

Straubing, July 26, 2000

**T E S T - R E P O R T**

**No. 50118-00241-2**

**for**

**WIMAN II**

**FHSS RF Modem**

Applicant: Aidata WIMAN Systems Inc.

Purpose of testing: To show compliance with  
FCC Code of Federal Regulations,  
Part 15 Subpart C, Section §15.247

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**Note:**

The test data of this report relate only to the individual item which has been tested.  
This report shall not be reproduced except in full extent without the written approval of  
the testing laboratory.

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## 1. Administrative Data

Equipment Under Test (EUT): WIMAN II

Serial number(s): 0001

Type of equipment: FHSS RF Modem

Parts/accessories:

FCC-ID: NB9-WIMAN II

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Applicant: Airdata WIMAN Systems Inc.  
(full address) 2180 Immokalee Road, Suite 201  
Naples, FL 34110

Contract identification: ---

Contact person: Mr. Andreas Brauer

Manufacturer: Airdata WIMAN Systems Inc.

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Receipt of EUT: April 26, 2000

Date of test: May 2000

Note: ---

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Responsible for testing: Johann Roidt

Responsible for test report: Johann Roidt

## 2. Identification of Test Laboratory

Test Laboratory:  
(full address): Senton GmbH EMI/EMC Test Center  
Aeussere Fruehlingstrasse 45  
D-94315 Straubing  
Germany

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Contact person: Mr. Johann Roidt  
Communication: Telephone (+49) 0 94 21 / 55 22-0  
Fax (+49) 0 94 21 / 55 22-99  
eMail: Office@senton.de

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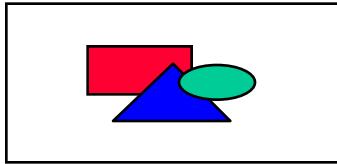
FCC file number: 31040/SIT 1300F2

Industry Canada file number: IC 3050

### 3. Summary of Test Results

The tested sample complies with the requirements set forth in the

**Code of Regulations Part 15 Subpart C, Section §15.247 (intentional  
radiators) of the Federal Communication Commission (FCC).**



Johann Roidt  
Technical Manager

#### 4. Operation Mode of EUT

The EUT features an onboard diagnostic software which allows access to either transmit or receive mode, individual RF channels and hopping or static mode. This software is accessible via RS 232 interface and a standard terminal program.

All tests were performed on the lowest, middle and highest RF channel while in transmit mode and on middle channel while in receive mode.

## 5. Configuration of EUT and Peripheral Devices

### **Configuration of cables of EUT**

Every signal port of the EUT was loaded with a shielded cable. The EUT received power from an external AC adapter

### **Configuration of peripheral devices connected to EUT**

A Notebook PC with Windows HyperTerminal loaded was used as RS 232 terminal.

## 6. Measuring Methods

### 6.1. Conducted RF Measurements at RF Output of EUT

All measurements were performed according to and with the test instruments settings of FCC Public Notice DA 00-705.

Test equipment used (see equipment list for details):  
02, 18, 57, 67, 68

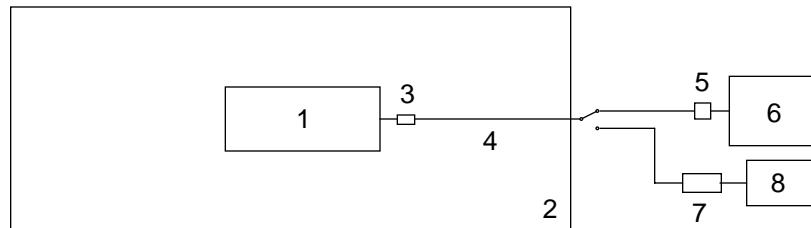


Figure 0: Measurement setup for testing on antenna connector

1 Transmitter (EUT)  
2 Wooden table

3 DC-block  
4 Test cable  
5 Attenuator  
6 Spectrum analyzer  
7 Power sensor  
8 Power meter

## 6.2. Conducted Power Line Emission 0.45 MHz - 30 MHz (§15.207)

Conducted emissions were measured in the frequency range 0.45 MHz to 30 MHz. The bandwidth of the EMI-Receiver was set to 9 kHz and the detector-function was set to CISPR quasi-peak.

