0.022	77.0	0.042
-2.0	0.251	18.0	0.020	38.0	0.047	58.0	0.028	78.0	0.036
-1.0	0.302	19.0	0.057	39.0	0.007	59.0	0.038	79.0	0.027
0.0	0.667	20.0	0.044	40.0	0.005	60.0	0.018	80.0	0.018
1.0	0.952	21.0	0.066	41.0	0.035	61.0	0.016	81.0	0.012
2.0	0.438	22.0	0.024	42.0	0.036	62.0	0.032	82.0	0.012
3.0	0.364	23.0	0.033	43.0	0.016	63.0	0.015	83.0	0.013
4.0	0.208	24.0	0.048	44.0	0.011	64.0	0.028	84.0	0.013
5.0	0.098	25.0	0.053	45.0	0.023	65.0	0.071	85.0	0.012
6.0	0.199	26.0	0.024	46.0	0.040	66.0	0.091	86.0	0.010
7.0	0.074	27.0	0.010	47.0	0.016	67.0	0.081	87.0	0.007
8.0	0.064	28.0	0.048	48.0	0.018	68.0	0.049	88.0	0.004
9.0	0.103	29.0	0.021	49.0	0.031	69.0	0.012	89.0	0.002
								90.0	0.000

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## MECHANICAL SPECIFICATIONS



Proposal No. **C-71686-4**  
 Date **22-Nov-22**  
 Call Letters **WAIQ**  
 Channel **27**  
 Frequency **551 MHz**  
 Antenna Type **TFU-36JTH/VP-R O6**

### Preliminary Specifications

#### Top Mounted

##### With ice TIA-222-H

Height AGL(z) 580 ft (176.8 m)  
 Design Ult. Wind Speed 112 m/h (180.2 km/h)

Risk Category II  
 Exposure Category C  
 Topography Category 1

Design Ice 1 in  $t_{iz} = 1.33$  in  
 Wind Speed w/ice 30 m/h (48.3 km/h)

#### Mechanical Specifications

		without ice	with ice
Height with Lightning Protector	H4	70.9 ft (21.6m)	
Height less Lightning Protector	H2	67.9 ft (20.7m)	
Height of Center of Radiation	H3	33.95 ft (10.3m)	
Effective Projected Area	(EPA) <sub>S</sub>	79.8 ft <sup>2</sup> (7.4m <sup>2</sup> )	183.7 ft <sup>2</sup> (17.1m <sup>2</sup> )
Moment Arm	D1	34.3 ft (10.5m)	34.7 ft (10.6m)

Weight W 12750 lb (5.8t) 15200 lb (6.9t)

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

Prepared by: CAB

Date: 10-Feb-21

ME:

EE:

Rev. No.4 by: SPJC

Date: 22-Nov-22

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## Summary

Proposal No. **C-71686-4**  
Date **22-Nov-22**  
Call Letters **WAIQ**  
Channel **27**  
Frequency **551 MHz**  
Antenna Type **TFU-36JTH/VP-R O6**

## Antenna

	Hpol		Vpol	
ERP:	<b>600 kW</b>	<b>( 27.78 dBk )</b>	<b>150 kW</b>	<b>( 21.76 dBk )</b>
RMS Gain*	23.12	( 13.64 dB )	5.78	( 7.62 dB )

**Antenna Input Power** **26.0 kW ( 14.14 dBk )**

## Transmission Line

Type:	<b>Rigid</b>	Attenuation:	<b>( 0.61 dB )</b>
Size:	<b>6-1/8"</b>	Efficiency:	<b>86.9%</b>
Impedance:	<b>75 Ohm</b>		
Length:	<b>535 ft</b>	<b>163.1 m</b>	

## Transmitter Output

**29.9 kW ( 14.75 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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