



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.

DNB Engineering, Inc.  
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Fullerton, CA 92833  
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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.

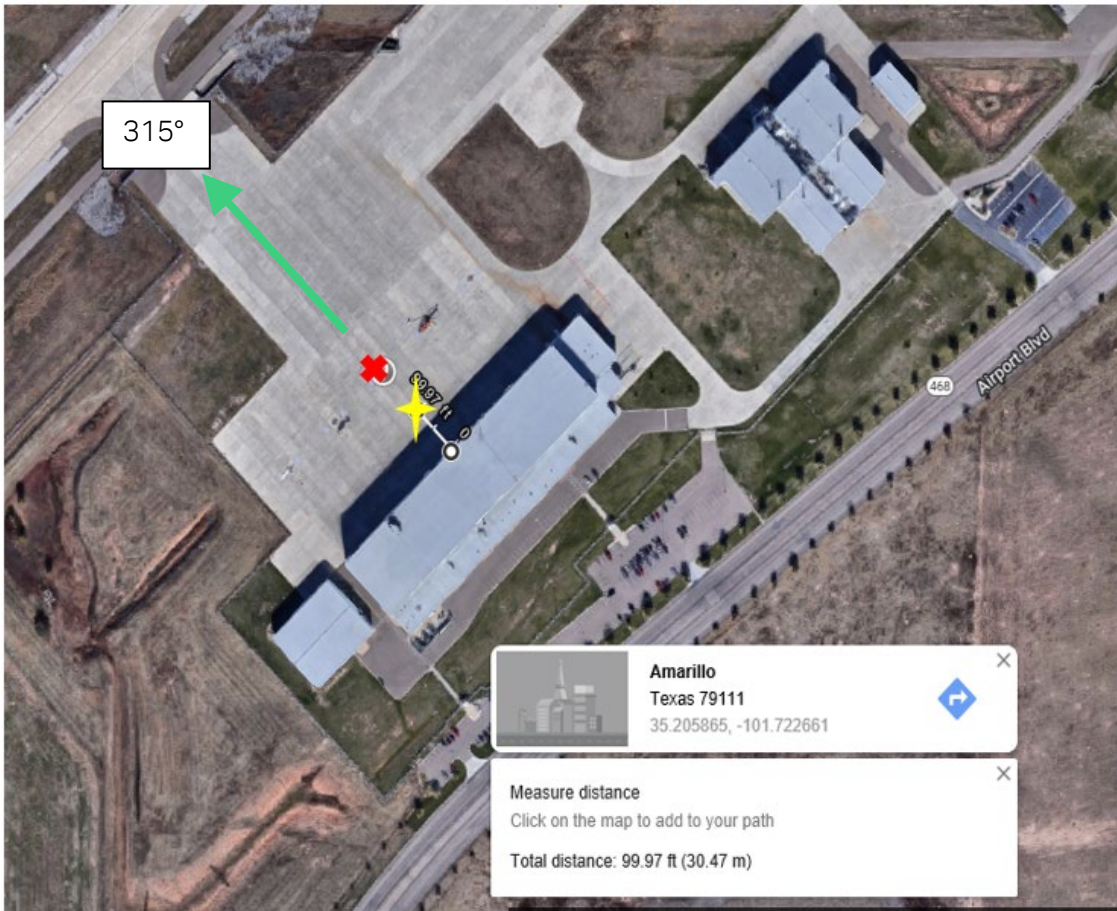
**Table 2: Transmitted Frequencies (MHz) per DO-160 Sec 20.3 formula  $f_{n+1}=f_n * 10^{(1/100)}$**