The test setup was made in accordance with ANSI C63.4-1992.

Measurements were performed on phase and neutral lines of the power-cords of the tested system. Preliminary scans were taken with the detector-function of the EMI-receiver set to peak to determine the conducted EMI-profile of the EUT. At the final test the cables and equipment were placed and moved within the range of positions likely to find their maximum emissions.

See figure 1 for the measurement setup.

Test equipment used (see equipment list for details):

04, 22, 23, 60, 63

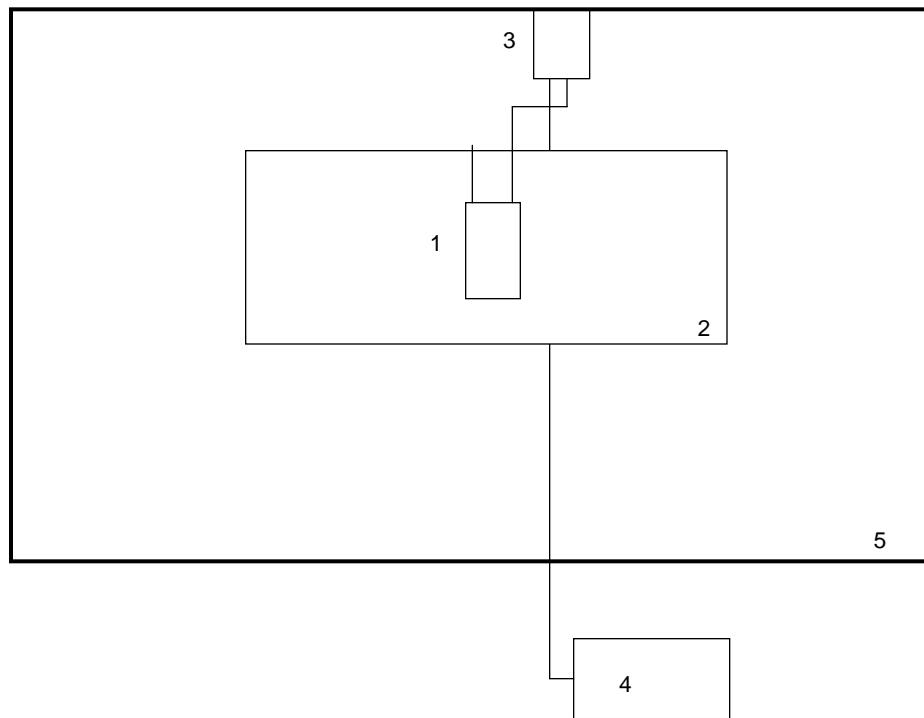


Figure 1: Measurement setup for conducted emission test

|                        |                     |
|------------------------|---------------------|
| 1 Computer (EUT)       | 14 LISN for EUT     |
| 2 RF-modem             | 15 LISN for monitor |
| 3 Keyboard             | 16 LISN for printer |
| 4 Mouse                | 17 Test receiver    |
| 5 Monitor              | 18 Shielded room    |
| 6 FireWire Hard Drives |                     |
| 7 Printer              |                     |
| 8 Microphone           |                     |
| 9 Headphone            |                     |
| 10 Headphone           |                     |
| 11 Headphone           |                     |
| 12 Telephone line      |                     |
| 13 Wooden table        |                     |

### 6.3. Radiated Emission 30 MHz - 1 GHz (§15.209, §15.247.c, §15.205.a,b)

Radiated emissions were measured over the frequency range from 30 MHz to 1 GHz. The bandwidth of the EMI-receiver was set to 120 kHz and the detector-function was set to CISPR quasi-peak.

The test setup was made in accordance with ANSI C63.4-1992. Measurements were made in both the horizontal and vertical planes of polarization. Preliminary scans were taken in a semi-anechoic room using a spectrum analyzer with the detector function set to peak. All tests were performed at a test-distance of 3 meters. For final testing an open-area test-site was used. During the tests the EUT was rotated all around and the receiving-antenna was raised and lowered from 1 meter to 4 meters to find the maximum levels of emissions. The cables and equipment were placed and moved within the range of position likely to find their maximum emissions.

See figure 2 for the measurement setup.

