

### **Compliance with Special Operating Conditions**

The WCOV-FM Construction Permit (File Number BPED-20180510AAT) contains several Special Operating Conditions summarized as follows:

1. Family Life Ministries, Inc. requests waiver of 47 C.F.R. § 73.509 to allow Station WCOV-FM, as authorized herein, to receive contour overlap from the 100 dBu contour of third adjacent channel Station WALF(FM), Alfred, New York (Facility ID No. 973) on Channel 209A. We have afforded this request the "hard look" called for under *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969), and find that the facts and circumstances presented in the applicant's justification are sufficient to establish that grant of the requested waiver is in the public interest. Accordingly, waiver of 47 C.F.R. § 73.509 IS HEREBY GRANTED. Further modifications of Station WALF will not be construed as a "per se" modification of WCOV's facility. (See *Educational Information Corporation*, 6 FCC Rcd 2207 (1991)).
2. The permittee/licensee, in coordination with other users of the site, must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of the FCC guidelines.
3. BEFORE PROGRAM TESTS ARE AUTHORIZED, the permittee must submit the results of a complete proof-of-performance to establish the horizontal plane radiation patterns for both the horizontally and vertically polarized radiation components. This proof-of-performance may be accomplished using the complete full size antenna, or individual bays therefrom, mounted on a supporting structure of identical dimensions and configuration as the proposed structure, including all braces, ladders, conduits, coaxial lines, and other appurtenances; or using a carefully manufactured scale model of the entire antenna, or individual bays therefrom, mounted on an equally scaled model of the proposed supporting structure, including all appurtenances. Engineering exhibits must include a description of the antenna testing facilities and equipment employed, including appropriate photographs or sketches and a description of the testing procedures, including scale factor, measurements frequency, and equipment calibration.
4. BEFORE PROGRAM TESTS ARE AUTHORIZED, the permittee must submit a certification executed by a licensed surveyor showing that the FM directional antenna system has been oriented at the azimuth(s) specified in the directional antenna proof of performance. This certification must include a description of the method used by the surveyor to determine the azimuth(s) of the installed directional antenna system and the accuracy of that determination.
5. BEFORE PROGRAM TESTS ARE AUTHORIZED, the permittee must submit an affidavit that the installation of the directional antenna system was overseen by a qualified engineer. This affidavit must include a certification by the engineer that the antenna was installed pursuant to the manufacturer's instructions and list the qualifications of the certifying engineer.

6. BEFORE PROGRAM TESTS ARE AUTHORIZED, the permittee must submit an exhibit demonstrating that the measured directional antenna pattern complies with the appropriate community coverage requirements of 47 C.F.R. Sections 73.315 or 73.515 (See 47 C.F.R. § 73.316(c)(2)(ix)(B)).
7. The RMS of the composite measured relative field horizontal plane directional antenna pattern must encompass at least 85% of the RMS of the composite relative field horizontal plane directional antenna pattern authorized by this construction permit.
8. The relative field strength of neither the measured horizontally nor vertically polarized radiation component shall exceed at any azimuth the value indicated on the composite radiation pattern authorized by this construction permit. A relative field strength of 1.0 on the composite radiation pattern herein authorized corresponds to the following effective radiated power: 9.5 kilowatts Principal minimum and its associated field strength limit: 280 degrees True: 2.874 kilowatts

Family Life Ministries, Inc. (FLM) complies with, or agrees to, these conditions as follows:

1. FLM agrees that further modifications of Station WALF will not be construed as a "per se" modification of WCOV's facility.
2. FLM agrees that in coordination with other users of the site, will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of the FCC guidelines.
3. A complete antenna Proof Of Performance is seen in Exhibit 9-A.
4. Exhibit 9-B is a certification executed by a licensed surveyor showing that the FM directional antenna system has been oriented at the azimuth(s) specified in the directional antenna proof of performance.
5. The installation of the directional antenna system was overseen by a qualified engineer. The engineer certification is Exhibit 9-C.
6. Exhibit 9-D demonstrates that the measured directional antenna pattern complies with the appropriate community coverage requirements.
7. The RMS of the composite measured relative field horizontal plane directional antenna pattern encompasses the FCC composite pattern by 85.63%, therefore meeting the 85% rule. See figure 1B of the Antenna Proof of Performance.
8. The measured relative field strengths of the horizontal and vertical patterns are seen in Exhibit 9-A and abide by the principle minima values as listed. Specifically, the field at 120 degrees is 1.0 which equates to 9.5kw. The field at 280 degrees is 0.209 which equates to a power level of .415kw.

