

# **T Z SAWYER TECHNICAL CONSULTANTS**

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## **APPLICATION FOR DIGITAL LOW POWER TELEVISION STATION MODIFICATION OF CONSTRUCTION PERMIT**

### **MINOR CHANGE APPLICATION**

**VAL VISTA RV PARK, LLC**

**W16DN, Digital Channel 16, BNPDTL-20100510AGN  
FACILITY ID: 186363  
TRAVERSE CITY, MI**

**APRIL 2021**

### **Engineering Statement - Narrative**

W16DN, a low power television facility (existing digital construction permit) seeks to change its transmitter site location and antenna type and height.

#### **Proposed Technical Facility:**

The proposed Channel 16 (482-488 MHZ) operation will employ a full-service RF emission mask and directional antenna system (ERI ALP-WRE) rotated to 230 degrees true, with an effective radiated power (ERP) of 15-Kilowatts, and an antenna radiation center above mean sea level (RCAMSL) of 389.3 meters and 58.0 meters above ground level (AGL).

Figure 1, is the proposed site location, as listed in FCC Tower ASR# 1061421

Figure 2, is a map showing the predicted f(50,90) 51 dBu service contour (present and proposed.)

Figure 3, contains the summary printout from the FCC TV Study program.

Figure 4, is a printout of the directional antenna pattern and its vertical elevation characteristics.

#### **Modification Compliance:**

Pursuant to 47 CFR §74.787(b) the instant application is considered a “minor” change because;

- There is no change in transmitting antenna location such that the protected contour resulting from the change does not overlap some portion of the protected contour of the authorized facilities of the existing station as illustrated in Figure 2, Present & Proposed Service Contours.

- There is no change in transmitting antenna location greater than 30 miles (48km) from the reference coordinates of the existing station's antenna location, as noted below:

CALCULATED DISTANCE BETWEEN EXISTING AND PROPOSED SITES

SITE	LAT (NAD83)	LON (NAD83)	(KM)	(MI)
CURRENT/EXISTING	44-45-30.9 N	85-41-36.9 W	0.9	0.5
PROPOSED	44-45-37.0 N	85-40-58.0 W		

Interference Analysis to other facilities:

An interference analysis to other television facilities is provided as Figure 3, FCC TV Study Results.

Contingent Application Rule:

No waiver is required. Operation is not dependent on spectrum to be vacated.

AM Facilities/International Coordination:

There are no authorized AM stations within 3 kilometers of the site. The nearest point to the border with Canada is 197.3 km, the proposed 23.94 dBu contour does NOT cross the border. Therefore, it is believed that international coordination with Canada WILL NOT BE required. No interference to protected Canadian facilities in Canada is predicted to occur.

Environmental Considerations:

Any changes in equipment or additions will not trigger any event with regards to Section 106 of the National Historical Preservation Act (NHPA). This is an existing developed communications site.

The proposal does not meet any of the criteria specified in Section 1.1307 of the FCC Rules. More specifically, the proposed facilities are not known to fall within any of the categories enumerated in Sections 1.1307(a)(1)-(7) and will not involve the use of high intensity white lights.

Furthermore, operation of the proposed facility will not involve the exposure of workers or the general public to levels of radio frequency electromagnetic fields exceeding guidelines adopted by the Federal Communications Commission. (The current FCC guidelines are based upon criteria contained in the National Council of Radiation Protection and Measurements (NCRP) Report No.86 (1986) and ANSI/IEEE C95.1-1992.)

CALCULATED POWER DENSITY AT 2 METERS AGL (0.5 ANTENNA RELATIVE FIELD VALUE)

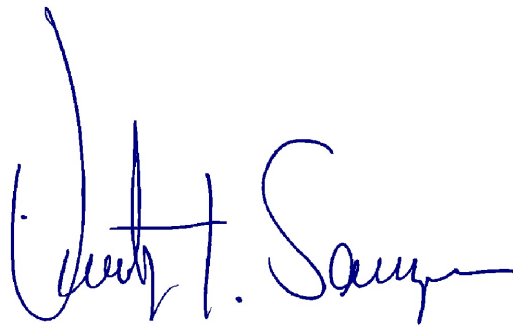
	MPE (MW/CM <sup>2</sup> )	CALCULATED VALUE	% OF MPE	PASS/FAIL
CONTROLLED AREA	1.6167	0.039939	2.47%	PASS
PUBLIC AREA	0.3233	0.039939	12.35%	PASS

The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC's guidelines. RF exposure warning signs are posted at the site. The applicant will coordinate exposure procedures with any co-located facilities and will reduce power or cease operation as necessary to protect persons having access to the site, tower, or antenna from RF electromagnetic field exposure in excess of FCC guidelines.

The proposed operation is fully in compliance with all areas of the Commission's rules and applicable international agreements.