Test equipment used (see equipment list for details):  
01, 06, 12, 38, 39, 40, 41, 58, 61, 64, 66

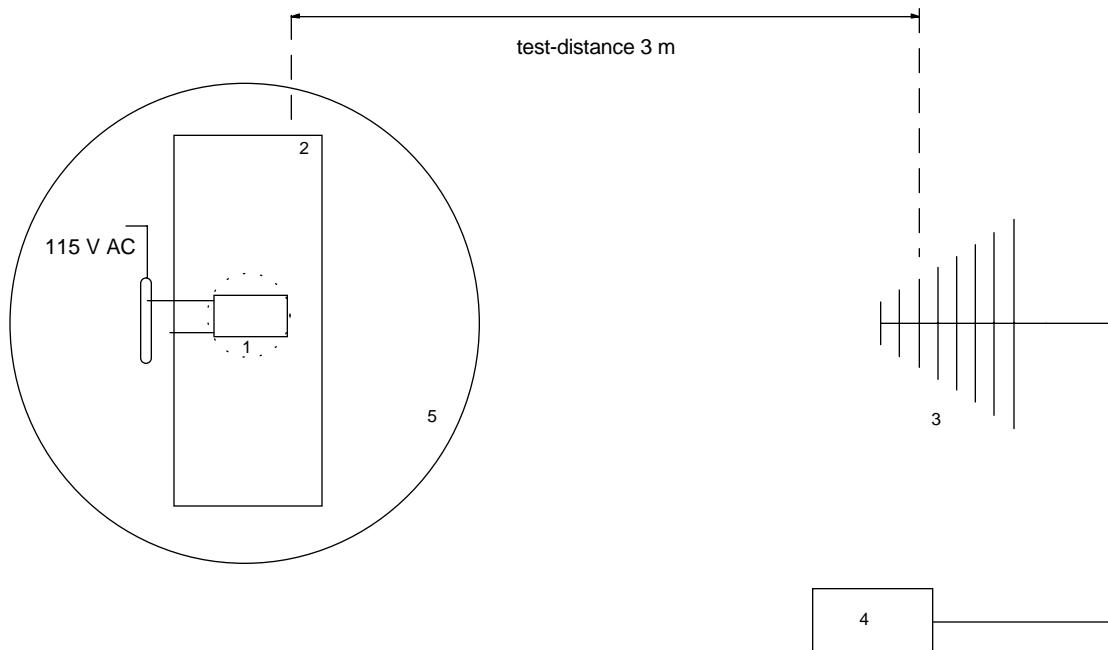


Figure 2: Measurement setup for radiated emission test below 1 GHz

|                               |                               |
|-------------------------------|-------------------------------|
| <b>1</b> Computer (EUT)       | <b>14</b> Measurement antenna |
| <b>2</b> RF-modem             | <b>15</b> Test receiver       |
| <b>3</b> Keyboard             | <b>16</b> Turn table          |
| <b>4</b> Mouse                |                               |
| <b>5</b> Monitor              |                               |
| <b>6</b> FireWire Hard Drives |                               |
| <b>7</b> Printer              |                               |
| <b>8</b> Microphone           |                               |
| <b>9</b> Headphone            |                               |
| <b>10</b> Headphone           |                               |
| <b>11</b> Headphone           |                               |
| <b>12</b> Telephone line      |                               |
| <b>13</b> Wooden table        |                               |

#### 6.4. Radiated Emission 1 GHz - 25 GHz (§15.209, §15.247.c, §15.205.a,b)

Radiated emissions were measured in the frequency range 1 GHz to 25 GHz in transmit mode and 1 GHz to 12.5 GHz in receive mode. The resolution bandwidth of the spectrum analyzer was set to 1 MHz. Scans for the whole frequency range were taken with video bandwidth set to 1 MHz to check out the highest peak levels. In case of less margin to average limit additional prescans were made with video bandwidth reduced from 1 MHz to 100 kHz, 30 kHz or 10 kHz. Final measurements were performed at the critical frequencies with video bandwidth of the spectrum analyzer set to 100 Hz (average mode). EUT was rotated all around and receiving antenna was raised and lowered to find the maximum levels of emission. Cables and equipment were placed and moved within the range of position likely to find their maximum emissions.

