

MULLANEY ENGINEERING, INC.

9049 SHADY GROVE COURT
GAITHERSBURG, MD 20877

ENGINEERING EXHIBIT EE:

**AD ASTRA PER ASPERA BROADCASTING, INC.
HUTCHINSON, KANSAS**

Ch. 240A 4.7 KW 113 M HAAT

DECEMBER 28, 2004

**ENGINEERING STATEMENT IN SUPPORT OF
AN APPLICATION FOR A
NEW FM STATION
FM AUCTION LONG FORM APPLICATION**

File No. BSFH-20040730BHR - Facility ID: 164086

ATTACHED TO EXHIBIT 25 OF FCC FORM 301



ENGINEERING EXHIBIT EE:

**AD ASTRA PER ASPERA BROADCASTING, INC.
HUTCHINSON, KANSAS**

Ch. 240A 4.7 KW 113 M HAAT

TABLE OF CONTENTS:

1. F.C.C. Form 301.
2. Declaration of Engineer
3. Narrative Statement
4. Figure 1, Topographic Map Showing Proposed Site. ##
5. Figure 2, Proposed Coverage Map.
6. Figure 3, Vertical Tower Sketch.
7. Figure 4, Channel Allocation.
8. Figure A, Commonly Owned Stations Map.
9. Figure B, Non-Common Stations Map.

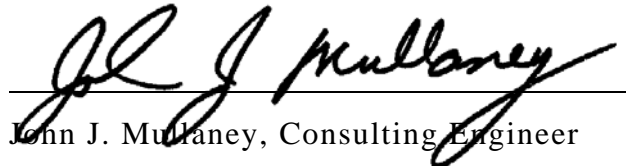
- Not Required.

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 a 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 Ad Astra Per Aspera Broadcasting, Inc., to prepare the instant engineering exhibit in support of an application for Construction Permit for a new FM radio station licensed to Hutchinson, Kansas (FCC Facility ID Number: 164086).

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.



John J. Mullaney, Consulting Engineer

Executed on the 28th day of December 2004.

ENGINEERING EXHIBIT EE:

**AD ASTRA PER ASPERA BROADCASTING, INC.
HUTCHINSON, KANSAS**

Ch. 240A 4.7 KW 113 M HAAT

NARRATIVE STATEMENT:

I. General:

This engineering statement has been prepared on behalf of Ad Astra Per Aspera Broadcasting, Inc. The purpose of this statement is to request a Construction Permit to build a new FM broadcast facility on Channel 240A at Hutchinson, Kansas, which will operate with an ERP of 4.7 KW and an HAAT of 113 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. Since the proposed facility contributes less than 1% of the "controlled" standard it is categorically excluded from further consideration.

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

II. Engineering Discussion:

A. Proposed Location:

The applicant proposes to extend the height of an existing tower 8 kilometers Northwest of Hutchinson, Kansas. The NAD-27 geographic coordinates are:

Latitude: 38° 08' 41.7"

Longitude: 97° 57' 15.9"

The Regional Office of the FAA was notified of this proposal. The current Antenna Structure Registration number is 1032769.

B. Antenna System and Tower:

A dual polarized 4-bay half-wave spaced FM antenna will be side mounted near the top of a modified tower. **Figure 3** is a sketch of the proposed tower. The antenna has a non-directional power gain of 1.3 H/V.

The antenna will be fed by 99 Meters (325 Feet) of 1-5/8" coaxial cable, with a rated efficiency of 85.9 percent for this length.

C. Transmitter:

The applicant plans to install a type accepted 5 KW FM transmitter. The transmitter will be operated at 4.2 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 4.7 KW for the Horizontal and 4.7 KW for the Vertical Component.

A Class-A FM station is restricted to a maximum of 6 KW (ERP) up to a maximum Height Above Average Terrain (HAAT) of 100 Meters. This proposal will operate with an HAAT that exceeds the maximum and consequently must reduce its ERP in order to obtain equivalent coverage within the 1.0 mV/m contour.

Current F.C.C. policy permits stations that are beyond 320 kilometers from the Mexican or Canadian Borders to use the F(50,50) curves to determine what reduced power at their HAAT will provide the equivalent maximum 1.0 mV/M coverage allowed.

Using the curve, it was determined that Class A operations at an HAAT of 113 Meters requires the ERP to be no greater than 4.7 KW.

