JOHN J. MULLANEY
JOHN H. MULLANEY, P.E. (1994)
ALAN E. GEARING, P.E.

301 921-0115 Voice
301 590-9757 Fax
mullengr@aol.com E-mail

MULLANEY ENGINEERING, INC.
9049 SHADY GROVE COURT
GAITHERSBURG, MD 20877

ENGINEERING EXHIBIT EE:

FM BROADCAST STATION WZPL
MYSTAR COMMUNICATIONS CORPORATION
GREENFIELD, INDIANA

CH 258B 19.0 KW ERP 236 M HAAT

12 APRIL 2002

FCC FACILITY ID NUMBER 47144

ENGINEERING EXHIBIT IN SUPPORT OF
AN APPLICATION FOR CONSTRUCTION PERMIT TO
CHANGE SITE, ERP, & HAAT OF A
GRANDFATHERED SHORT-SPACED FM BROADCAST STATION

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DECLARATION

I, Alan E. Gearing, declare and state that I am a graduate electrical engineer with a Bachelor of Science degree in Electrical Engineering from SUNY University at Buffalo, that I am a registered professional engineer in the District of Columbia (since 1979), and that I have provided engineering services in the areas of broadcasting and radio communications since 1973. My qualifications as an expert in radio engineering are a matter of record with the Federal Communications Commission. I am a senior engineer with the firm of Mullaney Engineering, Inc., consulting broadcast and radio communications engineers with offices in Gaithersburg, Maryland.

The firm of Mullaney Engineering, Inc. has been retained by Mystar Communications Corporation to prepare the instant engineering exhibit and Section III of FCC Form 301 [March 2001 version] in support of ***an Application for Construction Permit to change transmitter/antenna site, effective radiated power, and antenna radiation center height above average terrain*** of grandfathered short-spaced FM broadcast station WZPL, Greenfield, Indiana [FCC FACILITY ID NUMBER 47144].

All facts contained herein are true of my own knowledge except those stated to be on information and 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.

Alan E. Gearing

Alan E. Gearing, P.E.
District of Columbia Number 7406

Executed on the 12th day of April 2002

ENGINEERING EXHIBIT EE:

FM BROADCAST STATION WZPL
MYSTAR COMMUNICATIONS CORPORATION
GREENFIELD, INDIANA

CH 258B 19.0 KW ERP 236 M HAAT

12 APRIL 2002

NARRATIVE STATEMENT:

I. GENERAL:

This narrative statement and the engineering exhibit of which is part have been prepared on behalf of Mystar Communications Corporation (hereinafter Mystar), licensee of FM broadcast station WZPL, authorized to operate on channel 258B at Greenfield, Indiana. The instant exhibit is in support of a **request for a Construction Permit to change transmitter/antenna location, effective radiated power (ERP) and antenna radiation center height above average terrain (HAAT)**. WZPL will continue to operate on channel 258B and serve Greenfield.

The instant application proposes facilities which are in compliance with either the distance separation requirements specified in §73.207 or with the interference protection requirements of §73.213 for grandfathered short-spaced stations.

This application, if implemented, would not be a major environmental action, as defined by Section 1.1307 of the Commission's Rules. The instant proposal encompasses mounting of an antenna on an existing antenna tower and §73.1307(a)(4) is not applicable. Also, the proposed facility will be in full compliance with current FCC guidelines for exposure to radiofrequency electromagnetic fields and would, in fact, contribute less than 5% of the

"controlled" area guideline value near ground level. Therefore, the instant proposal is **categorically excluded** from further environmental processing pursuant to the terms of Note 1 to §73.1306(b) of the Rules.

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

II. ENGINEERING DISCUSSION:

A. Proposed Transmitter/Antenna Location:

Mystar proposes to side-mount the new WZPL transmitting antenna on an existing tower located at 553 South Post Road in Indianapolis, Indiana. The proposed site is approximately 0.9 km (0.5 mi.) south-southwest of the WZPL licensed main antenna site and only 95 meters (313') from its authorized auxiliary antenna site. Figure 1 is a topographic map showing the relative locations of all three sites. The geographic coordinates (NAD 27) of the proposed site are:

Latitude:	39°	45'	36"
Longitude:	86°	00'	22"

There are no known AM broadcast stations located within 3 km of the proposed site. There are two existing FM broadcast stations located approximately 0.9 km (0.5 mi.) from the site proposed herein; WNOU, CH 226B and WFMS, CH 238B; both licensed to serve Indianapolis. These stations are collocated with WZPL's existing licensed main facility. No adverse interaction is expected to result from the modifications to WZPL's operation proposed herein. There are five other FM broadcast stations and no known TV broadcast stations within 10 kilometers (6.2 miles) of the proposed site. However, based upon the

type of transmitter proposed, and the frequencies & powers involved no intermodulation interference problems with existing transmitting facilities is expected. In the unlikely event some problems would occur, Mystar will investigate and correct such cases in accordance with the Commission's Rules.

