

Technical Report Supporting a Minor Modification of a Licensed FM Translator

Pursuant to 47 C.F.R. Section 74:

for

*W283CJ.L - Cedarburg, WI
(Facility ID: 147649)*

*Non-Adjacent Channel Change per
47 C.F.R. Section 74.1233(a)(1)(i)(A)(2)
to
CH230D(93.9 MHz) - Cedarburg, WI*

*as a
Commercial, Fill-In
AM Translator for
WIBD(AM) - West Bend, WI*

April 2022

Asher Broadcast Consulting, LLC
justinasher@consultant.com
1(202)875-2986

Table of Contents

Table of Contents

Explanation of Technical Report

Exhibit 1 - Service Contour Study: Present vs Proposed Operations

Exhibit 2 - Service Contour Study: Proposed vs Primary Operations

Exhibit 3 - Copy of USGS Topographic Aerial Photomap of Existing Site

Exhibit 4 - Vertical Plan of Antenna System

Exhibit 5 - HAAT Calculation & Miscellaneous Coordinate Information

Exhibit 6 - Tabulation of Proposed Allocation

Exhibit 7(a-c) - Contour Protection Studies Toward Select Allocation Concern(s)

Exhibit 8 - §74.1204(d) Second / Third Adjacent Given Interference Waiver Request

Exhibit 9 - Manufacturer's Vertical Antenna Pattern Documentation

Supplemental Appendix(s):

RF Appendix 1 - Radio Frequency Radiation Compliance Showing

EXPLANATION OF PROPOSAL: This LMS filing and accompanying technical report supports a Minor Modification of a Licensed Facility (Construction Permit Application) for FM Translator W283CJ.L - Cedarburg, WI (Facility ID: 147649). This filing requests a 47 C.F.R. Section 74.1233(a)(1)(i)(A)(2) non-adjacent channel change from CH283D (104.5 MHz) to CH230D (93.9 MHz) based upon a showing of reduced interference. Operation on the new frequency of CH230D (93.9 MHz) with a non-directional power of 0.250 kW ERP circular polarization (H&V) is requested. The FM Translator will operate from a COR of 298.6 meters AMSL at a new site location. This filing will specify rebroadcast of new Class B, AM Primary Station WIBD(AM) - West Bend, WI (1470 kHz); Facility ID No. 71541. The Translator will remain licensed to the current community of Cedarburg, WI.

FACILITY COMPLIANCE SHOWINGS: The proposed Translator remains in compliance with 47 C.F.R. Section 74.1232 as noted herein. A map of the proposed 60 dBμ service contour in relation to the present 60 dBμ service contour has been included in *Exhibit 1*. The minor change proposed service area will overlap a portion of the presently licensed service area as noted in the exhibit. The proposed 60 dBμ contour of the Translator lies wholly inside the larger of the AM primary daytime 2.0 mV/m contour or a 25 mile radius around the AM site. The primary station service contour relationship has been plotted in *Exhibit 2*. Regarding permission to retransmit new Primary Station, WIBD(AM) - West Bend, WI; both WIBD(FM) and CH230D(W283CJ) are under common control of Magnum Communications, Inc. (David R. Magnum); therefore, permission to rebroadcast is implied. The applicant would like to note primary AM station WIBD(AM) will be rebroadcast on co-owned Fill-In Translator W267CL.L - West Bend, WI (FAC ID: 150574); however, each Translator will serve substantially different areas as noted in *Exhibit 2*.

The proposed facility will be located on an existing 59.4 meter (195 ft) tower which does not require Antenna Structure Registration. In support of this filing, a copy of USGS Topographic Aerial Photomapping of the existing tower site has been included in *Exhibit 3*. A depiction of the tower and antenna configuration has been included in *Exhibit 4*. Further notification to the FAA or ASR governing authorities is not required as this proposal will not increase the overall tower height.

The applicant would like to note use of the NED 03 second terrain database for all allocation, contour and HAAT showings contained herein. A copy of the proposed HAAT calculation, demonstrating compliance with 47 C.F.R. Section 74.1235, has been included in **Exhibit 5**.

The applicant certifies compliance with 47 C.F.R. Section 74.1234 regarding access to the transmitter site, at all hours and in all seasons; and/or providing means to turn on and off, at will, the transmitting apparatus from a point which is readily accessible at all hours and in all seasons. In addition, the transmitter is equipped with suitable automatic circuits which will place it in a non-radiating condition in the absence of a signal on the input channel; with the transmitting apparatus adequately protected against tampering by unauthorized persons.

ALLOCATION COMPLIANCE SHOWINGS: The proposed Translator remains in compliance with 47 C.F.R. Section 74.1204 & 74.1205 toward all allocation protection concerns with the exception of WKTI(FM) - Milwaukee, WI (CH233B) and WLDB(FM) - Milwaukee, WI (CH227B). A general allocation study for this proposal is found in **Exhibit 6**. There are three (3) additional facilities, existing or proposed, close enough to merit further study. Therefore, a supplemental contour protection study has been provided toward each facility as included in **Exhibit(s) 7(a-c)**.


The applicant would like to note the existence of a 47 C.F.R. Section 74.1204(d) Second/Third Adjacent Channel Given Interference Waiver Request toward WKTI(FM) - Milwaukee, WI (CH233B) and WLDB(FM) - Milwaukee, WI (CH227B) as included in **Exhibit 8**. Protection of the worst case calculated 116.4 dBμ F(50:10) Interference Contour, corresponding to the worst case calculated 76.4 dBμ F(50:50) Protected Contour, has been demonstrated through a downward radiation study. Full protection will be afforded all concerns as this area will not reach the ground nor a five meter artificial plane representing a standard two story house when taking into account the downward radiation characteristics of the antenna as supplied by the antenna manufacturer. A copy of the manufacturer's antenna specifications has been included in **Exhibit 9**.

Regarding protection of international concerns, the facility is, and will remain, more than 320 km from the common border between the United States and Canada or Mexico. As a result, no further international protection showings are believed required.

ENVIRONMENTAL COMPLIANCE SHOWINGS: The proposed facility complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments as set forth under §1.1310 and/or §1.1307(b)(3) of the Commission's rules and the RF radiation protection guidelines as set forth in OET Bulletin No. 65 (Edition 97-01), and the accompanying Supplement A, (Edition 97-01). Compliance has been demonstrated in the attached **RF Appendix 1** of this filing. The facility is, or will be, properly marked with signs. Entry is, or will be, restricted by means of fencing, locked doors or gates. In addition, coordination with other users of the site will be secured 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.

