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APPLICATION FOR DIGITAL LOW POWER TELEVISION STATION MODIFICATION OF CONSTRUCTION PERMIT

MINOR CHANGE APPLICATION

VAL VISTA RV PARK, LLC

**W22EL, Digital Channel 22, BNPDTL-20100223ADL
FACILITY ID: 184927
VANDERBILT, MI**

APRIL 2021

Engineering Statement - Narrative

W22EL, 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 22 (518-524 MHZ) operation will employ a full-service RF emission mask and directional antenna system (ERI ALP-BR) rotated to 190 degrees true, with an effective radiated power (ERP) of 15-Kilowatts, and an antenna radiation center above mean sea level (RCAMSL) of 602.0 meters and 134.4 meters above ground level (AGL).

Figure 1, is the proposed site location, as listed in FCC Tower ASR# 1000438

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	45-12-36.3 N	84-37-22.8 W	11.0	6.8
PROPOSED	45-10-12.0 N	84-45-04.0 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 115.4 km, the proposed 24.56 dBu contour does cross the border. Therefore, it is believed that international coordination with Canada WILL BE required.

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)

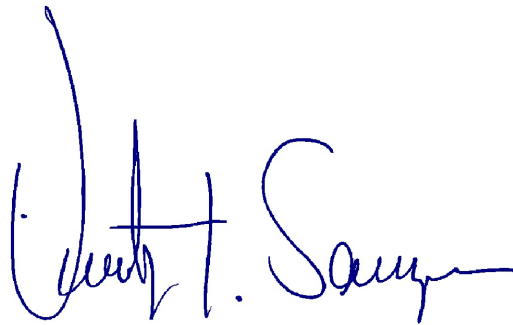
	MPE (MW/CM ²)	CALCULATED VALUE	% OF MPE	PASS/FAIL
CONTROLLED AREA	1.7267	0.007145	0.41%	PASS
PUBLIC AREA	0.3453	0.007145	2.07%	PASS

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

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A handwritten signature in blue ink, appearing to read "Timothy Z. Sawyer". The signature is stylized with a large initial "T" and a long horizontal stroke at the end.

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

Registration Detail			
Reg Number	1000438	Status	Constructed
File Number	A0594795	Constructed	08/28/1996
EMI	No	Dismantled	
NEPA	No		
Antenna Structure			
Structure Type	TOWER - Free standing or Guyed Structure used for Commu		
Location (in NAD83 Coordinates)			
Lat/Long	45-10-12.0 N 084-45-04.0 W	Address	02132 TOWER RD
City, State	VANDERBILT , MI		
Zip	49713	County	CHARLEVOIX
Center of AM Array		Position of Tower in Array	
Heights (meters)			
Elevation of Site Above Mean Sea Level		Overall Height Above Ground (AGL)	
467.6		193.0	
Overall Height Above Mean Sea Level		Overall Height Above Ground w/o Appurtenances	
660.6		192.0	
Painting and Lighting Specifications			
FAA Chapters 3, 4, 8, 13			
Paint and Light in Accordance with FAA Circular Number 70/7460-1J			
FAA Notification			
FAA Study	96-AGL-0264-OE	FAA Issue Date	03/25/1996

**T Z SAWYER TECHNICAL
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**FCC TOWER ASR REGISTRATION # 1000438
FAA NOTICE NOT REQUIRED**

