

APPLICATION FOR A NEW LPFM BROADCAST STATION TO SERVE CHATTANOOGA, TN

November 14, 2013

Prepared For:

Alton Park Development
Corporation
6425 Bonny Oaks Drove
Chattanooga, TN 37416

Prepared By:

Ryan Wilhour
Kessler and Gehman Assoc.
507 NW 60th Street Suite C
Gainesville, FL 32607

1.0 PURPOSE OF LPFM APPLICATION..... 2

2.0 STATION TRANSMITTER LOCATION 2

 2.1 Transmitter Site Physical Address: 2

 2.2 Transmitter Site Geographic Coordinates (NAD27) 2

 2.3 Antenna Structure Registration 2

3.0 ANTENNA AND SITE ELEVATIONS 2

 3.1 Height of Site Above Mean Sea Level (AMSL)..... 3

 3.2 Overall Height of Support Structure (Building) Above Ground Level (AGL) 3

 3.3 Overall Height of Mast above Rooftop 3

 3.4 Overall Height of Mast (AGL) 3

 3.5 LPFM Antenna Height above Rooftop..... 3

 3.6 LPFM Antenna Height (AGL) 3

 3.7 LPFM antenna height (AMSL)..... 3

 3.8 LPFM antenna Height Above Average Terrain (HAAT)..... 3

4.0 LPFM EFFECTIVE RADIATED POWER..... 3

5.0 FREQUENCY SEARCH PRESELECTION OVERVIEW 3

6.0 ALLOCATION ANALYSIS 4

 6.1 LPFM Short Space Study for Channel 261 4

7.0 INTERFERENCE TO TRANSLATOR OR BOOSTER INPUT SIGNALS..... 4

8.0 CHANNEL 6 TELEVISION STATIONS 5

9.0 AM STATION PROXIMITY 5

10.0 INTERNATIONAL COORDINATION..... 6

11.0 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) 6

 11.1 General Environmental Requirements 6

 11.2 Radio Frequency Radiation (RFR) Compliance..... 6

12.0 CONCLUSION 7

13.0 CERTIFICATION..... 7

APPENDIX A - FCC Towair Study 8

APPENDIX B - Height Above Average Terrain Calculation..... 9

APPENDIX C - Short Spacing Study for Channel 225 10

APPENDIX D – Translator and Booster Proximity 11

APPENDIX E – AM Station Proximity..... 13

APPENDIX F - Far Field Exposure to RF Emissions..... 14

1.0 PURPOSE OF LPFM APPLICATION

It is herein proposed to create a new LPFM broadcast station for the non-profit entity Alton Park Development Corporation. "APDC". The APDC is an organization recognized by the state of Tennessee as a non-profit corporation

Upon grant of the instant application, the LPFM station shall further allow APDC to advance its educational program as indicated in Section II – Legal question number (2) Exhibit 2. The technical and compliance details are outlined in the following sections.

2.0 STATION TRANSMITTER LOCATION

The proposed transmitter site shall consist of a rooftop mounted antenna on an existing building located at the following address and resulting site geographical coordinates.

2.1 Transmitter Site Physical Address:

701 Hooker Road
Chattanooga, TN 37410

2.2 Transmitter Site Geographic Coordinates (NAD27)

The following transmitter site coordinates were determined using a 7.5 minutes series U.S. Geological Survey topographic quadrangle map then checked for consistency using a GIS program:

N. Latitude 34° 59' 40.2"
W. Longitude 85° 18' 23.54"

2.3 Antenna Structure Registration

The proposed structure consists of a 5m building with a 5m mast erected on the rooftop. The combined structure and mast height of the roof mounted antenna system does not require an Antenna Structure Registration "ASR" number since the mast atop the rooftop meets the 6.1 meter (20-foot) rule criteria. Output resulting from the FCC's TOWAIR program is demonstrated in Appendix A.

3.0 ANTENNA AND SITE ELEVATIONS

The applicant proposes to use the studio roof top to erect a mast in which to mount the LPFM antenna. The pertinent elevations are as described:

- 3.1 Height of Site Above Mean Sea Level (AMSL)
202.4m (rounded to 202m for FCC Application)
- 3.2 Overall Height of Support Structure (Building) Above Ground Level (AGL)
5m
- 3.3 Overall Height of Mast above Rooftop
5m
- 3.4 Overall Height of Mast (AGL)
10.0m (Rounded to 10m for FCC Application)
- 3.5 LPFM Antenna Height above Rooftop
5m
- 3.6 LPFM Antenna Height (AGL)
10m (Rounded to 10m for FCC Application)
- 3.7 LPFM antenna height (AMSL)
212.4m
- 3.8 LPFM antenna Height Above Average Terrain (HAAT)
-73.0m (Refer to Appendix B for HAAT Calculations produced from the FCC's Website)

