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

July 23, 2003

Motion Computing, Inc.
9433 Bee Caves Road, Building 1, Suite 250
Austin, TX 78733

Reference: Tablet PC and RF Devices

Dear John Doherty,

Enclosed is the EMC Test Report for the Motion Computing, Inc. Tablet PC and RF Devices . The Motion Computing, Inc. Tablet PC and RF Devices was tested to the requirements of Title 47 of the CFR, Part 15, Subpart C.

Thank you for using the testing services of MET Laboratories. If you have any questions regarding these results or if MET can be of further to you, please feel free to contact me. We appreciate your business and look forward to working with you again soon.

Kindest Regards,
MET LABORATORIES, INC.

Joanna A. Kolasinski

Joanna Agnieszka Kolasinski
Documentation Department

Enclosures: (\CustomerName\EMC13354-FCC209.rpt)

Electro-Magnetic Compatibility
Test Report

of the

Motion Computing, Inc. Tablet PC and RF Devices

as a Periodic Intentional Radiator
under
Title 47 of the CFR, Part 15, Subpart C

MET REPORT: **EMC13354-FCC209**

July 23, 2003

PREPARED FOR:

Motion Computing, Inc.
9433 Bee Caves Road, Building 1, Suite 250
Austin, TX 78733

PREPARED BY:

MET Laboratories, Inc.
914 West Patapsco Avenue
Baltimore, Maryland 21230-3432

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Christopher R. Harvey, Director
Electromagnetic Compatibility Testing

Joanna Agnieszka Kolasinski
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 Part 15 of the FCC Rules under normal use and maintenance.

Liming Xu
Project Engineer

REPORT STATUS SHEET

Revision	Revision Date	Reason for Revision
⌀	July 23, 2003	Initial Issue.

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List of Terms and Abbreviations

AC	**A**lternating **C**urrent
Cal	**Cal**ibration
d	**M**easurement **D**istance
dB	**D**eci**b**els
dBµA	**D**eci**b**els above one **micro**amp
dBµV	**D**eci**b**els above one **micro**volt
dBµA/m	**D**eci**b**els above one **micro**amp **per m**eter
dBµV/m	**D**eci**b**els above one **micro**volt **per m**eter
DC	**D**irect **C**urrent
E	**E**lectric Field
DSL	**D**igital **S**ubscriber **L**ine
ESD	**E**lectro**s**tatic **D**ischarge
EUT	**E**quipment **U**nder **T**est
f	**F**requency
FCC	**F**ederal **C**ommunications **C**ommission
CISPR	**C**omite **I**nternational **S**pecial des **P**erturbations **R**adioelectriques (International Special Committee on Radio Interference)
GRP	**G**round **R**eference **P**lane
H	Magnetic Field
HCP	**H**orizontal **C**oupling **P**lane
Hz	**H**ert**z**
IEC	**I**nternational **E**lectrotechnical **C**ommission
kHz	**k**ilo**h**ert**z**
kPa	**k**ilo**pa**scal
kV	**k**ilo**v**olt
LISN	**L**ine **I**mpedance **S**tabilization **N**etwork
MHz	**M**ega**h**ertz
µ**H**	**microh**enry
µ**F**	**microf**arad
µ**s**	**micros**econds
NEBS	**N**etwork **E**quipment-**B**uilding **S**ystem
PRF	**P**ulse **R**epetition **F**requency
RF	**R**adio **F**requency
RMS	**R**oot-**M**ean-**S**quare
TWT	**T**raveling **W**ave **T**ube
V/m	**V**olts **per m**eter
VCP	**V**ertical **C**oupling **P**lane

I. Executive Summary

A. Purpose of Test

An EMI evaluation to determine compliance of the Motion Computing, Inc. Tablet PC and RF Devices with the requirements of Part 15, Subpart C was conducted. (All references are to the most current version of Title 47 of the Code of Federal Regulations in effect.) In accordance with §2.1033(b), the following test report is presented in support of the application for grant of certification of the Motion Computing, Inc. Tablet PC and RF Devices. Motion Computing, Inc. should retain a copy of this document for at least one year after the manufacturing of the Motion Computing, Inc.Tablet PC and RF Devices has been **permanently** discontinued, as per §2.938(c).

B. Executive Summary

All testing was conducted at MET Laboratories, Inc., 914 West Patapsco Avenue, Baltimore, Maryland 21230-3432. Radiated emissions measurements were performed on a three-meter open air test site (OATS). In accordance with §2.948, a complete site description is on file with the FCC Laboratory Division as 31040/SIT/MET.

Measurement of the variation of the radiated signal level of the fundamental frequency component, as required by §15.31(e), was not required due to battery operation. The unit was tested with a new battery.

