

TECHNICAL EXHIBIT
APPLICATION FOR MINOR LICENSE CHANGE
BOOSTER STATION WOYE-FM2
FAJARDO, PUERTO RICO
FACILITY ID 180882

March 19, 2019

CH 247 0.25 KW 313 M AMSL

TECHNICAL EXHIBIT
APPLICATION FOR LICENSE MODIFICATION
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Engineering Statement

This Technical Exhibit was prepared on behalf of AA Broadcast, Inc., licensee of FM Booster station WOYE-FM2, Facility ID 180882, Fajardo, Puerto Rico, in support of an application for a modification of its existing license. The instant application proposes a change in the antenna type, from directional, vertical polarization to non-directional circular polarization. No change in site, antenna supporting structure, antenna height, or ERP is proposed. The proposed booster facility will operate on Channel 247 (97.3 MHz) with an antenna radiation center height above mean sea level of 313 meters, using a Shively 6812, single bay, circularly polarized antenna. The proposed operating parameters are shown in Figure 1.

Proposed Transmitter Location

The proposed facility would operate from its existing site and antenna supporting structure; no change in the antenna radiation center height is proposed. The existing and proposed site location is described by the following NAD27 geographic coordinates:

18° 16' 52" North
65° 40' 09" West

The overall height above ground of the tower is 30 meters and is registered with the FCC with the Antenna Structure Registration Number 1233151. There will be no change in the overall height of the existing structure.

Notification of FCC Monitoring Station and Arecibo Observatory

FCC rules, Section 73.1030(c), requires that the proposed facility do not produce a field strength greater than 10 mV/m at the FCC stations. The closest FCC monitoring station to the proposed operation is located at Santa Isabel, Puerto Rico, at a distance of 80.6 kilometers on a bearing of 248° True. The proposed operation will produce field strengths much lower than 10 mV/m at the FCC Santa Isabel, PR station; notification to the FCC monitoring station is deemed necessary.

Pursuant to Section 73.1030 of the FCC Rules, the Arecibo Observatory has been notified of the proposed facility. Copies of the notification letter and of the Letter of Consent of the Observatory are shown in Appendix 1.

Environmental Considerations Environmental Considerations*

The proposal will comply with the FCC Rules concerning human exposure to radio frequency (RF) energy. The calculation of RF energy at 2-m above ground was made under the procedures of OET Bulletin No. 65.[†] The formula employed is as follows:

$$S = \frac{(33.4)F^2P}{R^2}$$

where, S = power density in uW/cm², F = relative field factor at the angle to the calculation point, P = the total effective radiated power relative to a dipole in watts, and R = distance from the antenna radiation center to the calculation point in meters.

The proposed antenna, a single bay Shively circularly polarized antenna, will be mounted with radiation center at a height of 30 meters on the tower; a total ERP of 500 Watts (Circular) is proposed. Figure 3 is a spreadsheet with a detailed RF exposure calculation at every other degree, using the proposed Shively antenna vertical plane radiation pattern and the proposed operational parameters. As shown in Figure 3, at no point in the site, at a height of 2 mts AGL, will the RF field exceed the 200 uW/sq.cm. allowed for a non-controlled, public environment in the FM band. Since the total RF exposure will be below 5% the FCC limits for

* This statement addresses only human exposure to radiofrequency radiation and not to other non-radiofrequency radiation matters listed in the National Environmental Policy Act of 1969.

[†] Federal Communications Commission OET Bulletin No. 65, Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields (Edition 97-01, August 1997).

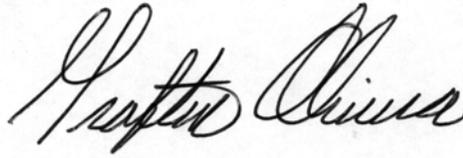
uncontrolled environments, the proposal will comply with the FCC limits for human exposure to RF radiation.

