

TECHNICAL EXHIBIT
MINOR CHANGE IN LICENSE APPLICATION
GAPE GROUP LLC
FM TRANSLATOR K281CB
LAREDO NORTH. TEXAS
FACILITY ID 147983

CH 253D 0.05 KW ND HAAT 73 M COR 227 M

MARCH 18, 2020

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Technical Narrative

The technical exhibit, of which this narrative is part, has been prepared on behalf of GAPE Group LLC, licensee of FM translator K281CB, Channel 281D, Fac. ID 147983 in Laredo North, TX. For the reasons stated below, GAPE Group LLC requests authority to change the site and channel number of K281CB.

Proposed Transmitter Location

The proposed transmitting facility would operate on channel 253 using a Micronetixx MCX-1, single bay, circularly polarized antenna, side-mounted on an existing tower. The proposed site location, 14.1 kilometers from the licensed site, is described by the following NAD83 geographic coordinates:

27° 38' 28.6" North

99° 33' 22.9" West

It is proposed to side mount the antenna at a height of 75.2 meters (247 feet) above ground on an existing tower at a site with an elevation of 151.8 meters AMSL. Thus, the antenna radiation center will be mounted at a height of 227 meters AMSL. According to the FCC HAAT calculation web utility, this corresponds to a HAAT of 73 meters. The permissible ERP of 50 Watts allowed under these conditions for FM Translators near the US-Mexican border is proposed. Appendix 1 shows the proposed Engineering Specifications for the new K281CB facility. Appendix 2 shows the FCC HAAT calculation results.

Tower Registration

The FAA is not being notified of the proposed construction, as it is proposed to side-mount the FM antenna on an existing 79.9 meter registered tower, ASR 1050000.

Environmental Considerations

The proposal is excluded from environmental processing, as an existing supporting structure is to be employed and the proposal complies with the FCC Rules concerning human exposure to radio frequency (RF) energy. * The proposal would not exceed 0.2 % of the RF exposure limit for general population/uncontrolled environments for the frequency proposed. The calculation of RF energy at 2-m above ground was made under the procedures of OET Bulletin No. 65.† The formula employed is as follows:

$$S = \frac{(33.4)F^2P}{R^2}$$

where, S = power density in $\mu\text{W}/\text{cm}^2$,

F = relative field factor at the angle to the calculation point,

P = the total effective radiated power relative to a dipole in watts, and

R = distance from the antenna radiation center to the calculation point in meters.

Based on the vertical radiation pattern of the proposed antenna, (shown in Appendix 3), a relative field factor of 0.88 or less for any depression angle equal or greater than 30 degrees below horizon, a total effective radiated power of 100 watts (circular polarization) and an antenna radiation center height above ground of 75.2 m, the calculated power density will not exceed $0.5 \mu\text{W}/\text{cm}^2$. Therefore, the calculated RF exposure at 2 m above ground will not exceed 0.2 % of the limit of $200 \mu\text{W}/\text{cm}^2$ for the general population and uncontrolled environments.

The antenna system shall be restricted from access and appropriate warning signs posted. In the event that personnel are required to climb the structure, the proposed FM translator transmissions shall be reduced or terminated as necessary to prevent RF exposure above the FCC recommended limits.

* Given that the proposed ERP will not exceed 100 watts, the proposal is categorically excluded from environmental processing pursuant to Section 1.1307 of the FCC Rules.

† Federal Communications Commission OET Bulletin No. 65, Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields (Edition 97-01, August 1997).

AM Stations Within 3.2 km

There are no AM stations located within 3.2 km of these coordinates and no modification of the existing tower is proposed, thus no adverse effect is predicted to any AM station and the proposal is compliant with Section 47 CFR 73.1692.

Allocation Considerations

Figure 1 summarizes the allocation study for the currently licensed channel 281 from the existing site. As shown in Figure 1, while the spacing requirements are met, station K281CB is predicted to be exposed to interference from co-channel station KSAH-FM, the entire 60 dBu of K281CB being covered by the interfering contours of KSAH-FM. Reception tests on channel 281 within the predicted 60 dBu coverage area of K281CB have shown occasional interference from KSAH-FM depending on propagation conditions, and a very strong and stable signal on 104.1 MHz when K281CB is off the air.

Section 73.207(c) specifies a minimum distance of 22 kilometers for Class A FM facilities on 98.5 MHz to a Channel 6 facility. There is no Channel 6 facility within 22 kilometers of the proposed site of K281CB.