**S.O. 36589**

**Report of Test 6810 G0.985**

**for**

**FAMILY LIFE MINISTRIES, INC.**

**WCOV 89.1 MHz FRIENDSHIP, NY**

## **OBJECTIVE:**

The objective of this test was to demonstrate the directional characteristics of a 6810-2R to meet the needs of WCOV and to comply with the requirements of the FCC construction permit, file number BPED-20180510AAT. 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-20180510AAT indicates that the Horizontal radiation component shall not exceed 9.5 kW at any azimuth and is restricted to the following values at the azimuths specified:

**280 Degrees True: 2.874 kilowatts**

MEMBER:



From Figure 1A, the maximum radiation of the Horizontal component occurs at 120 Degrees True. At the restricted azimuth of 280 Degrees True the Horizontal component is 17.924 dB down from the maximum of 9.5 kW or 0.153 kW.

The R.M.S. of the Horizontal component is 0.714. The total Horizontal power gain is 2.007. The R.M.S. of the Vertical component is 0.691. The total Vertical power gain is 1.987. See Figure 4 for calculations. The R.M.S. of the FCC composite pattern is 0.877. The R.M.S. of the measured composite pattern is 0.751. Eighty-five percent (85%) of the original authorized FCC composite pattern is 0.745. Therefore this pattern complies with the FCC requirement of 73.316(c)(2)(ix)(A).

#### **METHOD OF DIRECTIONALIZATION:**

One bay of the 6810-2R was mounted on a tower of precise scale to the 36" X-braced tower at the WCOV site. The spacing of the antenna to the tower was varied to achieve the vertical pattern shown in Figure 1A. A horizontal parasitic element was placed directly under the bay. The position of this horizontal parasitic element was changed until the horizontal pattern shown in Figure 1A was achieved. See Figure 2 for mechanical details.

#### **METHOD OF MEASUREMENT:**

As allowed by the construction permit, file number BPED-20180510AAT, a single level of the 6810-2R 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 parabolic dish 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 Hypercell Superflex and Cellflex ICF cabling respectively.

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 400.95 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 unpadded 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 black ink, appearing to read 'Angela Gillespie', written in a cursive style.

