Justification for filing application for Special Temporary Authority (STA) from Federal Communications Commision

Date: 10/27/2022

Applicant Main Address:
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Applicant Physical Address:
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Applicant: Glen Franson, glen.franson@caci.com, 303-920-6147, RF Test Engineer, FRN 0033021486

Applicant at Test Location: Jonathan Quinn, jonathan.quinn@caci.com, 303-920-5309, RF Development Engineer, FRN 0033026162

Test Location:
Yuma Proving Grounds, Cibola Range, North UAV facility
301 C St.
Yuma, AZ 85365
(La Paz County and Yuma County)

Test Location Coordinates:
- Latitude: 33° 21’ 15” N, Longitude: -114° 16’ 36” W

Test Operation Period: 11/7/2022 – 12/2/2022 (Note: Actual test expected to last 3-4 days, from 0700-1600 each day)

Test Platform: Jump-20 UAS

Test Hardware:
- Cinara R2 Base Station Router R2.2(P)
- Ghost Mantis R3 Configurable Front End (HxPA R3.1)
- Ghost Mantis Duplexer for 900 MHz Band, Hx9(8) R2.2
- Ghost Mantis Duplexer for 1900 MHz Band, Hx19(2) R2.1(P)

Test Antennas:
1. Nextivity, A52-V32-100, Directional Panel Antenna, Vertical Polarization, 6.5 dBi Gain in 698-960 MHz, 9 dBi Gain in 1710-2700 MHz, Beamwidth for Horizontal (AZ)/Vertical (EL) is 65°/55° respectively.
2. SureCall, SC-248W, Directional Panel Antenna, Vertical Polarization, 7 dBi Gain in 698-960 MHz, 10 dBi Gain in 1700-2700 MHz, Beamwidth for Horizontal (AZ)/Vertical (EL) is 70°/55° respectively for 698-960 MHz and 60°/45° respectively for 1700-2700 MHz.
3. Southwest Antennas, 1004-032, Directional Panel Antenna, Vertical Polarization, 9 dBi Gain in 1700-2500 MHz, Beamwidth for Horizontal (AZ)/Vertical (EL) is 55°/65° respectively.
4. LGS Innovations, Helios S6 Wideband Spiral Antenna, Directional Panel Antenna, Circular Polarization, 5.1 dBi Gain in 698-960 MHz, 7.7 dBi Gain in 1710-2700 MHz, Beamwidth 80°.

Test Emission Designators:
- GSM (Band: EGSM-900): 253KGXW
- GSM (Band: PCS-1900): 247KGXW
- UMTS (Band: 900, VIII): 4M18D7W

- UMTS (Band: 1900, II): 4M25D7W

Test Max Power Levels:

- GSM (Band: EGSM-900): 20W (43dBm) Avg, 20W (43dBm) PEP
- GSM (Band: PCS-1900): 20W (43dBm) Avg, 20W (43dBm) PEP
- UMTS (Band: 900, VIII): 20W (43dBm) Avg, 89W (49.5dBm) PEP
- UMTS (Band:1900, II): 20W (43dBm) Avg, 89W (49.5dBm) PEP

Test Frequencies (Note: Adjust if necessary to minimize site interference):

- GSM (Band: EGSM-900): Channel 38, Tx Frequency = 942.6 MHz, Rx Frequency = 897.6 MHz
- GSM (Band: PCS-1900): Channel 661, Tx Frequency = 1960.0 MHz, Rx Frequency = 1880.0 MHz
- UMTS (Band: 900, VIII): Channel 3013, Tx Frequency = 942.6 MHz, Rx Frequency = 897.6 MHz
- UMTS (Band:1900, II): Channel 9800, Tx Frequency = 1960.0 MHz, Rx Frequency = 1880.0 MHz

Test Flight Pattern:

- Antenna will be mounted to UAV and pointing down at 45 degrees.
- Flight altitude will be between 1,000 and 10,000 feet AGL
- Flight radius will be a maximum of 10,000 feet.

Justification for STA:

Request an STA for cellular antenna testing to be conducted 11/7/2022 – 12/2/2022 at Yuma Proving Grounds (Note: Actual test expected to last 3-4 days, from 0700-1600 each day). These tests will be temporary and non-recurring where a regular authorization is not appropriate. Testing will be conducted using GSM in bands EGSM-900 & PCS-1900 and using UMTS in bands 900 (band 8) & 1900 (band 2).

Purpose of Operation:

The purpose of the operation is to compare the transmission effectiveness of different antennas on a UAV platform in the air by measuring the receive levels on the ground using a reference antenna.