Figure 2 summarizes the allocation study for the proposed facility on channel 253. As indicated in Figure 2, there is a second-adjacent full-service facility, but no co-channel station or 1st adjacent channel to be considered. Thus, K281CB is not predicted to be exposed to interference from a co-channel station, as it is now the case. It is a well-known that modern radio receivers are much less susceptible to 2nd adjacent channel interference. Reception tests on channel 253 within the proposed 60 dBu coverage area of the proposed facility show substantially less potential interference, just static noise. Thus, a frequency change to channel 253 for K281CB is respectfully requested under the provisions of Section 74.1233(a)(A)(2), which justify remedial frequency changes to any same-band channel upon a showing of reduced interference. Figure 3 shows that, as required by FCC Rules, there will be overlap of the licensed and proposed 60 dBu contours of K281CB. Figure 3A shows that the proposed 60 dBu contour of K281CB is well within the licensed 60 dBu contour of KBNL, for which K281CB is a fill-in translator.

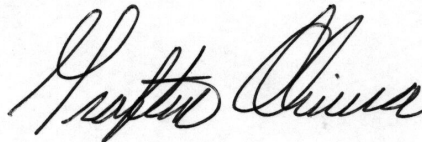
The proposed FX station will operate on Channel 253, second adjacent channel to KRRG, Channel 251C1. Thus, the protection requirement of the undesired signal from the proposal is 40 dB higher than the desired signal of this station. The proposed transmitter site is located 13.8 kilometers, at a bearing of 346 degrees true from station KRRG which operates with an ERP of 100 kW and a HAAT of 213 meters. The predicted KRRG F(50,50) field

strength at the proposed site is 92 dBu. Using the U/D ratio of 40 dB, the proposed F(50,10) interfering signal is 132 dBu; this contour thus defines the maximum extent of predicted interference.

Since an ERP of 50 watts is proposed, the 132 dBu signal contour is calculated by means of a free-space calculation. Based on free-space calculations, the minimum height above ground level that the 132 dBu contour would reach is 226 feet at a horizontal distance of 25 feet from the transmitting antenna. This is graphically depicted in Figure 5. There are no high-rise structure near the proposed site, thus the interfering contour will not cause any interference to KRRG as a result of the proposed K281CB facility. Figure 4 is a table and Figure 5 a graphic representation of the computed distances to the predicted 132 dBu contour.

The predicted contours were calculated in accordance with Section 73.313 of the FCC Rules, using the V-Soft FMCommander@2019 software in conjunction with the FCC NGDC 30-second terrain database; contour calculation were made using an evenly spaced set of 12 radials. The antenna height elevation above average terrain of the proposed RC height was used in conjunction with the propagation prediction curves of Section 73.333 to determine the distances to contours.

For the reasons above stated, it is believed that the proposed facility is in compliance with applicable FCC Rules and Regulations.



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March 18, 2020

FIGURE 1

W281CB – LICENSED ALLOCATION STUDY:

FCC NGDC 30 Sec								DATA: 01-13-20 West Zone	
N. Lat. 27 43 28.00		268 m COR		Contours are detailed		Laredo North TX X		k281cb lic jan 14,	
W. Lng. 99 26 57.10		0.04 kW		CH 281, 104.1 D		82.3 m HAAT		K281CB 01-14-20	
Call	Type	Ch	Location		Azi	Dist	In	Out	
KSAH-FM	LIC	281C1	Pearsall	TX	31.1	129.66	-49.3*	34.2	
K281CB	LIC	281D	Laredo North	TX	0.0	0.00	---		
AL0486	VAC	279A	Nuevo Laredo	TA	191.3	25.79	15.7	1.4	
AL5509	VAC	283A	Nuevo Laredo	TA	191.3	25.79	15.7	1.4	
KSAH-FM1	LIC-D	281D	Pearsall	TX	30.0	153.31	8.5	71.8	
AL7659		282C1	Villa Union	CI	294.0	139.16	23.5	57.1	
AU9814137	USE	282A	Hebbronville	TX	118.0	79.17	33.2	43.7	

End of Screen List, Cardinal Radials = 12

CONTOURS OVERLAP WITH KSAH-FM: PREDICTED INTERFERENCE:

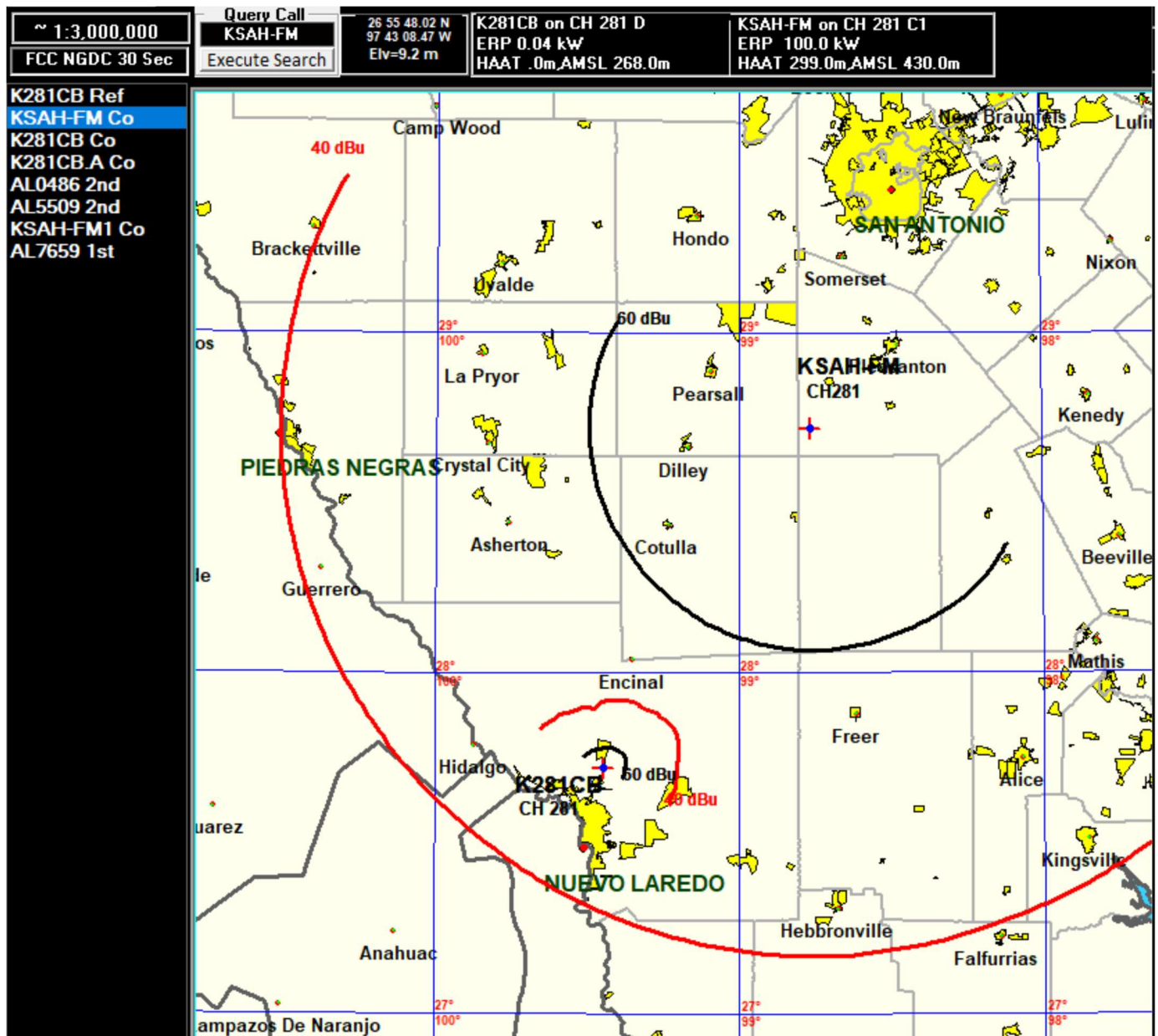


FIGURE 2a

W281CB – PROPOSED CH 253 FACILITY ALLOCATION STUDY:



CONTOURS OVERLAP WITH KRRG: PREDICTED INTERFERENCE:

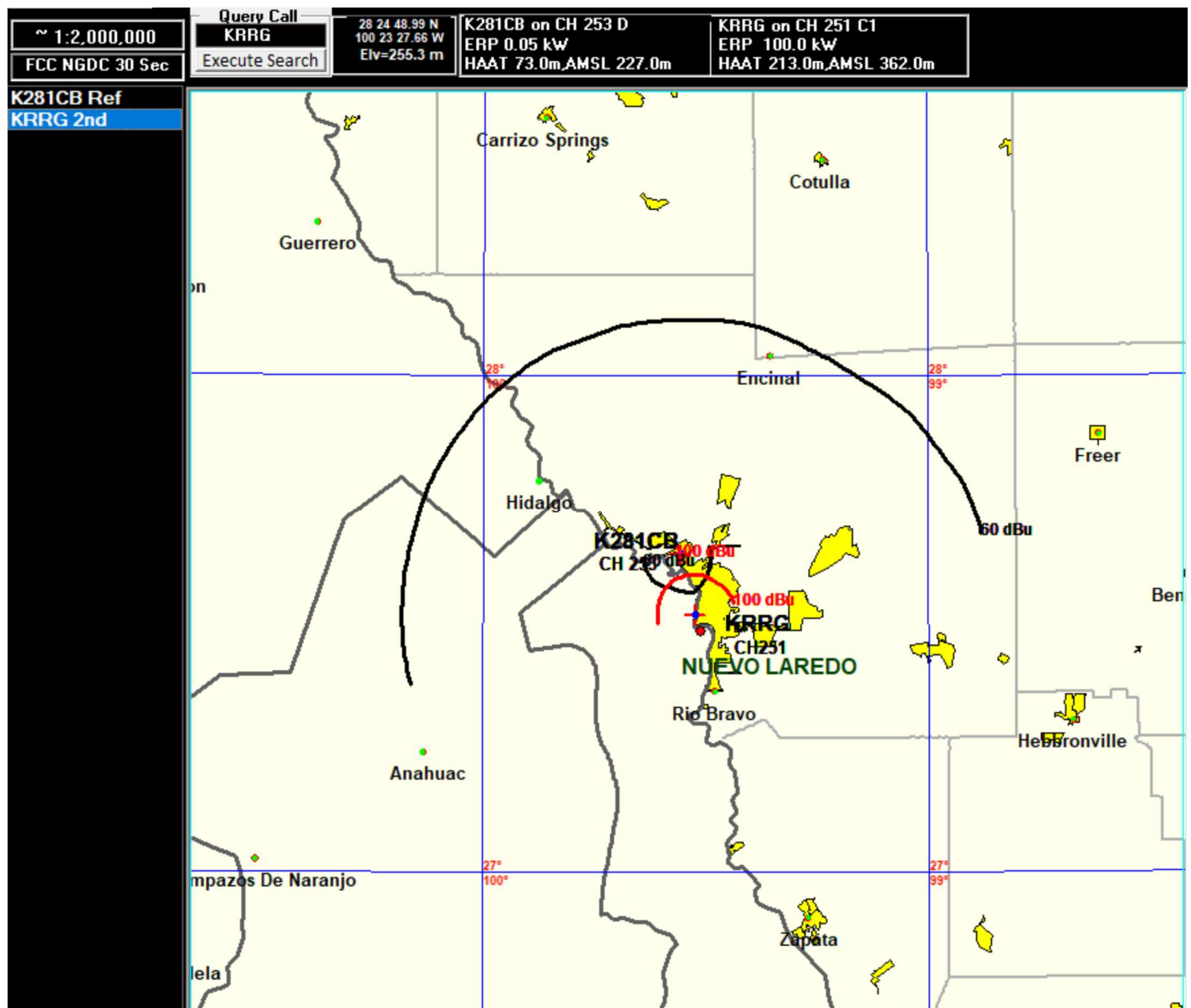


FIGURE 2b

W281CB – PROPOSED CH 253 FACILITY ALLOCATION STUDY:



CONTOURS OVERLAP WITH KRRG: PREDICTED INTERFERENCE (Zoom-In):

