

## **Application #4**

### **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 in Harris facility in Palm Bay, FL next to Harris Technology Center (HTC) (<https://www.harris.com/locations/palm-bay-0>), as a government-controlled test (by National Oceanic and Atmospheric Administration (NOAA)). 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 two LTE-like transmitters mounted to two vehicles which will function as two low power of base stations. The cellular standards – the 3<sup>rd</sup> Generation Partnership Project (3GPP) defined Band 70 where 1695 to 1710 MHz is uplink for user use and 1995 – 2020 MHz (AWS-3 spectrum) is downlink as a pairing downlink frequency band. We will use the 1995 – 2020 MHz to transmit signals. The test will be accomplished at low power levels. Each of transmitter's power level (EIRP) is less than 0 dBm. The test will be performed at the Harris test range and will greatly enhance our understanding of the system and improve the equipment for future testing.

### **Manufacturer**

Number of Units: 2 (Harris Test Facility in Palm Bay, FL)

### **Station Location**

Location 1: Harris Test Facility in Palm Bay, FL

- Transmitter 1: 28° 1' 45.0582" N, 80° 35' 51.8958" W (28.029183, -80.597749)
- Transmitter 2: 28° 1' 38.6106" N 80° 36' 3.348" W (28.027392, -80.600930)

**Datum:** NAD 83

Action Frequency: 1995 – 2020 MHz

Output Power: 0.001 W

Modulation Signal: LTE and QPSK

Figure 1 shows the locations of Transmitter 1 and 2.

