

ENGINEERING STATEMENT  
APPLICATION FOR CONSTRUCTION PERMIT  
FOR MODIFICATION OF LICENSE  
REPLACEMENT ANTENNA  
FOR AN EXISTING TELEVISION TRANSLATOR  
WFND-LD, FINDLAY, OHIO  
CHANNEL 19 15 KW MAX DA ERP  
329.2 METERS RC/AMSL

MARCH 2024

COHEN, DIPPELL AND EVERIST, P.C.  
CONSULTING ENGINEERS  
RADIO AND TELEVISION  
WASHINGTON, D.C.

### Introduction

This engineering statement has been prepared on behalf of West Central Ohio Broadcasting, Inc. (“WCOB”), licensee of low-power television station WFND-LD, Findlay, Ohio. This statement supports the licensee’s request to replace their impaired transmitting antenna with a replacement antenna.

On November 17, 2023, the WFND-LD transmitter went offline due to a voltage fault. It was determined that the cause of the problem was a VZWR fault. The antenna, an Alive Telecom model ATC-BCE48C1R-U, cannot be repaired.

WCOB contacted Alive Telecom about ordering a replacement antenna that would, as closely as possible, approach the radiation characteristics of the currently licensed antenna. The replacement antenna purchased is a Alive Telecom model ATC-BCSE8C1-U1-19 of which the technical details are available in Exhibit E-2. This exhibit also shows that the antenna system has been designed to not be an unduly weight windload issue.

### Conclusion

The replacement antenna was received on February 13, 2024. As WFND-LD’s current authority is described in Appendix A as operating under a Silent STA, WCOB would like to install the new antenna as quickly as possible.

Findlay is an important community and WFND-LD is the only TV facility licensed to Findlay. Findlay is the world headquarters for Marathon Petroleum Corporation and the home of Whirlpool dishwasher manufacturer plant and distribution center. It is understood Findlay is the location of other distribution centers.

Transmitter Site

The proposed new directional antenna will be utilized in order to protect domestic and international constraints. Significant alteration of the tower (Exhibit E-1) is not proposed. The existing tower is located at 3800 North County Road 220. There is no change in transmitter site. The geographic coordinates of the site follow below.

North Latitude: 41° 06' 40.9"

West Longitude: 83° 38' 52.9"

Unchanged

NAD-27

North Latitude: 41° 06' 41.1"

West Longitude: 83° 38' 52.7"

Unchanged

NAD-83

Equipment Data

Antenna: Alive Telecom, Model ATC-BCSE8C1-U1-19 (or equivalent) horizontal polarized directional antenna with one degree electrical beam tilt. The vertical radiation data is totally contained within the horizontal radiation pattern vertical ERP of 4.50 kW

Transmission Line: 350 feet (1148.29 meters) Dielectric, FlexLine 1-5/8", 50 ohm with total loss of 1.67 dB

Power Data

Transmitter Power Output	20.9 kW	3.21 dBk
Transmission Line Efficiency/Loss	68%	1.67 dB
Input Power to Antenna	1.43 kW	1.55 dBk
Antenna Power Gain	10.5	10.22 dBd
Effective Radiated Power	15 kW	11.76 dBk

Elevation Data

Elevation of site above mean sea level	245.1 meters (804 feet)
Center of radiation of antenna above ground level	83.82 meters (275 feet)
Center of radiation of antenna above mean sea level	329.18 meters (1080 feet)
Overall antenna structure height above ground level	93.6 meters (307 feet)
Overall antenna structure height above mean sea level	338.7 meters (1111 feet)

Note: slight height differences may result due to conversion to/from metric.

The Antenna Structure Registration Number ("ASRN") for the existing tower is 1047246. A tower sketch has been included as Exhibit E-1.

### Interference Analysis

A study of predicted interference caused by the proposed WFND-LD low-power digital operation has been performed using the FCC's TVStudy program version 2.2.5 for which the source data has been posted by the Commission on its website at [fcc.gov/oet/tvstudy](http://fcc.gov/oet/tvstudy). The model employs the Longley-Rice propagation methodology and evaluates in grid cells of approximately 1 sq. km. Using one-second terrain data sampled approximately every 1.0 km at one-degree azimuth intervals with 2010 census centroids, all studies are based upon data in the current LMS database update of the FCC's engineering database. A TVStudy study was performed with the proposed WFND-LD low-power digital facilities and all relevant stations listed in the FCC data base. The study results and the included stations are listed in Table I. A recent allocation study reveals no essential change in the allocation from that herein provided.

### International

A comprehensive search of LMS databases available containing Canadian broadcast information has been made. The closest Canadian station is 129.4 km away. It is CICO-DT-32 on Channel 19 in Windsor, Ontario.

A special designated antenna is specified that will protect the U.S.-Canadian border. Therefore, no coordination will be required. As can be seen on Exhibit E-5, the F(50,10) 24.25 dBu interfering contour from the proposed operation does not extend beyond the U.S.-Canadian border, and therefore, protects co-channel Canadian television stations.

Other Licensed and Broadcast Facilities

No adverse technical effect is anticipated by the proposed DTV operation to any other FCC licensed facility. If required, the licensee will install filters or take other measures as necessary to resolve the problem.

FCC Rule, Section 1.1307

The proposed 15 kW directional operation will utilize an Alive Telecom, Model ATC-BCSE8C1-U1-19 antenna (or equivalent) described above with a center of radiation above ground of 83.8 meters. The proposed antenna is side-mounted on a steel lattice tower with an overall height of 91.4 meters above ground.

The proposed operation based upon the current OET Bulletin No. 65, Edition 97-01 dated August 1997 and Supplement A meets the provisions of the FCC radiofrequency field ("RFF") guidelines, and thus, complies with Section 1.1307 of the FCC Rules. The elevation pattern for the Alive Telecom, Model ATC-BCSE8C1-U1-19 antenna, Exhibit E-2 shows a maximum relative field of less than 0.120 toward the ground (60° to 90° below the horizontal). Calculation according to OET Bulletin 65 predicts a maximum RFF power density of less than 7  $\mu\text{W}/\text{cm}^2$ , 2 meters above ground or less than 3% of the 339  $\mu\text{W}/\text{cm}^2$  uncontrolled Maximum Permissible Exposure ("MPE") guideline.

Authorized personnel and rigging contractors will be alerted to the potential zone of high field levels on the tower, and if necessary, the station will operate with reduced power or terminate the operation of the transmitter as appropriate when it is necessary for authorized

personnel or contractors to perform work on or near the tower. Workers and the general public, therefore, will not be subjected to RFF levels in excess of the current FCC guidelines.

Environmental Assessment

An environmental assessment ("EA") is categorically excluded under Section 1.1306 of the FCC Rules and Regulations as the tower was constructed prior to the requirements specified in WT Docket No. 03-128 and the licensee indicates:

- (a)(1) The existing tower is not located in an officially designated wilderness area.
- (a)(2) The existing tower is not located in an officially designated wildlife preserve.
- (a)(3) The proposed facilities will not affect any listed threatened or endangered species or habitats.
- (a)(3)(ii) The proposed facilities will not jeopardize the continued existence of any proposed endangered or threatened species or likely to result in the destruction or adverse modification of proposed critical habitats.
- (a)(4) The proposed facilities located on a tower which was built prior to the adoption of WT Docket No. 03-128 and is grandfathered and has not affected any known districts, sites, buildings, structures, or objects significant in American history, architecture, archaeology, engineering, or culture.
- (a)(5) The existing tower is not located near any known Indian religious sites.
- (a)(6) The existing tower is not located in a flood plain.
- (a)(7) The installation of the DTV facilities on an existing guyed tower will not involve a significant change in surface features of the ground in the vicinity of the tower.

- (a)(8) It is not proposed to equip the tower with high intensity white lights unless required by the FAA.
- (b) Workers and the general public will not be subjected to RFF levels in excess of the current FCC guidelines contained in OET Bulletin No. 65, Edition 97-01, dated August 1997 and Supplement A.

H:\wp70\don\WFND\WFND Replacement Antenna - March 2024.wpd



COHEN, DIPPELL AND EVERIST, P.C.

## APPENDIX A

## WFND Antenna Summary

Issues with the WFND antenna began on October 19<sup>th</sup>, 2023, when a VZWR fault stopped the transmitter from operating. Our Lead Broadcast Engineer (LBE) was able to get it started again. A month later, on November 17<sup>th</sup>, 2023, another VZWR fault occurred, but this time we were unable to get the transmitter back up and running. The transmitter would turn on, but when the LBE attempted to increase power past 5%, the transmitter faulted and powered down. It was noted that during both events took place when the weather conditions consisted of high winds and rain.

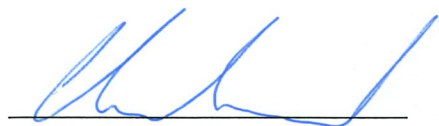
The decision was then made to file a Special Temporary Authority with the FCC (File Number 0000232474) and remain off air while we investigated. Great Lakes Tower and Antenna were hired to perform the climb and inspection on November 22, 2023. They discovered that the top cap of the antenna had come off which allowed it to fill with water leading to the VZWR issues.

The current antenna will be replaced by the following:

Make: Alive Telecom

Model: ATC-BCSE8C1-U1-19

Serial Number: 13350



Chad Rummel

Director of Technology and Engineering



Federal Communications Commission  
Washington, D.C. 20554

January 10, 2024

**CENTRAL OHIO BROADCASTING, INC.**  
CHAD RUMMEL  
1424 RICE AVENUE  
LIMA, OH 45805

In Re: **Special Temporary Authority**  
**For Station WFND-LD**  
FINDLAY, OH  
**Application File No. 0000232474**  
**Fac Id: 21475**

Dear Licensee:

This refers to the above application, requesting special temporary authority to remain silent.

In light of the above, special temporary authority IS GRANTED pursuant to Section 73.1635 of the Commission's Rules. This authorization expires on **May 17, 2024**.

During this period of discontinued operation, you are directed to pay strict attention to Section 73.1740 (a) (4). That is, you must continue to adhere to the requirements in your station license pertaining to the lighting of antenna structures.

We wish to point out that an extension of this request must include detailed reasons and a description of efforts being taken to return the station to full power operation.

