

Supplemental Frequency Coordination Study for Helicopter Operations

Following discussions with TV broadcasters related to the Frequency Coordination Study for the Proposed EESS Uplink near Pendergrass, Georgia¹, one additional area of concern surfaced.

This was the use of helicopters for news operations.

Helicopters are used by the TV stations principally in two ways. The first is as news gathering platform where content is generated onboard the helicopter itself and transmitted to a TV tower within range. This first type of helicopter usage is not affected by the command uplinks from the TT&C site.

The other use is for "bounce shots". The need for a bounce shot arises when a transmitter on the ground does not have a good line of sight to a nearby TV tower. To facilitate transmission of the desired program feed to the TV station, a helicopter equipped with special relay equipment is dispatched to the area. The helicopter flies within line of sight of both a TV tower and the ground based transmitter and relays (bounces) the transmission from the ground station to the TV tower.

When supporting bounce shot operations, helicopters typically fly 500 ft above ground level (AGL) over the transmitter on the ground, but may operate as high as 2000 ft AGL.

The area where the Pendergrass TT&C station is to be operated is fairly rural and well removed from the Atlanta metro area but generally within view of the Flowery Branch tower so helicopter bounce shots are not expected to be common in this region. The exception is an identified use for relay of video from cars racing at the Road Atlanta facility located approximately 13 km from the Pendergrass site. These events occur a few times per year and are well known in advance and thus can easily be coordinated.

To determine the area where helicopter bounce shots could potentially be affected, an Area Analysis using the Transfinite Visualyse software was performed. This analysis used the same receiver performance and I/N protection criteria used by Dane Ericksen, P.E., in his Frequency Coordination Study. These are, a receiver noise threshold of -105 dBm and a 0.5 dB degradation criteria, which equates to an I/N of -9 dB. Thus, the interference level must be -114 dBm (-144 dBW) or less to satisfy the protection criteria.

In configuring the Visualyse simulation, a fixed elevation angle of 10 degrees was used for the Pendergrass TT&C stations. This is because the Pendergrass TT&C station will be communicating with the Planet Labs EESS constellation which operates using a non-geostationary orbit. Accordingly, the pointing of the antenna over time could be at any azimuth or elevation angle within the programmed limits. By using a fixed 10 degree elevation angle,

¹ See Exhibit A

and then scanning a full 360 degrees in azimuth during the simulation, this ensures that every location tested within the area analysis will see the full potential of the TT&C station's transmit output.

The results in Figure 1 and Figure 2 below show the potentially affected area when the helicopter is operating at 500 ft AGL and at 2000 ft AGL respectively. The green contour represents an interference level of -114 dBm (-144 dBW) at the victim receiver and the orange and black contours represent -109 dBm and -119 dBm respectively.

Conclusion

In actual operation, the command uplink transmissions to the EESS satellites only occur for tens of seconds for any given satellite, which may be at an azimuth and elevation angle well removed from the direction towards the helicopter. Thus, the joint probability of the helicopter being in operation and the antenna pointing along the azimuth to its direction while commanding is very low. Due to the infrequent nature of helicopter bounce operations in the rural area where the TT&C site is located, coordination of TT&C transmissions while the helicopter is active in the area can be achieved.