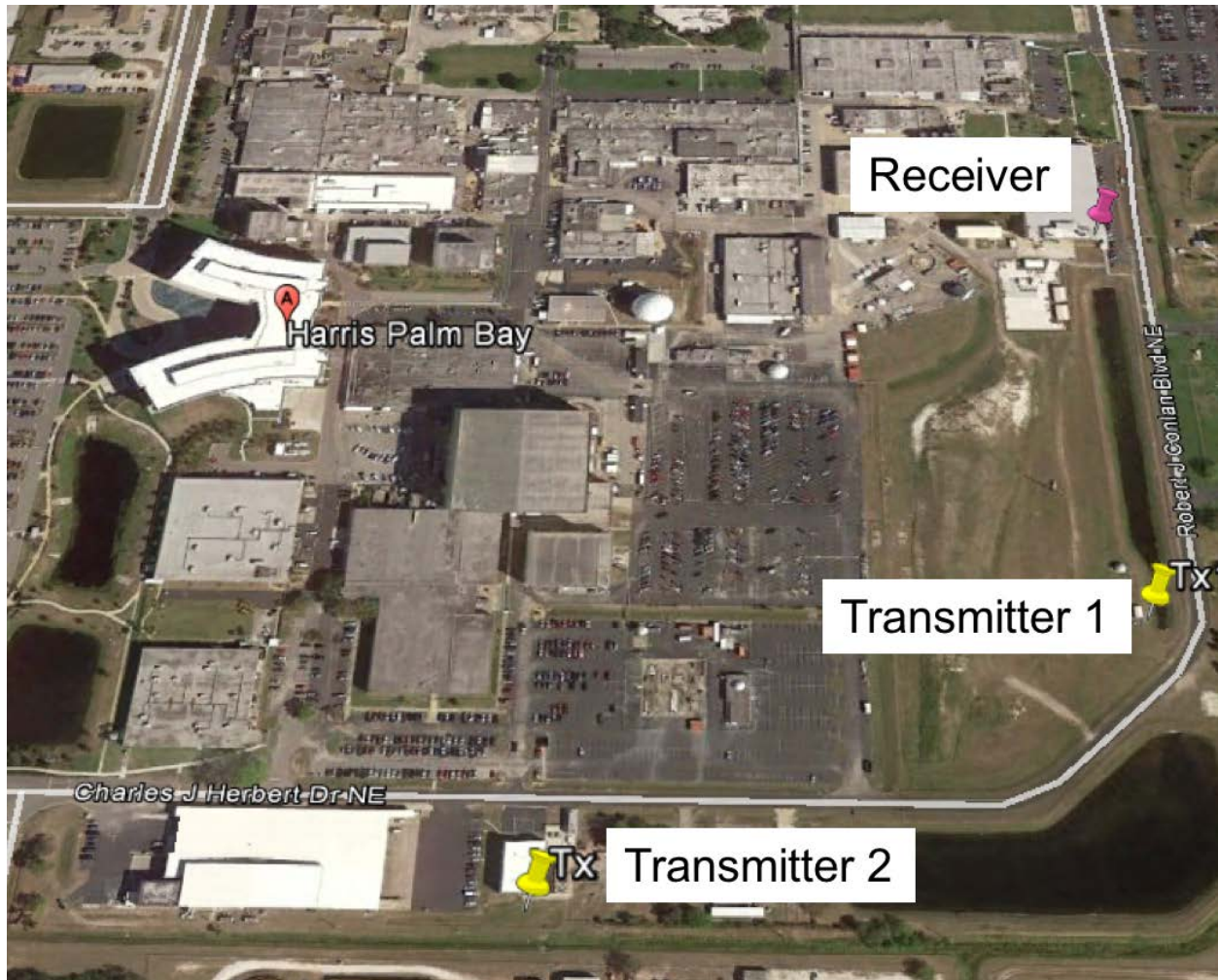


Figure 1. Transmitter locations in Palm Bay, Florida

The LTE emulation transmitter test will prepare the Aerospace Corporation to validate cellular use in the frequency band from 1695 to 1710 MHz, as a government-controlled test (by National Oceanic and Atmospheric Administration (NOAA)). 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 two LTE-like transmitters mounted to two vehicles which will function as two base stations at two locations. The test will be accomplished at low power levels not like real base stations with high powers. Each of transmitter's power level is less than 0 dBm. The test will be performed at the Harris test range and will greatly enhance our understanding of the system and improve the equipment for future testing. As a pairing band of uplink 1695 to 1710 MHz, the downlink frequency band of 1995 – 2020 MHz can be used to transmit our downlink signals.

Each LTE-like transmitter will consist of a Signal Generator, attenuator, band pass filter, amplifier and low gain Omnidirectional 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 transmitted signals from two locations will be received by a similar Omnidirectional antenna and supporting electronics to see the signal on a spectrum analyzer located 280 ~ 550 meters distance away. Figure 2 shows the test setup.

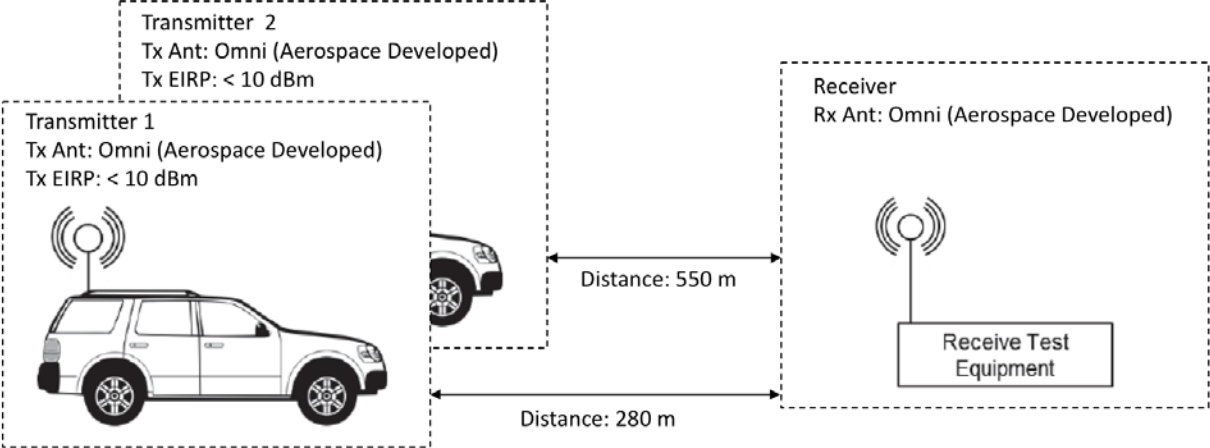


Figure 2. Test Diagram in Palm Bay, Florida