

APPLICATION FOR LICENSE

NCE FM STATION WMYZ
THE VILLAGES, FLORIDA
FACILITY ID: 27291 / BPED-20180117ACL

CENTRAL FLORIDA EDUCATIONAL FOUNDATION, INC.

FEBRUARY, 2019

APPLICATION FOR LICENSE

The following engineering statement and attached exhibits have been prepared for **Central Florida Educational Foundation, Inc.** ("CFEF"), licensee of NCE station WMYZ at The Villages, Florida, and are in support of their application for license.¹ This application seeks to cover the modification to the licensed facility authorized under FCC File No. BPED-20180117ACL.

The facility as authorized and constructed operates on FM Channel 204 as a class C2 facility with a maximum effective radiated power of 35 kW at a center of radiation of 82 meters above average terrain. This elevation corresponds to a center of radiation of 111 meters above mean sea level, or 88 meters above ground. The facility was constructed with a Shively Labs model 6025-3/2 antenna. This is a directional antenna comprised of three layers of sections spaced 0.90 wavelengths apart. No beamtilt is employed by WMYZ. The facility has been constructed in accordance with the terms of the construction permit.

The main studio complies with the provisions of Section 73.1125 of the Commission's Rules. CFEF has provided toll-free telephone access to the main studios throughout its coverage area, including The Villages, Florida, the community of license.

The specified transmitter power output achieves the authorized effective radiated power. The maximum effective radiated power authorized is 35 kW. The antenna utilized by the facility, a Shively model 6025-3/2 as previously stated, has a maximum power gain of 4.328 as specified in

¹ The Facility ID for WMYZ at The Villages, Florida is 27291.

JEREMY RUCK & ASSOCIATES, INC.

P.O. Box 415
221 S. 1st Avenue
Canton, IL 61520

Tel: 309.647.1200
Fax: 855.332.9537
jeremyruck.com

the antenna proof. The input power to the antenna to achieve the authorized effective radiated power is 8.09 kW.

Ahead of the antenna is 307 feet of Eupen EC7-50A transmission line. This line is a semi-flexible air-dielectric coaxial cable with a 1 5/8-inch nominal diameter. The insertion loss of this run of transmission line based on data from the manufacturer is 0.6245 dB, including connectors. This corresponds to an efficiency of 86.61 percent. The input power to the transmission line to achieve the effective radiated power is 9.34 kW.

Preceding the main run of transmission line is a transmission line switch, reducer, and 10 feet of 3 1/8" rigid transmission line. and step reducer. The insertion loss of these components in the aggregate is 0.1239 dB, which corresponds to an efficiency of 97.19 percent. The input power to the reducer and switch combination to achieve the authorized effective radiated power is 9.60 kW. The input to these components is the output of the transmitter, thus the specified transmitter power achieves the authorized effective radiated power.

As was previously stated, the facility was constructed in accordance with the terms of the underlying construction permit. The permit, as issued by the Commission, lists eleven (11) special conditions or restrictions. Each of the special conditions will be addressed in this technical exhibit.

The first special condition pertains to the allocation situation for the authorized facility. CFEF requested, and was granted, a waiver of the provisions of Section 73.509 of the Commission's Rules to receive overlap of the 100 dBu contour of third adjacent station WHIJ at

JEREMY RUCK & ASSOCIATES, INC.

P.O. Box 415
221 S. 1st Avenue
Canton, IL 61520

Tel: 309.647.1200
Fax: 855.332.9537
jeremyruck.com

Ocala, Florida. This condition advises CFEF that further modification of WHIJ will not be construed as a *per se* modification of WMZ.

Under the second condition, CFEF is advised that operation of the auxiliary facility authorized under FCC File No. BXLED-20070927AKN must cease due to violation of Section 73.1675 of the Commission's Rules. CFEF is cognizant of this violation, and will cease use of the auxiliary facility so authorized until such time as it can be appropriately modified.

The third special condition pertains to RF safety at the site. Under this condition, CFEF is advised that it must coordinate with all other users of the site to ensure that workers and other persons are not exposed to levels of radiofrequency radiation in excess of the applicable safety standards. CFEF certifies that it will coordinate with other users as required, and that such coordination procedures will include, but are not necessarily limited to, a reduction in transmitter power or cessation of operation.

The fourth condition pertains to the type of antenna utilized. Under the original construction permit application, a four-section type-1 antenna with element spacing of 0.75 wavelength was specified. The actual antenna as constructed consists of three layers spaced 0.90 wavelength apart. The antenna is comprised of an array of Yagi style antennas, which constitutes a "type-1" style antenna. The Commission's *FM Model* utility returns a maximum calculated power density of 131.2 $\mu\text{W}/\text{cm}^2$ at a distance of 15 meters from the tower base. This value complies with the upper limit of the uncontrolled environment condition of the safety standard. CFEF respectfully requests the restoration of full program test authority for WMYZ, as this antenna is apparently in compliance with applicable standards.

JEREMY RUCK & ASSOCIATES, INC.

P.O. Box 415
221 S. 1st Avenue
Canton, IL 61520

Tel: 309.647.1200
Fax: 855.332.9537
jeremyruck.com

The fifth through seventh special conditions require the submission of an antenna proof of performance, surveyor certification, and antenna installation certification. These documents all follow the text of this technical exhibit.

Under the eighth condition, CFEF must submit an exhibit detailing compliance with the community coverage requirements of Section 73.515 of the Commission's Rules. Exhibit E-1, attached to this technical exhibit is a contour map illustrating the 60 dBu service contour based on the measured pattern. It demonstrates the required compliance.

The ninth and tenth conditions pertain to the directional antenna for the facility. CFEF is in compliance with these conditions.