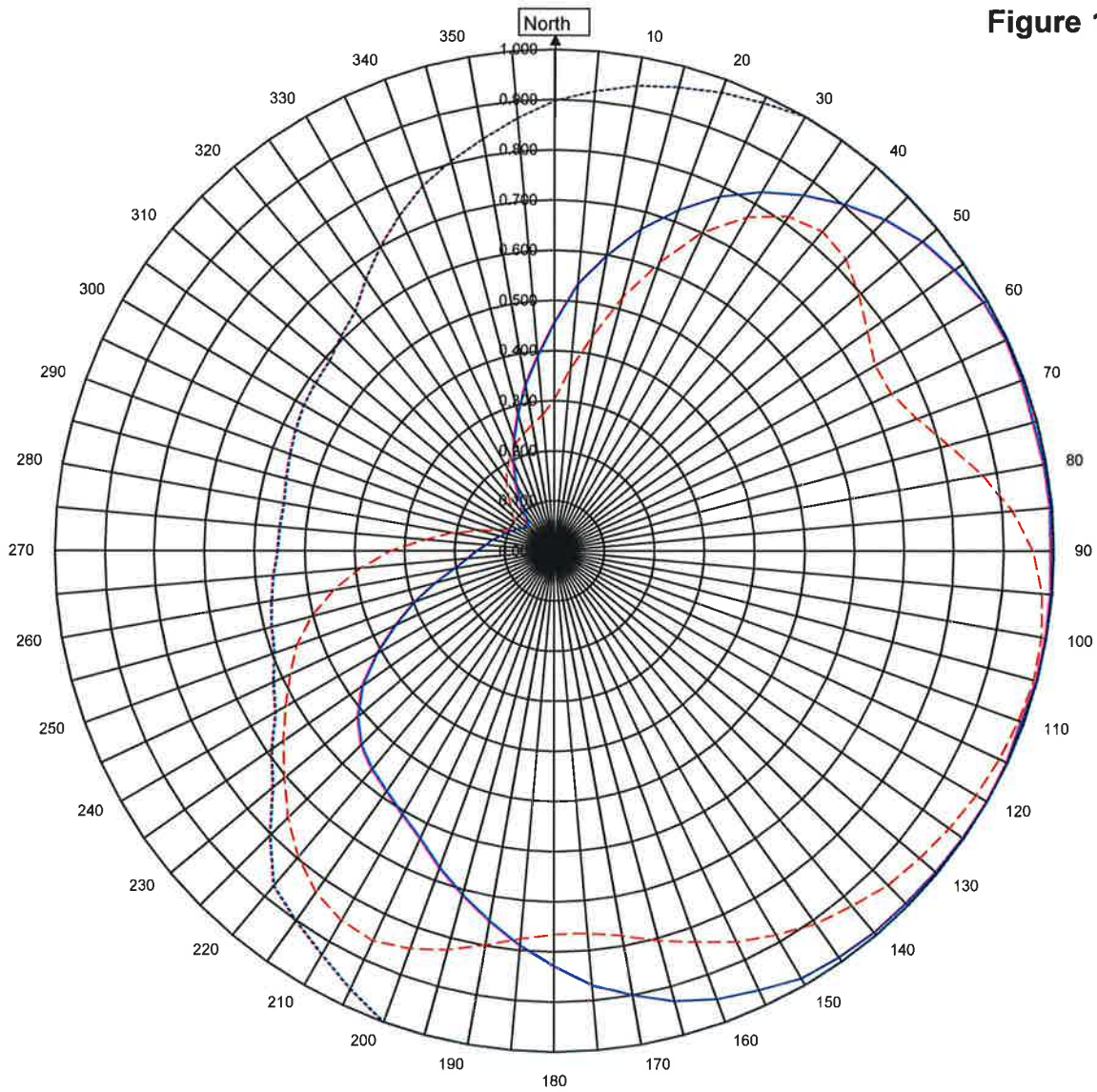
Angela Gillespie  
Vice President, Shively Labs

S/O 36589  
Date 23 Dec 2019

# Shively Labs

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

Figure 1A



WCOV

Friendship, NY

36589  
XX Dec 2019

Horizontal RMS	0.714
Vertical RMS	0.691
H/V Composite RMS	0.751
FCC Composite RMS	0.877

Frequency	89.1 / 400.95 MHz
Plot	Relative Field
Scale	4.5 : 1
See Figure 2 for Mechanical Details	

