

TECHNICAL EXHIBIT  
COMMUNITY BROADCASTING INC.  
MINOR CP MODIFICATION APPLICATION  
FM TRANSLATOR STATION W232DR  
FACILITY ID 202780  
CHANNEL 232D 250 WATTS RC: 84.7 M AMSL

AUGUST 18, 2020

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Technical Narrative

The technical exhibit of which this narrative is part has been prepared on behalf of Community Broadcasting Inc., licensee of a AM radio station WEXS, 610 KHz in Patillas, PR, Facility ID 12819. Community Broadcasting Inc. is herein requesting a minor modification of the construction permit of its FM translator W232DR, Facility ID 202780 to change site and antenna system.

Proposed Transmitter Location

The proposed transmitting facility would operate on channel 232 using a one-bay Micronetixx MCX-1, circularly polarized antenna, side-mounted on the WEXS tower. The proposed site location is described by the following NAD83 geographic coordinates:

18° 00' 29.0" North

66° 01' 27.0" West

It is proposed to side mount the antenna radiation center (RC) at a height of 78.3 meters (257 feet) above ground on an existing tower at a site with an elevation of 6.4 meters AMSL. Thus, the antenna RC will be mounted at a height of 84.7 meters AMSL, which corresponds to a HAAT of -133.5 meters. The permissible ERP of 250 Watts allowed under the proposed conditions is requested. It is proposed to mount the proposed FM translator antenna the existing registered tower of WEXS, ASRN 1010653; thus the FAA is not being notified of the proposed construction.

### 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 1.1% 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:

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

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, a relative field factor of 0.866 (see Appendix 2, Antenna Vertical Radiation Pattern) or less for any depression angle equal or greater than 30 degrees below horizon, a total effective radiated power of 500 watts (circular polarization) and an antenna radiation center height above ground of 78.3 m, the calculated power density will not exceed  $2.2 \mu\text{W}/\text{cm}^2$ . Therefore, the calculated RF exposure at 2 m above ground will not exceed 1.1% of the limit of  $200 \mu\text{W}/\text{cm}^2$  for the general population and uncontrolled environments.

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

### FCC Monitoring Stations

FCC rules pertaining to FCC monitoring stations, Section 73.1030(c), requires that the proposed facility does not produce a field strength greater than 10 mV/m at the FCC stations. The closest FCC monitoring station to the proposed operation is located at Santa Isabel, PR, at a distance of 37 kilometers. The proposed operation will produce field strengths much lower than 10 mV/m at the FCC station in Santa Isabel, PR.

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

### Quiet Zone Notification

As required by FCC rules pertaining to radio Quiet Zones, Section 73.1030(a), the National Astronomy and Ionosphere Center (NAIC) in Arecibo, Puerto Rico has been notified of this application. Copies of the notification letter to the Arecibo Observatory of the proposed facility and of the letter of consent are included herein as Appendix 1.

### AM Stations within 3.2 kilometers

There are no AM stations located within 3.2 km of the proposed site, except WEXS on whose tower the proposed facility will be mounted. It is proposed to mount the proposed FM translator antenna on the WEXS tower using a properly designed isolator, as to not affect the operation of the AM station. The WEXS antenna impedance will be measured before and after the FM translator antenna is installed, and should there be a significant impedance change, a new license application for WEXS will be filed. Thus, the proposal is believed to be compliant with Section 47 CFR 73.1692.

### Fill-In Compliance and Allocation Considerations

Figure 1 is a Fill-In Compliance map. As shown in Figure 1, the proposed translator 60 dBu contour will be contained within a 25-mile radius of WEXS. Figure 2 summarizes the allocation study for the proposed facility. As indicated in Figure 2 there is no co-channel or first-adjacent full-service station, translator, or LPFM facility to be concerned, as far as causing interference to by the proposed facility. Figure 3 shows the required 60 dBu contour overlap between the existing authorized facility and the proposed CP modification.