The applicant will verify that access to the tower site is restricted and the site will be appropriately marked with RFR warning signs. In addition, as this is a multi-user site, procedures will be in effect to coordinate in the event that workers or other authorized personnel need to enter the restricted area or climb the tower to ensure that appropriate measures will be taken to assure worker safety with respect to radio frequency radiation exposure. Such procedures include reducing the average exposure by spreading out the work over a longer period of time, wearing RFR exposure monitors or scheduling work when the station is shut down.

Predicted Coverage Contour

The predicted 60 dBu coverage contours were calculated in accordance with Section 73.313 of the FCC Rules. The average terrain elevations from 3 to 16 km from the proposed site were computed using the Globe 30-second terrain database. The distances to the predicted 60 dBu coverage contours for the proposed booster were determined using the average elevations of radials spaced every 5-degree of azimuth. The antenna radiation center height above average terrain and the ERP in each radial direction were used in conjunction with the propagation prediction curves of Section 73.333 to determine the distances to the contour. Appendix 3 shows the distance to 60 dBu contour table. The V-Soft FMCommader@2016 software was used to perform the above referred calculations.

As is the case for the licensed facility of WOYE-FM2, the 60 dBu F50,50 contour of the proposed facility extends beyond the 60 dBu contour of WOYE(FM), but only over the ocean water. Figure 2 is a map showing the predicted 60 dBu coverage contours of the proposed facility of WOYE-FM2 and the 60 dBu contour of WOYE(FM). As shown in Figure 2, the proposed 60 dBu contour of WOYE-FM2 will not extended beyond the contour of the main licensed facility at any point over land. Therefore, it is believed that the proposed facility meets all pertinent requirements of the FCC Rules.

A handwritten signature in black ink, appearing to read "Grafton Olivera". The signature is fluid and cursive, with the first name "Grafton" and last name "Olivera" clearly distinguishable.

Grafton Olivera, P.E.
Consulting Engineer

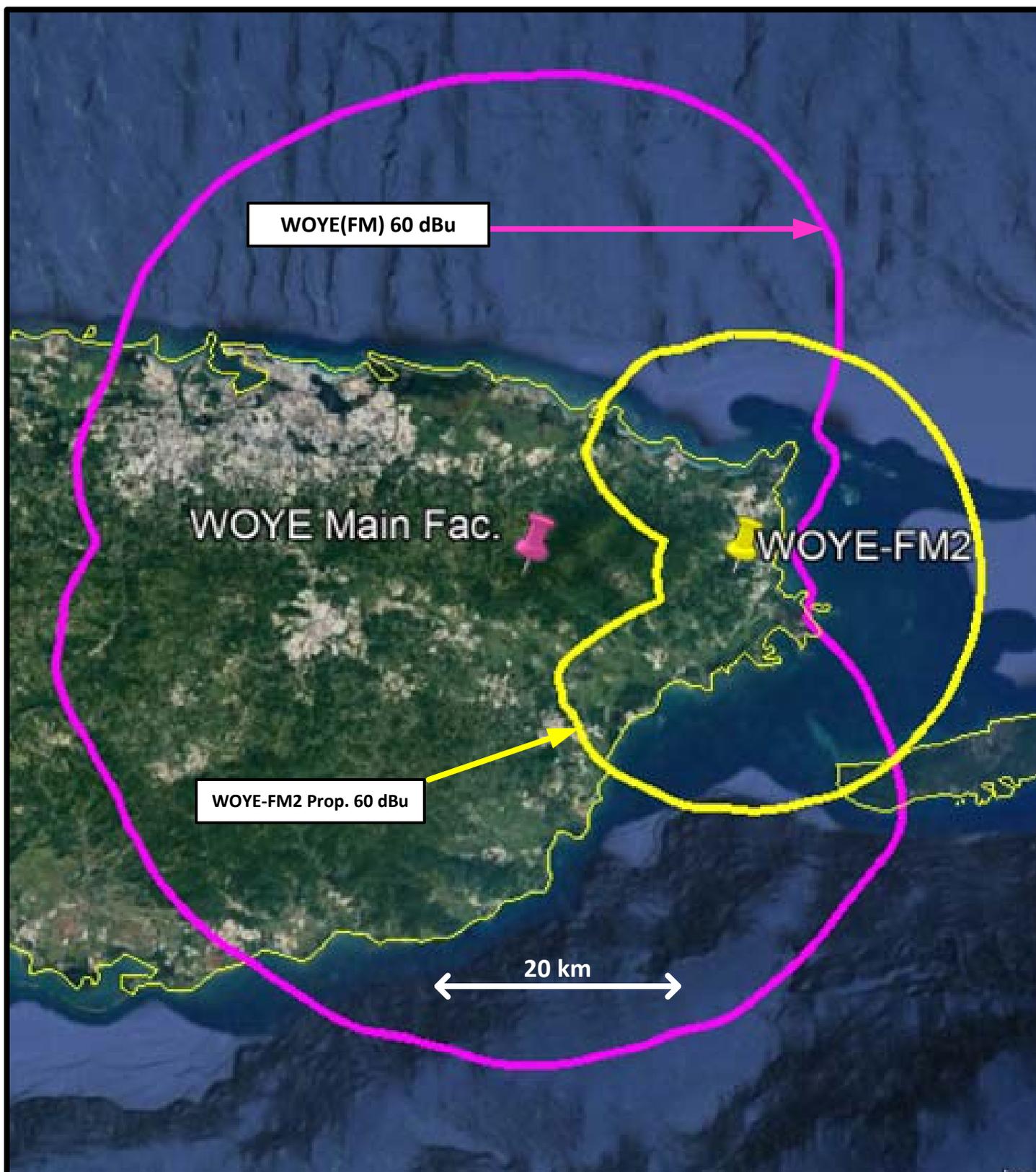
5119 60th Drive E.
Bradenton, FL 34203
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 BOOSTER STATION WOYE-FM2
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Engineering Specifications

