

ATTACHMENT 1

TECHNICAL DESCRIPTION OF THE I3 AOR-W SATELLITE TESTS

A. PURPOSE

FTNA wants to test the Broadband Global Area Network (R-BGAN) system from Inmarsat over an Inmarsat 3 satellite before the launch of a new Inmarsat satellite. The new Inmarsat satellite which is called I4 will be launched in late 2004, will include coverage of the United States and is to provide commercial service in 2005.

The RBGAN already exists as a commercial service in Europe and the Middle East over a different satellite. This service will be migrated to the Inmarsat 4 satellite in 2005. Some tests have been performed in Europe using the Inmarsat 3 (I3) Indian Ocean Region satellite located at 25 E. Additional tests in the United States are necessary to minimize the lead time to provide commercial service after the I4 satellite is launched.

To perform this phase of testing the existing Inmarsat 3 (I3) Atlantic Ocean Region-W satellite located at 54W would be used, and to operate the terminals an experimental license is required. Such testing is designed to ensure that the system technical performance and features are met under all conditions.

B. TEST FACILITY DESCRIPTION

The test facility consists of the satellite segment, the user terminal segment and the base station segment.

B.1) Satellite Segment

The satellite segment consists of the I3 AOR-W satellite located at 54W. The satellite characteristics are as follows:

- (terminal to satellite) The L-band spectrum bandwidth has a Return/Uplink range of 1626.5 MHz to 1660.5 MHz, and a Forward/Downlink frequency range of 1525 MHz to 1559 MHz. Terminals access the system through frequencies on a global beam and data is exchanged over frequencies that are allocated by the network.

The actual L-band frequencies to be used during the I3 AOR-W tests are in the following range:

- a) Global Beam Allocation (Carrier BW 31.25kHz):
 - 1537.90625MHz +/- 15.625 kHz (Forward/downlink)
 - 1639.40625MHz +/- 15.625 kHz (Return/uplink)
 - 1639.18750MHz +/- 15.625 kHz (Return/uplink)
- b) Spot Beam Allocations (Carrier BW 187.5kHz):
 - 1525.40000MHz +/- 250kHz (Forward/downlink)
 - 1626.90000MHz +/- 250kHz (Return/uplink)

- 1548.40000MHz +/- 250kHz (Forward/downlink)
 1649.90000MHz +/- 250kHz (Return/uplink)
- (satellite to base station) C-band starts from 6424 MHz to 6459 MHz in the Uplink direction, and 3599 MHz to 3629 MHz in the Down Link direction.
 - C/L Transponder:
 - G/T: -10 dB/K
 - EIRP: 48 dBW on spot beams + 39 dBW on Global beam
 - NPR: 14 dB
 - Gain: Nominal – 167 dB
 - Min – 153 dB
 - Max – 177 dB.
 - L/C Transponder:
 - G/T : -3 dB/K on Spot beams & -10 dB/K on Global beam
 - EIRP : 2 x 27 dBW on Global beam
 - NPR : 22 dB
 - Gain : Nominal – 159 dB
 - Min – 142 dB
 - Max – 175 dB for Spot beam and 165 dB for Global beam
 - Gain stability:
 - Short Term : 2 dB p-p in 24 hours
 - Long Term : 3 dB p-p in 1 year
 - Gain Flatness
 - 0.75 dB p-p /100 kHz and 1.5 dB p-p over channel

B.2) User Terminal

The characteristics of the user terminals are:

- Type of the transmitter - Hughes Model 9101 Regional BGAN Satellite IP Modem
- Transmitter power:
 - For Bluetooth interface - Power Class 2, Maximum Power 2.5 mW (4 dBm), Minimum Power 0.25 mW (-6 dBm), Nominal Power 1 mW (0 dBm)
 - For Satellite terminal two types of equipment are filed. The ranges are; -4 to -2 dbw; -10 to -4 dbw
 Peak power into the antenna. Internal Antenna gaining 14dbi maximum.
 And External Antenna Gain of 21.3dBi maximum.
- **Internal Antenna beam width at 3dB (Rx and Tx)**
 - a. RX (36 degrees +/- 10%)
 - b. TX (36 degrees +/- 10%)
- Total equivalent noise temperature of the receiver, K degrees –System Noise temperature: 16.2db/K Min; Operating Range: -10 deg to +55 deg C.
- Maximum density of the power with internal Antenna, (dBW/4kHz) - 6.2dBW/4kHz

- **External Antenna beam width**

- Complies with following Mask.