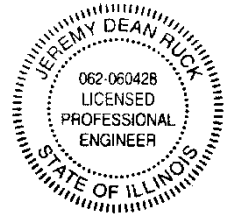
The final condition pertains to the antenna being mounted on the radiator for AM station WVLG at Wildwood, Florida (Facility ID 70724). CFEF has complied with the provisions of this special condition. The consulting engineer for WVLG will be visiting the site to make the final impedance measurements within the next week, and will be submitting the required direct measurement of power application. CFEF is cognizant that the grant of a license for WMYZ will be held in abeyance until the required application for WVLG is filed with the Commission.

JEREMY RUCK & ASSOCIATES, INC.

P.O. Box 415
221 S. 1st Avenue
Canton, IL 61520

Tel: 309.647.1200
Fax: 855.332.9537
jeremyruck.com

The preceding statement and attached exhibits have been prepared by me, or under my direction, and are true and accurate to the best of my belief and knowledge.



Above signature is digitized copy of actual signature
License Expires November 30, 2019

Jeremy D. Ruck, PE
February 12, 2019

JEREMY RUCK & ASSOCIATES, INC.

P.O. Box 415
221 S. 1st Avenue
Canton, IL 61520

Tel: 309.647.1200
Fax: 855.332.9537
jeremyruck.com

WMYZ.C

BPED20180117ACL

Latitude: 28-54-16 N

Longitude: 081-57-36 W

ERP: 35.00 kW

Channel: 204

Frequency: 88.7 MHz

AMSL Height: 111.0 m

Elevation: 23.0 m

Horiz. Pattern: Directional

Vert. Pattern: No

Prop Model: FCC Contour

Jeremy Ruck & Associates, Inc.

60 dBu Service Contour

City of License
The Villages, Florida**Exhibit E-1**

Measured Pattern 60 dBu Contour

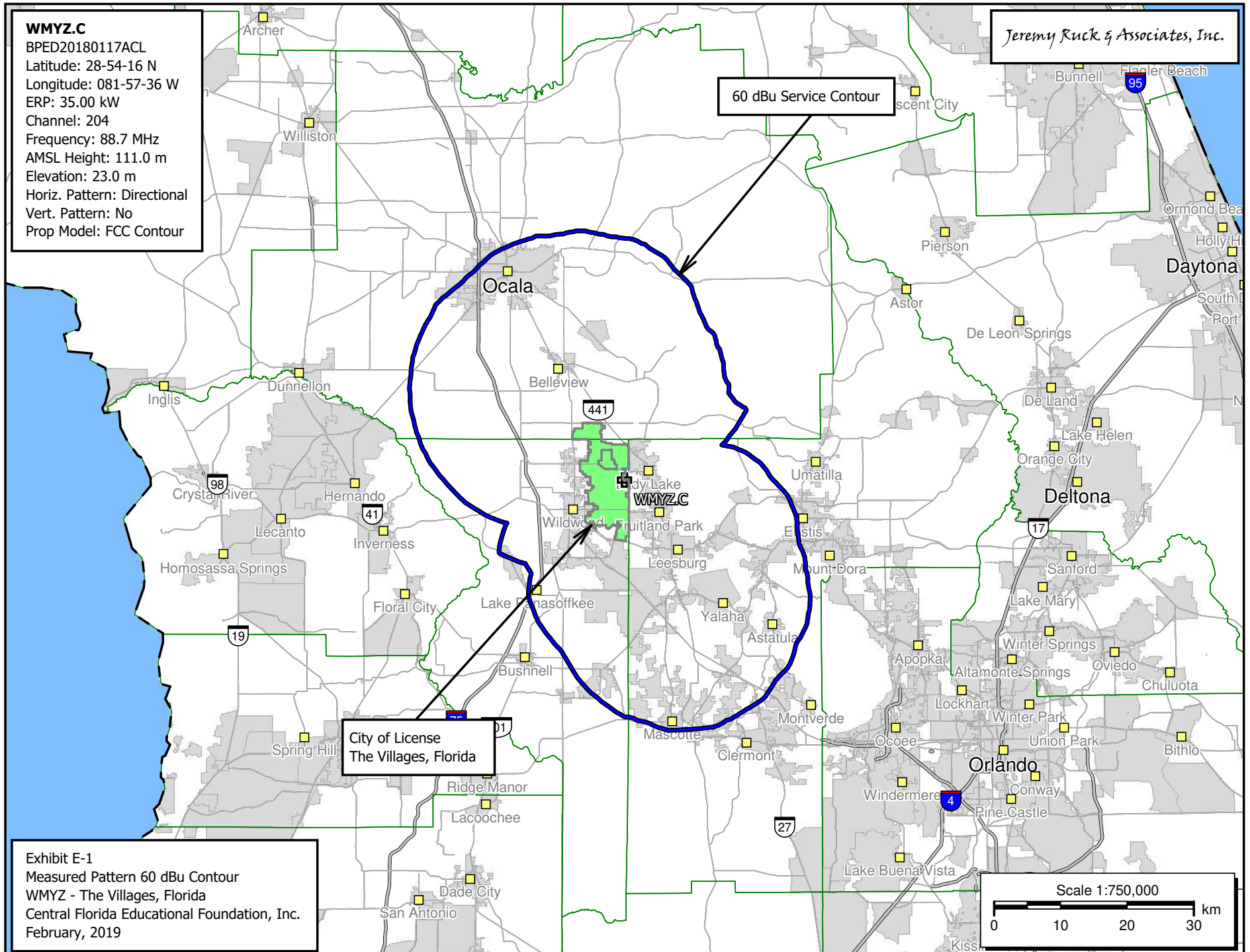
WMYZ - The Villages, Florida

Central Florida Educational Foundation, Inc.