W22EL
LOW POWER DIGITAL TELEVISION
VANDERBILT, MI

**FIGURE
1**

FALL CHURCH, VIRGINIA 22043-2555

SIZE

A

CAGE NO

N/A

DWG NO

20210412W20EL-F1

REV

(c) 2021, ALL RIGHTS RESERVED

SCALE

N/A

APRIL 2021

SHEET

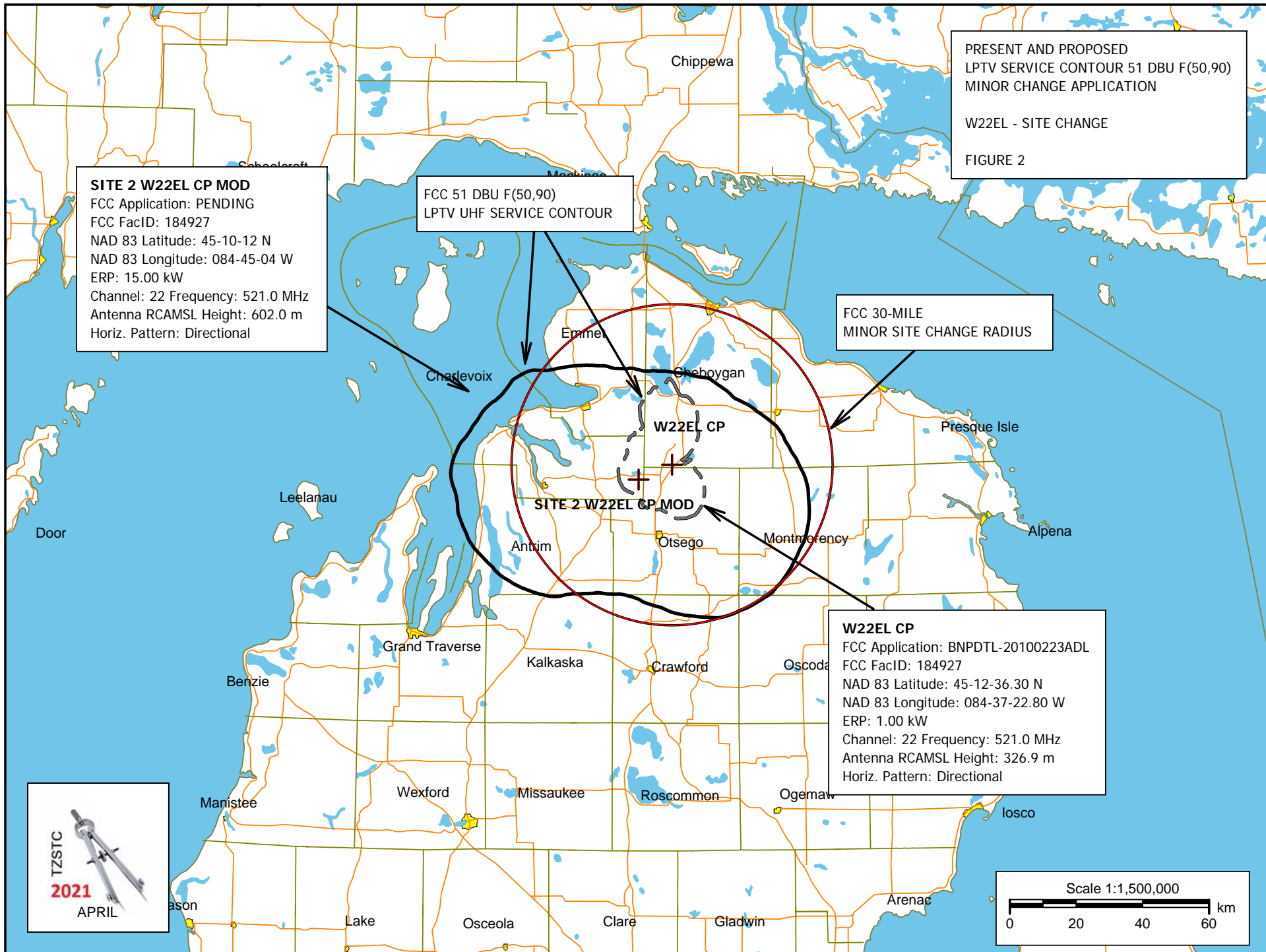


FIGURE 3 - FCC TV STUDY SUMMARY OR FULL REPORT

tvstudy v2.2.5 (4uoc83)

Database: localhost, Study: W22EL FINAL SITE 2 BR190 602M, Model: Longley-Rice

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

Proposal: W22EL-D D22 LD APP VANDERBILT, MI
 File number: W22EL FINAL SITE 2 BR190 602M
 Facility ID: 184927
 Station data: User record
 Record ID: 359
 Country: U.S.

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

Search options:
 Non-U.S. records included

Individual records excluded:
 20100223ADL W22EL-D D22 LD CP VANDERBILT, MI BNPDTL20100223ADL