Sincerely,

/s/

Kevin R. Harding  
Deputy Chief, Video Division  
Media Bureau

cc: Christina H. Burrow

ABOVE MEAN SEA LEVEL

ABOVE GROUND

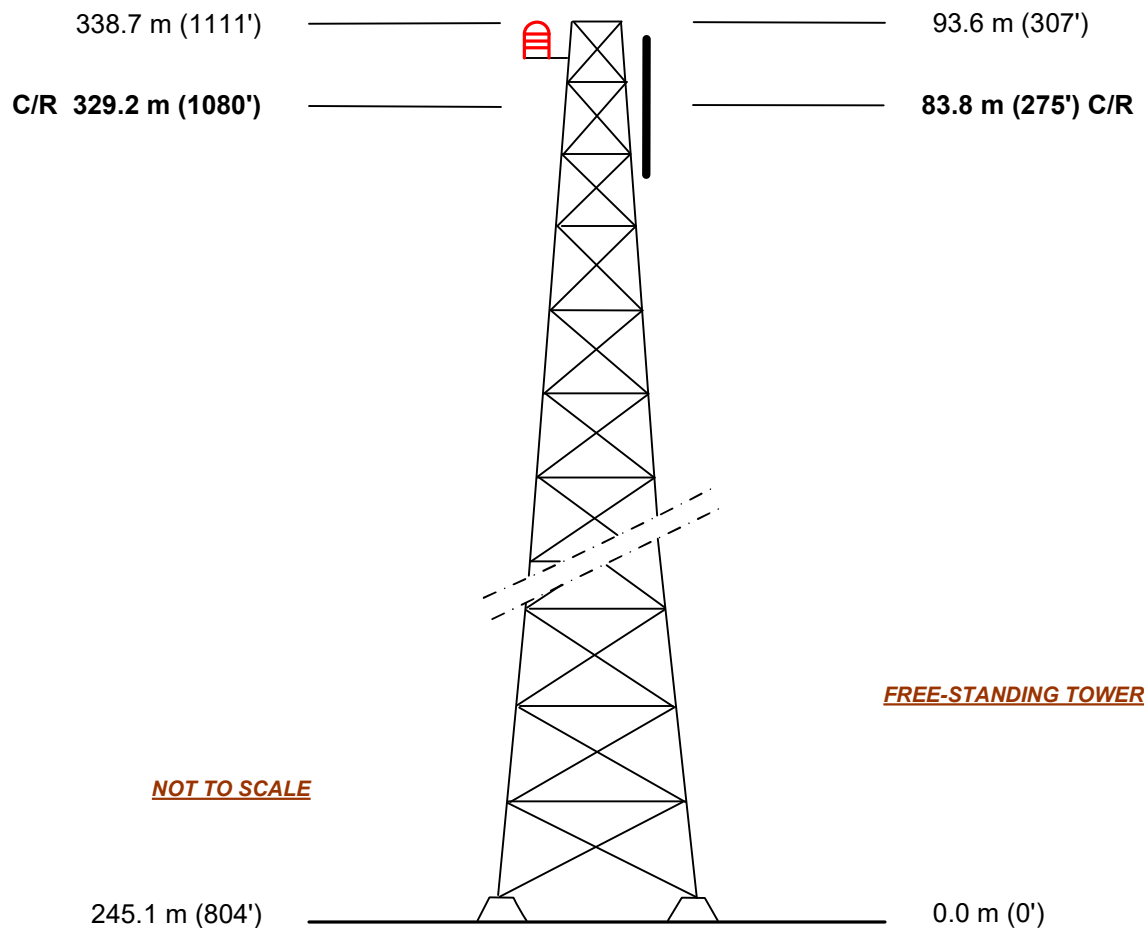


EXHIBIT E - 1  
VERTICAL SKETCH  
FOR THE PROPOSED OPERATION OF  
**WFND-LD, FINLAY, OHIO**  
MARCH 2024

EXHIBIT E-2

ANTENNA MANUFACTURER DATA



## **TECHNICAL MANUAL**

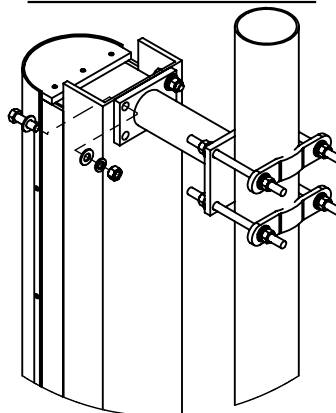
**ATC-BCSE8C1-U1-19**

**CHANNEL: 19**

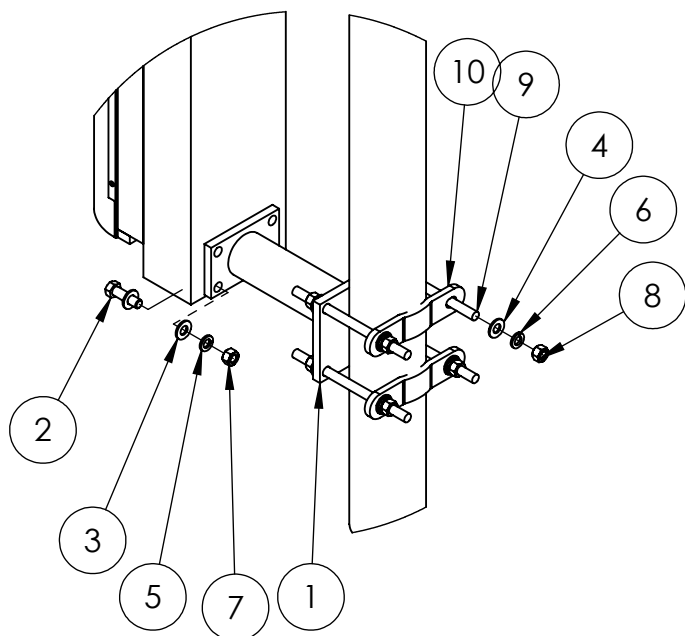
**LOCATION: Findlay, OH**



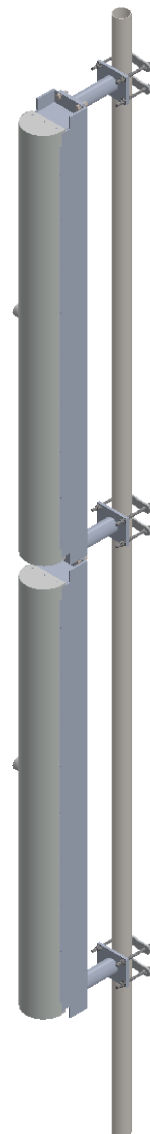
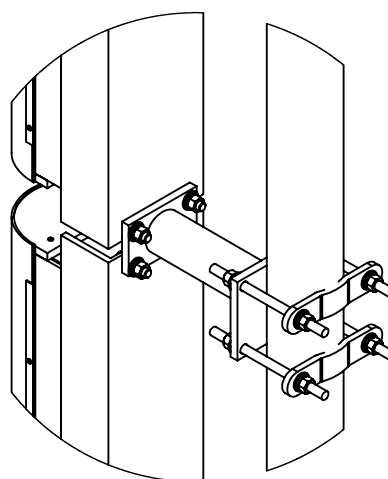
**TOP MOUNT DETAIL**



**BOTTOM MOUNT DETAIL**



**CENTER MOUNT DETAIL**



**\*KIT WEIGHT: XX LBS**

**\*KIT SUPPORTS  $\phi$  2.00-  $\phi$  4.00 SUPPORT LEG**

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	ATC-BCSH4O-U	CAVITY MOUNT	3
2	5-0212	.50-13 X 1.75" 18-8SS HCS	8
3	10-0083	.50 18-8SS FLAT WASHER	16
4	10-0037	.50 GALV. FLAT WASHER	24
5	15-0015	.50 18-8SS LOCK WASHER	8
6	15-0031	.50 GALV. LOCK WASHER	24
7	20-0170	.50-13 BLK. OX. HEX HEAD NUT	8
8	20-0126	.50-13 GALV. HEX HEAD NUT	24
9	45-0037	0.50-13 GALV THREADED ROD (8.25")	12
10	982-5	5.00" SADDLE CLAMP	6

TITLE:

