June 2023
FM Translator W232DG
Frederick, MD Channel 232D
Amended Allocation Study

Purpose of Amendment

This amendment is being filed in order to make a change to the proposed ERP and directional antenna pattern orientation, following the grant of a license for FM translator W232DE at Potomac. The amended W232DG proposal provides the required contour protection to the now-licensed W232DE facility.

Allocation Study

The attached spacing study shows the spacing between the proposed translator site and the location of cochannel and adjacent channel stations and proposals. This study was made with the Commission's Class A spacing requirements, and individual situations were examined to determine the lack of prohibited contour overlap per the requirements of §74.1204 of the Rules. The attached allocation study maps demonstrate compliance with the Commission's Rules for protection of FM broadcast stations and FM translators as outlined in §74.1204.

The spacing study demonstrates compliance with §73.207 of the Commission's Rules regarding spacing restrictions to stations which are 53 or 54 channels removed from the proposed operation.

One database entry warrants additional comment:

W232CL Baltimore

W232CL was authorized subsequent to W232DG, and receives overlap from the licensed W232DG 40 dBu F(50,10) contour. As is depicted on the attached cochannel study map, the proposed W232DG facility will maintain but not increase the level of existing overlap caused to W232CL. More specifically, the existing 27.2 sq km of overlap will be reduced to 25.8 sq km.

FMSTUDY.EXE Copyright 2021, Hatfield & Dawson, LLC Version 5.10

SEARCH PARAMETERS
Channel: 232A 94.3 MHz
Latitude: 39 29 40.6 (NAD83)
Longitude: 77 29 59.5
Safety Zone: 50 km
Job Title: W232DG MODIFICATION

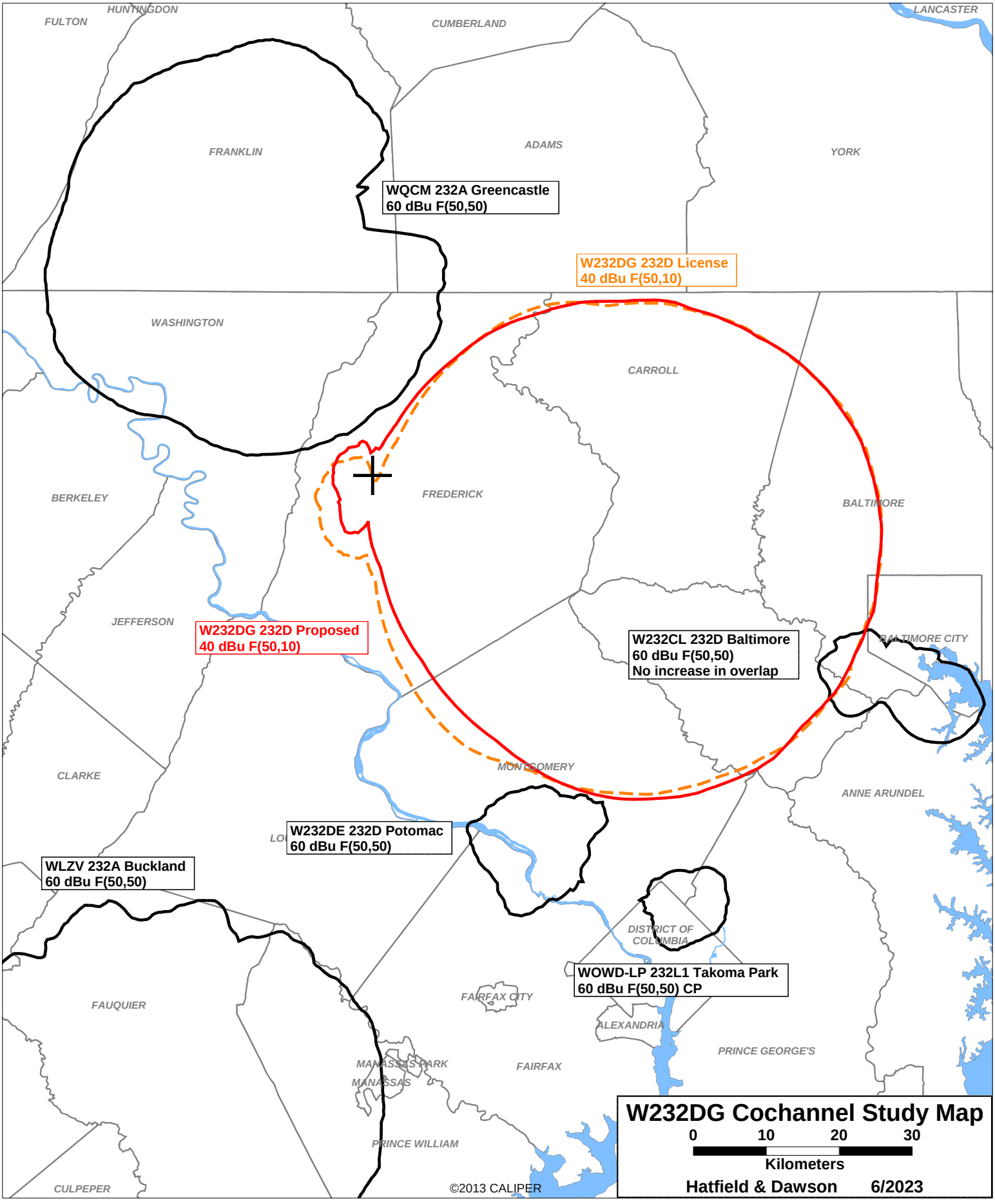
Call	City	Channel	ERP(kW)		Latitude	Bearing	Dist	Req
Status	St FCC File No.	Freq.	HAAT(m)		Longitude	deg-True	(km)	(km)
W229DK	GETTYSBURG	229D	0.250		39 50 30.3	31.4	45.24	0
LIC	PA BLFT-20190611AAX	93.7	0.0		77 13 25.9		0.00	TRANS
WRGG-LP	GREENCASTLE	229L1	0.009		39 47 29.0	335.7	36.21	29
LIC	PA 0000091844	93.7	98.0		77 40 29.0		7.21	CLOSE
W229CM	MARTINSBURG	229D	0.250	DA	39 27 48.0	265.4	41.98	0
LIC	WV BLFT-20160725ABW	93.7	0.0		77 59 10.0		0.00	TRANS
WKYS	WASHINGTON	230B	24.500		38 56 24.4	149.6	71.39	69
LIC	DC BMLH-20080505ACH	93.9	215.0		77 4 52.9		2.39	CLOSE
W230AX	SHIPPENSBURG	230D	0.145		40 4 30.3	357.3	64.52	0
LIC	PA BLFT-20100115ACS	93.9	0.0		77 32 7.9		0.00	TRANS
WQKX	SUNBURY	231B	16.000		40 47 10.3	25.2	158.91	113
LIC	PA BMLH-20050822AAE	94.1	268.0		76 41 47.9		45.91	CLEAR
WQZK-FM1	CUMBERLAND	231D	6.000	DA	39 38 4.3	278.5	110.94	0
LIC	MD BLFTB-20141209AA	94.1	0.0		78 46 41.1		0.00	BOOST
WQZK-FM	KEYSER	231B	13.000		39 25 7.3	266.6	125.43	113
LIC	WV BLH-20090617ADK	94.1	283.0		78 57 14.1	SS	12.43	CLEAR
WBXQ-FM1	ALTOONA	232D	0.004	DA	40 34 6.4	326.5	143.73	0
LIC	PA BLFTB-20190812AB	94.3	0.0		78 26 24.4		0.00	BOOST
WOWD-LP	TAKOMA PARK	232L1	0.020		38 58 28.7	143.7	71.55	67
LIC	MD BLL-20160714ABK	94.3	67.0		77 0 37.0		4.55	CLOSE
WLZV	BUCKLAND	232A	2.000		38 44 31.4	199.2	88.43	115
LIC	VA BMLED-20170519AA	94.3	175.0		77 50 5.9	SS	-26.57	SHORT