February, 2019

Scale 1:750,000

0 10 20 30 km



S.O. 36100

Report of Test 6025-3/2

for

CENTRAL FLORIDA EDUCATIONAL FOUNDATION, INC.

WMYZ 88.7 MHz THE VILLAGES, FL

OBJECTIVE:

The objective of this test was to demonstrate the directional characteristics of a 6025-3/2 to meet the needs of WMYZ and to comply with the requirements of the FCC construction permit, file number BPED-20180117ACL. This test characterizes only the radiation characteristics of the antenna when mounted on the tower as described. It does not represent or imply any guarantee of specific coverage which can be influenced by factors beyond the scope of this test.

RESULTS:

The following Figures are the results of the measurements from our pattern range:

- Figure 1A - Measured Azimuth Pattern with the FCC Composite
- Figure 1B - Measured Composite Azimuth Pattern with the FCC Composite
- Figure 1C - Tabulation of the Horizontal Polarization for the Measured Azimuth Pattern
- Figure 1D - Tabulation of the Vertical Polarization for the Measured Azimuth Pattern
- Figure 1E - Tabulation of the Measured Composite Azimuth Pattern
- Figure 1F - Tabulation of the FCC Composite

The calculated elevation pattern of the antenna is shown in Figure 3.

Construction permit file number BPED-20180117ACL indicates that the Horizontal radiation component shall not exceed 35 kW at any azimuth and is restricted to the following values at the azimuths specified:

70 Degrees True: 1.529 kilowatts

230 Degrees True: 2.170 kilowatts

From Figure 1A, At the restricted azimuth of 70 Degrees True the Horizontal component is 16.6 dB down from the maximum of 35 kW, or 0.756 kW and at the restricted azimuth of 230 Degrees True the horizontal component is 13.893 dB down from the maximum of 35 kW, or 1.428kW.

The R.M.S. of the Horizontal component is 0.589 The total Horizontal power gain is 4.327. The R.M.S. of the Vertical component is 0.621. The total Vertical power gain is 4.294. See Figure 4 for calculations. The R.M.S. of the FCC composite pattern is 0.689. The R.M.S. of the measured composite pattern is 0.639. Eighty-five percent (85%) of the original authorized FCC composite pattern is 0.586. Therefore this pattern complies with the FCC requirement of 73.316(c)(2)(ix)(A).

METHOD OF DIRECTIONALIZATION:

One level of the 6025-3/2 was mounted on a tower of precise scale to the 36" face tower at the WMYZ site. The spacing of the antenna to the tower and the angle of the antennas was varied to achieve the horizontal and vertical pattern shown in Figure 1A. See Figure 2 for mechanical details.

METHOD OF MEASUREMENT:

As allowed by the construction permit, file number BPED-20180117ACL, a single level of the 6025-3/2 was set up on the Shively Labs scale model antenna pattern measuring range. A scale of 4.5:1 was used.

EQUIPMENT:

The 4.5:1 scale model pattern range consists of a wooden rotating pedestal equipped with a position indicator. The scale model bay is placed on the top of this pedestal and is used in the transmission mode at approximately 20 feet above ground level. The receiving corner reflector is spaced 50 feet away from the rotating pedestal at the same level above ground as the transmitting model. The transmitting and receiving signals are carried to a control building by means of RG-9/U double shielded coax cable.

WMYZ

Page Three

The control building is equipped with:

Hewlett Packard Model 4395-A Network Analyzer

PC Based Controller

Output Standard Printer or 'pdf'

All testing is carried out in strict accordance with approved procedures under our ISO9001.

TEST PROCEDURES:

The receiving antenna system is mounted so that the horizontal and vertical azimuth patterns are measured independently. The network analyzer was set to 399.15 MHz Calibrated pads are used to check the linearity of the measuring system. For example, 6 dB padding yields a scale reading of 50 from an unpadding reading of 100 in voltage. From the recorded patterns, the R.M.S. values are calculated and recorded as shown in Figure 1A.

Respectfully submitted by:

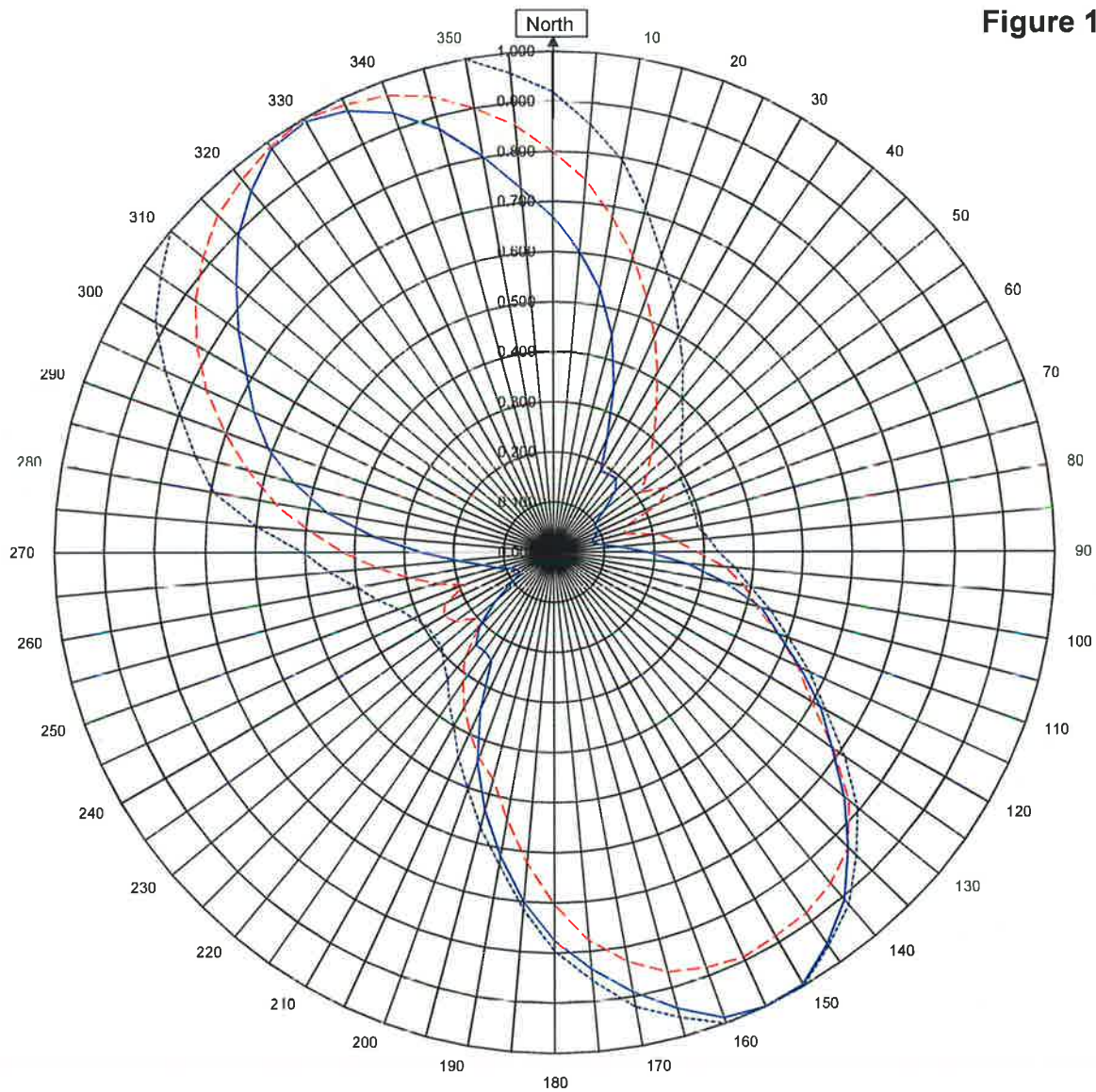
A handwritten signature in cursive script, appearing to read "Lyle G. Galtieri".

Vice President, Shively Labs
S/O 36100
December 31, 2018

Shively Labs

Shively Labs, a division of Howell Laboratories, Inc. Bridgton, ME (207)647-3327

Figure 1A



WMYZ

The Villages, FL

36100

December 31, 2018

Horizontal RMS	0.589
Vertical RMS	0.621
H/V Composite RMS	0.639
FCC Composite RMS	0.689

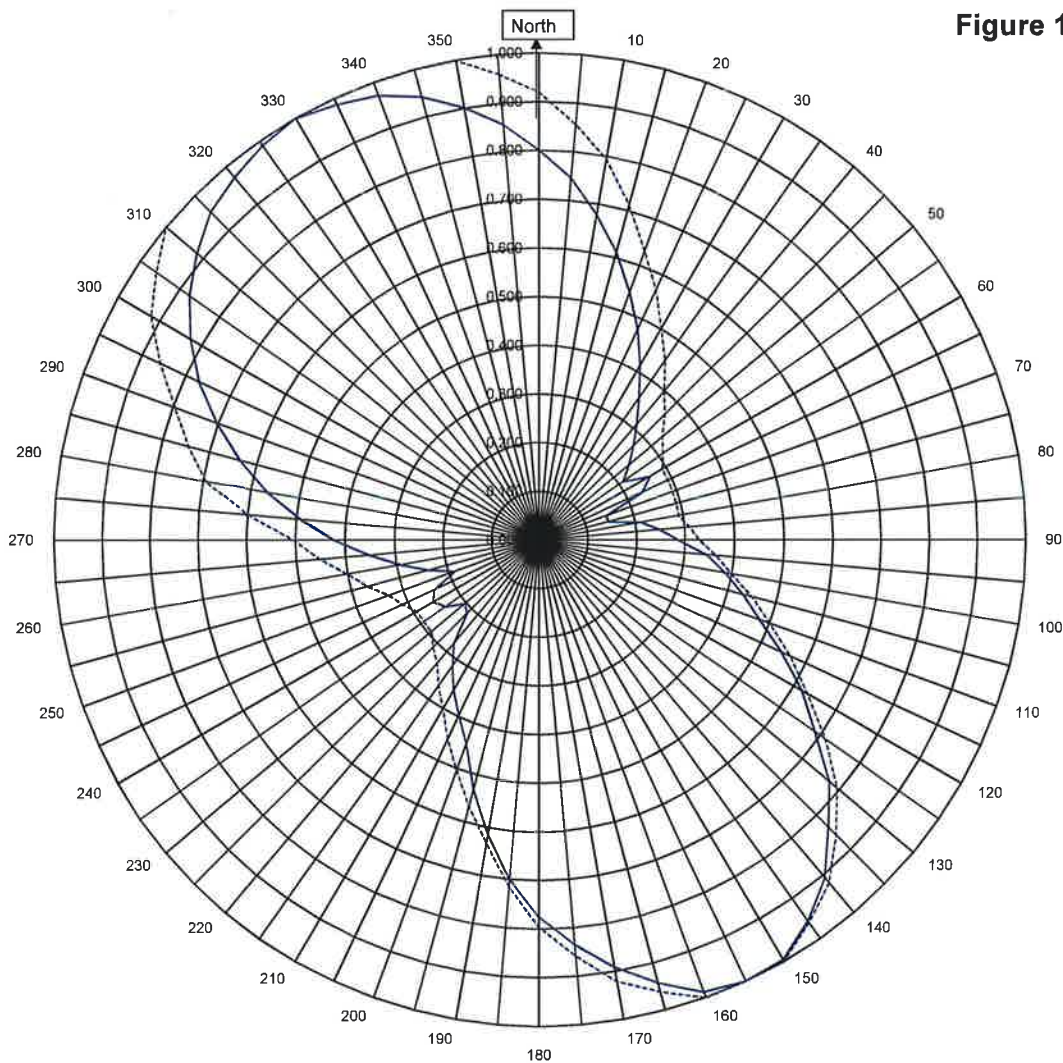
Frequency	88.7 / 399.15 MHz
Plot	Relative Field
Scale	4.5 : 1
See Figure 2 for Mechanical Details	

