



## MET Laboratories, Inc.

*Safety Certification - EMI - Telecom Environmental Simulation*

914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230-3432 • PHONE (410) 354-3300 • FAX (410) 354-3313

Navigational Sciences Inc.  
Corporate Square 1, Suite 100  
2420 Mall Drive  
North Charleston, SC 29406

May 9, 2005

Dear Jeffrey Scott Blair,

Enclosed is the EMC test report for compliance testing of the Navigational Sciences Inc., WARP 1.0, tested to the requirements of Title 47 of the Code of Federal Regulations (CFR), Part 15 Subpart B, Section 15.101(a).

Based on these results, MET Laboratories, Inc. certifies that the WARP 1.0, tested as configured, meets the requirements and interference limitations for a Class B Digital Devices under Title 47 of the CFR, Part 15 Subpart B, Section 15.107(a) and 15.109(a).

Thank you for using the services of MET Laboratories, Inc. If you have any questions regarding these results or if MET can be of further service to you, please feel free to contact me.

Sincerely yours,  
MET LABORATORIES, INC.

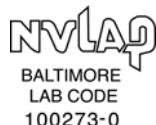
Marie Ann Confroy  
Documentation Department

Reference: (\Navigational Sciences Inc.\EMC16990-FCC)

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*The Nation's First Licensed Nationally Recognized Testing Laboratory*





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*Safety Certification - EMI - Telecom Environmental Simulation*

914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230-3432 • PHONE (410) 354-3300 • FAX (410) 354-3313

### **Electromagnetic Compatibility Criteria Test Report**

For the

**Navigational Sciences Inc.  
WARP 1.0**

**Title 47 of the Code of Federal Regulations (CFR),  
Part 15 Subpart B  
For a Class B Digital Device**

**MET Report: EMC16990-FCC**

**May 9, 2005**

Prepared for:

**Navigational Sciences Inc.  
Corporate Square 1, Suite 100  
2420 Mall Drive  
North Charleston, SC 29406**

**Prepared By:  
MET Laboratories, Inc.  
914 W. Patapsco Ave  
Baltimore, MD 21230**



Navigational Sciences Inc.  
WARP 1.0

Electromagnetic Compatibility  
CFR Title 47, Part 15, Subpart B

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Part 15 Subpart B  
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**MET Report: EMC16990-FCC**

A handwritten signature in blue ink that appears to read "K. Mehaffey".

Kevin Mehaffey  
Manager, Electromagnetic Compatibility Lab

A handwritten signature in blue ink that appears to read "Marie Ann Confroy".

Marie Ann Confroy  
Documentation Department

**Engineering Statement:** The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of Title 47 of the CFR, Part 15, Subpart B for a Class B Digital Device under normal use and maintenance.

A handwritten signature in blue ink that appears to read "Liming Xu".

Liming Xu  
Electromagnetic Compatibility Lab



Navigational Sciences Inc.  
WARP 1.0

Electromagnetic Compatibility  
CFR Title 47, Part 15, Subpart B

## Report Status Sheet

Revision	Report Date	Reason for Revision
Ø	May 9, 2005	Initial Issue.



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## List of Terms and Abbreviations

<b>AC</b>	Alternating Current
<b>ACF</b>	Antenna Correction Factor
<b>Cal</b>	Calibration
<b>d</b>	Measurement Distance
<b>dB</b>	Deci Bels
<b>dB<math>\mu</math>V</b>	Deci-Bels above one <b>micro Volt</b>
<b>dB<math>\mu</math>V/m</b>	Deci-Bels above one <b>micro Volt per meter</b>
<b>DC</b>	Direct Current
<b>DCF</b>	Distance Correction Factor
<b>E</b>	Electric Field
<b>DSL</b>	Digital Subscriber Line
<b>ESD</b>	Electrostatic Discharge
<b>EUT</b>	Equipment Under Test
<b>f</b>	Frequency
<b>FCC</b>	Federal Communications Commission
<b>GHz</b>	Giga Hertz
<b>Hz</b>	Hertz
<b>kHz</b>	kilohertz
<b>kPa</b>	kilopascal
<b>kV</b>	kilo Volt
<b>LISN</b>	Line Impedance Stabilization Network
<b>MHz</b>	MegaHertz
<b><math>\mu</math>H</b>	<b>micro</b> Henry
<b><math>\mu</math>F</b>	<b>micro</b> Farad
<b><math>\mu</math>s</b>	<b>micro</b> seconds
<b>RF</b>	Radio Frequency
<b>RMS</b>	Root-Mean-Square



