

LIEBERMAN & WALISKO
CONSULTING TELECOMMUNICATIONS ENGINEERS
701 YEATMAN PARKWAY
SILVER SPRING, MD 20902

ENGINEERING STATEMENT

This Engineering Statement supports the application of Luis Cajiga seeking a construction permit for an FM broadcast translator to serve the Gurabo, Puerto Rico area and to operate on FM Channel 280, (103.9 MHz) with an effective radiated power of 0.020 kilowatts employing a directional antenna at 132 meters AMSL.

A search of the FM band indicates there is no clear channel available that meets the criteria specifically set forth in 47 C.F.R. Section §74.1204. However, FM channel 280 appears most likely able to meet the separation requirements in 47 C.F.R. Section §74.1204.

A search of the pertinent adjacent channels using the standard prediction method and the ratio of desired to undesired signal strengths called for in 47 C.F.R. Section §74.1204, reveal three channels with which overlap could occur.

- A) WERR, Utuado, PR, Ch 281B, 50 kW, 609mAMSL
- B) WVJP, Caguas, PR, Ch 277B, 28 kW, 813mAMSL
- C) W280CE, San Juan, PR, Ch 280, 0.024 kW, 32mAMSL

WERR, Utuado, PR

The instant proposal must protect the 54 dBu, F50,50 contour of WERR with its 48 dBu, F50,10 contour. Employing

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the standard prediction method, the 54 dBu contour of WERR overlaps the proposed 48 dBu area of the instant proposed translator as shown in Exhibit 11, Figure 1.

47 C.F.R. Section §74.1204(d) states "an application will be accepted if it can be demonstrated that no actual interference will occur due to intervening terrain, etc". A close examination of the terrain between WERR and the instant proposed site indicates terrain of such magnitude that effectively blocks the WERR signal and reduces its strength to a value below 54 dBu over the instant proposed 48 dBu area. This is demonstrated in Exhibit 11, Figure 2.

The depiction in Figure 2 is of the instant proposed 48 dBu contour, created from the standard prediction method, and the field strength of the WERR signal over the contour. The field strength is shown in two colors - red for any value above 54 dBu and blue for any value below 54 dBu. It is readily apparent that blue prevails over the entire 48 dBu service area of the instant proposed.

Each line in Figure 2 represents a radial from the WERR transmitter and commences at 85° and terminates at 105°. As stated above, each line represents a terrain path along which the field strength was calculated as a function of radiated power and losses contributed by terrain blockage. The method employed for Exhibit 11, Figure 2 is in a computer program that utilizes free space loss plus an

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excess path loss factor that considers reflection plus multiple diffraction loss. This excess path loss calculation uses the essential techniques of the National Bureau of Standards Technical Note 101 and the TIREM model (Terrain Integrated Rough Earth Model) to find path loss using an explicit treatment of terrain effects based on a physical-deterministic (rather than an empirical-statistical approach such as found in the FCC's standard prediction method.

In the "line-of-sight" region where no terrain obstacles block the direct ray from the transmitter to the receiver, path loss is determined by considering the contribution of a single ground reflection added vectorially to the direct received ray. For paths where a terrain obstacle is high enough so that the 0.6 first Fresnel zone is partially obstructed, the excess path loss calculation includes an additional loss ranging from 0 to 6 dB depending on the extent to which the Fresnel zone is obstructed.

In the "over-the-horizon" region, the path loss is calculated by adding the diffraction losses over up to ten successive terrain obstacles. Each obstacle is dealt with separately.

No allowance was made for foliage loss which would add an additional loss factor into the calculations of all field strengths. Terrain data used in the herein referenced program was retrieved from 3 arc second terrain data.

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A second tool to demonstrate the absence of a WERR 54 dBu signal within the proposed 48 dBu contour, is the FCC's own PTP program. PTP is a tool developed by the FCC's Office of Engineering Technology and is widely used by the Audio Division of the Media Bureau to determine signal strengths in those cases where the standard prediction method fails.

Exhibit 11, Figures 3 through 5 are PTP plots again demonstrating the lack of a WERR 54 dBu signal in the proposed 48 dBu contour. In the instant case, a series of three plots were made, one at 90°, one at 96° and one at 103°; the three plots pass through the proposed 48 dBu contour of the instant proposed. Here too, it is evident, there is no 54 dBu signal which could be interfered with by the proposed 48 dBu signal.