April 12, 2021

Timothy Z. Sawyer, Technical Consultant  
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A handwritten signature in blue ink, appearing to read "Timothy Z. Sawyer". The signature is fluid and cursive, with the first name "Timothy" and last name "Sawyer" being the most prominent parts.

**Existing Communications Tower (No change in existing tower height is proposed)**

**Registration Detail**

Reg Number	1061421	Status	Constructed
File Number	A0983917	Constructed	06/19/1974
EMI	No	Dismantled	
NEPA	No		

**Antenna Structure**

Structure Type			
<b>Location</b> (in NAD83 Coordinates)			
Lat/Long	44-45-37.0 N 085-40-58.0 W	Address	5256 CEDAR RUN RD
City, State	TRAVERSE CITY , MI		
Zip	49684	County	GRAND TRAVERSE
Center of AM Array		Position of Tower in Array	

**Heights (meters)**

Elevation of Site Above Mean Sea Level	Overall Height Above Ground (AGL)
331.3	179.8
Overall Height Above Mean Sea Level	Overall Height Above Ground w/o Appurtenances
511.1	175.2

**Painting and Lighting Specifications**

FCC Paragraphs 1, 3, 4, 13, 21

**FAA Notification**

FAA Study	72-GL-0482	FAA Issue Date	03/28/1988
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**T Z SAWYER TECHNICAL  
CONSULTANTS**

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**FCC TOWER ASR REGISTRATION # 1061421  
FAA NOTICE NOT REQUIRED**

W16DN  
LOW POWER DIGITAL TELEVISION  
TRAVERSE CITY, MI

**FIGURE  
1**

FALL CHURCH, VIRGINIA 22043-2555

SIZE A	CAGE NO N/A	DWG NO 20210412W16DN-F1	REV
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SCALE N/A	APRIL 2021	SHEET
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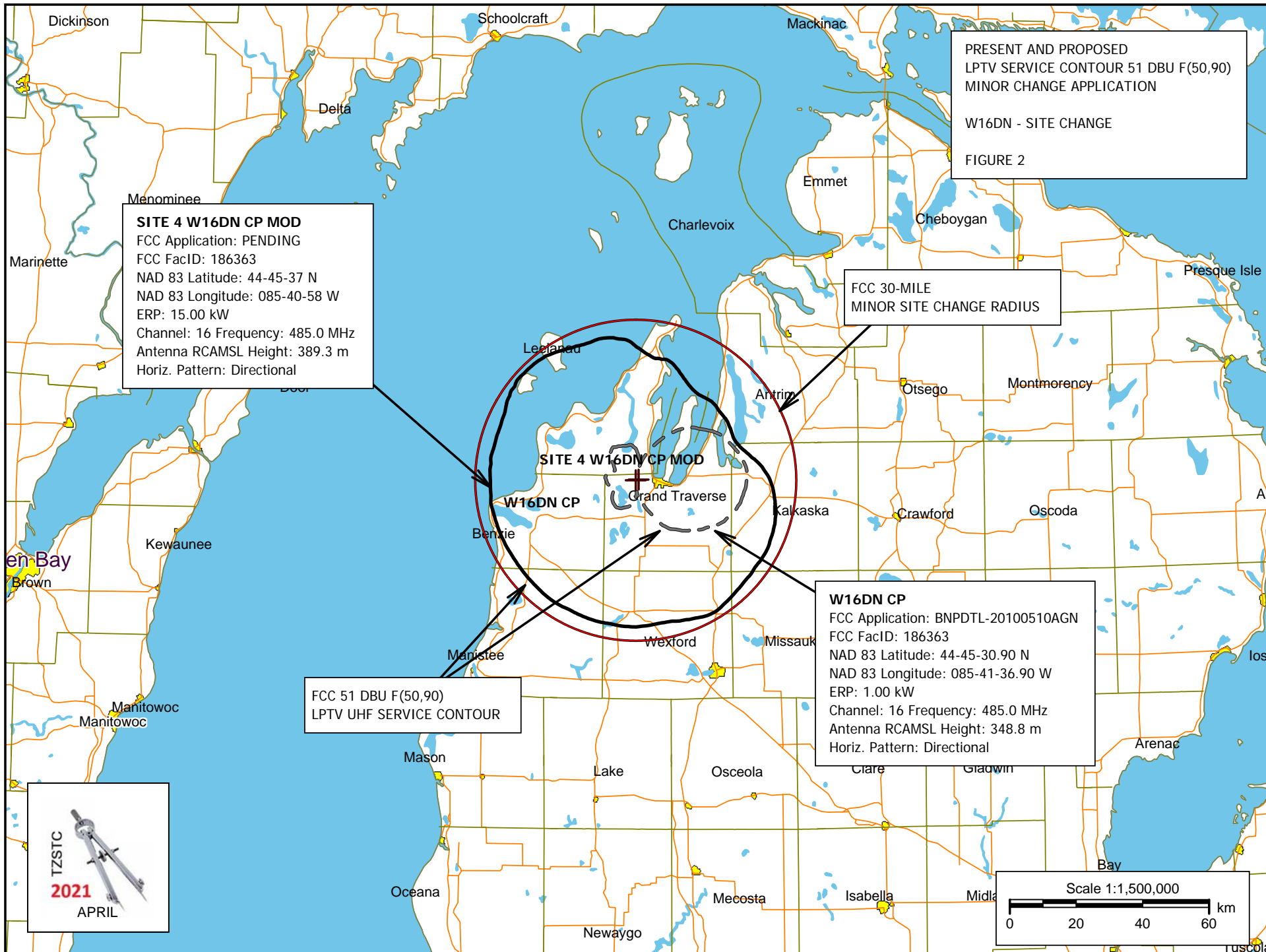