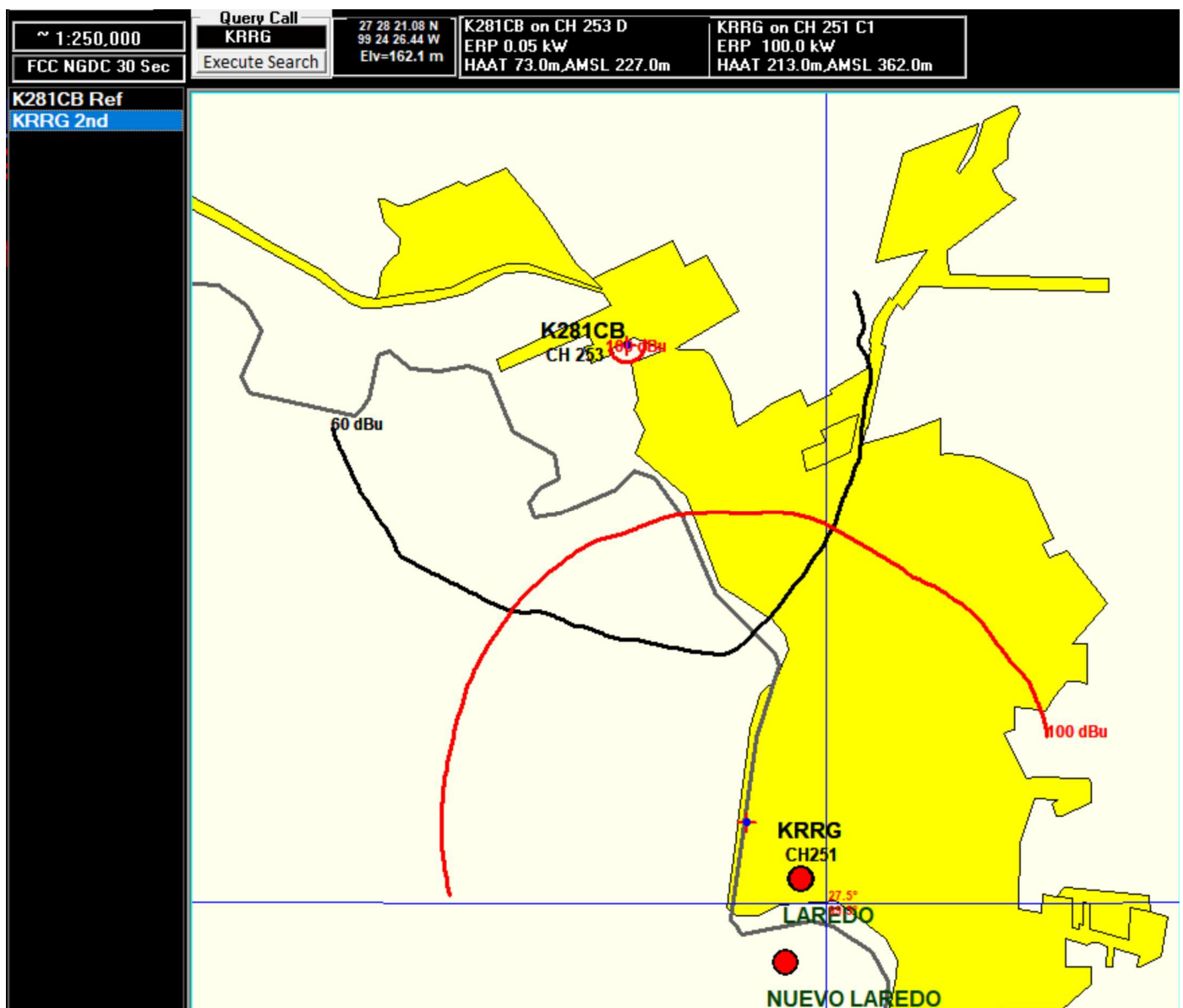
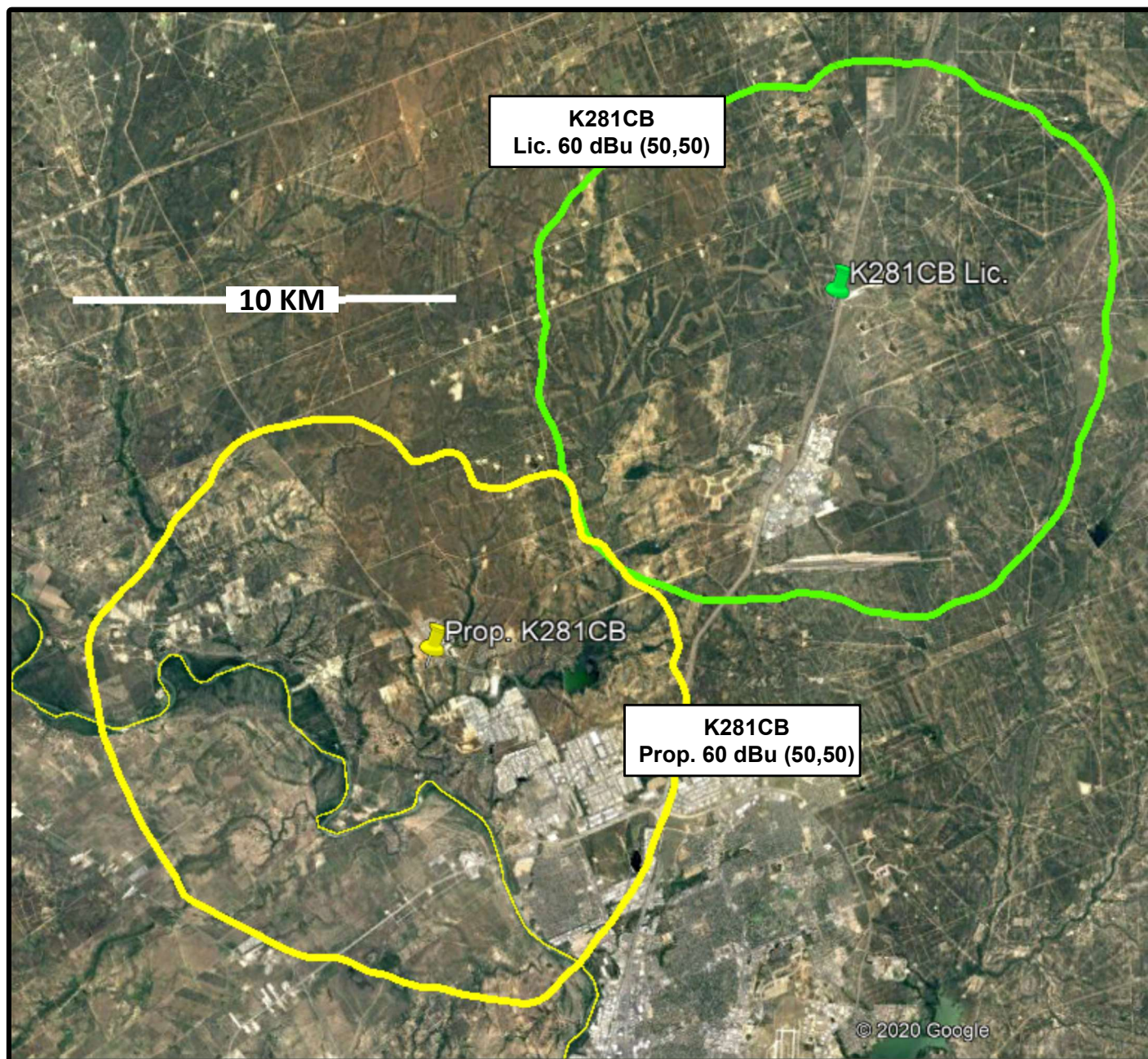