Mystar will fully comply with the requirements of §73.318(b) of the Rules concerning responding to reports of blanketing interference within its 115 dBu "FM Blanketing Contour".

B. Antenna System and Tower:

A circularly polarized 3-bay FM antenna will side mounted at the 224.3 meter (736') level of an existing 303.9 meter (997') tower. Figure 2 is a vertical plan sketch of the tower proposed for use by WZPL. The tower has been registered with the FCC by its owner and has been assigned Antenna Structure Registration Number 1031014.

The proposed FM antenna is an ERI Type SHP-3AE, which has a nondirectional horizontal plane pattern and a power gain of approximately 1.56, for both horizontal and vertical polarizations.

The antenna will be fed by 256 meters (840 Feet) of 3" air dielectric coaxial cable, with a rated efficiency of 76.2 percent for this length.

C. Transmitter:

Mystar plans to install a type accepted FM transmitter with a power rating of approximately 20 kW. The transmitter will be operated at 15.9 kW, which will be within the rated power of the unit installed.

D. Effective Radiated Power:

A Class B FM broadcast station is restricted to a maximum ERP of 50 kW up to a maximum antenna radiation center HAAT of 150 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 (60 dBu) contour.

Current FCC policy and pertinent international agreements permit stations that are beyond 320 kilometers from both 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. Since the site proposed herein is 340.4 km from the Canadian Border (and hence also well beyond 320 km from the Mexican border), the procedures outlined in §73.211(b) of the Rules have been employed to determine the equivalent maximum permitted power.

For the proposed HAAT of 236 meters, the maximum permitted equivalent ERP so determined is 20.5 kW. The proposed power has been has been further reduced in order to maintain existing interference levels with respect to grandfathered short-spaced stations, as explained in more detail in the following section addressing allocation matters. Giving consideration to maximum antenna gain, transmitter output power and transmission line loss, the maximum ERP will be 19.0 kW, for both the horizontal and vertical components.

The combination of ERP equal to 19.0 kW and HAAT equal to 236 meters produces a station reference distance of 51 km [calculated using the procedure

in §73.211(b)(1)(I)], which meets the criteria specified in §73.210(b) for qualification as a Class B station.

E. Terrain Profile Data & Coverage:

Terrain profile data were based upon 3-second arc digitized terrain database provided as part of the V-Soft computer program Probe II. The standard eight bearings (every 45 degrees) were used to obtain the proposed overall HAAT.

The predicted service contours, shown in Figure 3-A herein, were computed using a mathematical model adapted for computer use of data shown in Figure 1 of §73.333 of the Rules. This is the Commission's computer program TVFMFS REPORT RS-76-01, dated January 1976.

Figure 3-B is a tabulation of the distances to the 70 dBu (3.16 mV/m), the 54 dBu (1.0 mV/m - Primary), and 115 dBu (blanketing) contours. Also shown is a summary of the data upon which the contour distance calculations were based. Although the tabulation shows data at 15-degree increments, the contours shown on the map of Figure 3-A were determined at 1-degree increments.

The N-82.0-E radial is the direct path to the City of License. From the proposed site the 3.16 mV/m (70 dBu) "principal community" contour will completely encompass the City of License without major terrain obstruction in compliance with the requirements of §73.315(a) of the Rules. See the map of Figure 3-A.

F. Channel Allocation:

Figure 4 is a FM channel allocation study for the use of channel 258B at Greenfield. Page 1 is for the site and facilities proposed herein and Page 2 is for the licensed main WZPL operation. Both the existing licensed WZPL operation and the instant proposal are short-spaced to four stations[1]. Of these four grandfathered short-spaced stations, two of are cochannel to WZPL and two are first adjacent channel. Figures 5 through 8 are a series of maps showing the pertinent allocation contours for WZPL and each of these four short-spaced stations. As discussed in more detail in the following paragraphs, these maps show that all areas predicted to receive interference from the instant proposal lie completely within areas which are currently predicted to receive interference from WZPL's licensed operation.