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	W18BT	N18-	TX	LIC	Flint, MI	BLTTTL19981113JB	100.6 km
No	W21DQ-D	D21	LD	CP	MIDLAND, MI	BDISDTL20130430ACW	126.6
No	WFUP	D21	DT	LIC	VANDERBILT, MI	BLANK0000087814	0.0
No	WLS-TV	D22	DT	CP	CHICAGO, IL	BLANK0000086908	433.4
No	W22EM-D	D22	LD	CP	CHARLES, MI	BNPDTL20100223ADY	104.7
No	WDWO-CD	D22	DC	CP	DETROIT, MI	BLANK0000127531	320.1
No	WDWO-CD	D22	DC	LIC	DETROIT, MI	BLANK0000074926	320.1
No	WLLA	D22	DT	LIC	KALAMAZOO, MI	BLANK0000122579	295.1
No	WKNX-LP	D22z	LD	CP	PINCONNING, MI	BLANK0000071746	201.8
No	WKNX-LP	N22z	TX	LIC	PINCONNING, MI	BLTTTL20030714AEI	174.2
Yes	W22EB-D	D22	LD	CP	ROSCOMMON, MI	BNPDTL20100223ACX	70.1
Yes	WPBN-TV	D22	LD	CP	TRAVERSE CITY, MI	BLANK0000094906	125.1
No	WBGU-TV	D22	DT	LIC	BOWLING GREEN, OH	BLANK0000063785	453.5
Yes	WFRV-TV	D22	DT	LIC	GREEN BAY, WI	BLANK0000086896	271.4
No	WVCY-TV	D22	DT	LIC	MILWAUKEE, WI	BMLEDT20091116ABD	341.1
No	WBSF	D23	DT	LIC	BAY CITY, MI	BLANK0000078103	232.1
No	W23EB-D	D23	LD	LIC	CADILLAC, MI	BLDTL20140317ABS	123.5
Yes	W23EJ-D	D23	LD	CP	VANDERBILT, MI	BNPDTL20100223ADK	11.0
No	WBAY-TV	D23	DT	LIC	GREEN BAY, WI	BMLCDT20040723ADS	270.0
No	CICO-DT-28D22		DT	LIC	KITCHENER, ON	BLANKCANADA183	403.3
No	CHCH-TV-4	D22	DT	LIC	SUDBURY, ON	BLANKCANADA225	321.3

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D22
 Mask: Full Service
 Latitude: 45 10 12.00 N (NAD83)
 Longitude: 84 45 4.00 W
 Height AMSL: 602.0 m
 HAAT: 0.0 m
 Peak ERP: 15.0 kW
 Antenna: ERI-ALP-BR 190.0 deg
 Elev Pattern: Generic
 Elec Tilt: 0.75

49.6 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.320 kW	265.1 m	34.8 km
45.0	0.565	301.0	39.4

90.0	6.61	289.7	52.2
135.0	13.8	240.2	53.3
180.0	1.09	192.2	37.4
225.0	6.47	230.3	48.9
270.0	13.1	332.0	58.2
315.0	1.67	357.7	48.3

Database HAAT does not agree with computed HAAT
Database HAAT: 0 m Computed HAAT: 276 m

**Proposal 24.56 dBu contour crosses Canadian border, coordination required
Distance to Canadian border: 115.4 km

Distance to Mexican border: 2246.2 km

Conditions at FCC monitoring station: Allegan MI
Bearing: 199.1 degrees Distance: 300.9 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 258.7 degrees Distance: 1758.3 km

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%

Interference to BNPDTL20100223ACX CP scenario 1

Desired:	Call W22EB-D	Chan D22	Svc LD	Status CP	City, State ROSCOMMON, MI	File Number BNPDTL20100223ACX	Distance
Undesireds:	W22EL-D	D22	LD	APP	VANDERBILT, MI	W22EL FINAL SITE 2 BR1	70.1 km
	WDWO-CD	D22	DC	CP	DETROIT, MI	BLANK0000127531	255.6
	WLLA	D22	DT	LIC	KALAMAZOO, MI	BLANK0000122579	227.1
	WKNX-LP	D22z	LD	CP	PINCONNING, MI	BLANK0000071746	138.0
	WPBN-TV	D22	LD	CP	TRAVERSE CITY, MI	BLANK0000094906	83.1
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
1109.4	18,401	1088.4	18,386	969.3	16,788	938.4 16,512	3.19 1.64
Undesired				Total IX	Unique IX, before	Unique IX, after	
W22EL-D D22 LD APP		64.9	495			31.0	276
WLLA D22 DT LIC		7.0	371	4.0	175	0.0	0
WKNX-LP D22z LD CP		3.0	14	0.0	0	0.0	0
WPBN-TV D22 LD CP		115.1	1,423	109.1	1,213	83.1	1,205

