Federal Communications Commission Washington, D.C. 20554	Approved by OMB 3060-0506 (June 2002)	FOR FCC USE ONLY
FCC 302-FM		
APPLICATION FOR FM BROADCAST STATION LICENSE Read INSTRUCTIONS Before Filling Out Form		FOR COMMISSION USE ONLY FILE NO. -

Section I - General Information

1.	Legal Name of the Applicant INTERLOCHEN CENTER FOR THE ARTS			
	Mailing Address P. O. BOX 199			
	City INTERLOCHEN		State or Country (if foreign address) MI	ZIP Code 49643 - 0199
	Telephone Number (include area code) 2312767200		E-Mail Address (if available)	
	FCC Registration Number:	Call Sign WHBP	Facility Identifier 172716	
2.	Contact Representative (if other than Applicant) JOHN CRIGLER, ESQ.		Firm or Company Name GARVEY SCHUBERT BARER	
	Telephone Number (include area code) 2029657880		E-Mail Address (if available) JCRIGLER@GSBLAW.COM	
3.	If this application has been submitted without a fee, indicate reason for fee exemption (see 47 C.F.R. Section 1.1114): ○ Governmental Entity ◉ Noncommercial Educational Licensee/Permittee ○ Other ○ N/A (Fee Required)			
4.	Facility Information:			
	a. ○ Commercial	◉ Noncommercial		
	b. ◉ Directional	○ Nondirectional		
	c. Community of License:			
	City: HARBOR SPRINGS		State: MI	
5.	**Program Test Authority:**			
	◉ Requesting program test authority.			
	○ Station operating pursuant to automatic program test authority (47 C.F.R. Section 73.1620(a)(1)).			
6.	**Purpose of Application:**			
	◉ Cover construction permit (list most recent construction permit file number -- starts with the prefix BPH, BNPH, BMPH, BPED, BMPED, or BMPED):			BNPED-20071019ARW
	○ Modify an authorized license (list license file number -- starts with the prefix BLH, BMLH, BLED, or BMLED):			-
	○ Amend a pending application If an amendment, **submit as an Exhibit** a listing by Section and Question Number the portions of the pending application that are being revised.			[Exhibit 1]

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.

Section II - Legal and Financial

1.	**Certification.** Applicant certifies that it has answered each question in this application based on its review of the application instructions and worksheets. Applicant further certifies that where it has made an affirmative certification below, this certification constitutes its representation that the application satisfies each of the pertinent standards and criteria set forth in the application instructions and worksheets.	◉ Yes ○ No
2.	Licensee/Permittee certifies that all terms, conditions, and obligations set forth in the underlying construction permit have been fully met.	◉ Yes ○ No See Explanation in

		[Exhibit 2]
3.	Licensee/Permittee certifies that, apart from changes already reported, no cause or circumstance has arisen since the grant of the underlying construction permit which would result in any statement or representation contained in the construction permit application to be now incorrect.	(•) Yes ( ) No See Explanation in [Exhibit 3]
4.	**Character Issues.** Applicant certifies that neither licensee/permittee nor any party to the application has or has had any interest in, or connection with: a. any broadcast application in any proceeding where character issues were left unresolved or were resolved adversely against the applicant or party to the application; or b. any pending broadcast application in which character issues have been raised.	(•) Yes ( ) No See Explanation in [Exhibit 4]
5.	**Adverse Findings.** Applicant certifies that, with respect to the applicant and any party to the application, no adverse finding has been made, nor has an adverse final action been taken related to the following: any felony; mass media-related antitrust or unfair competition; fraudulent statements to another governmental unit; or discrimination.	(•) Yes ( ) No See Explanation in [Exhibit 5]
6.	**Anti-Drug Abuse Act Certification.** Applicant certifies that neither licensee/permittee nor any party to the application is subject to denial of federal benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. Section 862.	(•) Yes ( ) No

I certify that the statements in this application are true, complete, and correct to the best of my knowledge and belief, and are made in good faith. I acknowledge that all certifications and attached Exhibits are considered material representations. I hereby waive any claim to the use of any particular frequency as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise, and request an authorization in accordance with this application. (See Section 304 of the Communications Act of 1934, as amended.)

Typed or Printed Name of Person Signing THOM PAULSON	Typed or Printed Title of Person Signing VICE PRESIDENT FOR MEDIA
Signature	Date 5/16/2011

SECTION III - PREPARER'S CERTIFICATION

I certify that I have prepared Section III (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 JUSTIN W. ASHER	Relationship to Applicant (e.g., Consulting Engineer) CONSULTING ENGINEER	
Signature	Date 5/13/2011	
Mailing Address MUNN-REESE, INC. PO BOX 220, 385 AIRPORT DR.		
City COLDWATER	State or Country (if foreign address) MI	Zip Code 49036 - 0220
Telephone Number (include area code) 5172787339	E-Mail Address (if available) JUSTIN@MUNN-REESE.COM	

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 III - Engineering	
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: 211

2.	a. Effective Radiated Power: b. Maximum Effective Radiated Power: (Beam-Tilt Antenna ONLY) ☑ Not Applicable	1.2 kW(H) 1.2 kW(V) kW(H) kW(V)
3.	Transmitter Power Output: 0.67 kW	
4.	Antenna Data	

Manufacturer	Model	Number of Sections	Spacing Between Sections (wavelength)
DIE	DCRH2ERP	2	1

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

All applicants must complete this section.

5.	**Main Studio Location.** The main studio location complies with 47 C.F.R. Section 73.1125.	○ Yes ◉ No See Explanation in [Exhibit 6]
6.	**Transmitter Power Output.** The operating transmitter power output produces the authorized effective radiated power.	◉ Yes ○ No See Explanation in [Exhibit 7]

APPLICATIONS FILED TO COVER A CONSTRUCTION PERMIT.
Only applicants filing this application to cover a construction permit must complete the following section.

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.

