TEST REPORT

Report Number: 3080099MIN-001F
Project Number: 3080099
July 25, 2005

Testing performed on the
Wireless Switch System: 100-301-XX

to
47 CFR:2003, §15.107 and §15.109
Class B

For
Ablenet, Inc.

Test Performed by:	Test Authorized by:
Intertek	Ablenet, Inc.
7250 Hudson Blvd. Suite 100	2808 Fareview Avenue North
Oakdale, MN 55128	Roseville, MN 55113

Prepared by: _____ Date: July 25, 2005
Uri Spector

Reviewed by: _____ Date: July 25, 2005
Yuriy Litvinov

CONTENTS

1.0 JOB DESCRIPTION

Equipment:	Wireless Switch System: 100-301-XX consisting of transmitter unit and receiver unit
Equipment Serial No:	n/a
Voltage/Phase:	3VDC from internal AA batteries
Customer:	Mr. Steve Miller 2808 Fareview Avenue North Roseville, MN 55113 Ph: (651) 294-2212; Fax: (651) 294 2259
Test Standard:	**47 CFR:2003**, §15.107 and §15.109 Class B
Date Sample Submitted:	July 20, 2005
Test Work Started:	July 20, 2005
Test Work Completed:	July 25, 2005
Test Sample Conditions:	Good

2.0 TEST SUMMARY

Referring to the performance criteria and the operating mode during the tests specified in this report, the equipment complies with the requirements according to the following standards.

TEST STANDARD	TEST	COMMENTS
Subpart B – 15.107	Conducted Emissions	Pass
Subpart B – 15.109	Radiated Emissions	Pass

Where comments other than "pass" are entered in the "comments" column, further details may be found in the TEST RESULTS section.

Note 1: The measured result in this report is within the specification limits by more than the measurement uncertainty; the measured result indicates that the product tested complies with the specification limit.

2.1 Limits for Conducted and Radiated Disturbances for FCC parts 15.107 and 15.109

Conducted Emissions Limits

Frequency range (MHz)	Class A		Class B	
	QP Limits (dBµV)	AVG Limits (dBµV)	QP Limits (dBµV)	AVG Limits (dBµV)
0.15 to 0.50	79	66	66 to 56	56 to 46
0.50 to 5	73	60	56	46
5 to 30	73	60	60	50

NOTES 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz .

Radiated Emissions Limits

Frequency of Emissions (MHz)	CLASS A at 10 m		CLASS B at 3 m	
	µV/m	dBµV/m	µV/m	dBµV/m
30 to 88	90	39	100	40
88 to 216	150	44	150	44
216-960	210	46	200	46
Above 960	300	50	500	54

NOTE: In the emission tables above, the tighter limit applies at the band edges.

2.2 Emissions Test Results (see Appendix I)

No modifications were installed on the unit during the emissions testing.

Line Conducted Emissions testing is inappropriate and therefore unnecessary as batteries power the equipment.

The Radiated Emissions pre-test was performed in Anechoic Chamber at 3m-measurement distance in frequency range from 30MHz to 25GHz (see Tables 1, 2).

Note: During radiated emissions testing, fundamental transmitting frequency and its 2^{nd} and 3^{rd} harmonics were excluded from the measurements.

3.0 TEST EQUIPMENT

Receivers/Spectrum Analyzers and Test Software

DESCRIPTION	SERIAL NO.	LAST CAL	CAL DUE	USED
HP85462A Receiver RF Section	3325A00106	09/04	09/05	X
HP85460A RF Filter Section	3330A00109	09/04	09/05	X
TILE! Instrument Control System	ver. 3.4.G.3	N/A	N/A	X
Advantest R3271A Spectrum Analyzer	55050084	06/05	06/06	X

Antennas

DESCRIPTION	SERIAL NO.	LAST CAL	CAL DUE	USED
Schaffner-Chase Bicono-Log Antenna	2468	01/05	01/06	X
EMCO Horn Antenna 3115	9507-4513	12/04	12/05	X
Reactel 7HS-4G-S12 Filter	0223	01/05	01/06	X

4.0 TEST CONFIGURATION (see Appendix II)

4.1 Support Equipment/Services

N/A

4.2 Sample Set-Up

The system was powered 3VDC from internal AA batteries and was setup as a tabletop unit.