| | |
|--------------------------------------|--|
| Channel / Frequency | 247 / 97.3 MHz |
| Site Coordinates | 18° 16' 52" North Latitude 65° 40' 09" West Longitude |
| Site elevation | 283 m AMSL |
| Overall height of existing structure | 30 m AGL / 313 m AMSL |
| Height of antenna radiation center | 30 m AGL / 313 m AMSL |
| Transmitter | Nautel VS1 |
| Transmitter power output | 0.680 kW |
| Transmission line | Andrew, LDF4-50A |
| Transmission line length | 45 m |
| Transmission line efficiency | 79.9% |
| Antenna | Shively 6812 – 1 bay |
| Polarization | Circular |
| Power gain | 0.46 X |
| Antenna input power | 0.543 kW |
| Effective radiated power (H & V) | 0.25 kW |



PREDICTED COVERAGE CONTOURS
STATION WOYE-FM2
FAJARDO, PUERTO RICO
CH 247 0.25 KW 313 M AMSL
Grafton Olivera, P.E. Consulting Engineer

Figure 3

| Power Density Calc. | | Station: | WOYE-FM2 | RC Hght (feet): | 30 | SITE: Los Machos | | | Ant. G (X) | 0.46 | |
|---------------------|-------------------------|------------------|---------------------|--------------------|--------------|------------------|---------------------|----------------------------|--------------|-------------|-----|
| RCAGL (m) | 30.0 | ERP (kW): | 0.25 | Tot. Avg Pwr (kW): | | 0.500 | Max. RF-uW | 5.48 | Max. % | 2.7% | |
| | | Ant. Polariz. | | TV Channel: | | 6 | ERP (W) | | 250 | Ant. In (W) | 543 |
| | | (Sng=1, Cir=2) : | 2 | Freq. (MHz) | | 97.3 | ANTENA: | | Line Eff (%) | 79.9% | |
| | | Ant. => | Shively 6812-1 Circ | MPE (uW/cm^2) | | 200.00 | Shively 6812-1 Circ | | TPO (W): | 680 | |
| | | Max. RF Exp. = | | 5.48 | Max. RFE % = | | 2.7% | | | | |
| Depression Angle | Vertical Relative Field | | uW/sq.cm | R-dist (m) | X-dist. (m) | % of Max. | X-dist. (feet) | | | | |
| 1 | 1.000 | | 0.01 | 1,604.4 | 1,604.1 | 0.0 | 5,263 | | | | |
| 3 | 0.999 | | 0.06 | 535.0 | 534.3 | 0.0 | 1,753 | | | | |
| 5 | 0.996 | | 0.16 | 321.3 | 320.0 | 0.1 | 1,050 | | | | |
| 7 | 0.993 | | 0.31 | 229.8 | 228.0 | 0.2 | 748 | | | | |
| 9 | 0.988 | | 0.51 | 179.0 | 176.8 | 0.3 | 580 | | | | |
| 11 | 0.982 | | 0.75 | 146.7 | 144.0 | 0.4 | 473 | | | | |
| 13 | 0.975 | | 1.02 | 124.5 | 121.3 | 0.5 | 398 | | | | |
