

LMS application # 129982
Amendment to Minor Modification
April 2021

Included with this amendment:

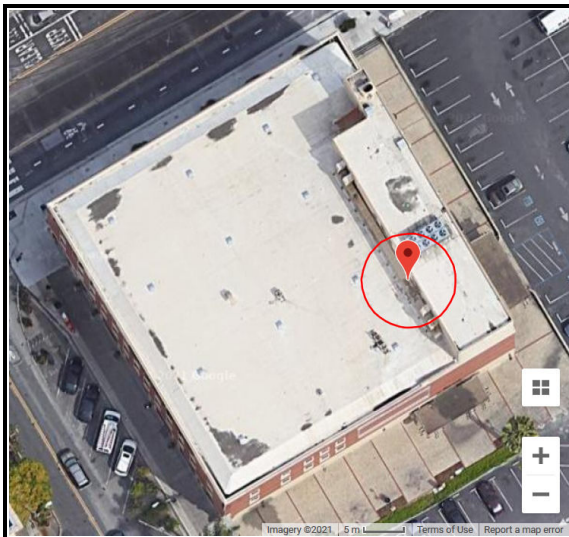
- Corrected TOWAIR exhibit to reflect overall tower height over building structure.
- Notes on short-spaced condition introduced by KREV (FM) in respect to § 73.807(a)(1).
- Updated second adjacent channel waiver exhibit with standard depression angle calculations demonstrating no interference to any population.

COORDINATES (NAD 83)	37 19 53.2 N, 121 53 11.2 W
ELEVATION	28.1 meters
BUILDING HEIGHT	24.4 meters
COR AGL	28.5 meters (4.1 m over building)
OVERALL TOWER AGL	29.4 meters (5 m over building)
CHANNEL	224 / 92.7 MHz
POWER	100 watts ERP

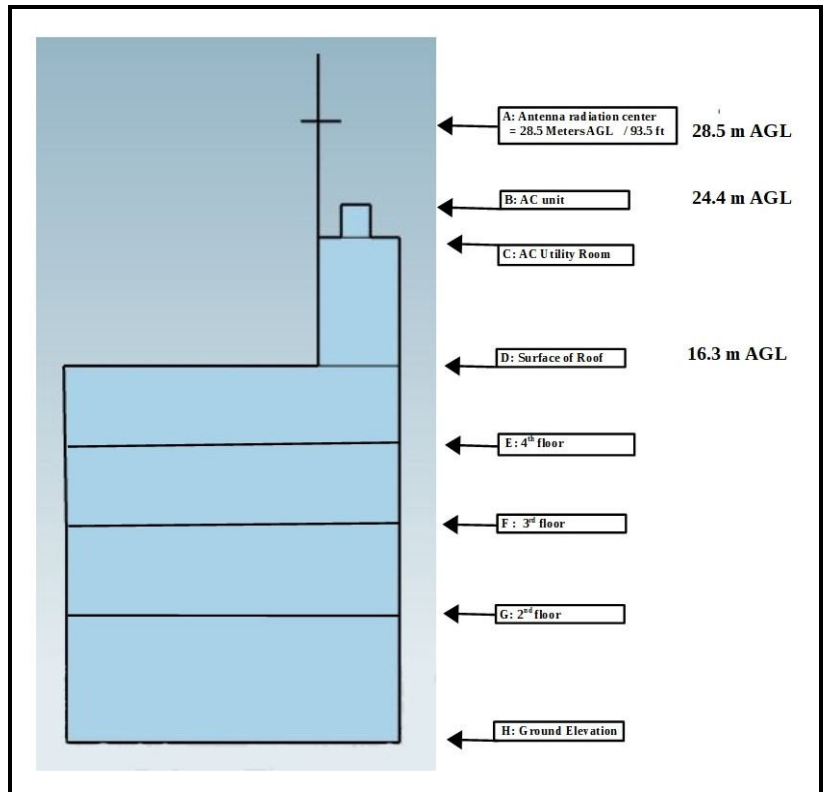
Radiation center of antenna at 4.1 m over total building height results in COR at 28.5 m AGL. Total height of the building structure at 24.4 meters above ground level includes AC unit/ elevator housing structure (8.07 m) extruding above surface of the roofline.