7.	**Constructed Facility .** The facility was constructed as authorized in the underlying construction permit or complies with 47 C.F.R. Section 73.1690.	◉ Yes ○ No See Explanation in [Exhibit 8]
8.	**Special Operating Conditions.** The facility was constructed in compliance with all special operating conditions, terms, and obligations described in the construction permit.	◉ Yes ○ No See Explanation in [Exhibit 9]
	An exhibit may be required. Review the underlying construction permit.	[Exhibit 10]

APPLICATIONS FILED PURSUANT TO 47 C.F.R. SECTIONS 73.1675(c) or 73.1690(c).
Only applicants filing this application pursuant to 47 C.F.R. Sections 73.1675(c) or 73.1690(c) must complete the following section.

9.	**Changing transmitter power output.** Is this application being filed to authorize a change in transmitter power output caused by the replacement of omnidirectional antenna with another omnidirectional antenna or an alteration of the transmission line system? See 47 C.F.R. Sections 73.1690(c)(1) and (c)(10).	○ Yes ○ No
10.	**Increasing effective radiated power.** Is this application being filed to authorize an increase in ERP for a station operating in the nonreserved band (Channels 221-300)? See 47 C.F.R. Sections 73.1690(c)(4), (c)(5) and (c)(7). If "Yes" to the above, the applicant certifies the following:	○ Yes ○ No
	a. **Spacing Requirements.** The increase in ERP was authorized pursuant to MM Docket 88-375 (Class A stations) OR the facility complies with the spacing requirements of 47 C.F.R. Section 73.207.	○ Yes ○ No See Explanation in [Exhibit 11]
	b. **International Coordination.** The transmitter site is greater than 320 km from the Canadian or Mexican borders OR coordination for the station's international class is complete.	○ Yes ○ No See Explanation in [Exhibit 12]
	c. **Interference.** The requirements of 47 C.F.R. Section 73.1030 regarding notification to radio astronomy installations, radio receiving installations and FCC monitoring stations have either been satisfied OR are not applicable.	○ Yes ○ No See Explanation in [Exhibit 13]

	Exhibit required. If the proposed facility must be notified to the entities set forth in 47 C.F.R. Section 73.1030, the applicant must provide a copy of the written approval for the ERP increase from the affected entity.	[Exhibit 14]
	d. **Multiple Ownership Showing.** The increase in ERP will not require the consideration of a multiple ownership showing pursuant to 47 C.F.R. Section 73.3555.	○ Yes ○ No See Explanation in [Exhibit 15]
	e. **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 Appendix A, an **Exhibit is required.**	○ Yes ○ No See Explanation in [Exhibit 16]
	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.	
11.	**Increasing vertically polarized effective radiated power.** Is this application being filed pursuant to 47 C.F.R. Section 73.1690(c)(4) to authorize an increase in the vertically polarized ERP for a station operating in the reserved band (Channels 200-220)? If "Yes" to the above, the applicant certifies the following:	○ Yes ○ No
	a. **TV Channel 6 Protection Requirements.** The facility complies with the spacing requirements of 47 C.F.R. Section 73.525(a)(1).	○ Yes ○ No See Explanation in [Exhibit 17]
	b. **Environmental Protection Act.** The proposed facility is excluded from environmental processing under 47 C.F.R. Section 1.1 306 (i.e., the facility will not have a significant environmental impact and complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and u ncontrolled environments). Unless the applicant can determine compliance through the use o f the RF worksheets in Appendix A, an **Exhibit is required.**	○ Yes ○ No See Explanation in [Exhibit 18]
	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.	
12.	**Decreasing effective radiated power (non-reserved channel).** Is this application being filed pursuant to 47 C.F.R. Section 73.1690(c)(8) to authorize a decrease in the ERP for a station operating in the nonreserved band (Channels 221-300)? If "Yes" to the above, the applicant certifies the following:	○ Yes ○ No
	a. **Community Coverage .** The proposed facility complies with the community coverage requirements of 47 C.F.R. Section 73.315 where the distance to the 3.16 mV/m contour is predicted using the standard prediction method in 47 C.F.R. Section 73.313.	○ Yes ○ No See Explanation in [Exhibit 19]
	b. **Auxiliary Facilities.** The authorized or pending auxiliary facilities for this station comply with 47 C.F.R. Section 73.1675(a).	○ Yes ○ No See Explanation in [Exhibit 20]
	c. **Multiple Ownership Showing.** The decrease in ERP is not requested or required to establish compliance with 47 C.F.R. Section 73.3555.	○ Yes ○ No See Explanation in [Exhibit 21]
13.	**Decreasing effective radiated power (reserved channel).** Is this application being filed pursuant to 47 C.F.R. Section 73.1690(c)(8) to authorize a decrease in the ERP for a station operating in the reserved band (Channels 200-220)? If "Yes" to the above, the applicant certifies the following:	○ Yes ○ No
	a. **Community Coverage .** The proposed facility complies with the community coverage requirements of 47 C.F.R. Section 73.1690(c)(8)(i) where the distance to the 1 mV/m contour is predicted using the standard prediction method in 47 C.F.R. Section 73.313.	○ Yes ○ No See Explanation in