| 15 | 0.967 | | 1.33 | 108.2 | 104.5 | 0.7 | 343 | | | | |
| 17 | 0.958 | | 1.67 | 95.8 | 91.6 | 0.8 | 300 | | | | |
| 19 | 0.948 | | 2.03 | 86.0 | 81.3 | 1.0 | 267 | | | | |
| 21 | 0.936 | | 2.40 | 78.1 | 72.9 | 1.2 | 239 | | | | |
| 23 | 0.924 | | 2.78 | 71.7 | 66.0 | 1.4 | 216 | | | | |
| 25 | 0.910 | | 3.15 | 66.3 | 60.0 | 1.6 | 197 | | | | |
| 27 | 0.895 | | 3.52 | 61.7 | 55.0 | 1.8 | 180 | | | | |
| 29 | 0.879 | | 3.87 | 57.8 | 50.5 | 1.9 | 166 | | | | |
| 31 | 0.862 | | 4.20 | 54.4 | 46.6 | 2.1 | 153 | | | | |
| 33 | 0.845 | | 4.51 | 51.4 | 43.1 | 2.3 | 141 | | | | |
| 35 | 0.826 | | 4.78 | 48.8 | 40.0 | 2.4 | 131 | | | | |
| 37 | 0.806 | | 5.01 | 46.5 | 37.2 | 2.5 | 122 | | | | |
| 39 | 0.785 | | 5.20 | 44.5 | 34.6 | 2.6 | 113 | | | | |
| 41 | 0.763 | | 5.34 | 42.7 | 32.2 | 2.7 | 106 | | | | |
| 43 | 0.741 | | 5.44 | 41.1 | 30.0 | 2.7 | 99 | | | | |
| 45 | 0.717 | | 5.48 | 39.6 | 28.0 | 2.7 | 92 | Max. RF Field at 2 mts AGL | | | |
| 47 | 0.693 | | 5.47 | 38.3 | 26.1 | 2.7 | 86 | | | | |
| 49 | 0.667 | | 5.40 | 37.1 | 24.3 | 2.7 | 80 | | | | |
| 51 | 0.641 | | 5.29 | 36.0 | 22.7 | 2.6 | 74 | | | | |
| 53 | 0.614 | | 5.12 | 35.1 | 21.1 | 2.6 | 69 | | | | |
| 55 | 0.586 | | 4.91 | 34.2 | 19.6 | 2.5 | 64 | | | | |
| 57 | 0.558 | | 4.66 | 33.4 | 18.2 | 2.3 | 60 | | | | |
| 59 | 0.529 | | 4.38 | 32.7 | 16.8 | 2.2 | 55 | | | | |
| 61 | 0.499 | | 4.06 | 32.0 | 15.5 | 2.0 | 51 | | | | |
| 63 | 0.469 | | 3.72 | 31.4 | 14.3 | 1.9 | 47 | | | | |
| 65 | 0.437 | | 3.34 | 30.9 | 13.1 | 1.7 | 43 | | | | |
| 67 | 0.406 | | 2.98 | 30.4 | 11.9 | 1.5 | 39 | | | | |
| 69 | 0.373 | | 2.58 | 30.0 | 10.7 | 1.3 | 35 | | | | |
| 71 | 0.341 | | 2.21 | 29.6 | 9.6 | 1.1 | 32 | | | | |
| 73 | 0.307 | | 1.84 | 29.3 | 8.6 | 0.9 | 28 | | | | |
| 75 | 0.273 | | 1.48 | 29.0 | 7.5 | 0.7 | 25 | | | | |
| 77 | 0.239 | | 1.16 | 28.7 | 6.5 | 0.6 | 21 | | | | |
| 79 | 0.204 | | 0.85 | 28.5 | 5.4 | 0.4 | 18 | | | | |
| 81 | 0.168 | | 0.59 | 28.3 | 4.4 | 0.3 | 15 | | | | |
| 83 | 0.133 | | 0.37 | 28.2 | 3.4 | 0.2 | 11 | | | | |
| 85 | 0.096 | | 0.19 | 28.1 | 2.4 | 0.1 | 8 | | | | |
| 87 | 0.059 | | 0.07 | 28.0 | 1.5 | 0.0 | 5 | | | | |
| 89 | 0.021 | | 0.01 | 28.0 | 0.5 | 0.0 | 2 | | | | |