Antenna will be mounted on an existing pole extending 5 meters above building height, bringing the overall structure height with pole to 29.4 meters AGL.

Antenna with U/D interference radius



Antenna and building elevations



Notes on existing short-spacing to KREV

The original Form 318 application for KCXU-LP was filed on November 13, 2013. Pursuant to the Commission Rules at 47 CFR § 73.807(a)(1), the application proposal, BNPL-20131113BQF, was fully-spaced in respect to all first-adjacent and co-channel stations. Per Public Notice 13-385 released June 17, 2013 and § 73.807 of the Rules, KCXU-LP was only required to protect applications filed before June 17, 2013.

KREV appeared in the Public Notice Report No. 28117 ("Broadcast Applications") on November 18, 2013, and introduced short-spacing to the application of KCXU-LP and other pending Low Power FMs.

(see https://transition.fcc.gov/Daily_Releases/Daily_Business/2013/db1118/DOC-324189A2.txt)

KCXU-LP was granted its' first license for 50 watts ERP on April 17, 2018 (see Form 319 BLL-20180413AAT), and subsequently granted its license for 100 watts ERP on January 29, 2019 (Form 319 BLL-20181219AAC). Whereas the Commission's Rules allow for Translators and Full-Power FMs to introduce short-spacing in respect to other facilities, Low Power FMs are subject to provisions of 47 CFR § 73.809.

In the time that passed since filing its first license application over three years ago, KCXU has received no complaints of interference to any adjacent or co-channel stations. In March 2019, KCXU-LP was also visited by an FCC Field Enforcement agent inspecting the facility, equipment settings, and monitored for interference. KCXU-LP was found to be in full compliance.

KCXU-LP's current authorization (BLL-20190711AAW) is grandfathered at 61 kilometers from KREV. The new proposed location is rounded to a distance of 60 km, thereby decreasing short-spacing.

Second adjacent waiver requested pursuant to Section 73.807(e)(1) with respect to KSJO

The attached D/U Ratio Study dataset calculations exported from V-Soft Probe 4 broadcast engineering software shows the estimated signal strength for KSJO at 87.67 dBuV/m FCC (f(50,50), and at 95.79 dBuV/m using Longley Rice terrain-sensitive methodology.

The use Longley-Rice methodology previously approved for KCXU-LP applications (BMPL-20190626AAK and BLL-20181219AAC) is consistent with 47 CFR § 73.807 (e)(1) which allows for "*terrain-sensitive propagation models, that its proposed operations will not result in interference to any authorized radio service.*"

VSoft Probe 4 software employs calculations based on Tech Note 101 consistent with OET procedures for determining 70 dBu Longley-Rice contours of FM facilities.

KCXU-LP has received no complaints of second-adjacent interference at its' current location. The station was also inspected and monitored by FCC Field Enforcement on March 29, 2019, and found to be in compliance.

Calculations for the new site show as posing even less interference than KCXU-LP's current LIC authorization.

With an additional 40 dBu, KSJO is protected to 128 dBuV/m with FCC (f)50,50 calculations, and at 135.79 dBuV/m by Longley Rice, calculations. By either methodology, whether FCC contour or Longley-Rice, a worst-case interference radius extends toward the horizon not more than 29 meters.

Radiation center of antenna extends 4.1 m over total building height, resulting in COR at 28.5 m AGL. An HVAC machine room / elevator housing structure (8.07 m) also extrudes above surface of the roofline, bringing the total height of the building structure to 24.4 m AGL.

Using a single-bay Shively 6812 antenna, depression angles fall quickly below the horizon. Per the attached elevation field pattern from the manufacturer, worst-case radius of interference extends no more than 5.76 meters below the radiation center per the Longley-Rice calculations. No population will receive interference under the desired/undesired ratio method.

Channel Study

REFERENCE
37 19 53.41 N.
121 53 07.36 W.