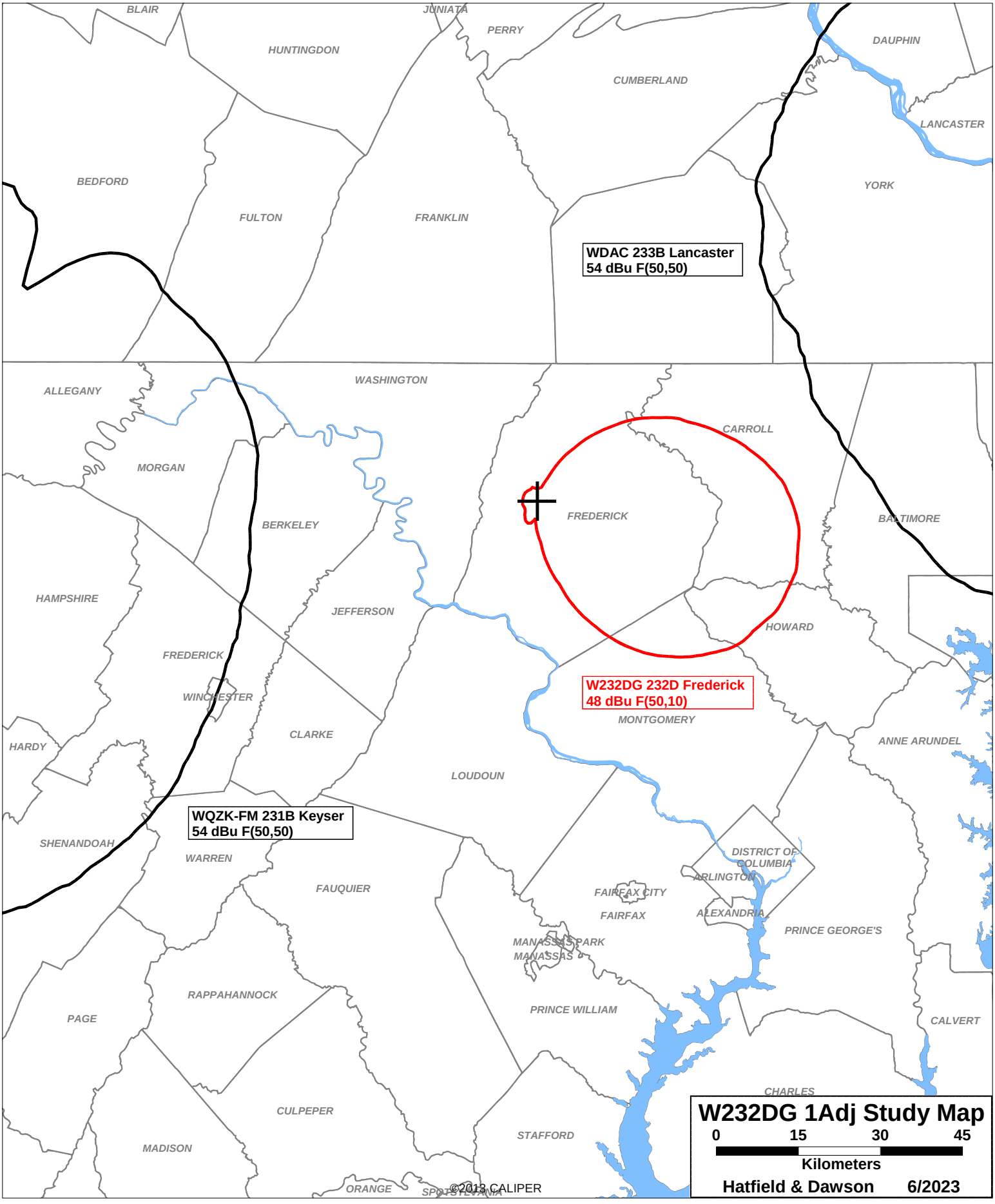
SEARCH PARAMETERS
Channel: 232A 94.3 MHz