## 1.0 Testing Summary

<b>Title 47 of the CFR, Part 15, Subpart B, Reference and Test Description</b>	<b>Results</b>	<b>Comments</b>
15.107 (a) Conducted Emission Limits for a Class B Digital Device	Not Applicable	The EUT is DC powered only.
15.109 (a) Radiated Emission Limits for a Class B Digital Device	Compliant	The EUT complies with the requirements of this section.

**Table 1. Summary of Test Results**



## 2.0 Equipment Configuration

### 2.1 Overview

MET Laboratories, Inc. was contracted by Navigational Sciences Inc. to perform testing on the WARP 1.0, under Navigational Sciences Inc. purchase order number SH0305-1.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Navigational Sciences Inc., WARP 1.0.

An EMC evaluation to determine compliance of the WARP 1.0 with the requirements of §15.101(a) for Class B Digital Devices was performed. (All references are to the most current version of Title 47 of the Code of Federal Regulations in effect). In accordance with §2.1075(a)(3), the following data is presented in support of the Declaration of Conformity of the WARP 1.0. Navigational Sciences Inc. should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the WARP 1.0 has been permanently discontinued, as per §2.1075(c).

The results obtained relate only to the item(s) tested.

<b>Model(s) Tested:</b>	WARP 1.0
<b>Model(s) Covered:</b>	WARP 1.0
<b>Primary Power:</b>	6-30 Vdc
<b>Equipment Emissions Class:</b>	B
<b>Highest Clock Frequency:</b>	None Listed
<b>Evaluated by:</b>	Liming Xu
<b>Report Date:</b>	May 3, 2005

Table 2. EUT Overview



## 2.2 Test Site

All testing was performed at MET Laboratories, Inc., 914 West Patapsco Avenue, Baltimore, MD 21230. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a semi-anechoic chamber. In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories. In accordance with §2.948(d), MET Laboratories has been accredited by the National Voluntary Laboratory Accreditation Program (Lab Code: 100273-0).

## 2.3 Description of Test Sample

The WARP 1.0, Equipment Under Test (EUT), is a compact asset-tracking device, which utilizes the GPS satellite system to determine location and the GSM/GPRS mobile telephony system for communication. User parameters are configured using an PC ASCII terminal or remotely by SMS or GPRS.

Various reported modes are supported, as below:

- a) Real- time reporting via GPRS (TCP)
- b) SMS text mode (either plain text or MPTP format)
- c) SMS PDU mode- 8 positions per SMS (to reduce running costs)
- d) Data logging only for download on demand

In full power mode, typical current consumption is only 22 mA at 13.8 Vdc. Faster GPS and reduced processor consumption allow even greater power savings in low power modes of operation. Autonomous battery powered applications (e.g. cargo tracking), will benefit from extended operation durations or smaller, lower cost battery solutions.

The WP010NS incorporates the latest GPS technology from FAstraX. In addition to the size and power efficiency benefits, many applicants will benefit from tracking into marginal areas, which were previously beyond GPS coverage.

When GSM communications are unavailable, data is logged to non-volatile flash memory for sending when communications resume (or download over GPRS upon request). The WP010NS has sufficient on-board flash memory for storage of 10, 000 individual position/date/status reports.

The GSM modem is a Wavecom dual band device (900/1800 or 850/1900), and is capable of fully automatic international roaming.



## 2.4 Equipment Configuration

The EUT was set up as outlined in Figure 1. All equipment incorporated as part of the EUT is included in the following list.

Name / Description	Model Number	Part Number	Serial Number
Tracking Device	GSM/GPRS		None Listed

**Table 3. Equipment Configuration**

## 2.5 Support Equipment

Support equipment necessary for the operation and testing of the EUT is included in the following list.