WVJP, Caguas, PR

The instant proposal must protect the 54 dBu F50,50 contour of WVJP on channel 277 with a separation of 40 dB. The distance between the WVJP transmitter site and the instant proposed transmitter site is 18.68 kilometers. The average elevation for the bearing 251.2° is 179.5 m. The WVJP transmitter site is 813 meters AMSL which places the radiated signal along that bearing at 633.5 meters AAT. At 28 kilowatts radiated and 633.5 meters AAT, the field at the instant proposed transmitter site is 90.51 dBu. Added to the undesired ratio of 40 dB, the resultant is 130.51 dBu for the area of interference. Since the radiated value and height of the instant proposed antenna is below the

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FCC F50,50 curves, the free space formula was employed to determine the area of interference.

The free space formula employed is:

$$\text{Field} = 106.9 + \text{ERP}_{\text{dBk}} - 20 \log_{10}(\text{Dist})$$

A variation of the above is used to obtain the distance:

$$\text{Dist} = \frac{106.9 + (16.9897) - 130.51}{20} \times 10^x = 0.0093 \text{ km}$$

0.0093 kilometers X 1094 = 10.21 yards or 30.63 feet for the 130.51 dBu contour.

The instant proposed site is the AM transmitter tower for WVJP-AM. The area is fenced and cleared to make way for the AM ground system. Thus, no one will be subject to interference from the operation of the instant proposed on FM channel 280 at this location.

W280CE, San Juan, PR

This is a co-channel FM translator operating at 0.024 kW at 32 mAMSL. The instant proposed translator must protect W280CE to its 60 dBu F50,50 contour. Exhibit 11, Figure 6 depicts the W280CE and the instant proposed 60 dBu, F50,50 and 40 dBu, F50,10 contours. There is no overlap of either facility to the other.

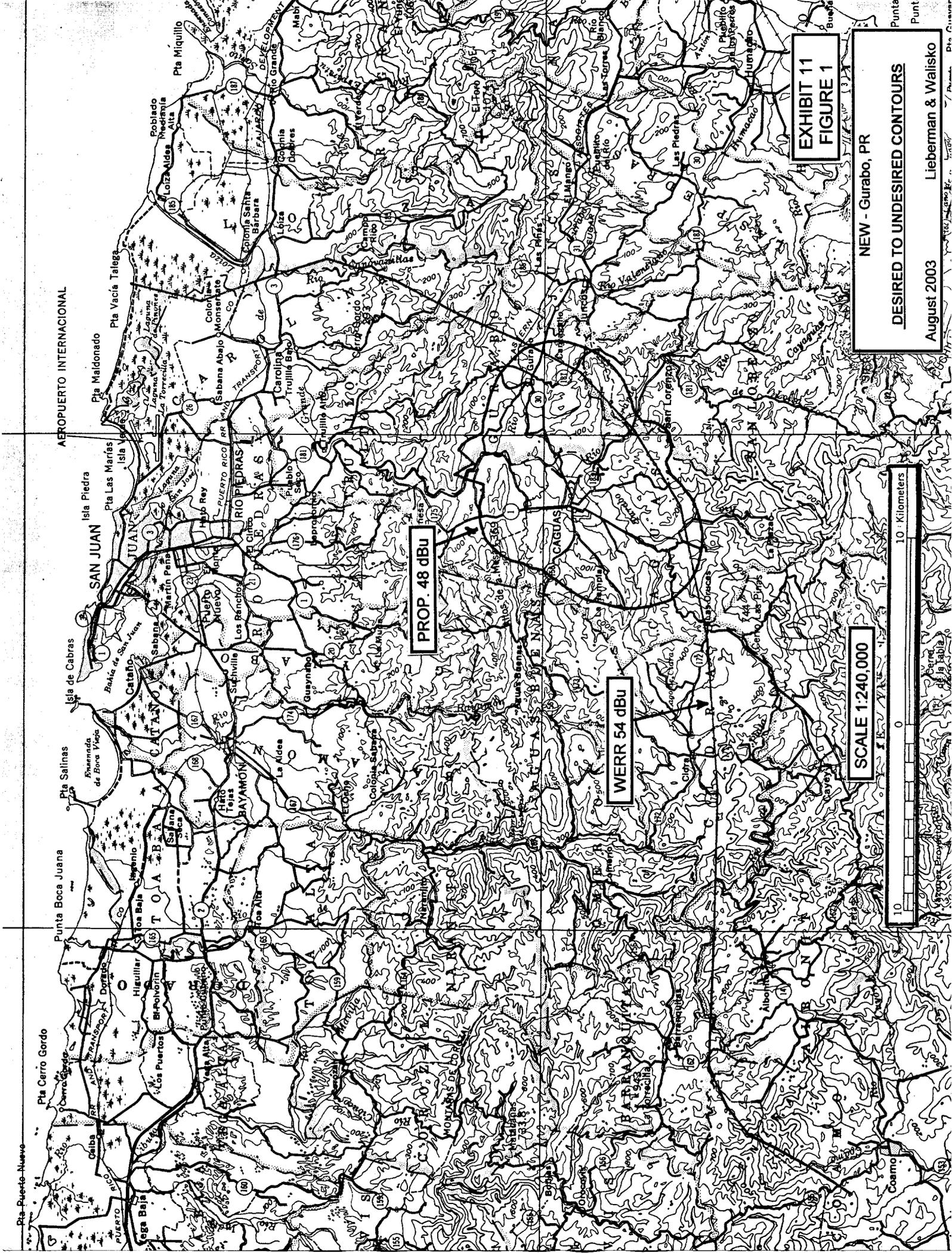
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STATEMENT WITH REGARD TO 47 C.F.R. SECTION §73.1692(a)