All tests were performed in a semi-anechoic chamber with a test-distance of 3 meters (except for the frequency range 18 GHz - 25 GHz where test distance was reduced to 0.5 meter).

To avoid overload in transmit mode no preamplifier was used between 1 GHz and 3.95 GHz. Above 3.95 GHz tests were performed with appropriate preamplifiers (attenuation of operating frequency by horn antenna is sufficient to avoid overload of preamplifier).

For receive mode appropriate preamplifiers were used for the whole frequency range.

To eliminate variations in amplification of the preamplifiers a signal generator was used for substitution (however, during testing a correction according to the minimum amplification was added).

Substitution was performed in the following steps:

- antenna cable was disconnected from receiving antenna and connected to signal generator output
- level of signal generator was increased until the reading value of the analyzer was the same as caused by EUT
- level of signal generator was noted
- final value was calculated by converting the signal generator level to dB $\mu$ V/m and adding the antenna correction factor.

See figure 3 for the measurement setup.

Test equipment used (see equipment list for details):  
02, 13, 14, 16, ,42, 43, 44, 45, 46, 47, 48, 49, 57, 64

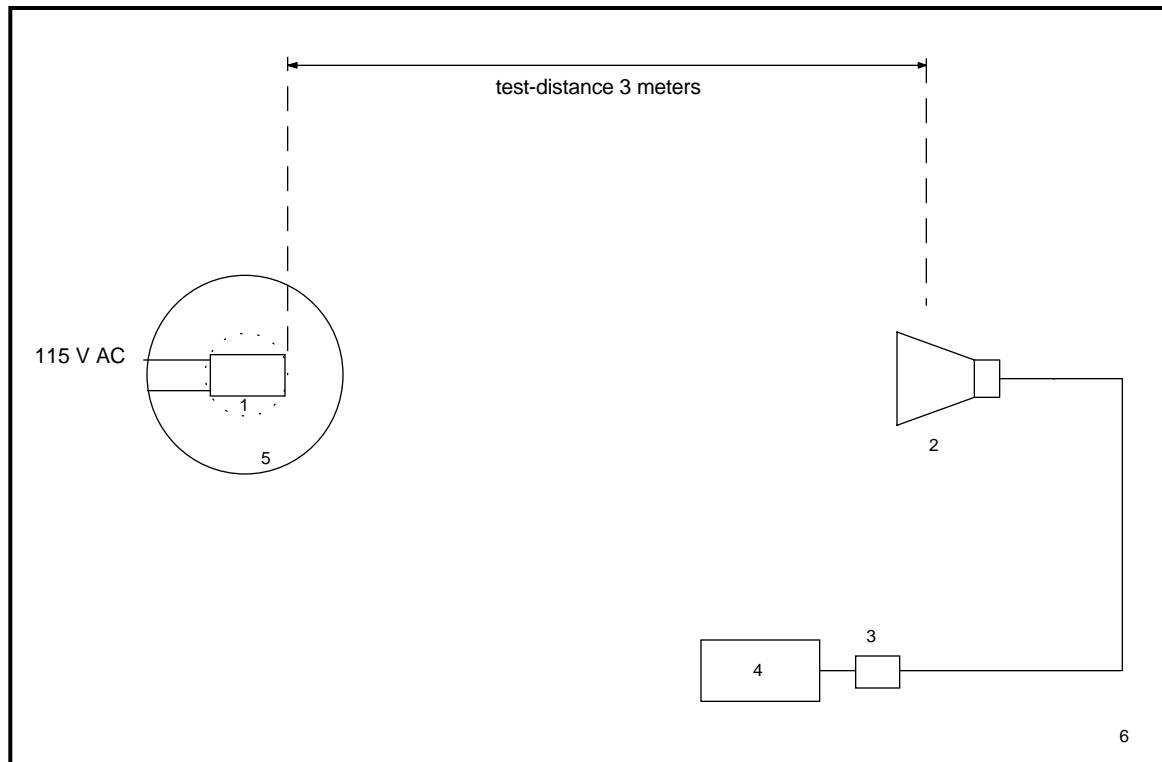


Figure 3: Measurement setup for radiated emission test above 1 GHz

- 1 Computer (EUT)
- 2 RF-modem
- 3 Keyboard
- 4 Mouse

- 5 Measurement antenna
- 6 Preamplifier (if applicable)
- 7 Spectrum analyzer
- 8 Signal generator
- 9 Turn table
- 10 Semi-anechoic room

