

ENGINEERING EXHIBIT

Application for Construction Permit

prepared for

The WBEZ Alliance, Inc.
WBEZ(FM) Chicago, Illinois
Facility ID 66649
Ch. 218B 5.6 kW 425 m

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FCC Form 340, Section VII - FM Engineering on Channels 200-220

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This material supplies a “hard copy” of the engineering portions of this application as entered August 30, 2005 for filing electronically. Since the FCC’s electronic filing system may be accessed by anyone with the applicant’s name and password, and electronic data may otherwise be altered in an unauthorized fashion, we cannot be responsible for changes made subsequent to our entry of this data and related attachments.

Section VII Preparer's Certification

I certify that I have prepared Section VII (Engineering Data) on behalf of the applicant, and that after such preparation, I have examined and found it to be accurate and true to the best of my knowledge and belief.

Name DANIEL G. RYSON		Relationship to Applicant (e.g., Consulting Engineer) CONSULTANT	
Signature		Date 08/30/2005	
Mailing Address CAVELL, MERTZ & DAVIS, INC. 7839 ASHTON AVENUE			
City MANASSAS		State or Country (if foreign address) VA	
		Zip Code 20109-2883	
Telephone Number (include area code) 7033929090		E-Mail Address (if available) 7033929559	

WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001), AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT (U.S. CODE, TITLE 47, SECTION 312(a)(1)), AND/OR FORFEITURE (U.S. CODE, TITLE 47, SECTION 503).

Section VII - FM Engineering on Channels 200-220												
TECHNICAL SPECIFICATIONS												
Ensure that the specifications below are accurate. Contradicting data found elsewhere in this application will be disregarded. All items must be completed. The response "on file" is not acceptable.												
TECH BOX												
1.	Channel Number: 218											
2.	Class (select one): <input type="radio"/> D <input type="radio"/> A <input type="radio"/> B1 <input checked="" type="radio"/> B <input type="radio"/> C3 <input type="radio"/> C2 <input type="radio"/> C1 <input type="radio"/> C0 <input type="radio"/> C											
3.	Antenna Location Coordinates: (NAD 27) Latitude: Degrees 41 Minutes 53 Seconds 56 <input checked="" type="radio"/> North <input type="radio"/> South Longitude: Degrees 87 Minutes 37 Seconds 23 <input checked="" type="radio"/> West <input type="radio"/> East											
4.	Antenna Structure Registration Number: 1009012 <input type="checkbox"/> Not Applicable <input type="checkbox"/> Notification filed with FAA											
5.	Antenna Location Site Elevation Above Mean Sea Level: 180.7 meters											
6.	Overall Tower Height Above Ground Level: 459 meters											
7.	Height of Radiation Center Above Ground Level: 425 meters(H) 425 meters(V)											
8.	Height of Radiation Center Above Average Terrain: 425 meters(H) 425 meters(V)											
9.	Effective Radiated Power: 5.6 kW(H) 5.6 kW(V)											
10.	Maximum Effective Radiated Power: <input checked="" type="checkbox"/> Not Applicable kW(H) kW(V) (Beam-Tilt Antenna ONLY)											
11.	Directional Antenna Relative Field Values: <input checked="" type="checkbox"/> Not applicable (Nondirectional) Rotation (Degrees): <input type="checkbox"/> No Rotation											
	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value
	0		10		20		30		40		50	
	60		70		80		90		100		110	
	120		130		140		150		160		170	

180	190	200	210	220	230
240	250	260	270	280	290
300	310	320	330	340	350
Additional Azimuths					

Relative Field Polar Plot

NOTE: In addition to the information called for in this section, an explanatory exhibit providing full particulars must be submitted for each question for which a "No" response is provided.

