World View
Experimental License Renewal Application
File No.: 0704-EX-CR-2021

Explanation of Experiment

Company Description/Overview:

World View, a Tucson, Arizona based company, was founded to build and launch stratospheric, lighter-than-air balloons carrying a range of payloads. See Figure 1 below for an image of a Stratollite. World View's customers range from the US Department of Defense to private citizens to commercial enterprises looking to take advantage of a platform that can bring them to the edge of space.

World View is seeking to renew this authorization to operate radios that carry telemetry data from its stratospheric balloon during its mission.

World View has been working with customers to demonstrate the capabilities of its Stratollite system. The license originally granted was for operations that were to last about a year. However, due to the effects of the pandemic on personnel, and customer travel schedules, this experimentation has been delayed, and World View is currently seeking an authorization that will allow it to keep working on the technology integration and demonstration for its customers. World View is seeking only the limited area of operations that were agreed to when initially World View worked with AFTRCC on an STA that covered these operations in 2020.

Technical Synopsis:

- Spectrum requested: at five specific locations 2360-2483 MHz; mobile in Texas: 2400-2483 MHz
- Power levels: 8 W mimo operations, with 5 dBi gain from airborne transmitter
- Limited time of use: ground testing just a few hours, airborne only during flights
- Balloon will operate at 50,000 to 80,000 feet
- Radio operations are directional

Description of Operations:

World View is seeking renewed authorization for operation of a data link system to transmit information from its Stratollite to a mobile ground station that tracks the balloon while it is in flight. The proposed test flights will operate in portions of Texas and Utah, in the areas depicted below in Figure 2.

The radios are tested to see how far the radio links will reach while delivering reliable information, and the radios will be tested to determine the speed of the data transmissions

that can be achieved across various distances. These tests are being conducted to show World View's potential customers the capabilities of the stratollite platform.

Data link: After the launch, the MIMO data link will be in use periodically through the flight. The plan is to use a narrower segment of spectrum, 2400-2483 MHz for general flight operations. The broader spectrum band 2360-2483 will be in use only over the specifically designated locations in Figure 2, which will be very limited in time, perhaps 96 hours per site, no more. The downlink will be used to transmit high-resolution imagery and other telemetry data from the balloon to the ground station. Given the altitude of the balloon, 10 miles or more from earth, the signal at ground level will be very low.

Figure 1. World View Stratospheric Balloon

Area of Operation: see *Figure 2* below:

Portions of Texas
Portions of Utah

The Stratollite movement is controlled by upper atmosphere wind patterns, so each flight will be somewhat different. Weather patterns and travel restrictions have placed significant constraints on World View's ability to test and demonstrate its technology. This application seeks authorization for ongoing testing to allow World View to complete its

series of customer demonstrations over the next 12 months. The general mobile spectrum request will cover operations of the Stratollite while it is in flight from the launch site to the demonstration sites. Then, the specific operations will take place that are for customer demonstrations. It is anticipated that the customer demonstrations will last only for a small percentage of the hours of the flight.