		[Exhibit 22]
	b. **Auxiliary Facilities.** The authorized or pending auxiliary facilities for this station comply with 47 C.F.R. Section 73.1675(a).	○ Yes ○ No See Explanation in [Exhibit 23]
14.	**Replacing a directional antenna.** Is this application being filed pursuant to 47 C.F.R. Section 73.1690(c)(2) to replace a directional antenna with another directional antenna? If "Yes" to the above, the applicant certifies the following:	○ Yes ○ No
	a. **Measurement of Directional Antenna.** The composite measured pattern and measurement procedures comply with 47 C.F.R. Section 73.1690(c)(2). **Exhibit required.**	○ Yes ○ No See Explanation in [Exhibit 24] [Exhibit 25]
	b. **Installation of Directional Antenna.** The installation of the directional antenna complies with 47 C.F.R. Section 73.1690(c)(2). **Exhibit required.**	○ Yes ○ No See Explanation in [Exhibit 26] [Exhibit 27]
15.	**Deleting contour protection status.** Is this application being filed pursuant to 47 C.F.R. Section 73.1690 (c)(6) to delete contour protection status (47 C.F.R. Section 73.215) for a station operating in the nonreserved band (Channels 221-300)?	○ Yes ○ No
	If "Yes" to the above, the applicant certifies that the facility complies with the spacing requirements of 47 C.F.R. Section 73.207.	○ Yes ○ No See Explanation in [Exhibit 28]
16.	**Use a formerly licensed main facility as an auxiliary facility.** Is this application being filed pursuant to 47 C.F.R. Section 73.1675(c)(1) to request authorization to use a formerly licensed main facility as an auxiliary facility and/or change the ERP of the proposed auxiliary facility? If "Yes" to the above, the applicant certifies the following:	○ Yes ○ No
	a. **Auxiliary antenna service area.** The proposed auxiliary facility complies with 47 C.F.R. Section 73.1675(a).	○ Yes ○ No See Explanation in [Exhibit 29]
	b. **Environmental Protection Act.** The proposed facility is excluded from environmental processing under 47 C.F.R. Section 1.1 306 (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 Appendix A, an **Exhibit is required.**	○ Yes ○ No See Explanation in [Exhibit 30]
	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.	
17.	**Change the license status.** Is this application being filed pursuant to 47 C.F.R. Section 73.1690(c)(9) to change the license status from commercial to noncommercial or from noncommercial to commercial?	○ Yes ○ No
	If "Yes" to the above, submit an exhibit providing full particulars. For applications changing license status from commercial to noncommercial, include Section II of FCC Form 340 as an exhibit to this application.	[Exhibit 31]

PREPARERS CERIFICATION ON PAGE 3 MUST BE COMPLETED AND SIGNED.

Exhibits

Exhibit 6

Description: MAIN STUDIO LOCATION

SEE EXHIBIT 10.

Attachment 6

Exhibit 10
Description: SPECIAL OPERATING CONDITIONS/RESTRICTIONS

1. THE PERMITTEE CERTIFIES IT HAS SUBMITTED THE RESULTS OF A COMPLETE PROOF-OF-PERFORMANCE ESTABLISHING THE HORIZONTAL PLANE RADIATION PATTERNS FOR BOTH THE HORIZONTALLY AND VERTICALLY POLARIZED RADIATION COMPONENTS. THIS PROOF-OF-PERFORMANCE HAS ACCOMPLISHED THIS USING A CAREFULLY MANUFACTURED SCALE MODEL OF THE ENTIRE ANTENNA, OR INDIVIDUAL BAYS THEREFROM, MOUNTED ON AN EQUALLY SCALED MODEL OF THE PROPOSED SUPPORTING STRUCTURE, INCLUDING ALL APPURTENANCES. ENGINEERING EXHIBITS HAVE BEEN PROVIDED INCLUDING A DESCRIPTION OF THE ANTENNA TESTING FACILITIES AND EQUIPMENT EMPLOYED, INCLUDING APPROPRIATE SKETCHES AND A DESCRIPTION OF THE TESTING PROCEDURES, INCLUDING SCALE FACTOR, MEASUREMENTS FREQUENCY, AND EQUIPMENT CALIBRATION. SEE ATTACHED PROOF OF PERFORMANCE.

2. THE PERMITTEE CERTIFIES IT HAS SUBMITTED AN AFFIDAVIT FROM A LICENSED SURVEYOR ESTABLISHING THAT THE DIRECTIONAL ANTENNA HAS BEEN ORIENTED AT THE PROPER AZIMUTH. SEE ATTACHED SURVEYOR'S AFFIDAVIT.

3. THE PERMITTEE CERTIFIES IT HAS SUBMITTED AN AFFIDAVIT STATING THAT THE INSTALLATION OF THE DIRECTIONAL ANTENNA SYSTEM WAS OVERSEEN BY A QUALIFIED ENGINEER. THIS AFFIDAVIT INCLUDES A CERTIFICATION BY THE ENGINEER THAT THE ANTENNA WAS INSTALLED PURSUANT TO THE MANUFACTURER'S INSTRUCTIONS AND LIST THE QUALIFICATIONS OF THE CERTIFYING ENGINEER.

4. THE PERMITTEE CERTIFIES THAT THE RELATIVE FIELD STRENGTH OF NEITHER THE MEASURED HORIZONTALLY NOR VERTICALLY POLARIZED RADIATION COMPONENT EXCEEDS AT ANY AZIMUTH THE VALUE INDICATED ON THE COMPOSITE RADIATION PATTERN AUTHORIZED BY THIS CONSTRUCTION PERMIT. A RELATIVE FIELD STRENGTH OF 1.0 ON THE COMPOSITE RADIATION PATTERN HEREIN AUTHORIZED CORRESPONDS TO THE FOLLOWING EFFECTIVE RADIATED POWER:
1.20 KILOWATTS. PRINCIPAL MINIMA AND THEIR ASSOCIATED FIELD STRENGTH LIMITS ARE AS FOLLOWS: 170 - 190 DEGREES TRUE: 0.038 KILOWATT. SEE ATTACHED ANTENNA PROOF OF PERFORMANCE.

5. THE PERMITTEE, INTERLOCHEN CENTER FOR THE ARTS, ACKNOWLEDGES IT HAS REQUESTED A WAIVER OF 47 C.F.R. SECTION 73.1125 TO OPERATE THE PROPOSED FACILITY AS A 'SATELLITE' OF CO-OWNED NONCOMMERCIAL EDUCATIONAL FM STATION WICA(FM), FACILITY ID# 89497, TRAVERSE CITY, MI. THE PERMITTEE REAFFIRMS THE SPECIFIC REPRESENTATIONS CONTAINED
THEREIN UNDER WHICH THE WAIVER REQUEST WAS GRANTED. INTERLOCHEN CENTER FOR THE ARTS AGREES TO ABIDE BY EACH REPRESENTATION PROFFERED IN THE WAIVER REQUEST.

