

## ***Airborne Wi-Fi Certification Requirements***

As more and more airline customers request the ability to use their cell phones, laptop computers and other Wi-Fi capable electronics, the airlines have responded to this request by installing accessible Wi-Fi systems on their aircraft and the FAA has imposed requirements to do so. For each model of aircraft a Wi-Fi system is to be used on, the operator must get FAA operational approval based on FAA certification (typically an STC). The approvals include testing to show the equipment performs its intended function and doesn't interfere with any aircraft systems during all phases of flight. Typically, airborne Wi-Fi equipment mimics its earthbound counterparts: routers, Ethernet cables, access ports and other communications hardware, all permanently installed in the airplane.

Aircraft Wi-Fi (WLAN – wireless local area network) installations can be a complex certification effort for a service that is commonplace outside of the aircraft environment. Normal certification steps apply with the additional requirement for a FAA Network Security Issue Paper that ensures protection against unauthorized access to critical systems.

The Network Security Issue Paper specifies applicants “shall prevent all inadvertent or malicious changes to, and all adverse impacts up on, all systems, networks, hardware, software, and data in the Aircraft Control Domain and in the Airline Information Domain from all points within the Passenger Information and Entertainment Domain.”

The challenge is not the approval of aviation grade wireless equipment but protecting the aircraft to be able to resist the variable, uncontrolled and potentially malicious portable wireless devices. A significant part of the certification requirement is to perform Electromagnetic Compatibility (EMC) testing and to list all required, essential and critical aircraft equipment that is evaluated.

The FAA Issue Paper assumes transmitters operate at FCC authorized power (1 watt plus 6 dBi gain). This provides margin for typical Wi-Fi portable devices (50 to 100 mW transmitter power) and IEEE 802.11a, b, and Networks authorized to transmit up to one watt with up to 6 dBi antenna gain (4 watts effective isotropic radiated power).

WLAN's certifications typically require the demonstration of the interference with avionics systems necessary for continued safe flight and landing by addressing the following:

1. Hardware Aspects of Certification
2. Software Aspects of Certification
3. Safety Assessment Process
4. Electromagnetic Compliance Demonstration
5. Electrical Architecture/Design Objectives
6. Configuration Management Procedures
7. Continued Airworthiness

Operational restrictions on use of PED's by passenger are specified in the WLAN's Aircraft Flight Manual Supplement.

The FAA is currently working to replace the “new and novel” Issue Paper for with formal guidance which will clarify the processes and procedures for certification and installation of Wi-Fi systems.

L2 President, Mark Lebovitz says, “The challenge is not approving aviation grade wireless equipment but protecting the aircraft systems from uncontrolled wireless devices.”