Regarding compliance with the NEPA, Nationwide Programmatic Agreement and NHPA Section 106 for tower co-location, compliance with the Agreement is not required where no new tower construction is being proposed and the tower is not being substantially altered. Specifically, compliance is not necessary where only an antenna and feed-line are being added to an existing structure, as here. However, should the Commission determine compliance is necessary, upon notification to the applicant, the applicant will file FCC Form 621.

CERTIFICATION OF TECHNICAL CONSULTANT: *I declare, under penalty of perjury, that the contents of this report are true and accurate to the best of my knowledge and belief. I further certify I have over twenty-three years of experience as a broadcast technical consultant before the Federal Communications Commission ("the FCC"); and am familiar with the Code of Federal Regulations Title 47 ("the Rules") as pertaining to this report and its contents herein. The underlying data utilized in this report was taken directly from FCC databases or indirectly through third party software vendors securing data directly from FCC databases. This firm cannot be held liable for errors or omissions resulting from the underlying data. The information contained herein is believed accurate to the date reported below.*



Justin W. Asher
Technical Consultant
April 13, 2022

NED 03 SEC Terrain Database
US Census 2020 PL Database
NED 1983 Coordinate Datum

Exhibit 1

Service Contour Study: Present vs Proposed Operations

Proposed 60 dBμ F(50:50) Contour

Present 60 dBμ F(50:50) Contour

CH230D.P
W283CJ.L

Cedarburg

Grafton

Saukville

Mequon

Germantown

Menomonee Falls

Bayside
River Hills

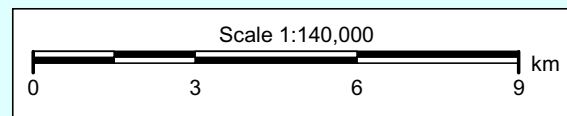
CH230D.P
Cedarburg, WI
Proposed Operation
Facility ID: 147649
Latitude: 43-17-36.40 N
Longitude: 087-59-22.80 W
ERP: 0.25 kW
Channel: 230D (93.9 MHz)
AMSL Height: 298.6 m
Horiz. Pattern: Omni

60 dBμ F(50:50) Contour
Total Population: 69,350
Total Area: 342.8 sq. km

W283CJ.L
Cedarburg, WI
BLFT20161109AAV
Facility ID: 147649
Latitude: 43-17-36 N
Longitude: 087-59-23.30 W
ERP: 0.25 kW
Channel: 283D (104.5 MHz)
AMSL Height: 291.0 m
Horiz. Pattern: Directional

60 dBμ F(50:50) Contour
Total Population: 57,483
Total Area: 233.1 sq. km

Asher Broadcast Consulting LLC
justinasher@consultant.com
1 (202) 875-2986



Primary 2 mV/m Daytime Contour

Exhibit 2
Service Contour Study:
Proposed vs Primary Operations

25 mile Radius from AM Site

Licensed 60 dBμ F(50:50) Contour

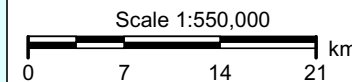
Proposed 60 dBμ F(50:50) Contour

WIBD(AM) - 1470 kHz
West Bend, Wisconsin
Station Class: B
Region 2 Class: B
Facility ID: 71541
File Number: BL-20100408ACT
43-22-14.0 N 88-09-58.0 W (NAD 27)
43-22-14.0 N 88-09-58.3 W (NAD 83)
Power: 2.5 kW, Directional
Hours: Daytime
Pattern Type: Standard
Towers: 3 Augmentations: 0
RMS Theoretical: 466.71 mV/meter
RMS Standard: 490.33 mV/meter

CH230D.P
Cedarburg, WI
Proposed Operation
Facility ID: 147649
Latitude: 43-17-36.40 N
Longitude: 087-59-22.80 W
ERP: 0.25 kW
Channel: 230D (93.9 MHz)
AMSL Height: 298.6 m
Horiz. Pattern: Omni

W267CL.L
West Bend, WI
BLFT20170614AAC
Facility ID: 150574
Latitude: 43-26-30.90 N
Longitude: 088-11-12.30 W
ERP: 0.25 kW
Channel: 267D (101.3 MHz)
AMSL Height: 342.0 m
Pattern: Omni

NED 03 SEC Terrain Database
US Census 2010 PL Database
NAD 1983 Coordinate Datum



The applicant would like to note primary AM station WIBD(AM) will be rebroadcast on co-owned Fill-In Translator W267CL.L - West Bend, WI (FAC ID: 150574); however, no Translator will serve substantially the same area as noted herein.

The National Map Advanced Viewer

Exhibit 3 - Copy of USGS Topographic Aerial Photomap of Existing Site

#1:789.83 ft/240.74 m

Site Coordinates

(NGS NADCON)

Latitude

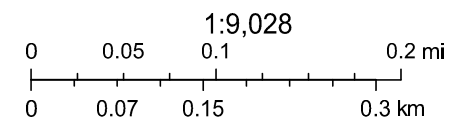
Longitude

NAD 27 datum values: ---

NAD 83 datum values: 43-17-36.4N 087-59-22.8W

Asher Broadcast Consulting LLC
justinasher@consultant.com
1 (202) 875-2986

4/12/2022, 9:26:40 AM



USGS The National Map: Orthoimagery and US Topo. Data refreshed January, 2022.

USGS
2021 USGS

Exhibit 4

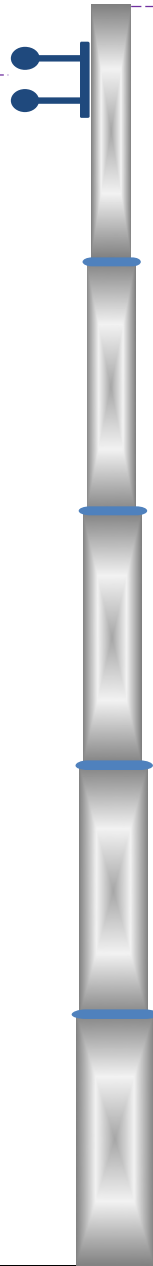
Vertical Plan of Antenna System and Support Tower

Proposed Antenna
 298.6 meters AMSL
 HAAT: Not Required (Fill-In Status)

300.1 meters AMSL
 (985 feet AMSL)

Overall Tower Height
 59.4 meters AGL
 (195 feet AGL)

Antenna COR Height
 57.9 meters AGL
 (190 feet AGL)