6. THE PERMITTEE CERTIFIES COORDINATION WITH OTHER USERS OF THE SITE TO REDUCE POWER OR CEASE OPERATION AS NECESSARY TO PROTECT PERSONS HAVING ACCESS TO THE SITE, TOWER OR ANTENNA FROM RADIOFREQUENCY ELECTROMAGNETIC FIELDS IN EXCESS OF FCC GUIDELINES.

Attachment 10

Description
DIE (SPX) - DCRH2ERP Directional Antenna Proof of Performance
Engineer's Affidavit
Surveyor's Affidavit

COMMUNICATION TECHNOLOGY

Date	**4/18/2011**
Call Letters	**WHBP**
Location	**Harbor Springs, MI**
Customer	**INTERLOCHEN**
Antenna Type	**DCRH2ERP**
Frequency	**90.1**
Drawing #	**9**

PATTERN CERTIFICATION

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FM Azimuth Pattern Approval

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Composite Pattern of Horizontal and Vertically Polarized Planes

Tabulation of Composite Pattern

Gain Summary

Rectangular Plot of Vertical Plane Pattern

Sketch of Scale Model Test

COMMUNICATION TECHNOLOGY

Date	**4/18/2011**
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PATTERN CERTIFICATION

Method of Measurement

The azimuth pattern for WHBP, Dielectric Document Sketch #9, was measured in the following manner.

A single 4.4 to 1 scale model “DCRH3ERP” bay radiator was mounted on a similarly scaled model of the tower according to information provided to Dielectric by the customer; refer to Dielectric Document Sketch #9. The antenna under test, all parasitics, all known tower appurtenances, and the tower section were rotated through 360 degrees while receiving a signal at the appropriate frequency from a linear cavity-backed source antenna. Both the horizontal and vertical polarization azimuth patterns were measured in an anechoic test range.

The transmit and scale model antennas are mounted at identical elevations and at opposite ends of the chamber. A Hewlett Packard model 8752C network analyzer was used to supply the RF signal to the source antenna at 4.4 times the fundamental FM frequency and to receive the signal intercepted by the antenna under test. The received signal was converted to a relative level, referenced to the source. This level was stored on a computer acting as the master controller. The computer controls the measurement system via IEEE-488 control bus through a GPIB card.

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COMMUNICATION TECHNOLOGY

Date	**4/18/2011**
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Drawing #	**9**

FM AZIMUTH PATTERN APPROVAL

The azimuth pattern of the horizontal polarization and vertical polarization as supplied by Dielectric in the document labeled “Pattern 9”, is acknowledged as acceptable.

We understand that Dielectric does not guarantee or predict signal strength in any particular location.

_____
(Customer's name)

By: _____
(Name typed or printed)

Title: _____

_____
(Signature)

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COMMUNICATION TECHNOLOGY

Date	**4/18/2011**
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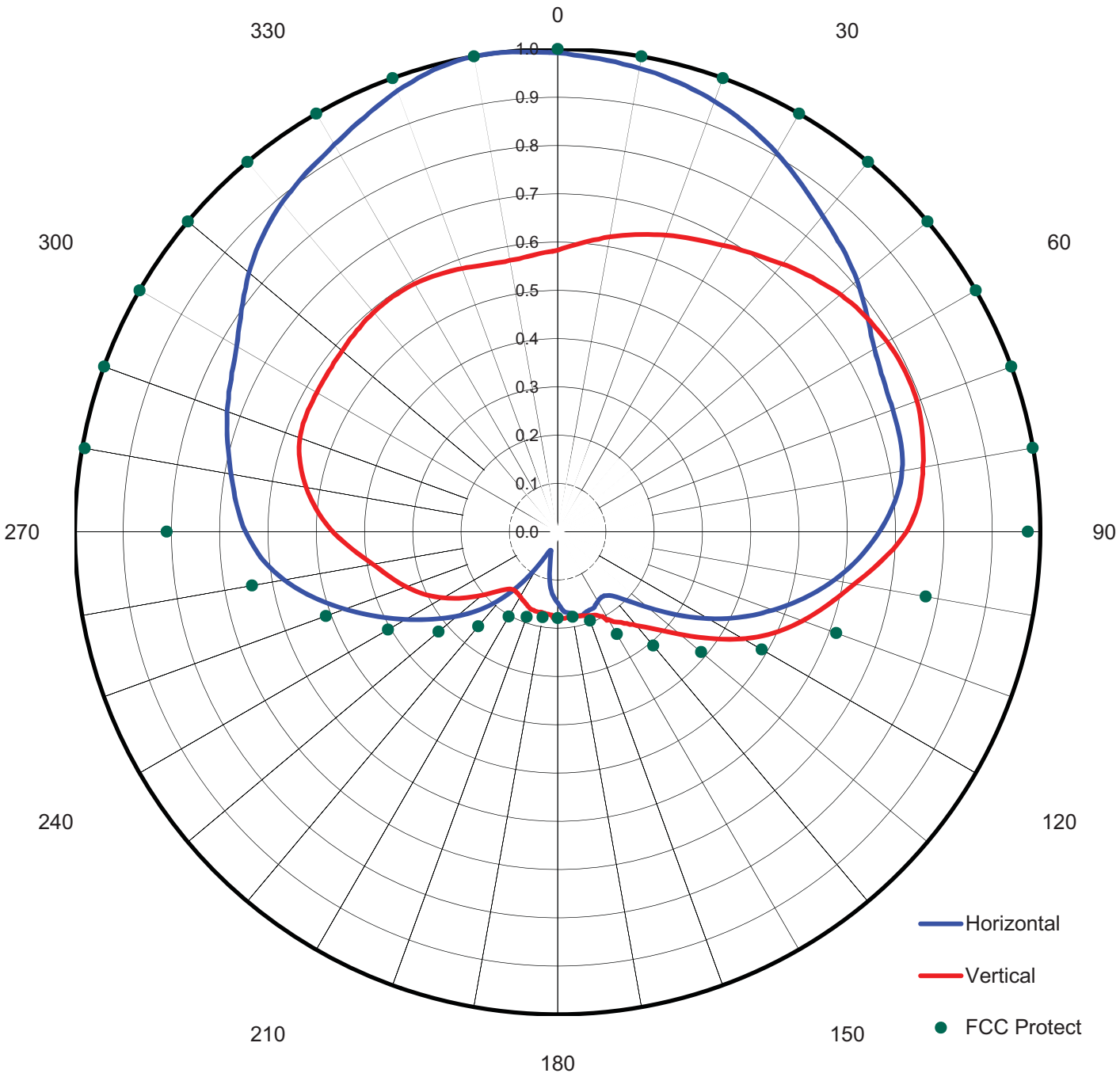
AZIMUTH PATTERN