Ref. ID	Name / Description	Manufacturer	Model Number
1	IBM Think Pad	IBM	2629
2	WARP Module	VASoTrack	WP010NS
3	GSM/ GPRS /GPS Antenna	San Jose	AU-3S-GSM
4	AC Adapter	IBM	AA21131
5	Programming Cable	VascoTrack	64219-01 CP
6	WARP Module Power Lead	N/A	N/A
14	GSM V 3.0 SunCom Sim Card	SunCom	89014 90110 12617 2118

**Table 4. Support Equipment**



## 2.6 Ports and Cabling Information

Ref. ID	Port Name on EUT	Cable Description	Qty.	Length (m)	Shielded (Y/N)	Termination Point
7	GPS	SSMB Jack	1	N/A	N/A	N/A
8	GSM	MCX Jack	1	N/A	N/A	N/A
9	Power	103653-1, 104505-1	1	N/A	N/A	N/A
10	Data	TX20A	1	N/A	N/A	N/A
11	None Listed	Programming Cable	1	0.4	Yes	Data Port/JAE TX20A-26PH1-D2P1-D1
12	GSM/GPRS/GPS Antenna	Combo GSM/GPS Antenna	1	3	Yes	GPS (SSMB)/ GSM (MCX)
13	Power	WARP Module Lead Power	1	2	No	Power

Table 5. Ports and Cabling Information

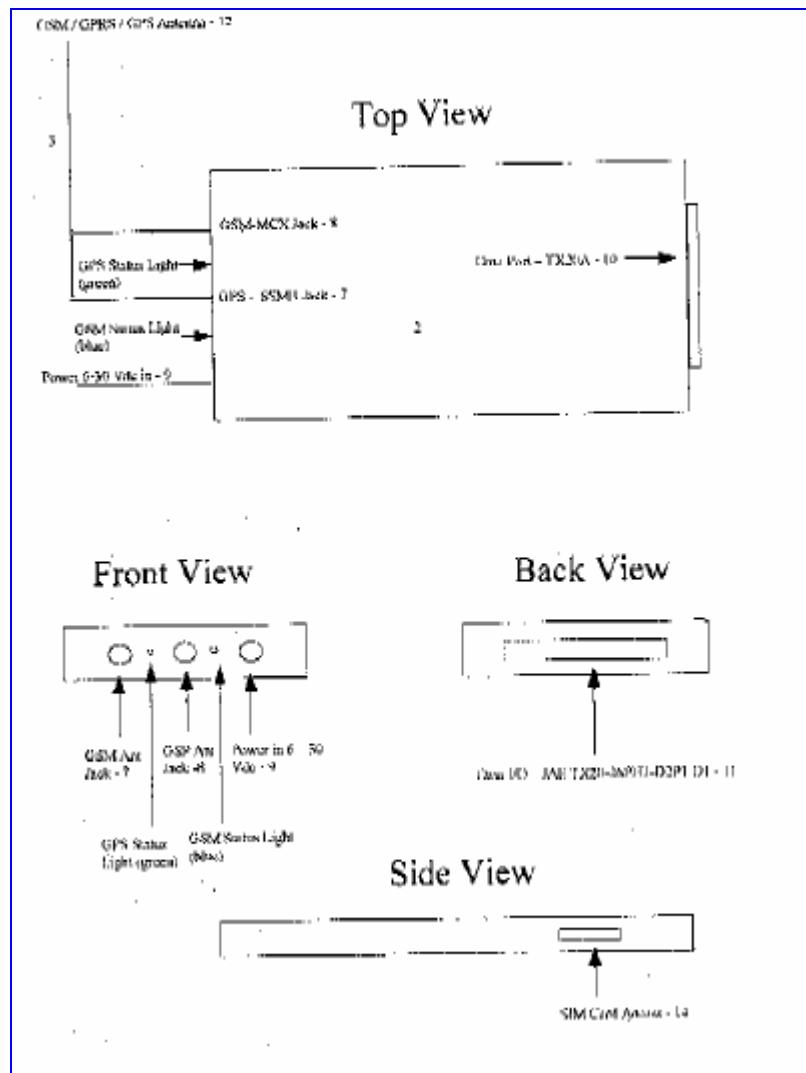


Figure 1. Block Diagram of Test Configuration



## 2.7 Mode of Operation

Communication with device can be done through the serial connection (programming cable) or via SMS / GPRS by using NEMA Commands. A list of all commands that can be issued to the unit via these two methods are listed in the System Integration Reference and in the NEMA Command Reference.

The unit operates in GSM / GPRS modes and can utilize SMS when available.