Ground Elevation: 240.7 meters AMSL (790 feet AMSL)

Address: Southwest Corner of the Intersection of Western Rd & Ozaukee Interurban Trail

City: Cedarburg

County: Ozaukee

State: Wisconsin

Latitude (D M S)

Longitude (D M S)

(NAD 1927)

Lat/Long: 43-17-36.4 N 087-59-22.8 W (NAD 1983)

Antenna Structure Registration

Not Required

Drawing
 Is Not
 To Scale

Asher Broadcast Consulting, LLC

justinasher@consultant.com

1(202)875-2986

Exhibit 5

HAAT and Miscellaneous Coordinate Information

HAAT Calculation (NAD 1983):

N. Lat. = 431736.4 W. Lng. = 875922.8
 HAAT and Distance to Contour,
 FCC, FM 2-10 Mi, 51 pts Method - NED 03 SEC

Azi.	AV EL	HAAT	ERP kW	dBk	Field	60-F5
000	267.6	31.0	0.2500	-6.02	1.000	7.19
030	237.9	60.7	0.2500	-6.02	1.000	10.23
060	199.6	99.0	0.2500	-6.02	1.000	12.80
090	189.5	109.1	0.2500	-6.02	1.000	13.42
120	187.0	111.6	0.2500	-6.02	1.000	13.58
150	208.7	89.9	0.2500	-6.02	1.000	12.22
180	211.3	87.3	0.2500	-6.02	1.000	12.05
210	239.6	59.0	0.2500	-6.02	1.000	10.10
240	266.2	32.4	0.2500	-6.02	1.000	7.34
270	276.4	22.2	0.2500	-6.02	1.000	7.09
300	266.0	32.6	0.2500	-6.02	1.000	7.35
330	266.2	32.4	0.2500	-6.02	1.000	7.33

Ave El= 234.66 M HAAT= 63.94 M AMSL= 298.6

NAD 1983 to NAD 1927 Conversion:

Various Coordinate Conversion Calculations (NAD 1983):

Position Type	Lat Lon
Degrees Lat Long	43.2934444°, -087.9896667°
Degrees Minutes	43°17.60667', -087°59.38000'
Degrees Minutes Seconds	43°17'36.4000", -087°59'22.8000"
UTM	16T 419718mE 4793877mN
UTM centimeter	16T 419718.59mE 4793877.61mN
MGRS	16TDN1971893877
Grid North	-0.7°
GARS	185MC17
Maidenhead	EN63AH10FK72
GEOREF	GJCP00621760

Exhibit 6

Tabulation of Proposed Allocation

Blue Text indicates contour protection studies toward select stations as included in ***Exhibit(s) 7(a-c)***.

Yellow Text denotes the existence of a 47 C.F.R. Section 74.1204(d) Second/Third Adjacent Channel Given Interference Waiver Request as included in ***Exhibit 8***.

David R. Magnum											
REFERENCE		CH# 230D - 93.9 MHz, Pwr= 0.25 kW, HAAT= 63.9 M, COR= 298.6 M								DISPLAY DATES	
43 17 36.40 N.		Average Protected F(50-50)= 10.46 km								DATA 04-12-22	
87 59 22.80 W.		Omni-directional								SEARCH 04-12-22	
CH	CALL	TYPE	ANT	AZI	DIST	LAT	PWR (kW)	INT (km)	PRO (km)	*IN*	*OUT*
CITY		STATE		<--	FILE #	LNG	HAAT (M)	COR (M)	LICENSEE	(Overlap	in km)
233B	WKTI	LIC	CN	162.4	23.56	43 05 29.00	14.000	5.5	65.7	5.8	-43.7*
Milwaukee		WI		342.5	BLH19991020ABM	87 54 07.30	291	498	Good Karma Brands Milwaukee		
227B	WLDB	LIC	NCN	162.5	23.00	43 05 46.00	16.000	5.5	64.7	5.3	-43.2*
Milwaukee		WI		342.5	BLH20050923AAH	87 54 15.30	270	468	Milwaukee Radio Alliance,		
229A	WBFM	LIC	CN	23.4	51.69	43 43 12.00	6.000	39.9	23.4	2.0	9.7
Sheboygan		WI		203.5	BLH19930225KB	87 44 04.30	77	277	Midwest Communications, In		
231B	WJJO	LIC	CN	253.7	90.81	43 03 32.00	50.000	79.3	65.9	4.1	10.5
Watertown		WI		72.9	BMLH20160921AAN	89 03 45.40	150	416	Mid-West Management, Inc.		
229D	W229CQ	LIC	DCN	168.3	28.89	43 02 20.10	0.250	8.4	5.8	8.3	5.0
Milwaukee		WI		348.4	BLFT20160720ABZ	87 55 04.30		379	Bustos Media Of Wisconsin,		
230B	WLIT-FM	LIC	CN	169.4	159.91	41 52 44.10	4.000	127.5	65.8	20.1	35.8
Chicago		IL		349.7	BMLH20140908AEF	87 38 08.20	482	663	Ihm Licenses, LLC		
230C1	WDOR-FM	LIC	CN	15.2	186.00	44 54 23.00	77.000	154.2	60.6	21.4	92.2
Sturgeon Bay		WI		195.6	BLH19801224AK	87 22 15.40	198	396	Door County Broadcasting C		
283A	WXER	LIC	NCN	354.0	48.27	43 43 32.00	5.100	3.8	43.1	9.5R	38.8M
Plymouth		WI		174.0	BLH20060109ACJ	88 03 07.30	108	401	Midwest Communications, In		
284A	WDDW	LIC	NCN	166.4	50.05	42 51 20.10	4.200	3.8	43.1	9.5R	40.6M
Sturtevant		WI		346.5	BLH20040317ADF	87 50 41.30	103	315	Bustos Media Of Wisconsin,		
230D	W230DA	LIC	DCN	346.2	89.28	44 04 22.60	0.250	35.5	10.4	45.1	53.5
New Holstein		WI		166.0	0000143108	88 15 24.40		357	Metro North Communications		
229D	W229DE	LIC	CN	325.5	64.81	43 46 21.90	0.250	10.1	7.1	47.3	47.6
Fond Du Lac		WI		145.2	BLFT20180822AAQ	88 26 50.30		268	Radio Plus, Inc.		
230D	W230DB	LIC	DCN	332.8	94.23	44 02 45.00	0.250	29.0	8.2	59.2	59.6
Oshkosh		WI		152.4	0000159332	88 31 45.20		320	Cumulus Licensing LLC		
230C3	WMMA-FM	LIC	NCN	305.6	180.29	44 13 22.90	18.000	106.1	36.4	66.8	120.0
Nekoosa		WI		124.3	0000124583	89 49 46.40	112	411	Relevant Radio, Inc.		
232C3	WYDR	LIC	ZCN	346.3	99.02	44 09 29.90	13.000	2.6	27.3	87.7	68.5
Neenah-Menasha		WI		166.1	BLH19950920KB	88 17 03.30	140	387	Midwest Communications, In		
229B	WBGR-FM	LIC	CN	240.7	159.94	42 34 35.00	36.000	73.8	61.9	77.4	82.6
Monroe		WI		59.5	BLH19820809AH	89 41 35.40	177	454	Big Radio		
229B	WBCT	LIC	CN	109.4	212.58	42 37 56.10	320.000	120.3	94.3	78.7	89.2
Grand Rapids		MI		291.1	BLH19800616AK	85 32 16.10	238	486	Ihm Licenses, LLC		
283A	WSLD	LIC	NCN	224.7	88.22	42 43 38.00	6.000	3.8	43.1	9.5R	78.7M
Whitewater		WI		44.2	BLH19921125KD	88 44 54.40	100	381	Cmc Media LLC		