86.11% Ccov 55.6% Hrms - 44.4% Vrms

Gain **2.37 (3.75 dB) HPOL**
2.33 (3.67 dB) HPOL

Calculated / Measured **Measured**



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COMMUNICATION TECHNOLOGY

Date	**4/18/2011**
Call Letters	**WHBP**
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Antenna Type	**DCRH2ERP**
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Drawing #	**9**

TABULATION OF HORIZONTAL AZIMUTH PATTERN

Angle	Field	dBk	ERP kW
	0.992	0.722	1.181
10	0.975	0.572	1.141
20	0.949	0.337	1.081
30	0.907	-0.056	0.987
40	0.854	-0.579	0.875
50	0.810	-1.038	0.787
60	0.758	-1.615	0.689
70	0.739	-1.835	0.655
80	0.724	-2.013	0.629
90	0.667	-2.726	0.534
100	0.581	-3.925	0.405
110	0.475	-5.674	0.271
120	0.360	-8.082	0.156
130	0.244	-11.460	0.071
140	0.173	-14.447	0.036
150	0.167	-14.754	0.033
160	0.176	-14.298	0.037
170	0.172	-14.498	0.036
180	0.147	-15.862	0.026
190	0.096	-19.563	0.011
200	0.041	-26.953	0.002
210	0.083	-20.827	0.008
220	0.181	-14.055	0.039
230	0.272	-10.517	0.089
240	0.363	-8.010	0.158
250	0.469	-5.785	0.264
260	0.575	-4.015	0.397
270	0.646	-3.004	0.501
280	0.687	-2.469	0.566
290	0.729	-1.954	0.638
300	0.768	-1.501	0.708
310	0.835	-0.774	0.837
320	0.889	-0.230	0.948
330	0.926	0.124	1.029
340	0.972	0.545	1.134
350	1.000	0.792	1.200

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COMMUNICATION TECHNOLOGY

Date	**4/18/2011**
Call Letters	**WHBP**
Location	**Harbor Springs, MI**
Customer	**INTERLOCHEN**
Antenna Type	**DCRH2ERP**
Frequency	**90.1**
Drawing #	**9**

TABULATION OF VERTICAL AZIMUTH PATTERN

Angle	Field	dBk	ERP kW
	0.583	-3.895	0.408
10	0.620	-3.360	0.461
20	0.654	-2.897	0.513
30	0.685	-2.494	0.563
40	0.724	-2.013	0.629
50	0.765	-1.535	0.702
60	0.788	-1.278	0.745
70	0.792	-1.234	0.753
80	0.768	-1.501	0.708
90	0.723	-2.025	0.627
100	0.624	-3.304	0.467
110	0.540	-4.560	0.350
120	0.444	-6.261	0.237
130	0.330	-8.838	0.131
140	0.254	-11.112	0.077
150	0.210	-12.764	0.053
160	0.185	-13.865	0.041
170	0.180	-14.103	0.039
180	0.179	-14.151	0.038
190	0.171	-14.548	0.035
200	0.169	-14.650	0.034
210	0.155	-15.402	0.029
220	0.155	-15.402	0.029
230	0.205	-12.973	0.050
240	0.274	-10.453	0.090
250	0.334	-8.733	0.134
260	0.389	-7.409	0.182
270	0.466	-5.840	0.261
280	0.529	-4.739	0.336
290	0.568	-4.121	0.387
300	0.576	-4.000	0.398
310	0.583	-3.895	0.408
320	0.593	-3.747	0.422
330	0.593	-3.747	0.422
340	0.580	-3.940	0.404
350	0.571	-4.075	0.391