Latitude: 39 29 40.6 (NAD83)
Longitude: 77 29 59.5
Safety Zone: 50 km
Job Title: W232DG MODIFICATION

Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)		Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
W232DG	FREDERICK		232D	0.160	DA	39 27 53.3	172.8	3.34	0
LIC	MD	BLFT-20170711AAM	94.3	0.0		77 29 41.9		0.00	TRANS
WBXQ-FM1	ALTOONA		232D	0.005	DA	40 34 6.4	326.5	143.73	0
LIC	PA	0000142436	94.3	0.0		78 26 24.4		0.00	BOOST
WQCM	GREENCASTLE		232A	3.500	DA	39 47 29.3	335.7	36.22	115
LIC	PA	BLH-19940513KB	94.3	131.0		77 40 28.9	SS	-78.78	SHORT
WBXQ	PATTON		232A	2.100		40 39 17.2	322.6	163.27	115
LIC	PA	BLH-20010711ABQ	94.3	167.0		78 40 33.0		48.27	CLEAR
WINX-FM	ST. MICHAELS		232A	4.600		38 37 49.4	127.2	157.51	115
LIC	MD	BLH-20090313ABZ	94.3	110.0		76 3 23.8		42.51	CLEAR
W232CL	BALTIMORE		232D	0.100	DA	39 15 19.0	110.3	75.88	0
LIC	MD	0000118477	94.3	0.0		76 40 29.9		0.00	TRANS
W232DE	POTOMAC		232D	0.250	DA	39 2 12.4	153.2	56.95	0
LIC	MD	BLFT-20190507ACA	94.3	0.0		77 12 7.9		0.00	TRANS
W233AA	WINCHESTER		233D	0.045	DA	39 11 40.3	240.2	66.79	0
LIC	VA	BLFT-19940426TA	94.5	0.0		78 10 17.0		0.00	TRANS
WDAC	LANCASTER		233B	19.000		39 53 46.3	67.1	116.97	113
LIC	PA	BLH-19880620KA	94.5	247.0		76 14 20.8		3.97	CLOSE
WIAD	BETHESDA		234B	20.500		38 57 49.3	149.9	68.11	69
LIC	MD	BMLH-20130308ADO	94.7	235.0		77 6 16.9		-0.89	SHORT
WRBT	HARRISBURG		235B	25.000	DA	40 18 58.3	27.0	102.63	69
LIC	PA	BMLH-20020131AAD	94.9	213.0		76 56 59.9		33.63	CLEAR

==== END OF FM SPACING STUDY FOR CHANNEL 232 ====


FULTON
HUNTINGDON
CUMBERLAND
LANCASTER
FRANKLIN
ADAMS
YORK
WQCM 232A Greencastle
60 dBu F(50,50)
W232DG 232D License
40 dBu F(50,10)
WASHINGTON
CARROLL
BERKELEY
FREDERICK
BALTIMORE
JEFFERSON
W232DG 232D Proposed
40 dBu F(50,10)
W232CL 232D Baltimore
60 dBu F(50,50)
No increase in overlap
BALTIMORE CITY
CLARKE
MONTGOMERY
ANNE ARUNDEL
W232DE 232D Potomac
60 dBu F(50,50)
WLZV 232A Buckland
60 dBu F(50,50)
DISTRICT OF COLUMBIA
WOWD-LP 232L1 Takoma Park
60 dBu F(50,50) CP
FAUQUIER
FAIRFAX CITY
ALEXANDRIA
PRINCE GEORGE'S
MANASSAS PARK
MANASSAS
FAIRFAX
PRINCE WILLIAM
CULPEPER
©2013 CALIPER
W232DG Cochannel Study Map
0 10 20 30
Kilometers
Hatfield & Dawson 6/2023


