

## Aircraft HIRF Shielding Effectiveness Testing Exhibit

This application is the same that was applied for, granted and executed prior by then Raytheon Aircraft Corporation, (Now known as Hawker Beechcraft). The station license WE2XDB was allowed to expire (File Number 0295-EX-PL-2006).

Wichita State University - National Institute for Aviation Research (NIAR) now operates the Environmental and Electromagnetic test facilities for Hawker Beechcraft. NIAR will conduct testing for Hawker Beechcraft and other Aircraft Manufacturers at the same test location and facilities as used previously under the expired license. Regardless of the aircraft manufacturer, the testing will remain constant in method and execution.

The purpose of this experiment is to quantify the RF shielding effectiveness of the external skin plus internal framework (ie. aircraft shell) of several types of commercial and business aircraft. This information is required to determine how well the aircraft fuselage shields internal aircraft systems from High Intensity Radiated Fields (HIRF) that originate outside the aircraft from ground and airborne transmitters near which the aircraft will operate. United States Federal Aviation regulations and the Aviation regulations of several foreign countries require that certain aircraft systems be protected from suffering adverse effects when the aircraft in which they reside is operating the HIRF environment.

This test will be performed by transmitting a low-power RF energy field of a known value from outside the aircraft toward the aircraft under test while measuring the RF energy field value received by test measurement equipment located in various compartments inside the aircraft. The difference between the external field value and the internal field value will provide the RF shielding effectiveness factor for the aircraft fuselage.

The transmitted RF field will be continuous wave, (NON): never modulated in any way. Transmitted power levels will always be set to the minimum level required to successfully accomplish each measurement, but never to a level that causes Effective Radiated Power (ERP) to exceed the level allowed by the FCC approval issued for this experiment.

Directional antennas will be used to assure the RF energy is not radiated over a wide pattern.

Testing will be conducted through the frequency range of 500KHz to 18GHz except on notch frequencies noted in the FCC approval where transmissions will not occur. Transmissions will be swept through the frequency range required for testing. Transmissions will never dwell on any one channel for much more than 1 second. Typically, dwell time per channel will be much less than one-half second. Multiple sweeps through each frequency band will be made during the testing of each aircraft type. Considering transmitter / antenna reconfigurations required between bands during the pass from 500kHz to 18GHz, on a pass through the entire frequency range being tested will take approximately 2 hours. Therefore, transmissions on any one frequency will not occur more than 12 times in a 24 hour period.

The 500kHz to 18GHz frequency range will be swept approximately 48 times during testing of one aircraft type. Approximately one week is required to test one aircraft type. The majority of this time is taken up by configuration changes when no transmission will occur. We estimate that NIAR will test 8 - 10 aircraft types during the 24 month period of this experiment.