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Antenna Manufacturer's Vertical Plane Radiation Pattern

{two sheets follow}

Antenna Mfg.: Shively Labs

Date: 11/23/2011

Antenna Type: 6812-1

Station: none

Beam Tilt 0

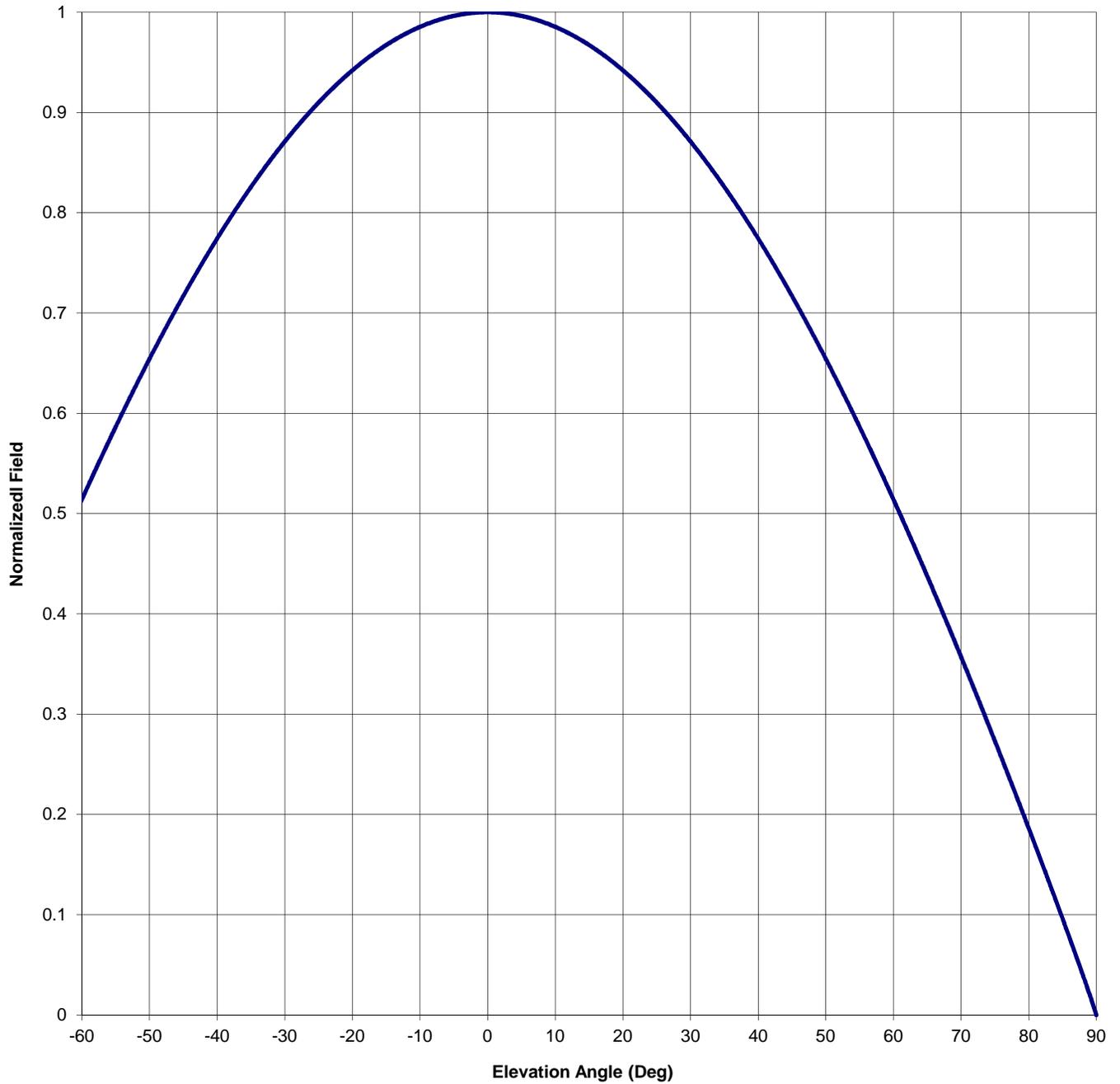
Frequency: 93.1

Gain (Max) 0.460 -3.369 dB

Channel #: 226

Gain (Horizon) 0.460 -3.369 dB

Figure: 3



Antenna Mfg.: Shively Labs

Date: 11/23/2011

Antenna Type: 6812-1

Station: none

Beam Tilt 0

Frequency: 93.1

Gain (Max) 0.460 -3.369 dB

Channel #: 226

Gain (Horizon) 0.460 -3.369 dB

Figure: 3

| Angle of Depression (Deg) | Relative Field |
|---------------------------|----------------|---------------------------|----------------|---------------------------|----------------|---------------------------|----------------|
| -90 | 0.000 | -44 | 0.729 | 0 | 1.000 | 46 | 0.705 |
| -89 | 0.021 | -43 | 0.741 | 1 | 1.000 | 47 | 0.693 |
| -88 | 0.040 | -42 | 0.752 | 2 | 0.999 | 48 | 0.680 |
| -87 | 0.059 | -41 | 0.763 | 3 | 0.999 | 49 | 0.667 |
| -86 | 0.078 | -40 | 0.774 | 4 | 0.998 | 50 | 0.654 |
| -85 | 0.096 | -39 | 0.785 | 5 | 0.996 | 51 | 0.641 |
| -84 | 0.114 | -38 | 0.796 | 6 | 0.995 | 52 | 0.628 |
| -83 | 0.133 | -37 | 0.806 | 7 | 0.993 | 53 | 0.614 |
| -82 | 0.151 | -36 | 0.816 | 8 | 0.991 | 54 | 0.600 |
| -81 | 0.168 | -35 | 0.826 | 9 | 0.988 | 55 | 0.586 |
| -80 | 0.186 | -34 | 0.835 | 10 | 0.985 | 56 | 0.572 |
| -79 | 0.204 | -33 | 0.845 | 11 | 0.982 | 57 | 0.558 |
| -78 | 0.221 | -32 | 0.854 | 12 | 0.979 | 58 | 0.544 |
| -77 | 0.239 | -31 | 0.862 | 13 | 0.975 | 59 | 0.529 |
| -76 | 0.256 | -30 | 0.871 | 14 | 0.971 | 60 | 0.514 |
| -75 | 0.273 | -29 | 0.879 | 15 | 0.967 | 61 | 0.499 |
