

**FAA Required WLAN Testing
The Boeing Company
Glasgow, MT**

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by

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Why a Special Temporary Authority is Necessary

The FAA has requested that Boeing perform an RF susceptibility ground test as soon as possible.

Purpose of Operation

The FAA has required Boeing to perform an RF susceptibility ground test to demonstrate that the airplane systems for a 777 are not susceptible to emissions from IEEE 802.11 a/b/g by passenger owned portable electronic devices (PEDs).

Frequencies, Power and Emission

The test will use the 2.4 GHz ISM band (2.412 – 2.484 GHz) and the 5 GHz UNII band (5.17 – 5.24 GHz, 5.250 – 5.325GHz, 5.745 – 5.7825 GHz) with 28 watts EIRP (simulating a worse case) radiating in very close proximity to the aircraft's electronics in the EE-Bay, Aft Cargo Area, and Passenger Cabin inside the airplane.

Band	Channel	Sub Band	Emission Type	Bandwidth	Power EIRP
2.4 GHz ISM	1	2.412 GHz	DSSS	22 MHz	28 Watts
	6	2.437 GHz	DSSS	22 MHz	28 Watts
	11	2.462 GHz	DSSS	22 MHz	28 Watts
5 GHz UNII	34	5.170 GHz	OFDM	22 MHz	28 Watts
	40	5.200 GHz	OFDM	22 MHz	28 Watts
	52	5.260 GHz	OFDM	22 MHz	28 Watts
	60	5.300 GHz	OFDM	22 MHz	28 Watts
	149	5.745 GHz	OFDM	22 MHz	28 Watts
	157	5.785 GHz	OFDM	22 MHz	28 Watts
	165	5.825 GHz	OFDM	22 MHz	28 Watts

Location, Conditions and Schedule

Address of the facility:

Wokal Field/Glasgow International Airport (KGGW)
Boeing Flight Test Facility
Glasgow (Valley County), MT. 59230-0831

48-12-48N 106-36-54 NAD83
1 mile NE of Glasgow, MT

The ground elevation is 2294 ft. / 699.2 m (surveyed).

Glasgow, MT was selected because it is one of our most isolated and remote flight testing facilities. Boeing Frequency Management considers this location as the best choice for maximum RF control and the least likely Boeing test facility to cause WLAN interference. The tests will be performed outdoors on an isolated part of the airfield with all doors on the airplane closed. The test will take approximately 12 hours with the majority of this time being for test setup and tear down. RF transmissions will be limited to less than 30 seconds for each sub test. Coordination with local Boeing facilities management for any local WLAN will be obtained. An elongated plateau between the small town and the airport is high enough to provide additional natural shielding.

The test will be performed once over two days between April 13 to 27, 2005. The focus scheduled days are 15, 16 and 17th.

Stop buzzer contact information

Charles Simontacchi Cell Phone 425-232-5961
Carl Foncannon Cell Phone 425-231-9901

Local Contact

Darcel D. Wesen
Bldg. 74-202
Glasgow, MT
406-524-3777 Office
406-524-7316 Fax
darcel.d.wesen@boeing.com

Boeing Management Approval

Boeing management has given authority to fly the aircraft and conduct the test at Glasgow, MT.

Robert H Denkmann
425-266-5120 Office
425/342-3643 Fax

Equipment and Antennas

These are the antennas that are selected for the tests.

EMCO 3115 is a used Double-Ridged Waveguide Horn Antenna

Web link for the EMCO 3115 antenna:

<http://www.emctest.com/Manuals/3115.pdf>

NARDA Antennas:

NARDA 643 is a used Standard Gain Horn



NARDA 643 (3.95-5.85 GHz)

