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February 4, 2021

**VIA IBFS**

Ms. Marlene H. Dortch  
Secretary  
Federal Communications Commission  
45 L St. NE  
Washington DC 20554

**Re: AT&T Corp. Modification of Call Sign E110107 to Add New 11m Ku-band Antenna and Telstar 11N as a Point of Communication, File No. SES-MFS-20210106-00005**

Dear Ms. Dortch:

AT&T Corp. (“AT&T”), by its undersigned counsel, respectfully submits this supplement to the above-captioned earth station modification application, which seeks to add a new 11m Ku-band antenna to the current authorization, including authority to communicate with the Telstar 11N satellite in the conventional and extended Ku-bands.<sup>1</sup> Section 25.204(e)(2)<sup>2</sup> and footnote US357 to the Table of Frequency Allocations<sup>3</sup> specify certain conditions for earth stations transmitting in the 13.75-14.0 GHz band. Specifically, the EIRP density must not exceed 71 dBW in any 6 MHz in the 13.77-13.78 GHz band, and automatic power control may be used to increase the EIRP density in a 6 MHz band in the 13.77-13.78 GHz band beyond the 71 dBW value provided that the power flux-density at the satellite in that 6 MHz does not exceed the value that would be obtained from an emission at 71 dBW in clear-sky conditions.

AT&T confirms that automatic power control will be used on the transmissions in this band and that the power control will be adjusted such that the clear-sky EIRP density of any emission in any 6 MHz in the 13.77-13.78 GHz band will not exceed 71 dBW. AT&T further confirms that the accuracy of the power control is such that, under faded conditions, the power flux density at the satellite in any 6 MHz in the 13.77-13.78 GHz band will not exceed the value that would be obtained from an emission at 71 dBW in that 6 MHz in clear-sky conditions. As requested in the instant application, AT&T seeks authorization to operate at a peak EIRP density of 25.7 dBW/4kHz in the 13.75-14.5 GHz band, which when converted to the density prescribed in US357 is equal to 57.5 dBW/6MHz—well below the 71 dBW/6MHz limit.

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<sup>1</sup> See IBFS File No. SES-MFS-20210106-00005.

<sup>2</sup> 47 C.F.R. § 25.204(e)(2).

<sup>3</sup> 47 C.F.R. § 2.106, footnote US357.

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In compliance with FCC Report & Order 96-377,<sup>4</sup> AT&T also herein attaches a Shipboard Study to demonstrate that the AT&T Roaring Creek earth station in Catawissa, Pennsylvania will not cause inference to U.S. Navy shipboard radiolocation operations (RADAR) in the 13.75-14.0 GHz band.

Please do not hesitate to contact the undersigned should you have any questions.

Respectfully Submitted,

/s/ Jennifer D. Hindin

Jennifer D. Hindin

*Counsel to AT&T Corp.*

Attachment

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<sup>4</sup> *Amendment of Parts 2, 25, and 90 of the Commission's Rules to Allocate the 13.75-14.0 GHz Band to the Fixed-Satellite Service*, Report and Order, 61 Fed. Reg. 52301 (Oct. 7, 1996).

## Attachment A

### Supplemental Interference Analysis for AT&T Roaring Creek, PA Earth Station E110107 With Respect to Naval Shipboard Radar in the 13.75-14.0 GHz Band

## 1 Introduction

This attachment provides an interference analysis of the AT&T Roaring Creek earth station in Catawissa, Pennsylvania in respect of U.S. Naval shipboard radar systems, as required in FCC Report and Order 96-377. The AT&T Roaring Creek earth station will operate in the 13.75-14.0 GHz band that is also allocated to U.S. Naval shipboard radiolocation services. Therefore, an interference analysis is required to ensure protection of these radiolocation services.

## 2 Earth Station Characteristics

Table 1 below provides the relevant AT&T Roaring Creek earth station parameters to be used in the interference analysis.