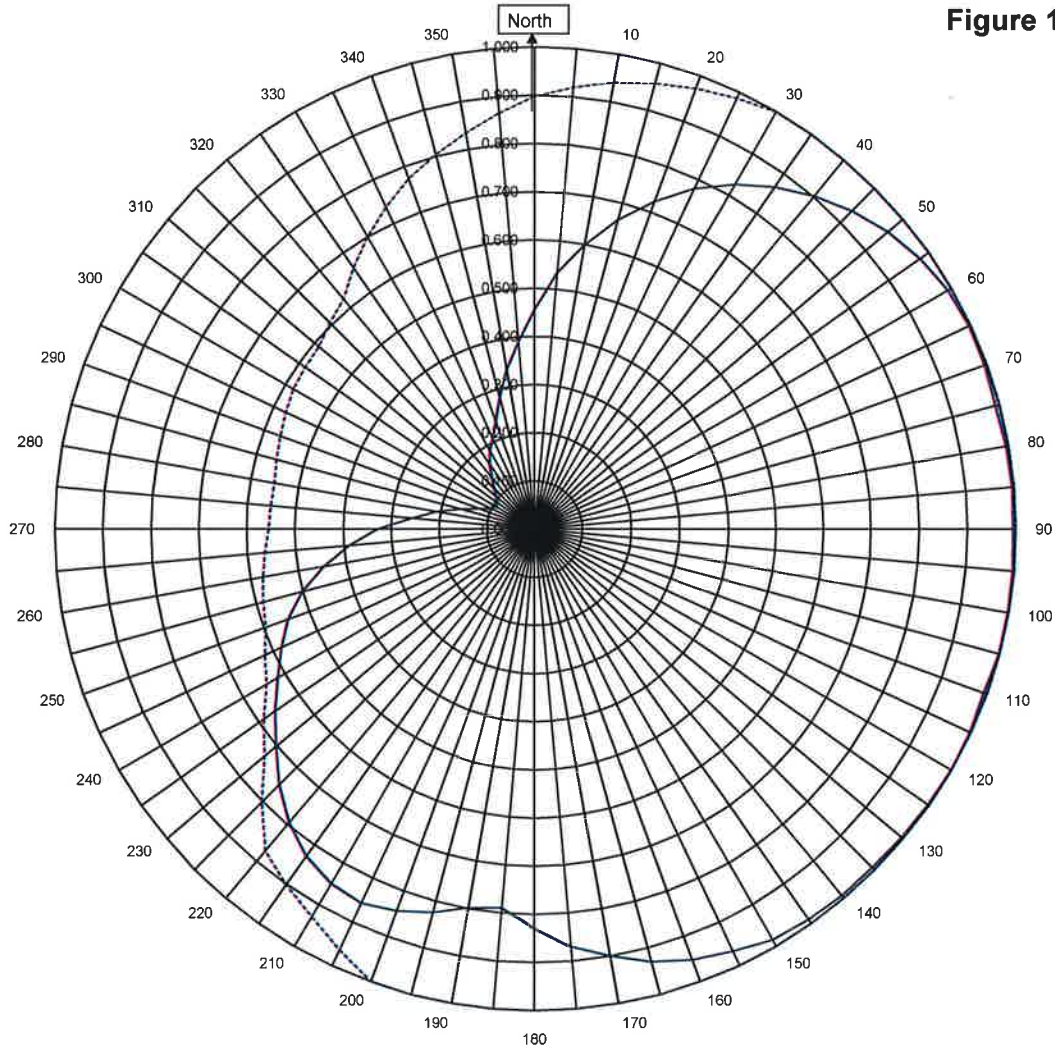
Antenna Model	6810-2R
Pattern Type	Directional Azimuth



# Shively Labs



Shively Labs, a division of Howell Laboratories, Inc. Bridgton, ME (207)847-3327

Figure 1B



**WCOV      Friendship, NY**

36589  
XX Dec 2019

 <b>H/V Composite RMS</b>	0.751
 <b>FCC Composite RMS</b>	0.877

Frequency	89.1 / 400.95 MHz
Plot	Relative Field
Scale	4.5 : 1
See Figure 2 for Mechanical Details	

Antenna Model	6810-2R
Pattern Type	Directional H/V Composite

Figure 1C

Tabulation of Horizontal Azimuth Pattern  
WCOV Friendship, NY

Azimuth	Rel Field	Azimuth	Rel Field
0	0.456	180	0.830
10	0.598	190	0.750
20	0.723	200	0.672
30	0.826	210	0.607
40	0.902	220	0.568
45	0.934	225	0.547
50	0.960	230	0.514
60	0.992	240	0.411
70	0.996	250	0.298
80	0.995	260	0.203
90	0.994	270	0.156
100	0.998	280	0.127
110	0.994	290	0.104
120	1.000	300	0.088
130	0.996	310	0.073
135	0.994	315	0.075
140	0.994	320	0.089
150	0.985	330	0.156
160	0.952	340	0.239
170	0.900	350	0.337



Figure 1D

Tabulation of Vertical Azimuth Pattern  
WCOV Friendship, NY

Azimuth	Rel Field	Azimuth	Rel Field
0	0.301	180	0.765
10	0.432	190	0.798
20	0.612	200	0.844
30	0.769	210	0.850
40	0.833	220	0.795
45	0.825	225	0.751
50	0.796	230	0.702
60	0.742	240	0.618
70	0.774	250	0.546
80	0.873	260	0.447
90	0.960	270	0.328
100	0.992	280	0.209
110	0.990	290	0.124
120	0.976	300	0.093
130	0.954	310	0.105
135	0.943	315	0.121
140	0.925	320	0.140
150	0.884	330	0.188
160	0.830	340	0.227
170	0.779	350	0.255