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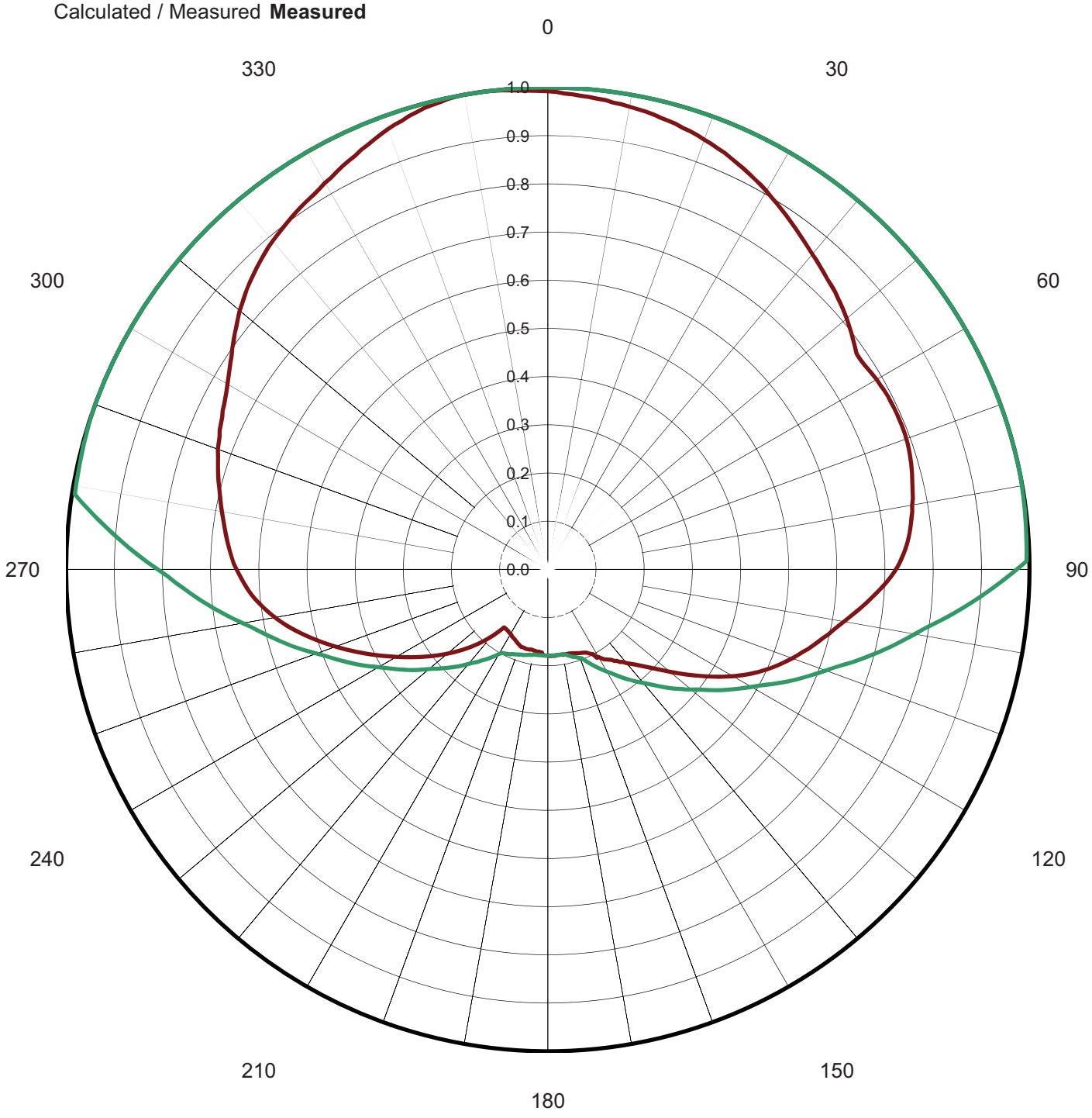
COMMUNICATION TECHNOLOGY

Date	**4/18/2011**
Call Letters	**WHBP**
Location	**Harbor Springs, MI**
Customer	**INTERLOCHEN**
Antenna Type	**DCRH2ERP**
Frequency	**90.1**
Drawing #	**9**

COMPOSITE AZIMUTH PATTERN

Calculated / Measured **Measured**



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COMMUNICATION TECHNOLOGY

Date	**4/18/2011**
Call Letters	**WHBP**
Location	**Harbor Springs, MI**
Customer	**INTERLOCHEN**
Antenna Type	**DCRH2ERP**
Frequency	**90.1**
Drawing #	**9**

TABULATION OF COMPOSITE AZIMUTH PATTERN

Angle	Field	dBk	Power kW	Input Power
	0.992	0.722	1.181	1.200
10	0.975	0.572	1.141	1.200
20	0.949	0.337	1.081	1.200
30	0.907	-0.056	0.987	1.200
40	0.854	-0.579	0.875	1.200
50	0.810	-1.038	0.787	1.200
60	0.788	-1.278	0.745	1.200
70	0.792	-1.234	0.753	1.200
80	0.768	-1.501	0.708	1.200
90	0.723	-2.025	0.627	1.200
100	0.624	-3.304	0.467	1.200
110	0.540	-4.560	0.350	1.200
120	0.444	-6.261	0.237	1.200
130	0.330	-8.838	0.131	1.200
140	0.254	-11.112	0.077	1.200
150	0.210	-12.764	0.053	1.200
160	0.185	-13.865	0.041	1.200
170	0.180	-14.103	0.039	1.200
180	0.179	-14.151	0.038	1.200
190	0.171	-14.548	0.035	1.200
200	0.169	-14.650	0.034	1.200
210	0.155	-15.402	0.029	1.200
220	0.181	-14.055	0.039	1.200
230	0.272	-10.517	0.089	1.200
240	0.363	-8.010	0.158	1.200
250	0.469	-5.785	0.264	1.200
260	0.575	-4.015	0.397	1.200
270	0.646	-3.004	0.501	1.200
280	0.687	-2.469	0.566	1.200
290	0.729	-1.954	0.638	1.200
300	0.768	-1.501	0.708	1.200
310	0.835	-0.774	0.837	1.200
320	0.889	-0.230	0.948	1.200
330	0.926	0.124	1.029	1.200
340	0.972	0.545	1.134	1.200
350	1.000	0.792	1.200	1.200

SPX®

COMMUNICATION TECHNOLOGY

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CUSTOMER GAIN SUMMARY

Azimuth Pattern Gain of Horizontal Polarization	2.37 (3.75 dB)
Elevation Pattern Gain Per Polarization	1.00 (0.00 dB)
Peak Gain at Horizontal Polarization	2.37 (3.75 dB)

