

The purpose of this experiment is to quantify the RF shielding effectiveness of the external skin plus internal framework (i.e. aircraft shell) of several types of pleasure and business aircraft manufactured by Raytheon Aircraft Company. This information is required to determine how well the aircraft shell 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 of the aircraft shell.

The transmitted RF field will be continuous wave; never modulated in any way. Transmitter power level 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 that RF energy is not radiated over a wide pattern.

Testing will be conducted through the frequency range of 500kHz to 18GHz except on frequencies noted in the FCC approval where transmission will not occur. Transmissions will be swept through the frequency range required for testing. Transmissions will never dwell on any one channel for 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 reconfiguration required between bands during the pass from 500kHz to 18GHz, 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 the testing of one aircraft type. Approximately one week is required to test one aircraft type. The majority of this time is taken up by equipment configuration changes when no transmissions will occur. We anticipate that we will test 8 aircraft types during the 24 months of this experiment.