Figure 3



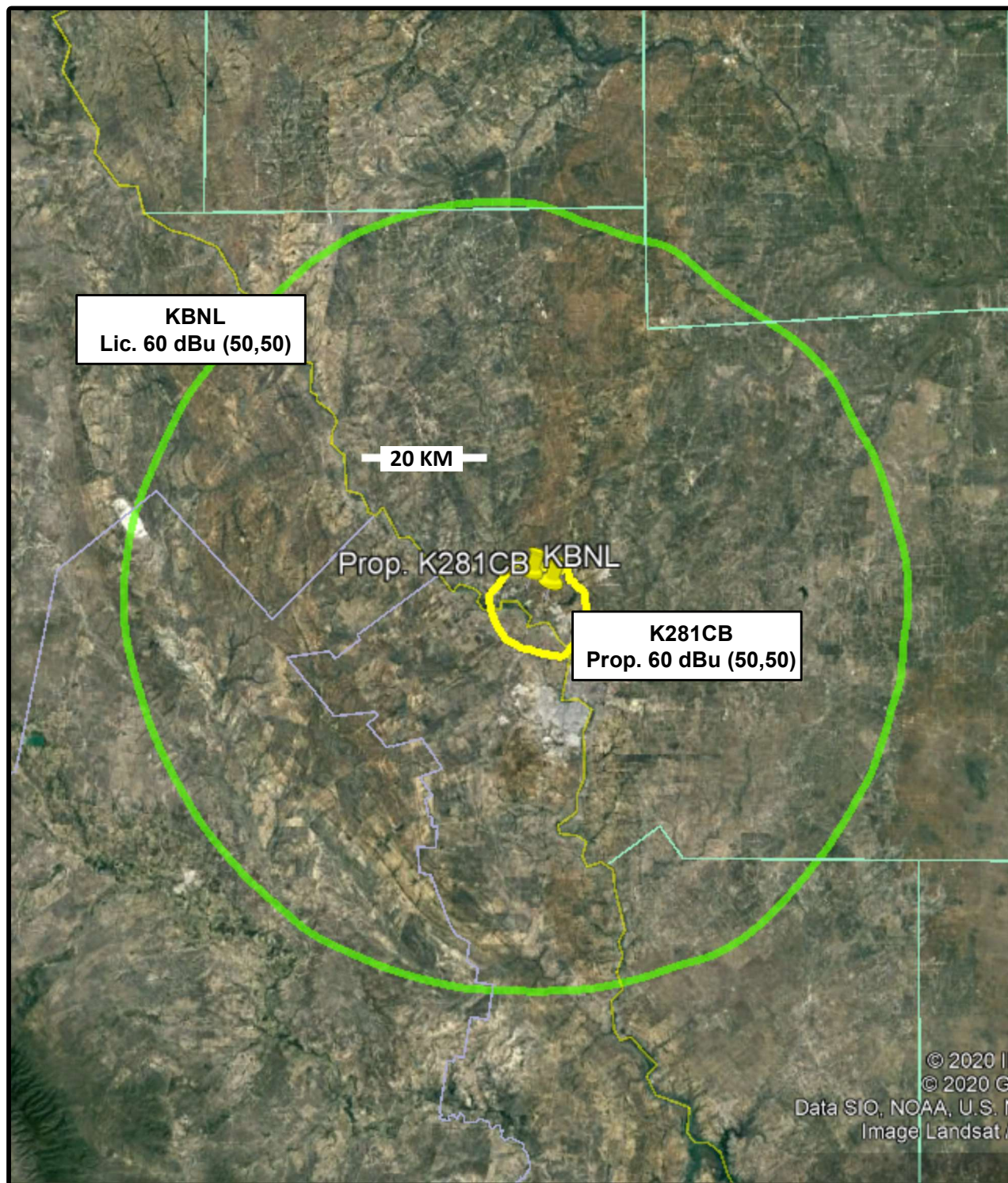
PREDICTED 60 DBU CONTOURS – LICENSED & PROPOSED

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Grafton Olivera, P.E. – Consulting Engineer