As required by §15.231(b) of CFR 47, ***radiated emissions*** *measurements* were made in accordance with the general procedures of §2.947 and §15.31, and ANSI C63.4-1992 "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The measurements were performed over the frequency range of 30 MHz to the tenth harmonic of the carrier using the following equipment:

Frequency Range	Input Transducer	Measurement Instrumentation
30 MHz to 300MHz 300 MHz to 1 GHz above 1 GHz	Biconical Antenna Log-Perodic Antenna Double Ridged Guide Horn	EMI receiver EMI receiver EMI receiver

The measurements were made with the detector set for "quasi-peak" with a bandwidth of 120 kHz (for measurements made between 30 MHZ and 1 GHz). In general, all radiated emissions measurements were made with the quasi-peak detector unless otherwise noted. For measurements above 1 GHz, a 1 MHz detector was used with either a "peak" detector or an "average" detector. In general, all radiated emissions above 1 GHz measurements were made with the peak detector unless otherwise noted. Additionally, it was verified that the peak levels of the emissions did not to exceed the radiated emission limit by more than 20 dB (reference §15.35(b)). A preliminary RF scan was performed in an RF-shielded enclosure. Final measurements were made on the OATS, as per §15.31(d).

C. References

Reference	Description
Purchase Order # 1253	Motion Computing, Inc. Purchase Order and FCC Identifier for Tablet PC and RF Devices Testing
Title 47 of the CFR, Part 15, Subpart C	Electromagnetic Compatibility - Radiated Emissions for a Class B Digital Device

Table 1. References

The EUT, as supplied to MET Laboratories, complied with the requirements stated in this test report.

II. General

A. Test Site

All testing was conducted at MET Laboratories, Inc., 914 West Patapsco Avenue, Baltimore, Maryland 21230-3432. Radiated Emissions measurements were performed on the OATS. 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)

B. Description of Test Sample

The EUT consisted of a Tablet PC and RF Devices. The EUT consists of a tablet computer, which uses a modulated magnetic field to detect the position of the stylus used to write on it. Also included as part of the EUT are a Docking station, and a DC-Power adapter.

C. General Test Setup

The EUT was tested in the configuration shown on the following pages.

D. Mode of Operation

The Motion Computing, Inc. Tablet PC and RF Devices was configured in accordance with the manufacturer's instructions and was operated as follows for all testing contained in this report unless stated otherwise:

The EUT is connected to the DC Power supply and placed in its docking station. A LAN cable, external CDROM, USB Keyboard, printer, and external monitor are connected to the EUT. The EUT is, when powered on, continuously scanning magnetically for the passive stylus.