4.0 LPFM EFFECTIVE RADIATED POWER

Pursuant to 47 C.F.R. Section 73.811(a) entitled "Maximum facilities", LPFM stations will be authorized to operate with maximum facilities of 100 watts ERP at 30 meters HAAT. An LPFM station with a HAAT that exceeds 30 meters will not be permitted to operate with an ERP greater than that which would result in a 60 dBu contour of 5.6 kilometers. In no event will an ERP less than one watt be authorized. No facility will be authorized in excess of one watt ERP at 450 meters HAAT.

Since the calculated HAAT is -73m as demonstrated in Appendix B, the applicant shall employ a 100 Watt ERP and is thus well within 47 C.F.R. Section 73.811(a) compliance.

5.0 FREQUENCY SEARCH PRESELECTION OVERVIEW

Channels Found With no Spacing Violations

Based upon a 47 C.F.R. Section 73.807 frequency search, the following table demonstrates channels which are available for the assignment of LPFM stations at the proposed location:

Channel	Comments
267	Meets the minimum spacing requirements pursuant to 47 C.F.R. Section 73.807 of the FCC Rules.
261	Meets the minimum spacing requirements pursuant to 47 C.F.R. Section 73.807 of the FCC Rules.

6.0 ALLOCATION ANALYSIS

As indicated in Section 5, several channels are available for an LPFM facility for the chosen location. Further area propagation and interference analysis studies identify channel 261 as having the least amount of inbound interference from surrounding FM broadcast stations.

6.1 LPFM Short Space Study for Channel 261

Appendix C is a long form channel study which demonstrates the distance separation requirements of 47 C.F.R. Section 73.807 to surrounding FM stations. As demonstrated there are no short spacing violations and is fully compliant with all spacing requirements.

7.0 INTERFERENCE TO TRANSLATOR OR BOOSTER INPUT SIGNALS

Pursuant to the requirements of 47 C.F.R. Section 73.827(a), Appendix D lists the following FM translator stations which are located within 10 km of the proposed LPFM site and are subject to potential third adjacent-channel interference to the reception of their input channel from their parent station from the herein proposed LPFM facility:

- W235AO FCC File No: BLFT-20121101AAW
Input Channel: WDYN(AM) Channel source: AM Frequency Band
- W241AF FCC File No: BLFT-20120828ABA
Input Channel: WUSY(FM) Ch. 264
- W257AZ FCC File No: BLFT-19931101TD
Programming Delivery Method: Unspecified
- W257AZ FCC File No: BPFT-20120329AJF
Input Channel: WUUQ-FM Ch. 247
- W284AE FCC File No: BLFT-20011119ABO
Input Channel: W215BH Ch. 215

As demonstrated, all but one of the listed translators or boosters has an input channel that is third-adjacent to the proposed LPFM facility; as such the proposed LPFM facility will not cause interference to the input signals of W235AO, W257AZ and W284AE.

W241AF has an input channel of 264 from WUSY(FM) which is third adjacent from the proposed LPFM facility on channel 261. As illustrated in the map in Appendix D, the proposed LPFM station lies 3.8 km and 115.2 degrees from true north from W241AF. W241AF receives its signal from WUSY which is located 13.5 degrees from true north from W241AF. As demonstrated the proposed LPFM station is not within 2km of the translator, nor is it within 10 km of the translator's +/- 30 degrees arcs from the 13.5 radial. As such the proposed LPFM station is OUTSIDE the potential interference area and warrants no further study.

8.0 CHANNEL 6 TELEVISION STATIONS

Section 47 C.F.R. Section 73.825 TV Channel 6 interference is not a factor for LPFM stations operating on channels 221 – 300 and thus is not applicable to the instant application for further analysis.

9.0 AM STATION PROXIMITY

Pursuant to 47 C.F.R. Section 1.30002(e), the addition of an antenna-supporting structure on a building shall be considered construction subject to the analysis and notification requirement only if the height of the antenna-supporting structure ALONE exceeds the 60 and 36 electrical degree threshold in Section 1.30002(a) and 1.30002(b) for a non-direction and directional AM facility respectively.