CERTIFICATION**AUXILIARY ANTENNA APPLICANTS ARE NOT REQUIRED TO RESPOND TO ITEMS 12-15.**

12.	Main Studio Location. The proposed main studio location complies with 47 C.F.R. Section 73.1125.	<input checked="" type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 13]
13.	Interference. The proposed facility complies with all of the following applicable rule sections. Check all that apply:	<input checked="" type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 14]
Contour Overlap Requirements. a. <input checked="" type="checkbox"/> 47 C.F.R. Section 73.509 Exhibit Required. [Exhibit 15]		
Spacing Requirements. b. <input checked="" type="checkbox"/> 47 C.F.R. Section 73.207 with respect to station(s)		
Grandfathered Short-Spaced. c. <input type="checkbox"/> 47 C.F.R. Section 73.213(a) with respect to station(s) Exhibit Required. [Exhibit 16]		
Contour Protection. d. <input type="checkbox"/> 47 C.F.R. Section 73.215(a) with respect to station(s) Exhibit Required. [Exhibit 17]		
Television Channel 6 Protection. e. <input checked="" type="checkbox"/> 47 C.F.R. Section 73.525 with respect to station(s) Exhibit Required. [Exhibit 18]		
14.	Reserved Channels Above 220. a. Allotment. The proposed facility complies with the allotment requirements of 47 C.F.R. Section 73.203. <input type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 19] b. Community Coverage. The proposed facility complies with 47 C.F.R. Section 73.315. <input type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 20]	
15.	International Borders. The proposed antenna location is not within 320 kilometers of the common border between the United States and Canada or Mexico. <input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Canada <input type="radio"/> Mexico If "No," specify the country and provide an exhibit of compliance with all provisions of the relevant International Agreement. [Exhibit 21]	

16.	Environmental Protection Act. The proposed facility is excluded from environmental processing under 47. C.F.R. Section 1.1306 (i.e., The facility will not have a significant environmental impact and complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments). Unless the applicant can determine compliance through the use of the RF worksheets in Worksheet #7, an Exhibit is required.	<input checked="" type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 22]
By checking "Yes" above, the applicant also certifies that it, in coordination with other users of the site, will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic exposure in excess of FCC guidelines.		

PREPARER'S CERTIFICATION ON PAGE 8 MUST BE COMPLETED AND SIGNED.

Exhibits

Exhibit 14

Description: EXHIBIT 14 - STATEMENT A - ALLOCATION

EXHIBIT 14 - STATEMENT A - ALLOCATION

Attachment 14

Description
Exhibit 14 - Statement A

Exhibit 22

Description: EXHIBIT 22 - STATEMENT B - ENVIRONMENTAL CONSIDERATIONS

EXHIBIT 22 - STATEMENT B - ENVIRONMENTAL CONSIDERATIONS

Attachment 22

Description
Exhibit 22 - Statement B

Exhibit 22 - Statement B
ENVIRONMENTAL CONSIDERATIONS
prepared for
The WBEZ Alliance, Inc.
WBEZ(FM) Chicago, Illinois
Facility ID 66649
Ch. 218B 5.6 kW 425 m

The instant proposal is not believed to have a significant environmental impact as defined under §1.1306 of the Commission's Rules. Consequently, preparation of an Environmental Assessment is not required.

Nature of The Proposal

The WBEZ Alliance, Inc., ("Alliance") herein seeks authorization to replace its main facility with its auxiliary facility (file number BXLED-20030618AAR). The instant application specifies an increase in antenna height and a commensurate reduction in effective radiated power ("ERP"). An existing antenna supporting structure will be employed (Antenna Structure Registration number 1009012), atop the John Hancock Center in Chicago.

The use of existing transmitting locations has been characterized as being environmentally preferable by the Commission, according to Note 1 of §1.1306 of the FCC Rules. Since no change in overall structure height is proposed, no change in current structure marking and lighting requirements is anticipated. Therefore, it is believed that this application may be categorically excluded from environmental processing pursuant to §1.1306 of the Commission's rules.

Human Exposure to Radiofrequency Electromagnetic Field

The proposed operation was evaluated for human exposure to radiofrequency energy using the procedures outlined in the Commission's OET Bulletin No. 65 ("OET 65"). OET 65 describes a means of determining whether a proposed facility exceeds the radiofrequency exposure guidelines adopted in §1.1310. Under present Commission policy, a facility may be presumed to comply with the limits specified in §1.1310 if it satisfies the exposure criteria set forth in OET 65. Based upon that methodology, and as demonstrated in the following, the proposed transmitting system will comply with the cited adopted guidelines.