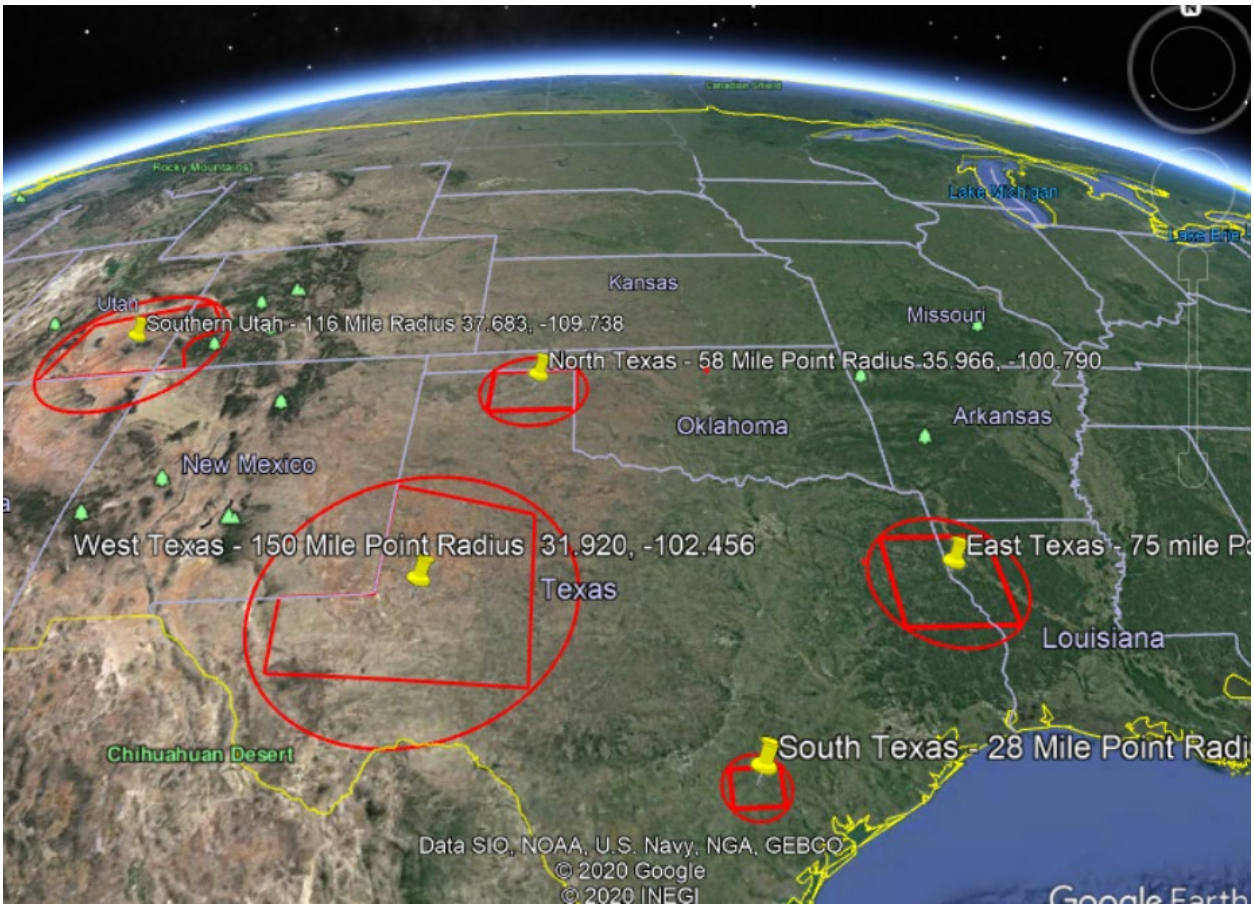

Figure 2. Proposed area of demonstration operations

To optimize the functioning of the radio systems, World View has built a mobile command center that uses a directional antenna to track and receive telemetry information from the transmitter on the Stratollite.

Minimization of risk of interference:

To minimize any potential interference, World View has worked to design a system that puts the most gain into the receive antenna rather than adding power to the transmitter.

FAA Coordination:

World View has worked with the FAA on this and other FCC applications that it has filed as it develops its stratollite platform. World View is mindful that the FAA wishes to restrict the operations unlicensed radios incorporated into lighter-than-air balloons.

As World View agreed when the FAA reviewed the initial STA application for these operations, the 2400-2483 MHz link will not be used to ascend or descend to earth. The RF link is only be used once the balloon is at altitude, between 50,000 and 80,000 feet to adjust the altitude of the balloon. World View respectfully requests that the FAA give its concurrence to this application, as World View continues with these demonstrations. World View continues to work with vendors to identify alternative radios that could be used to deliver the same performance with a mass that the stratollite can support.

Limited Time of Use:

World View is seeking an authorization for an additional twelve months of operations. However, it will only be operating its stratollite platform for 4-5 days per month, at the most, out of the requested 12 months. The company needs time flexibility to address concerns about weather, travel, and personnel availability due to the pandemic's effects on staffing.

World View has also sought experimental authority to test a new radio system, an application that is pending at the FCC. If the new radio system is effective, World View has an option that would allow it to move away from the radios used under this license. But, this license is needed until the other testing is proven to be successful.

Prior Coordination:

As a part of World View's negotiation with AFTRCC in the summer of 2020, World View has agreed to coordinate its operations using 2360-2390 MHz over the specific demonstration areas with the DOD-AFCs responsible for those areas. World View will work with the DOD-AFCs in advance of the flight to provide information about the probable launch window. The weather and wind variability makes it impossible to pre-schedule the flights at the time of the filing. World View intends to work on coordinated scheduling as soon as possible.

Second, after the launch, World View will coordinate more specifically with each DOD-AFC regarding the expected time when the flight operations are going to use the 2360-2483 MHz band over a particular target area. World View will give at least 24 hours prior notice to the relevant DOD-AFC of the stratollite operations in the area. To the extent possible, World View will keep the relevant DOD-AFCs informed of all flight progress. Further, World View will be in regular communication with the FAA about its flight operations before and throughout the flight.

These efforts should minimize the impact of these high altitude flights on any other users of the 2360-2390 MHz telemetry band.

Stop Buzzer Point of Contact:

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Conclusion:

World View continues to develop its stratospheric balloon platform for a range of government and an emerging sector of commercial customers. As part of the development of the balloon and the business case, World View needs additional time to demonstrate its new capabilities to determine what can be achieved over distances and varying altitudes. The proposed demonstrations will allow World View to show its customers the distances and throughputs it can achieve in imaging. This is essential to the growth of the industry and, in particular, to the growth of this company.

If there are any questions about this application, please contact Anne Cortez, WFS, 520-360-0925 or alc@conspecinternational.com.