Interference to BNPDTL20100223ACX CP scenario 2

Desired:	Call W22EB-D	Chan D22	Svc LD	Status CP	City, State ROSCOMMON, MI	File Number BNPDTL20100223ACX	Distance					
Undesireds:	W22EL-D	D22	LD	APP	VANDERBILT, MI	W22EL FINAL SITE 2 BR1	70.1 km					
	WDWO-CD	D22	DC	CP	DETROIT, MI	BLANK0000127531	255.6					
	WLLA	D22	DT	LIC	KALAMAZOO, MI	BLANK0000122579	227.1					
	WPBN-TV	D22	LD	CP	TRAVERSE CITY, MI	BLANK0000094906	83.1					
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX					
1109.4	18,401	1088.4		18,386		969.3	16,788	938.4	16,512	3.19	1.64	
Undesired				Total IX		Unique IX, before		Unique IX, after				
W22EL-D D22 LD APP		64.9		495		31.0		276				
WLLA D22 DT LIC		7.0		371		4.0		175		0.0		0

WPBN-TV D22 LD CP 115.1 1,423 112.1 1,227 83.1 1,205

Interference to BLANK0000094906 CP scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WPBN-TV	D22	LD	CP	TRAVERSE CITY, MI	BLANK0000094906	
Undesireds:	W22EL-D	D22	LD	APP	VANDERBILT, MI	W22EL FINAL SITE 2 BR1	125.1 km
	WDWO-CD	D22	DC	CP	DETROIT, MI	BLANK0000127531	278.0
	WLLA	D22	DT	LIC	KALAMAZOO, MI	BLANK0000122579	191.3
	WKNX-LP	D22z	LD	CP	PINCONNING, MI	BLANK0000071746	174.2
	W22EB-D	D22	LD	CP	ROSCOMMON, MI	BNPDTL20100223ACX	83.1
	WFRV-TV	D22	DT	LIC	GREEN BAY, WI	BLANK0000086896	180.6
	W23EB-D	D23	LD	LIC	CADILLAC, MI	BLDTL20140317ABS	36.0

	Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX
	9708.7	148,355	9547.4	144,101	8877.1	133,164	8835.1	132,062	0.47 0.83

Undesired		Total IX	Unique IX, before	Unique IX, after
W22EL-D D22 LD APP	71.9	4,298		42.0 1,102
WLLA D22 DT LIC	96.6	3,946	52.3 1,518	36.4 490
WKNX-LP D22z LD CP	4.0	7	0.0 0	0.0 0
W22EB-D D22 LD CP	7.1	47	0.0 0	0.0 0
WFRV-TV D22 DT LIC	140.3	2,920	115.1 639	110.1 597
W23EB-D D23 LD LIC	486.8	6,601	453.4 6,313	453.4 6,313

Interference to BLANK0000094906 CP scenario 2

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WPBN-TV	D22	LD	CP	TRAVERSE CITY, MI	BLANK0000094906	
Undesireds:	W22EL-D	D22	LD	APP	VANDERBILT, MI	W22EL FINAL SITE 2 BR1	125.1 km
	WDWO-CD	D22	DC	CP	DETROIT, MI	BLANK0000127531	278.0
	WLLA	D22	DT	LIC	KALAMAZOO, MI	BLANK0000122579	191.3
	W22EB-D	D22	LD	CP	ROSCOMMON, MI	BNPDTL20100223ACX	83.1
	WFRV-TV	D22	DT	LIC	GREEN BAY, WI	BLANK0000086896	180.6
	W23EB-D	D23	LD	LIC	CADILLAC, MI	BLDTL20140317ABS	36.0

	Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX
	9708.7	148,355	9547.4	144,101	8877.1	133,164	8835.1	132,062	0.47 0.83

Undesired		Total IX	Unique IX, before	Unique IX, after
W22EL-D D22 LD APP	71.9	4,298		42.0 1,102
WLLA D22 DT LIC	96.6	3,946	54.4 1,518	38.4 490
W22EB-D D22 LD CP	7.1	47	0.0 0	0.0 0
WFRV-TV D22 DT LIC	140.3	2,920	115.1 639	110.1 597
W23EB-D D23 LD LIC	486.8	6,601	453.4 6,313	453.4 6,313

Interference to BLANK0000086896 LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WFRV-TV	D22	DT	LIC	GREEN BAY, WI	BLANK0000086896	
Undesireds:	W22EL-D	D22	LD	APP	VANDERBILT, MI	W22EL FINAL SITE 2 BR1	271.4 km
	KPXR-TV	D22	DT	LIC	CEDAR RAPIDS, IA	BLANK0000063428	388.5
	WLS-TV	D22	DT	CP	CHICAGO, IL	BLANK0000086908	274.3
	WBAY-TV	D23	DT	LIC	GREEN BAY, WI	BMLCDT20040723ADS	8.6
	W23BW-D	D23	DC	CP	MADISON, WI	BLANK0000127546	186.3

	Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX
	31787.2	1,261,346	31728.1	1,257,433	31162.3	1,227,984	31161.3	1,227,984	0.00 0.00

Undesired		Total IX	Unique IX, before	Unique IX, after
W22EL-D D22 LD APP	1.0	0		1.0 0
KPXR-TV D22 DT LIC	5.0	17	0.0 0	0.0 0
WLS-TV D22 DT CP	387.1	27,116	381.0 27,099	381.0 27,099

WBAY-TV D23 DT LIC	179.7	2,333	178.7	2,333	178.7	2,333
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Interference to BLANK0000086896 LIC scenario 2

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WFRV-TV	D22	DT	LIC	GREEN BAY, WI	BLANK0000086896	
Undesireds:	W22EL-D	D22	LD	APP	VANDERBILT, MI	W22EL FINAL SITE 2 BR1	271.4 km
	KPXR-TV	D22	DT	LIC	CEDAR RAPIDS, IA	BLANK0000063428	388.5
	WLS-TV	D22	DT	BL	CHICAGO, IL	DTVBL73226	274.3
	WBAY-TV	D23	DT	LIC	GREEN BAY, WI	BMLCDT20040723ADS	8.6
	W23BW-D	D23	DC	CP	MADISON, WI	BLANK0000127546	186.3
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
31787.2 1,261,346		31728.1 1,257,433		31229.3 1,231,155		31228.3 1,231,155	0.00 0.00

Undesired	Total IX	Unique IX, before	Unique IX, after
W22EL-D D22 LD APP	1.0 0	1.0 0	
KPXR-TV D22 DT LIC	5.0 17	0.0 0	0.0 0
WLS-TV D22 DT BL	320.1 23,945	314.1 23,928	314.1 23,928
WBAY-TV D23 DT LIC	179.7 2,333	178.7 2,333	178.7 2,333

Interference to BNPDTL20100223ADK CP scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	W23EJ-D	D23	LD	CP	VANDERBILT, MI	BNPDTL20100223ADK	
Undesireds:	W22EL-D	D22	LD	APP	VANDERBILT, MI	W22EL FINAL SITE 2 BR1	11.0 km
	WBSF	D23	DT	LIC	BAY CITY, MI	BLANK0000078103	232.9
	W23EB-D	D23	LD	LIC	CADILLAC, MI	BLDTL20140317ABS	131.5
	WBAY-TV	D23	DT	LIC	GREEN BAY, WI	BMLCDT20040723ADS	280.9
	WCML	D24	DT	LIC	ALPENA, MI	BLEDT20110707ABQ	37.0
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
840.0 8,805		799.7 8,304		730.2 7,192		723.1 7,188	0.97 0.06

Undesired	Total IX	Unique IX, before	Unique IX, after
W22EL-D D22 LD APP	15.2 15	7.1 4	
WBSF D23 DT LIC	10.1 114	1.0 0	1.0 0
W23EB-D D23 LD LIC	1.0 0	0.0 0	0.0 0
WBAY-TV D23 DT LIC	1.0 0	1.0 0	0.0 0
WCML D24 DT LIC	67.5 1,112	58.5 998	51.4 987

Interference to proposal scenario 1
5.07% interference received

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	W22EL-D	D22	LD	APP	VANDERBILT, MI	W22EL FINAL SITE 2 BR1	
Undesireds:	WFUP	D21	DT	LIC	VANDERBILT, MI	BLANK0000087814	0.0 km
	W22EM-D	D22	LD	CP	CHARLES, MI	BNPDTL20100223ADY	104.7
	WDWO-CD	D22	DC	CP	DETROIT, MI	BLANK0000127531	320.1
	WKNX-LP	D22z	LD	CP	PINCONNING, MI	BLANK0000071746	201.8
	W22EB-D	D22	LD	CP	ROSCOMMON, MI	BNPDTL20100223ACX	70.1
	WPBN-TV	D22	LD	CP	TRAVERSE CITY, MI	BLANK0000094906	125.1
	WFRV-TV	D22	DT	LIC	GREEN BAY, WI	BLANK0000086896	271.4
	W23EJ-D	D23	LD	CP	VANDERBILT, MI	BNPDTL20100223ADK	11.0

