Test Description 1695-1710 MHz

Explanation

Please explain in the area below why an STA is necessary:
A STA is necessary due to a short development and test period. The test will be accomplished at a low power to do initial validation of the test system.

Purpose of Operation

Please explain the purpose of operation:
The Special Temporary Authority is for an LTE emulation transmitter test both in Aerospace facility and Department of Commerce (DOC) Table Mountain Field Site & Radio Quiet Zone in Boulder, CO (https://www.its.bldrdoc.gov/resources/table-mountain/tm-home.aspx). The LTE emulation transmitter test will prepare the Aerospace Corporation to understand cellular use impact on the services that utilize the frequency band from 1695 to 1710 MHz. This test will validate Aerospace's capability to assess the impact of cellular migration into the pre-defined AWS-3 coordination zones. This test will include a LTE-like transmitter mounted to a vehicle which will function as a cellular user. The test will be accomplished at low power levels (EIRP less than 20 dBm). The test will be performed at the Aerospace Corporations El Segundo Campus and will greatly enhance our understanding of the system and improve the equipment for future testing. Same test will be repeated in the DOC Table Mountain facility in Boulder, CO, as a government-controlled test (by NOAA). This test will include two LTE-like transmitters mounted to two vehicles which will function as two cellular users. Each of transmitter's power level is less than 20 dBm.

Manufacturer

Number of Units: 1 (Aerospace facility, California), 2 (DOC Table Mountain in Boulder, Colorado)

Station Location

Location 1: EL Segundo California North 33 25 45 West 118 22 29

Location 2: DOC Table Mountain Field Site & Radio Quiet Zone in Boulder, CO

- Transmitter 1: 40° 8' 18.9" N, 105° 15' 17.0" W (40.138584, -105.254712)
- Transmitter 2: 40° 8' 53.9" N 105° 13' 54.7" W (40.148302, -105.231859)

Datum: NAD 83

Action Frequency: 1695 – 1710 MHz

Output Power: 0.1 W

Modulation Signal: LTE and QPSK

Figure 1 shows the locations of Transmitter 1 and 2.

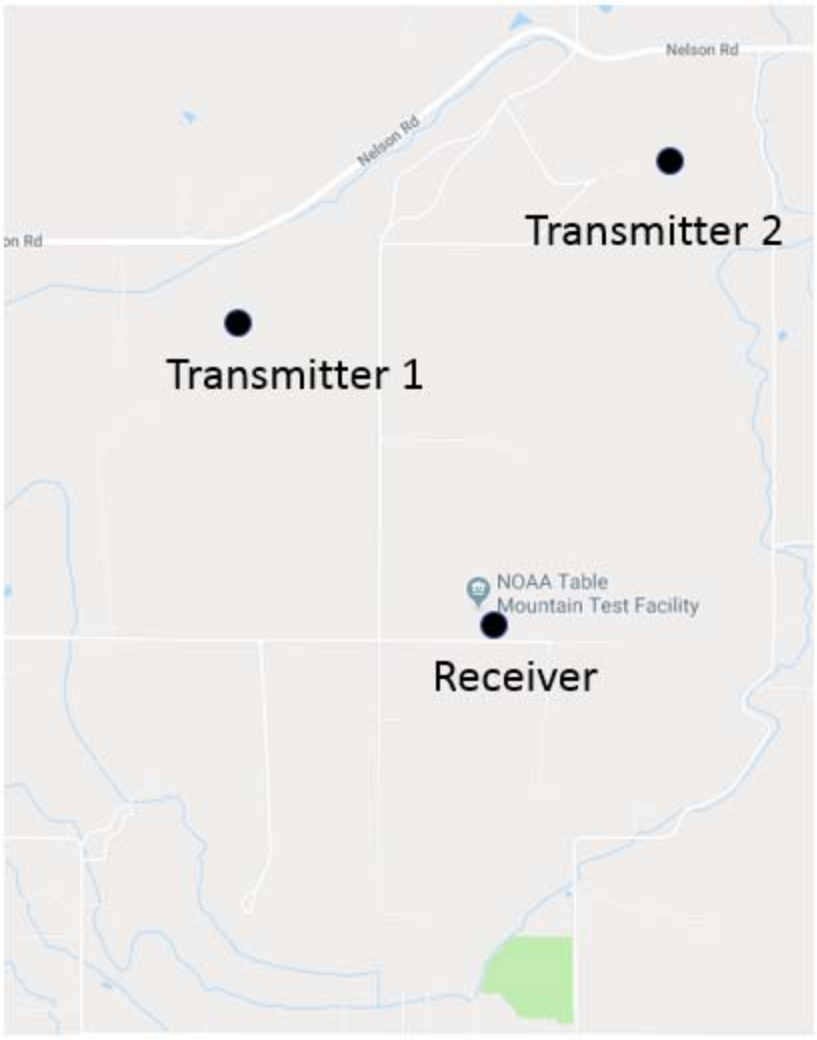

Figure 1. Transmitter locations in Boulder, Colorado

The LTE emulation transmitter test will prepare the Aerospace Corporation to validate cellular use in the frequency band from 1695 to 1710 MHz. This test will provide the capability to assess the impact of cellular migration into the pre-defined AWS-3 coordination zones. This test will include a LTE-like transmitter mounted to a vehicle which will function as a cellular user. The test will be accomplished at low power levels (EIRP less than 20 dBm). The test will be performed at the Aerospace Corporation's El Segundo Campus and will greatly enhance our understanding of the system and improve the equipment for future testing.