Figure 1E

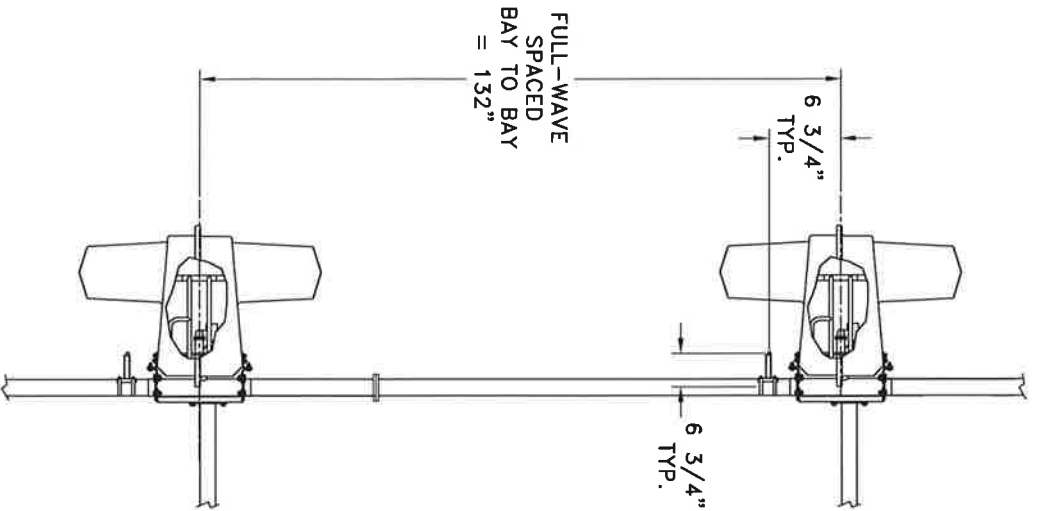
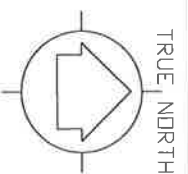
Tabulation of Composite Azimuth Pattern  
WCOV Friendship, NY

Azimuth	Rel Field	Azimuth	Rel Field
0	0.456	180	0.830
10	0.598	190	0.798
20	0.723	200	0.844
30	0.826	210	0.850
40	0.902	220	0.795
45	0.934	225	0.751
50	0.960	230	0.702
60	0.992	240	0.618
70	0.996	250	0.546
80	0.995	260	0.447
90	0.994	270	0.328
100	0.998	280	0.209
110	0.994	290	0.124
120	1.000	300	0.093
130	0.996	310	0.105
135	0.994	315	0.121
140	0.994	320	0.140
150	0.985	330	0.188
160	0.952	340	0.239
170	0.900	350	0.337

