

**MULLANEY ENGINEERING, INC.**

9049 SHADY GROVE COURT  
GAITHERSBURG, MD 20877

**ENGINEERING EXHIBIT EE:**

**RADIO STATION KXIT-FM  
DALHART RADIO, INC.  
DALHART, TEXAS**

**Ch. 241C3 25 KW 53 M HAAT**

**NOVEMBER 26, 2001**

ENGINEERING STATEMENT IN SUPPORT OF  
AN APPLICATION FOR A  
“ONE-STEP” UPGRADE  
&  
CORRECTION OF COORDINATES  
OF A LICENSED FM FACILITY

File No. BMLH-20010424AAK8 - Facility ID: 15018

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## Declaration

I, John J. Mullaney, declare and state that I am a graduate electrical engineer with a B.E.E. and my qualifications are known to the Federal Communications Commission, and that I am an principal engineer in the firm of Mullaney Engineering, Inc., and that I have provided engineering services in the area of telecommunications since 1977. My qualifications as an expert in radio engineering are a matter of record with the Federal Communications Commission.

The firm of Mullaney Engineering, Inc., has been requested by Dalhart Radio, Inc., to prepare the instant engineering exhibit in support of an application for Construction Permit for a “one-step” upgrade (on a first adjacent channel) and correction of coordinates for radio station KXIT-FM, licensed to Dalhart, Texas (FCC Facility ID Number: 15018).

All facts contained herein are true of my own knowledge except where stated to be on information or belief, and as to those facts, I believe them to be true. I declare under penalty of perjury that the foregoing is true and correct.

/s/ John J. Mullaney

John J. Mullaney, Consulting Engineer

Executed on the 26th day of November 2001.

**ENGINEERING EXHIBIT EE:**

**RADIO STATION KXIT-FM  
DALHART RADIO, INC.  
DALHART, TEXAS**

**Ch. 241C3 25 KW 53 M HAAT**

**NARRATIVE STATEMENT:**

**I. General:**

This engineering statement has been prepared on behalf of Dalhart Radio, Inc., proposed assignee of KXIT-FM at Dalhart, Texas. The purpose of this statement is to request a Construction Permit authorizing a “one-step” upgrade (on a first adjacent channel) and minor correction of coordinates. KXIT-FM proposes to change channels from 240A to 241C3 and will operate with an ERP of 25 KW and an HAAT of 53 Meters.

The application is not a major environmental action, as defined by Section 1.1307 of the Commission’s Rules. The proposed facility is in full compliance with both the “controlled” & “un-controlled” FCC Radiation Guidelines.

Answers to questions contained in F.C.C. Form 301, Section III-B, are incorporated in the following paragraphs and figures.

A separate 301 application will be filed to correct the official coordinates of KXIT (AM) which operates on 1240 kHz with 1 kW ND-U from this same tower.

## **II. Engineering Discussion:**

### **A. Proposed Location:**

KXIT-FM proposes to remain at its existing site which is located approximately 3.2 kilometers north of Dalhart, TX. Upon a review of the Antenna Structure Registration (ASR: 1048321) for this facility it was determined that the coordinates were corrected by 0.14 km (0.09 miles) but the licenses of the AM/FM facility were never updated to reflect the correction. The corrected NAD-27 geographic coordinates are:

Latitude: 36° 05' 41"

Longitude: 102° 30' 35"

The Regional Office of the FAA was notified of this proposal since an existing tower will be used with **no change in overall height or location.**

### **B. Antenna System and Tower:**

A dual polarized Jampro model JMPC-6 (EPA type: 2), "Double V", 6-bay FM antenna will be side mounted near the top of an existing tower. Figure 3 is a sketch of the tower. The antenna has a non-directional power gain of 3.2 H/V.

The antenna will be fed by 61 Meters (200 Feet) of 1-5/8" coaxial cable, with a rated efficiency of 90.4 percent for this length.

### **C. Transmitter:**

KXIT-FM plans to install a type accepted 10 KW FM transmitter. The transmitter will be operated at 8.64 KW which is within its rated power.

**D. Effective Radiated Power:**

Giving consideration for the maximum antenna gain, transmitter power and line loss, the maximum Effective Radiated Power is 25 KW for the Horizontal and 25 KW for the Vertical Component.