FIGURE 3 - FCC TVSTUDY SUMMARY OR FULL REPORT

tvstudy v2.2.5 (4uoc83)

Database: localhost, Study: W16DN FINAL SITE 4, Model: Longley-Rice

Study build station data: LMS TV 2021-04-10

Proposal: W16DN-CP D16 LD APP TRAVERSE CITY, MI  
File number: BNPDTL20100510AGN  
Facility ID: 186363  
Station data: User record  
Record ID: 307  
Country: U.S.

Build options:  
Protect pre-transition records not on baseline channel

Search options:  
Non-U.S. records included

Individual records excluded:  
20100510AGN W16DN-D D16 LD CP TRAVERSE CITY, MI BNPDTL20100510AGN

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	WDCQ-TV	D15	DT	LIC	BAD AXE, MI	BLEDT20030922ABG	210.6 km
No	WXSP-CD	D15	DC	LIC	GRAND RAPIDS, MI	BLANK0000141792	193.9
No	WXSP-CD	D15	DC	LIC	GRAND RAPIDS, MI	BLDTA20100714AAG	193.9
No	W15DP-D	D15	LD	CP	GRAYLING, MI	BNPDTL20100223ADD	63.5
No	W15DF-D	D15	LD	CP	HOUGHTON LAKE, MI	BNPDTL20100223AAN	83.8
No	WCWF	D15	DT	LIC	SURING, WI	BLANK0000117413	186.9
No	WTV0	D16	DT	LIC	ROCKFORD, IL	BLCDT20021024AAS	393.1
No	WFWC-CD	D16	DC	LIC	FORT WAYNE, IN	BLANK0000087020	409.3
No	WEID-LD	D16	LD	LIC	SOUTH BEND, IN	BLDTL20141105ADE	343.9
No	WAAA-LD	D16-	LD	LIC	Valparaiso, IN	BLANK0000100188	376.1
No	WOBC-CD	D16	DC	LIC	BATTLE CREEK, MI	BLANK0000085345	277.9
Yes	WTOM-TV	D16	DT	LIC	CHEBOYGAN, MI	BLANK0000123836	144.2
No	WSMH	D16	DT	LIC	FLINT, MI	BLCDT20090804ABG	213.6
No	W16EF-D	D16	LD	CP	MARQUETTE, MI	BLANK0000072041	239.7
No	WYTU-LD	D16	LD	LIC	MILWAUKEE, WI	BLANK0000084618	256.8
Yes	WJFW-TV	D16	DT	LIC	RHINELANDER, WI	BLCDT20070222AOP	293.8
No	WOTV	D17	DT	LIC	BATTLE CREEK, MI	BLANK0000117388	243.9
No	WOTV	D17	DT	LIC	BATTLE CREEK, MI	BLANK0000141782	243.9
Yes	WMNN-LD	D17	LD	LIC	LAKE CITY, MI	BLANK0000118076	64.6
No	WFFC-LD	D17	LD	LIC	MIDLAND, MI	BLANK0000087273	206.9
No	WGBD-LD	D17	LD	LIC	GREEN BAY, WI	BLANK0000068358	186.9
No	W17DZ-D	D17	LD	LIC	SISTER BAY, WI	BLANK0000086983	122.8
No	CIII-DT-4	D16	DT	LIC	OWEN SOUND, ON	BLANKCANADA208	372.2
No	CHWI-DT	D16	DT	LIC	WHEATLEY, ON	BLANKCANADA241	391.0

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D16  
Mask: Full Service  
Latitude: 44 45 37.00 N (NAD83)  
Longitude: 85 40 58.00 W  
Height AMSL: 389.3 m  
HAAT: 0.0 m  
Peak ERP: 15.0 kW  
Antenna: ERI ALP WRE ROT 230 230.0 deg  
Elev Pattn: Generic  
Elec Tilt: 0.75

48.9 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	3.65 kW	151.4 m	42.0 km
45.0	0.470	205.9	34.6
90.0	1.94	203.3	41.9
135.0	10.8	147.8	47.3
180.0	15.0	117.7	46.8
225.0	13.3	123.8	46.7
270.0	14.7	117.6	46.7
315.0	12.4	166.4	49.3