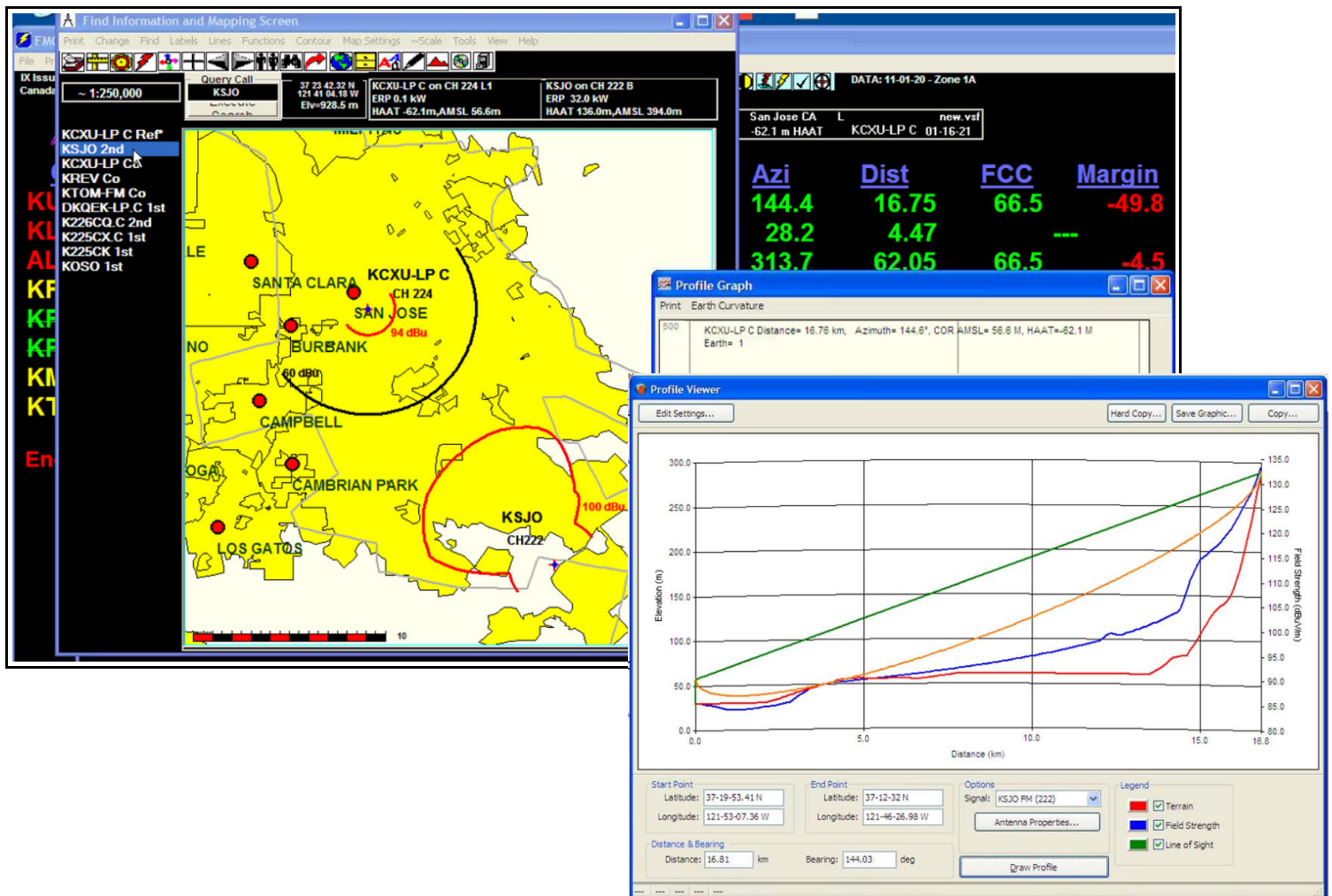
CLASS = L1
Current Spacings to 2nd Adj.
Channel 224 - 92.7 MHz