Table 1: Earth station parameters

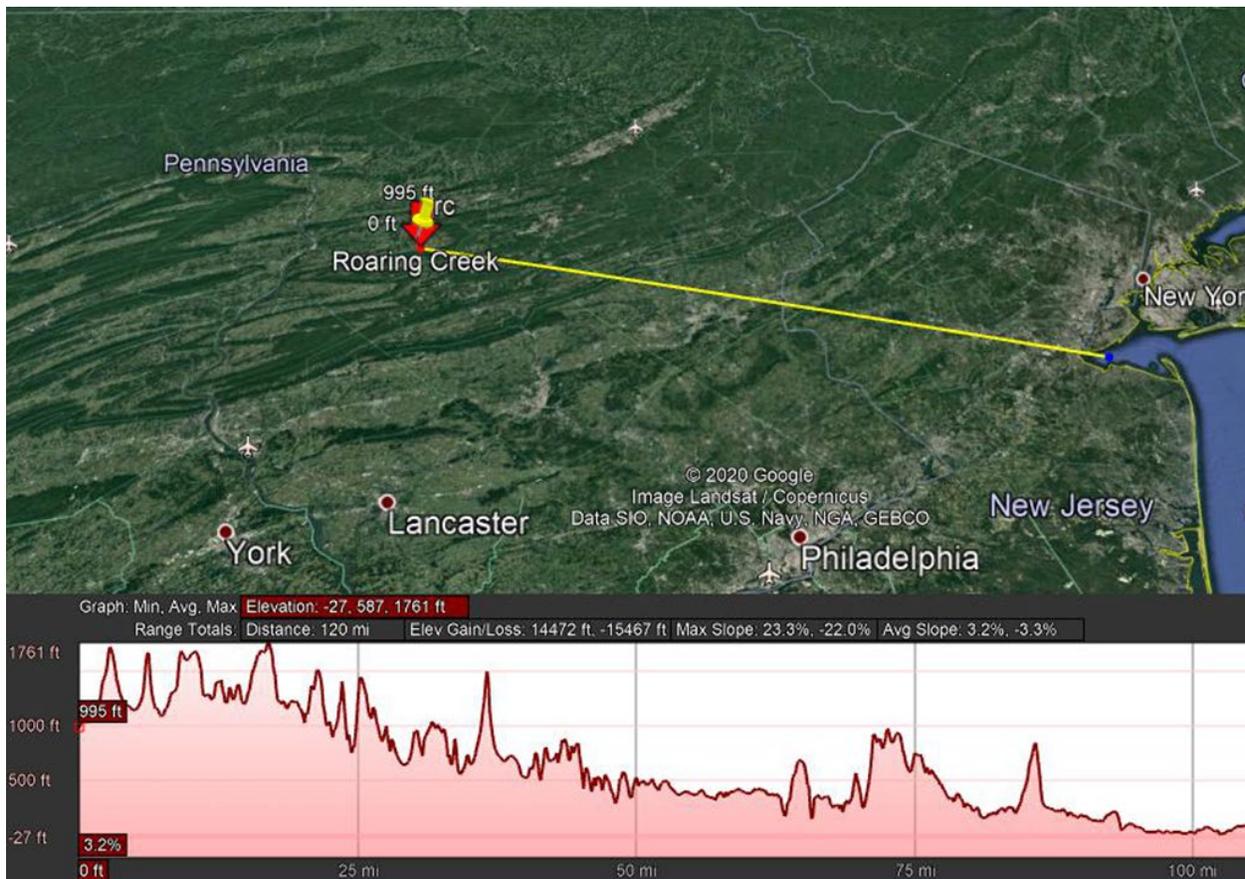
Parameter	Value
ES location (NAD83)	40° 53' 34.1"N/76° 26' 23.1"W
ES elevation (AMSL)	294.74 m
Satellite receiving transmissions	Telstar 11N (S2357) @ 37.5W.L.
ES antenna size	11 meters
Transmit freq band	13.75-14.0 GHz
Polarization	Horizontal and Vertical
Emission	36M0G9W
Maximum aggregate transmit power into antenna	20.0 dBW
Maximum transmit power density into antenna	-19.5 dBW/4kHz
Peak antenna gain	62.5 dBi
Maximum EIRP	82.5 dBW
Maximum EIRP density	43.0 dBW/4kHz
Minimum ES elevation angle	9.0 degrees
Antenna gain at horizon (assuming 32-25log( $\Theta$ ) pattern)	8.1 dBi
Maximum EIRP density towards horizon	-11.4 dBW/4kHz

## 3 Interference Analysis

The FCC's Report and Order 96-377 determined that FSS earth stations transmitting in the 13.75-14.0 GHz band must protect radiolocation receivers on board ships to a power flux-density level of -167 dB(W/m<sup>2</sup>/4kHz). The following analysis is used to demonstrate compliance with this criterion.

The AT&T Roaring Creek earth station is 195 km west-northwest of the nearest point to the Atlantic Ocean, at Raritan Bay near the New York/New Jersey border, as shown in Figure 1. The elevation profile between Catawissa, Pennsylvania (Roaring Creek) and Raritan Bay, also shown in Figure 1 indicates there is a large ridge of high terrain a few miles to the east, southeast and south of Roaring Creek. Therefore, no line-of-sight path exists between Roaring Creek and the Atlantic Ocean, resulting in significant propagation losses due to terrain and diffraction.

Figure 1: Path from Roaring Creek ES to nearest shore



Recommendation ITU-R P.526-15, Propagation by Diffraction, provides calculations and charts for determining propagation loss as a function of frequency and separation distance. Figure 3 (“Diffraction by a spherical Earth – effect of distance”) of this Recommendation indicates that at 14.0 GHz and for a separation of 195 km, the additional diffraction loss, in relation to free space path loss, is in excess of 350 dB. This amount of diffraction loss due to the surrounding terrain will therefore ensure that emissions from the AT&T Roaring Creek earth station will not exceed the protection criterion for shipboard radar systems at the nearest location in the Atlantic Ocean. This statement is further supported by the calculation below:

PFD at nearest shipboard site = Maximum EIRP density – spreading loss – additional losses.

Maximum EIRP density towards the horizon: -11.4 dBW/4kHz.

Spreading loss:  $10 \cdot \log(4\pi d^2) = 10 \cdot \log(4 \cdot \pi \cdot (195,000)^2) = 116.8$  dBW/m<sup>2</sup>.

Additional losses (Rec. ITU-R P.526-15): > 350 dB.

Free space PFD at nearest shipboard site = -11.4 – 116.8 = -128.2 dBW/m<sup>2</sup>/4kHz.

When applying an additional +350 dB of diffraction loss to this free space PFD, the protection limit of -167 dBW/m<sup>2</sup>/4kHz is easily met. Therefore, emissions from the AT&T Roaring Creek earth station should not produce interference to any U.S. Navy shipboard radar systems.