

MULLANEY ENGINEERING, INC.

9049 SHADY GROVE COURT
GAITHERSBURG, MD 20877

ENGINEERING EXHIBIT EE:

**RADIO STATION KHVT(FM)
HOUSTON CHRISTIAN BROADCASTERS, INC.
BLOOMINGTON, TEXAS**

Ch. 218C2 13 KW 147 M HAAT

OCTOBER 21, 2005

**ENGINEERING STATEMENT IN SUPPORT OF
AN APPLICATION FOR A
MINOR MODIFICATION OF CONSTRUCTION PERMIT
NEW FM STATION**

File No. BPED-19971114MA - Facility ID: 89111

ATTACHED TO EXHIBIT 14 OF FCC FORM 340



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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 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 Houston Christian Broadcasters, Inc., to prepare the instant engineering exhibit in support of an application for minor modification of an unbuilt Construction Permit for a new FM radio station KHVT(FM), licensed to Bloomington, Texas (FCC Facility ID Number: 89111).

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 21st day of October 2005.

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HOUSTON CHRISTIAN BROADCASTERS, INC.
BLOOMINGTON, TEXAS**

Ch. 218C2 13 KW 147 M HAAT

NARRATIVE STATEMENT:

I. General:

This engineering statement has been prepared on behalf of Houston Christian Broadcasters, Inc. The purpose of this statement is to request a minor modification of an unbuilt Construction Permit for a new FM broadcast facility on Channel 218C2 at Bloomington, Texas. The facility as modified herein will operate with an ERP of 13 KW and an HAAT of 147 Meters. This application proposes facilities which are in compliance with the contour protection requirements of Section 73.509 to other existing and proposed FM facilities. In addition, this application complies with Section 73.525 regarding Channel 6 TV Stations.

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 340, are incorporated in the following paragraphs and figures.

II. Engineering Discussion:

A. Proposed Location:

HCB proposes to locate on an yet to be built tower which has an Antenna Structure Registration Number (ASRN) of 1250478.

B. Antenna System and Tower:

A dual polarized 8-bay FM antenna will be side mounted on a tower. **Figure 3** is a sketch of the proposed antenna location.

C. Effective Radiated Power:

Giving consideration for the maximum antenna gain, transmitter power and line loss, the maximum Effective Radiated Power is 13 KW for the Horizontal and 13 KW for the Vertical Component.

D. Channel Allocation:

Figure 4 is a channel allocation study from the proposed site which identifies all FM & TV Channel 6 stations which are close enough to be of concern. **Figure 5** is a map which demonstrates full compliance with Section 73.509 regarding FM to FM protection. **Figure 6** is a map which demonstrates full compliance with Section 73.525 regarding FM to TV Channel 6 protection. No prohibited overlap occurs.

E. 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 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.

F. Terrain Profile to City of License:

The N-166-E radial is the direct path to the City of License. From the proposed site the 1.0 mV/M or 60 dBu City Grade Contour will encompass more than 80% of the City of License without major terrain obstruction.

G. 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.

H. FM Blanketing Contour:

HCB 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 (1.4 km) and is in a sparsely populated area. Given the height of the proposed antenna, no problems are anticipated.

I. Other Services in Area:

There are no known AM Broadcast Stations within 3.2 kilometers of the proposed site. Besides what already exists on this tower, 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, HCB will investigate and correct such cases in accordance with the Commission's Rules.

J. Environmental Assessment Statement:

HCB 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 or currently registered tower will be used with no change 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

HCB 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 RF facility** that will exist is the proposed FM facility.

FM Broadcast Stations

For FM Broadcast Stations the following formula is used:

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

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 FM Facility owned by HCB will operate with an ERI rototiller SHPX-8AC, 1.0 wave length spaced FM antenna. **Figure 7** is a plot of the RF exposure at

2 meters above the ground. The proposed FM facility contributes less than 0.3% of the FCC “controlled” standard. 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, HCB 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.

K. Compliance with National Historic Preservation Act - Section 106:


HCB is in the process of preparing and filing the FCC form 620. In addition, HCB has already submitted its Tower Notification for Indian Tribes using the FCC's website (including topo site map & tower sketch). HCB is not aware of any potential adverse affect on places of historic, cultural or endangered species. Upon completion of the form 620 process, HCB will notify the FCC through an amendment to the pending application.

L. Compliance with Radio Duopoly Rules:

Houston Christian Broadcasters, Inc., only owns non-commercial stations in the local area. These stations are not subject to the duopoly rules.

III. SUMMARY:

Houston Christian Broadcasters, Inc., requests a minor modification of its existing construction permit for a new unbuilt FM facility on Channel 218C2 at Bloomington, Texas. This engineering proposal is in full compliance with the Commission's Rules.



John J. Mullaney, Consulting Engineer

October 21, 2005.