DISPLAY DATES
DATA 04-16-21
SEARCH 04-22-21

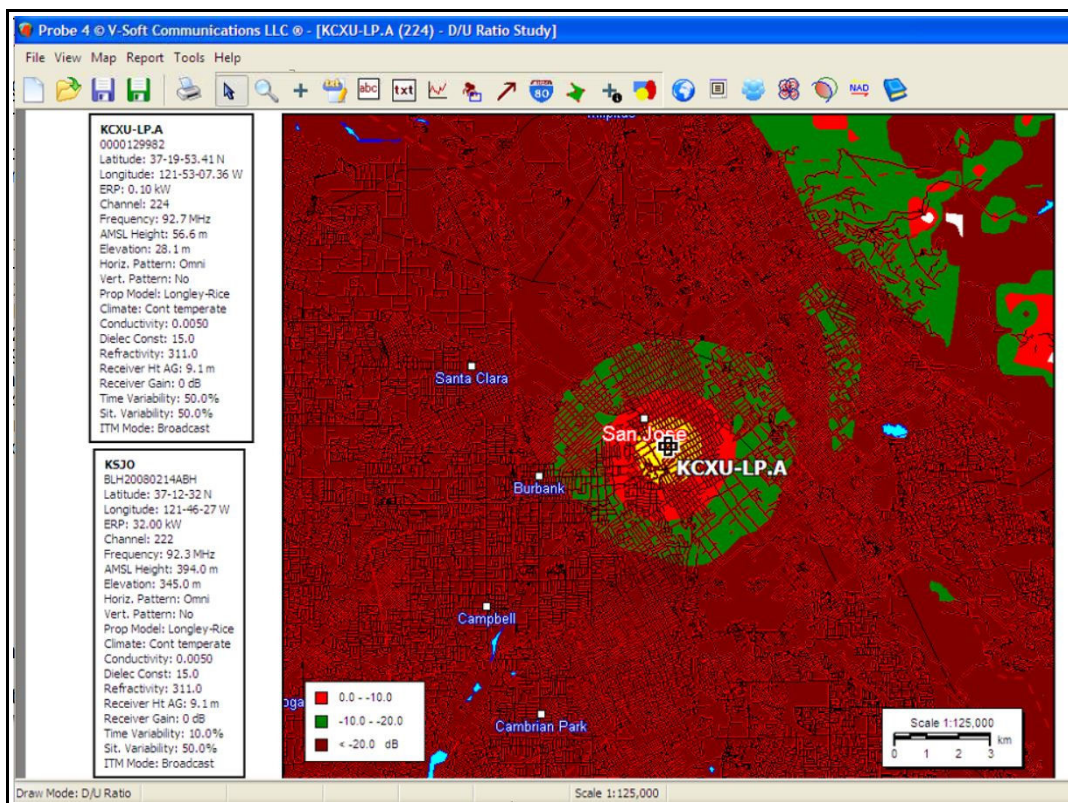
Call	Channel	Location	Azi	Dist	FCC	Margin
KSJO	LIC 222B	San Jose	CA 144.4	16.75	66.5	-49.8
KCXU-LP	LIC 224L1	San Jose	CA 28.2	4.47	23.5	-19.0
KREV	LIC-Z 224A	Alameda	CA 313.7	62.05	66.5	-4.5
KREV	APP-Z 224A	Alameda	CA 313.7	62.05	66.5	-4.5
KTOM-FM	LIC 224B1	Marina	CA 174.3	86.87	86.5	0.37
DKQEK-LP	CP 225L1	Cupertino	CA 252.4	17.05	13.5	3.6
K226CQ	CP -D 226D	Gilmore	CA 162.3	31.89	20.5	11.4
K225CX	CP -D 225D	Palo Alto	CA 307.7	27.89	14.5	13.4
K225CK	LIC-D 225D	Union City	CA 342.4	29.51	14.5	15.0
KOSO	LIC 225A	Patterson	CA 67.3	80.39	55.5	24.9