Terrain database is NED 03 SEC , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM
In & Out distances between contours are shown at closest points. Reference zone= East Zone, Co to 3rd adjacent.
All separation margins (if shown) include rounding.
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, _= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)
***affixed to 'IN' or 'OUT' values = site inside restricted contour.
« = Station meets FCC minimum distance spacing for its class.

Exhibit 7a
Contour Protection Studies Toward Select Allocation Concern(s)

David R. Magnum

FMCommander Single Allocation Study - 04-12-2022 - NED 03 SEC
CH230D.P's Overlaps (In= 2.04 km, Out= 9.72 km)

CH230D.P CH 230 D
Lat= 43 17 36.40, Lng= 87 59 22.80
0.25 kW 63.9 m HAAT, 298.6 m COR
Prot.= 60 dBu, Intef.= 54 dBu

WBFM CH 229 A BLH19930225KB
Lat= 43 43 12.00, Lng= 87 44 04.30
6.0 kW 77 m HAAT, 277 m COR
Prot.= 60 dBu, Intef.= 54 dBu

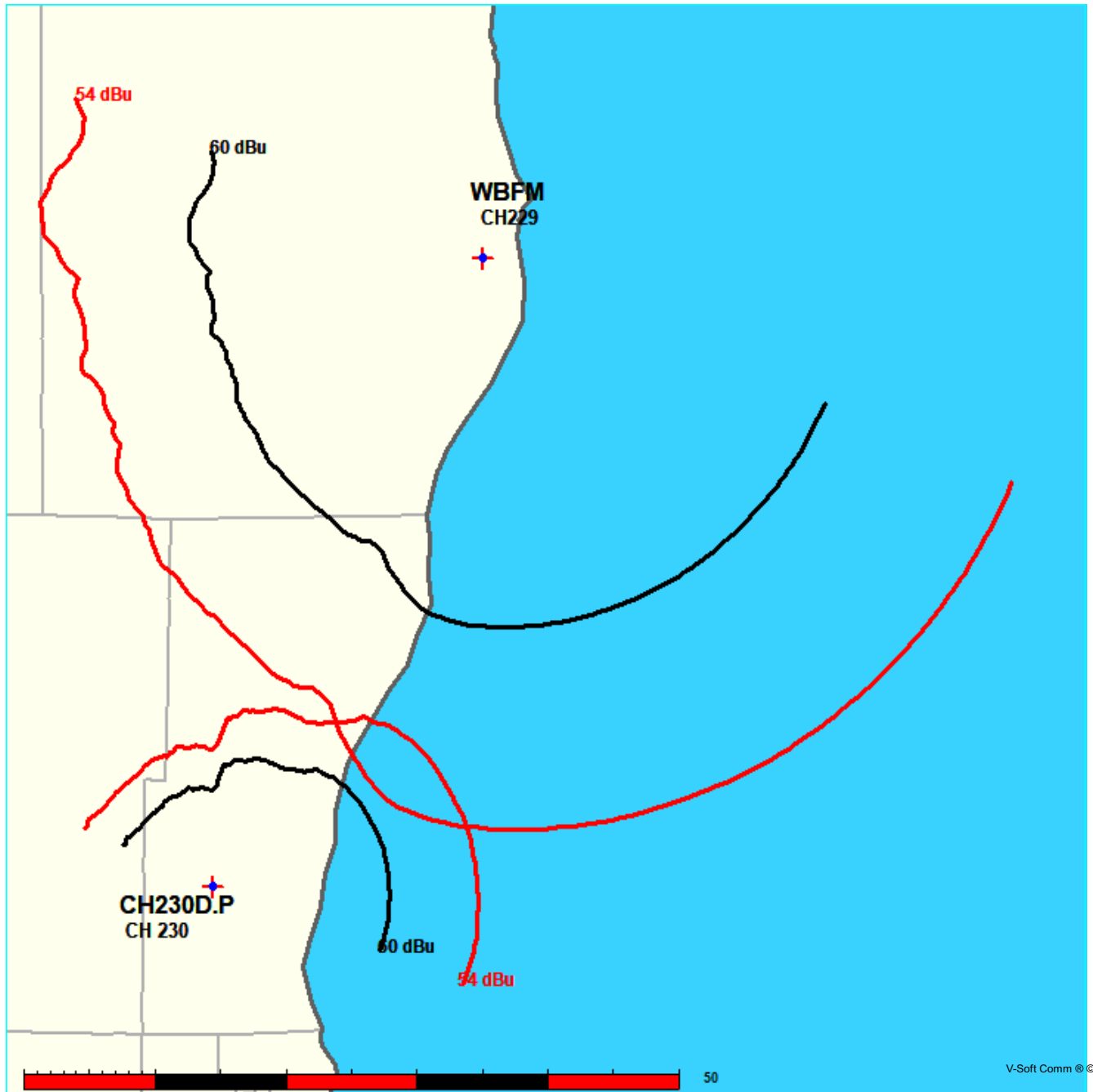


Exhibit 7b

Contour Protection Studies Toward Select Allocation Concern(s)

David R. Magnum

FMCommander Single Allocation Study - 04-12-2022 - NED 03 SEC
CH230D.P's Overlaps (In= 4.11 km, Out= 10.47 km)

