



A Textron Company

October 08, 2019

**Federal Communications Commission
445 12th Street SW
Washington, DC 20554
(316) 821-9516**

Title: STA License Request for HIRF Testing at Bell Facility, Amarillo, Texas

**Application File Number: 1884-EX-ST-2019
Confirmation Number: EL972256**

Dear FCC,

This request for Special Temporary Authority (STA) is submitted pursuant to 47 CFR 5.61 to request authorization to perform High Intensity Radiated Field (HIRF) testing. This testing is to be performed in support of an FAA aircraft certification program and is intended to show compliance with 14 CFR 25.1317. The proposed operation is expected to be completed within a period not to exceed two months. Note: requested period is for 6 months to allow for schedule changes should they arise. STA is required because the aircraft and its systems will be subjected to HIRF susceptibility tests including the use of frequencies from 1.5 MHz to 100 MHz.

HIRF testing: The operation to be performed includes the execution of low-level coupling HIRF tests comprised of low level swept current (LLSC) tests. The LLSC test will involve illuminating the aircraft with low-level external HIRF field to measure the transfer function between the external field and the aircraft and equipment wire bundle currents. By calculating the ratio between the induced wire bundle current and the illuminating antenna field strength and normalizing this ratio to 1 V/m, the transfer function in terms of induced current per unit of external field strength will be defined. The current induced by the applicable external HIRF environment can then be calculated by multiplying the transfer function by the external HIRF field strength.

Bell has hired DNB Engineering, Inc., a full-service EMC/EMI, HIRF, RF and Indirect Lightning testing service for Aerospace, Commercial and Military industries, to be onsite at the Bell Amarillo, Texas facility supporting the HIRF testing.

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Fort Worth, Texas 76101
Tel: 817-280-7984

EQUIPMENT:

Table 1 lists all relevant test equipment.

Table 1: Test Equipment

| Manufacturer | Model Number | Function | No of Units |
|-----------------|--------------|--|-------------|
| Aeroflex | IFR 2023B | Signal Generator 10kHz to 2000 MHz | 1 |
| Atec | IFI SCCX 100 | Amplifier 100 Watts 10kHz to 220 MHz | 1 |
| DNB Engineering | BD05-25 | Large Dipole Antenna 0.5 to 30 MHz (-12dBi gain) | 1 |
| EMCO | 3243 | BiconiLog Antenna 25 MHz to 1000MHz (-6 to -24 dBi gain) | 1 |

TRANSMITTED FREQUENCIES:

Table 2 lists the specific frequencies being transmitted. This list has been coordinated with the Aerospace & Flight Test Radio Coordinating Council (AFTRCC) and incorporates recommended AFTRCC changes so as not to require a formal AFTRCC coordination.

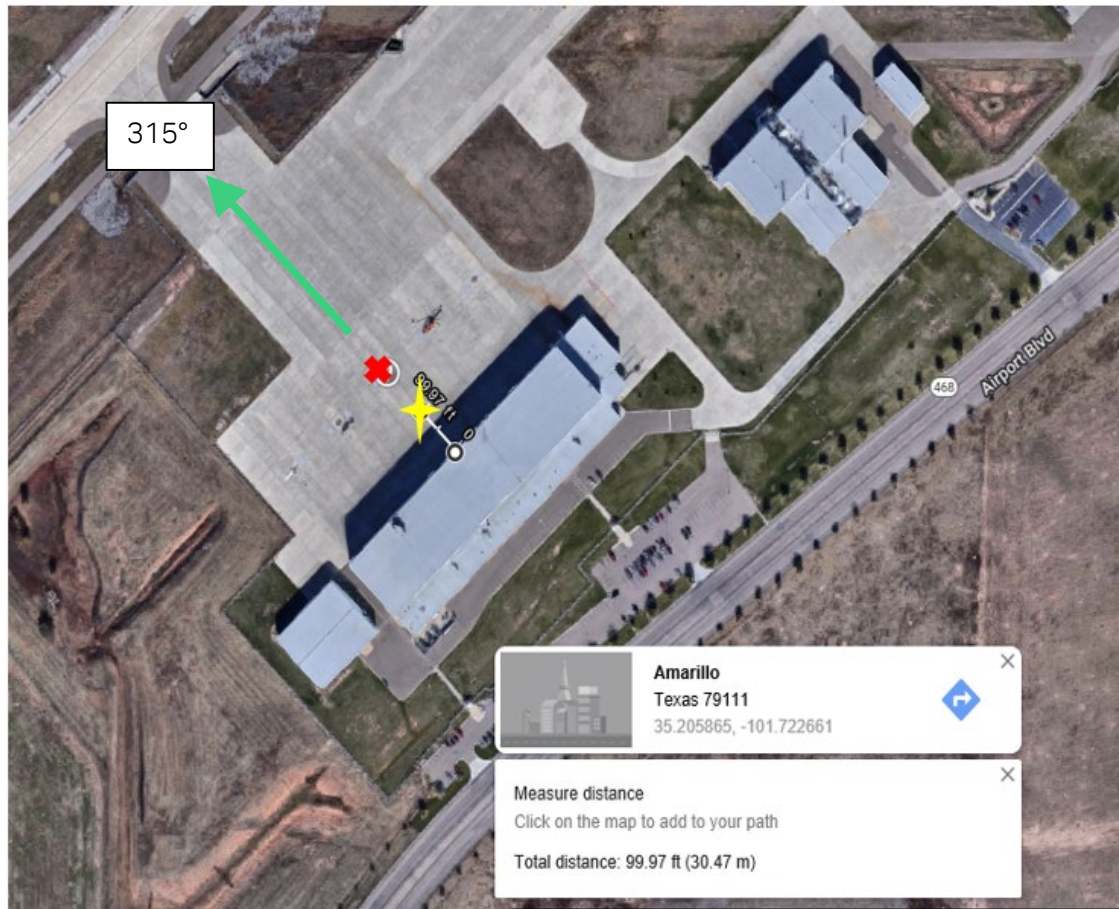
Table 2: Transmitted Frequencies (MHz) per DO-160 Sec 20.3 formula $f_{n+1}=f_n*10^{(1/100)}$