Cables

External Switch cable- not shielded, 6 ft. long.
Output cable- not shielded, 7 in long, Jack plug connector

4.3 Mode of Operation

The system was exercised continuously in transmitting and receiving mode.

5.0 TEST PROCEDURES

5.1 Emissions Testing: General Setup & Application Information

Radiated emission measurements are performed according to the procedures in ANSI C63.4 (2001) and CISPR. Measurements are performed in Open Area Test Sites (Distances: 3 meters, 10 meters, 30 meters) or the 3m full-size Anechoic Chamber. For each scan, the procedure for maximizing emissions in Appendices D and E were followed.

All test sites include a metal ground plane constructed of 22-gauge sheet metal. Each site contains a 2.5 meters diameter turntable for floor standing equipment, and a wooden table measuring 1.5 x 1.5 x 0.8 meters for tabletop equipment to facilitate testing, also it has heat and air conditioning systems to control environmental test conditions.

Measurements from 30 MHz to 1000 MHz are taken with bicono-log antennas. A horn antenna is used above 1000 MHz. The mast to support the antennas is capable of a 1 to 4 meter height range, which meets CISPR requirements. The antenna mast is non-conductive and remotely controllable.

Since radiated emissions, and to a lesser extent, conducted emissions, are a function of cable placement, the cable placement is varied to encompass all configurations that an end user would encounter to determine the configuration resulting in maximum emissions. At least one cable for each I/O port type is attached to the EUT. If peripherals or modules are available, at least one of each available type is installed and noted in the report. Generally, only one of each type is used unless good engineering judgment dictates that the use of more will affect emission levels. Excess cable lengths are arranged into a 30 x 40-cm bundle. Cables requiring non-standard lead dress are recorded in the report.

For conducted emissions testing, the equipment is moved to an insulating platform over the ground plane, and the EUT is powered from a LISN. Both sides of the AC line are measured and the results are compared to the applicable limits. Measurements are taken using CISPR quasi-peak and average detectors when the peak readings approach or exceed the average limit. Only quasi-peak readings are taken when the emissions from the EUT meet the average limit as measured with the quasi-peak detector.

5.2 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured emissions reading on the EMI Receiver.
The basic equation with a sample calculation is as follows:
FS = RA + AF + CF - AG

Where: FS = Field Strength in dB(µV/m)
RA = Receiver Amplitude in dB(µV)
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB(m^{-1})
AG = Amplifier Gain in dB

Assume a receiver reading of 48.1 dB(µV) is obtained. The antenna factor of 7.4 dB(m^{-1}) and cable factor of 1.6 dB is added and amplifier gain of 16.0 dB is subtracted giving field strength of 41.1 dB(µV/m).

RA = 48.1 dB(µV)
AF = 7.4 dB(m^{-1})
CF = 1.6 dB
AG = 16.0 dB
FS = RA + AF + CF - AG
FS = 48.1 + 7.4 + 1.6 – 16.0
FS = 41.1 dB(µV/m)

In the Tables of the Appendix I Total Correction Factor includes the Cable Attenuation Factor and the Antenna Factor.

5.3 Measurement Uncertainty

The expanded uncertainty (k = 2) for radiated emissions from 30 to 1000 MHz has been determined to be:
±4 dB at 10m ±5.4 dB at 3m

The expanded uncertainty (k = 2) for conducted emissions from 150 kHz to 30 MHz has been determined to be: ±2.6 dB

6.0 RESPONSIBILITY OF MANUFACTURER AND IDENTIFICATION

6.1 Limitation on Declaration of Conformity

(a) The Declaration of Conformity signifies that the responsible party, as defined in §2.909, has determined that the equipment has been shown to comply with the applicable technical standards if no unauthorized change is made in the equipment and if the equipment is properly maintained and operated. Compliance with these standards shall not be construed to be a finding by the responsible party with respect to matters not encompassed by the Commission's rules.