All separation margins include rounding

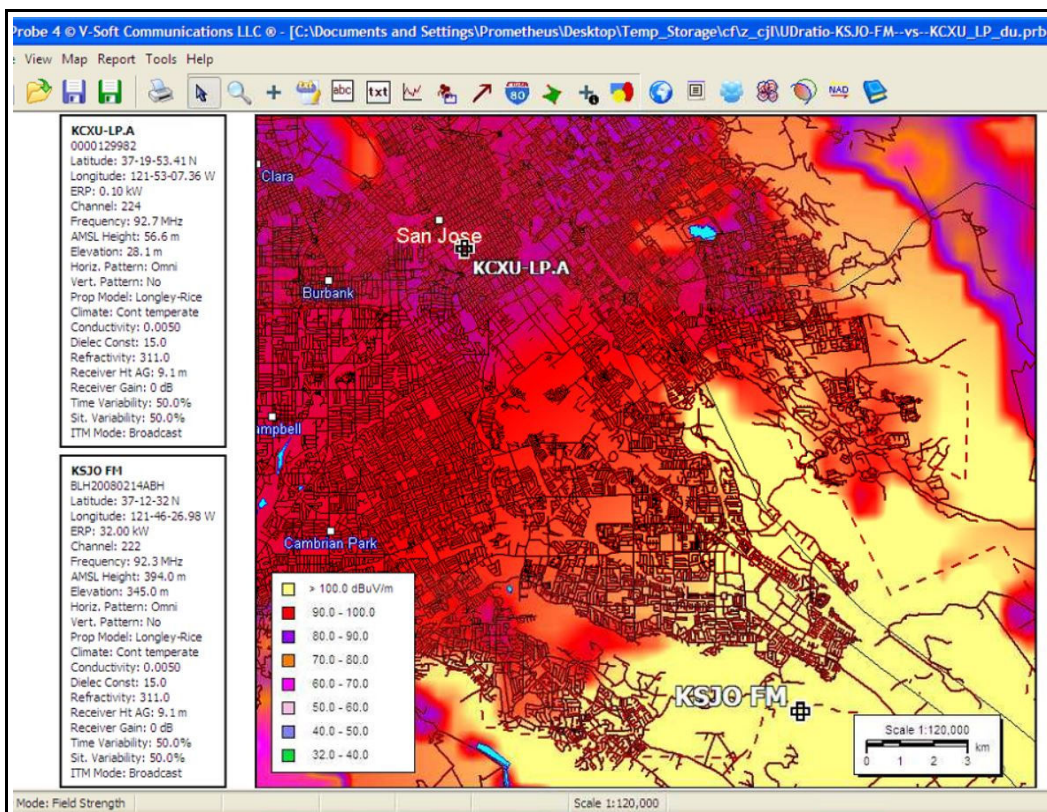
Elevation Profile KSJO (FM) vs KCXU-LP



D/U Ratio Study KSJO (FM) at KCXU-LP



Longley Rice Signal Coverage: KSJO (FM)



Calculations for Engineering Studies
Export from V-Soft Probe 4 software

KSJO D/U ratio study at reference point

FCC (f) 50,50 calculations

Study Information:

D/U Ratio Study

Signal Resolution: 0.5 km

Study Date: 4/21/2021

Land Cover was not considered in this study.

Primary Terrain: V-Soft 30 Second US Database

Secondary Terrain: V-Soft 3 Second Alaska Terrain

Coordinate System: NAD27

Transmitters:

Transmitter Information:

Call Letters: KSJO

File Number: BLH20080214ABH

Latitude: 37-12-32 N

Longitude: 121-46-27 W

ERP: 32.00 kW

Channel: 222

Frequency: 92.3 MHz

AMSL Height: 394.0 m

Elevation: 345.0 m

Horiz. Antenna Pattern: Omni

Vert. Elevation Pattern: No

Propagation Model: FCC Model

Location Variability: 50.0%

Time Variability: 10.0%

HAAT Method: FCC

Transmitter Information:

Call Letters: KCXU-LP.A

File Number: 0000129982

Latitude: 37-19-53.41 N

Longitude: 121-53-07.36 W

ERP: 0.10 kW

Channel: 224
Frequency: 92.7 MHz
AMSL Height: 56.6 m
Elevation: 28.1 m
Horiz. Antenna Pattern: Omni
Vert. Elevation Pattern: No
Propagation Model: FCC Model
Location Variability: 50.0%
Time Variability: 50.0%
HAAT Method: FCC

Point Information Report

Latitude: 37-19-53.41 N
Longitude: 121-53-07.36 W

Signal Strength: 87.671 dBuV/m
Elevation: 30.0 m

Distance From Transmitter: 16.807 km
Azimuth From Transmitter: 324.1 degrees

Call Letters: KSJO
File Number: BLH20080214ABH
Latitude: 37-12-32 N
Longitude: 121-46-27 W
ERP: 32.00 kW
Channel: 222
Frequency: 92.3 MHz
AMSL Height: 394.0 m
Elevation: 345.0 m
Horiz. Antenna Pattern: Omni
Vert. Elevation Pattern: No