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ENVIRONMENTAL CONSIDERATIONS
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The proposed WBEZ(FM) transmitting antenna is configured such that its center of radiation is 425 meters above ground level. A two-layer, non-directional antenna with an ERP of 5.6 kilowatts, circularly polarized, will be employed. As shown in the attached **Exhibit 22 - Figure 6**, the transmitting antenna (an ERI model COG3-20P-2-70-2 antenna) has a relative field of less than 25% percent from 35 to 90 degrees below the horizontal plane (*i.e.*, below the antenna) on Channel 218, according to data provided by the manufacturer. Thus, a value of 25% percent relative field is used for this calculation. The “uncontrolled/general population” limit specified in §1.1310 for Channel 218 (91.5 MHz) is 200 $\mu\text{W}/\text{cm}^2$.

Using equation (9) in OET-65, calculations were made to predict power density at points two meters above ground level locations. Using this formula, the proposed facility would contribute a power density of 0.13 $\mu\text{W}/\text{cm}^2$ at two meters above ground level near the antenna support structure, or 0.1 percent of the general population/uncontrolled limit. At ground level locations away from the base of the building, the calculated RF power density is even lower, due to the increasing distance from the transmitting antenna.

Numerous FM and TV broadcast stations utilize the John Hancock Center as an antenna support structure. §1.1307(b)(3) states that facilities contributing less than five percent of the exposure limit at locations with multiple emitters (such as the case at hand) are categorically excluded from responsibility for taking any corrective action in the areas where their contribution is less than five percent. Since the instant situation meets the five percent exclusion test at all ground level areas, the impact of various other facilities near this site may be considered independently from this proposal.

Thus, based on this analysis, the Commission’s limit regarding general population / uncontrolled exposure to RF electromagnetic field is not exceeded at ground level locations near the WBEZ transmitter site. Accordingly, it is believed that the impact of the proposed operation should not be considered to be a factor at or near ground level as defined under §1.1307(b).

Consideration was also given with respect to other nearby “tall” buildings. Exposure levels exceeding five percent of the general population / uncontrolled limit for the proposed operation are

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ENVIRONMENTAL CONSIDERATIONS
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calculated to occur only at certain locations within 49 meters of the transmitting antenna (at elevations from 25 to 90 degrees below the horizon, considering a maximum elevation field of 25%). Nearby buildings, including the John Hancock Center rooftop itself (at a distance of 81 meters), do not encroach upon this distance. Thus, for rooftop and any publicly-accessible areas on the John Hancock Center and nearby buildings, the five percent exclusion of §1.1307(b)(3) applies.

With respect to the impact of the proposed WBEZ operation on building occupants and accessible upper level areas, access to the John Hancock Center rooftop, antenna support structures, and any areas within the building that may exceed exposure limits is strictly controlled by the building owner. Further, *Alliance* will continue to participate in the building's RF exposure safety program along with the other broadcasters and FCC licensees that utilize the John Hancock Center as a transmission site. As necessary, based on calculations or actual measurements considering all emitters, exposure abatement procedures will be established, amended as necessary, and followed.

Regarding worker safety, a site exposure policy is in place and will continue to be employed protecting maintenance and installation workers from excessive exposure when work must be performed in locations where measurements indicate high RF levels may be present. Such areas have been placed under strict restricted access and properly identified.

Protective measures for workers requiring entry into those controlled areas may include, but will not be limited to, restriction of access to areas where levels in excess of the guidelines may be expected, power reduction for the involved facilities, and/or the complete shutdown of facilities when work or inspections must be performed in areas where the exposure guidelines will be exceeded. *Alliance* will coordinate exposure procedures with all pertinent structure users.

Conclusion

Based on the preceding, it is believed that the instant proposal may be categorically excluded from environmental processing under Section 1.1306 of the Rules, hence preparation of an Environmental Assessment is not required.