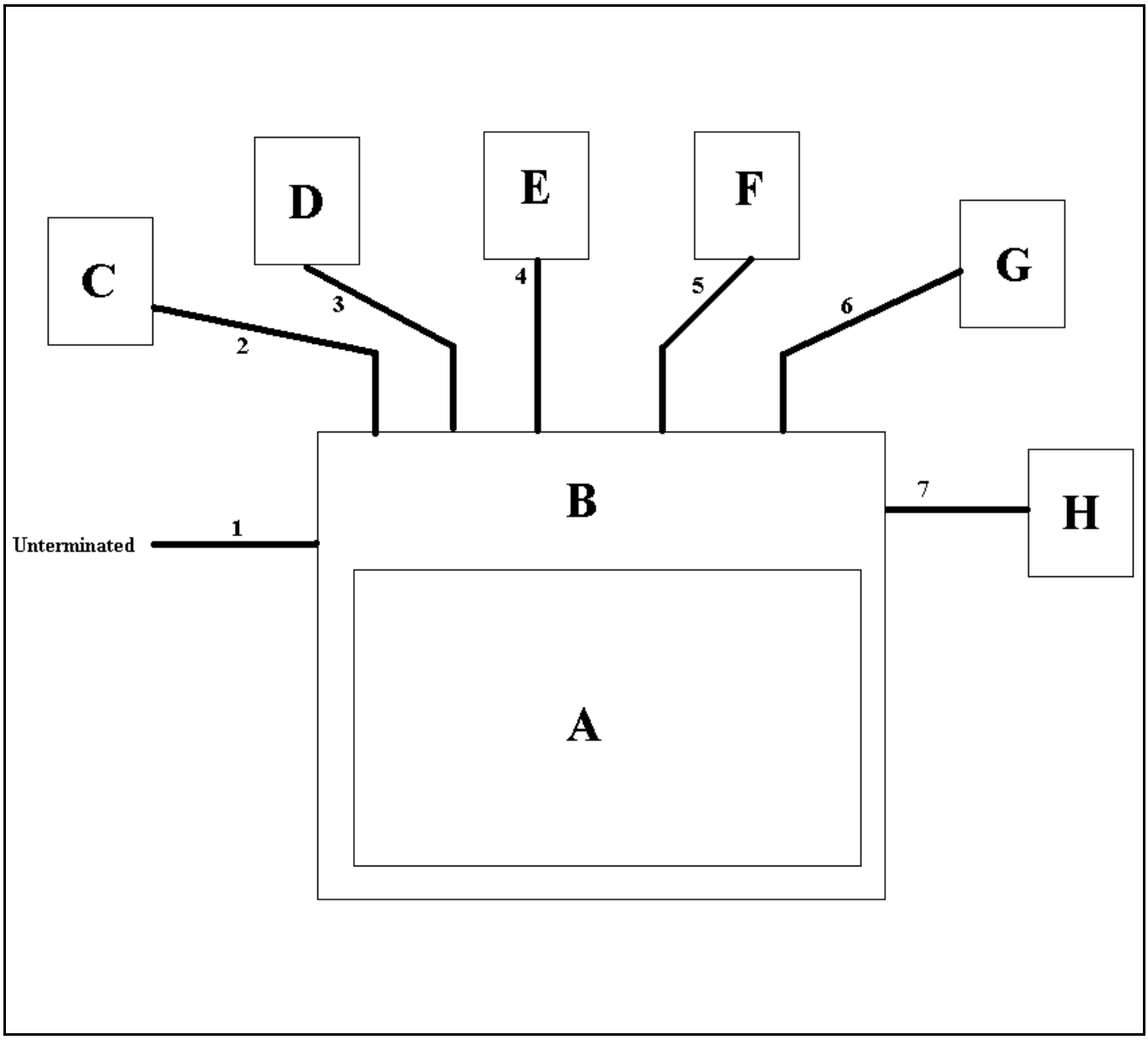

Figure 1. Test Configuration

EUT

Reference to Test Configuration [Figure 1]	Description/ Nomenclature	Model Number	Serial Number	Revision
A	Tablet PC	Rapier 1	CX00	1.5
B	Docking station	D001	017010001	-
C	DC Power Supply	ADP-50HH	KBW0244000351	-

Support Equipment

Reference to Test Configuration [Figure 1]	Description/ Nomenclature	Manufacturer	Model Number	Serial Number
D	External CDROM Drive	Motion Computing	ESU-178I	915CD370122
E	USB Keyboard	Motion Computing	KB-1011	21100501
F	Computer Speakers	Labtek	SP-101	35546
G	Monitor	ViewSonic	14Ei	FZ3342
H	USB Mouse	Microsoft	Intellimouse	5382424

Card/Module Information

Ref ID	Port name on EUT	Type of Cable or reason for no cable	How many by default?	Length (m)	Shielded?	Termination Box ID & Port ID
1	Lan Cable	Category 5	1	3	N	Unterminated
2	CDROM Cable	USB	1	1.5	Y	USB Port
3	Keyboard	USB	1	1.5	Y	USB Port
4	Mouse	USB	1	1.5	Y	USB Port
5	Speakers	22 AWG 3c.	1	1.5	N	Audio Output
6	Monitor	VGA Cable	1	1.5	N	VGA
7	DC Power Adapter	18AWG, 2c.	1	1.5	N	DC Power supply

E. Modifications

No modifications were made during testing.

F. Disposition of Test Sample

Returned to:

Motion Computing, Inc.
9433 Bee Caves Road, Building 1, Suite 250
Austin, TX 78733

III. Electromagnetic Compatibility Emission Criteria

III. Electromagnetic Interference Emission Criteria

A. Radiated Emissions - 560kHz Magnetic Field Transmitter

Requirements: The EUT shall meet the limits specified in FCC Part 15 Subpart C, Sections: 15.209.

Test Equipment: Test Equipment for FCC Radiated Emissions is listed in Section IV of this report.

Test Conditions: The EUT was installed located inside a shielded enclosure. The EUT was located 3 m from a loop antenna in a test area selected for low ambient Magnetic Emissions.

III. Electromagnetic Compatibility Emission Requirements

Photograph:

Photograph 1. FCC 15.209 Radiated Emissions Test Setup Photo

Procedure: For radiated magnetic measurements, the EUT was placed in a magnetically shielded enclosure. The antenna was then rotated about its vertical axis for maximum response at each azimuth about the EUT. Additionally, it was verified that the peak levels of the emissions did not to exceed the radiated emission limit by more than 20 dB (reference §15.35(b)).

III. Electromagnetic Compatibility Emission Requirements

Results: The EUT complied with the Radiated Emissions limits of Sections 15.209.

Frequency	Azimuth of EUT	Degree	Height (m)	Raw Amplitude (dBuV/m)	ACF	Cable Loss	Corrected Amplitude (dBuA/m)	Limit R3-4	Margin
0.56-0.567	0	180	1.0	21.09	0.00	-0.29	21.38	52.7	-31.32

Note 1: There were no detectable signals between 560kHz - 567kHz.
Note 2: EUT was scanned with loop antenna in Horizontal and Vertical orientations.
Note 3: There were no detectable emissions up to 30MHz.

Test Engineer: Liming Xu

Test Date: 2/28/2003

IV. Test Equipment

IV. 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.

MET #	Nomenclature	Manufacturer	Model	Cal Date	Cal Due
1T4300	Test Room	Ch# 1	n/a	8/21/02	8/21/03
1T4272	Loop Antenna	EMCO	6512	11/20/02	11/20/03
1T4302	Spectrum Analyzer	Hewlett Packard	8546A	9/17/02	9/17/03

Table 2. Test Equipment for Class A Radiated Emissions

Note: Functionally verified test equipment is verified at the time of testing.

END OF REPORT