GSM- Global Standards for Mobile

GPRS- General Packet Radio Services

SMS- Short Messaging Service

## 2.8 Method of Monitoring EUT Operation

There are Green and Blue lights on the front of the unit. These lights indicate what operation the unit is undertaking and what the status is.

GPS Status (Green):	Constant ON	Searching for internal fix
	Flash (1 Hz)	GPS 3D navigation
	Constant OFF	Lost GPS signal

GSM Status (Blue):	Constant ON	GSM ON, searching for network
	Slow Flash (0.5 Hz)	GSM registered on network
	Quick Flash (1 Hz)	GSM communication in progress
	Constant OFF	GSM Modem OFF

## 2.9 Modifications

### 2.9.1 Modifications to EUT

No modifications were made to the EUT.

### 2.9.2 Modifications to Test Standard

No modifications were made to the test standard.

## 2.10 Disposition of EUT

The test sample including all support equipment (if any), submitted to the Electro-Magnetic Compatibility Lab for testing was returned to Navigational Sciences Inc. upon completion of testing.



### 3.0 Electromagnetic Compatibility Emission Criteria

#### 3.1 Conducted Emission Limits

**Test Requirement(s):** **15.107 (a)** ‘‘Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in Table 6. Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.’’

**15.107 (b)** ‘‘For a Class A digital device that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in Table 6. Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals. The lower limit applies at the band edges.’’

Frequency range (MHz)	15.107(b), Class A Limits (dB $\mu$ V)		15.107(a), Class B Limits (dB $\mu$ V)	
	Quasi-Peak	Average	Quasi-Peak	Average
* 0.15 – 0.5	79	66	66 - 56	56 - 46
0.5 - 5.0	73	60	56	46
5.0 – 30.0	73	60	60	50

Note 1 — The lower limit shall apply at the transition frequencies.  
Note 2 — The limit decreases linearly with the logarithm if the frequency in the range 0.15 MHz to 0.5 MHz.  
\* — The FCC issued a Recommended Opinion and Order (RO&O) 989-80 in May 2002, providing transition into the emission limits and frequency ranges shown above.

**Table 6. Conducted Limits for Radio Frequency Devices calculated from FCC Part 15 Section 15.107(a) (b)**

**Test Results:** The EUT was not applicable with the requirements of this section. The EUT is DC powered only.



### 3.2 Radiated Emission Limits

**Test Requirement(s):** **15.109(a)** Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the Class B limits expressed in Table 7.

**15.109 (b)** The field strength of radiated emissions from a Class A digital device, as determined at a distance of 10 meters, shall not exceed the Class A limits expressed in Table 7.

Frequency (MHz)	Field Strength (dB $\mu$ V/m)	
	§ 15.109 (b), Class A Limit (dB $\mu$ V) @ 10m	§ 15.109 (a), Class B Limit (dB $\mu$ V) @ 3m
30 - 88	39.00	40.00
88 - 216	43.50	43.50
216 - 960	46.40	46.00
Above 960	49.50	54.00

**Table 7. Radiated Emissions Limits calculated from FCC Part 15, § 15.109 (a) (b)**

**Test Procedures:**

The EUT was placed on a 0.8 m high wooden table (See Photograph 1). Various antennas were placed near the EUT and measurements were taken of the field strengths and frequencies.

For final radiated measurements, the EUT was placed in semi-anechoic chamber, and located 3 m from an adjustable antenna mast. For pre-scanning, the spectrum analyzer scanned the frequency range from 30 MHz to 1 GHz to obtain an emission profile of the EUT.

For each point of measurement, the turntable was rotated, and the antenna height was varied between 1 m and 4 m, in order to find the maximum radiated emissions. Measurements above 30 MHz were taken using this technique with the antenna in two polarizations: horizontal and vertical.

Unless otherwise specified, measurements were made using a quasi-peak detector with a 120 kHz bandwidth for below 1 GHz. For above 1 GHz, measurements were made using an average detector with a 1 MHz Resolution bandwidth and 10 Hz Video bandwidth.