Service area		Terrain-limited		IX-free		Percent IX	
6908.5 111,425		6645.6 107,349		6314.5 101,905		4.98 5.07	
Undesired		Total IX		Unique IX		Prct Unique IX	
WFUP D21 DT LIC		225.7 4,726		216.6 4,606		3.26 4.29	
W22EM-D D22 LD CP		1.0 67		0.0 0		0.00 0.00	
W22EB-D D22 LD CP		3.1 6		1.0 0		0.02 0.00	
WPBN-TV D22 LD CP		106.4 765		101.3 718		1.52 0.67	

WFRV-TV D22 DT LIC	2.0	0	0.0	0	0.00	0.00
W23EJ-D D23 LD CP	4.0	0	1.0	0	0.02	0.00

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

*Prepared For
W22EL
Channel 22*

April 2021

**ANTENNA TYPE:
ALP8L3-HSBR-22**

**SPECIFICATION NO:
FIGURE 4**



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

ELECTRICAL CHARACTERISTICS:

CHANNEL:	DTV:	22
FREQUENCY RANGE:	DTV:	518.00 - 524.00 MHz
AZIMUTH PATTERN NUMBER:	Hor Pol:	ALP-BR
ELEVATION PATTERN NUMBER:	Hor Pol:	ALP8L3
AZIMUTH DIRECTIVITY:	Hor Pol:	2.75 (4.39 dB)
ELEVATION DIRECTIVITY:	Hor Pol:	9.05 (9.57 dBd)
PEAK POWER GAIN:	Hor Pol:	24.89 (13.96 dBd)
GAIN AT HORIZONTAL:	Hor Pol:	23.51 (13.71 dBd)
ELECTRICAL BEAM TILT:		-0.75 Degrees
INPUT POWER REQUIRED:		0.603 kW Average Power, 8VSB Digital
MAXIMUM INPUT POWER:		2.00 kW Average Power
INPUT TYPE:		1-5/8" EIA
ANTENNA VSWR (MAXIMUM):	DTV:	1.10 Over 6 MHz of Channel

Preliminary, subject to final design and review.

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

MECHANICAL CHARACTERISTICS:

MOUNTING CONFIGURATION:

*(Tower Interface supplied and installed by others.)

Side Mount

HEIGHT OF ANTENNA:

20.8 feet

HEIGHT OF CENTER OF
RADIATION:

10.4 feet

OVERALL HEIGHT (A):

20.8 feet

DEICING:

Unpressurized Slot Cover Radome Enclosure

RADOME DIAMETER (C):

CONTACT ERI

RADOME COLOR:

TBA

CLIMBING DEVICE:

NOT APPLICABLE

CALCULATED WEIGHT¹:

126 lbs.

ANTENNA AREA³:

FRONT AREA:

$C_A A_C$: 23.6 square feet

A_C : 19.7 square feet

SIDE AREA:

$C_A A_C$: 14.0 square feet

A_C : 11.7 square feet

This antenna is designed to be supported by a structure that can resist the antenna base reactions and which provides a support that is rigid in the three translational and three rotational degrees of freedom.

¹ Calculated weight is based on the PRELIMINARY design of the antenna. The actual weight of the antenna will be within $\pm 10\%$ of the calculated weight. The actual weight will be given in the technical manual that accompanies the antenna.