Figure 3A



PREDICTED 60 DBU CONTOURS – LIC. KBNL & PROP. K281CB

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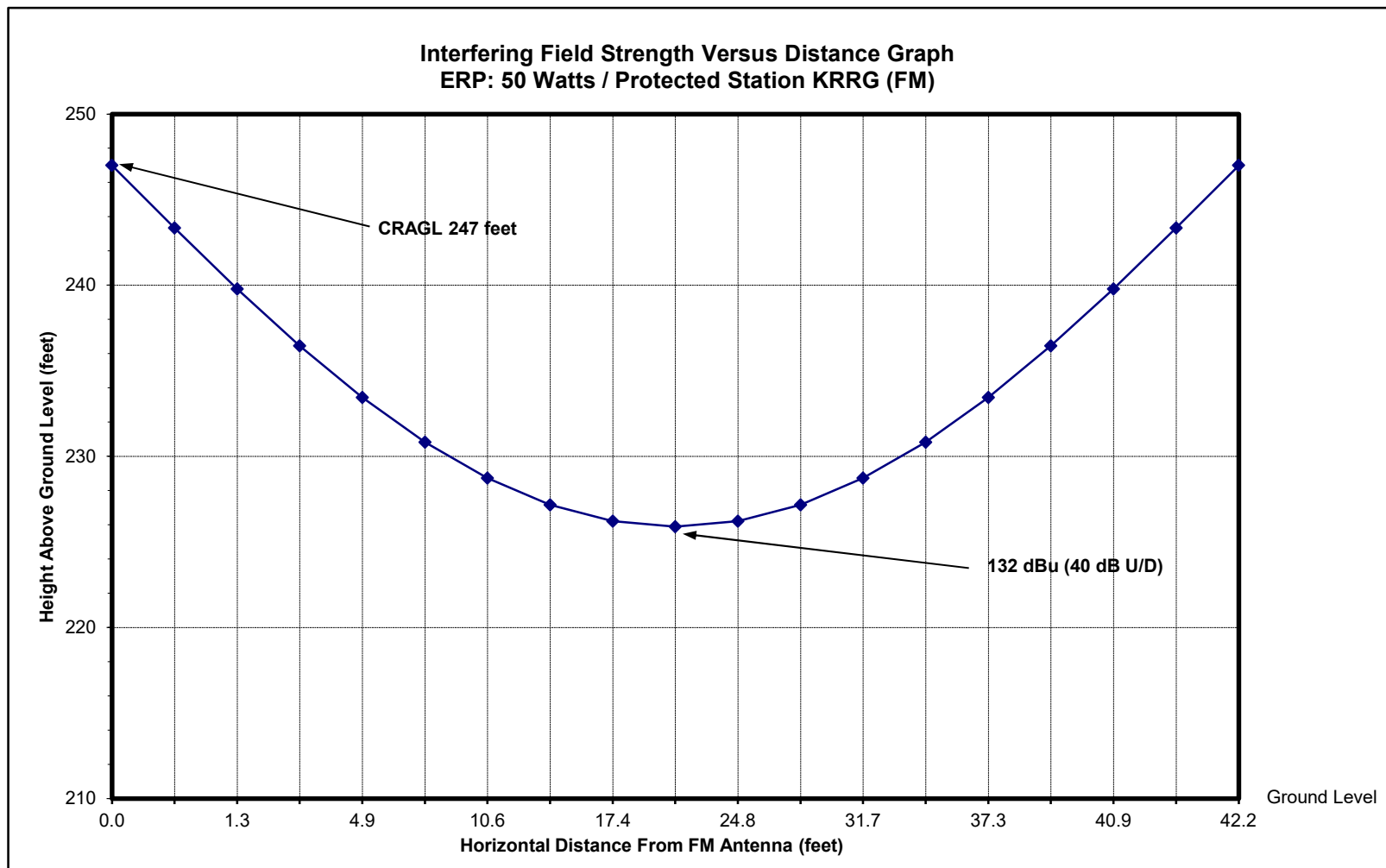
Figure 4