Database HAAT does not agree with computed HAAT  
Database HAAT: 0 m    Computed HAAT: 154 m

Proposal 23.94 dBu contour does not cross Canadian border  
Distance to Canadian border: 197.3 km

Distance to Mexican border: 2162.0 km

Conditions at FCC monitoring station: Allegan MI  
Bearing: 185.3 degrees    Distance: 240.5 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:  
Bearing: 259.1 degrees    Distance: 1677.6 km

No land mobile station failures found

Proposal is not within the Offshore Radio Service protected area

Study cell size: 1.00 km  
Profile point spacing: 1.00 km

Maximum new IX to full-service and Class A: 0.50%  
Maximum new IX to LPTV: 2.00%

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Interference to BLANK0000123836 LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WTOM-TV	D16	DT	LIC	CHEBOYGAN, MI	BLANK0000123836	
Undesireds:	W16DN-CP	D16	LD	APP	TRAVERSE CITY, MI	BNPDTL20100510AGN	144.2 km
	WSMH	D16	DT	LIC	FLINT, MI	BLCDDT20090804ABG	270.4
	CIII-DT-4	D16	DT	LIC	OWEN SOUND, ON	BLANKCANADA208	294.7

	Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX	
	16169.2	119,686	16006.8	115,806	16001.7	115,788	15782.5	115,352	1.37    0.38
	53.8	0	53.8	0	53.8	0	53.8	0	0.00    0.00 (in Canada)

Undesired				Total IX	Unique IX, before	Unique IX, after
W16DN-CP	D16	LD	APP	219.2	436	219.2    436
WSMH	D16	DT	LIC	2.0	18	1.0    18
CIII-DT-4	D16	DT	LIC	4.1	0	3.0    0

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Interference to BLCDDT20070222AOP LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WJFW-TV	D16	DT	LIC	RHINELANDER, WI	BLCDDT20070222AOP	
Undesireds:	W16DN-CP	D16	LD	APP	TRAVERSE CITY, MI	BNPDTL20100510AGN	293.8 km
	WCWF	D15	DT	LIC	SURING, WI	BLANK0000117413	169.4
	WTVO	D16	DT	LIC	ROCKFORD, IL	BLCDDT20021024AAS	375.7
	WTOM-TV	D16	DT	LIC	CHEBOYGAN, MI	BLANK0000123836	377.8
	WEAU	D17	DT	LIC	EAU CLAIRE, WI	BLANK0000120880	177.0

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
28743.7 277,497	28262.1 271,651	28121.7 270,682	28120.7 270,682	0.00 0.00

Undesired	Total IX	Unique IX, before	Unique IX, after
W16DN-CP D16 LD APP	1.0 0		1.0 0
WCWF D15 DT LIC	44.6 103	42.6 103	42.6 103
WTVQ D16 DT LIC	2.0 0	0.0 0	0.0 0
WTOM-TV D16 DT LIC	5.0 6	5.0 6	5.0 6
WEAU D17 DT LIC	90.8 860	90.8 860	90.8 860

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Interference to BLANK0000118076 LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WMNN-LD	D17	LD	LIC	LAKE CITY, MI	BLANK0000118076	

Undesireds:	W16DN-CP	D16	LD	APP	TRAVERSE CITY, MI	BNPDTL20100510AGN	64.6 km
	WOTV	D17	DT	LIC	BATTLE CREEK, MI	BLANK0000117388	186.0
	WFFC-LD	D17	LD	LIC	MIDLAND, MI	BLANK0000087273	146.1
	WGBD-LD	D17	LD	LIC	GREEN BAY, WI	BLANK0000068358	213.5
	W17DZ-D	D17	LD	LIC	SISTER BAY, WI	BLANK0000086983	178.6
	WPBN-TV	D18	LD	CP	TRAVERSE CITY, MI	BLANK0000094903	66.3

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
7910.1 117,718	7705.9 115,364	7554.9 112,010	7553.9 111,953	0.01 0.05

Undesired	Total IX	Unique IX, before	Unique IX, after
W16DN-CP D16 LD APP	1.0 57		1.0 57
WOTV D17 DT LIC	122.8 2,021	112.7 1,361	112.7 1,361
WFFC-LD D17 LD LIC	34.3 1,925	25.2 1,320	25.2 1,320
WGBD-LD D17 LD LIC	1.0 9	1.0 9	1.0 9
W17DZ-D D17 LD LIC	1.0 0	1.0 0	1.0 0
WPBN-TV D18 LD CP	2.0 59	1.0 4	1.0 4

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Interference to BLANK0000118076 LIC scenario 2

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WMNN-LD	D17	LD	LIC	LAKE CITY, MI	BLANK0000118076	

