

0146-EX-ST-1999

April 21, 1999
G-8930-RBD-1078

Federal Communications Commission
Experimental Radio Service
P.O. Box 358320
Pittsburgh, PA 15251-5315



Subject: Request for Special Temporary Authorization (STA)
HIRF - Marana, AZ

Gentlemen:

This request for a Special Temporary Authorization (STA) is submitted in accordance with CFR 47, Part 5.56. It's purpose is to perform High Intensity Radiated Field (HIRF) Testing on a new derivative of Boeing aircraft. Previous HIRF testing has not been conducted at this location. Licensing for base line testing at this location is currently pending.

1. **Name and Address:**
The Boeing Company
Frequency Management M/C 3U-AJ
P.O. Box 3707
Seattle, WA 98124-2207
2. **Need for special action:** This STA is required to conduct High Intensity Radiated Field (HIRF) tests on a new derivative Boeing aircraft in accordance with directives listed in Exhibit 1. The testing window is for a duration of three weeks.
3. **Type of operations:** The tests to be conducted include the use of frequencies from 50 Hz to 18 GHz. Testing using widely spread discrete frequencies would miss critical resonant frequencies. These tests include the following:

50-100 MHz: Direct drive, swept carrier wave transfer function tests on production airplanes. These tests require driving a transmission line formed by the airplane parked over a wire grid. Current is driven onto the aircraft by directly attaching the output of a 25 watt amplifier to the nose, wing tips, or engine nacelle. A "stepped swept" test is required to measure as many aircraft and cable resonance's as possible. The dwell time per frequency point will be a maximum of 75 milliseconds per point, based on 401 points on a 30 second maximum sweep. The maximum number of sweeps per test will be 64.

A second sweep carrier wave test will used over the frequency range 400 MHz to 18 GHz. All the same conditions apply, except the dwell

time per frequency point will be a maximum of 5 seconds. Intervals between test segments will be approximately 2 minutes.

A third technique involves radiating a CW signal mixed with bandwidth limited white gaussian noise. The bandwidth of the noise can adjust from 1 to 50 MHz. This produces a random frequency modulation centered on the selected CW frequency but limited to two times the selected noise bandwidth. The electronic stirring method is very fast and the scan time for any given set of test frequencies is less than one second. Calculations done by Air Force/Phillips Laboratories show that during a typical test scan the dwell time at any specific frequency is less than one microsecond. This test method is a much less severe RF radiation condition than the current CW test methods with up to 5 second dwell at each discrete frequency. It is unlikely that RF receivers would be sensitive to the sub-microsecond duration signals produced by electronic frequency stirring.

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4. **Time and Date:** Testing is planned to occur between the dates of December 1, 1999 and February 28, 2000. If approved, Boeing will coordinate the use of frequencies and dates for testing with the appropriate agency Frequency Management Office(s).
5. **Class of Station:** XR
Call Sign: TBD
Nature of Service: Experimental
6. **Location (Only checked boxes apply):**
 - ☐ Boeing Field International, Seattle, WA. This is a Company facility located at the following coordinates: 47°32'21"N 122°18'44"W.
 - ☐ Glasgow Industrial Airpark, Glasgow, MT. This is a Company facility located at the following coordinates: 48°25'21"N 106°32'10"W.
 - ☐ Paine Field, Everett, WA. This is a Company facility located at the following coordinates: 47°54'12"N 122°17'12"W
 - ☐ Renton International Airport, Renton, WA. This is a Company facility located at the following coordinates: 47°29'42"N 122°12'18"W
 - ☒ Pinal Airpark, Marana, AZ. 32°30'06"N 111°19'07"W This location is also known as Evergreen Air Center.
 - ☐ Tuscon International Airport, Tuscon AZ. 32°07'00"N 110°56'24"W
 - ☐ Yuma International, Yuma, AZ. This location is a Company owned facility located at coordinates: 32°39'23" N 114°36'22"W.

7. **Equipment Manufacturer:** (See Exhibit 3)
8. **Frequency Bands:** (See Exhibit 2)
9. **Power Output to Antenna:** 20 to 25 watts (band dependent)
10. **Emission:** (See Exhibit 2)
11. **Antenna height:** Less than 18 feet above ground level
Antenna Type: See Exhibit 3
Gain: 10dB
Beamwidth: Less than 90° at the ½ power point
Polarization: Various
Direction: 360° North

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Should you require additional information, please contact Bob Douglass at 253-657-6421 or bob.douglass@boeing.com email.

Joel H. Rogneby
Manager, Frequency Management Services
Boeing Shared Services Group
253-657-6095

Enclosures:

FCC Form 159
Check #: 462060
Exhibit One (Pertinent HIRF Directives)
Exhibit Two (Frequency Band Information)
Exhibit Three (HIRF Equipment Information)

M. Dosch 05-AP