- +/- 16 degrees Gain 21dBi

- 16 – 21 degrees Gain 8dBi

- 21 – 51 degrees Gain (41 – 25log)

- > 51 degrees Gain –3dBi

- Maximum density of power with external Antenna 13.5dBW/4kHz

The terminal would be placed at one location:

- FTNA's location in Davie Florida – located at 12555 Orange Drive Suite 267 Davie, Florida 33330. This terminal could also be moved up to 100 km from this location

At the application level all tests would involve the transmission and receipt of IP data packets. The user terminal will be connected to a computer (PC) and the user terminal will be perceived as a modem by the computer.

B.3) Base Station

The Base Station to be used during the tests is located in Fucino, Italy.

It communicates with the satellite over the C-Band.

The Base Station provides all the RF equipment, channel unit equipment and network switching equipment. Besides the transceiver equipment, the Base Station is responsible for radio synchronization, resource and channel management and providing the interface for the IP packets received or transmitted by the terminal to be relayed to the public internet.

FTNA is applying for an STA simultaneously with this application so that it may start executing these tests as soon as possible.

C. INTERFERENCE TO OTHER SERVICES

The test environment proposed is not likely to cause interference to any other licensed service or systems. The particular L-Band frequencies FTNA requests are already allocated to Inmarsat. The user terminal has been in commercial service in Europe and Middle East for 13 months, it is CE certified and has the ITU GMPCS-MoU mark.

01st September 2004

FAO Eric Verheylewegen, Director Americas
FTMSC

Inmarsat hereby grants your Company authority to utilise our Inmarsat AORW I3 satellite for RBGAN testing. Your Company will be using a Hughes Network Systems RBGAN terminal anywhere within the AORW I3 satellite coverage area. The frequencies, automatically controlled and assigned by Inmarsat to the RBGAN terminals, are as indicated in Hughes Network Systems FCC STA 0370-EX-ST-2004 dated June 15, 2004. The maximum terminal transmitting power density will be 6.2dBW/4kHz and the maximum channel bandwidth 187.5 KHz.

The expected duration of the testing period is from August 2004 until March 2005. Your Company can utilise the AORW I3 satellite for testing within this period, subject to previous coordination with Inmarsat for each period of testing.

Furthermore, Inmarsat confirms that the FCC, in a decision by the full Commission, has granted United States market access over the AORW I3 satellite.

Sincerely

Antonio Franchi
Senior Manager
Inmarsat



**United States of America
FEDERAL COMMUNICATIONS COMMISSION
EXPERIMENTAL
SPECIAL TEMPORARY AUTHORIZATION**

EXPERIMENTAL
(Nature of Service)

XD FX MO
(Class of Station)

WD2XJU
(Call Sign)

0370-EX-ST-2004
(File Number)

NAME Hughes Network Systems, Inc.

This Special Temporary Authorization is granted upon the express condition that it may be terminated by the Commission at any time without advance notice or hearing if in its discretion the need for such action arises. Nothing contained herein shall be construed as a finding by the Commission that the authority herein granted is or will be in the public interest beyond the express terms hereof.

This Special Temporary Authorization shall not vest in the grantee any right to operate the station nor any right in the use of the frequencies designated in the authorization beyond the term hereof, nor in any other manner than authorized herein. Neither the authorization nor the right granted hereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934. This authorization is subject to the right of use of control the Government of the United States conferred by Section 706 of the Communications Act of 1934.

Special Temporary Authority is hereby granted to operate the apparatus described below:

Purpose Of Operation:

Conducting manufacturer trials of user terminals using the existing Inmarsat 3 satellite in preparation for operations on the upcoming Inmarsat 4 satellite network.

