

TECHNICAL EXHIBIT
APPLICATION FOR FM CONSTRUCTION PERMIT
FM TRANSLATOR W249BN
MEMPHIS, TENNESSEE
CH 249D 0.250 KW (MAX-DA)

Technical Narrative

This Technical Exhibit was prepared in support of an application for construction permit for a FM translator station W249BN at Ellendale, Tennessee. W249BN is currently licensed to operate with an effective radiated power (ERP) of 19 watts (BLFT-20070627ACF). This application proposes to change the community of license to Memphis, Tennessee, increase the effective radiated power to 250 watts and relocate its transmitter site to another tower located near Bartlett, Tennessee. This application is classified as a minor change as there will be contour overlap with the present and proposed 60 dBu contours. The translator will become a fill-in translator for WHBQ(AM) at Memphis, Tennessee.

Tower Registration

The proposed antenna supporting structure is located on a registered structure, ASR number 1249321.

Predicted Coverage Contour

The predicted 60 dBu coverage contour was 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 N.G.D.C. 30-second terrain database. The distances to the predicted 60 dBu coverage contour for the proposal was determined using the average elevations of radials spaced every 30-degrees 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. Figure 3 is a map showing the predicted 60 dBu coverage contour of the proposed translator facility.

The presently licensed 60 dBu contour is also shown on the map to indicate this is a minor change application.

Allocation Considerations

Toward all other licensed and authorized stations, there is no prohibited contour overlap predicted except toward: WHRK(FM) on Channel 246C1 (97.1 MHz) at Memphis and WXXM(FM) on Channel 251C1 (98.1 MHz) at Millington.

The protected 60 dBu contours of both WHRK(FM) and WXXM(FM) overlap the proposed W249BN 100 dBu interfering contour. However, no actual interference is predicted to occur to any populated area as required by Section 74.1204(d) of the Commission's Rules.

The FCC propagation curves predict that WHRK(FM) has a field strength of 81 dBu at the proposed translator transmitter site and that WXXM(FM) has a field strength of 106 dBu at the proposed translator transmitter site. Applying a 40 dB desired-to-undesired ratio, the proposed facility does not cause interference to population within the "worst-case" 121 dBu interfering contour.

The “worst-case” 121 dBu translator interfering contour is only predicted to extend 98 meters from the transmitting antenna. The proposed transmitting antenna radiation center above ground level on the tower is 182 meters (600 feet), well above the 98 meter “worst-case” interference zone. Therefore, the predicted interference area to either WHRK(FM) or WXXM(FM) will not occur at ground level and therefore is permitted by Section 74.1204(d) of the Commission’s Rules.

Radio Frequency Exposure Analysis

The proposal is categorically excluded from environmental processing, as an existing tower site is to be employed, and the proposal complies with the FCC Rules concerning human exposure to radio frequency (RF) energy. The proposal will not exceed one percent of the RF exposure limit for general population/uncontrolled environments for the frequency proposed. The calculation of RF energy at ground level was made under the procedures of OET Bulletin No. 65.¹ The formula employed is as follows:

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

Where, S = power density in $\mu\text{W}/\text{cm}^2$, 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. Based on the conservative assumption of a relative field factor of 1.0 with a total effective radiated power of 250 watts, and an antenna radiation center height above ground of 182 meters (600 feet), the calculated power density will not exceed $0.5 \mu\text{W}/\text{cm}^2$. Therefore, the calculated RF exposure at ground level will not exceed 5 percent of the limit of $200 \mu\text{W}/\text{cm}^2$ for an uncontrolled electromagnetic environment. As the predicted exposure contribution is less than five percent, consideration of other emitters is not necessary.

¹ Federal Communications Commission OET Bulletin No. 65, Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields (Edition 97-01, August 1997).