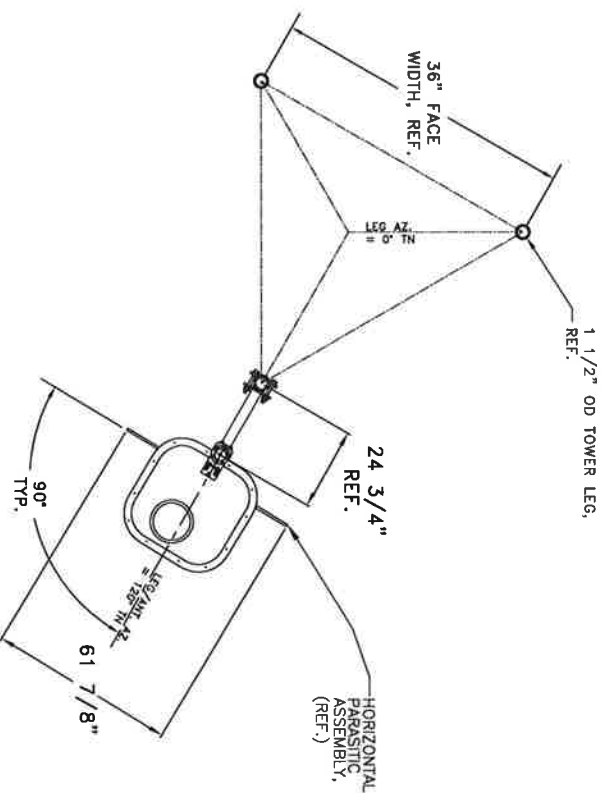
Figure 1F

Tabulation of FCC Directional Composite  
WCOV Friendship, NY

Azimuth	Rel Field	Azimuth	Rel Field
0	0.898	180	1.000
10	0.942	190	1.000
20	0.973	200	1.000
30	1.000	210	0.930
40	1.000	220	0.872
50	1.000	230	0.734
60	1.000	240	0.644
70	1.000	250	0.596
80	1.000	260	0.575
90	1.000	270	0.554
100	1.000	280	0.550
110	1.000	290	0.564
120	1.000	300	0.581
130	1.000	310	0.589
140	1.000	320	0.623
150	1.000	330	0.700
160	1.000	340	0.774
170	1.000	350	0.835



SIDE VIEW



TOP VIEW

TOWER MAKE: VALMONT SSV

ANTENNA HEADING 120° TRUE NORTH

SHIVELY LABS			
A DIVISION OF HOWELL LABORATORIES INC., BRIDGTON, MAINE			
PROJECT NO.	36589	SCALE	N.T.S.
DATE	12-23-19	DESIGNED BY	JRP
MODEL-6810-2-DIRECTIONAL ANTENNA			