Undesireds:	W16DN-CP	D16	LD	APP	TRAVERSE CITY, MI	BNPDTL20100510AGN	64.6 km
	WOTV	D17	DT	LIC	BATTLE CREEK, MI	BLANK0000141782	186.0
	WFFC-LD	D17	LD	LIC	MIDLAND, MI	BLANK0000087273	146.1
	WGBD-LD	D17	LD	LIC	GREEN BAY, WI	BLANK0000068358	213.5
	W17DZ-D	D17	LD	LIC	SISTER BAY, WI	BLANK0000086983	178.6
	WPBN-TV	D18	LD	CP	TRAVERSE CITY, MI	BLANK0000094903	66.3

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
7910.1 117,718	7705.9 115,364	7554.9 112,010	7553.9 111,953	0.01 0.05

Undesired	Total IX	Unique IX, before	Unique IX, after
W16DN-CP D16 LD APP	1.0 57		1.0 57
WOTV D17 DT LIC	122.8 2,021	112.7 1,361	112.7 1,361
WFFC-LD D17 LD LIC	34.3 1,925	25.2 1,320	25.2 1,320
WGBD-LD D17 LD LIC	1.0 9	1.0 9	1.0 9
W17DZ-D D17 LD LIC	1.0 0	1.0 0	1.0 0
WPBN-TV D18 LD CP	2.0 59	1.0 4	1.0 4

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Interference to BLANK0000118076 LIC scenario 3

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WMNN-LD	D17	LD	LIC	LAKE CITY, MI	BLANK0000118076	

Undesireds:	W16DN-CP	D16	LD	APP	TRAVERSE CITY, MI	BNPDTL20100510AGN	64.6 km
	WOTV	D17	DT	LIC	BATTLE CREEK, MI	BLANK0000117388	186.0
	WFFC-LD	D17	LD	LIC	MIDLAND, MI	BLANK0000087273	146.1
	WGBD-LD	D17	LD	LIC	GREEN BAY, WI	BLANK0000068358	213.5
	W17DZ-D	D17	LD	LIC	SISTER BAY, WI	BLANK0000086983	178.6



WPBN-TV	D18	LD	LIC	TRAVERSE CITY, MI	BLANK0000143297	66.3
Service area	Terrain-limited		IX-free, before		IX-free, after	Percent New IX
7910.1 117,718	7705.9	115,364	7554.9	112,010	7553.9 111,953	0.01 0.05
Undesired	Total IX		Unique IX, before		Unique IX, after	
W16DN-CP D16 LD APP	1.0	57			1.0 57	
WOTV D17 DT LIC	122.8	2,021	112.7	1,361	112.7 1,361	
WFFC-LD D17 LD LIC	34.3	1,925	25.2	1,320	25.2 1,320	
WGBD-LD D17 LD LIC	1.0	9	1.0	9	1.0 9	
W17DZ-D D17 LD LIC	1.0	0	1.0	0	1.0 0	
WPBN-TV D18 LD LIC	2.0	59	1.0	4	1.0 4	

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Interference to BLANK0000118076 LIC scenario 4

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WMNN-LD	D17	LD	LIC	LAKE CITY, MI	BLANK0000118076	
Undesireds:	W16DN-CP	D16	LD	APP	TRAVERSE CITY, MI	BNPDTL20100510AGN	64.6 km
	WOTV	D17	DT	LIC	BATTLE CREEK, MI	BLANK0000141782	186.0
	WFFC-LD	D17	LD	LIC	MIDLAND, MI	BLANK0000087273	146.1
	WGBD-LD	D17	LD	LIC	GREEN BAY, WI	BLANK0000068358	213.5
	W17DZ-D	D17	LD	LIC	SISTER BAY, WI	BLANK0000086983	178.6
	WPBN-TV	D18	LD	LIC	TRAVERSE CITY, MI	BLANK0000143297	66.3

Service area	Terrain-limited		IX-free, before		IX-free, after	Percent New IX
7910.1 117,718	7705.9	115,364	7554.9	112,010	7553.9 111,953	0.01 0.05
Undesired	Total IX		Unique IX, before		Unique IX, after	
W16DN-CP D16 LD APP	1.0	57			1.0 57	
WOTV D17 DT LIC	122.8	2,021	112.7	1,361	112.7 1,361	
WFFC-LD D17 LD LIC	34.3	1,925	25.2	1,320	25.2 1,320	
WGBD-LD D17 LD LIC	1.0	9	1.0	9	1.0 9	
W17DZ-D D17 LD LIC	1.0	0	1.0	0	1.0 0	
WPBN-TV D18 LD LIC	2.0	59	1.0	4	1.0 4	

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Interference to proposal scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	W16DN-CP	D16	LD	APP	TRAVERSE CITY, MI	BNPDTL20100510AGN	
Undesireds:	WTOM-TV	D16	DT	LIC	CHEBOYGAN, MI	BLANK0000123836	144.2 km
	WMNN-LD	D17	LD	LIC	LAKE CITY, MI	BLANK0000118076	64.6