CH230D.P CH 230 D
Lat= 43 17 36.40, Lng= 87 59 22.80
0.25 kW 63.9 m HAAT, 298.6 m COR
Prot.= 60 dBu, Intef.= 48 dBu

WJJO CH 231 B BMLH20160921AAN
Lat= 43 03 32.00, Lng= 89 03 45.40
50.0 kW 150 m HAAT, 416 m COR
Prot.= 54 dBu, Intef.= 54 dBu

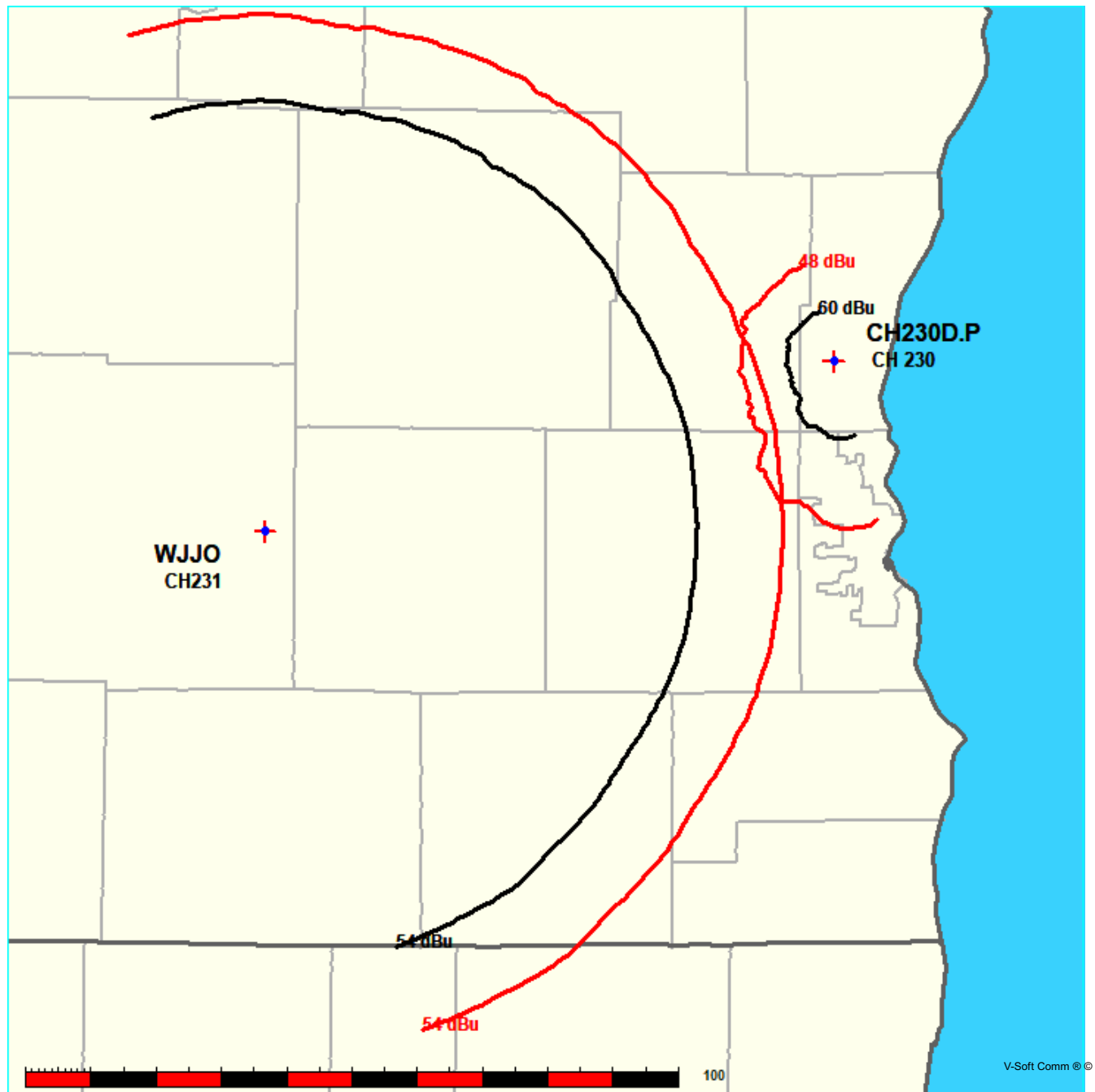


Exhibit 7c

Contour Protection Studies Toward Select Allocation Concern(s)

David R. Magnum

FMCommander Single Allocation Study - 04-12-2022 - NED 03 SEC
CH230D.P's Overlaps (In= 8.26 km, Out= 4.97 km)

CH230D.P CH 230 D
Lat= 43 17 36.40, Lng= 87 59 22.80
0.25 kW 63.9 m HAAT, 298.6 m COR
Prot.= 60 dBu, Intef.= 54 dBu

W229CQ CH 229 D DA BLFT20160720ABZ
Lat= 43 02 20.10, Lng= 87 55 04.30
0.25 kW 0 m HAAT, 379 m COR
Prot.= 60 dBu, Intef.= 54 dBu