KSJO D/U ratio study at reference point

Longley-Rice calculations

Point Information Report

Latitude: 37-19-53.41 N

Longitude: 121-53-07.36 W

Signal Strength: 95.792 dBuV/m

Elevation: 30.0 m

Distance From Transmitter: 16.807 km

Azimuth From Transmitter: 324.1 degrees

Call Letters: KSJO

File Number: BLH20080214ABH

Latitude: 37-12-32 N

Longitude: 121-46-27 W

ERP: 32.00 kW

Channel: 222

Frequency: 92.3 MHz

AMSL Height: 394.0 m

Elevation: 345.0 m

Horiz. Antenna Pattern: Omni

Vert. Elevation Pattern: No

Study Information:

D/U Ratio Study

Signal Resolution: 0.5 km

Study Date: 4/21/2021

Land Cover was not considered in this study.

Primary Terrain: V-Soft 30 Second US Database

Secondary Terrain: V-Soft 3 Second Alaska Terrain

Coordinate System: NAD27

Transmitters:

Transmitter Information:

Transmitter Information:

Call Letters: KSJO

File Number: BLH20080214ABH

Latitude: 37-12-32 N

Longitude: 121-46-27 W

ERP: 32.00 kW

Channel: 222

Frequency: 92.3 MHz

AMSL Height: 394.0 m

Elevation: 345.0 m

Horiz. Antenna Pattern: Omni

Vert. Elevation Pattern: No

Propagation Model: Longley-Rice

Climate: Continental temperate

Conductivity: 0.0050

Dielectric Constant: 15.0

Refractivity: 311.0

Receiver Height AG: 9.1 m

Receiver Gain: 0 dB

Time Variability: 10.0%

Situation Variability: 50.0%

ITM Mode: Broadcast

Transmitter Information:

Call Letters: KCXU-LP.A

File Number: 0000129982

Latitude: 37-19-53.41 N

Longitude: 121-53-07.36 W

ERP: 0.10 kW

Channel: 224

Frequency: 92.7 MHz

AMSL Height: 56.6 m

Elevation: 28.1 m

Horiz. Antenna Pattern: Omni

Vert. Elevation Pattern: No

Propagation Model: Longley-Rice

Climate: Continental temperate

Conductivity: 0.0050

Dielectric Constant: 15.0

Refractivity: 311.0

Receiver Height AG: 9.1 m

Receiver Gain: 0 dB

Time Variability: 50.0%

Situation Variability: 50.0%

ITM Mode: Broadcast

Depression angle calculations

Shively 6812 – 1 Bay

Power – 100 w

Height –28.5 m

Interfering Contour – 135.79 dBu

depression angle below horizon	relative field	db from relative	ERP	angular distance to contour	vertical distance	horizontal distance	clearance above ground
0	1.000	0.00	100.00	11.369	0.000	11.369	28.500
5	0.996	-0.03	99.20	11.323	0.987	11.280	27.513
10	0.985	-0.13	97.02	11.198	1.945	11.028	26.555
15	0.967	-0.29	93.51	10.994	2.845	10.619	25.655
20	0.942	-0.52	88.74	10.709	3.663	10.064	24.837
25	0.910	-0.82	82.81	10.346	4.372	9.376	24.128
30	0.871	-1.20	75.86	9.902	4.951	8.576	23.549
35	0.826	-1.66	68.23	9.391	5.386	7.692	23.114
40	0.774	-2.23	59.91	8.800	5.656	6.741	22.844
45	0.717	-2.89	51.41	8.151	5.764	5.764	22.736
50	0.654	-3.69	42.77	7.435	5.696	4.779	22.804
55	0.586	-4.64	34.34	6.662	5.457	3.821	23.043
60	0.514	-5.78	26.42	5.844	5.061	2.922	23.439
65	0.437	-7.19	19.10	4.968	4.503	2.100	23.997
70	0.357	-8.95	12.74	4.059	3.814	1.388	24.686
75	0.273	-11.28	7.45	3.104	2.998	0.803	25.502
80	0.186	-14.61	3.46	2.115	2.082	0.367	26.418
85	0.096	-20.35	0.92	1.091	1.087	0.095	27.413
90	0.001	-60.00	0.00	0.011	0.011	0.000	28.489