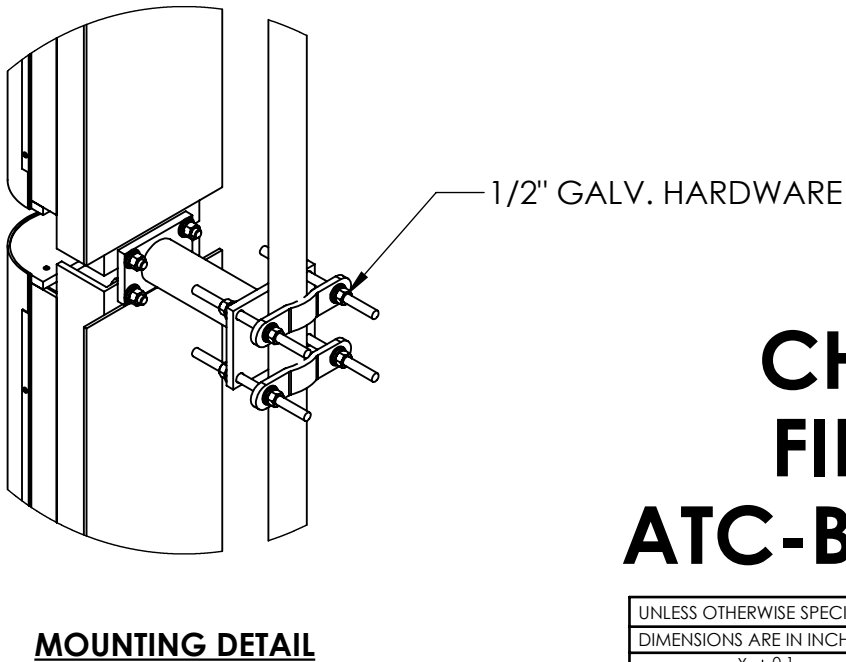
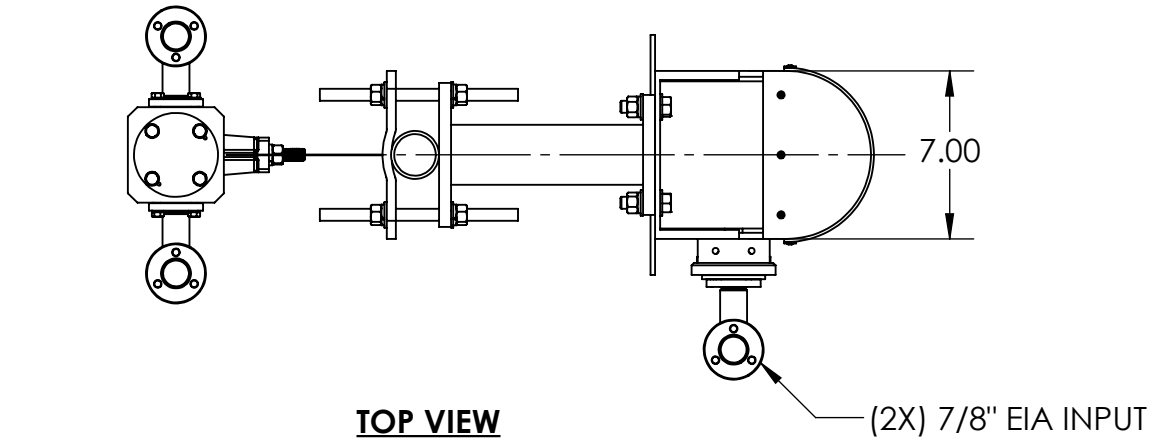
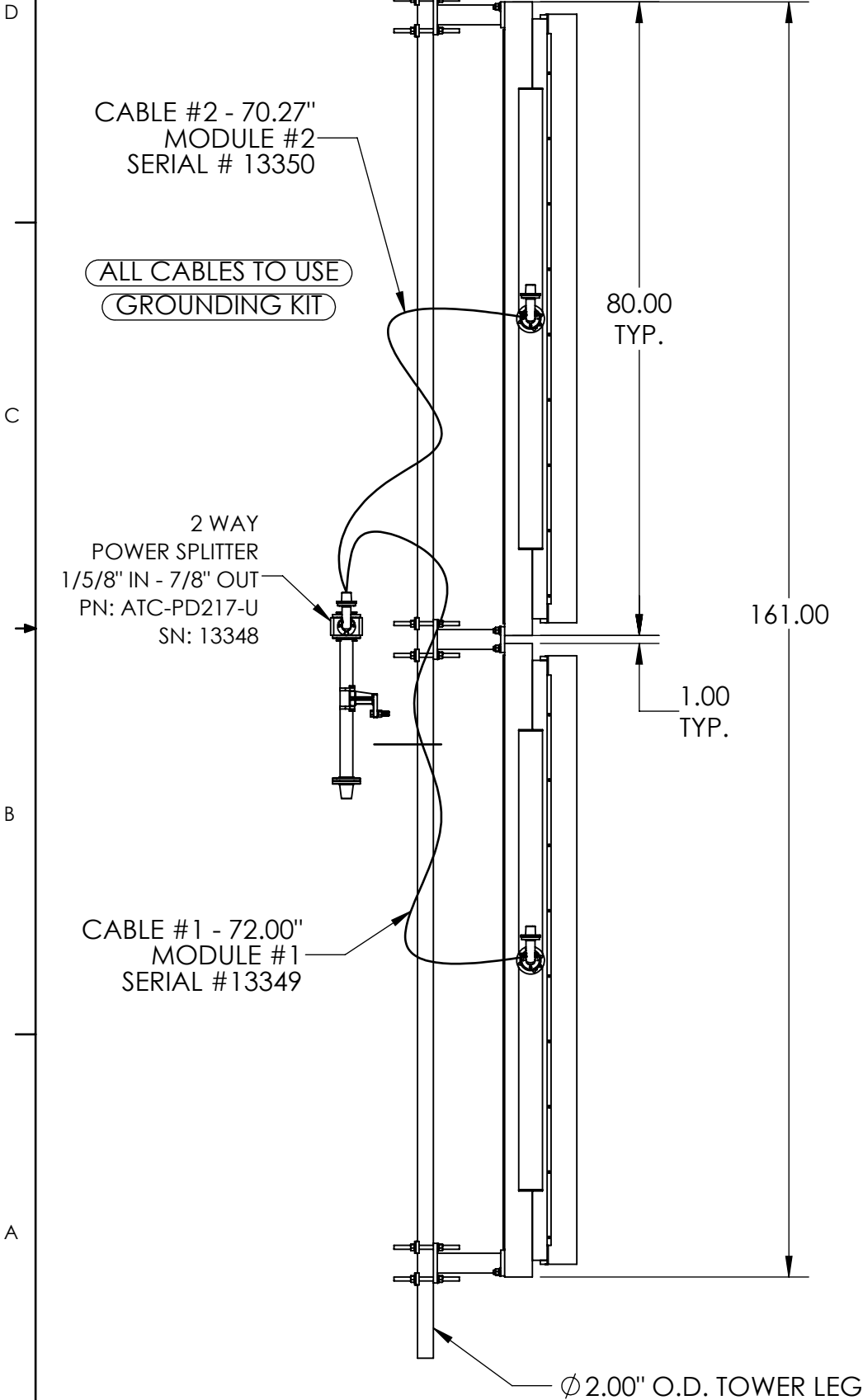
**CVMTKIT-2 - ASSEMBLY**

DRAWN BY: SM

DWG#: CVMTKIT-2

SHEET 1 OF 1

ITEM NO.	PART NUM.	DESCRIPTION	QTY
1	ATC-PD217-U	2-WAY POWER SPLITTER 1-5/8"IN/7/8"OUT	1
2	201-042-1	1-5/8" HANGER; MYAT	1
3	CVMTKIT-2	2 MODULE HARDWARE KIT	1
4	ATC-BCSC*	CAVITY ANTENNA MODULE	2
5	GK-S78	7/8" GROUNDING KIT; EUPEN	2
6	BH-78	7/8" BUTTERFLY HANGER; EUPEN	4
7	EC5-50A	7/8" CABLE; EUPEN	2



CH19 - WFND  
FINDLAY, OH  
ATC-BCSE8C1-U1-19

UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES		DRAWN BY	JC
.X ± 0.1		CHECKED	1/19/24
.XX ± 0.02			
.XXX ± 0.005			
ANGLE ± 0.05°			
MATERIAL	----	PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF ALIVE TELECOM. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF ALIVE TELECOM IS PROHIBITED.	
FINISH	----		
BCSE8C1-U1-19	---		
USED ON	NEXT ASSEMBLY	DO NOT SCALE DRAWING	

9850 W. 190TH ST SUITE F		MOKENA, IL 60448	(708) 478-6886
TITLE: ATC-BCSE8C1-U1-19 - TOP LEVEL ASSEMBLY			
SCALE: NTS	DWG#: 6750	SHEET 1 OF 1	



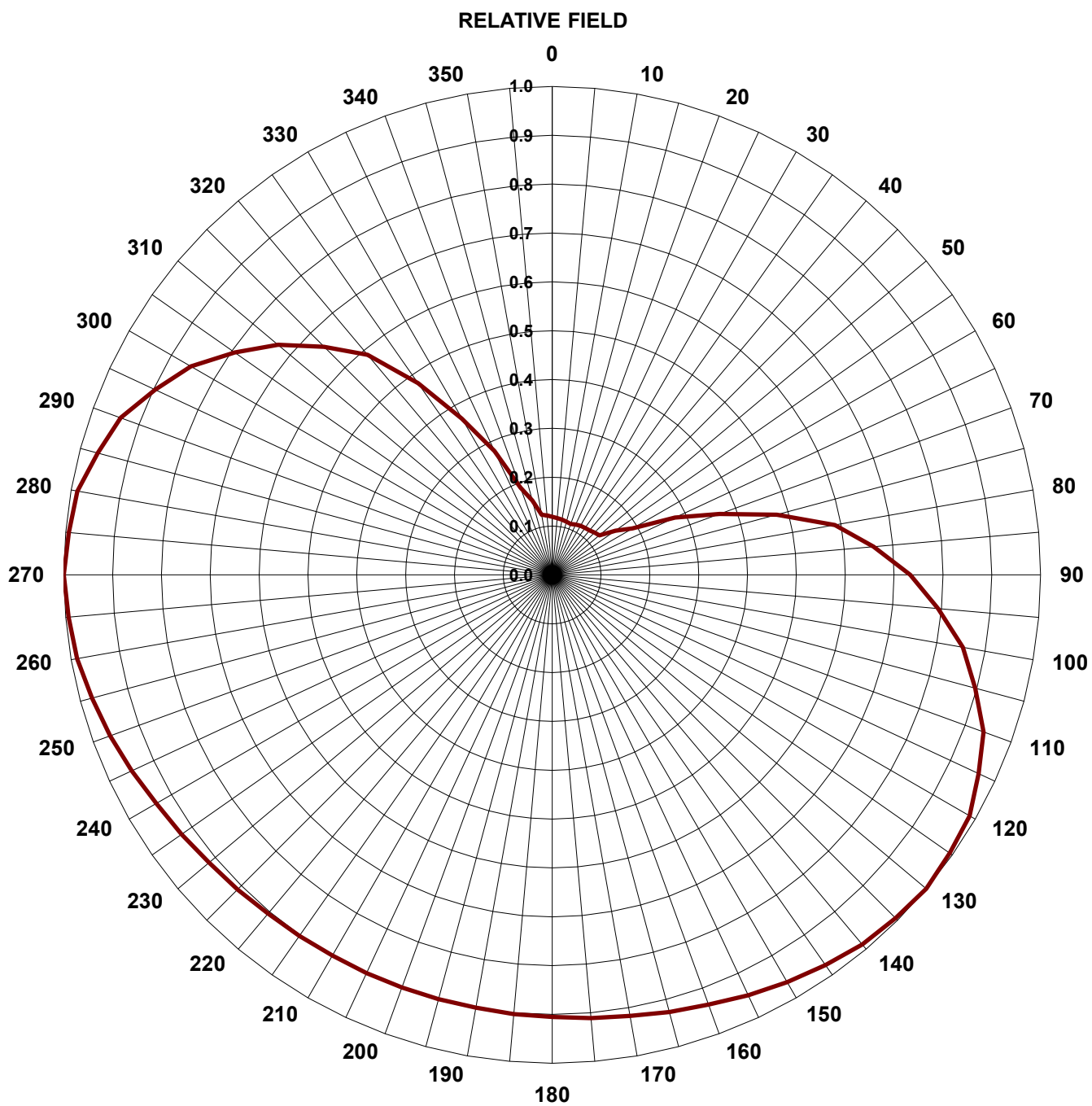
## Summary

Antenna Specifications	
Antenna Type	Cavity Slot
Antenna Model	ATC-BCSE8C1-U1-19
Electrical Specifications	
Channel(s)	19
Frequency Range (MHz)	500 - 506
Polarization	Elliptical
Horizontal Azimuth Pattern	C1
Directivity	1.80
dB	2.355
Vertical Azimuth Pattern	V1-Wide Cardioid
Directivity	2.16
dB	3.34
Vertical Component	30 %
Azimuth Peak of Beam	200 °
Elevation Pattern	8
Directivity	8.00
dB	9.03
Electrical Beam Tilt	1.00 °
Antenna Peak Power Gain	
Horizontal Gain Power	10.50
Horizontal Gain Ratio	10.22 dBd
Vertical Gain Power	3.15
Vertical Gain Ratio	4.98 dBd
Line Type	1-5/8" 50 Ohm Air Flex Line
Line Length	350 ft
Total Line Loss	1.67 dB
Effective Radiated Power (ERP)	15 kW
ERP Vertical Power	4.50 kW
Transmitter Power Output (TPO)	
TPO Power	2.09 kW
TPO Ratio	3.21 dBk
Input Type	EIA 1-5/8"
Mechanical Specifications	
Mount Type	Side Mount
Length of Antenna	14 ft
Center of Radiation	7.00 ft
Radome Diameter	TBD
Color	White
Calculated Weight	Contact Alive Telecom 1 2
Windload (Shear)	Contact Alive Telecom 1 2