Applicant proposes to mount the instant proposed antenna on the AM broadcast radiator of WVJP. WVJP is a non-directional AM broadcast facility and will be secured according to the requirements of 47 C.F.R. Section §73.1692(a).

To the extent necessary, a waiver of any pertinent rule is requested on behalf of the instant application. Based upon the foregoing, it is believed the applicant has amply fulfilled the requirement of 47 C.F.R. Section §74.1204(d).



AEROPUERTO INTERNACIONAL

SAN JUAN

RIO PEDRAS

CAGUAS

PROP. 48 dBu

WERR 54 dBu

EXHIBIT 11
FIGURE 1

NEW - Gurabo, PR
DESIRED TO UNDESIRED CONTOURS
August 2003
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SCALE 1:240,000



10 Kilometers

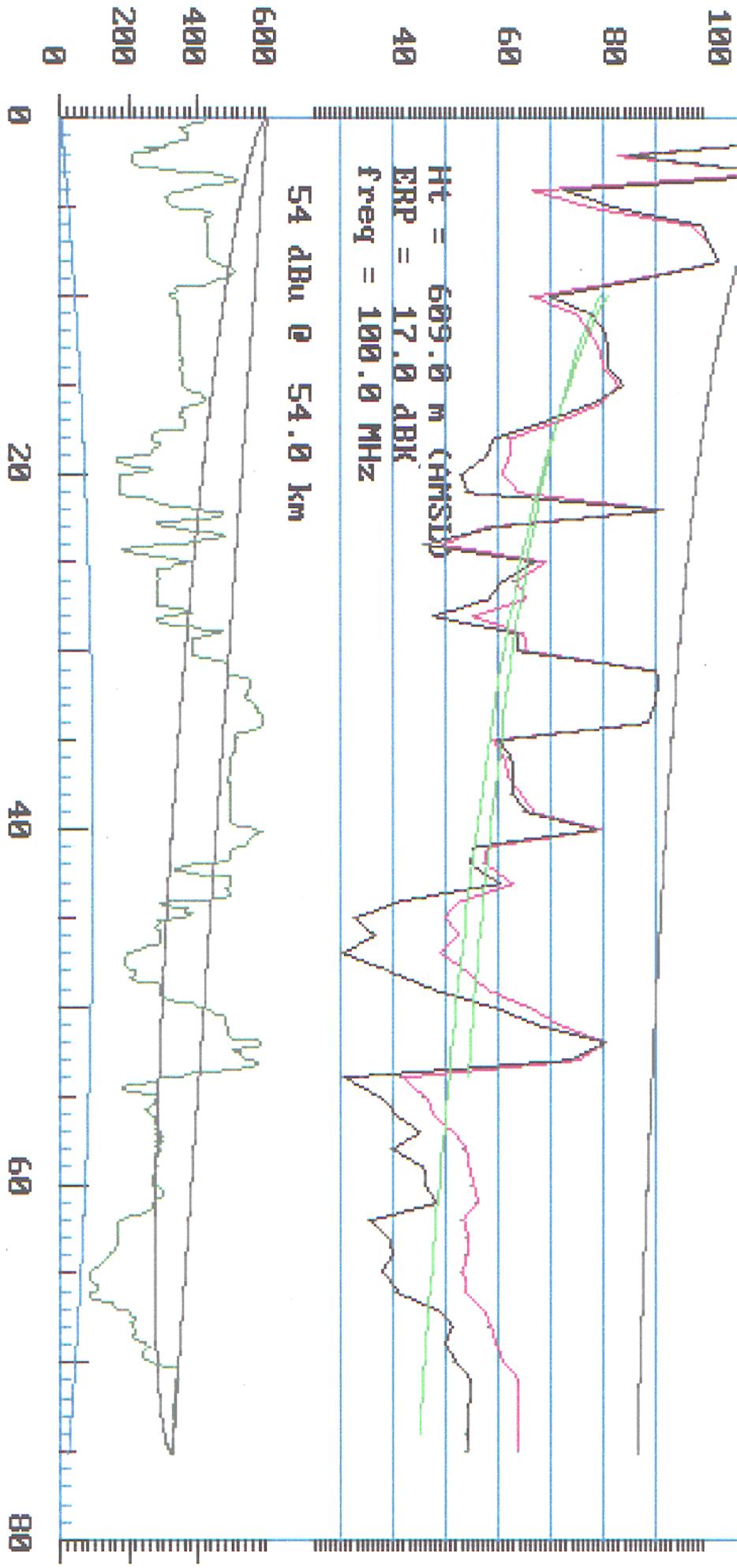


EXHIBIT 11
 FIGURE 3

NEW - Gurabo, PR

RADIAL PROFILE &
 CONTOUR VALUE USING PTP

Aug: 2003

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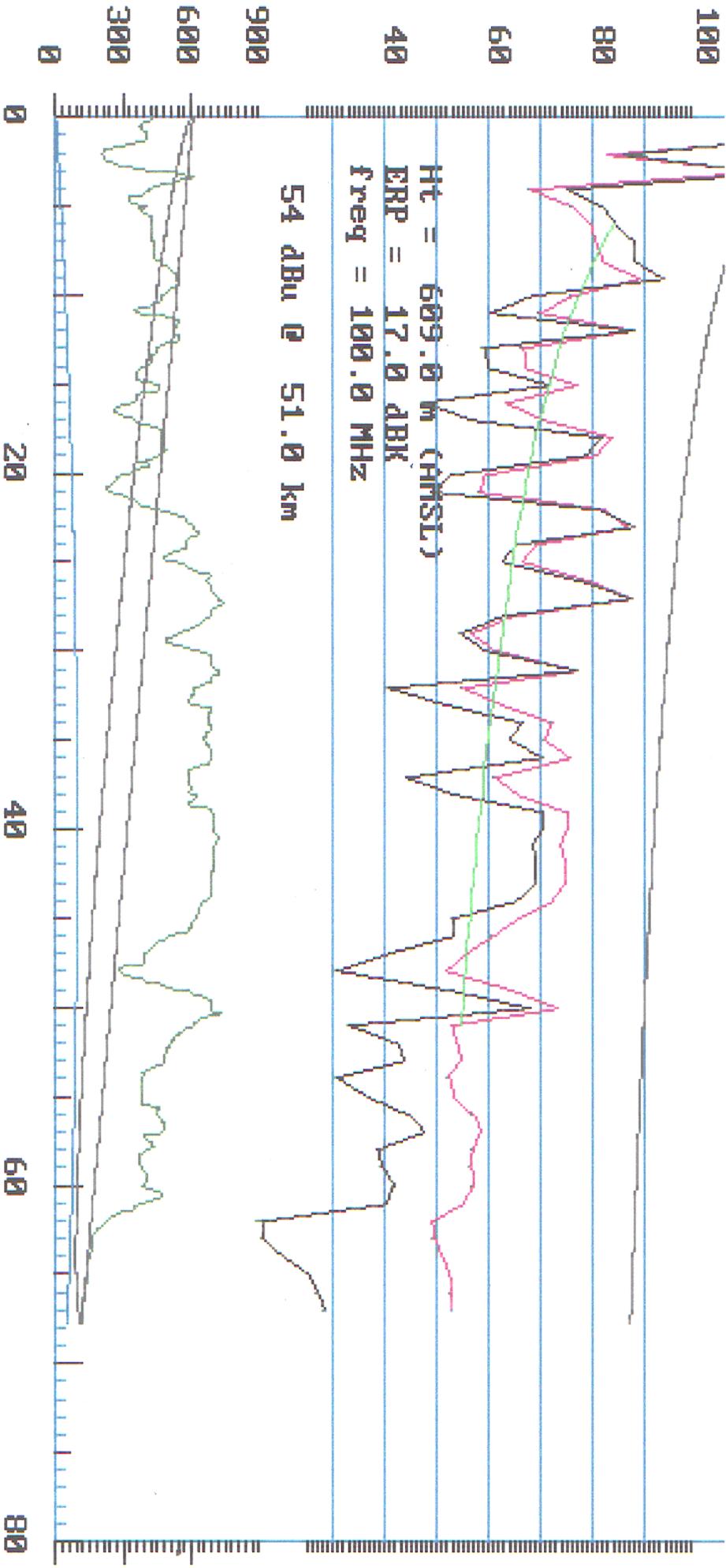