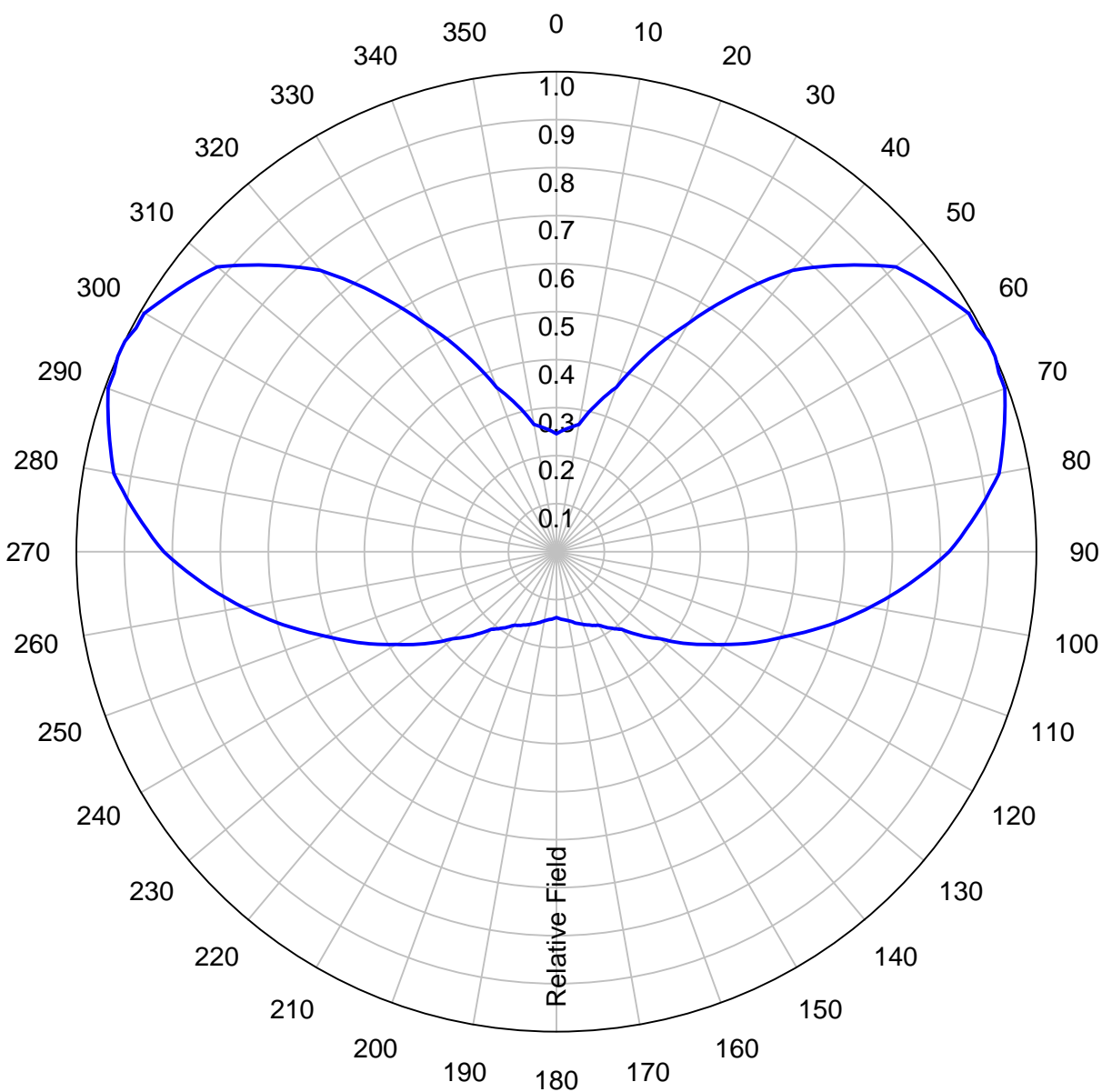
³ Antenna Area is calculated per EIA/TIA-RS222-F.

Note: Localized conditions may require higher wind speed specifications than TIA/EIA specifications. Check with local authorities to verify wind speed requirements.

Preliminary, subject to final design and review.

AZIMUTH PATTERN PRE ROTATION**Type:**ALP-BR**Channel:**22**Directivity:**NumericdBd2.754.39**Peak(s) at:****Location:****Polarization:**Horizontal

Note: Pattern shape and directivity may vary with channel and routing configuration.



Preliminary, subject to final design and review.