ELECTRONICS RESEARCH, INC.
7777 GARDNER ROAD
CHANDLER, IN. 47610

FIGURE 1

-----THEORETICAL-----
VERTICAL PLANE RELATIVE FIELD

2 LEVELS OF TYPE 1080 ELEMENTS
+0.00 DEGREE(S) BEAM TILT
0 PERCENT FIRST NULL FILL
0 PERCENT SECOND NULL FILL

POWER GAIN IS .870 IN THE HORIZONTAL PLANE(.870 IN THE MAX.)
[POWER GAINS AT 95% ANTENNA EFFICIENCY]

APRIL 4, 2003

91.5 MHz.

BAY SPACING:
92 INCHES

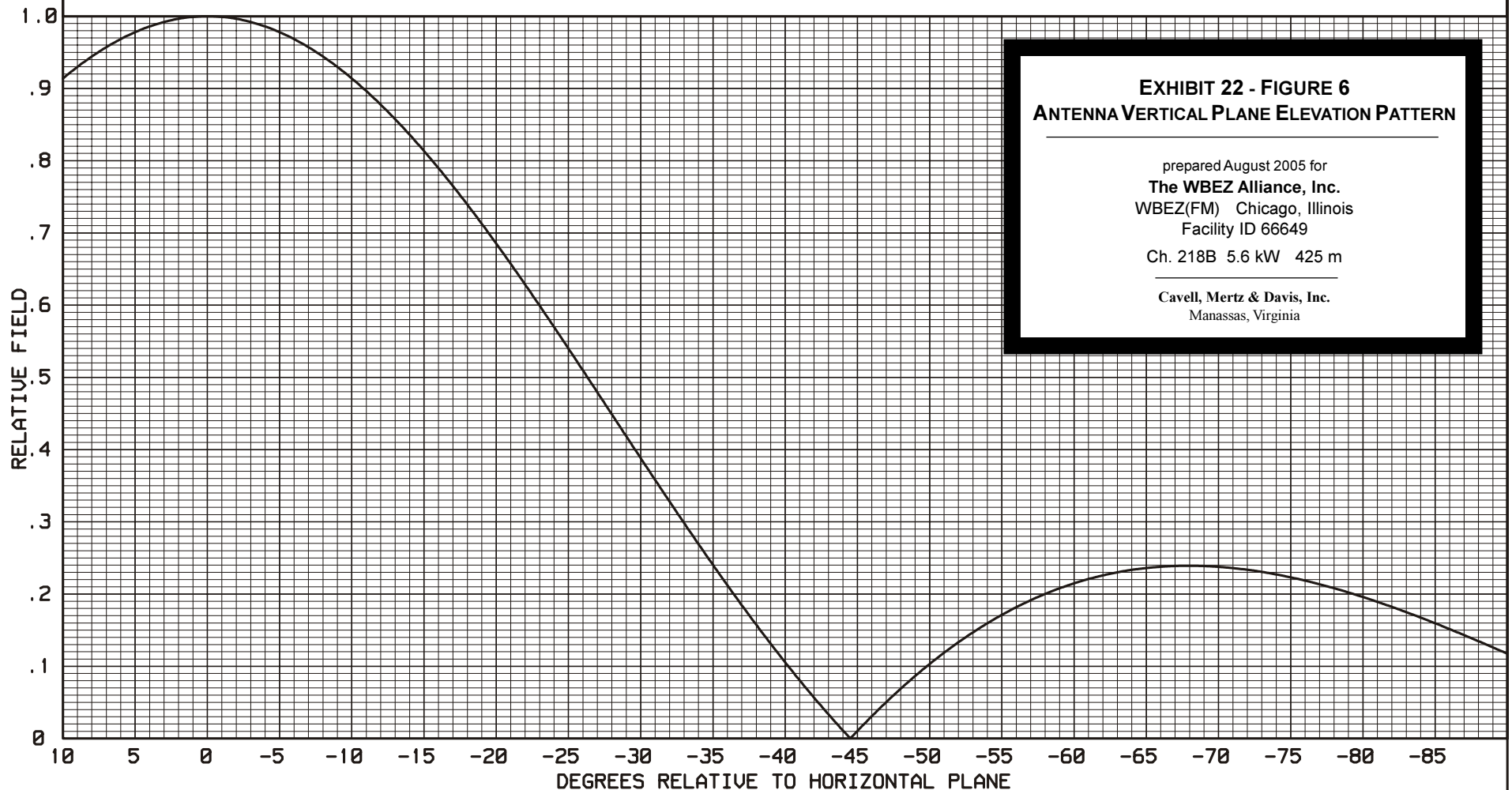


EXHIBIT 22 - FIGURE 6
ANTENNA VERTICAL PLANE ELEVATION PATTERN

prepared August 2005 for
The WBEZ Alliance, Inc.
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Cavell, Mertz & Davis, Inc.
Manassas, Virginia