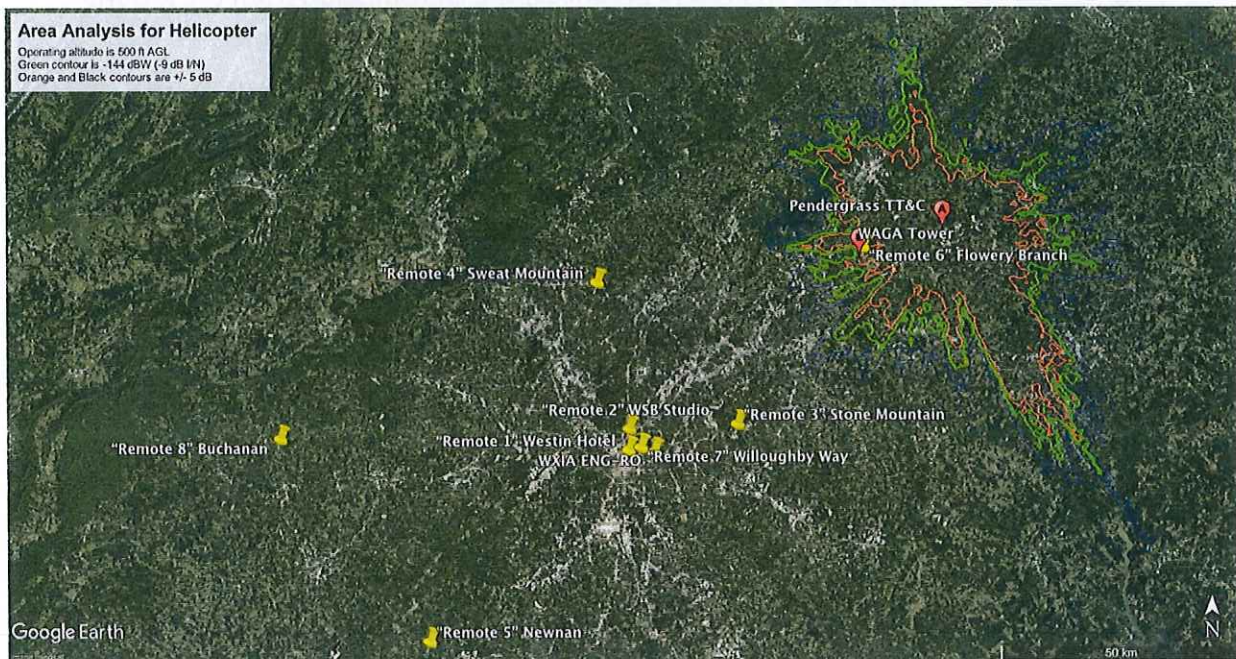


Figure 1 Area Analysis for Helicopter at 500 ft AGL

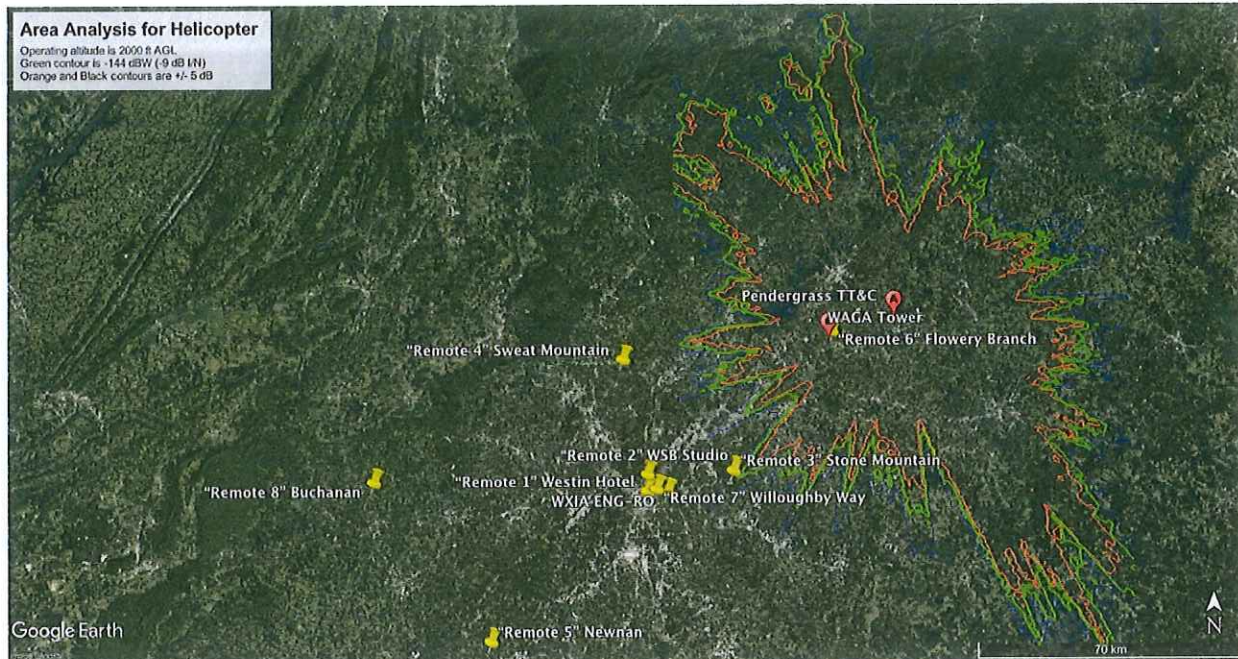


Figure 2 Area Analysis for Helicopter at 2000 ft AGL

DECLARATION

I, Daryl T. Hunter, hereby make the following declarations under penalty of perjury. I understand that this Declaration will be submitted to the Federal Communications Commission.

1. I am Senior Director, Regulatory Affairs of ViaSat, Inc.
2. I have prepared or reviewed the technical information in the foregoing Description of Application and Supplemental Frequency Coordination Study for Helicopter Operations, and such information is true and correct to the best of my knowledge, information and belief.



Daryl T. Hunter
 Daryl T. Hunter, P.E.

Executed October 24, 2016