(b) A Declaration of Conformity by the responsible party is effective until the Commission otherwise establishes a termination date.

(c) No person shall in any advertising matter, brochure, etc.; use or make reference to a Declaration of Conformity in a deceptive or misleading manner; or convey the impression that such a Declaration of Conformity reflects more than a determination by the responsible party that the device or product has been shown to be capable of complying with the applicable technical standards of the Commission's rules.

6.2 Responsibilities

(a) The responsible party, as defined in §2.909, 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 standards rely on the manufacturer or independent testing agency to determine compliance. However, the test records required by § 2.1075 shall be in the English language and shall be made available to the Commission upon a reasonable request in accordance with the provisions of §2.1076.

(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 re-tested to demonstrate continued compliance with the applicable technical standards if the responsible party makes any modifications or changes that could adversely affect the emanation characteristics of the equipment. 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 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.

6.3 Identification

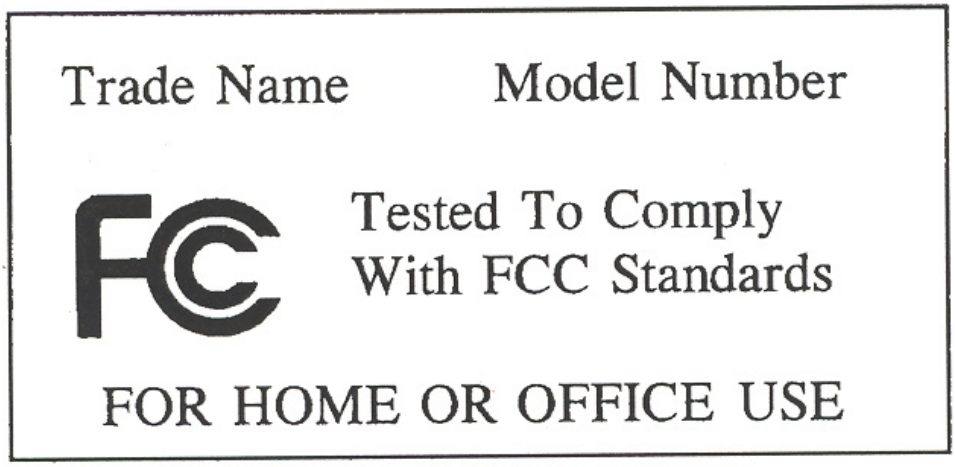
Devices subject only to a Declaration of Conformity shall be uniquely identified by the responsible party. This identification shall not be of a format that could be confused with the FCC Identifier required on certified, notified, type accepted or type approved equipment. The responsible party shall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

6.4 Labeling Requirement

Products subject to authorization under a Declaration of Conformity shall be labeled as follows:

The label shall be located in conspicuous location on the device and shall contain the unique identification; if the product is authorized based on testing of the product or system (see logo below).

When the device is so small or for such use that it is not practicable to place the statement specified under previous paragraph 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 number) and the logo must be displayed on the device.



7.0 EXAMPLE OF THE DECLARATION OF CONFORMITY

DECLARATION OF CONFORMITY
ACCORDING TO 47 CFR, Parts 2 and 15
Class B Computer Peripherals

Manufacturer's Name:	ABC Company
Manufacturer's Address:	000 Baker Road, Suit 000 Minnetonka, MN 55345
Manufacturers Phone:	612-333-5555
Model Number:	XXXX
Product Options:	All (or?)