The proposed support structure in this instance extends 5 meters above the roof top. A worst case proposed support structure height in electrical degrees shall be calculated using the highest frequency on the AM band of 1600 kHz which subsequently has the highest wavelength and thus is the most prone to vertical radiators. As such the worst case proposed structure height in electrical degrees is as follows:

- AM Wavelength = $300/1.6 = 187.5$ meters
- Prop. Support Structure. Ht. in elec. Deg. = $(5/187.5)(360) = 9.6$ electrical degrees

As demonstrated the calculated height in electrical degrees is well below the 60 and 36 electrical degree thresholds for non-directional and directional AM facilities respectively. As such, the proposed LPFM facility and its support

structure are not subject to the moment method analysis and 30 day advance notification of the commencement of construction of the proposed rooftop support structure.

10.0 INTERNATIONAL COORDINATION

The proposed facility lies beyond 320km from any international boarder and thus international coordination is not required.

11.0 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

11.1 General Environmental Requirements

The proposed support structure and antenna will not:

- Require high intensity white lighting.
- Is not located in an official designated wilderness area or wildlife preserve.
- Does not threaten the existence or habitat of endangered species.
- Does not affect districts, sites, buildings, structures or objects significant in American history, architecture, archaeology, engineering or culture that are listed in the National Register of Historic Places or are eligible for listing.
- Does not affect Indian religious sites.
- Is not located in a floodplain
- Does not require construction that involves significant changes in surface features (e.g., wetland fill, deforestation or water diversion).

11.2 Radio Frequency Radiation (RFR) Compliance.

Appendix F is a RFR analysis which demonstrates that the peak RFR exposure is 87.0% of the most restrictive permissible exposure threshold standing anywhere on the rooftop in any proximity to the proposed support structure. Pursuant to OET Bulletin 65, since the proposed operation exceeds 5% of the most permissible exposure at any location 2 meters above the rooftop, it is considered a significant contributor to RFR exposure and other sources of RFR must be taken into account for a cumulative RFR analysis. Since there are no other RF sources in the area to contribute to a cumulative RFR analysis, Appendix F is considered the cumulative RFR analysis. It should be further noted that access to the roof top where the antenna is located is restricted to the general public. The instant application is compliant with the FCC limits for human

exposure to RFR and thus is excluded from further environmental processing.

12.0 CONCLUSION

As the frequency search and other studies indicate, channel 261 along with the other proposed technical parameters meets or exceeds all regulatory criteria.

13.0 CERTIFICATION

The foregoing statement and the report regarding the aforementioned engineering work are true and correct to the best of my knowledge. Executed on November 14, 2013.

KESSLER AND GEHMAN ASSOCIATES, INC.



Ryan Wilhour
Consulting Engineer

APPENDIX A - FCC Towair Study

Antenna Structure Registration (ASR) filing determination was calculated from the FCC's structure registration tool:

<http://wireless2.fcc.gov/UlsApp/AsrSearch/towairSearch.jsp>

Results are as follows:

DETERMINATION Results	
Structure does not require registration. The structure meets the 6.10-meter (20-foot) Rule criteria.	
Your Specifications	
NAD83 Coordinates	
Latitude	34-59-39.9 north
Longitude	085-18-23.7 west
Measurements (Meters)	
Overall Structure Height (AGL)	10
Support Structure Height (AGL)	5
Site Elevation (AMSL)	202.4
Structure Type	
BMAST - Building with Mast	

APPENDIX B - Height Above Average Terrain Calculation

The Height above Average Terrain (HAAT) was calculated from the FCC's HAAT Calculator tool:

http://transition.fcc.gov/mb/audio/bickel/haat_calculator.html

Results are as follows:

Antenna Height Above Average Terrain Calculations -- Input

Latitude **34 59 40.2 North**
Longitude **85 18 23.5 West** (NAD 27)

Height of antenna radiation center above mean sea level [RCAMSL] = **212.4** meters

Number of Evenly Spaced Radials = 8 0° is referenced to True North

Results:

Calculated HAAT= -73. meters

(Antenna Height Above Average Terrain)
using the 30 second FCC/NGDC terrain data)

Antenna Radiation Center Heights Above Individual Radials:

0.0°	-11.2 meters
45.0°	-22.6 meters
90.0°	-8.0 meters
135.0°	-21.7 meters
180.0°	-43.1 meters
225.0°	-181.1 meters
270.0°	-171.2 meters
315.0°	-127.8 meters

APPENDIX C - Short Spacing Study for Channel 225

```

REFERENCE                                     CLASS = L1                                     DISPLAY DATES
34 59 40.2 N.                                Current Spacings to 2nd Adj.                DATA 11-13-13
85 18 23.5 W.                                Channel 261 - 100.1 MHz                    SEARCH 11-14-13
-----
    
```