FIGURE 2

Antenna Mfg.: Shively Labs

Antenna Type: 6810-2R

Station: WCOV

Frequency: 89.1

Channel #: 206

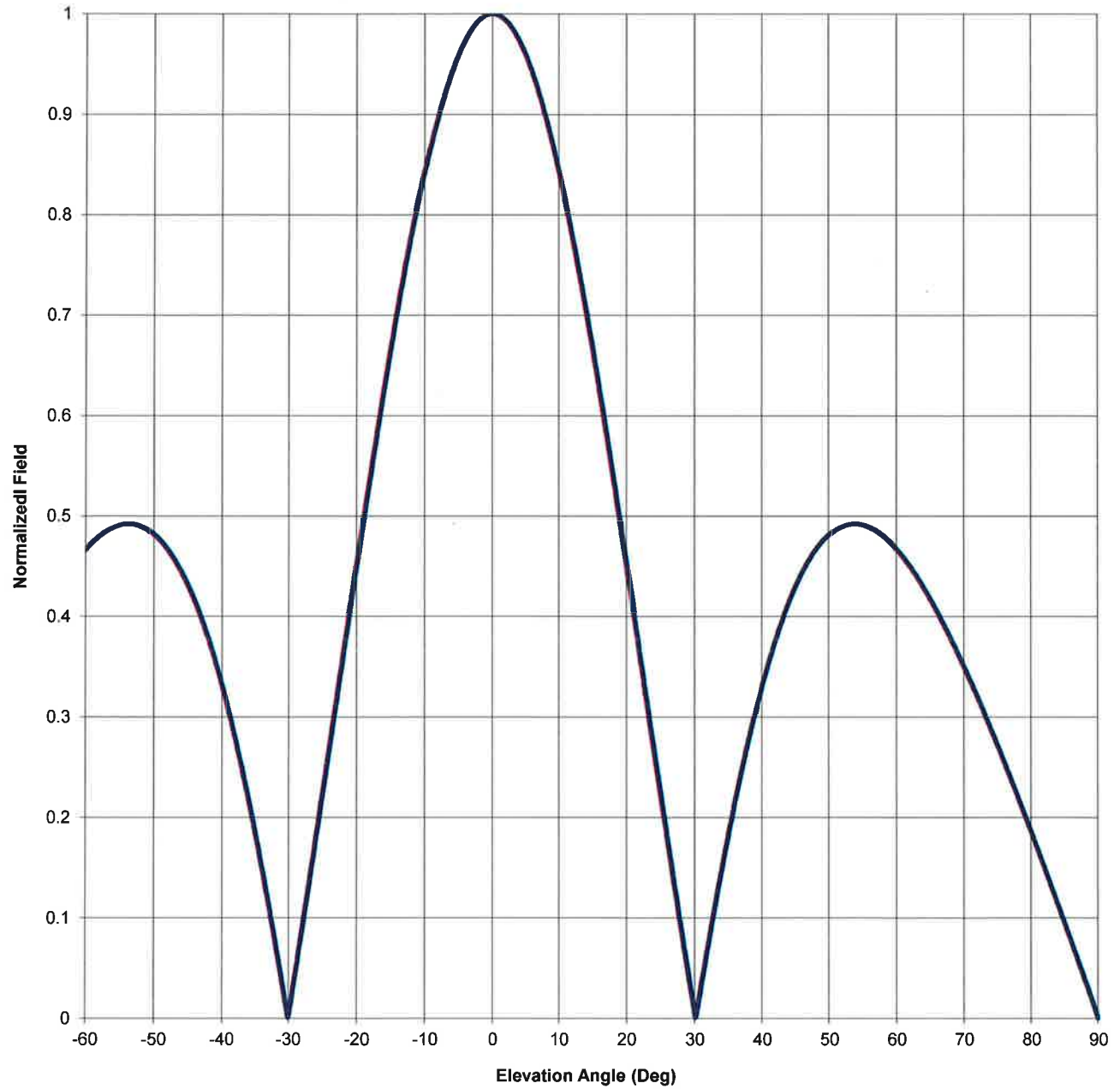
Figure: Figure 3

Date: 12/23/2019

Beam Tilt 0

Gain (Max) 0.990 -0.044 dB

Gain (Horizon) 0.990 -0.044 dB



Antenna Mfg.: Shively Labs  
Antenna Type: 6810-2R

Date: 12/23/2019

Station: WCOV  
Frequency: 89.1  
Channel #: 206

Beam Tilt 0  
Gain (Max) 0.990 -0.044 dB  
Gain (Horizon) 0.990 -0.044 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	0.414	0	1.000	46	0.444
-89	0.021	-43	0.396	1	0.998	47	0.456
-88	0.040	-42	0.376	2	0.993	48	0.466
-87	0.059	-41	0.354	3	0.985	49	0.475
-86	0.078	-40	0.331	4	0.974	50	0.482
-85	0.096	-39	0.305	5	0.959	51	0.487
-84	0.114	-38	0.278	6	0.942	52	0.490
-83	0.132	-37	0.248	7	0.921	53	0.492
-82	0.150	-36	0.217	8	0.898	54	0.492
-81	0.168	-35	0.184	9	0.872	55	0.491
-80	0.186	-34	0.149	10	0.843	56	0.489
-79	0.203	-33	0.113	11	0.812	57	0.485
-78	0.221	-32	0.075	12	0.779	58	0.480
-77	0.238	-31	0.036	13	0.743	59	0.474
-76	0.255	-30	0.005	14	0.706	60	0.467
-75	0.271	-29	0.047	15	0.667	61	0.459
-74	0.288	-28	0.090	16	0.626	62	0.450
-73	0.304	-27	0.133	17	0.584	63	0.440
-72	0.320	-26	0.178	18	0.541	64	0.429
-71	0.335	-25	0.223	19	0.497	65	0.417
-70	0.350	-24	0.269	20	0.452	66	0.405
-69	0.364	-23	0.315	21	0.406	67	0.392
-68	0.379	-22	0.361	22	0.361	68	0.379
-67	0.392	-21	0.406	23	0.315	69	0.364
-66	0.405	-20	0.452	24	0.269	70	0.350
-65	0.417	-19	0.497	25	0.223	71	0.335
-64	0.429	-18	0.541	26	0.178	72	0.320
-63	0.440	-17	0.584	27	0.133	73	0.304
-62	0.450	-16	0.626	28	0.090	74	0.288
-61	0.459	-15	0.667	29	0.047	75	0.271
-60	0.467	-14	0.706	30	0.005	76	0.255
-59	0.474	-13	0.743	31	0.036	77	0.238
-58	0.480	-12	0.779	32	0.075	78	0.221
-57	0.485	-11	0.812	33	0.113	79	0.203
-56	0.489	-10	0.843	34	0.149	80	0.186
-55	0.491	-9	0.872	35	0.184	81	0.168
-54	0.492	-8	0.898	36	0.217	82	0.150
-53	0.492	-7	0.921	37	0.248	83	0.132
-52	0.490	-6	0.942	38	0.278	84	0.114
-51	0.487	-5	0.959	39	0.305	85	0.096
-50	0.482	-4	0.974	40	0.331	86	0.078
-49	0.475	-3	0.985	41	0.354	87	0.059
-48	0.466	-2	0.993	42	0.376	88	0.040
-47	0.456	-1	0.998	43	0.396	89	0.021
-46	0.444	0	1.000	44	0.414	90	0.000
-45	0.430			45	0.430		