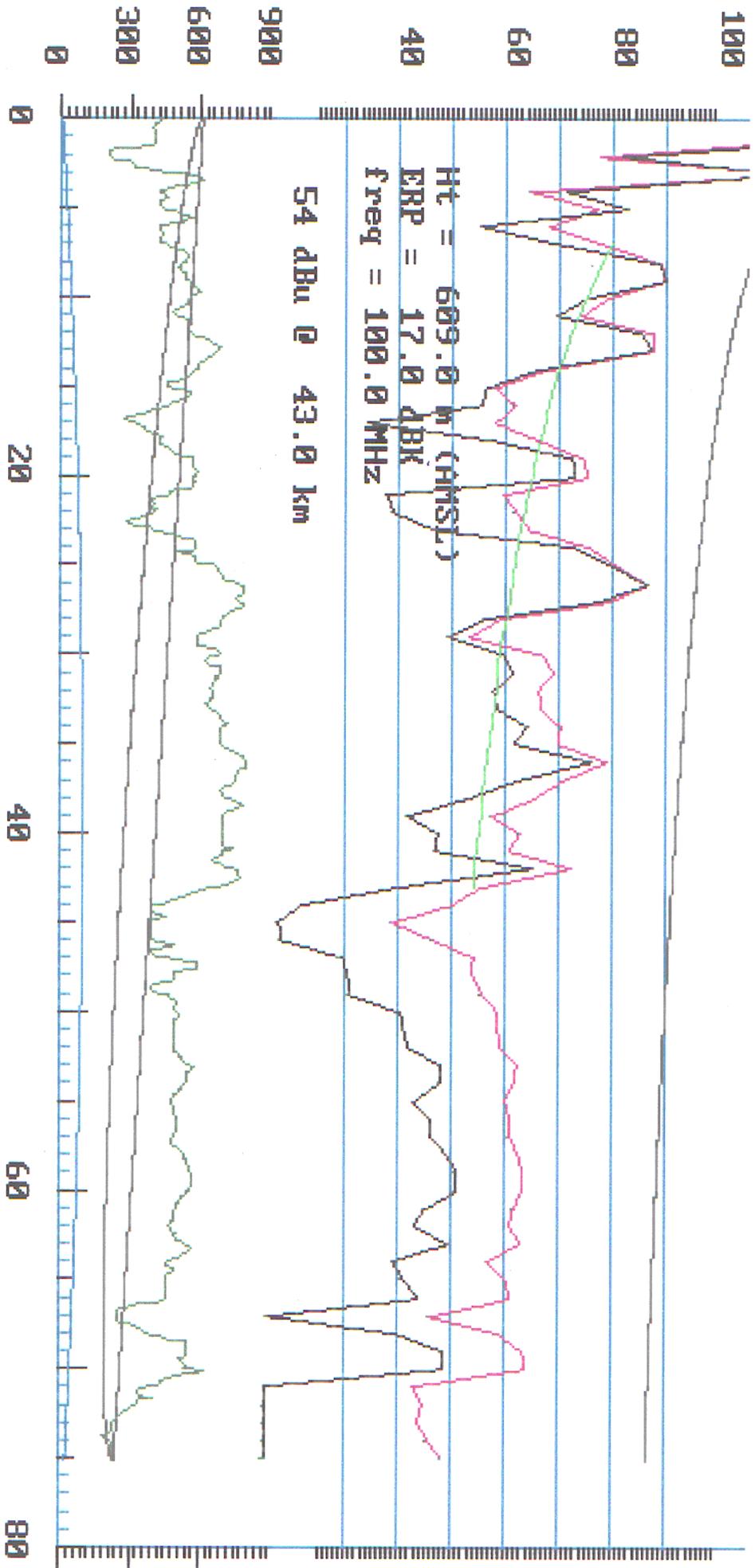
EXHIBIT 11
 FIGURE 4

NEW - Gurabo, PR

RADIAL PROFILE &
 CONTOUR VALUE USING PTP

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RADIAL = 103 Deg

EXHIBIT 11
FIGURE 5

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RADIAL PROFILE &
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DESIRED TO UNDESIED CONTOURS
NEW - Gurabo, PR
FIGURE 6
EXHIBIT 11

10 Kilometers

SCALE 1:240,000

PROP. 60 DBU

PROP. 40 DBU

W280CE. 40 DBU

W280CE. 60 DBU

AEROPUERTO INTERNACIONAL

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C
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