Supplementary Information:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

October 15, 1997 **John Smith, Quality Manager.**

APPENDIX I - EMISSIONS TEST DATA

Radiated Emissions from 30MHz to 1GHz **Date:** 07-21-2005

Company: Ablenet, Inc.
Model: Wireless Switch System
Test Engineer: Uri Spector
Standard: FCC Part 15.109, Class B
Test Site: 3m Anechoic Chamber, 3m measurement distance
Note: The table shows the worst case radiated emissions
All measurements were taken using a peak detector

Table # 1

Frequency	Antenna			Total at 3m	QP Limit	Margin	Comments
MHz	Polarity	Hts(cm)	Factor (dB1/m)	dBµV/m	dBµV/m	dB	
36.00	V	100	17.1	26.9	40.0	-13.1	
40.91	V	100	14.4	26.6	40.0	-13.4	
114.87	V	100	13.3	26.2	43.5	-17.3	
171.05	V	100	11.3	24.6	43.5	-19.0	
216.72	V	100	12.4	25.4	46.0	-20.6	
264.41	V	100	14.7	27.5	46.0	-18.5	
30.40	H	100	20.4	27.1	40.0	-12.9	
36.46	H	100	16.8	28.1	40.0	-11.9	
68.39	H	100	7.2	22.9	40.0	-17.1	
91.83	H	100	10.1	23.6	43.5	-19.9	
207.43	H	100	11.8	24.4	43.5	-19.1	
283.00	H	100	15.2	28.7	46.0	-17.3	

Radiated Emissions above 1GHz **Date:** 7-21-2005

Company: Ablenet, Inc.

EUT: Wireless Switch

Standard: FCC Part 15.109, Class B

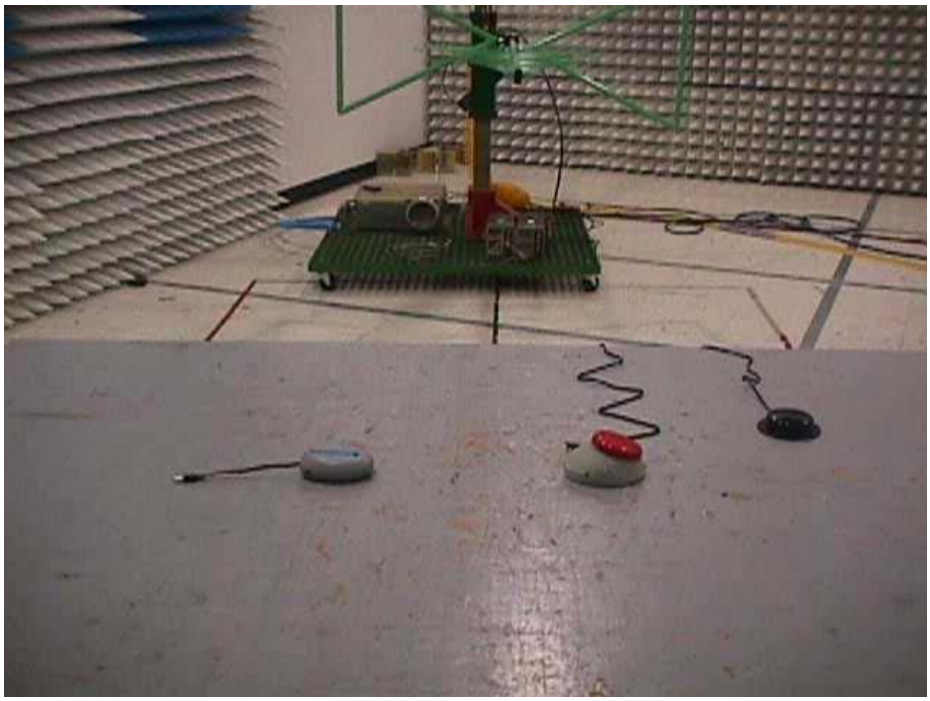
Test Site: 3 meters Anechoic Chamber, 3m measurement distance

Note: The table shows the worst case radiated emissions taken with peak detector and RBW 1MHz