| -74 | 0.290 | -28 | 0.887 | 16 | 0.963 | 62 | 0.484 |
| -73 | 0.307 | -27 | 0.895 | 17 | 0.958 | 63 | 0.469 |
| -72 | 0.324 | -26 | 0.903 | 18 | 0.953 | 64 | 0.453 |
| -71 | 0.341 | -25 | 0.910 | 19 | 0.948 | 65 | 0.437 |
| -70 | 0.357 | -24 | 0.917 | 20 | 0.942 | 66 | 0.422 |
| -69 | 0.373 | -23 | 0.924 | 21 | 0.936 | 67 | 0.406 |
| -68 | 0.390 | -22 | 0.930 | 22 | 0.930 | 68 | 0.390 |
| -67 | 0.406 | -21 | 0.936 | 23 | 0.924 | 69 | 0.373 |
| -66 | 0.422 | -20 | 0.942 | 24 | 0.917 | 70 | 0.357 |
| -65 | 0.437 | -19 | 0.948 | 25 | 0.910 | 71 | 0.341 |
| -64 | 0.453 | -18 | 0.953 | 26 | 0.903 | 72 | 0.324 |
| -63 | 0.469 | -17 | 0.958 | 27 | 0.895 | 73 | 0.307 |
| -62 | 0.484 | -16 | 0.963 | 28 | 0.887 | 74 | 0.290 |
| -61 | 0.499 | -15 | 0.967 | 29 | 0.879 | 75 | 0.273 |
| -60 | 0.514 | -14 | 0.971 | 30 | 0.871 | 76 | 0.256 |
| -59 | 0.529 | -13 | 0.975 | 31 | 0.862 | 77 | 0.239 |
| -58 | 0.544 | -12 | 0.979 | 32 | 0.854 | 78 | 0.221 |
| -57 | 0.558 | -11 | 0.982 | 33 | 0.845 | 79 | 0.204 |
| -56 | 0.572 | -10 | 0.985 | 34 | 0.835 | 80 | 0.186 |
| -55 | 0.586 | -9 | 0.988 | 35 | 0.826 | 81 | 0.168 |
| -54 | 0.600 | -8 | 0.991 | 36 | 0.816 | 82 | 0.151 |
| -53 | 0.614 | -7 | 0.993 | 37 | 0.806 | 83 | 0.133 |
| -52 | 0.628 | -6 | 0.995 | 38 | 0.796 | 84 | 0.114 |
| -51 | 0.641 | -5 | 0.996 | 39 | 0.785 | 85 | 0.096 |
| -50 | 0.654 | -4 | 0.998 | 40 | 0.774 | 86 | 0.078 |
| -49 | 0.667 | -3 | 0.999 | 41 | 0.763 | 87 | 0.059 |
| -48 | 0.680 | -2 | 0.999 | 42 | 0.752 | 88 | 0.040 |
| -47 | 0.693 | -1 | 1.000 | 43 | 0.741 | 89 | 0.021 |
| -46 | 0.705 | 0 | 1.000 | 44 | 0.729 | 90 | 0.000 |
| -45 | 0.717 | | | 45 | 0.717 | | |