**Test Results:** The EUT complies with the Class B requirements of this section.

**Test Engineer(s):** Liming Xu

**Test Date(s):** 04/19/05



## Radiated Emissions Limits Test Results, Class B

Frequency (MHz)	EUT Azimuth (Degrees)	Antenna Polarity (H/V)	Antenna Height (m)	Uncorrected Amplitude (dBuv)	Antenna Correction Factor (dB) (+)	Cable Loss (dB) (+)	Distance Correction Factor (dB) (-)	Corrected Amplitude (dBuv)	Limit (dBuv)	Margin (dB)
98.000	0	H	1.00	9.11	7.60	2.27	0.00	18.98	43.50	-24.52
98.000	0	V	1.00	9.15	7.40	2.27	0.00	18.82	43.50	-24.68
120.500	140	H	1.97	9.10	7.31	2.44	0.00	18.85	43.50	-24.65
120.500	275	V	1.39	13.28	7.83	2.44	0.00	23.55	43.50	-19.95
134.050	78	H	2.99	16.45	7.66	2.53	0.00	26.64	43.50	-16.86
134.050	105	V	1.03	20.50	7.78	2.53	0.00	30.81	43.50	-12.69
144.375	236	H	1.84	12.76	8.07	2.61	0.00	23.44	43.50	-20.06
144.375	64	V	1.03	26.26	8.35	2.61	0.00	37.22	43.50	-6.28
148.750	233	H	1.92	13.26	8.10	2.64	0.00	24.00	43.50	-19.50
148.750	62	V	1.03	26.18	8.25	2.64	0.00	37.07	43.50	-6.43
464.975	95	H	2.11	12.01	16.90	4.34	0.00	33.25	46.00	-12.75
464.975	202	V	1.03	10.96	17.10	4.34	0.00	32.40	46.00	-13.60

**Table 8. Radiated Emissions Limits Test Results**

Note: There is no detectable emissions from 464.975 MHz to 20 GHz.



Navigational Sciences Inc.  
WARP 1.0

Electromagnetic Compatibility  
Emission Criteria  
CFR Title 47, Part 15, Subpart B

## Radiated Emission Limits Test Setup



Photograph 1. Radiated Emission Limits Test Setup



## 4.0 Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ANSI/NCSL Z540-1-1994 and ANSI/ISO/IEC 17025:2000.

Test Name: Radiated Emissions			Test Date(s): 04/19/05		
MET Asset #	Nomenclature	Manufacturer	Model	Last Cal Date	Cal Due Date
1T4302	EMI Reciver	HP	85462A	10/18/2004	10/18/2005
1T4300	Semi-Anechoic Chamber #1	EMC Test System	None	05/03/2003	04/03/2006
1T4303	Antenna ; BILOG	Schafner-Chase EMC	CBL6140A	04/22/2004	04/22/2005
1T4461	Thermo-Hygrometer	Fisher Scientific	11-661-7D	11/08/2004	11/08/2006

**Table 9. Test Equipment**



## 5.0 Compliance Information

The following text excerpts are from the Code of Federal Regulations, Title 47, Part 2 and 15.

### § 2.1073 Responsibilities

- (a) The responsible party, as defined in Section 2.909 of this part, must warrant that each unit of equipment marketed under a Declaration of Conformity is identical to the unit tested and found acceptable with the standards and that the records maintained by the responsible party continue to reflect the equipment being produced under the Declaration of Conformity within the variation that can be expected due to quantity production and testing on a statistical basis.
- (b) The responsible party, if different from the manufacturer, may upon receiving a written statement from the manufacturer that the equipment complies with the appropriate technical standard rely on the manufacturer or independent testing agency to determine compliance. However, the test records required in Section 2.1075 of this part shall be in the English language and shall be made available to the Commission upon a reasonable request in accordance with the provisions of Section 2.1076 of this part.
- (c) In the case of transfer of control of the equipment, as in the case of sale or merger of the responsible party, the new responsible party shall bear the responsibility of continued compliance of the equipment.
- (d) Equipment shall be retested to demonstrate continued compliance with the applicable technical standards if any modifications or changes that could adversely affect the emanation characteristics of the equipment are made by the responsible party. The responsible party bears responsibility for the continued compliance of subsequently produced equipment.
- (e) If any modifications or changes are made by anyone other than the responsible party for the Declaration of Conformity, the party making the modifications or changes, if located within the U.S., becomes the new responsible party. The new responsible party must comply with all the provisions for the Declaration of Conformity, including having test data on file demonstrating that the product continues to comply with all of the applicable technical standards.