TOWAIR Determination Results

HELP

 [New Search](#)

 [Printable Page](#)

*** NOTICE ***

TOWAIR's findings are not definitive or binding, and we cannot guarantee that the data in TOWAIR are fully current and accurate. In some instances, TOWAIR may yield results that differ from application of the criteria set out in 47 C.F.R. Section 17.7 and 14 C.F.R. Section 77.13. A positive finding by TOWAIR recommending notification should be given considerable weight. On the other hand, a finding by TOWAIR recommending either for or against notification is not conclusive. It is the responsibility of each ASR participant to exercise due diligence to determine if it must coordinate its structure with the FAA. TOWAIR is only one tool designed to assist ASR participants in exercising this due diligence, and further investigation may be necessary to determine if FAA coordination is appropriate.

DETERMINATION Results	
Structure does not require registration. The structure meets the 6.10-meter (20-foot) Rule criteria.	
Your Specifications	
NAD83 Coordinates	
Latitude	37-19-53.2 north
Longitude	121-53-11.2 west
Measurements (Meters)	
Overall Structure Height (AGL)	24.4
Support Structure Height (AGL)	24.4
Site Elevation (AMSL)	28.1
Structure Type	
BPOLE - Building with Pole	

Antenna Height Above Average Terrain Calculations -- Results

Input Data

Latitude **37° 19' 53.4"** North

Longitude **121° 53' 7.4"** West (NAD 27)

These coordinates convert to NAD 83 coordinates of
37° 19' 53.19", North, 121° 53' 11.24" West (NAD 83).

Height of antenna radiation center above mean sea level: **56.6** meters AMSL

Number of Evenly Spaced Radials = **8** 0° is referenced to True North

Results

Calculated HAAT = **-51 meters**

Antenna Height Above Average Terrain calculated
using 1 km [GLOBE terrain data](#)

Individual "Radial HAAT" Values, in meters

0°	19.1 m
45°	-238.0 m
90°	-169.0 m
135°	4.8 m
180°	-48.4 m
225°	-37.1 m
270°	7.0 m
315°	52.0 m

[Print Results?](#)

[New Calculation?](#)