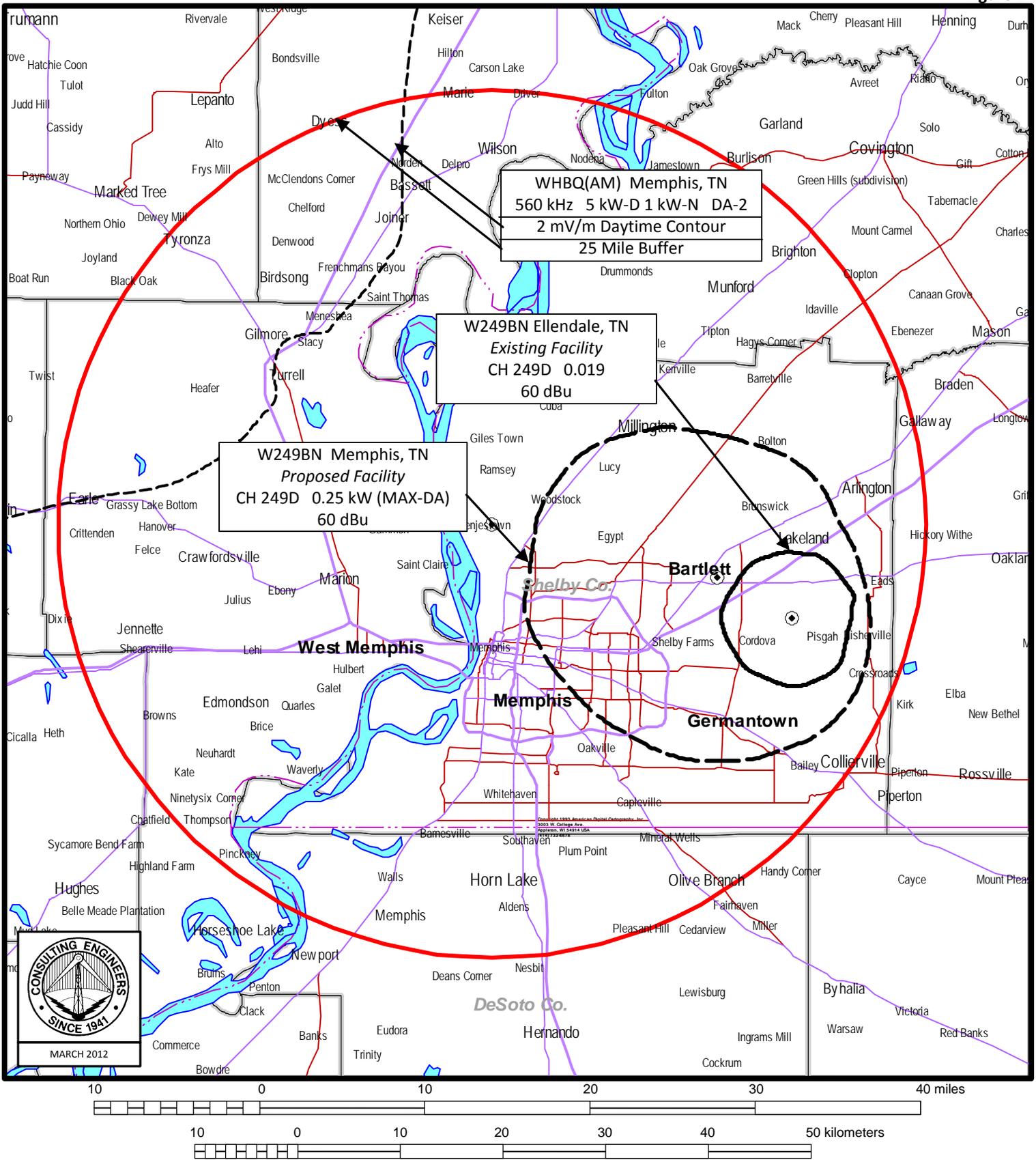
The transmitter site shall be restricted from access. In the event that personnel are required to climb the structure, the proposed FM translator transmissions shall be reduced or terminated as necessary to prevent RF exposure above the FCC recommended limits.

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Figure 1



FCC PREDICTED COVERAGE CONTOURS

FM TRANSLATOR W249BN
MEMPHIS, TENNESSEE

CH 249D 0.25 KW (MAX-DA)

du Treil, Lundin & Rackley, Inc Sarasota, Florida

APPENDIX

PROPOSED TRANSMITTING ANTENNA MANUFACTURER SPECIFICATIONS

Model 6020 Vertically-Polarized FM Antenna

(USA domestic)

Vertical polarization

5 kW power rating per bay

Radomes & de-icers not required

Shively standard features:

- Low weight and windload
- Rugged corrosion-resistant adjustable mounts
- Easy to install - minimum maintenance
- Non-pressurized
- Pattern studies and directional patterns available

Performance specifications:

Polarization: Vertical only.

Frequency range: 88-108 MHz

Impedance: 50 Ω

VSWR: Better than 1.3 : 1 over the FM band

Dimensions (per bay): 56 in x 41.6 in x 5.5 in

Materials: External parts: stainless
Internal parts: copper & stainless

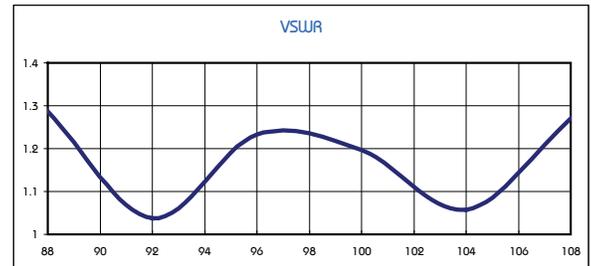
Input Connection: One bay: female 7/8" EIA.

Electrical specifications:

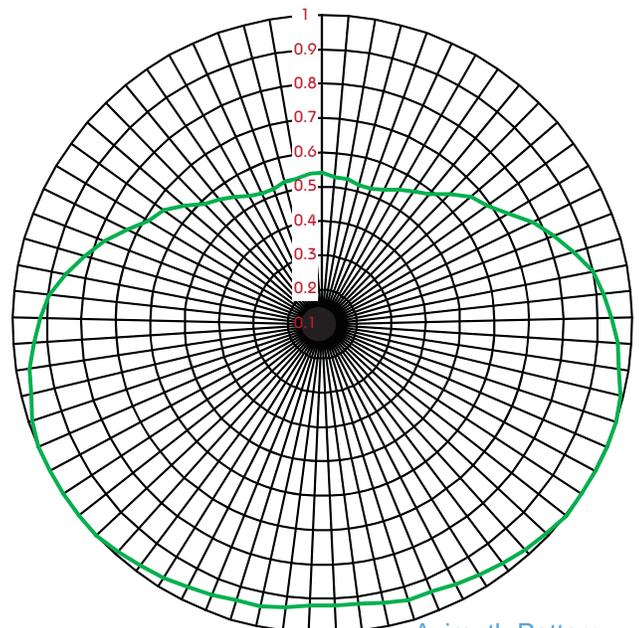
No. of bays	Gain		Power rating (kW)	Max. ERP (kW)
	Power	dB		
1	0.92	-0.36	5	4.6
2	1.98	2.97	10	19.8
3	3.10	4.91	14	43.4
4	4.24	6.27	20	118.7
5	5.40	7.32	25	151.2
6	6.56	8.17	28	183.7
7	7.74	8.89	28	216.7
8	8.92	9.50	28	249.8

NOTE

Gain and patterns depend on mounting geometry.
Gain figures are derived from the computed directivity and include the losses in the antenna feed system. Gain and patterns depend on mounting geometry.



VSWR vs. frequency



Azimuth Pattern

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