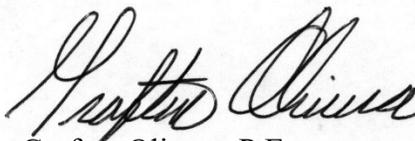
The proposed FM station will operate on Channel 232, second adjacent channel to WODA (FM), Channel 234B and third adjacent channel to WZNT (FM), Channel 229B. The predicted WODA F(50,50) field strength at the proposed site is 80.0 dBu and the predicted WZNT F(50,50) field strength at the proposed site is 79.5 dBu, thus WZNT, being the weaker of the two signal, is the determining protection facility. The protection requirements of the undesired signal from the proposal is 40 dB higher that the desired signals of these stations.

The proposed transmitter site is located 29.7 kilometers from station WZNT, which operates with an ERP of 28 kW and HAAT of 560 meters. The predicted WZNT F(50,50) field strength at the proposed site is 79.5 dBu. Using the U/D ratio of 40 dB, the proposed F(50,10) interfering signal is 119.5 dBu, thus this contour defines the maximum extent of predicted interference.

Since an ERP of 250 watts is proposed, the 119.5 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 119.5 dBu contour would reach is 58 feet at a horizontal distance of 199 feet from the transmitting antenna. This is depicted in the calculation table of Figure 4. Therefore, no harmful interference is predicted to WZNT (or WODA) as a result of the proposed facility. Figure 4 is a tabulation and Figure 5 a graphic representation of the computed distances and heights of the predicted 119.5 dBu contour.

The predicted contours were calculated in accordance with Section 73.313 of the FCC Rules, using the V-Soft FMCommander@2020 software in conjunction with the 30 second Global terrain database; contour calculations were made using an evenly spaced set of twelve radials. The antenna height elevations of the facilities was used in conjunction with the propagation prediction curves of Section 73.333 to determine distances to contours.

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



Grafton Olivera, P.E.