### § 2.1074 Identification

Devices subject only to a Declaration of Conformity shall be uniquely identified by the responsible party. This identification shall not be of a format which could be confused with the FCC Identifier required on certified, notified, type accepted, or type approved equipment. The responsible party shall maintain adequate identification records to facilitate positive identification for each device.



## § 2.1077 Compliance information

(a) If a product must be tested and authorized under a Declaration of Conformity, A COMPLIANCE INFORMATION STATEMENT SHALL BE SUPPLIED WITH THE PRODUCT AT THE TIME OF MARKETING OR IMPORTATION, containing the following information:

- (1) Identification of the product, e.g., name and model number;
- (2) A statement, similar to that contained in §15.19(a)(3) of this chapter, that the product complies with part 15 of this chapter; and
- (3) The identification, by name, address, and telephone number, of the responsible party, as defined in §2.909. The responsible party for Declaration of Conformity must be located in the United States.

(b) If a product is assembled from modular components that, by themselves, are authorized under a Declaration of Conformity and/or a grant of certification, and the assembled product is also subject to authorization under a Declaration of Conformity but, in accordance with the applicable regulations does not require additional testing, the product shall be supplied, at the time of marketing or importation, with a compliance information statement containing the following information:

- (1) Identification of the assembled product, e.g., name and model number.
- (2) Identification of the modular components used in the assembly. A modular component authorized under a Declaration of Conformity shall be identified as specified in paragraph (a)(1) of this section. A modular component authorized under a grant of certification shall be identified by name and model number (if applicable) along with the FCC Identifier number.
- (3) A statement that the product complies with part 15 of this chapter.
- (4) The identification, by name, address, and telephone number, of the responsible party who assembled the product from modular components, as defined in § 2.909. The responsible party for a Declaration of Conformity must be located within the United States.
- (5) Copies of the compliance information statements for each modular components used in the system that is authorized under a Declaration of Conformity.

(c) The compliance information statement shall be included in the user's manual or as a separate sheet.

## § 15.3 Definitions

(a) Peripheral Device An input/output unit of a system that feeds data into and/or receives data from the central processing unity of a digital device. Peripherals to a digital device include any device that is connected external to the digital device, any device internal to the digital device that connects the digital device to an external device by wire or cable, and any circuit board designed for interchangeable mounting, internally or externally, that increases the operating or processing speed of a digital device, e.g., "turbo" cards and "enhancement" boards. Examples of peripheral devices include terminals, printers, external floppy disk drives and other data storage devices, video monitors, keyboards, interface boards, external memory expansion cards, and other input/output devices that may or may not contain digital circuitry. This definition does not include CPU boards, as defined in paragraph (bb) of this section, even though a CPU board may connect to an external keyboard or other components.

(b) CPU Board A circuit board that contains a microprocessor, or frequency determining circuitry for the microprocessor, the primary function of which is to execute user-provided programming, but not including: (1) a circuit board that contains only a microprocessor intended to operate under the primary control or instruction of a microprocessor external to such a circuit board; or (2) a circuit board that is a dedicated controller for a storage or input/output device.



## 5.1 Label and User's Manual Information

### § 15.19 Labeling requirements

- (a) (4) Where a device is constructed in two or more sections connected by wires and marketed together, a statement specified under paragraph (a) of this section is required to be affixed only to the main control unit.
- (5) When a device is so small or for such use this is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.
- (b) Products subject to authorization under the Declaration of Conformity shall be labeled as follows:
  - (1) The label shall be located in a conspicuous location on the device and shall contain the unique identification described in Section 2.1074 of this chapter and the following logo:
    - (i) If the product is authorized based on testing of the product or system:
    - (ii) If the product is authorized based on assembly using separately authorized components and the resulting product is not separately tested:
  - (2) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (b)(1) of this section on it, such as for a CPU board or a plug-in circuit board peripheral device, the text associated with the logo may be placed in a prominent location in the instruction manual or pamphlet supplied to the user. However, the unique identification (trade name and model number) and the logo must be display on the device.
  - (3) The label shall not be a stick-on, paper label. The label shall be permanently affixed to the product and shall be readily visible to the purchaser at the time of purchase. "Permanently affixed" means that the label is etched, engraved, stamped, silk-screened, indelibly printed or otherwise permanently marked on a permanent attached part of the equipment or on a nameplate of metal, plastic, or other material fastened to the equipment by welding, riveting or a permanent adhesive. The label must be designed to last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable. Reference new Section 15.19(b)(3).