| | | | | | | | | |
|-------|-------|-------|--------|--------|--------|--------|--------|---------|
| 1.500 | 2.433 | 3.945 | 6.399 | 10.377 | 16.830 | 26.067 | 42.276 | 68.563 |
| 1.535 | 2.489 | 4.037 | 6.547 | 10.619 | 17.222 | 26.674 | 43.260 | 70.160 |
| 1.571 | 2.547 | 4.131 | 6.700 | 10.867 | 17.623 | 27.296 | 44.268 | 71.795 |
| 1.607 | 2.607 | 4.228 | 6.856 | 11.120 | 18.034 | 27.931 | 45.299 | 73.467 |
| 1.645 | 2.667 | 4.326 | 7.016 | 11.379 | 18.454 | 28.582 | 46.354 | 75.178 |
| 1.683 | 2.730 | 4.427 | 7.179 | 11.644 | 18.884 | 29.248 | 47.434 | 76.929 |
| 1.722 | 2.793 | 4.530 | 7.347 | 11.915 | 19.324 | 29.929 | 48.539 | 78.721 |
| 1.762 | 2.858 | 4.635 | 7.518 | 12.192 | 19.774 | 30.626 | 49.670 | 80.555 |
| 1.803 | 2.925 | 4.743 | 7.693 | 12.476 | 20.234 | 31.339 | 50.827 | 82.431 |
| 1.845 | 2.993 | 4.854 | 7.872 | 12.767 | 20.706 | 32.069 | 52.011 | 84.351 |
| 1.888 | 3.063 | 4.967 | 8.055 | 13.064 | 21.188 | 32.816 | 53.222 | 86.316 |
| 1.932 | 3.134 | 5.083 | 8.243 | 13.369 | 21.682 | 33.581 | 54.462 | 88.327 |
| 1.977 | 3.207 | 5.201 | 8.435 | 13.680 | 22.187 | 34.363 | 55.730 | 90.384 |
| 2.023 | 3.284 | 5.322 | 8.632 | 13.999 | 22.703 | 35.163 | 57.028 | 92.489 |
| 2.071 | 3.358 | 5.446 | 8.833 | 14.325 | 23.232 | 35.982 | 58.357 | 94.644 |
| 2.119 | 3.436 | 5.574 | 9.038 | 14.659 | 23.773 | 36.821 | 59.716 | 96.848 |
| 2.168 | 3.516 | 5.703 | 9.249 | 15.000 | 24.327 | 37.678 | 61.107 | 99.104 |
| 2.219 | 3.598 | 5.836 | 9.464 | 15.349 | 24.894 | 38.556 | 62.530 | 100.000 |
| 2.270 | 3.682 | 5.972 | 9.685 | 15.707 | 25.000 | 39.454 | 63.987 | |
| 2.323 | 3.768 | 6.111 | 9.910 | 16.073 | | 40.373 | 65.477 | |
| 2.377 | 3.856 | 6.253 | 10.141 | 16.447 | | 41.313 | 67.003 | |

TEST LOCATION:

Testing will be conducted onsite at the Bell facility located at 401 Tiltrotor Dr. Amarillo, TX 79111. The specific location in WGS 84 coordinates is Latitude 35° 12' 21.114" N and Longitude 101° 43' 21.5796" W at an elevation of 3607' MSL. The antenna location, indicated by the yellow star, will be approximately 100' in front of the hangar. The aircraft location (red X) will be 100' from the antenna. The antenna is 15m tall in the vertical position. The height of the hangar is about 80 feet tall and 900 feet wide providing good blockage to the southeast.