Consulting Engineer

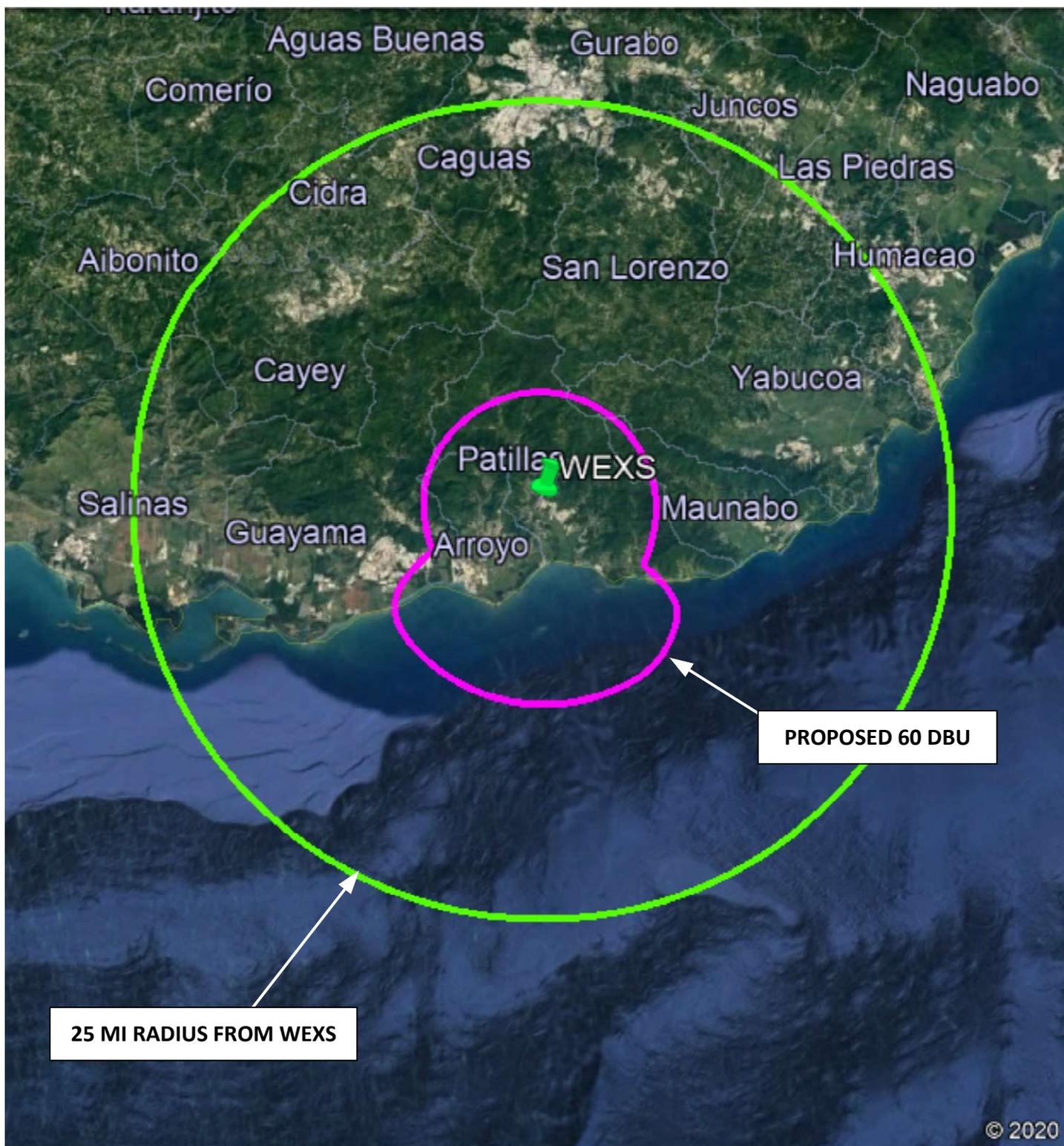
5119 60<sup>th</sup> Drive E

Bradenton, Florida 34203

(941) 329-6001

August 18, 2020

FIGURE 1



**AM FILL-IN COMPLIANCE MAP  
PROPOSED CP MOD. W232DR FM TRANSLATOR FOR WEXS (AM)  
CHANNEL 232D 250 WATTS RC: 84.7 M AMSL  
PATILLAS, PUERTO RICO**

Figure 2

## Allocation Study – Proposed Minor CP Modification W232DR



### Allocation Study - Proposed CP Modificaytion W232DR

Community Broadcasting, Inc.

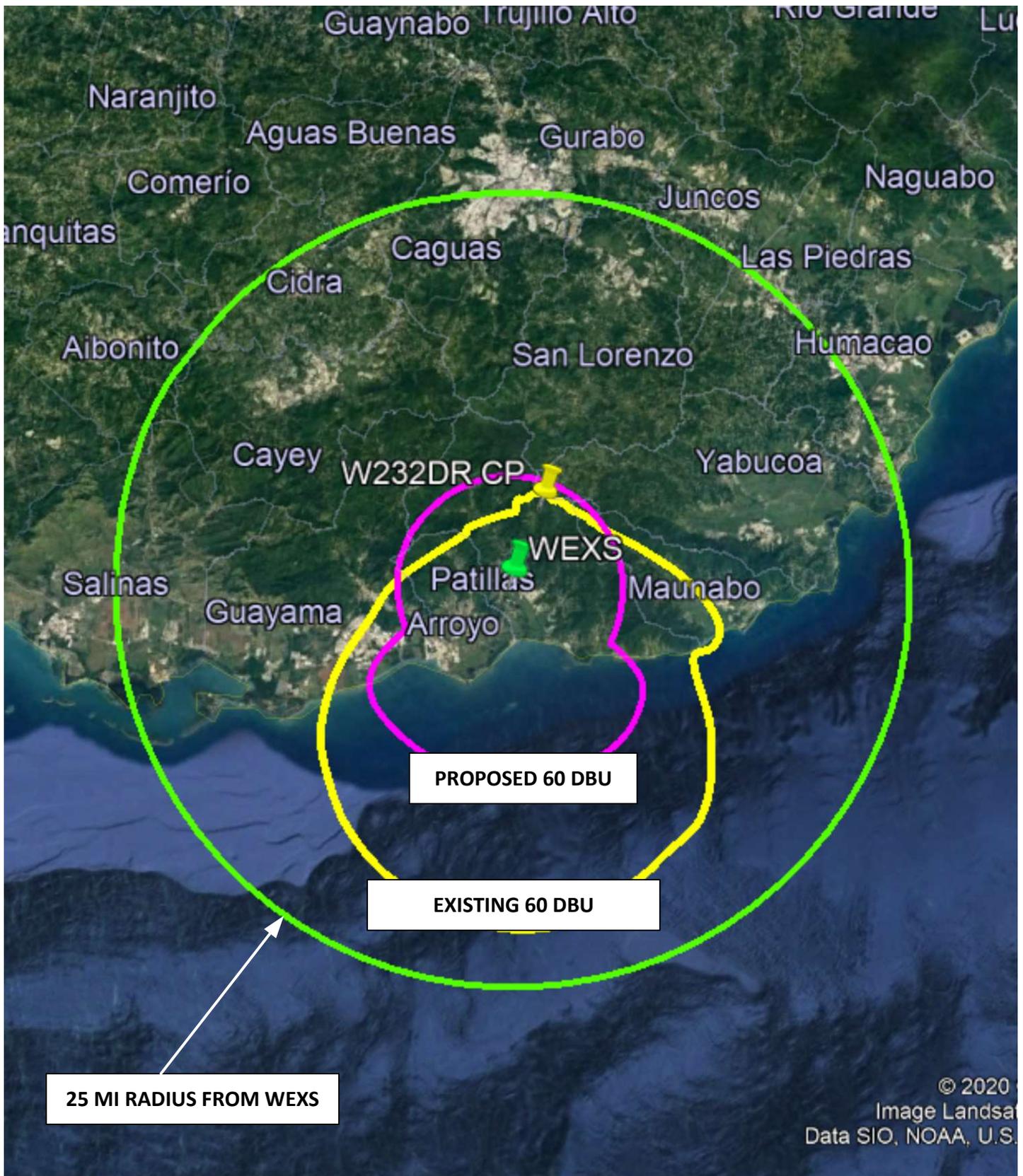
REFERENCE  
18 00 29.00 N.  
66 01 27.00 W.