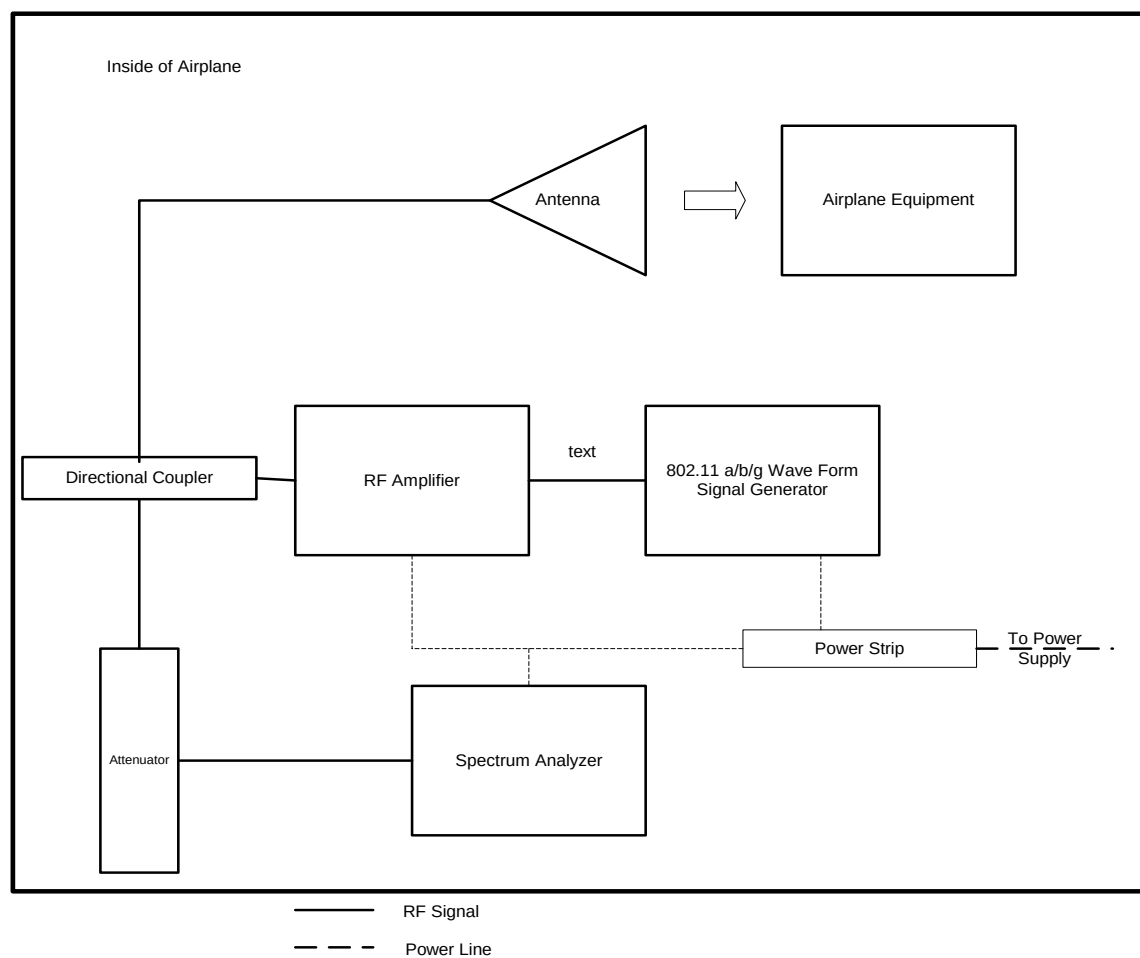
GHz	Gain (dBi)
3.95	14.95
4	15
4.2	15.35
4.4	15.67
4.6	16
4.8	16.3
5	16.61
5.2	16.9
5.4	17.2
5.6	17.5
5.8	17.78
5.85	17.85

NARDA 645 is a Waveguide Standard Gain Horn



GHz	Gain (dBi)
1.7	14.25
1.8	14.64
1.9	15.04
2.0	15.42
2.1	15.8
2.2	16.17
2.3	16.5
2.4	16.85
2.5	17.17
2.6	17.5

Equipment	Manufacturer	Model	ID Number	Quantity
Signal Generator	Agilent	4438C		1
Signal Generator	Miltope	Cabin Access Point 901164-1	FCC ID SH5-CAP	1
Traveling Wave Amplifier	Hughes	1277HO1HOO	10577023	1
Traveling Wave Amplifier	Alto Scientific Co	2-c4.0-8.0Q60	10321651	1
Traveling Wave Amplifier	Hughes	8020H2-4		
Traveling Wave Amplifier	Hughes	8020H4-8		
Traveling Wave Amplifier	Varian	VZS695K1		1
Antenna	NARDA	643		1
Antenna	NARDA	645		1
Horn Antenna	EMCO	3115	30255068	1
Directional Coupler	NARDA	4226-20	1X968876	1
Band Pass Filter 4-6 GHz	Hewlett Packard	HP8432A		1
Low Pass Filter <4.1 GHz	Hewlett Packard	HP 360D		1



Block Diagram of Test Equipment Setup