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Environmental Assessment

for

Mobiles/Fixed Base Station

FCC ID: FCC ID: ROJEXPLORER-500
Model: Explorer 500

to

Federal Communications Commission

47 CFR 1.1310 (MPE)
Radiofrequency Radiation Exposure Limits

Date Of Report: August 23, 2005

On the Behalf of the Applicant:

Thrane & Thrane A/S

At the Request of:

P.O. ATSJUNOS-1

Thrane & Thrane A/S
Lundtoftegardsvej 93D
DK-2800 Lyngby, Denmark

Attention of:

Morten Becker Saul
+45 39 55 8209
Email: mbs@thrane.com

Supervised By:

David E. Lee, Quality Assurance Manager

Table of Contents

Required information per ISO/IEC Guide 25-1990, paragraph 13.2:

a)	**Test Report (Supplemental)**
b) Laboratory: (FCC: 31040/SIT) (Canada: IC 2044)	M. Flom Associates, Inc. 3356 N. San Marcos Place, Suite 107 Chandler, AZ 85225
c) Report Number:	d0580059
d) Client:	Thrane & Thrane A/S Lundtoftegardsvej 93D DK-2800 Lyngby, Denmark
e) Identification: Description:	Explorer 500 FCC ID: ROJEXPLORER-500 Immarsat Terminal
f) EUT Condition:	Not required unless specified in individual tests.
g) Report Date: EUT Received:	August 23, 2005 August 22, 2005
h, j, k):	As indicated in individual tests.
i) Sampling method:	No sampling procedure used.
l) Uncertainty:	In accordance with MFA internal quality manual.
m) Supervised by:	 David E. Lee, Quality Assurance Manager
n) Results:	The results presented in this report relate only to the item tested.
o) Reproduction:	This report must not be reproduced, except in full, without written permission from this laboratory.

Identification of the Equipment Under Test (EUT)

Name and Address of Applicant:

Thrane & Thrane A/S
Lundtoftegardsvej 93D
DK-2800 Lyngby, Denmark

Manufacturer:

Thrane & Thrane A/S
Lundtoftegardsvej 93D
DK-2800 Lyngby, Denmark

FCC ID:	ROJEXPLORER-500
Model Number:	Explorer 500
Description:	Immarsat Terminal
Type of Emission:	16QAM, QPSK
Frequency Range, MHz:	1626.5 – 1660.5
Power Rating, Watts (EIRP): ____ Switchable X Variable ____ N/A	15.0

Modulation:

____	AMPS
____	TDMA
X	CDMA
X	OTHER

Antenna:

____	Helical
____	Monopole
____	Whip
X	Other

Note: For RF Safety test antenna gain taken at the upper range of expected gain (i.e. 11 dBi) and RF Power set to highest nominal power across all channels.

THE AMERICAN
ASSOCIATION
FOR LABORATORY
ACCREDITATION

ACCREDITED LABORATORY

A2LA has accredited

M. FLOM ASSOCIATES, INC.
Chandler, AZ

for technical competence in the field of

Electrical Testing

The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration Laboratories" and any additional program requirements in the identified field of testing.

Presented this 16th day of June 2004.

President
For the Accreditation Council
Certificate Number 2152-01
Valid to August 31, 2006

For tests or types of tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

A2LA

"A2LA has accredited M. Flom Associates, Inc. Chandler, AZ for technical competence in the field of Electrical Testing. The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO/IEC 17025 – 1999 'General Requirements for the Competence of Testing and Calibration Laboratories' and any additional program requirements in the identified field of testing."

Certificate Number: **2152-01**

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-

September 15, 1999

Mr. Morton Flom
M. Flom Associates Inc.
3356 N. San Marcos Place, Suite 107
Chandler, AZ 85224

Dear Mr. Flom:

I am pleased to inform you that your laboratory has been validated by the Chinese Taipei Bureau of Standards, Metrology, and Inspection (BSMI) under the Asia Pacific Economic Cooperation Mutual Recognition Arrangement (APEC MRA). Your laboratory is now formally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA between the American Institute in Taiwan (AIT) and the Taipei Economic and Cultural Representative Office (TECRO) in the United States, covering equipment subject to Electro-Magnetic Compatibility (EMC) requirements. The names of all validated and nominated laboratories will be posted on the NIST website at http://ts.nist.gov/laps under the "Asia" category.