E. Channel Allocation:

Figure 4 is a channel allocation study from the proposed site. This application is in full compliance with Section 73.207(a).

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. Twelve equally spaced radials (every 30 degrees) were used to obtain the proposed HAAT.

The predicted service contours, as shown in 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.

G. Terrain Profile to City of License:

The N-160-E radial is the direct path to the City of License. From the proposed site the 3.16 mV/M or 70 dBu 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:

The applicant 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 (0.9 km) and is in a sparsely populated area. Given the height of the proposed antenna, no problems are anticipated.

J. Other Services in Area:

There are no known AM Broadcast Stations within 3.2 kilometers of the proposed site. There are no known transmission facilities within 60 meters (197 feet) of the proposed antenna.

There are no other known FM or 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, the applicant will investigate and correct such cases in accordance with the Commission's Rules.

K. Environmental Assessment Statement:

The applicant 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 only a modest change (16.4%) in overall height the only remaining environmental issue is R.F. Exposure. Specifically the proposed facility:

1) 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:

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

The applicant 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 facility** that will exist is the proposed FM facility.

FM Broadcast Stations

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/cm²
- SQRT = Square Root
- Freq = Frequency in mega-cycles/sec. (MHz)

The vertical radiation pattern of the FM antenna specified in this application is very 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 95.9 MHz and an “un-controlled” Power Density of 0.2 milliwatts results in a minimum distance of 39.7 meters (131 feet) from the antenna. Inasmuch as the lowest element on the proposed antenna will be approximately 81.7 meters (268 feet) above the ground level, it is self-evident that no hazard from radiation will exist to persons at ground level. At approximately 2 meters above the ground and assuming maximum downward radiation, the proposed FM facility contributes 4.4% of the FCC “controlled” standard. However, using a modest form factor of $F=0.7$ the proposed FM facility contributes 0.7% of the FCC “controlled” standard at 2 meters above ground. For FM, the “un-controlled” standard is 20% and, therefore, this proposal is in full compliance and is categorically excluded from further consideration since it is less than 5%.

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, the applicant 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. In the instance of a multiple use site, a single site access policy incorporating the above philosophy will be established. All procedures will be reviewed & updated as necessary.

L. Duopoly Certification:

Besides being an applicant for this new FM facility, Ad Astra Per Aspera Broadcasting, Inc., is licensee of KSKU(FM), KGGG(FM) and KXKU(FM). It was determined that none of the cities of licenses are located within a rated market. The proposed ownership of this new FM facility will increase the **duopoly overlap to four same service facilities.**

Figure A is a map illustrating the FM 70 dBu contours for each of the four commonly owned stations/applications. It should be noted that in addition to the licensed facilities, KSKU has a pending application & an existing CP for C2 facilities; KGGG has a pending upgrade application for C2 facilities. Using only licensed facilities for each of the stations the duopoly increases from two to three same service overlaps. There is no overlap between the licensed facilities of KSKU & KGGG. However, under a worst case analysis the maximum duopoly involves all four FM facilities.

KSKU - if this pending application/RM is granted and subsequently built the duopoly overlap will be no larger than three overlapping FM service. There will never be an overlap between KSKU & KGGG. This would maintain the present level of overlap and therefore, since it exists does not need to be justified.

KGGG - if this pending application is granted there will for the first time be an **overlap between all three “existing” commonly owned FM stations**. The KGGG app would result in an overlap to both the KSKU license & CP authorizations. However, if KSKU implements its pending application/RM the duopoly overlap will stay at three.

Figure B is a map which outlines the overlap footprint of KSKU-App, KXKU-Lic, KSKU-Lic and this new application. The map also shows the antenna sites and 70 dBu contours for 19 other existing FM stations all of which are located within 92 km of the perimeter of the area of the 4 FM overlap.

Based upon this analysis it was concluded that the radio market consists of at least 23 stations including the four under common control. In order to justify the ownership of 4 overlapping same service stations it is only necessary to show a minimum of 15 stations in the market. This statement demonstrates that there are at least 23 stations or 8 more than necessary in the radio market.

III. SUMMARY:

Ad Astra Per Aspera Broadcasting, Inc., proposes to construct a new FM facility on Channel 240A at Hutchinson, Kansas. This engineering proposal is in full compliance with the Commission's Rules.



John J. Mullaney, Consulting Engineer

December 28, 2004.