Call	Channel	Location	Azi	Dist	FCC	Margin
W260AJ	LIC-D 260D	Ringgold	GA 111.5	20.67	20.5	0.17
WNSY	LIC 261C3	Talking Rock	GA 118.3	84.81	77.5	7.3
WWFC-LP	LIC 260L1	Bryant	AL 243.0	28.86	13.5	15.4
WOOP-LP	LIC 260L1	Cleveland	TN 59.1	44.86	13.5	31.4
WQRV	LIC-N 262C2	Meridianville	AL 259.9	123.09	79.5	43.6
WCYQ	LIC 262C	Oak Ridge	TN 35.7	165.32	119.5	45.8
AL3855	RSV-A 262C2	Meridianville	AL 261.9	132.25	79.5	52.8
1558219	APP 259D	Damascus	GA 144.8	60.52	7.5	53.0
1571996	APP-D 259D	Damascus	GA 150.3	62.11	7.5	54.6
W262CD	LIC-D 262D	Rome	GA 175.3	84.58	27.5	57.1
WWTN	LIC 259C0	Hendersonville	TN 310.0	143.36	83.5	59.9

 RSV-R = reserved - needs protection, RSV-A = allocation.
 All separation margins include rounding

APPENDIX D – Translator and Booster Proximity

The proposed transmitter site proximity to FM boosters and translators was determined using the FCC's FMQuery tool:

<http://www.fcc.gov/encyclopedia/fm-query-broadcast-station-search>

Results are as follows:

Boosters within 10km of the proposed LPFM transmitter site:

Search Parameters

Service:	FB
Search radius:	10.00 km
Center lat / lon:	N 34 59 40.20 W 85 18 23.50
Lower channel	200
Upper channel	300

*** 0 FM Records within 10.00 km distance of 34° 59' 40.20" N, 85° 18' 23.50" W ***

Translators within 10km of the proposed LPFM transmitter site:

Search Parameters

Service:	FX
Search radius:	10.00 km
Center lat / lon:	N 34 59 40.20 W 85 18 23.50
Lower channel	200
Upper channel	300

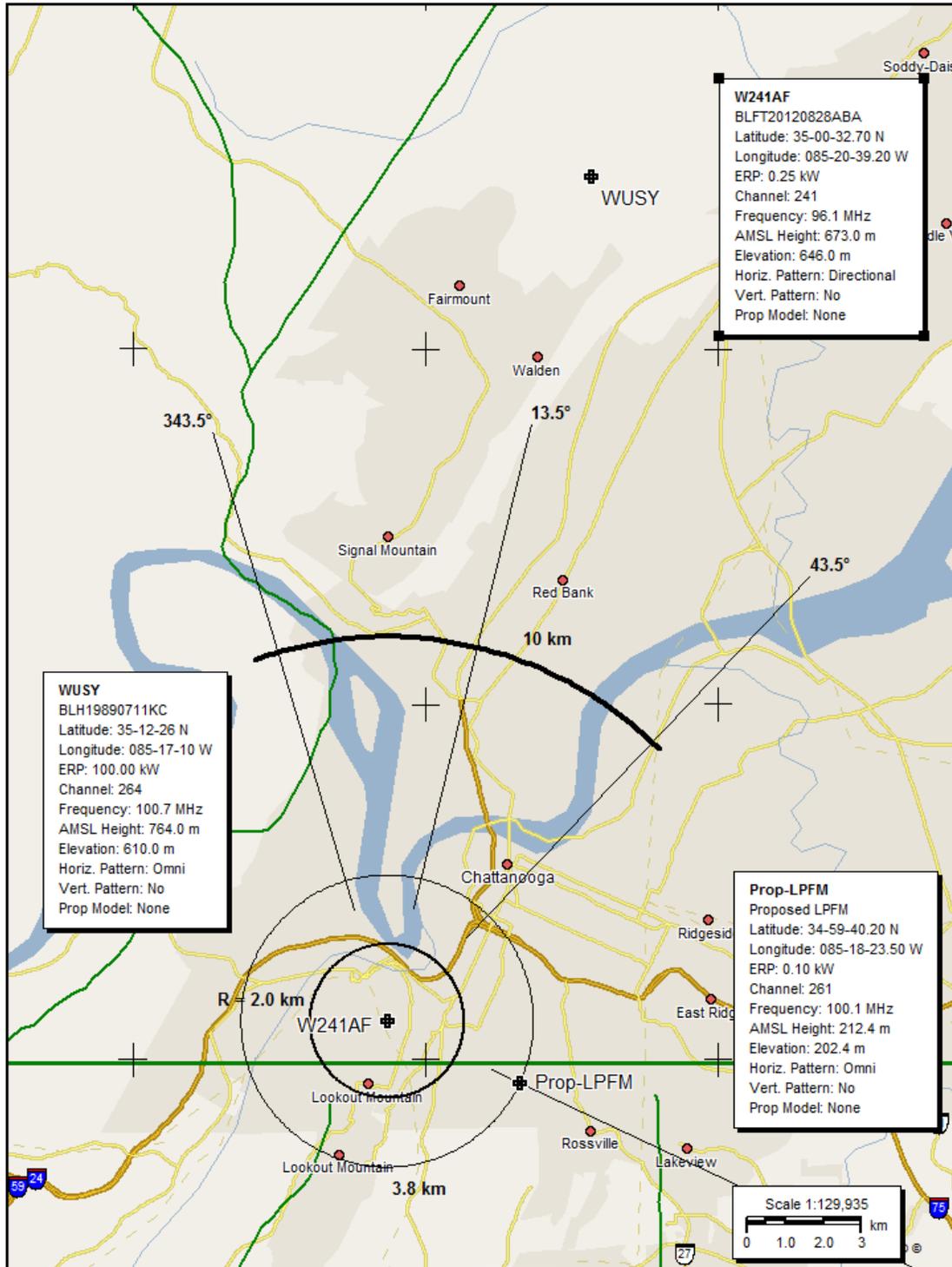
Call	channel	Class	Service	Frequency	status	City	State	Country	File Number	Docket
W235AO	235	D	FX	94.9 MHz	LIC	CHATTANOOGA	TN	US	BLFT-20121101AAW	
W241AF	241	D	FX	96.1 MHz	LIC	ROSSVILLE	GA	US	BLFT-20120828ABA	
W257AZ	257	D	FX	99.3 MHz	LIC	LOOKOUT MOUNTAIN	TN	US	BLFT-19931101TD	
W257AZ	257	D	FX	99.3 MHz	CP	LOOKOUT MOUNTAIN	TN	US	BPFT-20120329AJF	
W284AE	284	D	FX	104.7 MHz	LIC	ORCHARD HILLS	GA	US	BLFT-20011119ABO	