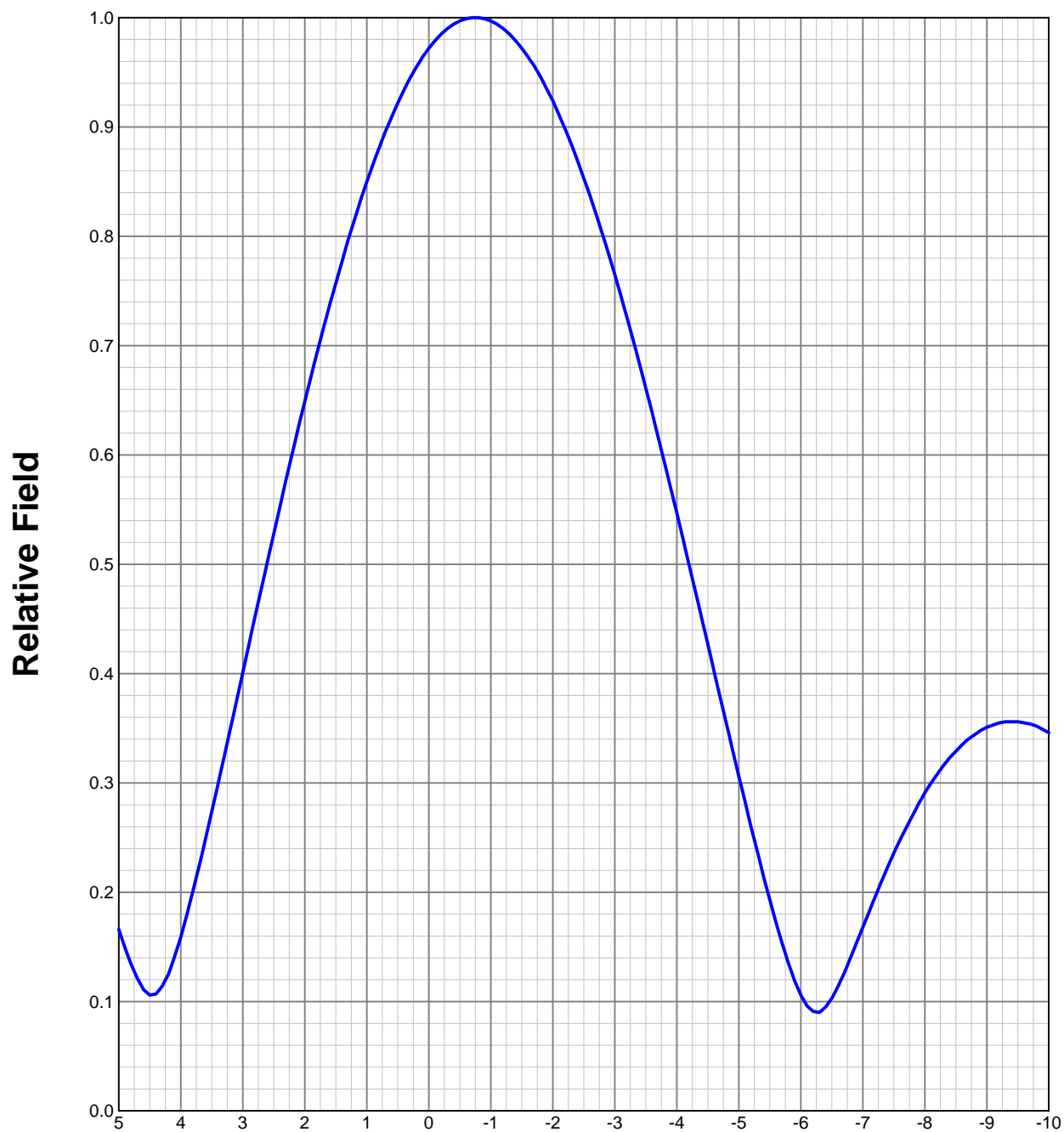
TABULATED DATA FOR AZIMUTH PATTERN FCC FILING FORMAT PRE ROTATION TABULATION

Type: ALP-BR

PolarizationHorizontal ROTATE THIS PATTERN 190 DEG

ANGLE	FIELD	ERP (kW)	ERP (dBk)
0	0.246	0.908	-0.420
10	0.269	1.085	0.356
20	0.364	1.987	2.983
30	0.549	4.521	6.552
40	0.765	8.778	9.434
50	0.923	12.779	11.065
60	0.992	14.761	11.691
70	0.994	14.821	11.709
80	0.936	13.141	11.186
90	0.818	10.037	10.016
100	0.664	6.613	8.204
110	0.513	3.948	5.963
120	0.386	2.235	3.493
130	0.282	1.193	0.766
140	0.211	0.668	-1.753
150	0.177	0.470	-3.280
160	0.161	0.389	-4.103
170	0.146	0.320	-4.952
180	0.137	0.282	-5.505
190	0.146	0.320	-4.952
200	0.161	0.389	-4.103
210	0.177	0.470	-3.280
220	0.211	0.668	-1.753
230	0.282	1.193	0.766
240	0.386	2.235	3.493
250	0.513	3.948	5.963
260	0.664	6.613	8.204
270	0.818	10.037	10.016
280	0.936	13.141	11.186
290	0.994	14.821	11.709
300	0.992	14.761	11.691
310	0.923	12.779	11.065
320	0.765	8.778	9.434
330	0.549	4.521	6.552
340	0.364	1.987	2.983
350	0.269	1.085	0.356

Preliminary, subject to final design and review.

ELEVATION PATTERN**Type:****ALP8L3****Channel:****22****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

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