CH# 232D - 94.3 MHz, Pwr= 0.25 kw, HAAT= -133.5 M, COR= 84.7 M  
Average Protected F(50-50)= 7.09 km  
Omni-directional

DISPLAY DATES  
DATA 08-10-20  
SEARCH 08-14-20

CH CITY	CALL	TYPE	ANT STATE	AZI <-->	DIST FILE #	LAT LNG	PWR(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
232D	W232DR	CP	D	18.0	5.38	18 03 14.80	0.250		---Reference---		
	Patillas	PR		198.0	BNPFT20180424ABC	66 00 30.50		446	Community Broadcasting, In		
234B	WODA	LIC		31.2	34.93	18 16 36.80	31.000	9.3	94.9	18.5	-70.2*
	Bayamon	PR		211.2	BLH20020430AAG	65 51 10.50	560	787	Spanish Broadcasting System		
229B	WZNT	LIC	N	31.2	34.93	18 16 36.80	28.000	9.0	93.9	18.9	-58.9*
	San Juan	PR		211.2	BLH20020430AAH	65 51 10.50	560	787	Spanish Broadcasting System		
231B	WNOD	LIC		278.9	103.12	18 08 57.80	25.000	88.2	65.1	8.2	7.8
	Mayaguez	PR		98.6	BMLH19990720KA	66 59 18.60	597	896	Spanish Broadcasting System		
232D	W232DH	LIC		353.8	41.96	18 23 00.00	0.250	23.8	7.1	11.1	11.1
	San Juan	PR		173.8	BLFT20180802AAD	66 04 01.00		115	Arso Radio Corporation		
232C	NEW	CP	D	72.4	152.06	18 25 00.00	100.000	130.7	31.0	14.3	97.3
	British Virgin Isla	VI		252.8		64 39 00.00	488	0			
229D	WZNT-FM1	LIC		51.0	48.25	18 16 52.00	1.000	2.0	27.0	39.2	20.0
	Ceiba	PR		231.1	BLFTB20080417ABN	65 40 09.00		304	Spanish Broadcasting System		
234D	WODA-FM1	LIC		51.0	48.25	18 16 52.00	1.000	2.0	27.0	39.2	20.0
	Ceiba	PR		231.1	BLFTB20080417ABL	65 40 09.00		304	Spanish Broadcasting System		

Terrain database is FCC NGDC 30 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.  
Reference station has protected zone issue: Arecibo AM tower