Service area	Terrain-limited		IX-free		Percent IX	
6217.1 153,267	5997.0	151,080	5852.0	149,696	2.42 0.92	
Undesired	Total IX		Unique IX		Prct Unique IX	
WTOM-TV D16 DT LIC	131.0	1,262	131.0	1,262	2.18 0.84	
WMNN-LD D17 LD LIC	14.0	122	14.0	122	0.23 0.08	

***PRELIMINARY SPECIFICATION FOR  
ERI CARINA™ HORIZONTALLY POLARIZED  
COAXIAL SLOTTED ARRAY ANTENNA***

*Prepared For  
W16DN  
Channel 16*

*April 2021*

**ANTENNA TYPE:  
ALP8L3-HSWRE-16**

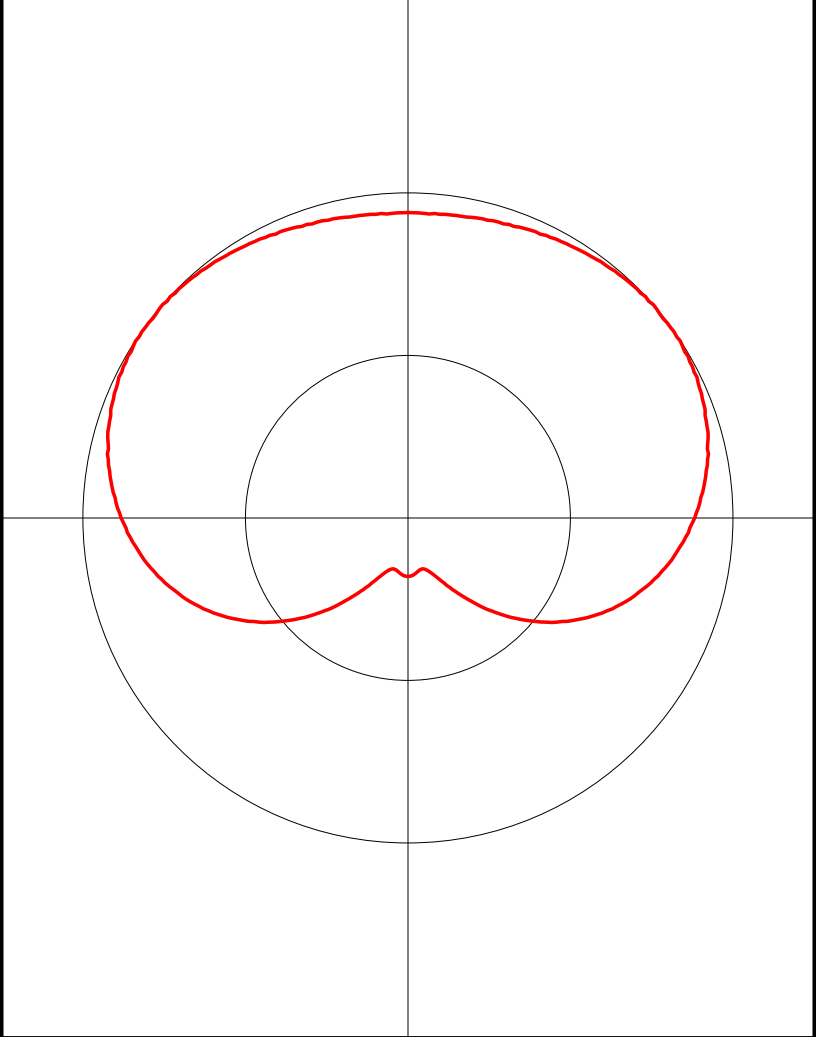
**SPECIFICATION NO:  
FIGURE 4**

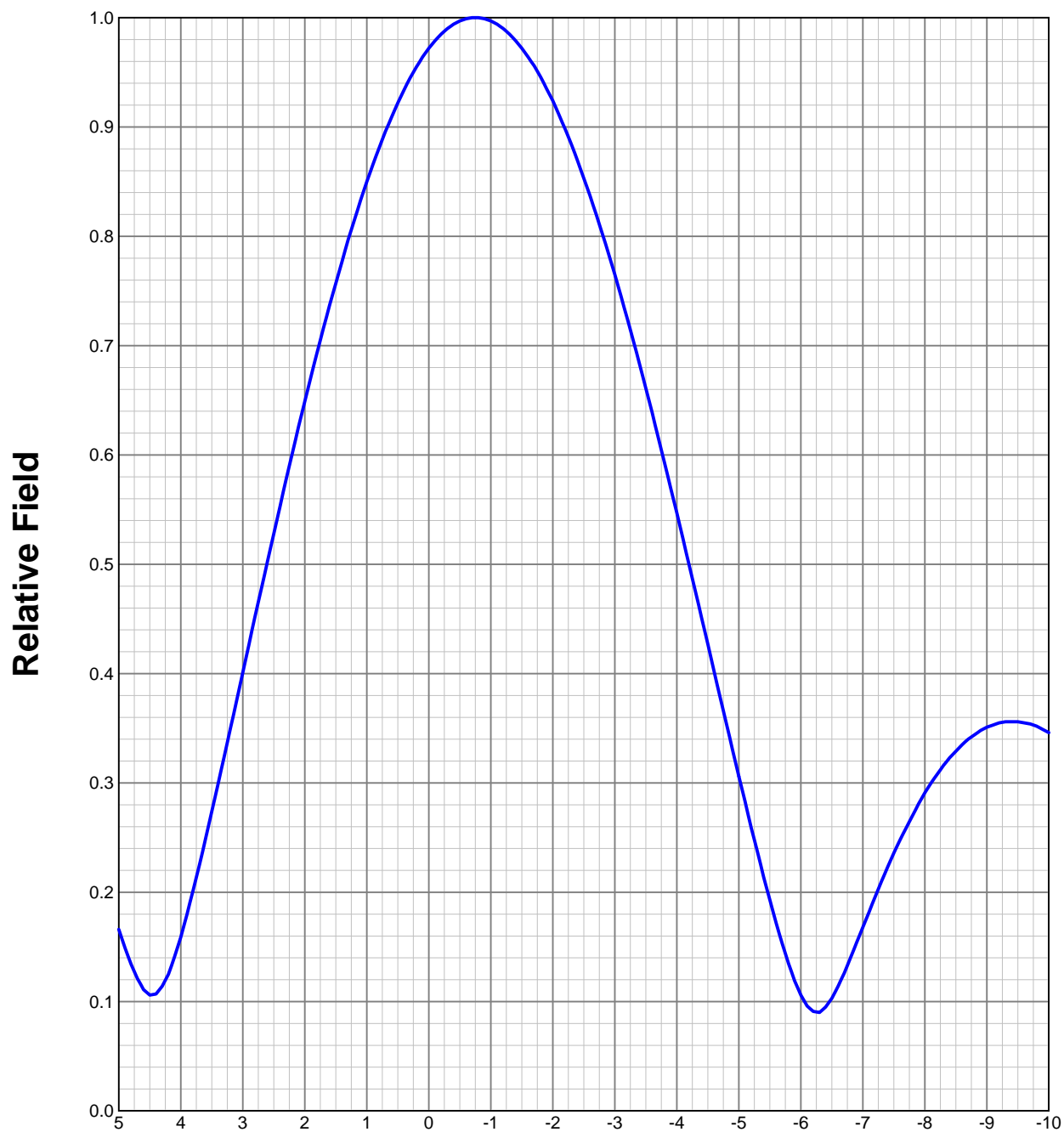


ERI ALP WRE Antenna Pattern

Pre-Rotation Antenna Pattern....

Azimuth (deg)	Relative Field
0.0	0.939
10.0	0.942
20.0	0.954
30.0	0.974
40.0	0.991
50.0	1.000
60.0	0.995
70.0	0.973
80.0	0.935
90.0	0.882
100.0	0.814
110.0	0.728
120.0	0.62
130.0	0.493
140.0	0.36
150.0	0.24
160.0	0.171
170.0	0.168
180.0	0.18
190.0	0.168
200.0	0.171
210.0	0.24
220.0	0.36
230.0	0.493
240.0	0.62
250.0	0.728
260.0	0.814
270.0	0.882
280.0	0.935
290.0	0.973
300.0	0.995
310.0	1.000
320.0	0.991
330.0	0.974
340.0	0.954
350.0	0.942



**ELEVATION PATTERN****Type:****ALP8L3****Channel:****16****Directivity:****Numeric****dBd****Location:****Main Lobe:****9.05****9.57****Beam Tilt:****-0.75****Horizontal:****8.55****9.32****Polarization:****Horizontal***Preliminary, subject to final design and review.*