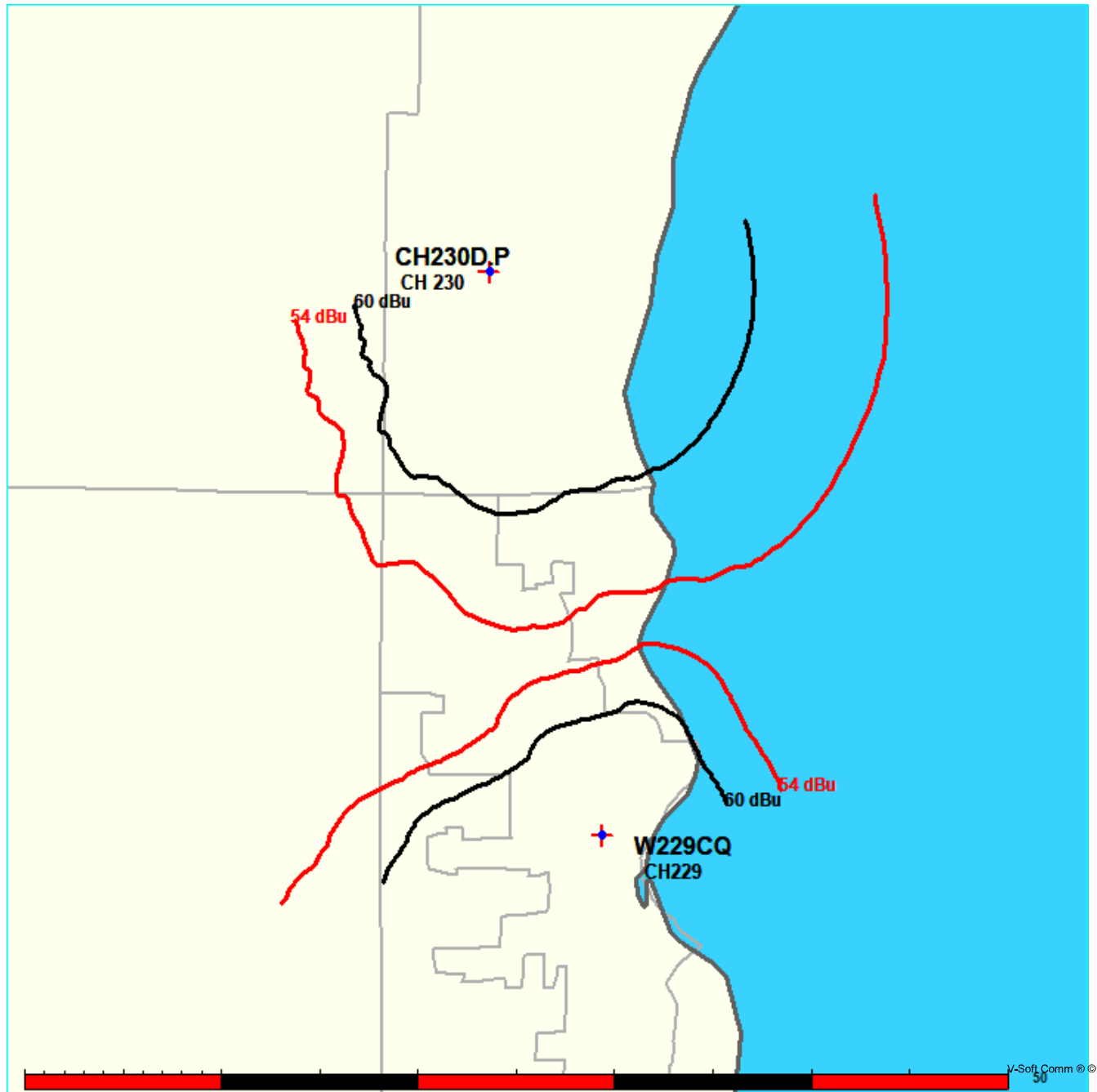


Exhibit 8

47 C.F.R. Section 74.1204(d) Second / Third Adjacent Given Interference Waiver Request

The applicant would like to note the existence of a 47 C.F.R. Section 74.1204(d) Second/Third Adjacent Channel Given Interference Waiver Request toward WKTl(FM) - Milwaukee, WI (CH233B) and WLDB(FM) - Milwaukee, WI (CH227B) as included in **Exhibit 8**. Protection of the worst case calculated 116.4 dBμ F(50:10) Interference Contour, corresponding to the worst case calculated 76.4 dBμ F(50:50) Protected Contour, has been demonstrated through a downward radiation study. Full protection will be afforded all concerns as this area will not reach the ground nor a five meter artificial plane representing a standard two story house when taking into account the downward radiation characteristics of the antenna as supplied by the antenna manufacturer. A copy of the manufacturer's antenna specifications has been included in **Exhibit 9**.

Signal Report ✕

WKTl Signal value at Reference site = 76.4 dBu. Distance to CH230D.P interference signal contour = 168.0 m

Signal Report ✕

WLDB Signal value at Reference site = 76.5 dBu. Distance to CH230D.P interference signal contour = 166.5 m