## 7. Measuring Methods

### 7.1. Radiated Emission 30 MHz - 1 GHz (FCC §15.205.a,b, §15.209, §15.231.b / RSS-210 Sections 6.1.1.b, 6.3)

Radiated emissions are measured over the frequency range from 30 MHz to 1 GHz. The bandwidth of the EMI-receiver is set to 120 kHz and the detector-function is set to CISPR quasi-peak.

The test setup is made in accordance with ANSI C63.4-1992.

Measurements are made in both the horizontal and vertical planes of polarization. Preliminary scans are taken in a semi-anechoic room using a spectrum analyzer with the detector function set to peak. Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit and therefore shall be used for final testing.

All tests are performed at a test-distance of 3 meters.

For final testing an open-area test-site is used. During the tests the EUT is rotated all around and the receiving-antenna is raised and lowered from 1 meter to 4 meters to find the maximum levels of emissions. The cables and equipment is placed and moved within the range of position likely to find their maximum emissions.

See figure 2 for the measurement setup.

Test equipment used (see equipment list for details):

01, 02, 05, 12, 38, 39, 40, 41, 58, 61, 64, 66

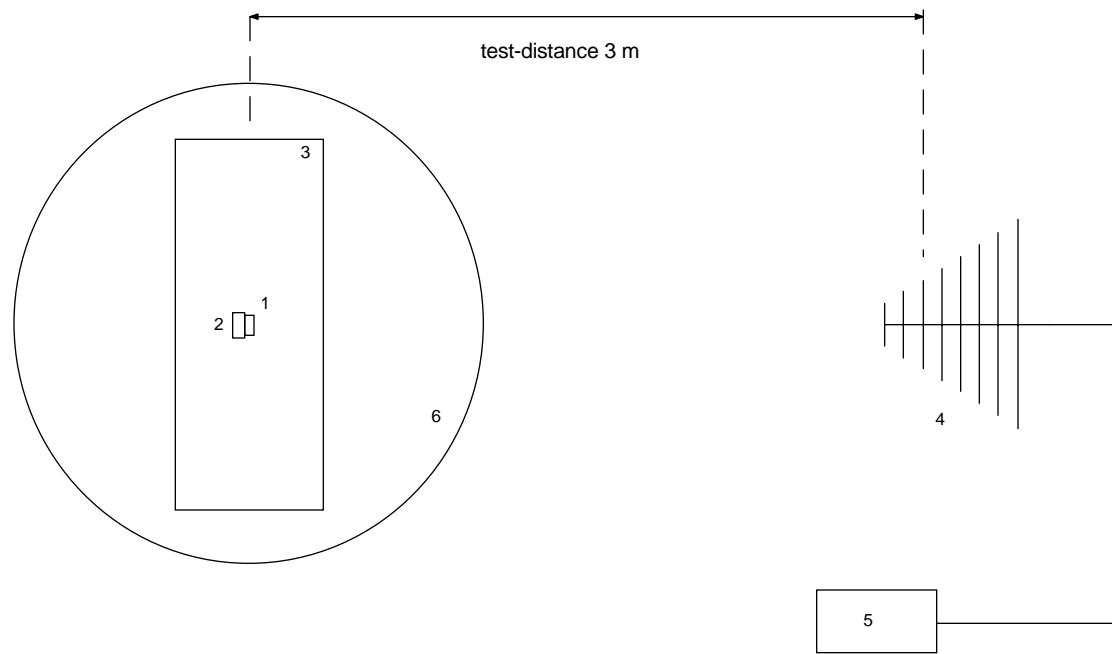


Figure 2: Measurement setup for radiated emission test below 1 GHz

- 1 Transmitter (EUT)
- 2 Wooden pedestal (if necessary)
- 3 Wooden table

- 4 Measurement antenna
- 5 Test receiver
- 6 Turn table

**7.2. Radiated Emission 1 GHz - 10 GHz (FCC §15.205.a,b, §15.209,  
§15.231.b / RSS-210 Sections 6.1.1.b, 6.3)**

Radiated emissions are measured in the frequency range 1 GHz to 10 GHz. Resolution and video bandwidth of the spectrum analyzer are set to 1 MHz. Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit and therefore shall be used for final testing.