## TABULATED DATA FOR ELEVATION PATTERN

Type: ALP8L3

PolarizationHorizontal

ANGLEFIELD	dB	ANGLEFIELD	dB	ANGLEFIELD	dB	ANGLEFIELD	dB	ANGLEFIELD	dB
5.00	0.166	-15.60	-6.75	0.133	-17.52	-27.00	0.053	-25.51	-50.50
4.75	0.128	-17.89	-7.00	0.168	-15.49	-27.50	0.034	-29.37	-51.00
4.50	0.106	-19.49	-7.25	0.203	-13.85	-28.00	0.018	-34.89	-51.50
4.25	0.119	-18.45	-7.50	0.236	-12.54	-28.50	0.008	-41.94	-52.00
4.00	0.159	-15.97	-7.75	0.265	-11.55	-29.00	0.006	-44.44	-52.50
3.75	0.214	-13.41	-8.00	0.291	-10.72	-29.50	0.004	-47.96	-53.00
3.50	0.274	-11.24	-8.25	0.312	-10.12	-30.00	0.000	-40.00	-53.50
3.25	0.337	-9.45	-8.50	0.329	-9.66	-30.50	0.009	-40.92	-54.00
3.00	0.401	-7.94	-8.75	0.342	-9.32	-31.00	0.021	-33.56	-54.50
2.75	0.466	-6.64	-9.00	0.351	-9.09	-31.50	0.037	-28.64	-55.00
2.50	0.528	-5.55	-9.25	0.355	-8.98	-32.00	0.054	-25.35	-55.50
2.25	0.590	-4.58	-9.50	0.356	-8.97	-32.50	0.074	-22.62	-56.00
2.00	0.649	-3.76	-9.75	0.353	-9.04	-33.00	0.093	-20.63	-56.50
1.75	0.705	-3.04	-10.00	0.346	-9.22	-33.50	0.112	-19.02	-57.00
1.50	0.757	-2.42	-10.50	0.323	-9.82	-34.00	0.129	-17.79	-57.50
1.25	0.806	-1.87	-11.00	0.289	-10.78	-34.50	0.144	-16.83	-58.00
1.00	0.850	-1.41	-11.50	0.247	-12.15	-35.00	0.156	-16.14	-58.50
0.75	0.889	-1.03	-12.00	0.201	-13.94	-35.50	0.165	-15.65	-59.00
0.50	0.922	-0.71	-12.50	0.153	-16.31	-36.00	0.169	-15.44	-59.50
0.25	0.950	-0.45	-13.00	0.107	-19.41	-36.50	0.170	-15.39	-60.00
0.00	0.972	-0.25	-13.50	0.064	-23.88	-37.00	0.166	-15.60	-60.50
-0.25	0.988	-0.11	-14.00	0.028	-31.06	-37.50	0.159	-15.97	-61.00
-0.50	0.997	-0.03	-14.50	0.001	-60.00	-38.00	0.148	-16.59	-61.50
-0.75	1.000	0.00	-15.00	0.021	-33.56	-38.50	0.134	-17.46	-62.00
-1.00	0.997	-0.03	-15.50	0.032	-29.90	-39.00	0.117	-18.64	-62.50
-1.25	0.988	-0.11	-16.00	0.033	-29.63	-39.50	0.098	-20.18	-63.00
-1.50	0.972	-0.25	-16.50	0.027	-31.37	-40.00	0.079	-22.05	-63.50
-1.75	0.951	-0.44	-17.00	0.020	-33.98	-40.50	0.059	-24.58	-64.00
-2.00	0.924	-0.69	-17.50	0.027	-31.37	-41.00	0.040	-27.96	-64.50
-2.25	0.891	-1.00	-18.00	0.051	-25.85	-41.50	0.025	-32.04	-65.00
-2.50	0.853	-1.38	-18.50	0.081	-21.83	-42.00	0.021	-33.56	-65.50
-2.75	0.811	-1.82	-19.00	0.112	-19.02	-42.50	0.029	-30.75	-66.00
-3.00	0.765	-2.33	-19.50	0.143	-16.89	-43.00	0.041	-27.74	-66.50
-3.25	0.714	-2.92	-20.00	0.172	-15.29	-43.50	0.051	-25.85	-67.00
-3.50	0.661	-3.60	-20.50	0.197	-14.11	-44.00	0.058	-24.73	-67.50
-3.75	0.605	-4.37	-21.00	0.217	-13.27	-44.50	0.063	-24.01	-68.00
-4.00	0.547	-5.24	-21.50	0.231	-12.73	-45.00	0.064	-23.88	-68.50
-4.25	0.487	-6.25	-22.00	0.238	-12.47	-45.50	0.063	-24.01	-69.00
-4.50	0.427	-7.39	-22.50	0.238	-12.47	-46.00	0.058	-24.73	-69.50
-4.75	0.366	-8.73	-23.00	0.232	-12.69	-46.50	0.051	-25.85	-70.00
-5.00	0.306	-10.29	-23.50	0.220	-13.15	-47.00	0.042	-27.54	-70.50
-5.25	0.248	-12.11	-24.00	0.202	-13.89	-47.50	0.030	-30.46	-71.00
-5.50	0.193	-14.29	-24.50	0.180	-14.89	-48.00	0.017	-35.39	-71.50
-5.75	0.144	-16.83	-25.00	0.155	-16.19	-48.50	0.003	-50.46	-72.00
-6.00	0.106	-19.49	-25.50	0.129	-17.79	-49.00	0.012	-38.42	-72.50
-6.25	0.090	-20.87	-26.00	0.102	-19.83	-49.50	0.027	-31.37	-73.00
-6.50	0.103	-19.74	-26.50	0.077	-22.27	-50.00	0.042	-27.54	-73.50

Preliminary, subject to final design and review.