

ScanEagle UAV Flight Tests

The Boeing Company
Boardman Bombing Range, OR

Submitted 11/22/04

by

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PURPOSE

Boeing is requesting a Special Temporary Authority to flight test 3 UAV systems at the Boardman Bombing Range south of Boardman (Morrow County), OR. The purpose of the flight tests is to validate the system in preparation for a UK Research and Development testing in Scotland under British authority for maritime capabilities in February-March 2005.

LOCATION

The tests will be conducted within dedicated Restricted Airspace (R-5701 and R-5706) coordinated with Naval Air Station Whidbey Island, WA (scheduling authority), as coordinated by the Boeing Flight Test Group in St. Louis, MO.

The area of operation is 33 km (22.5 miles) radius of 45-45-0.0 N 119-45-0.0 W NAD83. The maximum altitude of the UAV during flight testing is 1000 meters (3,280 feet). The UAV does not use a traditional airfield. Instead the UAV uses a catapult launch and a skyhook recovery system. The launch and recovery location is 45-44-53.4 N 119-47-0.1 W NAD83. The ground elevation at this point is 192 meters (630 feet).

SCHEDULE

Actual date and time of operation depends primarily on weather conditions and other scheduled military activity at the Boardman Bombing Range. The planned date window for testing is from **November 30, 2004 to December 31, 2004**. Flight time is planned for 4 to 6 hours for several days. Actual day and time of flight depends on the weather.

MISC.

No proprietary or classified programs/contracts are connected with this project.

For photographs, video and other information about the basic system go to the following link:
<http://www.insitugroup.com/>



ScanEagle UAV



**Video
Downlink
2360 MHz
2400 MHz**

**Telemetry
Downlink
327.850 MHz
353.850 MHz**

**Command
Telemetry
Uplink
372.850 MHz
353.850 MHz**

**Flight
Termination
Telemetry
Uplink
389.575 MHz**

**The Boeing Company
Frequency Management
Services
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11/16/04**

ScanEagle UAV Ground Station RF Equipment

Telemetry Uplink TX

Freewave DGBR-115R

No FCC Type ID (per Freewave, Type ID not required for Military Band/Export radios)

327.850 MHz, 4 watt, 230KF1D

353.850 MHz, 4 watt, 230KF1D

www.freewave.com

U.S. Government or Export Sales Only!

Uses spread spectrum modulation that operates over a 225 to 400 MHz frequency range. The radios may also be programmed to operate over any portion of this range to avoid interference with other radio systems in the area of operation.

Uses frequency hopping technology and a 4 watt RF output. Uses error-free data transmission with propriety 32-bit CRC error check, automatic acknowledgment and data retransmission.

Specifications:

60 dB at $f_c \pm 460$ KHz

Transmitter:

Frequency Range 225 to 400 MHz

Output Power 4 Watts

Modulation GFSK, 2 levels

RF Connector Straight or Reverse SMA (OEM Modules)

Type N female (Enclosures)

Data Transmission:

Error Detection 32 bit CRC, retransmit on error

Link Throughput 115.2 Kbps

Data Interface RS232 or TTL

Telemetry Uplink Antenna (and Downlink Video Receive Antenna)

TekSharp 1.8m Dish #130111

10 dBi gain

www.plumdragon.com/teksharp

www.plumdragon.com/teksharp/hr_AO-40_products.htm



Flight Termination System TX

Custom QinetiQ UK designed system based on Warwick Wireless TX6000 transmitter
389.575 MHz, 5 watts EPR, 25K0F3D
No FCC Type ID

www.radiotelemetry.co.uk/module.htm

www.qinetiq.com

Integrated with an RF power amplifier from the manufacturer. RF power set to 2.5 watts to the antenna.



The TX6000 Radio Module is a credit card sized, crystal controlled, half watt transmitter. The radio module RF power can be adjusted from 5mW to 500mW with a frequency range of 400MHz to 475MHz.

UK Type approvals:

ETSI 300-220

ETSI 300-683

MPT1329

Flight Termination System Antenna

Yagi (2-Element) #7039

3 dBi gain, 5 Watts ERP

www.jaybeam.co.uk

www.jaybeam.co.uk/sec_products/usa/frameset_search.php



No. of Elements	2
Frequency (MHz)	88...470
Bandwidth (%)	± 6 (Typical)
VSWR	<1.5 : 1
Gain (dBd)	3
Impedance (Ohms)	50
Polarization	Vertical
Vert Plane Beamwidth (-3 dB)	75°
Horiz Plane Beamwidth (-3 dB)	150°
Front to Back Ratio (dB)	>12
Maximum Power (Watts)	150
Termination	3m of RG213 Cable + N socket

ScanEagle UAV Aircraft RF Equipment

Telemetry Downlink TX

Freewave DGBR-115R

No FCC Type ID (per Freewave, Type ID not required for Military Band/Export radios)

327.850 MHz, 4 watt, 230KF1D

353.850 MHz, 4 watt, 230KF1D

www.freewave.com

SAME AS TELEMETRY UPLINK TX (SEE PREVIOUS)

Telemetry Downlink Antenna

Insitu Custom Antenna (winglet mounted)

Vertical made from brass tube and tuned for specific frequency

0 dBi gain (airborne), 4 watts ERP

www.insitugroup.com

No further information is available.

Video Downlink TX

GMS NT Series

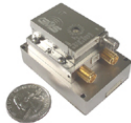
FCC ID – No label

2433.8000 MHz 1 watt, 20M0F3F

2472.800 MHz 1 watt, 20M0F3F

www.gmsinc.com

www.gmsinc.com/product_details.asp?prod_idno=108&prod_cat_idno=1



NT Transmitter mounted to 1 Watt PA and SME

The new NT series transmitters from GMS incorporate the latest microwave technology in a subminiature package. The new NT operates in L, S, or C-Bands with a nominal RF power output of 10 or 250mW. An integrated 1 watt amplifier is attached. Broadcast quality video (NTSC or PAL) with one audio subcarrier make this transmitter ideal for hidden camera and point-of-view applications where weight and size are critical factors. The new NT Series is a fully synthesized 16 channel (field programmable) transmitter. Two video transmitters are used in each UAV simultaneously providing frequency diversity to the ground based receiver.

SPECIFICATIONS

RF

Frequency range: 0.9 - 6 GHz (in bands) (other frequencies available)

Frequency stability: $\pm 0.005\%$

Power output: 10 mW, 250 mW (Factory set), 1 Watt RF Amp output

Spurious: Lower than -25 dBm

Sensitivity: $\pm 4\text{MHz/Volt}$ (FM)

Power

Voltage: 11 - 15 VDC

Current: 80 mA at 1 mW RF out

150 mA at 250 mW RF out

Video (FM modulated)

Input impedance: 75

Input level: 1 Volt (peak-to-peak)

Pre-emphasis: Per CCIR 525/625 line

Frequency response: 10Hz-5MHz (NTSC) or 5.5 MHz (PAL)

Video Downlink Antenna

Insitu Custom Antenna (winglet mounted)

Vertical made from brass tube and tuned for specific frequency

0 dBi gain (airborne), 1 Watt ERP

www.insitugroup.com

No further information is available.