BLAIR
JUNIATA
PERRY
HUNTINGDON
CUMBERLAND
DAUPHIN
LANCASTER
BEDFORD
FULTON
FRANKLIN
YORK
WDAC 233B Lancaster
54 dBu F(50,50)
ALLEGANY
WASHINGTON
CARROLL
MORGAN
FREDERICK
BERKELEY
BALTIMORE
HAMPSHIRE
JEFFERSON
HOWARD
FREDERICK
W232DG 232D Frederick
48 dBu F(50,10)
WINCHESTER
MONTGOMERY
CLARKE
ANNE ARUNDEL
HARDY
LOUDOUN
WQZK-FM 231B Keyser
54 dBu F(50,50)
SHENANDOAH
WARREN
DISTRICT OF COLUMBIA
ARLINGTON
FAUQUIER
FAIRFAX CITY
FAIRFAX
ALEXANDRIA
PRINCE GEORGE'S
MANASSAS PARK
MANASSAS
RAPPAHANNOCK
PAGE
PRINCE WILLIAM
CALVERT
CHARLES
CULPEPER
STAFFORD
MADISON
ORANGE
SPOTSYLVANIA
©2013 CALIPER
W232DG 1Adj Study Map
0 15 30 45
Kilometers
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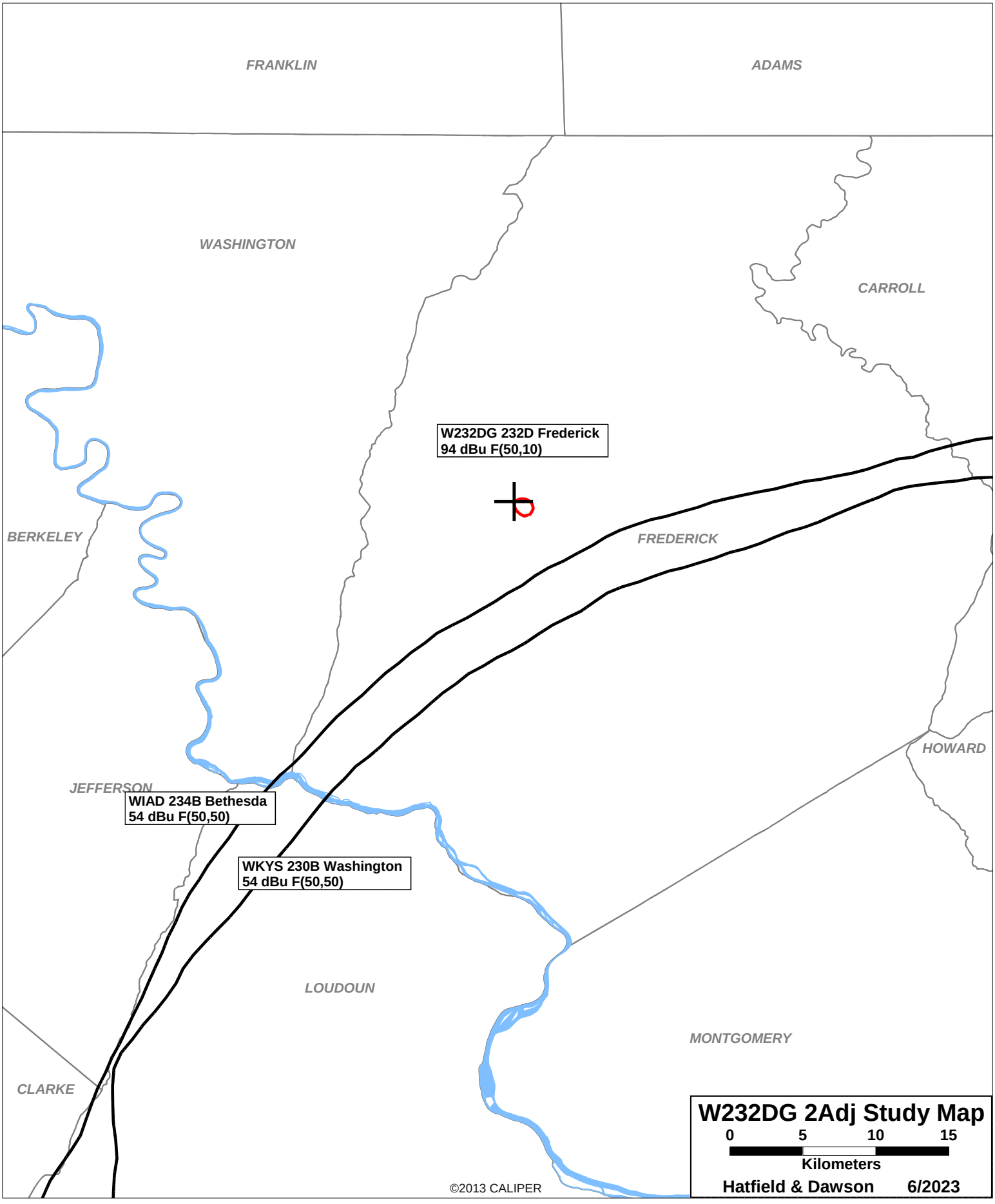
FRANKLIN
ADAMS
WASHINGTON
CARROLL
W232DG 232D Frederick
94 dBu F(50,10)
BERKELEY
FREDERICK
HOWARD
JEFFERSON
WIAD 234B Bethesda
54 dBu F(50,50)
WKYS 230B Washington
54 dBu F(50,50)
LOUDOUN
MONTGOMERY
CLARKE
W232DG 2Adj Study Map
0 5 10 15
Kilometers
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June 2023
FM Translator W232DG
Frederick, MD Channel 232D
Amended RF Exposure Study

Facilities Proposed

The proposed operation will be on Channel 232D (94.3 MHz) with a maximum lobe effective radiated power of 112 watts. Operation is proposed with an antenna array (two Scala CL-FM log periodic antennas in slant polarization and reduced-rear configuration) to be mounted on an existing tower.

The antenna support structure does not exceed 60.96 meters (200 feet) above ground and does not require notification to the Federal Aviation Administration. Therefore, this structure does not require an Antenna Structure Registration Number.

DETERMINATION Results	
Structure does not require registration. There are no airports within 8 kilometers (5 miles) of the coordinates you provided.	
Your Specifications	
NAD83 Coordinates	
Latitude	39-29-40.6 north
Longitude	077-29-59.5 west
Measurements (Meters)	
Overall Structure Height (AGL)	55
Support Structure Height (AGL)	55
Site Elevation (AMSL)	527
Structure Type	
GTOWER - Guyed Structure Used for Communication Purposes	

RF Exposure Calculations

The power density calculations shown below were made using the techniques outlined in OET Bulletin No. 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on the ground in the vicinity of the tower. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(\mu W / cm^2) = \frac{33.4 \times AdjERP(Watts)}{D^2}$$

Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

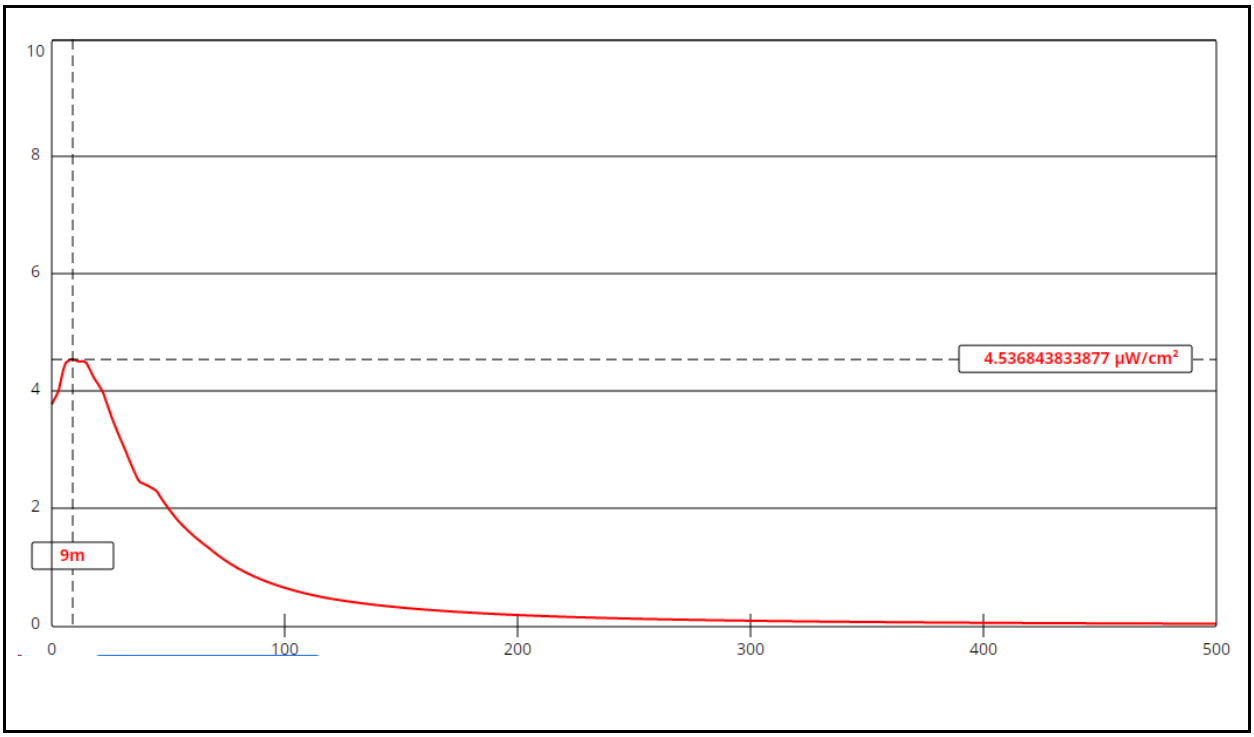
D is the distance in meters from the center of radiation to the calculation point.

Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 500 meters. Values past this point are increasingly negligible.

Calculations of the power density produced by the proposed antenna system assume a Type 1 element pattern, which is the "worst case" element pattern. Under this worst-case study, the highest calculated ground level power density occurs at a distance of 9 meters from the base of the antenna support structure. At this point the power density is calculated to be 4.5 $\mu W/cm^2$, which is 2.3% of 200 $\mu W/cm^2$ (the FCC standard for uncontrolled environments).

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation alone is less than 5% of the applicable FCC exposure limit at all locations between 1 and 500 meters from the base of the antenna support structure. Section 1.1307 of the Commission's Rules exempts applications for new facilities or modifications to existing facilities from the requirement of preparing an environmental assessment when the calculated emissions from the applicants proposed facility are predicted to be less than 5% of the applicable FCC exposure limit. Therefore, the proposed facility is in compliance with Section 1.1301 *et seq* and no further analysis of RF exposure at this site is required in this application.

The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency radiation in excess of FCC guidelines.