Antenna Model	6025 3-2
Pattern Type	Directional Azimuth

Shively Labs

Shively Labs, a division of Howell Laboratories, Inc. Bridgton, ME (207)647-3327

Figure 1B



WMYZ The Villages, FL

36100

December 31, 2018

— H/V Composite RMS	0.639
..... FCC Composite RMS	0.689

Frequency	88.7 / 399.15 MHz
Plot	Relative Field
Scale	4.5 : 1
See Figure 2 for Mechanical Details	

Antenna Model	6025 3-2
Pattern Type	Directional H/V Composite

Figure 1C

Tabulation of Horizontal Azimuth Pattern
WMYZ The Villages, FL

Azimuth	Rel Field	Azimuth	Rel Field
0	0.671	180	0.774
10	0.535	190	0.614
20	0.351	200	0.445
30	0.188	210	0.248
40	0.194	220	0.240
45	0.173	225	0.209
50	0.129	230	0.152
60	0.100	240	0.077
70	0.084	250	0.090
80	0.095	260	0.141
90	0.190	270	0.261
100	0.349	280	0.460
110	0.481	290	0.609
120	0.619	300	0.712
130	0.761	310	0.831
135	0.835	315	0.895
140	0.906	320	0.943
150	0.996	330	0.994
160	0.988	340	0.934
170	0.890	350	0.804

Figure 1D

Tabulation of Vertical Azimuth Pattern
WMYZ The Villages, FL

Azimuth	Rel Field	Azimuth	Rel Field
0	0.801	180	0.703
10	0.680	190	0.539
20	0.543	200	0.436
30	0.414	210	0.356
40	0.312	220	0.276
45	0.273	225	0.213
50	0.241	230	0.202
60	0.263	240	0.254
70	0.147	250	0.187
80	0.213	260	0.290
90	0.288	270	0.420
100	0.388	280	0.566
110	0.480	290	0.702
120	0.599	300	0.826
130	0.774	310	0.917
135	0.835	315	0.953
140	0.864	320	0.972
150	0.885	330	1.000
160	0.881	340	0.972
170	0.828	350	0.902

Figure 1E

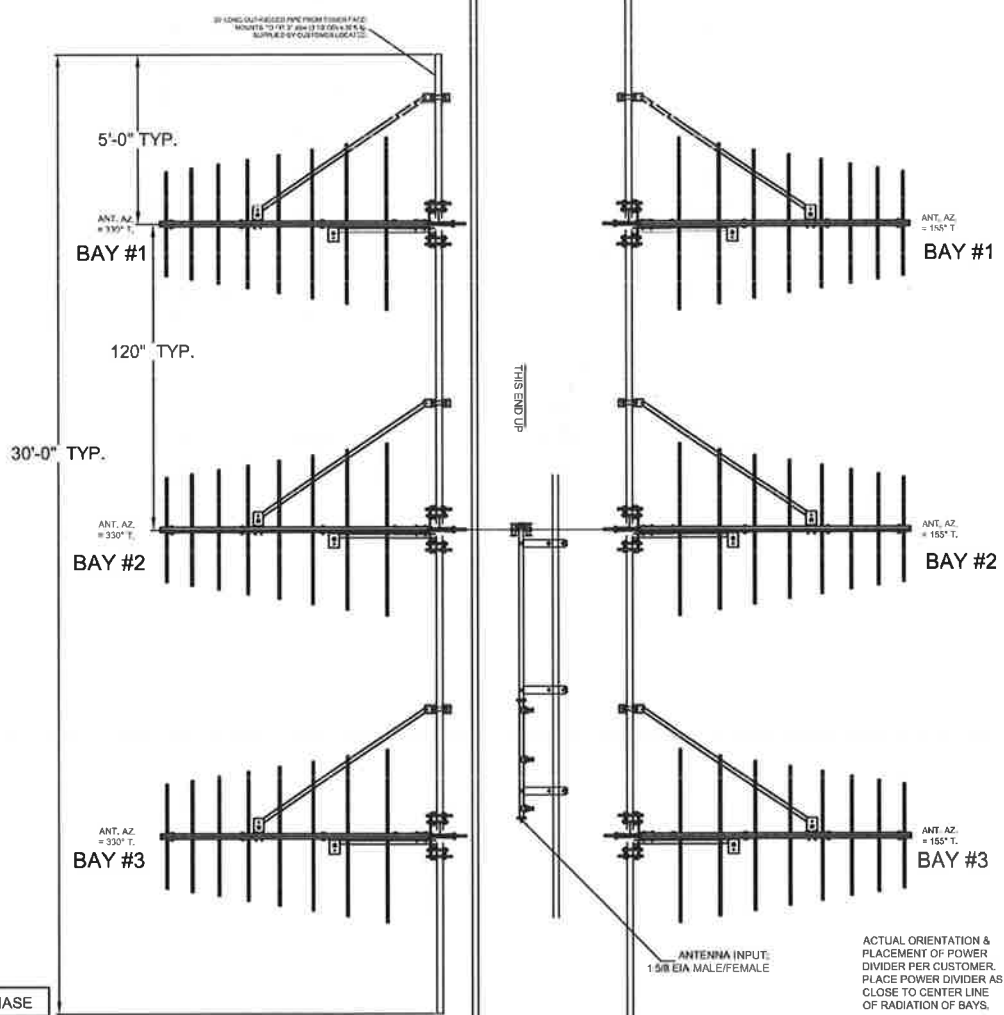
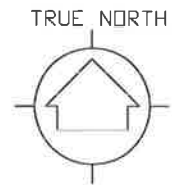
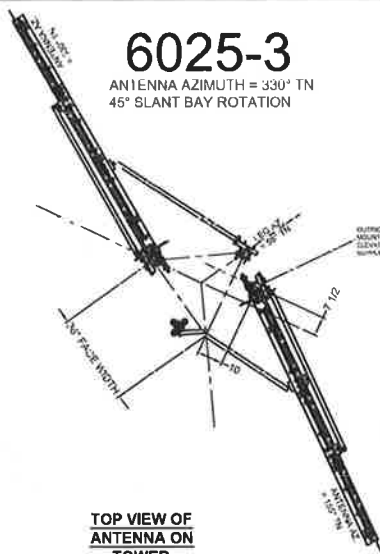
Tabulation of Composite Azimuth Pattern
WMYZ The Villages, FL