FX K281CB		CHANNEL:	253				75.2	22.9
At ASR 1050000				IX TO:		RCAGL-M		RCAGL-FT
Interfering Field Strength Vs. Distance				KRRG		22.9		75.2
Antenna: Micronetixx 1-Bay CP Antenna				<div>ERP0.05kW</div> <div>-13.0103dBk</div>				
RCAGL		247	feet					
Interfering Contour		132	dBu					
Signal from Station		92	dBu					
Depression Angle		VRF	ERP (dBk)	Distance to Contour (m)**	Distance to Contour (feet)**	Horiz. Dist. (feet)	Height AGL (feet)	
90		0.000	-337.3	0.0	0	0	247	
85		0.087	-34.2	1.1	4	0	243	
80		0.174	-28.2	2.2	7	1	240	
75		0.259	-24.8	3.3	11	3	236	
70		0.342	-22.3	4.4	14	5	233	
65		0.423	-20.5	5.4	18	8	231	
60		0.500	-19.0	6.4	21	11	229	
55		0.574	-17.8	7.4	24	14	227	
50		0.643	-16.8	8.3	27	17	226	
45		0.707	-16.0	9.1	30	21	226	
40		0.766	-15.3	9.9	32	25	226	
35		0.819	-14.7	10.5	35	28	227	
30		0.866	-14.3	11.1	37	32	229	
25		0.906	-13.9	11.7	38	35	231	
20		0.940	-13.6	12.1	40	37	233	
15		0.966	-13.3	12.4	41	39	236	
10		0.985	-13.1	12.7	42	41	240	
5		0.996	-13.0	12.8	42	42	243	
0		1.000	-13.0	12.9	42	42	247	
						Min. Hgt (ft)	226	

RCAGL-FT	RCAGL-M
75.2	22.9
RCAGL-M	RCAGL-FT
22.9	75.2

ERP	0.05 kW
	-13.0103 dBk

Figure 5



Appendix 1

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Engineering Specifications

Channel / Frequency	253D / 98.5 MHz
Site Coordinates (NAD83)	27° 37' 31.0" North Latitude 99° 29' 26.1" West Longitude
Site elevation	162 m AMSL
Overall height of antenna structure	106.4 m AGL / 268.4 m AMSL
Height of antenna radiation center	103 m AGL / 265 m AMSL
Antenna radiation center HAAT	108 m AMSL
Transmitter	Type Approved – 200 Watts
Transmitter power output	140 Watts
Transmission line, 7/8" foam-dielectric	Andrew, LDF4-50A
Transmission line length	115 m
Transmission line efficiency	73.1 %
Antenna	Micronetixx MCX-1, single bay
Polarization	Circular (50/50)
Power gain	0.49 Circular Pol
Antenna input power	102 Watts
Effective radiated power	50 Watts Circular Pol.

Appendix 2

Antenna Height Above Average Terrain Calculations -- Results

Input Data

Latitude **27° 38' 28.6"** North

Longitude **99° 33' 22.9"** West (NAD 83)

These coordinates convert to NAD 27 coordinates of
27° 38' 27.55", North, 99° 33' 21.75" West (NAD 27).

Height of antenna radiation center above mean sea level: **227 meters** AMSL

Number of Evenly Spaced Radials = **12** 0° is referenced to True North

Results

Calculated HAAT = **73 meters**

Antenna Height Above Average Terrain calculated
using FCC 30 second terrain database (continental USA only)

Individual "Radial HAAT" Values, in meters

0°	39.5 m
30°	44.2 m
60°	42.6 m
90°	55.6 m
120°	71.3 m
150°	95.4 m
180°	92.1 m
210°	90.0 m
240°	95.3 m
270°	101.7 m
300°	78.1 m
330°	71.0 m

Print Results?

New Calculation?

Appendix 3

Antenna Vertical Plane Radiation Pattern



Antenna: MCX 1-Bay CP Antenna, Gain C/P 0.49 (-3.1 dB)