Figure 1: Aerial View of Test Location



TEST CONFIGURATION:

Figure 2 depicts the basic setup for both the large dipole antenna, as well as the BiconiLog antenna, transmitting in the vertically polarized position. This setup covers transmitting frequencies from 1.5 MHz to 29.929 MHz for the large dipole and 3.626 MHz to 100 MHz for the BiconiLog. In order to accommodate different aircraft azimuths, the aircraft will be rotated about the landing gear and the transmitting dipole will remain stationary. Figure 3 depicts the basic setup for both the large dipole antenna as well as the BiconiLog antenna transmitting in the horizontally polarized position.

Large Dipole Antenna:

- Width of beam in degrees at the half power point is 78
- Orientation in horizontal plane is 315 (degrees from True North)
- Orientation in vertical plan is 0 (degrees from horizontal)

BiconiLog Antenna:

- Width of beam in degrees at the half power point is 100
- Orientation in horizontal plane is 315 (degrees from True North)
- Orientation in vertical plan is 0 (degrees from horizontal)

Figure 2: Large Dipole Antenna in the Vertical Configuration

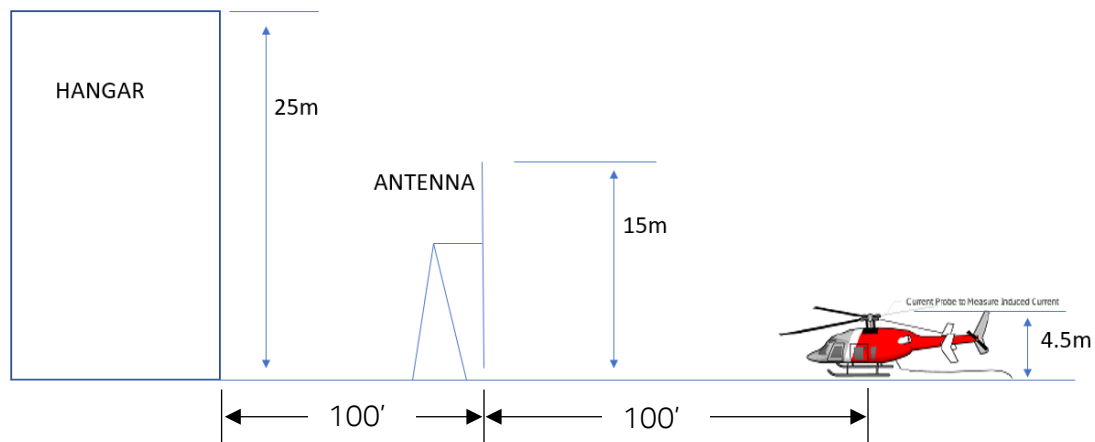
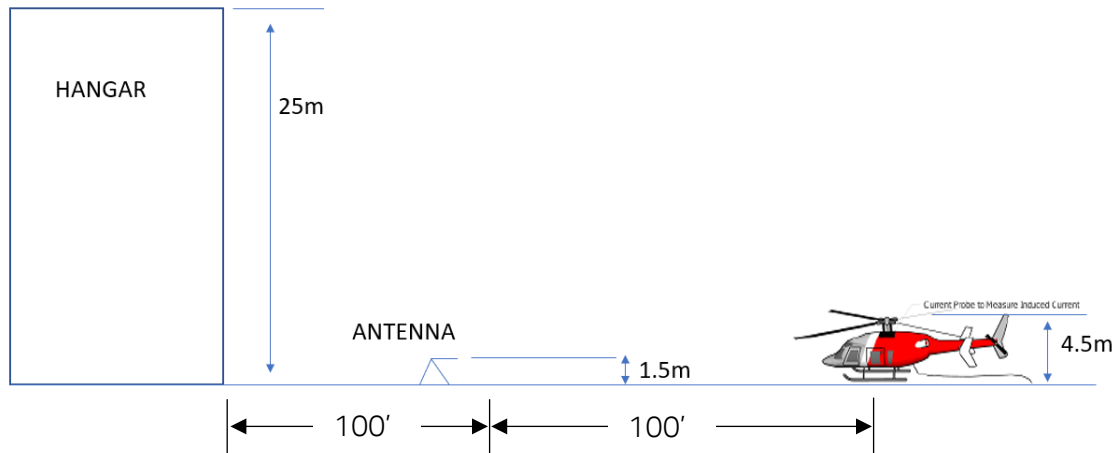


Figure 3: Large Dipole Antenna in the Horizontal Configuration



Stop Buzzer Contact:
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Kind Regards,

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