



June 4, 2014

Nnake Nweke, PhD (Engr.), Esq.  
Branch Chief  
Experimental Licensing Branch  
Office of Engineering and Technology  
Federal Communications Commission  
(202) 418-0758 (office)  
(202) 207-5816 (mobile)  
[nnake.nweke@fcc.gov](mailto:nnake.nweke@fcc.gov)

SUBJECT: Expanding use of T-PED Devices.

FCC Registration No. 0023647811.  
STA Confirmation No. EL994490  
STA File No. 0494-EX-ST-2014

Dear Mr. Nnake Nweke,

Allegiant Airlines ("Allegiant") requests an experimental special temporary authority ("STA") for 60 days commencing July 1, 2014 to conduct aircraft back door ground testing as required by the FAA to gain approval of expanded use of Portable Electronic Devices (PEDs) and Transmitting PEDs (T-PEDs) in Allegiant's commercial aircraft. It is requested that STA authorization be granted to conduct the testing at the McCarran International Airport, Las Vegas, Nevada.

Authority is sought for testing that will examine the potential for interference to airplane avionics and communications from passenger-carried T-PEDs (back door interference). These tests will involve electromagnetic interference ("EMI") ground testing of multiple, simulated T-PED RF transmissions in the aircraft and will be conducted in the Wi-Fi, frequency bands, in which T-PEDs are authorized to operate in the United States. These tests will also be conducted onboard parked aircraft, with all aircraft doors closed.

#### **Request for Experimental Special Temporary Authority**

Allegiant is seeking the requested experimental STA to conduct T-PED back door interference ground testing on the remote parking ramp at the McCarran International Airport, Las Vegas, Nevada. (Geographic Coordinates: N36.05.220 W115.09.430). Only T-PED interference testing will be conducted in the identified frequencies using a signal generator to simulate the operation of multiple T-PEDs.

The proposed testing will be conducted onboard Allegiant Boeing MD-83/MD-88 and 757 aircraft. The aircraft are currently in commercial operation and our schedule is extremely limited for testing. This only allows for a short window – in most cases only overnight - once an airplane is available to conduct the testing before it must be returned to service. Testing and re-testing in the authorized frequencies will be conducted at scheduled intervals during the several days that the airplanes are available within the authorized testing period.

June 4, 2014

## **Background**

Wireless devices that have been authorized for use on board aircraft in flight in the United States use the Wi-Fi spectrum (e.g., notebook computers and PDAs operating at 2.4 GHz) for aeronautical broadband data services such as AirCell's "Gogo Wireless" and the former Connexion by Boeing Ku-band AMSS service.

Testing for and approval of expanded use of PEDs and T-PEDs has been granted for a number of U.S. Commercial Airlines and there is substantial understanding of the technical and regulatory conditions associated with their use. Indeed, such devices operate in the air today with the AirCell Gogo and Row 44 Wireless system, which has been installed on a substantial number of U.S. commercial aircraft. Although the technical aspects of such operations are well-understood, Allegiant must conduct back door EMI testing with its specific system architecture in each aircraft type in which it seeks to operate in order to satisfy FAA certification requirements.

The proposed tests are similar in scope and duration to experimental testing previously authorized by the Commission. See Call Sign EB9XWP, File No. 0320-EX-ST-2004 (RF compatibility testing between T-PEDS and aircraft systems).

## **Purpose of Experimental Tests**

The proposed experimental back door EMI ground testing is needed to support Federal Aviation Administration ("FAA") certification of expanded use of PEDs in flight. FAA regulations (14 C.F.R. § 91.21) stipulate that the aircraft operator demonstrate that onboard electronic devices, such as T-PEDs, not interfere with critical aircraft avionics systems. Industry documents, such as RTCA DO-294, and RTCA DO-307 provide guidelines on how to test avionics systems' susceptibility to RF signals on board airplanes. The recommended tests involve the simulation of multiple T-PEDs transmitting simultaneously within the aircraft across several frequencies that are used Wi-Fi equipment. The requested experimental STA will assist Allegiant in assessing the potential interference issues associated with the use of T-PEDs aboard its commercial aircraft and developing the technical and operational requirements necessary to mitigate any potential interference issues to airplane avionics and communications.