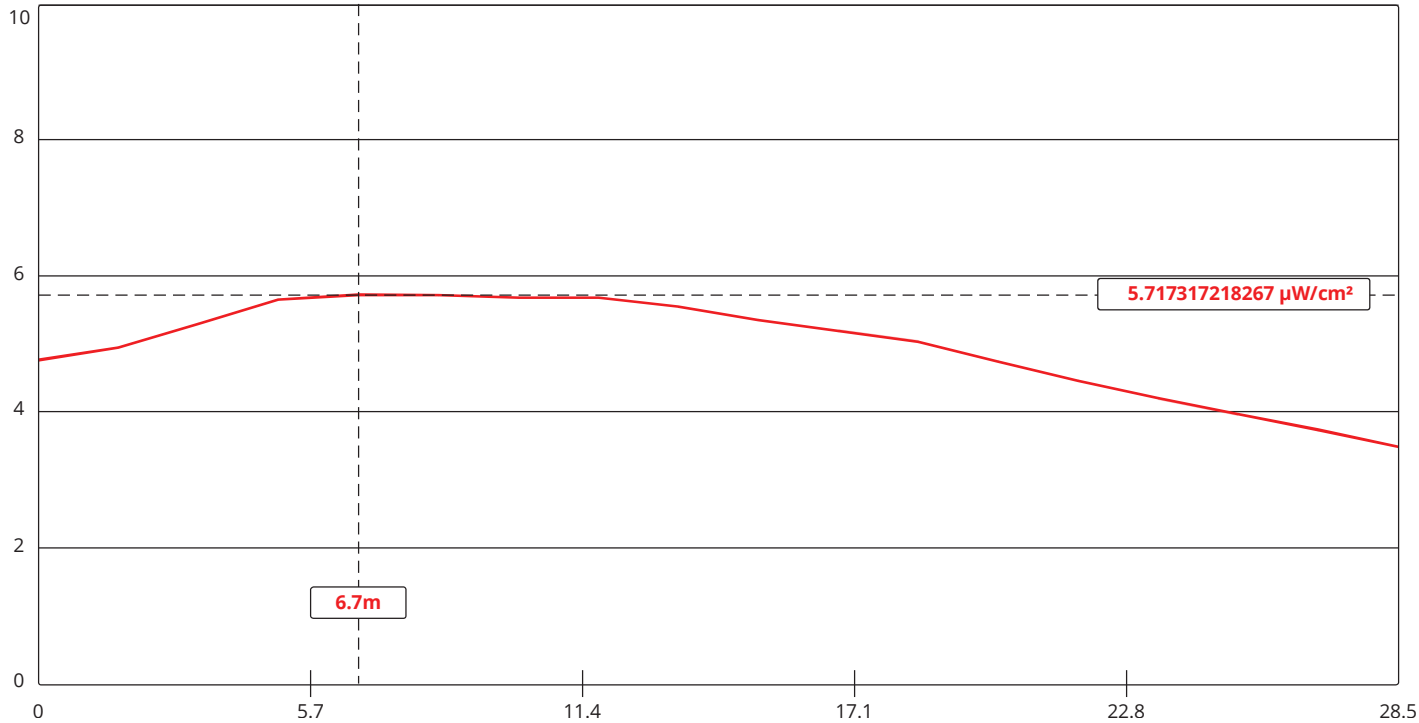


FM Model

The FM Model calculator determines the potential exposure from radiofrequency (RF) electromagnetic fields produced by FM broadcast station antennas at ground level. The FM Model software was originally developed by the FCC in 1997 as a standalone executable program and this improved version provides more precise predictions and runs via a JavaScript enabled web browser. The FM Model is originally based on measured data [published in 1985 by the EPA \(http://nepis.epa.gov/Exe/ZyNET.exe/2000ED2W.TXT?ZyActionD=ZyDocument&Client=EPA&Index=1981+Thru+1985&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A\zyfiles\Index%20Data\81thru85\Txt\00000003\2000ED2W.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h|-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=p|f&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL\)](http://nepis.epa.gov/Exe/ZyNET.exe/2000ED2W.TXT?ZyActionD=ZyDocument&Client=EPA&Index=1981+Thru+1985&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A\zyfiles\Index%20Data\81thru85\Txt\00000003\2000ED2W.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h|-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=p|f&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL).

This version uses the actual distance to each antenna element, rather than the distance to the antenna’s radiation center, improving separation distance precision. While most predictions using this updated FM Model will be similar to the previous version, this correction could result in significant differences from the previous model at short separation distances from the bottom element of an antenna array where accurate exposure estimation is most critical. Appendix A of the [FM Model Public Notice \(https://www.fcc.gov/document/oet-announces-updates-fmmodel-software\)](https://www.fcc.gov/document/oet-announces-updates-fmmodel-software) contains a brief description of these changes.

Under *Antenna Type* in the user interface below is a collapsible list of associated antenna models cross-referenced with the five EPA element types, initially in Appendix B of the [FM Model Public Notice \(https://www.fcc.gov/document/oet-announces-updates-fmmodel-software\)](https://www.fcc.gov/document/oet-announces-updates-fmmodel-software), including any subsequent changes we received. Element designs that are not in this list because they were not specifically evaluated by EPA, e.g., panel antennas, vertical dipoles, etc., should be treated as Type 1. We continue to invite suggested changes and corrections to this list. Inclusion of antenna models on this list does not constitute an endorsement of those manufacturers or their products by the FCC.



Channel Selection	Channel 224 (92.7 MHz) ▼		
Antenna Type +	EPA Type 1: Ring-and-Stub or "Other" ▼		
Height (m)	28.5	Distance (m)	28.5
ERP-H (W)	100	ERP-V (W)	100
Num of Elements	1	Element Spacing (λ)	1
Num of Points	17	Apply	

Hide Tabular Results -

Distance (m)	Power Density (μW/cm²)
0	4.8
1.7	4.9
3.4	5.3
5.0294	5.6
6.7	5.7
8.3824	5.7
10.059	5.7
11.7	5.7
13.4	5.5
15.088	5.3
16.8	5.2
18.4	5.0
20.1	4.7
21.8	4.5
23.5	4.2
25.1	4.0
26.8	3.7
28.5	3.5

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