Azimuth	Rel Field	Azimuth	Rel Field
0	0.801	180	0.774
10	0.680	190	0.614
20	0.543	200	0.445
30	0.414	210	0.356
40	0.312	220	0.276
45	0.273	225	0.213
50	0.241	230	0.202
60	0.263	240	0.254
70	0.147	250	0.187
80	0.213	260	0.290
90	0.288	270	0.420
100	0.388	280	0.566
110	0.481	290	0.702
120	0.619	300	0.826
130	0.774	310	0.917
135	0.835	315	0.953
140	0.906	320	0.972
150	0.996	330	1.000
160	0.988	340	0.972
170	0.890	350	0.902

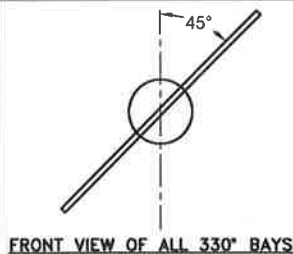
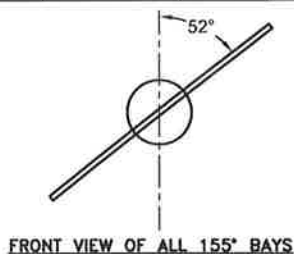
Figure 1F

Tabulation of FCC Directional Composite
WMYZ The Villages, FL

Azimuth	Rel Field	Azimuth	Rel Field
0	0.920	180	0.795
10	0.795	190	0.632
20	0.632	200	0.502
30	0.502	210	0.400
40	0.400	220	0.330
50	0.330	230	0.292
60	0.292	240	0.292
70	0.292	250	0.330
80	0.292	260	0.400
90	0.330	270	0.502
100	0.400	280	0.693
110	0.502	290	0.795
120	0.632	300	0.920
130	0.795	310	1.000
140	0.920	320	1.000
150	1.000	330	1.000
160	1.000	340	1.000
170	0.920	350	1.000



AZIMUTH	ATTENUATION	PHASE
155°	0 db	0°
330°	0 db	0°



SHIVELY LABS®
 A DIVISION OF HOWELL LABORATORIES INC., BRIDGTON, MAINE

SHOP ORDER:	FREQUENCY:	SCALE:	DRAWN BY:
36100	88.7	N.T.S.	ASP
APPROVED BY:			
TITLE:			
FIGURE 2, WMYZ, 88.7 MHz MODEL 6025-3/2, SLANT ELEMENTS			
DATE:		FIGURE 2	
12-27-18			