## VALIDATION OF TOTAL POWER GAIN CALCULATION

WCOV Friendship, NY

MODEL 6810-2R

Elevation Gain of Antenna

0.99

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

H RMS 0.713689

V RMS 0.691225

H/V Ratio 1.032

Elevation Gain of Horizontal Component 1.022

Elevation Gain of Vertical Component 0.959

Horizontal Azimuth Gain equals  $1/(\text{RMS})^2$ . 1.963Vertical Azimuth Gain equals  $1/(\text{RMS}/\text{Max Vert})^2$ . 2.072

Max. Vertical 0.995

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

Total Horizontal Power Gain = 2.007

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

Total Vertical Power Gain = 1.987

ERP divided by Horizontal Power Gain equals Antenna Input Power

9.5 kW ERP Divided by H Gain 2.007 equals 4.734 kW H Antenna Input Power

Antenna Input Power times Vertical Power Gain equals Vertical ERP

4.734 kW Times V Gain 1.987 equals 9.405 kW V ERP

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

 $(0.995)^2$  Times 9.50 Equals 9.405 kW Vertical ERP

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



**Daniel L. Barry Land Surveyor LLC**  
*Licensed In New York and Pennsylvania*  
92 Baxter Avenue  
Lakewood, NY 14750  
716-763-1254  
*E-mail [dan@danbarrysurveyor.com](mailto:dan@danbarrysurveyor.com)*  
[www.danbarrysurveyor.com](http://www.danbarrysurveyor.com)

*Member of the New York State Association of Professional Land Surveyors*  
*Member of the Pennsylvania Society of Land Surveyors*  
*Member of the National Society of Professional Surveyors*

Daniel L. Barry, PLS

Scott R. Johnson, PLS

June 27, 2020

Family Life Network  
PO Box 506  
Bath, NY 14810

RE: Tower at 2695 Pine Grove Road, Town of Wirt  
Allegany County, NY, tax parcel 233.3-25.4

I certify that the tower is located at 42°07'06.3" north latitude and 078°10'41.4" west longitude, and that the antennas are oriented at and azimuth of 120° as designed, as observed on June 20, 2020.

Sincerely,

*Daniel L Barry*

Daniel L. Barry, PLS



**Affidavit**

Federal Communications Commission  
Audio Services Division  
Mass Media Bureau  
445 12<sup>th</sup> St. SW  
Washington, DC 20554

John R. Coulter  
Chief Engineer  
Family Life Ministries, Inc.  
PO Box 506  
Bath, NY 14810

June 19, 2020

Certification Statement

I, John R. Coulter, being a duly qualified radio engineer, do hereby certify that I have overseen the installation of the directional antenna to fulfill construction permit BPED-20180510AAT for WCOV-FM, Friendship, New York.

The directional antenna was designed, built, and tested by Shively, Inc. The antenna model 6810-2R-DA has been installed according to the manufacturer specifications. The two antenna bays are indeed mounted at an azimuth of 120° clockwise from true north and are correctly spaced from the tower as specified with all elements of the antenna installed exactly to the manufacturer's specifications.

I state that I am an FCC GROL licensed engineer, license PG00029156.

Sincerely,

John R. Coulter  
Chief Engineer  
Family Life Ministries, Inc.  
Bath, NY

Signature John Coulter

Date June 19, 2020

Friendship, NY  
Community of License Coverage  
DA Pattern - Composite Proof

Exhibit 9-D

**WCOV-FM.C**

BPED20180510AAT  
Latitude: 42-07-06.96 N  
Longitude: 078-10-42.96 W  
ERP: 9.50 kW  
Channel: 206  
Frequency: 89.1 MHz  
AMSL Height: 757.0 m  
Elevation: 701.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

Community of License Corporate Boundary  
Note - WCOV-FM Composite Proof Antenna Pattern  
Completely Encompasses the Community of License