SPX®

COMMUNICATION TECHNOLOGY

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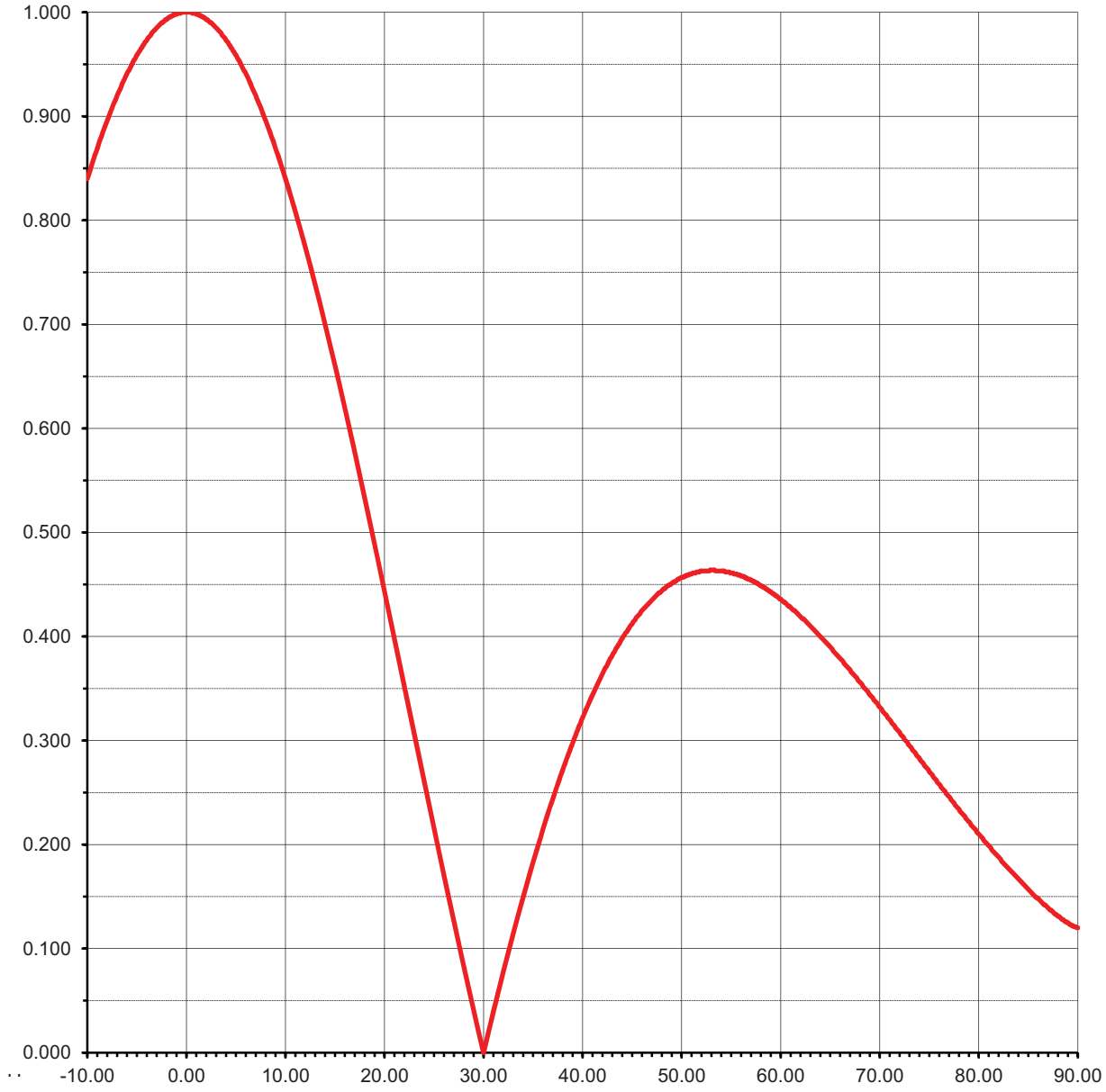
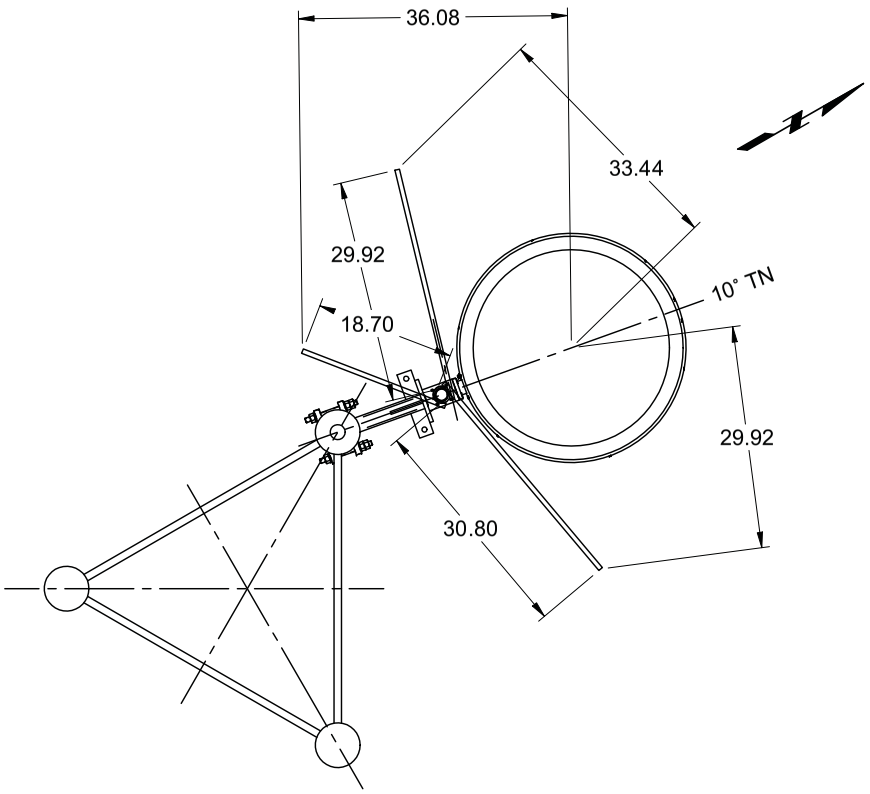
Drawing #	**9**

ELEVATION PATTERN

RMS Gain at Main Lobe	**1.00**	Beam Tilt	
Per Polarization		Frequency	**90.1 MHz**
Calculated / Measured	**Calculated**		




36.08
33.44
29.92
18.70
10° TN
29.92
30.80

IPR
Interlochen Public Radio

Classical Music
88.5 FM
88.7 FM
100.9 FM

News
91.5 FM

Listener-supported radio from INTERLOCHEN CENTER FOR THE ARTS

May 13, 2011

RE: WHBP antenna installation

I certify that the WHBP FM directional antenna was assembled, mounted, and tested under my supervision, according to plans and descriptions provided by the consulting engineers, Munn-Reese, and the antenna manufacturer, Dielectric Communications, and persuant to Construction Permit BNPED-20071019ARW.