LARGE DIPOLE						BICONILOG		
1.5	2.433	3.945	6.399	10.377	16.83	26.067	42.276	68.563
1.535	2.489	4.037	6.547	10.619	17.222	26.674	43.26	70.16
1.571	2.547	4.131	6.7	10.867	17.623	27.296	44.268	71.795
1.607	2.607	4.228	6.856	11.12	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	2.73	4.427	7.179	11.644	18.884	29.248	47.434	76.929
1.722	2.793	4.53	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	49.67	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	13.68	22.187	34.363	55.73	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	24.327	37.678	61.107	99.104
2.219	3.598	5.836	9.464	15.349	24.894	38.556	62.53	100
2.27	3.682	5.972	9.685	15.707	25	39.454	63.987	
2.323	3.768	6.111	9.91	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 Amarillo facility located at 401 Tiltrotor Dr. Amarillo, TX 79111. The specific location in WGS 84 coordinates is Latitude 35° 12' 21.11" N and Longitude 101° 43' 21.58" W at an elevation of 1100 m. Figure 1 below shows an aerial view of the test location. The antenna location, indicated by the yellow star, will be approximately 100 feet in front of the hangar. The aircraft location (red X) will be 100 feet 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 25.000 MHz for the large dipole and 26.067 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.

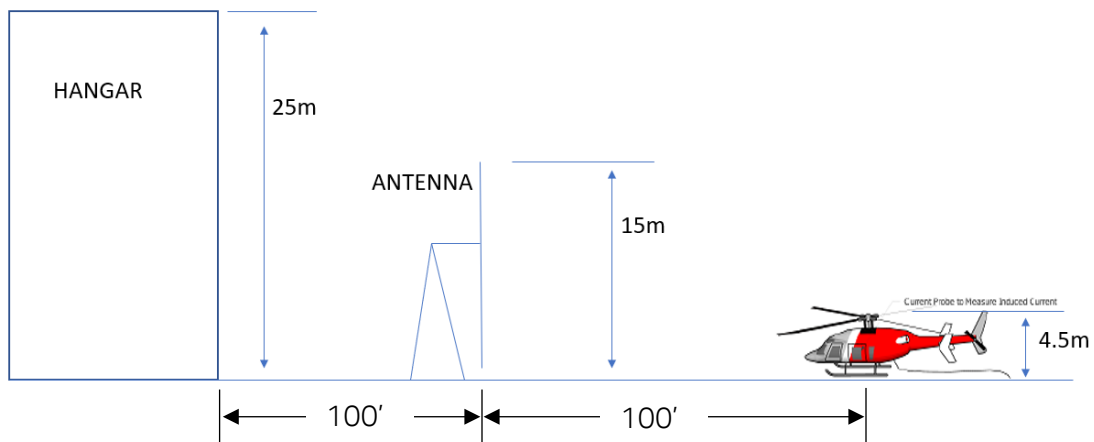
### Large Dipole Antenna:

- 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)

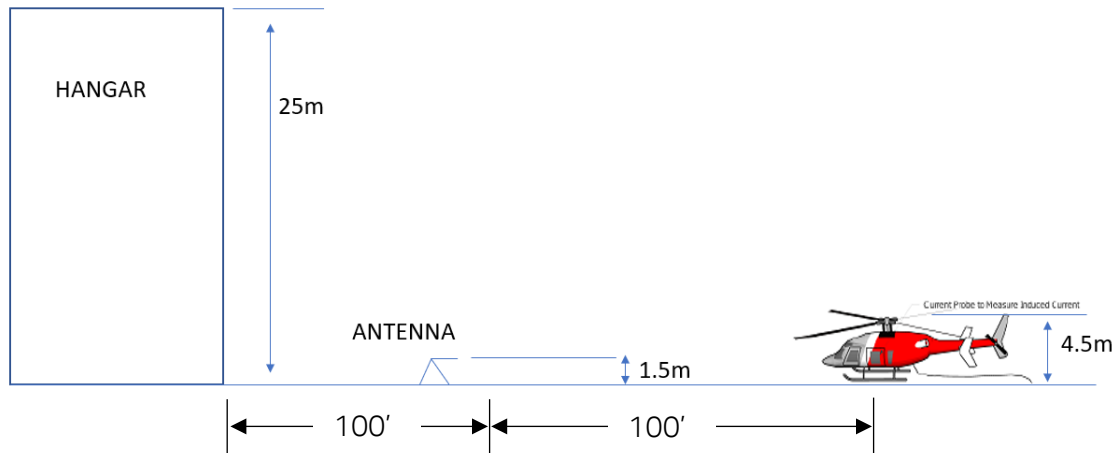
### BiconiLog Antenna:

- 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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