**E. Channel Allocation:**

Figure 4 is a channel allocation study for 241C3 from the existing/corrected site. This "one-step" upgrade application is in full compliance with Section 73.207(a). Since the existing site is properly spaced it can be used for allotment purposes.

**F. Terrain Profile Data & Coverage:**

Terrain profile data was extracted from the NGDC 30 Second Digitized Terrain Data Base provided out of Boulder, Colorado. At least twenty-four bearings (every 15 degrees) were used to obtain the proposed coverage data. The standard eight bearings (every 45 degrees) were used to obtain the proposed HAAT.

The predicted service contours, as shown in Figure 2 of the attached report, were computed using a mathematical model adapted for computer use of data shown in Figure 1 of Section 73.333. This is the Commission's computer program TV FM FS REPORT RS-76-01, dated January 1976.

Figure 4 also provides a tabulation of the distances to the 70 dBu (3.16 mV/M - City Grade) & 60 dBu (1.0 mV/M - Primary) contours in Metric Units (Meters/Kilometers).

**G. Terrain Profile to City of License:**

The N-180-E radial is the direct path to the City of License. From the proposed site the 3.16 mV/M City Grade Contour will completely encompass the City of License without major terrain obstruction.

**H. Coverage Area and Population:**

The area contained within the 60 dBu (1.0 mV/M) contour has been computed mathematically. The population within this contour was obtained through a computerized analysis of the census designated places population data contained in the 2000 census.

**I. FM Blanketing Contour:**

KXIT-FM recognizes its obligation to resolve related interference complaints for a one year period within its 115 dBu "FM Blanketing Contour" as required by Section 73.318 of the FCC Rules.

The radius around the base of the tower in which Blanketing interference is possible is fairly small (2.0 km). Given the height of the proposed antenna, no problems are anticipated.

**J. Other Services in Area:**

Besides the co-located operation of KXIT (AM) on 1240 kHz, there are no known AM Broadcast Stations within 3.2 kilometers of the proposed site.

Besides what exists on the tower there are no known transmission facilities within 60 meters (197 feet) of the proposed antenna.

There is one existing FM translator and no TV transmitters within 10 kilometers (6.2 miles) of the proposed site, however, based upon the type of transmitter proposed, and the frequency & power involved no intermodulation interference problems with existing transmitting facilities is expected. In the unlikely event some problems would occur, KXIT-FM will investigate and correct such cases in accordance with the Commission's Rules.

**K. Environmental Assessment Statement:**

KXIT-FM believes its proposal will not significantly affect the environment since it does not meet any of the criteria specified in Section 1.1307 of the rules. Since an existing tower will be used with no change in overall height the only remaining environmental issue is R.F. Exposure. Specifically the proposed facility:

Will NOT involve the exposure of workers or the general public to levels of Radio Frequency radiation in excess of the guidelines recommended by the FCC - OET Bulletin 65 (August 25, 1997).

The following is a more detailed discussion of this protection standard:

**A. National Environmental Policy Act of 1969:**

In 1969, Congress enacted the National Environmental Policy Act (NEPA), which requires the FCC to evaluate the potential environmental significance of the facilities it regulates and authorizes. Human exposure to Radio Frequency (RF) radiation had been identified as an issue that the FCC must consider.



Beginning with the filing of applications after January 1, 1986, broadcast stations were required to “certify compliance” with FCC prescribed guidelines on human exposure to RF radiation. The FCC standard was based upon the American National Standards Institute’s (ANSI) RF radiation protection guides (ANSI C95.1-1982). These exposure limits are expressed in terms of milli-watts per square centimeter.

In October 1997, the FCC implemented a two tier evaluation criteria utilizing recommendations of the National Council on Radiation Protection and Measurement (NCRP). The “controlled” tier involves areas which have restricted access while the “un-controlled” tier involves areas which have unrestricted access. The Maximum Permissible Exposure (MPE) limits for “controlled” areas are the same as adopted in 1985, while the “un-controlled” limits for FM and TV frequencies are one-fifth or 20% of the limits for “controlled” areas.