I have been active in broadcast engineering for more than 20 years. I am certified as a Radio Broadcast Engineer (#3047) by the Society of Broadcast Engineers, Indianapolis, Indiana. (Re-certified March, 1996).

I hold a Federal Communications Commission lifetime General Radiotelephone license, issued September, 1990.

Interlochen Center for the Arts employs me as Chief Engineer, radio, and I am the designated Chief Operator of radio stations WIAA-FM, WIZY-FM, WICA-FM, WIAB-FM, WLMN-FM and WHBP-FM.

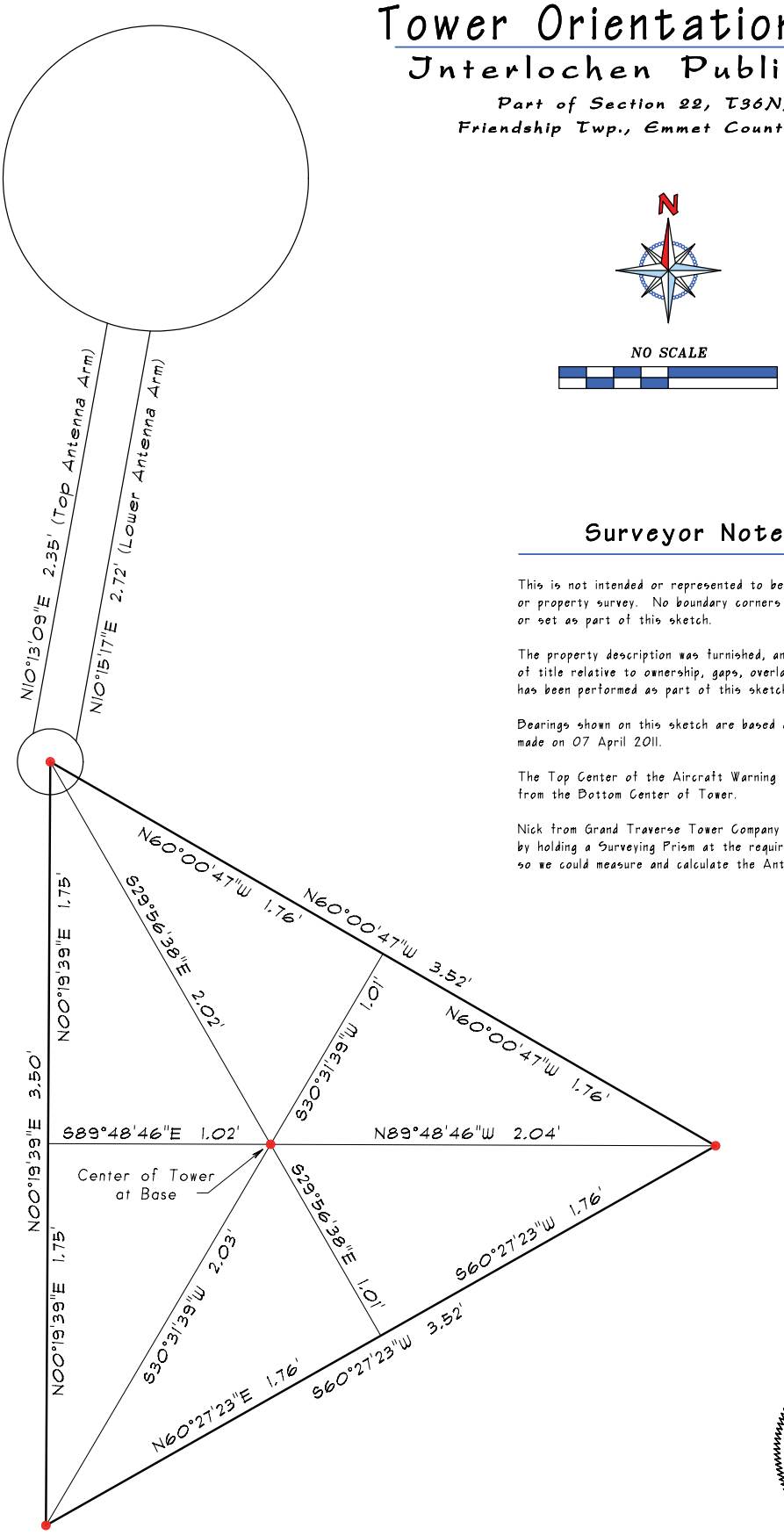
Jack Conners
Chief Engineer
Interlochen Public Radio

P.O. Box 199 Interlochen, MI 49643-0199 231.276.4400 www.interlochen.org

Tower Orientation Sketch

Interlochen Public Radio

Part of Section 22, T36N, R6W
Friendship Twp., Emmet County, Michigan



Surveyor Notes:

This is not intended or represented to be a land or property survey. No boundary corners were found or set as part of this sketch.

The property description was furnished, and no check of title relative to ownership, gaps, overlaps or occupation has been performed as part of this sketch.

Bearings shown on this sketch are based on GPS Observations made on 07 April 2011.

The Top Center of the Aircraft Warning Light is ±N79°01'54"E 0.17' from the Bottom Center of Tower.

Nick from Grand Traverse Tower Company assisted in our measurements by holding a Surveying Prism at the required locations on the Antenna so we could measure and calculate the Antenna Orientation.

STATE OF MICHIGAN
NEIL A. HOLSHOE
PROFESSIONAL SURVEYOR
No. 56482
LICENSED PROFESSIONAL SURVEYOR

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Client:	Interlochen Public Radio
Project Mgr:	Holshoe
Drawn By:	Holshoe
Field By:	Holshoe - Winter
File:	N11065 - Tower Orientation - final.gxd
Job #:	11-065
Date:	13 May 2011
Sheet #:	One of One

Tower Orientation Sketch
Interlochen Public Radio
Part of Section 22, T36N, R6W
Friendship Twp., Emmet County, Michigan

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