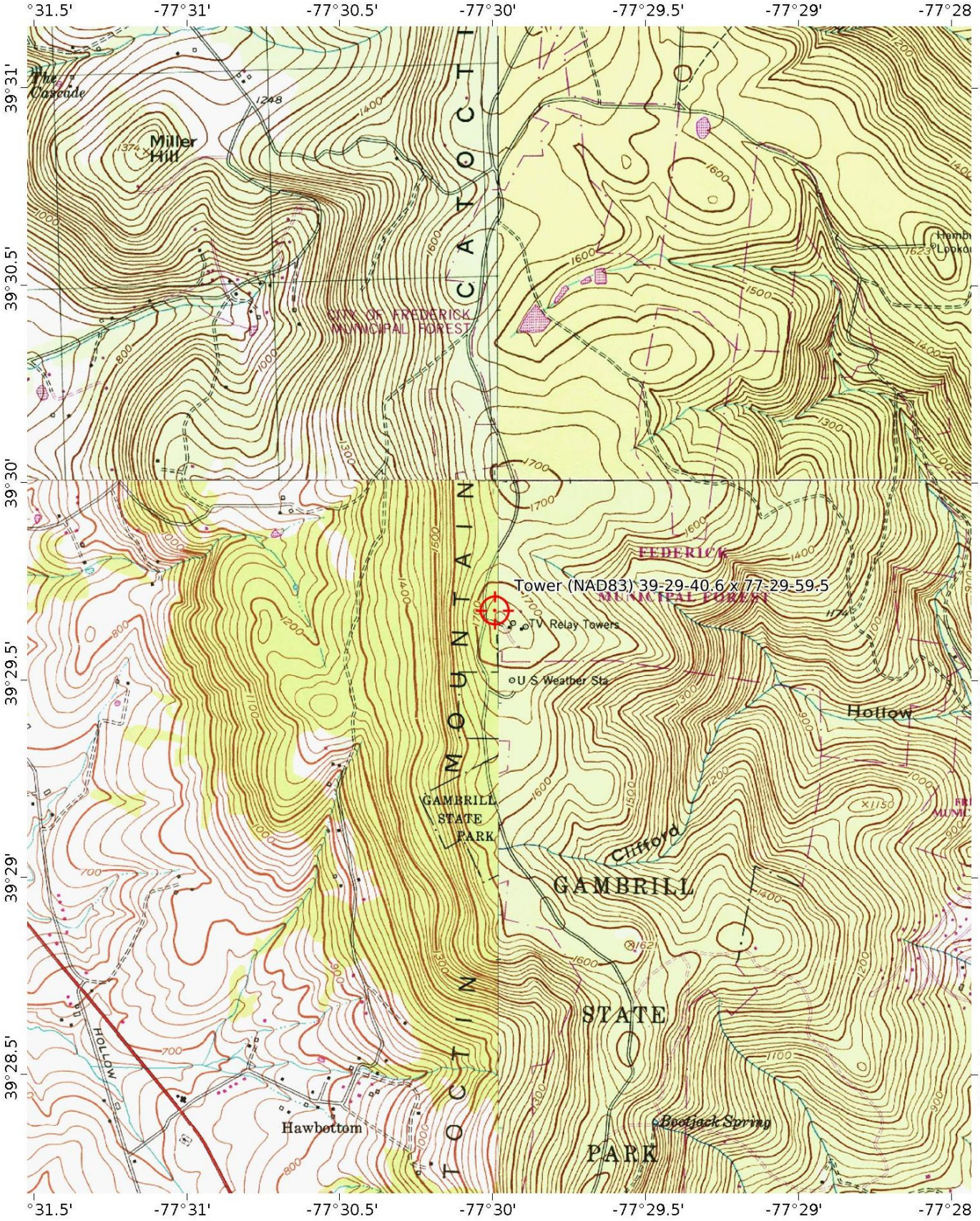


Ground-Level RF Exposure **OET FMModel**

W232DG Frederick

Antenna Type:	Type 1 assumed
No. of Elements:	1
Element Spacing:	1.0 wavelength
Distance:	500 meters
Horizontal ERP:	112 watts
Vertical ERP:	112 watts
Antenna Height:	33.5 meters AGL

Maximum Calculated Power Density is 4.5 µW/cm^2 at 9 meters from the antenna structure.



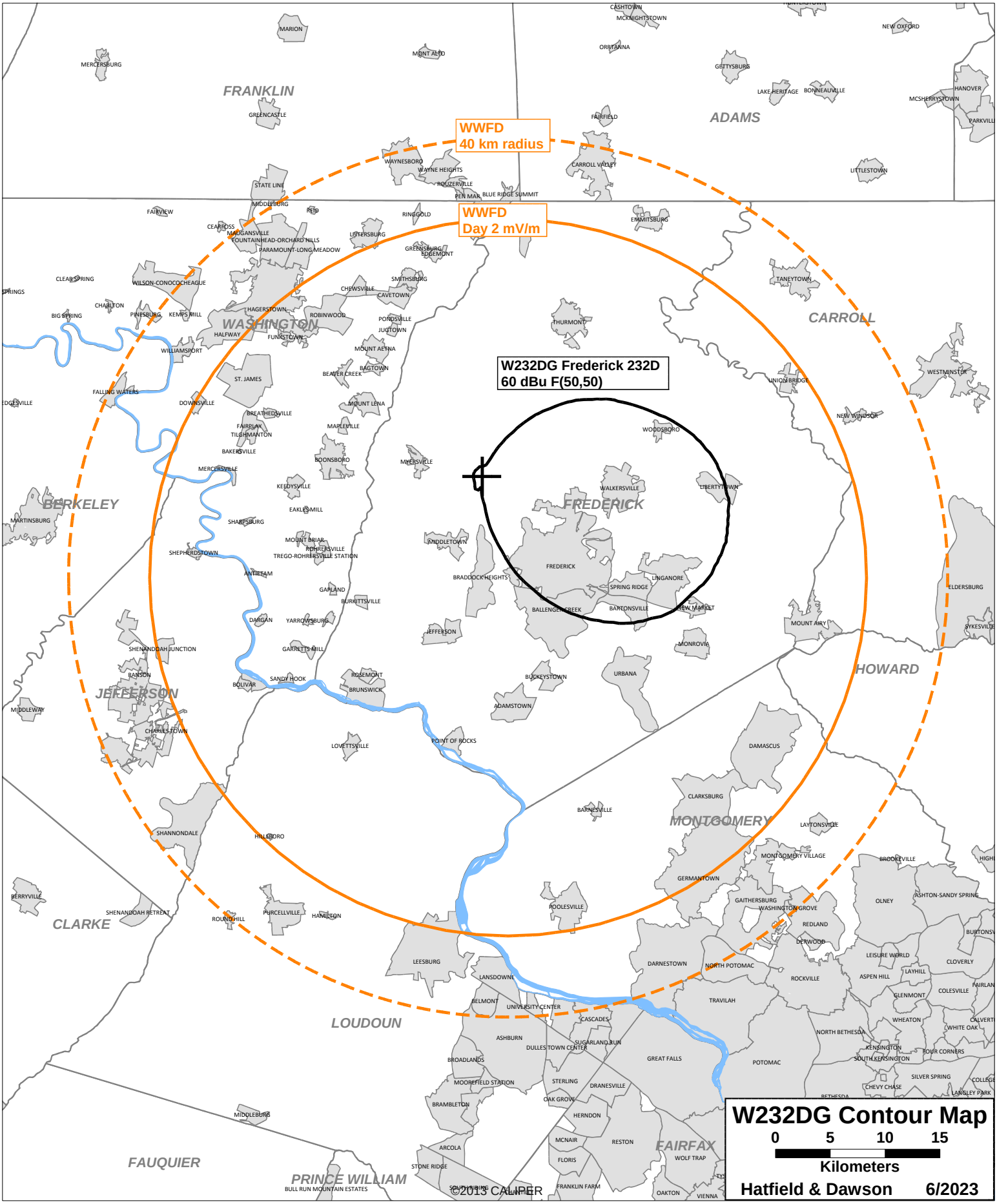
Mercator Projection
WGS84
UTM Zone 18S
CALTOPO