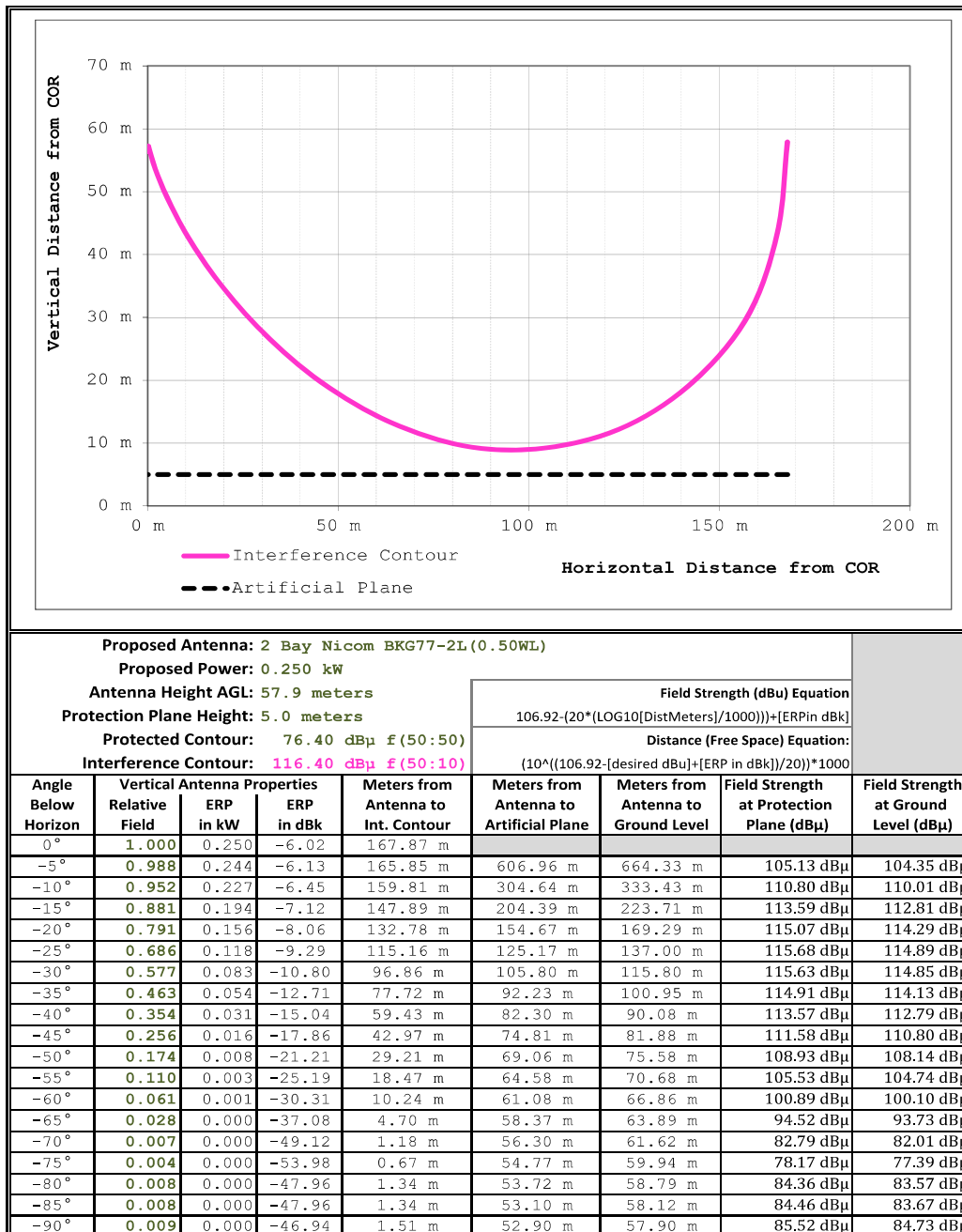


Exhibit 9

Copy of Manufacturer's Vertical Antenna Documentation

(public record copy)



Your Number 1 Source For Radio And Digital TV Gear

BKG 77

Medium Power Broadband FM Circular Polarization Antenna

TECHNICAL SPECIFICATIONS

Antenna type: circular

polarization: dipole

Front-to-back ratio: 3 dB

Frequency range: 87.5 - 108 MHz

Lightening protection: all parts grounded

Bandwidth: 20 MHz

Max wind velocity: 120 mph (190 km/h)

Impedance: 50 ohms

Wind load: 53 Lbs (24 kg)

Connectors: N type (1 kw) -7/8 type / 7/16DIN(2 kw)

Wind surface: 1.1 ft² (0.10 m²)

Power rating: 2000 Watts max

Materials (external): stainless steel

VSWR: < 1.3

Mounting: from 2" to 4"

Polarization: vertical and horizontal

Weight: 25 Lbs (11.3 kg)

Gain: -3 dBd (referred to half-wave dipole)

Dimensions: 58"x32"x32" (1450x800x800mm)

H plane: omnidirectional ± 1.5 dB (with a 4" mast)

V plane: omnidirectional ± 3 dB (with a 4" mast)

Packing: 68"x10"x10"



Optional Mini-Radome

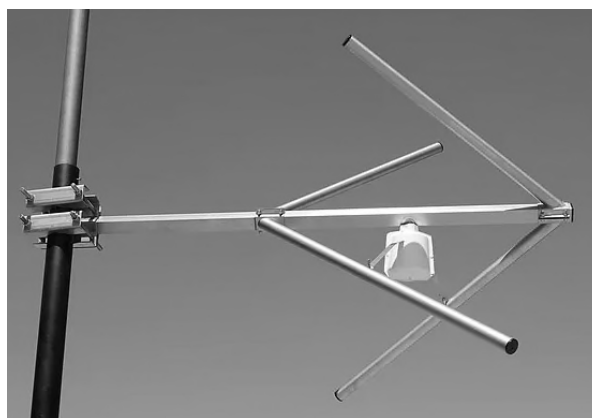


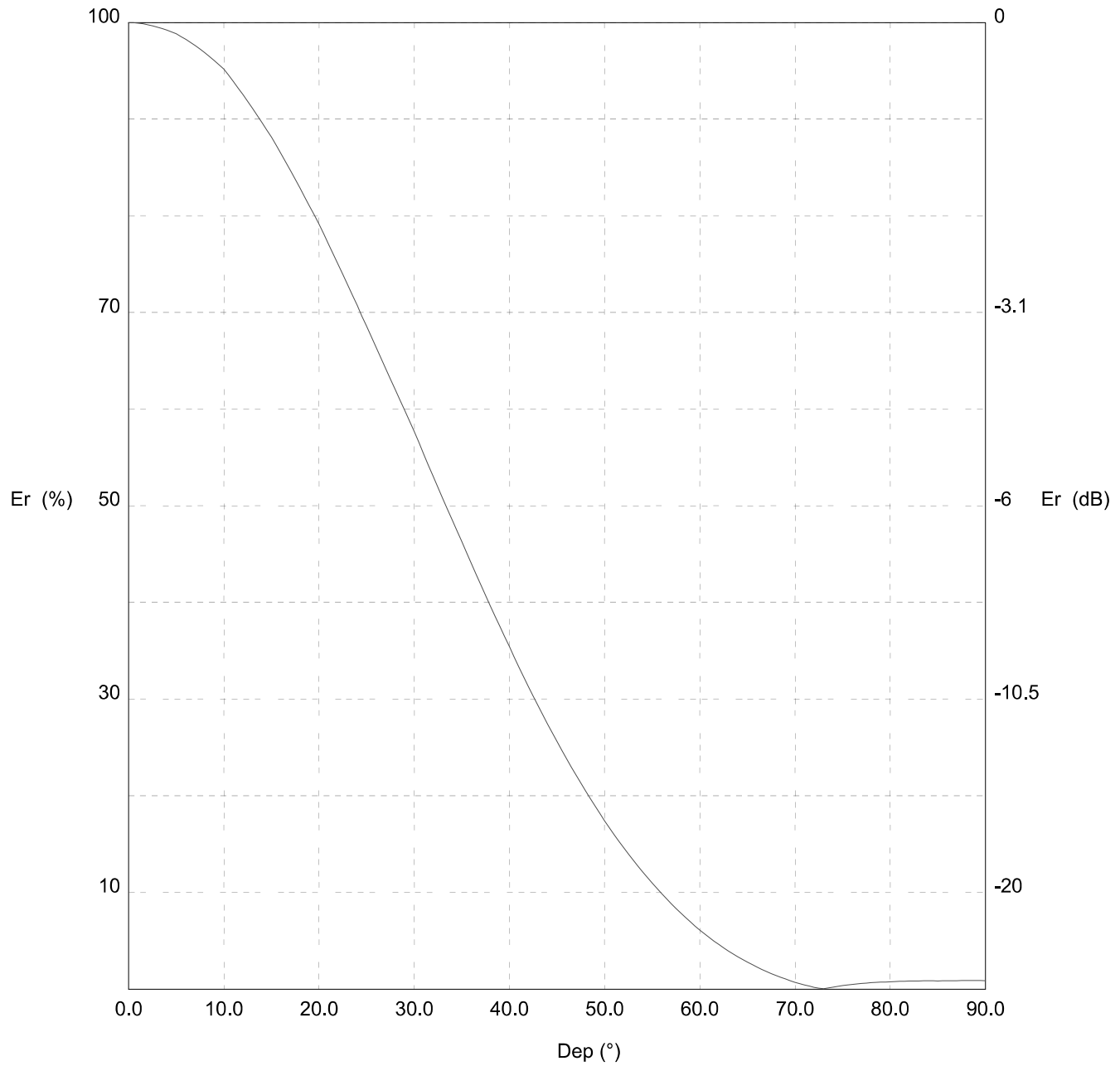
Exhibit 9
Copy of Manufacturer's Vertical Antenna Documentation
(public record copy)