As of August 1, 1999, you may submit test data to BSMI to verify that the equipment to be imported into Chinese Taipei satisfies the applicable EMC requirements. **Your assigned BSMI number is SL2-IN-E-041R; you must use this number when sending test reports to BSMI.** Your designation will remain in force as long as your NVLAP and/or A2LA and/or BSMI accreditation remains valid for the CNS 13438.

Please note that BSMI requires that the entity making application for the approval of regulated equipment must make such application in person at their Taipei office. BSMI also requires the names of the authorized signatories who are authorized to sign the test reports. You can send this information via fax to C-Taipei CAB Response Manager at 301-975-5414. **I am also enclosing a copy of the cover sheet that, according to BSMI requirements, must accompany every test report.**

NIST

If you have any questions, please contact Robert Gladhill at 301-975-4273 or Joe Dhillon at 301-975-5521. We appreciate your continued interest in our international conformity assessment activities.

Sincerely,

Belinda L. Collins, Ph.D.
Director, Office of Standards Services

Enclosure

NIST

I am pleased to inform you that your laboratory has been validated by the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Your laboratory is now formally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA between the American Institute in Taiwan (AIT) and the Taipei Economic and Cultural Representative Office (TECRO) in the United States, covering equipment subject to Electro-Magnetic Compatibility (EMC) requirements. The names of all validated and nominated laboratories will be posted on the NIST website at http://ts.nist.gov/mra under the 'Asia' category."

BSMI Number: **SL2-IN-E-041R**

Standard Test Conditions
and
Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with ANSI C63.4-1992/2000, section 6.1.9, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104 °F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst-case measurements.

Name of Test: Environmental Assessment

Specification: FCC: 47 CFR 1.1310

Measurement Guide: ANSI/IEEE C95.1 1992

Test Equipment: Maximum Permissible Exposure (MPE) measurement system, consisting of:
Amplifier Research FP6001 Electric Field Probe Kit
(Calibrated July 2005)

Measurement Procedure:

1. The following measurements were performed with a probe using ANSI/IEEE C95.1 as a guide.

2. Prior to making any measurements, the measurements system was calibrated in accordance with the manufacturer's procedures.

3. The EUT's radiating element (antenna) was placed on a 1 m tall table for ease of testing. For equipment normally operated on a metal surface, a ground plane was used.

4. The remaining equipment necessary to operate the EUT was maintained at a distance from the measurement arrangement suitable to minimize interference with the measurements.

5. The minimum safe distance was calculated from the formula Power Density = EIRP / $4\pi R^2$ (Peak Watts/m^2). The calculation is shown with the measurement data.

6. With the EUT operating at maximum power, a search was initiated for worst case emissions with the probe raised and lowered over a range of 0.2 to 2 meters in height and over a horizontal plane of 0^o to 360^o.

7. Average values were calculated for the whole body (0.2-2.0m), lower body (0.2-0.8m) and upper body (1.0-2.0m).

Results: Attached.

Test Setup: Maximum Permissible Exposure (MPE)

Name of Test: R.F. Radiation Exposure

FCC Rules: 1.1307, 1.1310, 1.1311, 2.1091
Description, EUT: See page 2 of Test Report

Limits: Uncontrolled Exposure	0.3-1.234 MHz:	Limit [mW/cm^2] = 100
47 CFR 1.1310	1.34-30 MHz:	Limit [mW/cm^2] = ($180/f^2$)
Table 1, (B)	30-300 MHz:	Limit [mW/cm^2] = 0.2
	300-1500 MHz	Limit [mW/cm^2] = f/1500
	1500-100,000 MHz:	Limit [mW/cm^2] = 1.0

Test Frequencies, MHz	1626.5	1643.5	1660.5
Power, Conducted, W	= 1.29 (15.0W EIRP)		
Antenna Gain	= 11.1 dBi (Integral Antenna)		
Antenna Model	Directional Panel		

Note: The unit contains a Class 1 Bluetooth transmitter. All tests were carried out with the Bluetooth operating at full power.