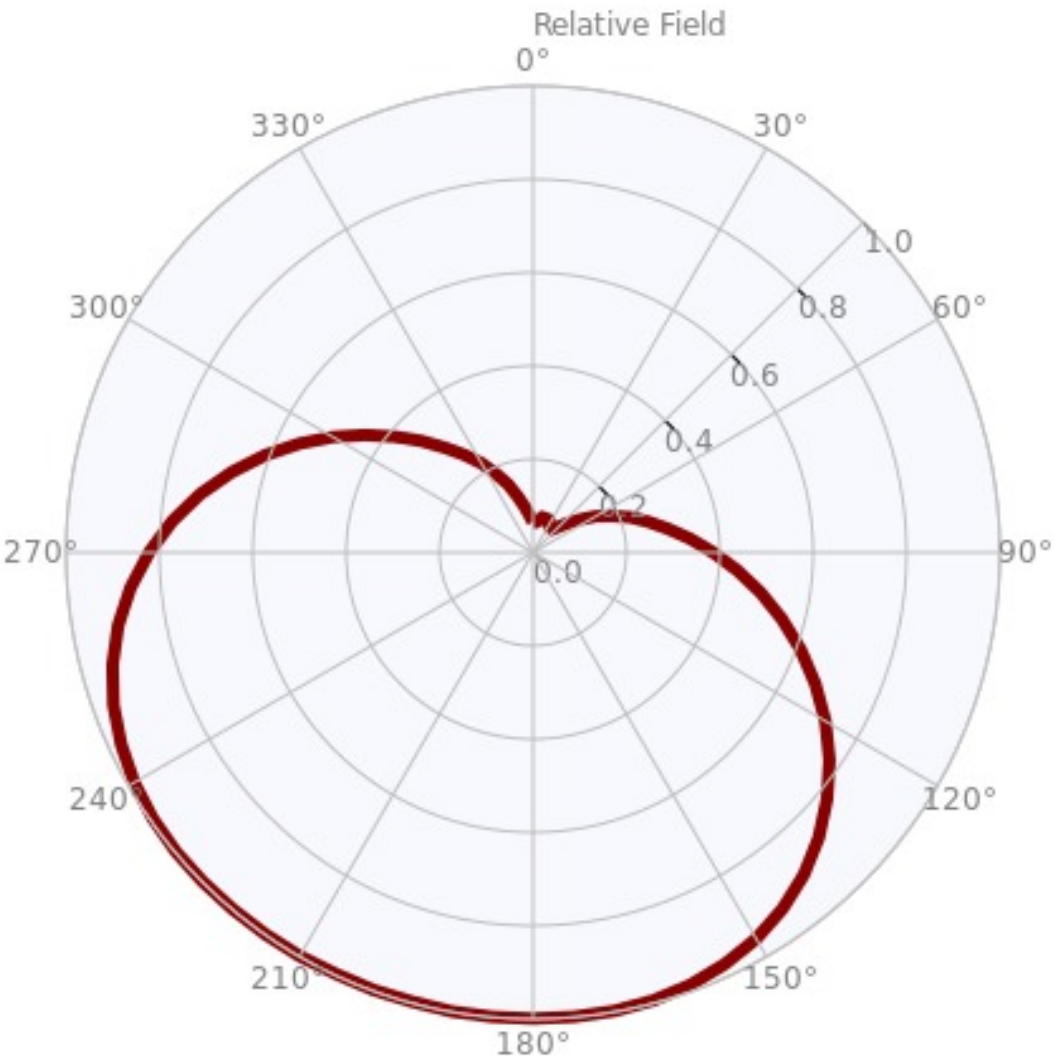
# AZIMUTH PATTERN



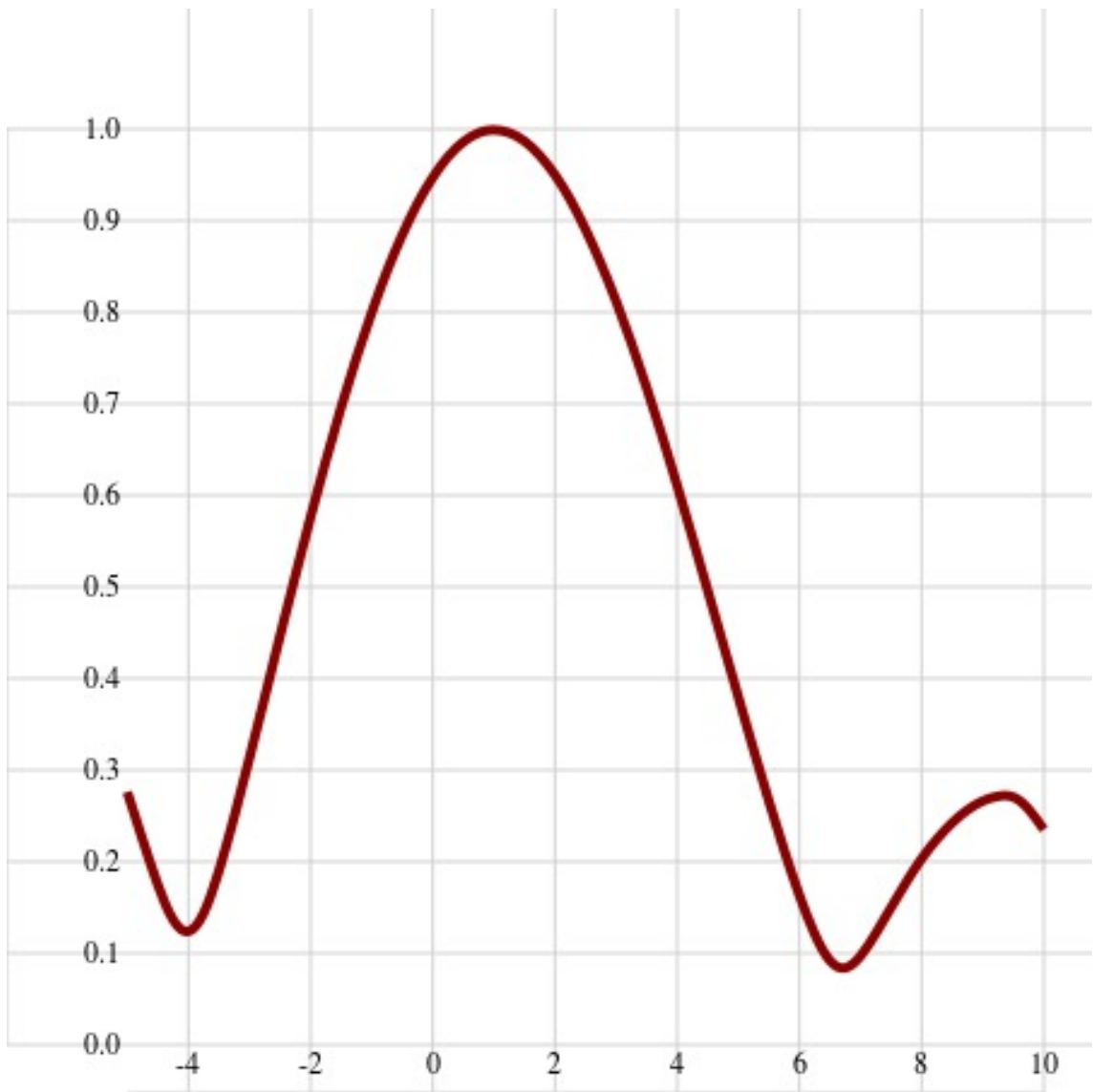
TYPE:	Cavity Slot Directional	
	Numeric	dB
Directivity:	1.9	2.79
Polarization:	H-POL	
Channel:	19	
Location:	WFND	