The LTE-like transmitter will consist of a Signal Generator, attenuator, band pass filter, amplifier and low gain Omni directional antenna. The signal generator will be an industry standard generator that is capable of generating the latest LTE version. The attenuator will provide accurate control of the signal from the signal generator. The band pass filter will ensure that the signal is free of unwanted harmonics and spurious signals. The amplifier and antenna are going to be operated to ensure linear operation which will limit any additional erroneous signals.

The signals will be received by a similar Omni antenna and supporting electronics to see the signal on a

spectrum analyzer located a short distance away (less than 200 meters). Figure 2 shows the test setup.

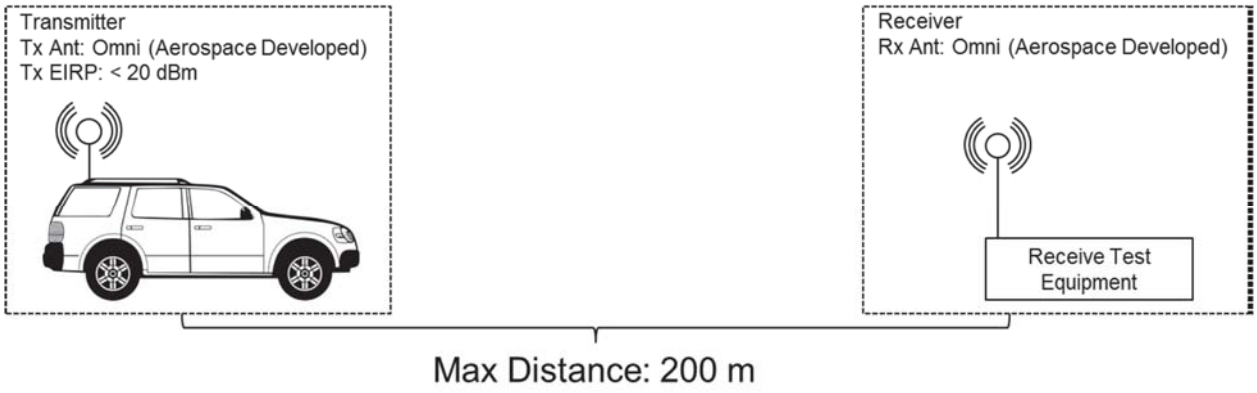

Figure 2. Test Diagram in EL Segundo, California

Same test performed in El Segundo, California will be repeated in the DOC Table Mountain facility in Boulder, CO, as a government-controlled test (by National Oceanic and Atmospheric Administration (NOAA)). This test will include two sets of LTE-like transmitters mounted to two vehicles which will function as two cellular users at two locations. The test will be accomplished at low power levels. Each of transmitter's power level is less than 20 dBm. The test will be performed to validate cellular use in the frequency band from 1695 to 1710 MHz. The LTE-like transmitter will consist of a Signal Generator, attenuator, band pass filter, amplifier and low gain Omni directional antenna. The transmitted signals from two locations will be received by a similar Omni antenna and supporting electronics to see the signal on a spectrum analyzer located 1500 ~ 2000 meters distance away. Figure 3 shows the test setup.

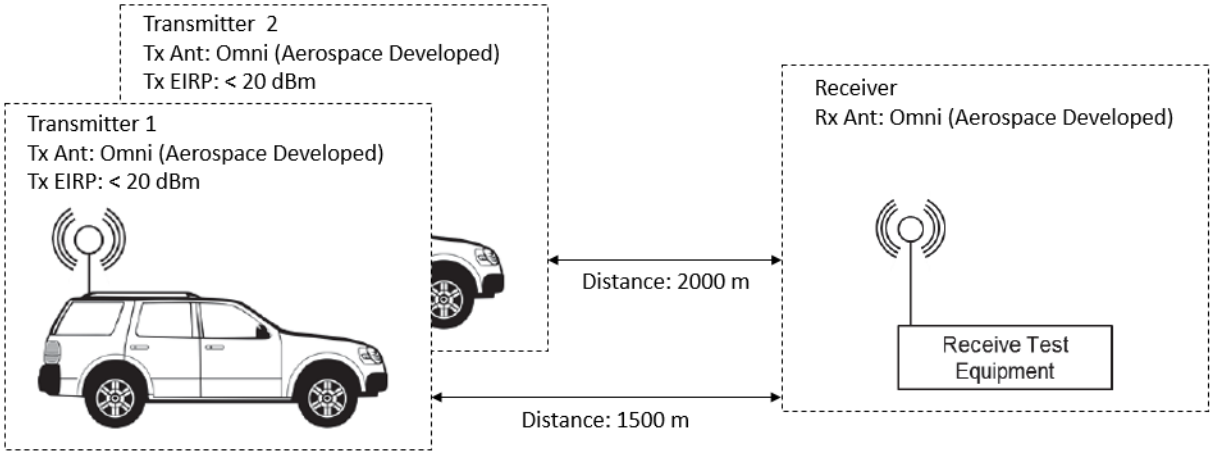

Figure 3. Test Diagram in Boulder, Colorado