Pre-test Calculations	$Power_{[W\ EIRP]} = P_{[conducted]} \times G_{[antenna]}$	= 15.0
	$Limit_{[mW/cm2]}$	= 1.0
	$Limit_{[W/m2]} = 10 \times Limit_{[mW/cm2]}$	= 10.0
	$R_{[m]} = [P_{[W\ EIRP]} / (4\pi \times Limit_{[W/m2]})]^{1/2}$	= 0.345

Results at tested distances

Probe Height, m	Power Density, mW/cm^2 Freq. 1626.5 MHz (Bluetooth 2402 MHz) Distance 60 cm	Freq. 1643.5 MHz (Bluetooth 2441 MHz) Distance 60 cm	Freq. 1660.5 MHz (Bluetooth 2481 MHz) Distance 60 cm
2.0	0.0330	0.0455	0.0455
1.8	0.0797	0.0626	0.0966
1.6	0.1313	0.1654	0.1520
1.4	0.2099	0.2740	0.2636
1.2	0.3842	0.4130	0.3800
1.0	0.5657	0.5808	0.5048
0.8	0.5487	0.5393	0.4790
0.6	0.3628	0.3337	0.3282
0.4	0.1766	0.1828	0.1675
0.2	0.1025	0.1030	0.0588

Power Density Calculations: The measured power density readings were summed and the results divided by the number of readings to calculate the average.

	1626.5 MHz	1643.5 MHz	1660.5 MHz
Whole body average (0.2 - 0.8 m, mW/cm^2) =	0.2594	0.2700	0.2476
Lower body average (0.2 - 0.8 m, mW/cm^2) =	0.2977	0.2897	0.2584
Upper body average (1.0 - 2.0 m, mW/cm^2) =	0.2340	0.2569	0.2404

END OF TEST REPORT

(The following will be placed in the Instruction Manual)

Mandatory Safety Instructions to Installers & Users

Use only manufacturer supplied antennas.

Antenna Minimum Safe Distance: 60cm**.**

Antenna Gain: Directional, with maximum gain of 11.1dB reference to isotropic.

The Federal Communications Commission has adopted a safety standard for human exposure to RF (Radio Frequency) energy which is below the OSHA (Occupational Safety and Health Act) limits.

Antenna Mounting: The antenna supplied by the manufacturer must not be located such that during radio transmission, any person or persons can come closer than the above indicated minimum safe distance to the antenna i.e. **60cm**.

To comply with current FCC RF Exposure limits, the antenna must be installed at or exceeding the minimum safe distance shown above, and in accordance with the requirements of the antenna manufacturer or supplier.

Antenna Substitution: Do not substitute any antenna for the models supplied or recommended by the manufacturer. You may be exposing person or persons to excess radio frequency radiation. You may contact the manufacturer for further instructions.

Warning: Maintain a separation distance from the antenna to a person(s) of at least **60cm**.

You, as the qualified end-user of this radio device must control the exposure conditions of bystanders to ensure the minimum separation distance (above) is maintained between the antenna and nearby persons for satisfying RF Exposure compliance. The operation of this transmitter must satisfy the requirements of Occupational/Controlled Exposure Environment, for work-related use. Transmit only when person(s) are at least the minimum distance from the front face of the antenna.

Testimonial
and
Statement of Certification

This is to certify that:

1. **That** the application was prepared either by, or under the direct supervision of, the undersigned.

2. **That** the technical data supplied with the application was taken under my direction and supervision.

3. **That** the data was obtained on representative units, randomly selected.

4. **That**, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct.

Certifying Engineer: David E. Lee, Quality Assurance Manager

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