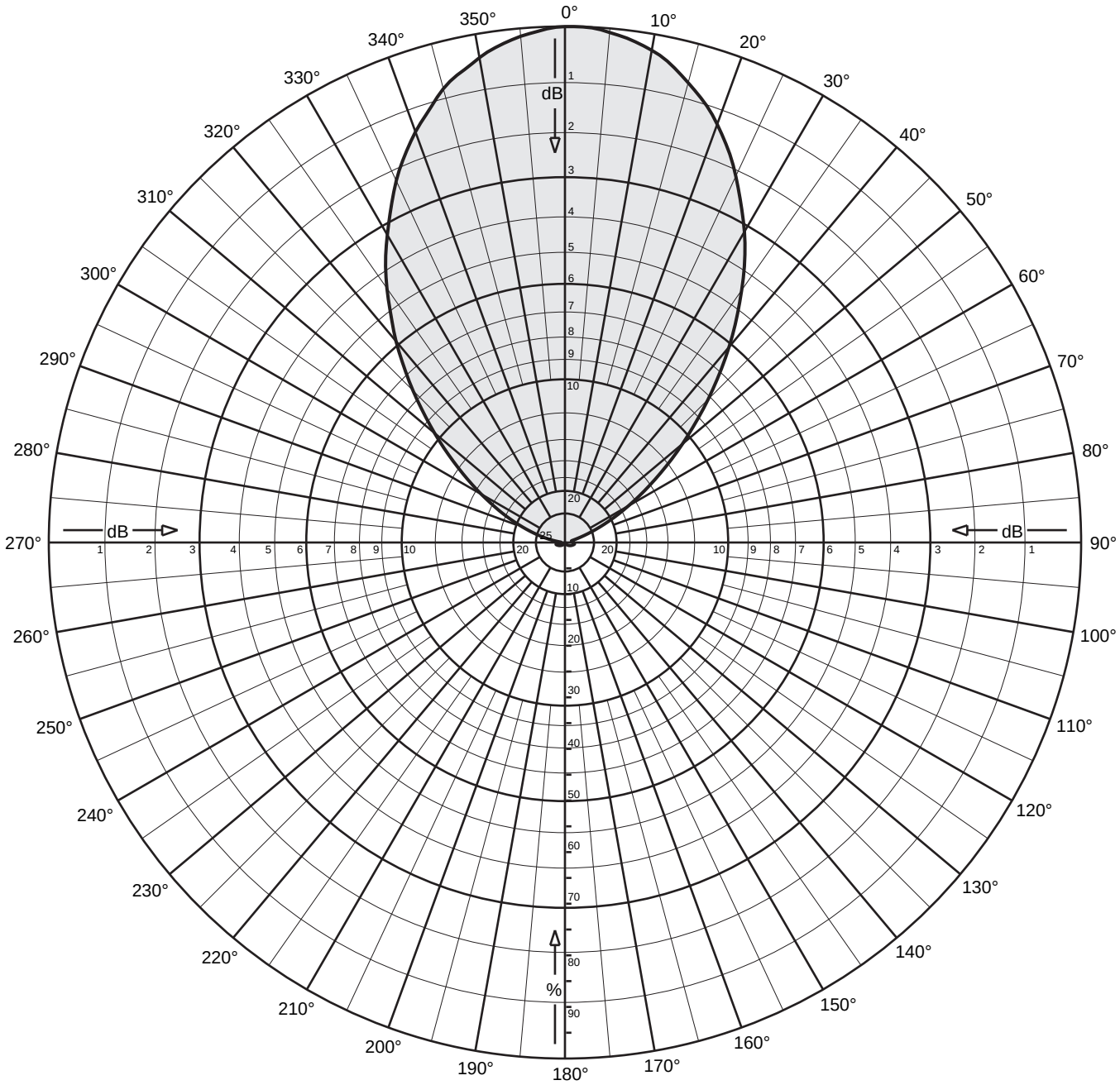
0.5 1.0 1.5 2.0 2.5 km
0.5 1.0 1.5 mi

Scale **1:24000** 1 inch = 2000 feet

MN
-10.6º

Hatfield & Dawson Consulting Engineers





2xCL-FM/SRM/SV/RR Array

Ant #1 skewed 0° w/ 50 % power , 0° phase

Ant #2 skewed 0° w/ 50 % power , 90° phase

vertically stacked .87wl CTC

Ant # Mechanically forward .25 wl

Max gain (H and V-pol Component): 6.5 dBd

Slant 45° polarization

Horizontal plane pattern

SCALA

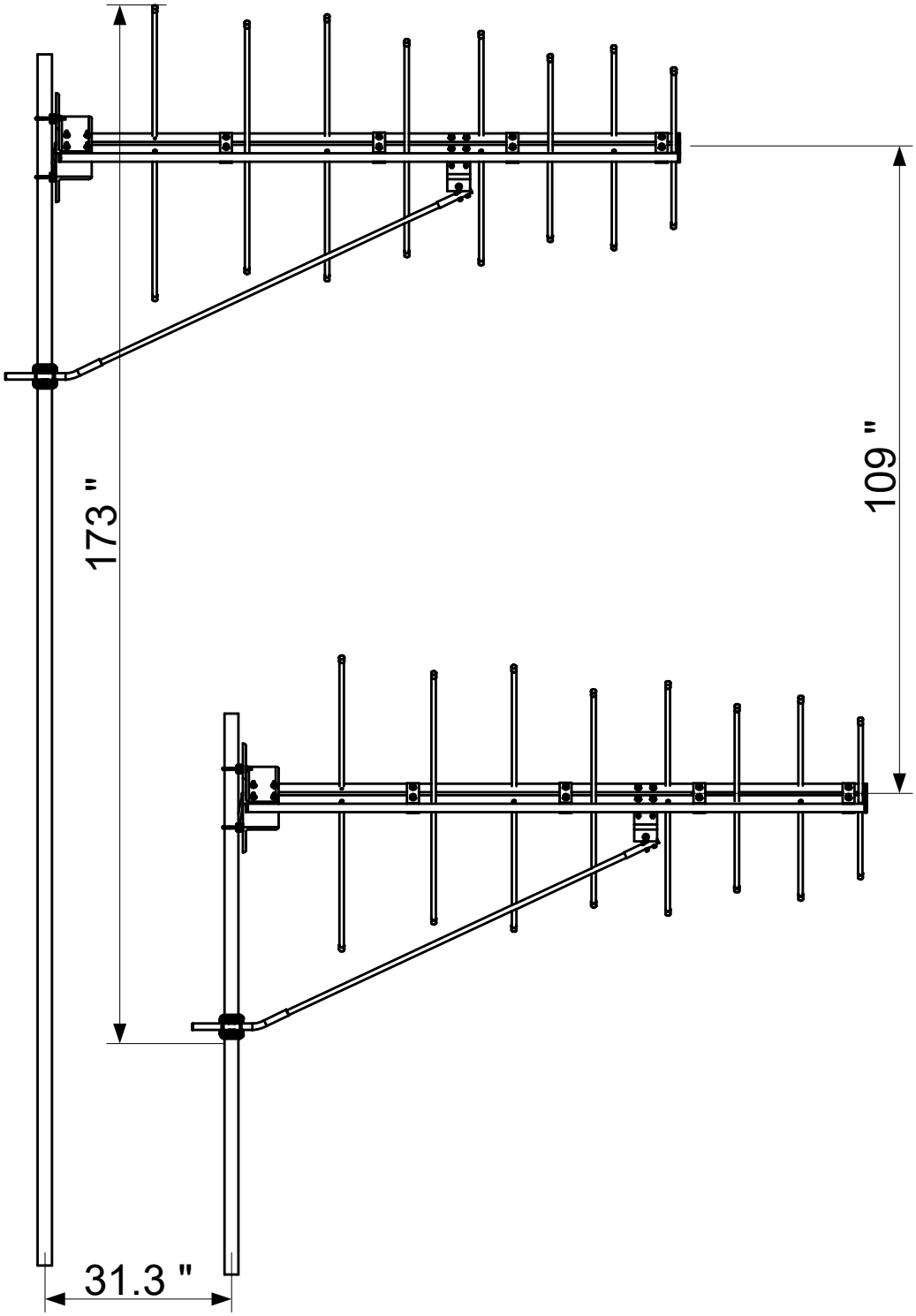
A Kathrein Broadcast Brand

Kathrein Broadcast USA 8337 11th Street White City OR 97503
Phone: 541-879-2300 Email: support-usa@kathrein-bca.com

KATHREIN Broadcast USA

CL-FM-SRM-SV-RR
Configured at 94.3MHz

SCALA