Antenna Mfg.: Shively Labs
Antenna Type: 6025-3/2

Date: 1/11/2019

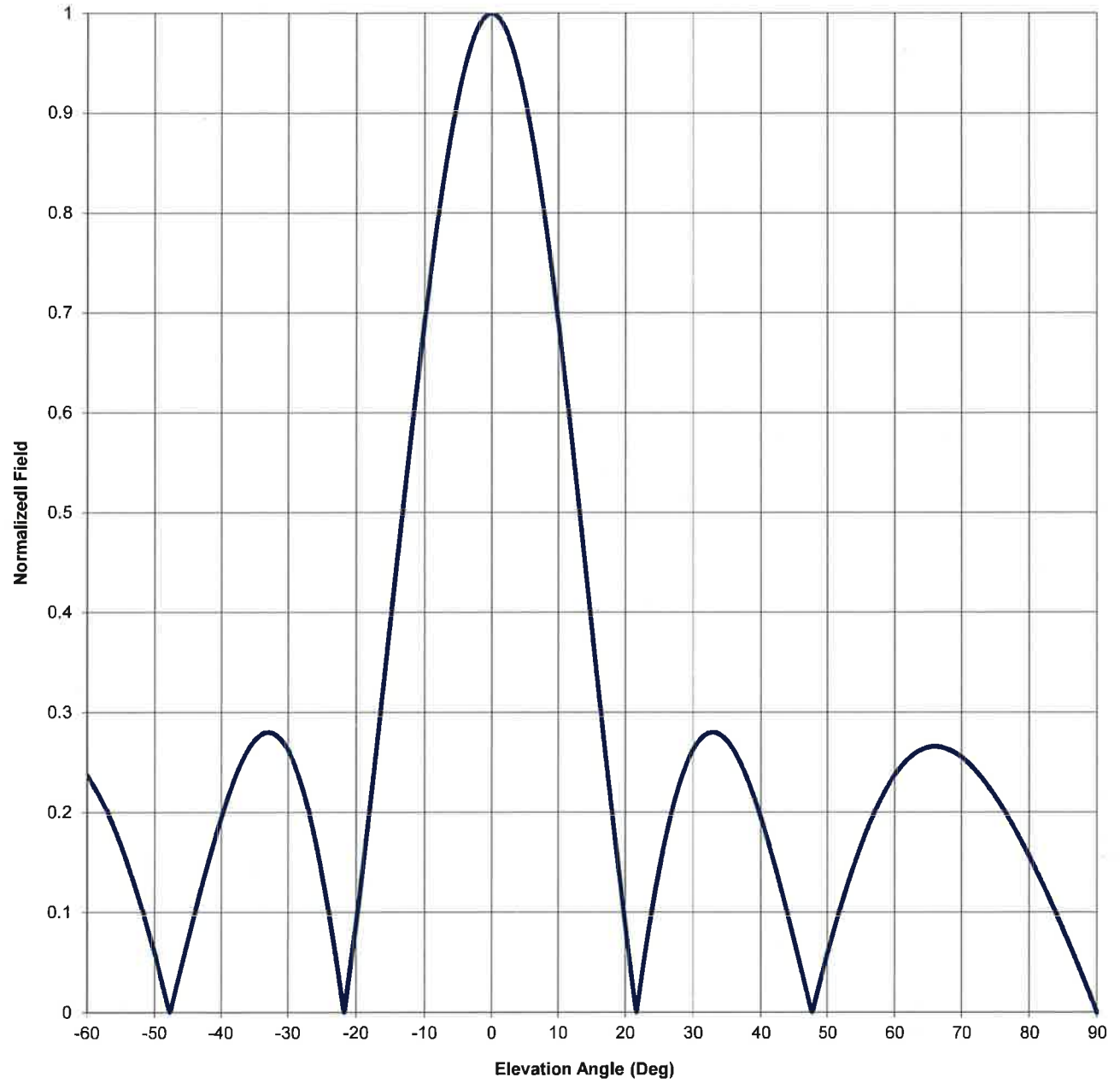
Station: WMYZ

Frequency: 88.7

Channel #: 204

Figure: Figure 3

Beam Tilt	0	
Gain (Max)	4.328	6.362 dB
Gain (Horizon)	4.328	6.362 dB



Antenna Mfg.: Shively Labs
Antenna Type: 6025-3/2

Date: 1/11/2019

Station: WMYZ

Beam Tilt 0

Frequency: 88.7

Gain (Max) 4.328

6.362 dB

Channel #: 204

Gain (Horizon) 4.328

6.362 dB

Figure: Figure 3

Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field
-90	0.000	-44	0.097	0	1.000	46	0.044
-89	0.018	-43	0.123	1	0.997	47	0.018
-88	0.035	-42	0.148	2	0.986	48	0.009
-87	0.051	-41	0.172	3	0.970	49	0.035
-86	0.068	-40	0.195	4	0.946	50	0.060
-85	0.083	-39	0.215	5	0.917	51	0.084
-84	0.099	-38	0.234	6	0.882	52	0.107
-83	0.114	-37	0.249	7	0.841	53	0.129
-82	0.129	-36	0.262	8	0.796	54	0.149
-81	0.143	-35	0.272	9	0.746	55	0.168
-80	0.157	-34	0.278	10	0.692	56	0.185
-79	0.170	-33	0.281	11	0.635	57	0.201
-78	0.183	-32	0.279	12	0.576	58	0.215
-77	0.195	-31	0.273	13	0.515	59	0.227
-76	0.206	-30	0.263	14	0.452	60	0.238
-75	0.217	-29	0.248	15	0.390	61	0.247
-74	0.226	-28	0.229	16	0.327	62	0.254
-73	0.235	-27	0.204	17	0.265	63	0.259
-72	0.243	-26	0.175	18	0.204	64	0.263
-71	0.250	-25	0.142	19	0.145	65	0.266
-70	0.256	-24	0.104	20	0.089	66	0.266
-69	0.260	-23	0.061	21	0.035	67	0.266
-68	0.264	-22	0.015	22	0.015	68	0.264
-67	0.266	-21	0.035	23	0.061	69	0.260
-66	0.266	-20	0.089	24	0.104	70	0.256
-65	0.266	-19	0.145	25	0.142	71	0.250
-64	0.263	-18	0.204	26	0.175	72	0.243
-63	0.259	-17	0.265	27	0.204	73	0.235
-62	0.254	-16	0.327	28	0.229	74	0.226
-61	0.247	-15	0.390	29	0.248	75	0.217
-60	0.238	-14	0.452	30	0.263	76	0.206
-59	0.227	-13	0.515	31	0.273	77	0.195
-58	0.215	-12	0.576	32	0.279	78	0.183
-57	0.201	-11	0.635	33	0.281	79	0.170
-56	0.185	-10	0.692	34	0.278	80	0.157
-55	0.168	-9	0.746	35	0.272	81	0.143
-54	0.149	-8	0.796	36	0.262	82	0.129
-53	0.129	-7	0.841	37	0.249	83	0.114
-52	0.107	-6	0.882	38	0.234	84	0.099
-51	0.084	-5	0.917	39	0.215	85	0.083
-50	0.060	-4	0.946	40	0.195	86	0.068
-49	0.035	-3	0.970	41	0.172	87	0.051
-48	0.009	-2	0.986	42	0.148	88	0.035
-47	0.018	-1	0.997	43	0.123	89	0.018
-46	0.044	0	1.000	44	0.097	90	0.000
-45	0.071			45	0.071		

S.O. 36100

Figure 4

VALIDATION OF TOTAL POWER GAIN CALCULATION

WMYZ The Villages, FL

MODEL 6025 3-2

Elevation Gain of Antenna

1.584

Horizontal RMS value divided by the Vertical RMS value equals the Horiz. - Vert. Ratio

H RMS

0.589066

V RMS

0.621288

H/V Ratio

0.948

Elevation Gain of Horizontal Component

1.502

Elevation Gain of Vertical Component

1.671

Horizontal Azimuth Gain equals $1/(\text{RMS})^2$.