These exposure limits are time-averaged over any six minute period and vary depending upon the frequency involved. The following are the Maximum Permissible Exposure (MPE) limits for “controlled” areas:

<b>Frequency Range (MHz)</b>	<b>Power Density (mW/sq.cm)</b>
*****	*****
0.3 to 3	100 AM
3 to 30	900/(Freq <sup>2</sup> )
30 to 300	1.0 VHF TV & FM
300 to 1,500	Freq/300 UHF TV
1500 to 100,000	5.0

KXIT-FM recognizes that compliance with the above criteria at sites involving multiple AM, FM and/or TV facilities is based upon the contributions of all such facilities. At the site discussed in this application, **the only significant facilities** are the proposed C3 FM and the existing operation of KXIT (AM) on 1240 kHz with 1 kW ND-U.

### **FM Broadcast Stations RF Exposure**

For FM Broadcast Stations the following formula is used:

$$D = \frac{\text{SQRT}(F^2 * [\text{HERP} + \text{VERP}])}{1.667 * \text{SQRT}(\text{PD}) * 3.2808}$$

Where:

D = the closest distance in meters that a human should come to an operating antenna (To obtain feet multiply by 3.2808)

F = typical relative field factor in downward direction (F=1 is worst case main lobe)

HERP = Horizontal ERP in watts (above a dipole)

VERP = Vertical ERP in watts (above a dipole)

PD = highest Power Density in milli-watts/cm<sup>2</sup>

SQRT = Square Root

Freq = Frequency in mega-cycles/sec. (MHz)

The vertical radiation pattern of the FM antenna specified in this application is narrow and, therefore, the power density as seen by an observer on the ground near the base of the tower will be less than 20 percent of the total ERP.

The application of the above equation (assuming maximum ERP), in our case, for a frequency of 96.1 MHz and an “un-controlled” Power Density of 0.2 milli-watts results in a minimum distance of 91.5 meters (300 feet) from the antenna. Inasmuch as the lowest element on the proposed antenna will be approximately

41 meters (135 feet) above the ground level, additional analysis is required before one can conclude that no hazard will exist.

Figure 5 is a composite vertical elevation plot for a Jampro model **JMPC-6 (EPA type: 2)**, “Double V”, 6-bay full wave FM antenna.

Figure 5-A is a plot of the predicted RF Exposure at 7 feet above ground level. The “solid” line assumes a vertical form factor of  $F=1.0$  while the “dashed” line uses the vertical form factor from Figure 5. As can be seen, the use of the 6 bay full wave FM antenna reduced the exposure at ground level below 80 uW/sq.cm or 8 percent of the standard for a “controlled” area. For FM, the “un-controlled” standard is 20% and therefore, this proposal is in full compliance. The tower will be surrounded by a locked fence to limit access.

Workers employed to climb the tower or work in a potential overexposure location will not be permitted to enter the work area until cleared by the station manager or other responsible person. Appropriate warning signs will be posted to ensure safety. In addition, KXIT-FM will establish and enforce work rules and safety procedures applicable in a potential over-exposure area. The rules will establish how close a worker can get to the antenna when it is operating at normal power and specify the power reduction required in order to make other locations safe. It is recognized that maintenance or installation work on or near the antenna may require the station to completely shutdown or switch temporarily to an auxiliary antenna or an auxiliary transmitter site. All employees, contract and other persons having access to areas of potential

exposure will be required to sign a site management guide indicating they are aware of and will comply with all safety rules. All procedures will be reviewed & updated as necessary.

### **AM Broadcast Stations RF Exposure**

KXIT-FM will insure that the AM tower is surrounded by a gated fence, at least seven feet tall. The fence will be not less than one meter from any point on the tower or feed line. This is the “worst case” distance from Section 1 of Supplement A to OET Bulletin No. 65 (Edition 97-01) assuming: a 1.0 kW, 1240 kHz, AM station with an antenna tower of 0.25 wavelength in height (90.8 degrees). The fence gate will be kept locked and appropriate warning signs posted on each face of the fence. Procedures have been adopted to protect workers requiring access to the tower inside the fenced area, including reduction of power or cessation of operation, to comply with germane exposure guidelines.

**III. SUMMARY:**

Dalhart Radio, Inc., proposed assignee of KXIT-FM at Dalhart, Texas, requests authorization for a “one-step” upgrade (on its first adjacent channel) and a correction of coordinates so as to conform with the ASR currently on file. KXIT-FM proposes to operate on Channel 241C3. This engineering proposal is in full compliance with the Commission’s Rules.

/s/ John J. Mullaney

John J. Mullaney, Consulting Engineer

November 26, 2001.