

Engineering Statement in support of  
FCC FORM 349  
APPLICATION FOR AUTHORITY TO CONSTRUCT OR MAKE CHANGES IN AN FM  
TRANSLATOR OR FM BOOSTER STATION  
(For a New FM Translator)

This is a minor change to an existing facility by Circuitwerkes, Inc. (the Applicant) for an FM Translator serving the community of West Palm Beach, FL. The facility ID 158103 and the call sign is W223CJ. This application seeks to change the location, height and power of W223CJ.

Figure 1 is a showing of protected and interfering contours. The proposed W223CJ will employ a non-directional antenna. The proposed location of W223CJ is within the 60dB $\mu$  service contours of 2<sup>nd</sup> adjacent station WRLX, FCC Fac ID# 20442. The WRLX 97dBu contour encompasses the proposed W223CJ 137dBu contour. The antenna will be 119m AGL and a free space loss calculation shows that the interfering contour extends less than 5 meters from the antenna, thus no interference approaches the ground, nor nearby structure or roadway.

The proposed facility is in compliance with 47 C.F.R. Section 1.1306 with regards to radio-frequency electromagnetic exposure in that the contribution to the rf environment is less than 5% of the maximum public exposure. The tower is located within a secured compound. The public does not have access to the tower compound. The applicant will reduce power or cease operation when workers are present near the transmitting antenna.

This application was prepared using FCC 3-arc-second terrain data.

This facility will be a fill-in translator for AM station WWRF (facility ID# 24461) and its power is limited by the interfering contours and the distance to the service contour of the primary station as shown in Figure1 and figure 3 below.

The proposal is sufficiently distant from all facilities mentioned in 73.1030(a), (b) & (c) so that notification under 73.1030 is not required.

Kyle Magrill, President/applicant  
07 Dec 2016

CircuitWerkes, Inc.  
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**Section VII Engineering Data:**

Tech Box Data:

1. Channel: **223**

2. Primary Station: **FID: 24461**  
**WWRF (AM)**  
**Lake Worth, FL**

3. Delivery Method: **direct**

4. Antenna Location Coordinates: (NAD27):  
**26° 45' 42 " N**  
**80° 04' 42 " W**

5. Antenna Structure Registration: **1031315**

6. Antenna Location Site Elevation Above Mean Sea Level: **5 meters**

7. Overall Tower Height Above Ground Level: **158meters**

8. Height of Radiation Center Above Ground Level: **119 meters (H) AGL**  
**119 meters (V) AGL**

9. ERP:  
**0.009 kW (H)**  
**0.009 kW (V)**

10. Transmitting Antenna: **Non-Directional**

11. Fill-in Translator: **Yes**

12. Interference: **Yes**  
a) Section 74.1204, **Checked.**  
b) Section 74.1205, **Not Checked.**

13. Unattended operation: **Yes**

14. Multiple Translators: **Yes**

15. NEPA: **Yes.** This proposal is excluded from environmental processing: The modeled rf at the base of the tower is less than 5% of the maximum public exposure level at prescribed in 1.1307(b).

## Protected and Interfering Contours

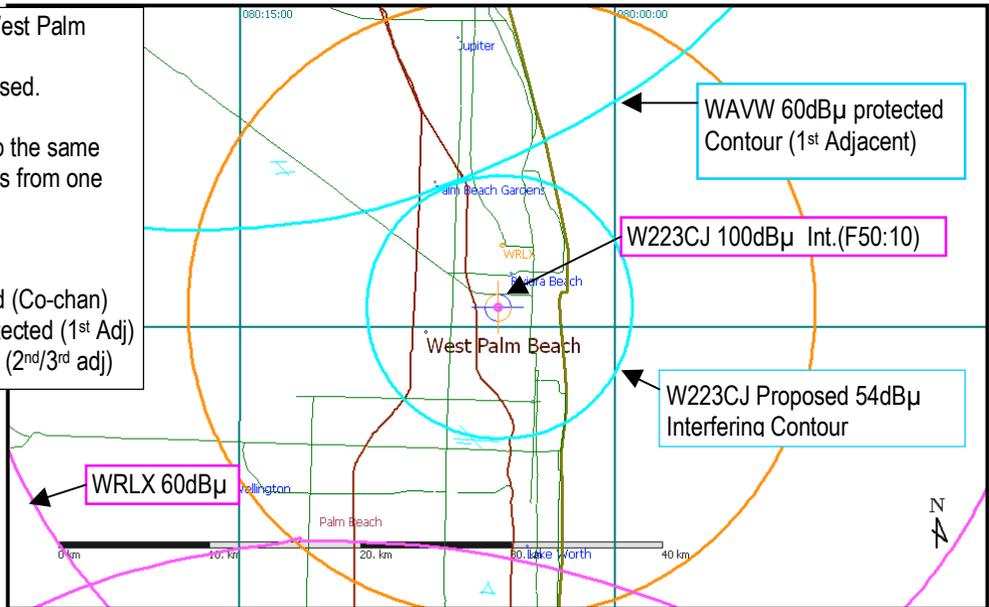
Contours are color-coded so that prohibited overlap is indicated by LIKE color contours overlapping.