2.882

Vertical Azimuth Gain equals $1/(\text{RMS}/\text{Max Vert})^2$.

2.570

Max. Vertical

0.996

***Total Horizontal Power Gain is the Elevation Gain Times the Azimuth Gain**

Total Horizontal Power Gain =

4.328

***Total Vertical Power Gain is the Elevation Gain Times the Azimuth Gain**

Total Vertical Power Gain =

4.294

=====

ERP divided by Horizontal Power Gain equals Antenna Input Power

35

kW ERP

Divided by H Gain

4.328

equals

8.087

kW H Antenna Input Power

Antenna Input Power times Vertical Power Gain equals Vertical ERP

8.087

kW

Times V Gain

4.294

equals

34.721

kW V ERP

Maximum Value of the Vertical Component squared times the Maximum ERP equals the Vertical ERP

$(0.996)^2$ Times 35.00 Equals 34.721 kW Vertical ERP

NOTE: Calculating the ERP of the Vertical Component by two methods validates the total power gain calculations



**FARNER
BARLEY**
AND ASSOCIATES, INC.

ENGINEERS ▲ SURVEYORS ▲ PLANNERS

February 6, 2019

To Whom It May Concern,

Re: WVLG Tower

8739 NE 102nd Road, Lady Lake, Florida 32162

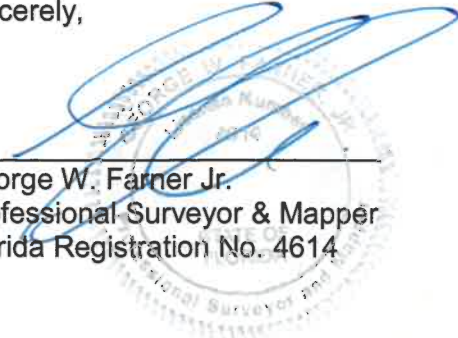
I have measured the azimuth of the new directional antennas for WVLG, on the referenced site. The azimuth was based on grid north, using the State Plane Coordinate System, Florida West Zone, NAD83 adjustment of 1990 established between two Sumter County published horizontal control points, designation, Sumter 41, being a horizontal control disk set on top of a concrete monument labeled Sumter 41 and designation, Sumter 5, being a horizontal control disk set on top of a concrete monument labeled Sumter 5, using a RTK GPS, I have determined the two group antenna's geodetic azimuths to be as follows:

Antenna Group One = 115 degrees

Antenna Group Two = 330 degrees

If you have any questions feel free to contact me.

Sincerely,



George W. Farner Jr.
Professional Surveyor & Mapper
Florida Registration No. 4614

Affidavit and Verified Statement of Engineer

State of Florida)
Altamonte Springs) ss:
County of Seminole)

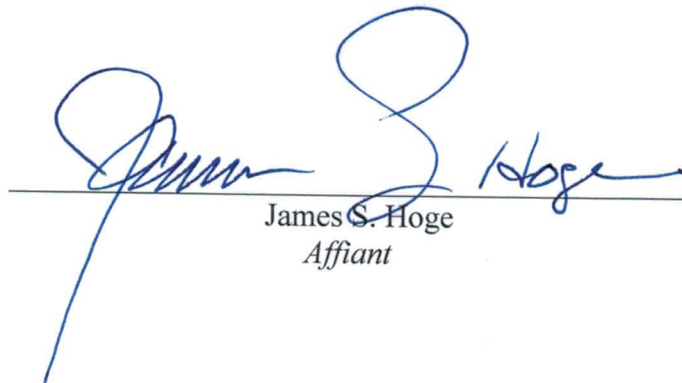
James S. Hoge, being duly sworn, deposes and says that he is the Founder, President and Chief Operator of Central Florida Educational Foundation, Inc., (the applicant) which owns and operates Radio Stations WPOZ, Orlando FL; WMYZ, The Villages FL; WHYZ, Palm Coast FL; WDOZ, Pierson FL and thirteen (13) FM translators throughout Central Florida.

Mr. Hoge has degrees in Electrical Engineering Technology from Bluefield State College and Bachelors in Business Administration from Marshall University. He has worked in every facet of broadcasting since 1973 including the manufacture of broadcast equipment, chief engineer, director of engineering and as a technical consultant to major US broadcast groups.

He holds a FCC General Radiotelephone Operator License, PG-4-2729, which replaced his First Class Radio Telephone Operator License, P1-4-8541; is an active member of Chapter 42 of the Society of Broadcast Engineers, (SBE Member #24448) and is an amateur radio operator, K4DEK.

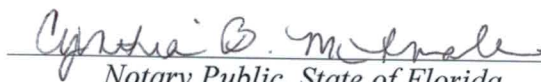
Mr. Hoge personally assembled and/or oversaw the assembly, orientation and mounting of the Shively Labs Model 6025-3/2 directional antenna for WMYZ's move to The Villages, Florida. Mr. Hoge certifies that the antenna is assembled correctly according to manufacturer's instructions.

This the 7th day of February 2019



James S. Hoge
Affiant

*Sworn to and subscribed before me
this the 7th day of February 2019*



Notary Public, State of Florida

My Commission Expires, 06/07/2021