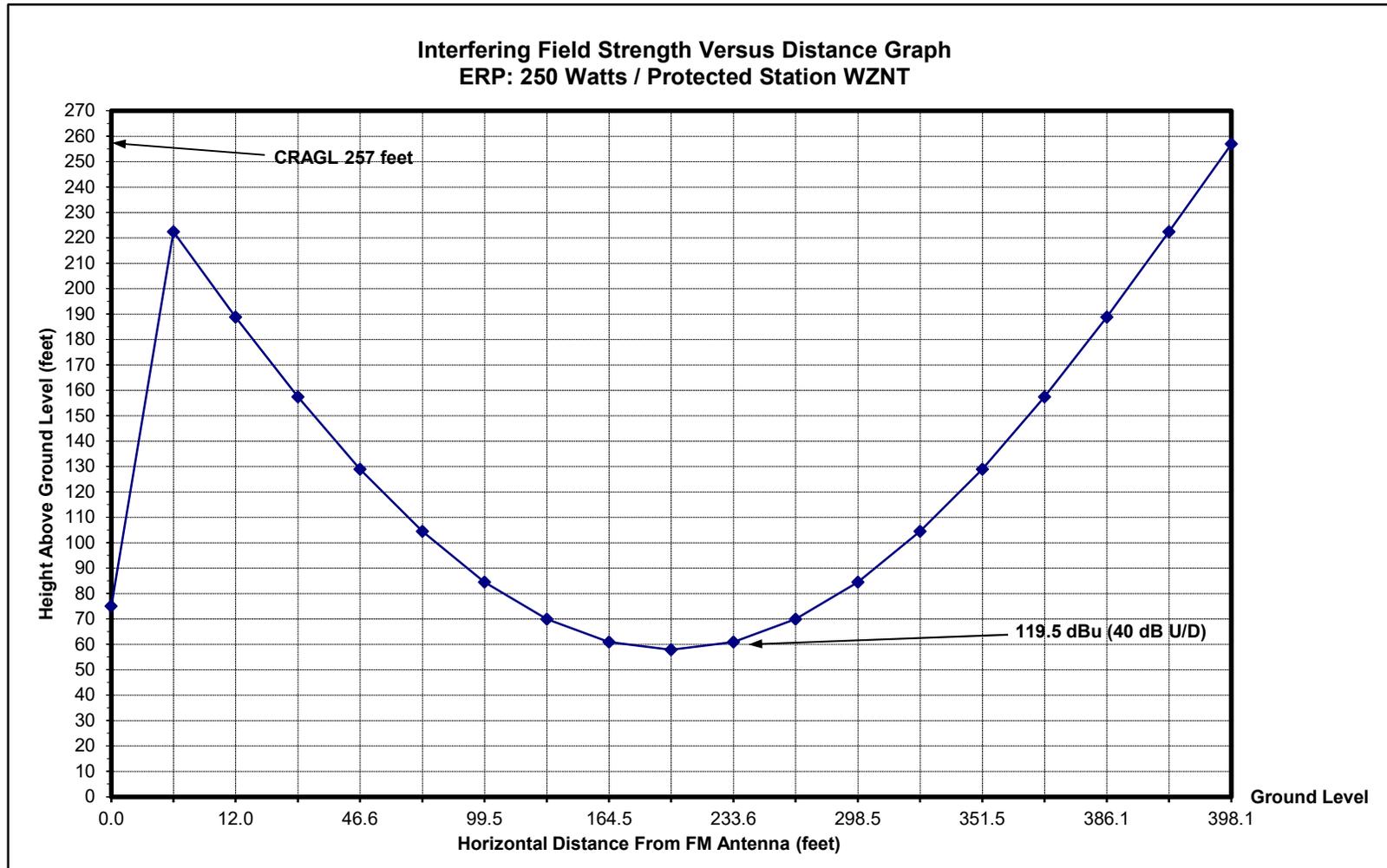
**60 DBU CONTOUR OVERLAP – EXISTING & PROPOSED CP MODIFICATION  
W232DR FM - TRANSLATOR FOR WEXS (AM)  
CHANNEL 232D 250 WATTS RC: 84.7 M AMSL  
PATILLAS, PUERTO RICO**