## Protected and Interfering Contours

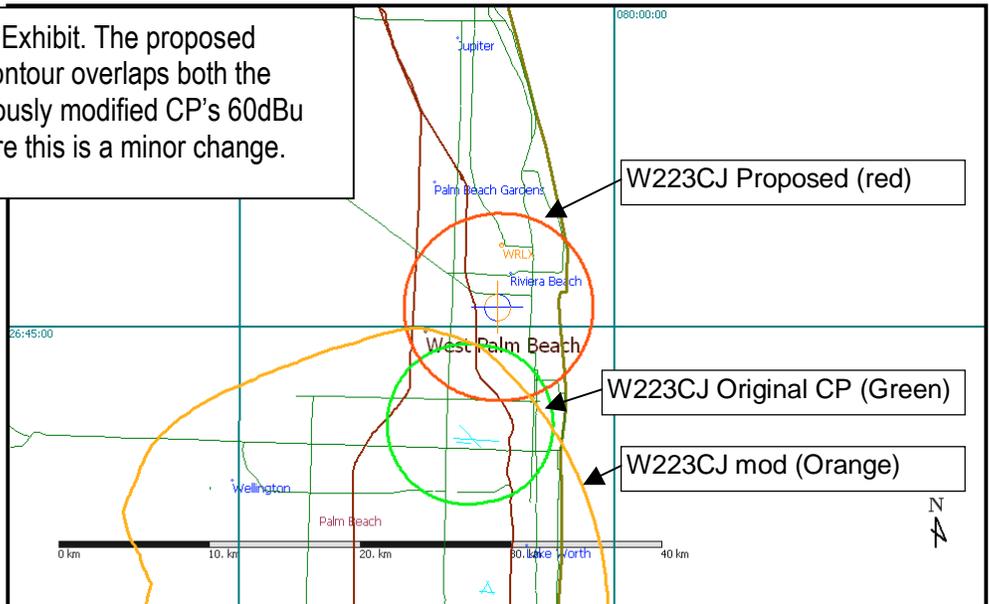
Figure 1: Contour analysis of Ch223, West Palm Beach, FL.  
Colors are referenced to W223CJ proposed.

Other facilities' colors should not overlap the same colors from W223CJ. Overlapping colors from one affected station to another is okay.

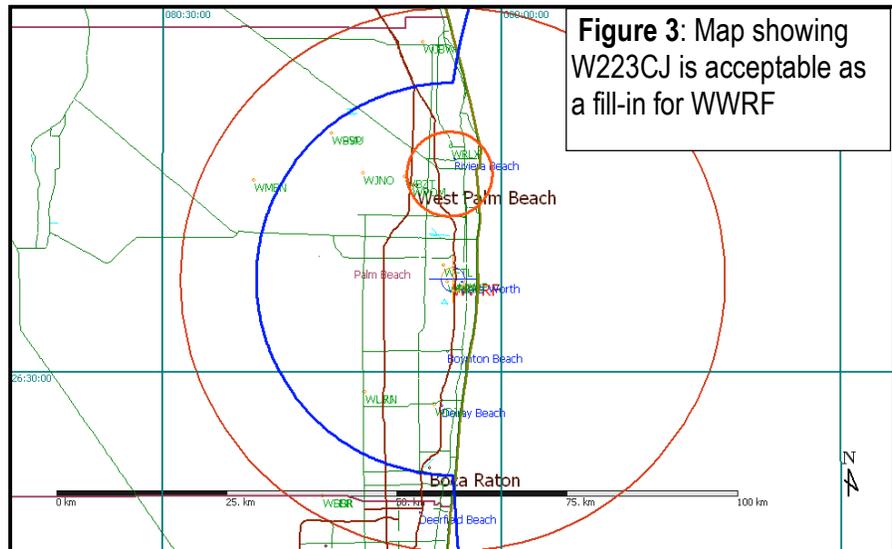
Key:  
Orange = Interfering 40dBu vs Protected (Co-chan)  
Blue or cyan = Interfering 54dBu vs Protected (1<sup>st</sup> Adj)  
Violet = Interfering 100dBu vs Protected (2<sup>nd</sup>/3<sup>rd</sup> adj)



**Figure 2:** Minor Change Exhibit. The proposed facility's 60dBu service contour overlaps both the original CP and the previously modified CP's 60dBu service contour. Therefore this is a minor change.



The proposed W223CJ 1mV/m contour (small Red) fits entirely within the proposed 2mV/m service contour of WWRF (Blue). The 1mV/m contour does not extend more than 40km (Large Red).



**Desired to Undesired ratio (D/U) studies of W223CJ vs WRLX**

W223CJ is within the service contours of WRLX. The WRLX 97dBμ contour encompasses the proposed W223CJ location. As shown in figure 3, the W223CJ 137dBμ contour (shown as the point that is the proposed location) is completely contained within the WRLX 97dBμ contour. Therefore the worst case scenario for interference is  $97\text{dB}\mu + 40\text{dB}\mu = 137\text{dB}\mu$ . The antenna is located 119m above the ground and the interfering contour extends less than 5 meters from the antenna. Therefore no harmful interference will occur to WRLX as a result of the operation of this proposed facility.

**Figure 4:** Map showing W223CJ 137dBμ Interfering contour vs WRLX 97dBμ Protected