Distance to 60 dBu Contour Table

N. Lat. = 181652.0 W. Lng. = 654009.0
 FCC, FM 2-10 Mi, 51 pts Method - GLOBE 30 SEC

| Azi. | AV EL | ERP kW | 60-F5 |
|------|-------|--------|-------|
| 000 | 24.7 | 0.2500 | 22.13 |
| 005 | 20.6 | 0.2500 | 22.28 |
| 010 | 17.3 | 0.2500 | 22.40 |
| 015 | 14.7 | 0.2500 | 22.49 |
| 020 | 16.3 | 0.2500 | 22.44 |
| 025 | 14.0 | 0.2500 | 22.52 |
| 030 | 7.9 | 0.2500 | 22.74 |
| 035 | 3.4 | 0.2500 | 22.91 |
| 040 | 2.7 | 0.2500 | 22.93 |
| 045 | 4.0 | 0.2500 | 22.89 |
| 050 | 5.3 | 0.2500 | 22.84 |
| 055 | 5.6 | 0.2500 | 22.83 |
| 060 | 5.3 | 0.2500 | 22.84 |
| 065 | 6.4 | 0.2500 | 22.80 |
| 070 | 6.7 | 0.2500 | 22.79 |
| 075 | 6.0 | 0.2500 | 22.81 |
| 080 | 3.8 | 0.2500 | 22.89 |
| 085 | 2.4 | 0.2500 | 22.94 |
| 090 | 1.1 | 0.2500 | 22.99 |
| 095 | 1.3 | 0.2500 | 22.98 |
| 100 | 1.6 | 0.2500 | 22.97 |
| 105 | 2.5 | 0.2500 | 22.94 |
| 110 | 6.1 | 0.2500 | 22.81 |
| 115 | 5.9 | 0.2500 | 22.82 |
| 120 | 4.7 | 0.2500 | 22.86 |
| 125 | 8.0 | 0.2500 | 22.74 |
| 130 | 10.4 | 0.2500 | 22.65 |
| 135 | 9.7 | 0.2500 | 22.68 |
| 140 | 7.3 | 0.2500 | 22.77 |
| 145 | 9.7 | 0.2500 | 22.68 |
| 150 | 13.3 | 0.2500 | 22.54 |
| 155 | 15.2 | 0.2500 | 22.47 |
| 160 | 23.6 | 0.2500 | 22.17 |
| 165 | 26.2 | 0.2500 | 22.07 |
| 170 | 27.4 | 0.2500 | 22.03 |
| 175 | 28.8 | 0.2500 | 21.97 |
| 180 | 35.8 | 0.2500 | 21.72 |
| 185 | 36.4 | 0.2500 | 21.69 |
| 190 | 32.7 | 0.2500 | 21.83 |
| 195 | 36.3 | 0.2500 | 21.70 |
| 200 | 43.4 | 0.2500 | 21.43 |
| 205 | 45.2 | 0.2500 | 21.36 |
| 210 | 43.5 | 0.2500 | 21.43 |

| Azi. | AV EL | ERP kW | 60-F5 |
|-------------|--------------|---------------|--------------|
| 215 | 45.6 | 0.2500 | 21.35 |
| 220 | 54.4 | 0.2500 | 21.01 |
| 225 | 71.2 | 0.2500 | 20.34 |
| 230 | 83.3 | 0.2500 | 19.84 |
| 235 | 90.5 | 0.2500 | 19.52 |
| 240 | 104.9 | 0.2500 | 18.90 |
| 245 | 172.1 | 0.2500 | 15.31 |
| 250 | 278.3 | 0.2500 | 7.57 |
| 255 | 392.0 | 0.2500 | 7.09 |
| 260 | 502.0 | 0.2500 | 7.09 |
| 265 | 551.6 | 0.2500 | 7.09 |
| 270 | 574.3 | 0.2500 | 7.09 |
| 275 | 549.7 | 0.2500 | 7.09 |
| 280 | 543.2 | 0.2500 | 7.09 |
| 285 | 515.4 | 0.2500 | 7.09 |
| 290 | 404.9 | 0.2500 | 7.09 |
| 295 | 284.9 | 0.2500 | 7.09 |
| 300 | 223.7 | 0.2500 | 12.18 |
| 305 | 165.9 | 0.2500 | 15.71 |
| 310 | 124.4 | 0.2500 | 18.02 |
| 315 | 112.6 | 0.2500 | 18.55 |
| 320 | 94.4 | 0.2500 | 19.35 |
| 325 | 73.2 | 0.2500 | 20.26 |
| 330 | 63.1 | 0.2500 | 20.67 |
| 335 | 45.4 | 0.2500 | 21.36 |
| 340 | 36.5 | 0.2500 | 21.69 |
| 345 | 42.1 | 0.2500 | 21.48 |
| 350 | 39.8 | 0.2500 | 21.57 |
| 355 | 30.4 | 0.2500 | 21.92 |

Ave El= 96.02 M HAAT= 216.98 M AMSL= 313.0