Figure 4

NEW FX FOR WEXS	CHANNEL:	232				
ASR: N/A						
Interfering Field Strength Vs. Distance Graph						
Antenna: MCX 1-Bay CP Antenna						
RCAGL	257	feet	IX TO:	ERP:	0.25	kW
Interfering Contour	119.5	dBu	WZNT		-6.020599913	dBk
Signal from Station	79.5	dBu				
Depression Angle	VRF	ERP (dBk)	Distance to Contour (m)**	Distance to Contour (feet)**	Horiz. Dist. (feet)	Height AGL (feet)
90	0.000	-330.3	0.0	0	0	75
85	0.087	-27.2	10.6	35	3	222
80	0.174	-21.2	21.1	69	12	189
75	0.259	-17.8	31.4	103	27	157
70	0.342	-15.3	41.5	136	47	129
65	0.423	-13.5	51.3	168	71	104
60	0.500	-12.0	60.7	199	100	85
55	0.574	-10.8	69.6	228	131	70
50	0.643	-9.9	78.0	256	164	61
45	0.707	-9.0	85.8	281	199	58
40	0.766	-8.3	92.9	305	234	61
35	0.819	-7.8	99.4	326	267	70
30	0.866	-7.3	105.1	345	299	85
25	0.906	-6.9	110.0	361	327	104
20	0.940	-6.6	114.0	374	352	129
15	0.966	-6.3	117.2	385	371	157
10	0.985	-6.2	119.5	392	386	189
5	0.996	-6.1	120.9	397	395	222
0	1.000	-6.0	121.3	398	398	257
					Min. Height	58

RCAGL-FT	RCAGL-M
257	78.3
RCAGL-M	RCAGL-FT
78.3	257

Figure 5



## Appendix 1

**Grafton Olivera, P.E.**

Consulting Engineer

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August 14, 2020

Via email ([prcz@naic.edu](mailto:prcz@naic.edu))

Angel M. Vázquez, Spectrum Manager  
National Astronomy and Ionosphere Center  
Arecibo Observatory  
HC3 Box 53995  
Arecibo, PR 00612

Gentlemen:

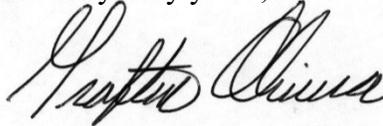
On behalf of our client, Community Broadcasting Inc., licensee of AM station WEXS in Patillas, PR, Fac. ID 12819 in accordance with Section 73.1030 of FCC Rules, we hereby notify of a proposed Minor Modification of the Construction Permit of FM translator station W232DR. The particulars of the proposal are as follows:

Proposed Facility:

Geographical coordinates of antenna location (NAD83): 18-00-29.0 / 66-01-27.0  
Antenna RC height: 78.3 m AGL; 84.7 m AMSL  
Antenna Gain: 0 dBd (ND)  
Operating channel: 232 (94.3 MHz)  
Type of emission: F3E  
Effective isotropic radiated power: 0.41 kW – Circular Polarization

Please review this proposal and let me know your findings; feel free to communicate via email (<mailto:Grafton.Olivera@me.com>), telephone (941-323-0381) or regular mail.

Very truly yours,



Grafton Olivera, P.E.  
5119 60th Drive E  
Bradenton, FL 34203

Tel. 941-323-0381  
Email: [Grafton.Olivera@me.com](mailto:Grafton.Olivera@me.com)

# ARECIBO OBSERVATORY

The William E. Gordon Telescope  
Angel Ramos Foundation Science and Visitor Center



August 17, 2020

Mr. Grafton Olivera, P.E.  
Consulting Engineer  
5119 60<sup>th</sup> Drive E  
Bradenton, FL 34203

Re: licensee of AM station WEXS in Patilla's , FM translator station W232DR  
Operating channel: 232 (94.3 MHz)  
Antenna location (NAD83): 18-00-29.0 / 66-01-27.0  
Facility ID 12819

Dear Eng. Olivera:

Thank you very much for your PRCZ approval request sent to us in accordance with the Puerto Rico Coordination zone agreements. We have considered the technical aspects of your application and find that the proposed application of Patillas, PR station is unlikely to cause harmful interference to the passive use of the Radio Astronomy bands at the Arecibo Observatory:.

We therefore have no objections to your proposed installation.

Sincerely yours,

---

Angel M. Vázquez  
Spectrum Manager

AMV/ic

Cc: PRCZ files [File #17Aug20\_01]

## Appendix 2

### Antenna Vertical Plane Radiation Pattern



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