A Kathrein Broadcast Brand

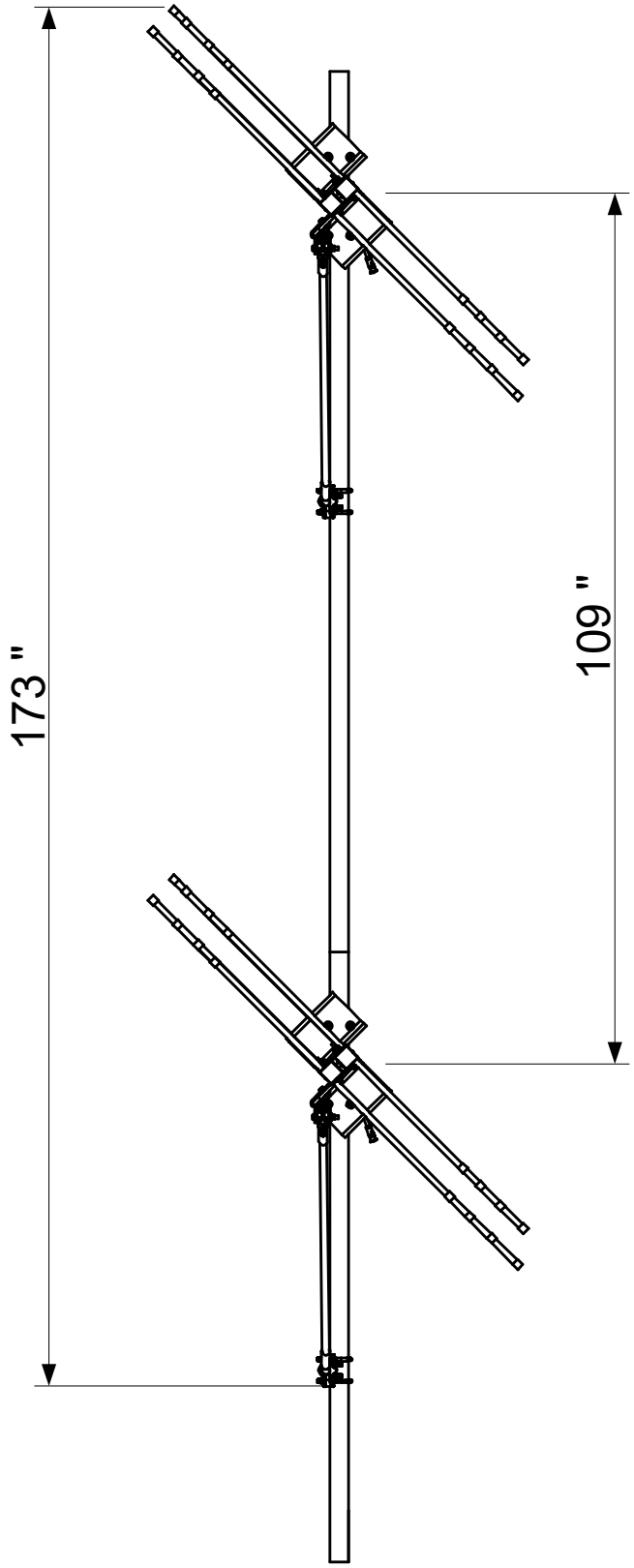


NOTES:
- Mount Power Divider to the mast in a location that best permits connection to all antennas
- Be sure that all leads are secured close to the mast and away from the antenna elements
- The lead lengths must remain as built, any change will result in improper operation.

KATHREIN Broadcast USA

CL-FM-SRM-SV-RR
Configured at 94.3MHz

SCALA
A Kathrein Broadcast Brand



NOTES:
- Mount Power Divider to the mast in a location that best permits connection to all antennas
- Be sure that all leads are secured close to the mast and away from the antenna elements
- The lead lengths must remain as built, any change will result in improper operation.