Navigational Sciences Inc.  
WARP 1.0

Electromagnetic Compatibility  
Compliance Information  
CFR Title 47, Part 15, Subpart B

## DECLARATION OF CONFORMITY LABELLING REQUIREMENTS FOR PERSONAL COMPUTERS AND PERSONAL COMPUTER PERIPHERALS

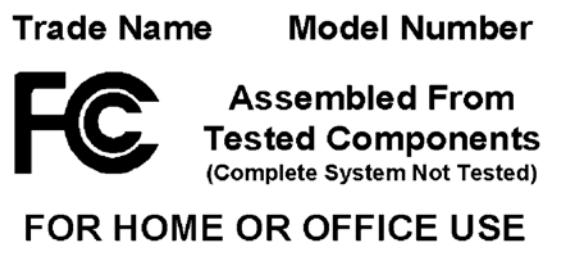
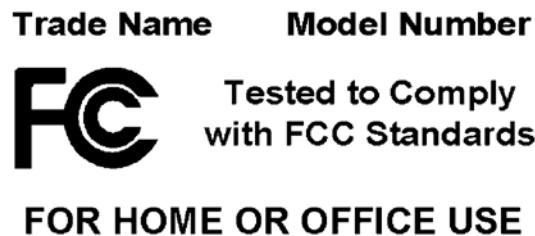
The labeling requirements below apply only to personal computers and personal computer peripherals that are self-authorized under the Declaration of Conformity procedure.

### Required label formats

**Label A** is required if the device is authorized based on testing of the product or system. **Label B** is required if the device is authorized based on assembly using separately authorized components and the resulting device is not separately tested. Refer to new Sections 15.19(b)(1) - (b)(1)(i).

### Alternate label format for small devices

The FCC logo, trade name and model number must be shown on the product. The text shown in ***bold-face italics*** may be placed in a prominent location in the instruction manual or pamphlet supplied to the user. Refer to the new Section 15.19(b)(2).





### § 15.21 Information to user.

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

### § 15.32 Test Procedures for CPU boards and computer power supplies

Power supplies and CPU boards used with personal computers and for which separate authorizations are required to be obtained shall be tested as follows:

(a) CPU boards shall be tested as follows:

(1) Testing for radiated Emissions shall be performed with the CPU board installed in a typical enclosure but with the enclosure's cover removed so that the internal circuitry is exposed at the top and on at least two sides. Additional components, including a power supply, peripheral devices, and subassemblies, shall be added, as needed, to result in a complete personal computer system. If the oscillator and the microprocessor circuits are contained on separate circuit boards, both boards, typical of the combination that would normally be employed, must be used in the test. Testing shall be in accordance with the procedures specified in Section 15.31 of this part. Under these test conditions, the system under test shall not exceed the radiated emission limits specified in Section 15.109 of this part by more than 3dB.

(2) Unless the test in paragraph (a)(1) of this section demonstrates compliance with the limits in Section 15.109 of this part, a second test shall be performed using the same configuration described above but with the cover installed on the enclosure. Testing shall be in accordance with the procedures specified in Section 15.31 of this part. Under these test conditions, the system under test shall not exceed the radiated emission limits specified in Section 15.109 of this part.

(3) The test demonstrating compliance with the AC power line conducted limits specified in Section 15.107 of this part shall be performed in accordance with the procedures specified in Section 15.31 using an enclosure, peripherals, power supply, and subassemblies that are typical of the type with which the CPU board under test would normally be employed.

(b) The power supply shall be tested installed in an enclosure that is typical of the type within which it would normally be installed. Additional components, including peripheral devices, a CPU board, and subassemblies, shall be added, as needed, to result in a complete personal computer system. Testing shall be in accordance with the procedures specified in Section 15.31 and must demonstrate compliance with all of the standards contained in this part.

### § 15.105 Information to the user.

(a) For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in



accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

(b) For a Class B digital device or peripheral, the instructions furnished to the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

(c) The provisions of paragraphs (a) and (b) of this section do not apply to digital devices exempted from the technical standards under the provisions of § 15.105.

(d) For systems incorporating several digital devices, the statement shown in paragraph (a) or (b) of this section needs to be contained only in the instruction manual for the main control unit.