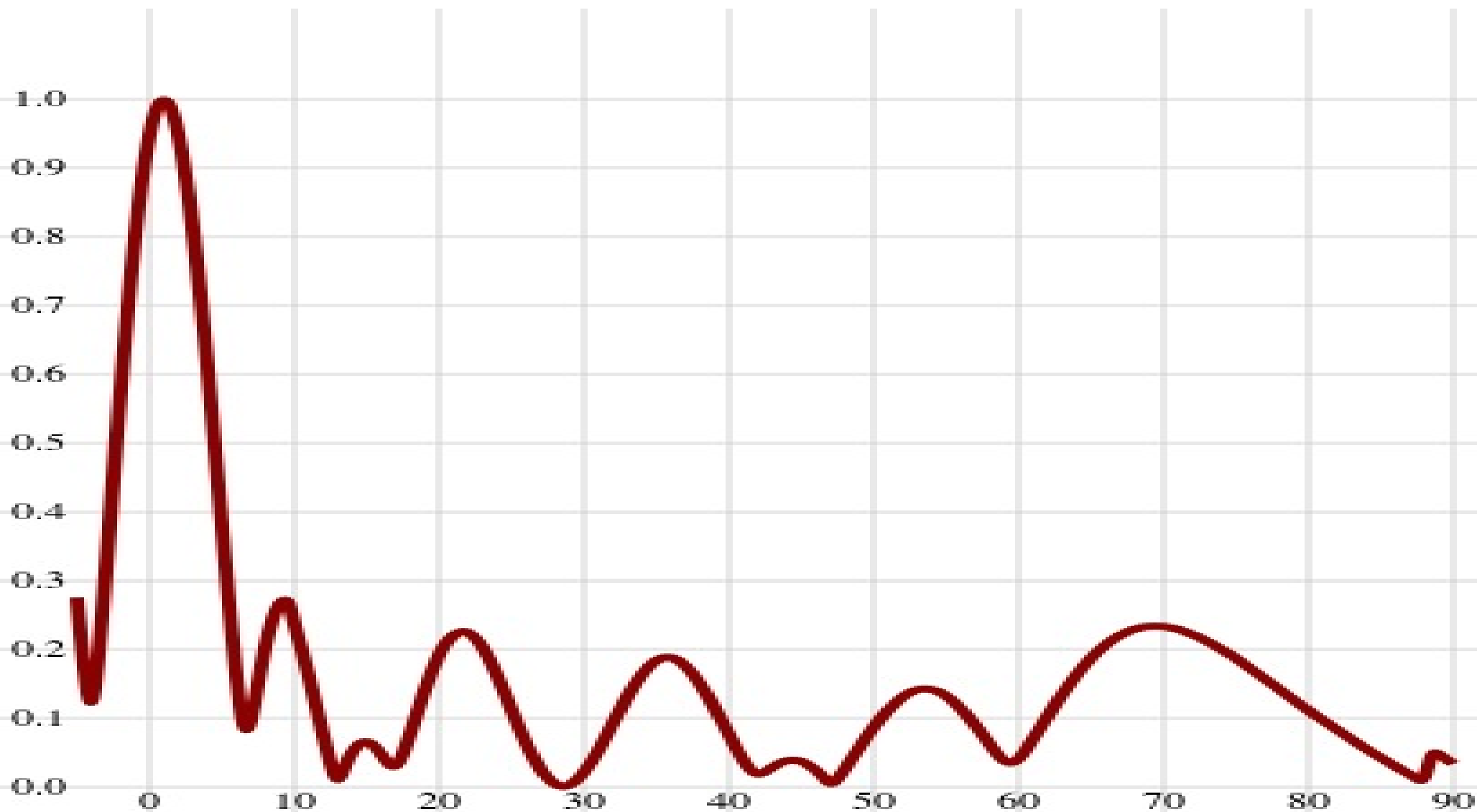
# Vertical Azimuth Pattern



# Elevation pattern -5 to 10



## Elevation pattern -5 to 90



ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB
0	0.119	-18.49	94	0.778	-2.18	188	0.901	-0.91	282	0.981	-0.17
2	0.119	-18.49	96	0.809	-1.85	190	0.900	-0.92	284	0.969	-0.27
4	0.118	-18.60	98	0.839	-1.53	192	0.900	-0.92	286	0.958	-0.38
6	0.117	-18.67	100	0.854	-1.37	194	0.900	-0.92	288	0.946	-0.48
8	0.116	-18.71	102	0.865	-1.26	196	0.899	-0.92	290	0.940	-0.54
10	0.115	-18.79	104	0.886	-1.05	198	0.899	-0.92	292	0.929	-0.64
12	0.115	-18.79	106	0.908	-0.84	200	0.899	-0.92	294	0.908	-0.84
14	0.114	-18.90	108	0.929	-0.64	202	0.899	-0.92	296	0.886	-1.05
16	0.113	-18.98	110	0.940	-0.54	204	0.899	-0.92	298	0.865	-1.26
18	0.112	-19.05	112	0.946	-0.48	206	0.900	-0.92	300	0.854	-1.37
20	0.111	-19.09	114	0.958	-0.38	208	0.900	-0.92	302	0.839	-1.53
22	0.112	-19.04	116	0.969	-0.27	210	0.900	-0.92	304	0.809	-1.85
24	0.113	-18.95	118	0.981	-0.17	212	0.901	-0.91	306	0.778	-2.18
26	0.114	-18.85	120	0.987	-0.11	214	0.902	-0.90	308	0.748	-2.52
28	0.115	-18.76	122	0.989	-0.10	216	0.903	-0.89	310	0.733	-2.70
30	0.116	-18.71	124	0.992	-0.07	218	0.904	-0.87	312	0.715	-2.92
32	0.116	-18.68	126	0.995	-0.04	220	0.905	-0.87	314	0.679	-3.37
34	0.117	-18.63	128	0.998	-0.01	222	0.907	-0.85	316	0.642	-3.84
36	0.118	-18.57	130	1.000	0.00	224	0.910	-0.82	318	0.606	-4.35
38	0.119	-18.52	132	0.997	-0.02	226	0.913	-0.80	320	0.588	-4.61
40	0.119	-18.49	134	0.995	-0.04	228	0.916	-0.77	322	0.561	-5.02
42	0.120	-18.43	136	0.993	-0.06	230	0.917	-0.75	324	0.506	-5.91
44	0.122	-18.30	138	0.990	-0.08	232	0.919	-0.73	326	0.452	-6.90
46	0.123	-18.18	140	0.988	-0.10	234	0.924	-0.69	328	0.397	-8.02
48	0.125	-18.05	142	0.985	-0.13	236	0.929	-0.64	330	0.370	-8.64
50	0.126	-17.99	144	0.979	-0.19	238	0.934	-0.60	332	0.348	-9.18
52	0.134	-17.46	146	0.972	-0.24	240	0.936	-0.57	334	0.303	-10.39
54	0.150	-16.48	148	0.966	-0.30	242	0.939	-0.54	336	0.258	-11.78
56	0.166	-15.60	150	0.963	-0.33	244	0.946	-0.48	338	0.213	-13.45
58	0.182	-14.80	152	0.960	-0.36	246	0.953	-0.42	340	0.190	-14.42
60	0.190	-14.42	154	0.953	-0.42	248	0.960	-0.36	342	0.182	-14.80
62	0.212	-13.48	156	0.946	-0.48	250	0.963	-0.33	344	0.166	-15.62
64	0.256	-11.85	158	0.939	-0.54	252	0.966	-0.30	346	0.149	-16.51
66	0.299	-10.48	160	0.936	-0.57	254	0.972	-0.24	348	0.133	-17.51
68	0.343	-9.29	162	0.934	-0.60	256	0.979	-0.19	350	0.125	-18.06
70	0.365	-8.75	164	0.929	-0.64	258	0.985	-0.13	352	0.124	-18.11
72	0.393	-8.11	166	0.924	-0.69	260	0.988	-0.10	354	0.123	-18.22
74	0.449	-6.96	168	0.919	-0.73	262	0.990	-0.09	356	0.121	-18.33
76	0.504	-5.94	170	0.917	-0.75	264	0.993	-0.07	358	0.120	-18.43
78	0.560	-5.03	172	0.916	-0.77	266	0.996	-0.04	360	0.119	-18.49
80	0.588	-4.61	174	0.913	-0.80	268	0.999	-0.01			
82	0.606	-4.35	176	0.910	-0.82	270	1.000	0.00			
84	0.642	-3.84	178	0.907	-0.85	272	0.998	-0.01			
86	0.679	-3.37	180	0.905	-0.87	274	0.995	-0.04			
88	0.715	-2.92	182	0.904	-0.87	276	0.992	-0.07			
90	0.733	-2.70	184	0.903	-0.89	278	0.989	-0.10			
92	0.748	-2.52	186	0.902	-0.90	280	0.987	-0.11			