Station Locations

- (1) San Diego (SAN DIEGO), CA - NL 32-54-31; WL 117-11-26
- (2) MOBILE: At temporarily fixed locations within 60 km of Gaithersburg (MONTGOMERY), MD, within 60 km, centered around NL 39-09-02; WL 77-12-31

Frequency Information

San Diego (SAN DIEGO), CA - NL 32-54-31; WL 117-11-26

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
1626.65-1627.15 MHz	FX	156KD7W	51.8 W (ERP)	
1626.65-1627.15 MHz	FX	156KG7W	51.8 W (ERP)	
1626.65-1627.15 MHz	FX	31K2D7W	51.8 W (ERP)	
1626.65-1627.15 MHz	FX	31K2G7W	51.8 W (ERP)	
1630.7-1631.035 MHz	FX	156KD7W	51.8 W (ERP)	
1630.7-1631.035 MHz	FX	156KG7W	51.8 W (ERP)	
1630.7-1631.035 MHz	FX	31K2D7W	51.8 W (ERP)	
1630.7-1631.035 MHz	FX	31K2G7W	51.8 W (ERP)	
1638.5-1643 MHz	FX	31K2D7W	51.8 W (ERP)	
1638.5-1643 MHz	FX	31K2G7W	51.8 W (ERP)	

This authorization effective June 15, 2004 and
will expire 3:00 A.M. EST September 16, 2004

**FEDERAL
COMMUNICATIONS
COMMISSION**



Frequency Information

San Diego (SAN DIEGO), CA - NL 32-54-31; WL 117-11-26

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
1649.82-1650.05 MHz	FX	156KD7W	51.8 W (ERP)	
1649.82-1650.05 MHz	FX	156KG7W	51.8 W (ERP)	
1649.82-1650.05 MHz	FX	31K2D7W	51.8 W (ERP)	
1649.82-1650.05 MHz	FX	31K2G7W	51.8 W (ERP)	

MOBILE: At temporarily fixed locations within 60 km of Gaithersburg (MONTGOMERY), MD, within 60 km, centered around NL 39-09-02; WL 77-12-31

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1638.5-1643 MHz	FX	31K2G7W	51.8 W (ERP)	
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1649.82-1650.05 MHz	FX	31K2G7W	51.8 W (ERP)	
1649.82-1650.05 MHz	FX	156KD7W	51.8 W (ERP)	
1649.82-1650.05 MHz	FX	156KG7W	51.8 W (ERP)	

Special Conditions:

- (1) In lieu of frequency tolerance, the occupied bandwidth of the emission shall not extend beyond the band limits set forth above.
- (2) POINT OF COMMUNICATION: INMARSAT Satellite
- (3) Prior to operation of this experimental earth station with any INMARSAT satellite system, the satellite service provider must obtain an appropriate authorization from the International Bureau of the Federal Communications Commission.

**United States of America
FEDERAL COMMUNICATIONS COMMISSION
EXPERIMENTAL
RADIO STATION CONSTRUCTION PERMIT
AND LICENSE**

EXPERIMENTAL
(Nature of Service)

FX
(Class of Station)

WD2XJU
(Call Sign)

0116-EX-PL-2004
(File Number)

NAME Hughes Network Systems, Inc.

Subject to the provisions of the Communications Act of 1934, subsequent acts, and treaties, and all regulations heretofore or hereafter made by this Commission, and further subject to the conditions and requirements set forth in this license, the licensee hereof is hereby authorized to use and operate the radio transmitting facilities hereinafter described for radio communications in accordance with the program of experimentation described by the licensee in its application for license.

Station Locations

- (1) San Diego (SAN DIEGO), CA - NL 32-54-31; WL 117-11-26
- (2) Gaithersburg, MD - NL 39-09-02; WL 77-12-31

Frequency Information

San Diego (SAN DIEGO), CA - NL 32-54-31; WL 117-11-26

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This authorization effective June 08, 2004 and
will expire 3:00 A.M. EST June 01, 2005

**FEDERAL
COMMUNICATIONS
COMMISSION**



Frequency Information

Gaithersburg, MD - NL 39-09-02; WL 77-12-31

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