*** 5 FM Records within 10.00 km distance of 34° 59' 40.20" N, 85° 18' 23.50" W ***

APPLICATION FOR A NEW LPFM BROADCAST STATION TO SERVE CHATTANOOGA, TN

Alton Park Development Corporation

November 14, 2013



APPENDIX E – AM Station Proximity

The proposed transmitter site proximity to AM stations was determined using the FCC's FMQuery tool:

<http://www.fcc.gov/encyclopedia/am-query-broadcast-station-search>

Results are as follows:

AM Stations within 3.2 km radius for 47 C.F.R. Section 73.1692 compliance:

Search Parameters	
Search radius:	3.20 km
Center lat / lon:	N 33 7 44.10 W 95 55 28.50
Lower Frequency	530
Upper Frequency	1700

*** 0 AM Records within 3.20 km distance of 33° 7' 44.10" N, 95° 55' 28.50" W ***

APPENDIX F - Far Field Exposure to RF Emissions

A theoretical analysis has been conducted of the human exposure to radio frequency radiation (“RFR”) using the calculation methodology described in OET Bulletin 65, Edition 97-01. The RFR analysis is conducted pursuant to the following methodology:

Terrain¹ extraction is compiled from the support structure site, if the support structure is on a rooftop with no higher elevations (e.g., elevator shaft) then flat terrain is compiled. Terrain is extracted using radial lengths of 0.25 miles in 0.001 mile increments for 360 radials. The power density is calculated for each terrain point at 6 feet above ground level using the elevation and azimuth pattern of the proposed broadcast antenna. The power density calculations are conducted using the lower edge of the proposed channel frequency. To account for ground reflections, a coefficient of 1.6 was included in the calculation.

The resulting cylindrical polar analysis is then summarized into a coordinate plane graph using the following methodology:

Starting from the origin the maximum calculated RFR value is determined among the 360 degree radials for each 0.001 mile increment, the value is then converted into a percentage of the maximum allowable general population or uncontrolled exposure and plotted as a function of perpendicular distance from the tower.

-  Maximum Allowable General Population or Uncontrolled Exposure
-  5 % of Maximum General Population or Uncontrolled Exposure
-  Percentage of Maximum General Population or Uncontrolled Exposure

¹ Terrain extraction is based upon a 3 arc second point spacing terrain database.