# Elevation Pattern Tabulation

-5 to 10 in 0.25 increments, 10 to 90 in 0.50 increments

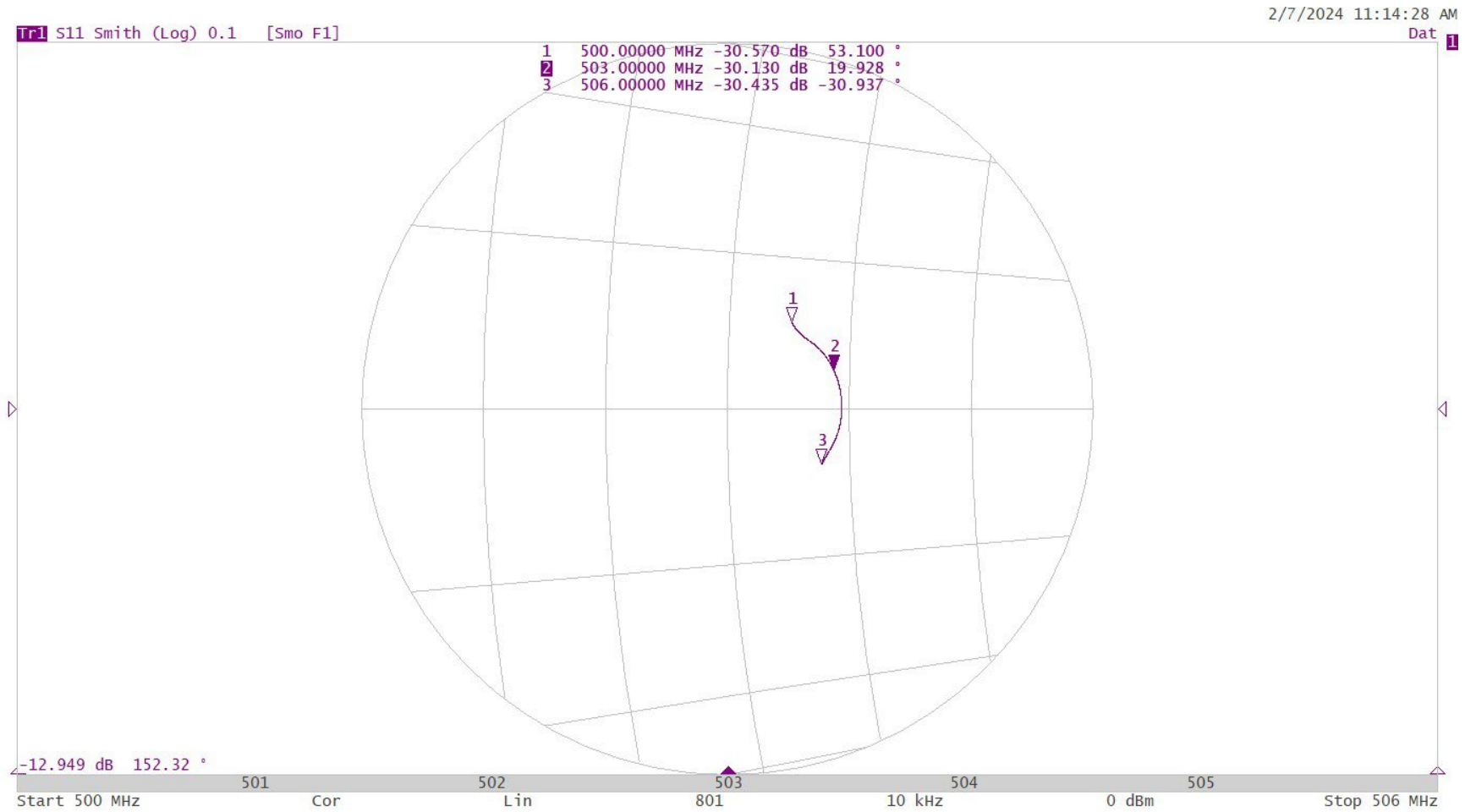
Angle	Field	dB	Angle	Field	dB	Angle	Field	dB	Angle	Field	dB
-5.00	0.276	-11.18	8.75	0.257	-11.80	35.00	0.185	-14.66	62.50	0.120	-18.42
-4.75	0.224	-13.00	9.00	0.267	-11.47	35.50	0.189	-14.47	63.00	0.135	-17.39
-4.50	0.173	-15.24	9.25	0.272	-11.31	36.00	0.189	-14.47	63.50	0.150	-16.48
-4.25	0.132	-17.59	9.50	0.273	-11.28	36.50	0.185	-14.66	64.00	0.164	-15.70
-4.00	0.118	-18.56	9.75	0.259	-11.73	37.00	0.177	-15.04	64.50	0.177	-15.04
-3.75	0.139	-17.14	10.00	0.235	-12.58	37.50	0.166	-15.60	65.00	0.188	-14.52
-3.50	0.188	-14.52	10.50	0.201	-13.94	38.00	0.151	-16.42	65.50	0.198	-14.07
-3.25	0.248	-12.11	11.00	0.161	-15.86	38.50	0.134	-17.46	66.00	0.207	-13.68
-3.00	0.313	-10.09	11.50	0.118	-18.56	39.00	0.116	-18.71	66.50	0.215	-13.35
-2.75	0.379	-8.43	12.00	0.075	-22.50	39.50	0.096	-20.35	67.00	0.221	-13.11
-2.50	0.447	-6.99	12.50	0.034	-29.37	40.00	0.076	-22.38	67.50	0.226	-12.92
-2.25	0.512	-5.81	13.00	0.001	-60.00	40.50	0.056	-25.04	68.00	0.230	-12.77
-2.00	0.577	-4.78	13.50	0.031	-30.17	41.00	0.038	-28.40	68.50	0.233	-12.65
-1.75	0.638	-3.90	14.00	0.052	-25.68	41.50	0.024	-32.40	69.00	0.234	-12.62
-1.50	0.697	-3.14	14.50	0.064	-23.88	42.00	0.017	-35.39	69.50	0.234	-12.62
-1.25	0.751	-2.49	15.00	0.067	-23.48	42.50	0.022	-33.15	70.00	0.234	-12.62
-1.00	0.800	-1.94	15.50	0.061	-24.29	43.00	0.029	-30.75	70.50	0.232	-12.69
-0.75	0.846	-1.45	16.00	0.048	-26.38	43.50	0.035	-29.12	71.00	0.230	-12.77
-0.50	0.885	-1.06	16.50	0.032	-29.90	44.00	0.039	-28.18	71.50	0.226	-12.92
-0.25	0.920	-0.72	17.00	0.027	-31.37	44.50	0.040	-27.96	72.00	0.222	-13.07
0.00	0.948	-0.46	17.50	0.047	-26.56	45.00	0.038	-28.40	72.50	0.218	-13.23
0.25	0.971	-0.26	18.00	0.077	-22.27	45.50	0.032	-29.90	73.00	0.212	-13.47
0.50	0.987	-0.11	18.50	0.109	-19.25	46.00	0.025	-32.04	73.50	0.207	-13.68
0.75	0.997	-0.03	19.00	0.141	-17.02	46.50	0.015	-36.48	74.00	0.200	-13.98
1.00	1.000	0.00	19.50	0.169	-15.44	47.00	0.002	-53.98	74.50	0.194	-14.24
1.25	0.997	-0.03	20.00	0.193	-14.29	47.50	0.011	-39.17	75.00	0.187	-14.56
1.50	0.988	-0.10	20.50	0.211	-13.51	48.00	0.026	-31.70	75.50	0.180	-14.89
1.75	0.972	-0.25	21.00	0.222	-13.07	48.50	0.042	-27.54	76.00	0.172	-15.29
2.00	0.951	-0.44	21.50	0.227	-12.88	49.00	0.057	-24.88	76.50	0.165	-15.65
2.25	0.924	-0.69	22.00	0.226	-12.92	49.50	0.073	-22.73	77.00	0.157	-16.08
2.50	0.891	-1.00	22.50	0.217	-13.27	50.00	0.087	-21.21	77.50	0.150	-16.48
2.75	0.854	-1.37	23.00	0.204	-13.81	50.50	0.101	-19.91	78.00	0.142	-16.95
3.00	0.813	-1.80	23.50	0.185	-14.66	51.00	0.113	-18.94	78.50	0.134	-17.46
3.25	0.767	-2.30	24.00	0.163	-15.76	51.50	0.123	-18.20	79.00	0.127	-17.92
3.50	0.718	-2.88	24.50	0.138	-17.20	52.00	0.132	-17.59	79.50	0.119	-18.49
3.75	0.666	-3.53	25.00	0.113	-18.94	52.50	0.138	-17.20	80.00	0.112	-19.02
4.00	0.611	-4.28	25.50	0.087	-21.21	53.00	0.142	-16.95	80.50	0.104	-19.66
4.25	0.554	-5.13	26.00	0.064	-23.88	53.50	0.143	-16.89	81.00	0.097	-20.26
4.50	0.496	-6.09	26.50	0.043	-27.33	54.00	0.142	-16.95	81.50	0.090	-20.92
4.75	0.438	-7.17	27.00	0.025	-32.04	54.50	0.139	-17.14	82.00	0.083	-21.62
5.00	0.380	-8.40	27.50	0.012	-38.42	55.00	0.133	-17.52	82.50	0.076	-22.38
5.25	0.322	-9.84	28.00	0.004	-47.96	55.50	0.125	-18.06	83.00	0.069	-23.22
5.50	0.266	-11.50	28.50	0.000	inf	56.00	0.115	-18.79	83.50	0.062	-24.15
5.75	0.212	-13.47	29.00	0.003	-50.46	56.50	0.103	-19.74	84.00	0.056	-25.04
6.00	0.162	-15.81	29.50	0.010	-40.00	57.00	0.090	-20.92	84.50	0.049	-26.20
6.25	0.119	-18.49	30.00	0.021	-33.56	57.50	0.076	-22.38	85.00	0.043	-27.33
6.50	0.088	-21.11	30.50	0.036	-28.87	58.00	0.062	-24.15	85.50	0.037	-28.64
6.75	0.080	-21.94	31.00	0.053	-25.51	58.50	0.048	-26.38	86.00	0.030	-30.46
7.00	0.095	-20.45	31.50	0.072	-22.85	59.00	0.037	-28.64	86.50	0.024	-32.40
7.25	0.121	-18.34	32.00	0.093	-20.63	59.50	0.034	-29.37	87.00	0.018	-34.89
7.50	0.150	-16.48	32.50	0.113	-18.94	60.00	0.040	-27.96	87.50	0.012	-38.42
7.75	0.178	-14.99	33.00	0.132	-17.59	60.50	0.054	-25.35	88.00	0.006	-44.44
8.00	0.204	-13.81	33.50	0.150	-16.48	61.00	0.070	-23.10	88.50	0.055	-25.19
8.25	0.225	-12.96	34.00	0.165	-15.65	61.50	0.086	-21.31	89.00	0.048	-26.38
8.50	0.243	-12.29	34.50	0.177	-15.04	62.00	0.103	-19.74	89.50	0.041	-27.74
8.75	0.257	-11.80	35.00	0.185	-14.66	62.50	0.120	-18.42	90.00	0.034	-29.37

## Azimuth Vertical Pattern Tabulation

Angle	Field	dB	Angle	Field	dB	Angle	Field	dB	Angle	Field	dB
0°	0.065	-23.74	90°	0.386	-8.27	180°	0.999	-0.01	270°	0.822	-1.70
2°	0.065	-23.74	92°	0.407	-7.81	182°	0.999	-0.01	272°	0.804	-1.89
4°	0.065	-23.74	94°	0.428	-7.37	184°	1.000	0.00	274°	0.784	-2.11
6°	0.065	-23.74	96°	0.449	-6.96	186°	0.999	-0.01	276°	0.765	-2.33
8°	0.067	-23.48	98°	0.472	-6.52	188°	0.999	-0.01	278°	0.744	-2.57
10°	0.069	-23.22	100°	0.495	-6.11	190°	0.999	-0.01	280°	0.723	-2.82
12°	0.073	-22.73	102°	0.517	-5.73	192°	0.997	-0.03	282°	0.701	-3.09
14°	0.076	-22.38	104°	0.540	-5.35	194°	0.997	-0.03	284°	0.678	-3.38
16°	0.080	-21.94	106°	0.563	-4.99	196°	0.997	-0.03	286°	0.656	-3.66
18°	0.079	-22.05	108°	0.587	-4.63	198°	0.998	-0.02	288°	0.632	-3.99
20°	0.078	-22.16	110°	0.610	-4.29	200°	0.998	-0.02	290°	0.610	-4.29
22°	0.079	-22.05	112°	0.632	-3.99	202°	0.998	-0.02	292°	0.587	-4.63
24°	0.080	-21.94	114°	0.656	-3.66	204°	0.997	-0.03	294°	0.563	-4.99
26°	0.076	-22.38	116°	0.678	-3.38	206°	0.997	-0.03	296°	0.540	-5.35
28°	0.073	-22.73	118°	0.701	-3.09	208°	0.997	-0.03	298°	0.517	-5.73
30°	0.069	-23.22	120°	0.723	-2.82	210°	0.999	-0.01	300°	0.495	-6.11
32°	0.067	-23.48	122°	0.744	-2.57	212°	0.999	-0.01	302°	0.472	-6.52
34°	0.065	-23.74	124°	0.765	-2.33	214°	0.999	-0.01	304°	0.449	-6.96
36°	0.065	-23.74	126°	0.784	-2.11	216°	1.000	0.00	306°	0.428	-7.37
38°	0.065	-23.74	128°	0.804	-1.89	218°	0.999	-0.01	308°	0.407	-7.81
40°	0.065	-23.74	130°	0.822	-1.70	220°	0.999	-0.01	310°	0.386	-8.27
42°	0.070	-23.10	132°	0.841	-1.50	222°	0.999	-0.01	312°	0.367	-8.71
44°	0.076	-22.38	134°	0.857	-1.34	224°	0.999	-0.01	314°	0.348	-9.17
46°	0.083	-21.62	136°	0.873	-1.18	226°	0.999	-0.01	316°	0.329	-9.66
48°	0.089	-21.01	138°	0.888	-1.03	228°	0.999	-0.01	318°	0.311	-10.14
50°	0.098	-20.18	140°	0.902	-0.90	230°	0.998	-0.02	320°	0.293	-10.66
52°	0.106	-19.49	142°	0.914	-0.78	232°	0.996	-0.03	322°	0.276	-11.18
54°	0.117	-18.64	144°	0.926	-0.67	234°	0.995	-0.04	324°	0.263	-11.60
56°	0.130	-17.72	146°	0.937	-0.57	236°	0.992	-0.07	326°	0.249	-12.08
58°	0.142	-16.95	148°	0.946	-0.48	238°	0.990	-0.09	328°	0.235	-12.58
60°	0.155	-16.19	150°	0.956	-0.39	240°	0.986	-0.12	330°	0.221	-13.11
62°	0.167	-15.55	152°	0.963	-0.33	242°	0.982	-0.16	332°	0.206	-13.72
64°	0.179	-14.94	154°	0.969	-0.27	244°	0.976	-0.21	334°	0.191	-14.38
66°	0.191	-14.38	156°	0.976	-0.21	246°	0.969	-0.27	336°	0.179	-14.94
68°	0.206	-13.72	158°	0.982	-0.16	248°	0.963	-0.33	338°	0.167	-15.55
70°	0.221	-13.11	160°	0.986	-0.12	250°	0.956	-0.39	340°	0.155	-16.19
72°	0.235	-12.58	162°	0.990	-0.09	252°	0.946	-0.48	342°	0.142	-16.95
74°	0.249	-12.08	164°	0.992	-0.07	254°	0.937	-0.57	344°	0.130	-17.72
76°	0.263	-11.60	166°	0.995	-0.04	256°	0.926	-0.67	346°	0.117	-18.64
78°	0.276	-11.18	168°	0.996	-0.03	258°	0.914	-0.78	348°	0.106	-19.49
80°	0.293	-10.66	170°	0.998	-0.02	260°	0.902	-0.90	350°	0.098	-20.18
82°	0.311	-10.14	172°	0.999	-0.01	262°	0.888	-1.03	352°	0.089	-21.01
84°	0.329	-9.66	174°	0.999	-0.01	264°	0.873	-1.18	354°	0.083	-21.62
86°	0.348	-9.17	176°	0.999	-0.01	266°	0.857	-1.34	356°	0.076	-22.38
88°	0.367	-8.71	178°	0.999	-0.01	268°	0.841	-1.50	358°	0.070	-23.10