TX station: BKG77-2(0.5WL)

Site name: 1/2 WAVE SEPARATION

Frequency: 198.10 MHz

Vertical diagram



— 0.0° Az. (Total antenna)

NicomUSA, Inc

Exhibit 9

Copy of Manufacturer's Vertical Antenna Documentation

(public record copy)

TX station: BKG77-2(0.5WL)

Site name: 1/2 WAVE SEPARATION

Frequency: 98.10 MHz

Vertical diagram at an azimuth of 0° degrees

Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)
0.0	100.0	914.2	30.0	57.7	304.2	60.0	6.1	3.4
0.5	100.0	913.7	30.5	56.5	292.0	60.5	5.7	3.0
1.0	99.9	912.9	31.0	55.3	280.1	61.0	5.3	2.6
1.5	99.9	911.6	31.5	54.2	268.5	61.5	5.0	2.3
2.0	99.8	910.0	32.0	53.0	257.2	62.0	4.6	1.9
2.5	99.7	908.1	32.5	51.9	246.3	62.5	4.3	1.7
3.0	99.5	905.7	33.0	50.8	235.6	63.0	3.9	1.4
3.5	99.4	903.0	33.5	49.6	225.3	63.5	3.6	1.2
4.0	99.2	899.9	34.0	48.5	215.3	64.0	3.3	1.0
4.5	99.0	896.5	34.5	47.4	205.5	64.5	3.1	0.9
5.0	98.8	892.7	35.0	46.3	196.1	65.0	2.8	0.7
5.5	98.5	887.7	35.5	45.2	186.5	65.5	2.5	0.6
6.0	98.2	882.4	36.0	44.0	177.3	66.0	2.3	0.5
6.5	97.9	876.7	36.5	42.9	168.4	66.5	2.0	0.4
7.0	97.6	870.7	37.0	41.8	159.8	67.0	1.8	0.3
7.5	97.2	864.3	37.5	40.7	151.5	67.5	1.6	0.2
8.0	96.9	857.7	38.0	39.6	143.5	68.0	1.4	0.2
8.5	96.5	850.8	38.5	38.5	135.8	68.5	1.2	0.1
9.0	96.1	843.5	39.0	37.5	128.5	69.0	1.0	0.1
9.5	95.6	836.0	39.5	36.4	121.4	69.5	0.9	0.1
10.0	95.2	828.2	40.0	35.4	114.6	70.0	0.7	0.0
10.5	94.5	817.1	40.5	34.4	107.9	70.5	0.6	0.0
11.0	93.9	805.8	41.0	33.3	101.5	71.0	0.4	0.0
11.5	93.2	794.4	41.5	32.3	95.4	71.5	0.3	0.0
12.0	92.5	782.7	42.0	31.3	89.5	72.0	0.2	0.0
12.5	91.8	770.9	42.5	30.3	84.0	72.5	0.1	0.0
13.0	91.1	759.0	43.0	29.3	78.7	73.0	0.0	0.0
13.5	90.4	746.9	43.5	28.4	73.6	73.5	0.1	0.0
14.0	89.6	734.6	44.0	27.4	68.8	74.0	0.2	0.0
14.5	88.9	722.3	44.5	26.5	64.3	74.5	0.3	0.0
15.0	88.1	709.8	45.0	25.6	59.9	75.0	0.4	0.0
15.5	87.3	696.2	45.5	24.7	55.8	75.5	0.4	0.0
16.0	86.4	682.5	46.0	23.8	51.9	76.0	0.5	0.0
16.5	85.5	668.7	46.5	23.0	48.2	76.5	0.5	0.0
17.0	84.6	655.0	47.0	22.1	44.7	77.0	0.6	0.0
17.5	83.8	641.2	47.5	21.3	41.5	77.5	0.6	0.0
18.0	82.8	627.4	48.0	20.5	38.4	78.0	0.7	0.0
18.5	81.9	613.7	48.5	19.7	35.4	78.5	0.7	0.0
19.0	81.0	599.9	49.0	18.9	32.7	79.0	0.7	0.0
19.5	80.1	586.2	49.5	18.2	30.1	79.5	0.7	0.1
20.0	79.1	572.5	50.0	17.4	27.7	80.0	0.8	0.1
20.5	78.1	557.6	50.5	16.7	25.5	80.5	0.8	0.1
21.0	77.1	542.9	51.0	16.0	23.4	81.0	0.8	0.1
21.5	76.0	528.2	51.5	15.3	21.4	81.5	0.8	0.1
22.0	75.0	513.7	52.0	14.6	19.6	82.0	0.8	0.1
22.5	73.9	499.3	52.5	14.0	17.9	82.5	0.8	0.1
23.0	72.8	485.1	53.0	13.3	16.3	83.0	0.8	0.1
23.5	71.8	471.1	53.5	12.7	14.8	83.5	0.9	0.1
24.0	70.7	457.2	54.0	12.1	13.4	84.0	0.9	0.1
24.5	69.6	443.5	54.5	11.5	12.2	84.5	0.9	0.1
25.0	68.6	429.9	55.0	11.0	11.0	85.0	0.8	0.1
25.5	67.5	416.4	55.5	10.4	9.9	85.5	0.9	0.1
26.0	66.4	403.0	56.0	9.9	8.9	86.0	0.9	0.1
26.5	65.3	389.8	56.5	9.3	8.0	86.5	0.9	0.1
27.0	64.2	376.9	57.0	8.8	7.1	87.0	0.9	0.1
27.5	63.1	364.2	57.5	8.3	6.4	87.5	0.9	0.1
28.0	62.0	351.7	58.0	7.9	5.6	88.0	0.9	0.1
28.5	60.9	339.4	58.5	7.4	5.0	88.5	0.9	0.1
29.0	59.8	327.4	59.0	7.0	4.4	89.0	0.9	0.1
29.5	58.8	315.7	59.5	6.5	3.9	89.5	0.9	0.1