## **Description of Experiments**

T-PED EMI Testing. The planned testing will be conducted Allegiant's MD-83/MD-88 and 757 commercial passenger airplanes parked at the McCarran International Airport. An outside contractor under Allegiant's direction and control will conduct the actual testing. The first step of the testing will be to undertake a system analysis for the specific aircraft configuration to be installed to determine those avionics systems that may be susceptible to interference from T-PED RF transmissions. A test plan will then be prepared for each aircraft, which will include the relevant T-PED transmission locations and power levels within the aircraft cabin. A signal generator in the aircraft cabin will be used to simulate the T-PED transmissions. The aircraft avionics components and systems that are the subject of the proposed tests will operate while the aircraft is on the ground consistent with normal operations and protocols, including applicable power levels, and measured for any disruptive effects caused by the simulated T-PED transmissions. The testing will simulate multiple T-PED transmissions operating simultaneously. In order to assess the potential for interference -- i.e., "worst case" scenarios -- to avionics systems and communications, it will be necessary to simulate multiple T-PEDs operating at relatively high power levels. The maximum transmit power levels of the simulated T-PEDs transmissions are limited to the power levels listed in the tables below, expressed as both ERP and EIRP.



June 4, 2014

### **Test Frequencies and Other Technical Information**

T-PED Interference Testing. The table below identifies the relevant frequencies in which Allegiant proposes to conduct the T-PED interference testing. Additional technical information, such as the relevant power levels and modulation types, is also provided in the Table 1, below:



June 4, 2014

**Table 1 - T-PED EMI Test Frequencies / Transmit Power Requirements**

| Wireless Standard | Frequency Start of Band (MHz) | Frequency End of Band (MHz) | Test Frequency (MHz) | Modulation Type | T-PED Intentional EIRP (dBm) From DO-294C Table 6.F-4 | Target MEF (dB) | Target EIRP (dBm) | Target EIRP (W) |
|-------------------|-------------------------------|-----------------------------|----------------------|-----------------|-------------------------------------------------------|-----------------|-------------------|-----------------|
| 802.11b/g         | 2400                          | 2484                        | 2472                 | Pulse           | 27                                                    | 10              | 37                | 5.01            |
| 802.11a/n         | 5125                          | 5250                        | 5200                 | Pulse           | 27                                                    | 10              | 37                | 5.01            |
| 802.11a/n         | 5250                          | 5350                        | 5300                 | Pulse           | 27                                                    | 10              | 37                | 5.01            |
| 802.11a/n         | 5725                          | 5825                        | 5800                 | Pulse           | 27                                                    | 10              | 37                | 5.01            |





June 4, 2014

### **Conditions and Contacts**

Allegiant acknowledges that the planned tests are not to cause interference to licensed services and are subject to immediate shut down should any harmful interference occur and until the interference issues are resolved.

During the testing periods, Allegiant will make available 24/7 personnel with authority to be contacted with reports of harmful interference. These personnel shall have the authority to shut down testing immediately upon receipt of any such reports. The Allegiant personnel are:

**Lead Contact:**

Timothy Johnson  
Allegiant Airlines  
Phone: 702.-830-8323  
Mobile: 907-887-4900  
Email: Timothy.Johnson@allegiantair.com

**Secondary Contact:**

Phil Baehr  
LAS Maintenance Base Manager  
Phone: 702-830-8395  
Mobile: 952-715-7195  
Email: Phil.Baehr@allegiantair.com

### **Conclusion**

The planned ground tests will satisfy the FAA requirements for back-door testing on Allegiant's MD-83/MD-88 and 757 aircraft so that Allegiant may offer expanded use of PEDs to its customers and crew. Allegiant respectfully requests an experimental STA for a period 60 days commencing July 1, 2014.