## FINAL DATA SMITH CHART



P/N ATC-BCSE8C1-U1-19  
SN 13350



## FINAL DATA LOG MAG

### POWER DIVIDER PORT 1 POWER SPLIT



P/N ATC-BCSE8C1-U1-19

SN 13350

## FINAL DATA LOG MAG

### POWER DIVIDER PORT 2 POWER SPLIT



P/N ATC-BCSE8C1-U1-19

SN 13350

EXHIBIT E-3

ALLOCATION STUDY

tvstudy v2.2.5 (4uoc83)

Database: localhost, Study: WFND-Replace-Final-IX, Model: Longley-Rice

Start: 2024.03.11 13:03:35

Study created: 2024.03.11 13:03:35

Study build station data: LMS TV 2024-03-01

Proposal: WFND-LD D19 LD APP FINDLAY, OH

File number: Replace-Final

Facility ID: 21475

Station data: User record

Record ID: 120

Country: U.S.

Build options:

Protect pre-transition records not on baseline channel

Search options:

Non-U.S. records included

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	WFWA	D18	DT	LIC	FORT WAYNE, IN	BLANK0000063130	129.2 km
No	WUHO-LD	D18+	LD	CP	KALAMAZOO, MI	BLANK0000169853	211.0
No	WEYI-TV	D18	DT	LIC	SAGINAW, MI	BLANK0000185142	234.1
No	W18EY-D	D18	LD	APP	CANTON, OH	BLANK0000212511	203.8
No	WSTR-TV	D18	DT	LIC	CINCINNATI, OH	BLANK0000228070	225.0
No	WCBZ-CD	D18	DC	LIC	Columbus, OH	BLANK0000069165	124.2
No	W18ES-D	D18	LD	LIC	MANSFIELD, OH	BLANK0000087113	107.3
No	WOIO	D18	LD	LIC	SHAKER HEIGHTS, OH	BLANK0000079849	173.1
No	WDTJ-LD	D18	LD	CP	TOLEDO, OH	BLANK0000158049	60.8
No	WDTJ-LD	D18	LD	LIC	TOLEDO, OH	BLDTL20121219ABP	60.8
No	WGN-TV	D19	DT	LIC	CHICAGO, IL	BLANK0000235154	342.8
No	WIPB	D19	DT	LIC	MUNCIE, IN	BLANK0000087336	185.6
No	W19FD-D	D19	LD	LIC	TERRE HAUTE, IN	BLANK0000213529	379.7

No	WDKY-TV	D19	DT	LIC	DANVILLE, KY	BLANK0000072980	363.7
No	WXMI	D19	DT	LIC	GRAND RAPIDS, MI	BLANK0000143294	234.5
No	W19EZ-D	D19	LD	LIC	HOUGHTON LAKE, MI	BLANK0000208408	363.7
Yes	WKYC	D19	DT	LIC	CLEVELAND, OH	BLANK0000087282	166.5
Yes	WCLL-CD	D19	DC	LIC	COLUMBUS, OH	BLANK0000052505	137.1
No	WEPA-LD	D19	LD	LIC	ERIE, PA	BLANK0000223323	317.2
No	WBYD-CD	D19	DC	LIC	PITTSBURGH, PA	BLANK0000096151	339.0
No	WFFT-TV	D20	DT	LIC	FORT WAYNE, IN	BLANK0000086952	129.6
No	WTVS	D20	DT	LIC	DETROIT, MI	BLANK0000117036	153.7
No	WOHZ-CD	D20	DC	LIC	Canton, OH	BLANK0000158522	201.0
No	WLWT	D20	DT	LIC	CINCINNATI, OH	BLANK0000157838	233.0
No	WTCL-LD	D20z	LD	LIC	CLEVELAND, OH	BLANK0000196805	163.9
No	CJMT-DT-1	D19	DT	LIC	LONDON, ON	BLANKCANADA187	279.0
No	CICA-DT	D19	DT	LIC	TORONTO, ON	BLANKCANADA233	448.8
No	CICO-DT-32	D19	DT	LIC	WINDSOR, ON	BLANKCANADA244	129.4

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D19  
 Mask: Simple  
 Latitude: 41 6 41.10 N (NAD83)  
 Longitude: 83 38 52.70 W  
 Height AMSL: 329.2 m  
 HAAT: 95.8 m  
 Peak ERP: 15.0 kW  
 Antenna: Alive-ATC-BCSE8C1-U1-19 0.0 deg  
 Elev Pattn: Generic  
 Elec Tilt: 1.00

49.3 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.212 kW	110.7 m	24.1 km
45.0	0.225	101.7	23.5

90.0	8.06	85.4	39.8
135.0	14.8	83.2	42.5
180.0	12.3	87.6	42.2
225.0	12.4	91.5	42.8
270.0	15.0	96.4	44.3
315.0	6.54	109.6	41.6

Proposal 24.25 dBu contour does not cross Canadian border  
Distance to Canadian border: 96.5 km

Distance to Mexican border: 2034.2 km

Conditions at FCC monitoring station: Allegan MI  
Bearing: 311.8 degrees Distance: 253.1 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:  
Bearing: 273.8 degrees Distance: 1818.6 km

No land mobile station failures found

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 BLANK0000087282 LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WKYC	D19	DT	LIC	CLEVELAND, OH	BLANK0000087282	
Undesireds:	WFND-LD	D19	LD	APP	FINDLAY, OH	Replace-Final	166.5 km

WIPB	D19	DT	LIC	MUNCIE, IN	BLANK0000087336	343.3
WCLL-CD	D19	DC	LIC	COLUMBUS, OH	BLANK0000052505	193.6
WBYD-CD	D19	DC	LIC	PITTSBURGH, PA	BLANK0000096151	196.0
WOHZ-CD	D20	DC	LIC	Canton, OH	BLANK0000158522	65.4
WPGH-TV	D20	DT	LIC	PITTSBURGH, PA	BLANK0000112578	172.7
CJMT-DT-1	D19	DT	LIC	LONDON, ON	BLANKCANADA187	176.6
CICA-DT	D19	DT	LIC	TORONTO, ON	BLANKCANADA233	313.8
CICO-DT-32	D19	DT	LIC	WINDSOR, ON	BLANKCANADA244	135.1

Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX	
26497.7	4,180,300	25976.0	4,125,819	24916.4	4,041,952	24861.8	4,039,904	0.22	0.05
2734.0	171	2734.0	171	1934.3	0	1934.3	0	0.00	0.00 (in
Canada)									

Undesired		Total IX		Unique IX, before		Unique IX, after	
WFND-LD D19 LD APP	78.8	4,402				54.7	2,048
WIPB D19 DT LIC	5.0	242	2.0	31		1.0	29
WCLL-CD D19 DC LIC	7.0	885	2.0	220		2.0	220
WBYD-CD D19 DC LIC	227.9	27,374	139.6	14,816		139.6	14,816
WOHZ-CD D20 DC LIC	252.6	19,370	225.8	18,282		225.8	18,282
WPGH-TV D20 DT LIC	1.0	0	0.0	0		0.0	0
CJMT-DT-1 D19 DT LIC	165.2	12,889	130.1	11,843		130.1	11,843
CICA-DT D19 DT LIC	24.1	457	0.0	0		0.0	0
CICO-DT-32 D19 DT LIC	551.1	37,979	442.9	25,192		423.8	23,104
CICO-DT-32 D19 DT LIC	799.7	171	799.7	171		799.7	171 (in Canada)

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Interference to BLANK0000052505 LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WCLL-CD	D19	DC	LIC	COLUMBUS, OH	BLANK0000052505	
Undesireds:	WFND-LD	D19	LD	APP	FINDLAY, OH	Replace-Final	137.1 km
	WCBZ-CD	D18	DC	LIC	Columbus, OH	BLANK0000069165	16.5
	WIPB	D19	DT	LIC	MUNCIE, IN	BLANK0000087336	201.7
	WKYC	D19	DT	LIC	CLEVELAND, OH	BLANK0000087282	193.6



Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
6708.7 1,676,297	6660.5 1,666,173	6591.3 1,660,320	6591.3 1,660,320	0.00 0.00
Undesired	Total IX	Unique IX, before	Unique IX, after	
WFND-LD D19 LD APP	1.0 38		0.0 0	
WCBZ-CD D18 DC LIC	1.0 181	1.0 181	1.0 181	
WIPB D19 DT LIC	17.0 2,708	7.0 1,878	7.0 1,878	
WKYC D19 DT LIC	61.2 3,794	51.2 2,964	50.2 2,926	

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Interference to proposal scenario 1

Call	Chan	Svc	Status	City, State	File Number	Distance
Desired: WFND-LD	D19	LD	APP	FINDLAY, OH	Replace-Final	
Undesireds: WDTJ-LD	D18	LD	CP	TOLEDO, OH	BLANK0000158049	60.8 km
WKYC	D19	DT	LIC	CLEVELAND, OH	BLANK0000087282	166.5

Service area	Terrain-limited	IX-free	Percent IX
4603.9 179,972	4603.9 179,972	4571.6 179,521	0.70 0.25
Undesired	Total IX	Unique IX	Prcnt Unique IX
WKYC D19 DT LIC	32.3 451	32.3 451	0.70 0.25

COHEN, DIPPELL AND EVERIST, P.C.