Figure 5 shows the situation with respect to first adjacent channel station WSHW, CH 259B, Frankfort, IN. The map clearly shows that over the entire arc where the WZPL 48 dBu contours overlap the WSHW 54 dBu contour and vice-versa, the proposed WZPL contours (red-hued) are wholly within the authorized licensed WZPL contours (blue-hued). Hence, no new interference is predicted.

Figure 6 shows the situation with respect to cochannel station WKDQ, CH 258C, Henderson, KY. Sheet 1 of the map shows the overall situation and Sheet 2 is a more detailed picture of just the overlap area. The maps clearly show that over the entire arc where the WKDQ 34 dBu contour overlaps the WZPL 54 dBu contours, the proposed WZPL contour (red-hued) is wholly

[1] NOTE: Under current §73.207, WZPL would be considered short-spaced to Class A station WCJC, CH257, Van Buren, IN. However, WCJC is a grandfathered 3 kW Class A station and is fully spaced with respect to WZPL under the provisions of §73.213(c)(1).

within the authorized licensed WZPL contour (blue-hued). Hence, no new interference is predicted. (There is no overlap between the WZPL interfering contours and the WKDQ protected service area.)

Figure 7 shows the situation with respect to first adjacent channel station WDJX, CH 259B, Louisville, KY. Sheet 1 of the map shows the overall situation and Sheet 2 is a more detailed picture of just the overlap areas. The maps clearly show that over the entire arc where the WZPL 48 dBu contours overlap the WDJX 54 dBu contour and vice versa, the proposed WZPL contours (red-hued) are wholly within the authorized licensed WZPL contours (blue-hued). Hence, no new interference is predicted.

Finally, Figure 8 shows the situation with respect to cochannel station WAOL, CH 258C3, Ripley, OH. In this instance, the map clearly shows that despite the short-spacing there is no overlap between the WZPL interfering contours and the WKDQ protected service area, or vice-versa.

Therefore, it is believed that the instant proposal is fully in compliance with the pertinent Commission allocation rules.

G. <u>Environmental Assessment Statement</u>:

The applicant believes it proposal will <u>not</u> significantly affect the environment. Since an existing tower will be used with no change in overall height, pursuant to the provisions of Note 1 to §1.1306(b) the only pertinent environmental issues are §1.1307(a)(4) - historic sites - and §1.1307(b) - human exposure to radiofrequency electromagnetic fields. In the instant case, the proposed WZPL site is not near any known districts, sites, buildings, structures or objects, significant in American history, architecture, archeology or culture, that are

listed in the National Register of Historic places or are eligible for such listing. The following is a more detailed discussion of protection from exposure to excessive radiofrequency electromagnetic fields.

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) electromagnetic fields 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 electromagnetic fields. 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 milliwatts 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:

$$D = \frac{SQRT(F2 * [HERP + VERP])}{1.667 * SQRT(PD) * 3.2808}$$

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 mW/sq cm
SQRT = Square Root
Freq = Frequency in megacycles/sec. (MHz)

The application of the above equation (assuming maximum ERP, in our case 19.0 kW) for a frequency of 99.5 MHz and an "un-controlled" power density guideline value of 0.2 mW/sq.cm results in a minimum distance of 79.7 meters (261 feet) from the antenna. Inasmuch as the lowest element on the proposed antenna will be approximately 221 meters (726 feet) above ground level, it is self-evident that no hazard from radiofrequency electromagnetic fields will exist to persons at ground level. At approximately 2 meters above the ground and assuming maximum downward radiation, the proposed FM facility would generate a power density of only 0.026 mW/sq.cm, contributing only 2.6% of the FCC "controlled" standard. 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 is 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 insure 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.

III. SUMMARY:

Mystar Communications Corporation, licensee of FM broadcast station WZPL, Channel 258B, Greenfield, Indiana, herein requests a Construction Permit for a change of site, ERP & HAAT. This application proposes facilities which are in compliance with either the distance separation requirements specified in §73.207 or with the interference protection requirements of §73.213 for grandfathered short-spaced stations. This engineering proposal is in full compliance with all applicable Commission's Rules and international agreements.

Alan E. Gearing

Alan E. Gearing, PE