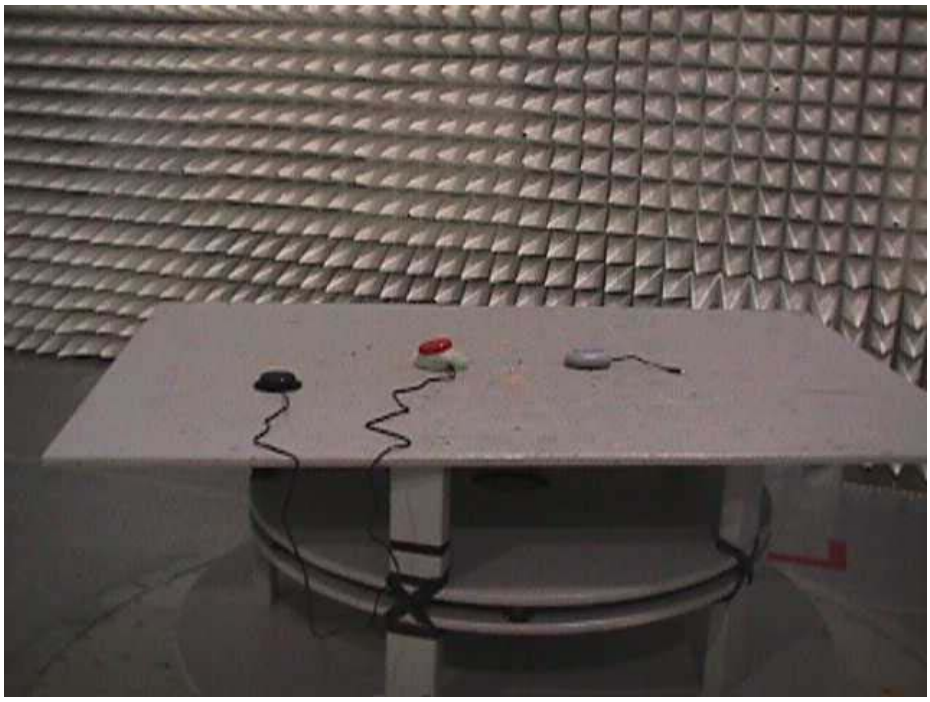
Table # 2

Frequency	Antenna		Total	Peak Reading	Total Emissions	Limit	Margin
MHz	Polarity	Hts(cm)	Factor(dB/m)	dBuV	dBuV/m	dBuV/m	dB
1500.00	V	100	-8.8	45.5	36.7	54.0	-17.3
1500.00	H	100	-8.8	43.7	34.9	54.0	-19.1
2000.00	V	100	-5.4	42.2	36.8	54.0	-17.2
2000.00	H	100	-5.4	40.9	35.5	54.0	-18.5
2300.00	V	100	-3.8	34.5	30.8	54.0	-23.3
2300.00	H	100	-3.8	42.0	38.3	54.0	-15.8

APPENDIX II - CONFIGURATION PHOTOGRAPHS



Radiated Emissions Test Configuration



Radiated Emissions Test Configuration

7250 Hudson Blvd., Suite 100, Oakdale, MN 55128

EMC VERIFICATION No. 3080099MIN-001 - 172

EQUIPMENT UNDER TEST

Type of equipment	Wireless Switch System
Brand name	Ablenet
Type/Model	100-301-XX
Manufacturer	Ablenet, Inc.
Tested by request of	Ablenet, Inc.
STANDARD	**TEST REPORT No. 3080099MIN-001**

47 CFR:2003, §15.107 and §15.109 Class B

SUMMARY OF RESULTS

We confirm that the product tested and our review of the above numbered report without reasonable doubt will fulfill the requirements concerning electromagnetic compatibility according to the above-mentioned standard.

EMC Department
Date of issue: July 25, 2005

ACCREDITED
CERT NO: 1427.01

Signature: Yuriy Litvinov **Yuriy Litvinov, Site Manager**

See back for Labeling and Manual Requirements

Class B Labeling and Instruction Manual Requirements

Devices subject to Class B shall bear the following statement in conspicuous location on the device:

> **This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.**

In addition, for a Class B 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:

Warning: **Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.**

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.**

If shielded cables or other specialized accessories are necessary for the unit to achieve compliance, a statement similar to the following should be added:

Shielded cables must be used with this unit to ensure compliance with the Class B FCC Limits.

Also a Class B digital device meets all requirements of the Canadian Interference-Causing Equipment Regulations.