TABLE I  
COMPUTED COVERAGE DATA  
FOR THE PROPOSED DTV OPERATION OF  
WFND-LD, FINDLAY, OHIO  
CHANNEL 19 15 KW MAX ERP 329.2 METERS RC/AMSL  
MARCH 2024

<u>Radial</u>	<u>Average</u>	<u>Effective</u>	<u>Depression</u>	<u>Effective</u>	<u>Distance to Contour</u>
<u>N ° E, T</u>	<u>Elevation</u>	<u>Height</u>	<u>Angle</u>	<u>Radiated</u>	<u>49.254 dBu</u>
	<u>meters</u>	<u>meters</u>	<u>degrees</u>	<u>Power</u>	<u>km</u>
0	218.7	110.5	0.294	0.2	24.1
10	220.0	109.2	0.293	0.2	23.6
20	221.0	108.2	0.291	0.2	23.1
30	223.4	105.8	0.288	0.2	23.3
40	226.5	102.7	0.284	0.2	23.3
50	228.8	100.4	0.281	0.2	23.7
60	233.0	96.2	0.275	0.5	27.5
70	238.1	91.1	0.268	2.0	33.6
80	240.9	88.3	0.264	5.2	38.0
90	244.1	85.2	0.259	8.1	39.8
100	248.1	81.1	0.253	10.9	40.7
110	251.0	78.2	0.248	13.3	41.2
120	250.6	78.6	0.249	14.6	41.7
130	246.6	82.6	0.255	15.0	42.5
140	245.9	83.3	0.256	14.6	42.4
150	245.1	84.1	0.258	13.9	42.3
160	243.4	85.8	0.260	13.1	42.3
170	242.0	87.2	0.262	12.6	42.3
180	241.8	87.4	0.262	12.3	42.2
190	242.5	86.7	0.261	12.2	42.0
200	242.2	87.0	0.262	12.1	42.0
210	240.7	88.5	0.264	12.2	42.3
220	240.3	88.9	0.265	12.3	42.4
230	237.5	91.7	0.269	12.6	42.9
240	240.8	88.4	0.264	13.1	42.6
250	244.4	84.8	0.258	13.9	42.4
260	239.7	89.5	0.265	14.6	43.3
270	233.0	96.2	0.275	15.0	44.3
280	227.8	101.4	0.282	14.6	44.8

COHEN, DIPPELL AND EVERIST, P.C.

TABLE I  
COMPUTED COVERAGE DATA  
FOR THE PROPOSED DTV OPERATION OF  
WFND-LD, FINDLAY, OHIO  
CHANNEL 19 15 KW MAX ERP 329.2 METERS RC/AMSL  
MARCH 2024

<u>Radial</u>	<u>Average</u>	<u>Effective</u>	<u>Depression</u>	<u>Effective</u>	<u>Distance to Contour</u>
<u>N ° E, T</u>	<u>Elevation</u>	<u>Height</u>	<u>Angle</u>	<u>Radiated</u>	<u>49.254 dBu</u>
	meters	meters	degrees	kW	km
290	224.9	104.3	0.286	13.3	44.6
300	222.6	106.6	0.289	10.9	43.9
310	220.6	108.6	0.292	8.1	42.6
320	219.4	109.8	0.293	5.2	40.5
330	218.7	110.5	0.294	2.1	35.9
340	218.5	110.7	0.294	0.5	29.0
350	218.2	111.0	0.295	0.2	24.6

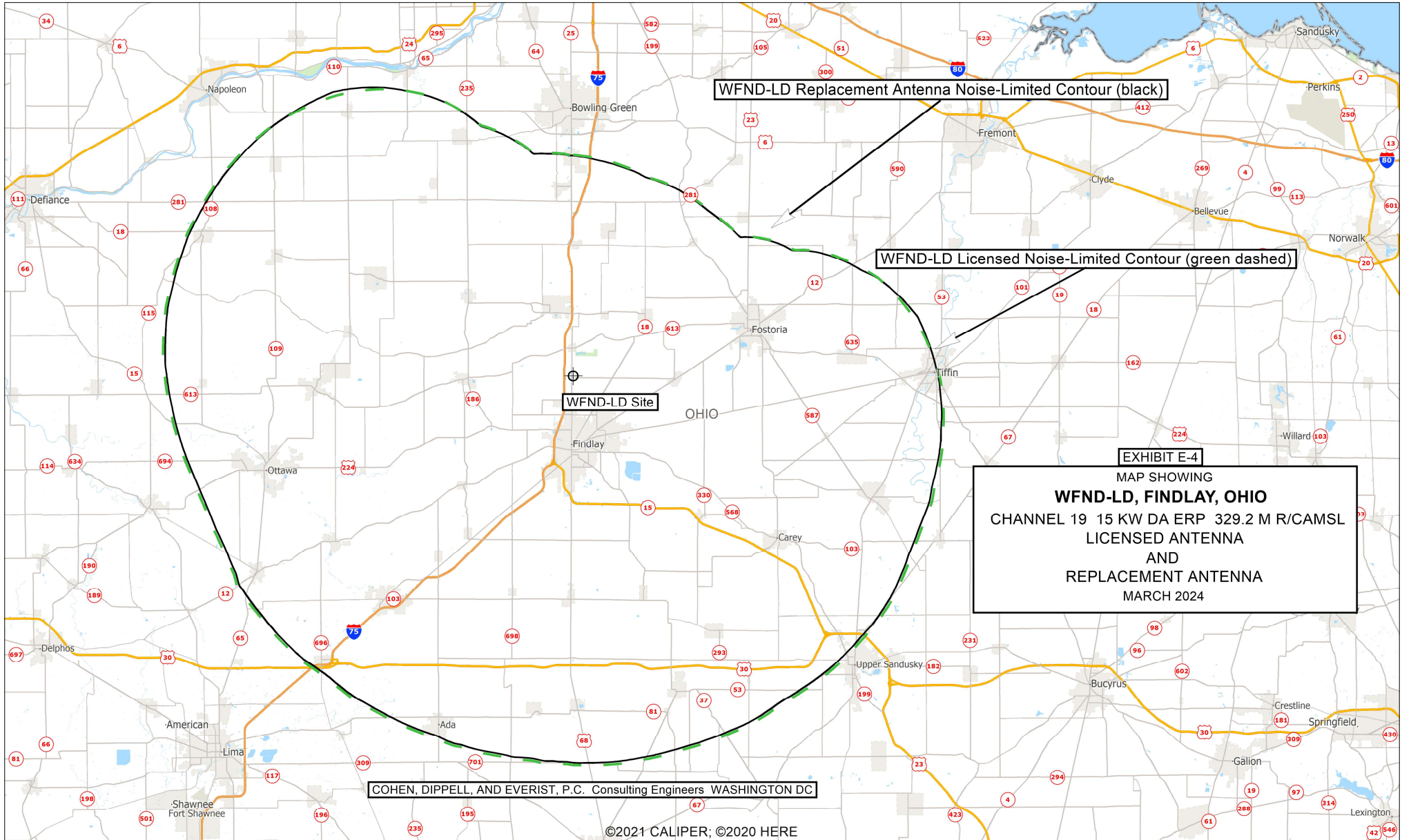


TABLE II  
COMPUTED COVERAGE DATA  
FOR THE PROPOSED CANADIAN COORDINATION CONTOUR  
WFND-LD, FINDLAY, OHIO  
CHANNEL 19 15 KW MAX ERP 329.2 METERS RC/AMSL  
MARCH 2024

<u>Radial</u>	<u>Average</u>	<u>Effective</u>	<u>Depression</u>	<u>Effective</u>	<u>Distance to Contour</u>
<u>N ° E, T</u>	<u>Elevation</u>	<u>Height</u>	<u>Angle</u>	<u>Radiated</u>	<u>24.254 dBu</u>
	meters	meters	degrees	kW	km
0	218.7	110.5	0.294	0.2	86.2
10	220.0	109.2	0.293	0.2	84.5
20	221.0	108.2	0.291	0.2	82.7
30	223.4	105.8	0.288	0.2	84.1
40	226.5	102.7	0.284	0.2	84.7
50	228.8	100.4	0.281	0.2	86.8
60	233.0	96.2	0.275	0.5	104.6
70	238.1	91.1	0.268	1.9	133.6
80	240.9	88.3	0.264	4.3	156.2
90	244.1	85.2	0.259	7.0	166.4
100	248.1	81.1	0.253	10.5	173.3
110	251.0	78.2	0.248	12.9	177.5
120	250.6	78.6	0.249	14.4	180.1
130	246.6	82.6	0.255	14.9	181.6
140	245.9	83.3	0.256	14.7	181.2
150	245.1	84.1	0.258	14.0	180.0
160	243.4	85.8	0.260	13.2	178.9
170	242.0	87.2	0.262	12.7	178.2
180	241.8	87.4	0.262	12.3	177.5
190	242.5	86.7	0.261	12.2	177.1
200	242.2	87.0	0.262	12.1	177.1
210	240.7	88.5	0.264	12.2	177.5
220	240.3	88.9	0.265	12.3	177.8
230	237.5	91.7	0.269	12.6	179.1
240	240.8	88.4	0.264	13.1	179.5
250	244.4	84.8	0.258	13.9	180.2
260	239.7	89.5	0.265	14.6	182.4
270	233.0	96.2	0.275	15.0	184.3
280	227.8	101.4	0.282	14.6	184.5

TABLE II  
COMPUTED COVERAGE DATA  
FOR THE PROPOSED CANADIAN COORDINATION CONTOUR  
WFND-LD, FINDLAY, OHIO  
CHANNEL 19 15 KW MAX ERP 329.2 METERS RC/AMSL  
MARCH 2024

<u>Radial</u>	<u>Average</u>	<u>Effective</u>	<u>Depression</u>	<u>Effective</u>	<u>Distance to Contour</u>
N ° E, T	<u>Elevation</u>	<u>Height</u>	<u>Angle</u>	<u>Radiated</u>	<u>24.254 dBu</u>
	meters	meters	degrees	kW	km
290	224.9	104.3	0.286	13.3	182.6
300	222.6	106.6	0.289	11.1	178.2
310	220.6	108.6	0.292	8.1	170.9
320	219.4	109.8	0.293	4.7	160.3
330	218.7	110.5	0.294	2.1	137.9
340	218.5	110.7	0.294	0.6	107.4
350	218.2	111.0	0.295	0.2	88.5

**EXHIBIT E-5**  
**MAP SHOWING**  
**CANADIAN BORDER**  
**AND**  
**CANADIAN COORDINATION CONTOUR**  
**WFND-LD, FINDLAY, OHIO**  
**CHANNEL 19 15 KW DA ERP 329.2 METERS RCAMS**  
**MARCH 2024**

Canadian Border

WFND-LD 24.25 dBu 50/10 Contour

COHEN, DIPPELL, AND EVERIST, P.C. Washington DC CONSULTING ENGINEERS