Additional measurements are performed at critical frequencies with reduced span. EUT is rotated all around and receiving antenna is raised and lowered to find the maximum levels of emission. The cables and equipment are placed and moved within the range of position likely to find their maximum emissions.

All tests are performed in a semi-anechoic chamber with a test-distance of 3 meters.

If possible preamplifiers are used for the whole frequency range. Special care is taken to avoid overload in transmit mode (using appropriate attenuators if necessary).

See figure 3 for the measurement setup.

Test equipment used (see equipment list for details):  
02, 13, 14, 16, ,42, 44, 45, 57, 64

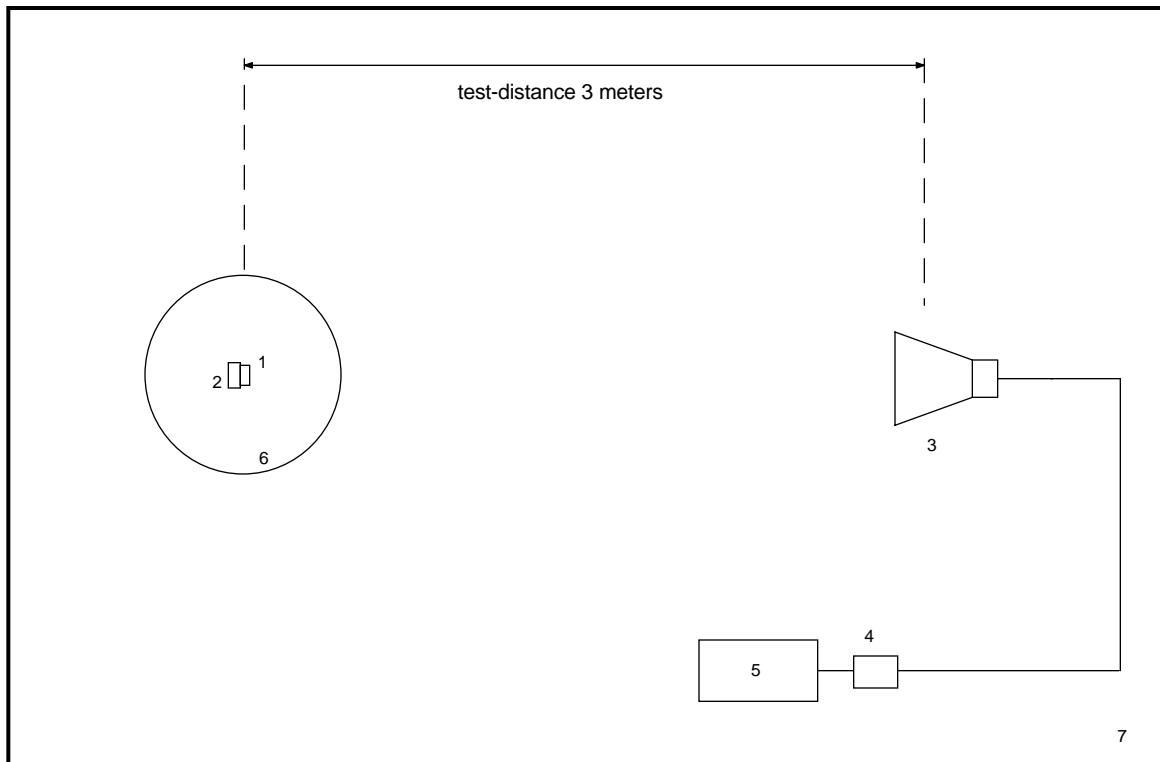


Figure 3: Measurement setup for radiated emission test above 1 GHz

|                                  |                                |
|----------------------------------|--------------------------------|
| 1 Transmitter (EUT)              | 3 Measurement antenna          |
| 2 Wooden pedestal (if necessary) | 4 Preamplifier (if applicable) |
|                                  | 5 Spectrum analyzer            |
|                                  | 6 Turn table                   |
|                                  | 7 Semi anechoic room           |

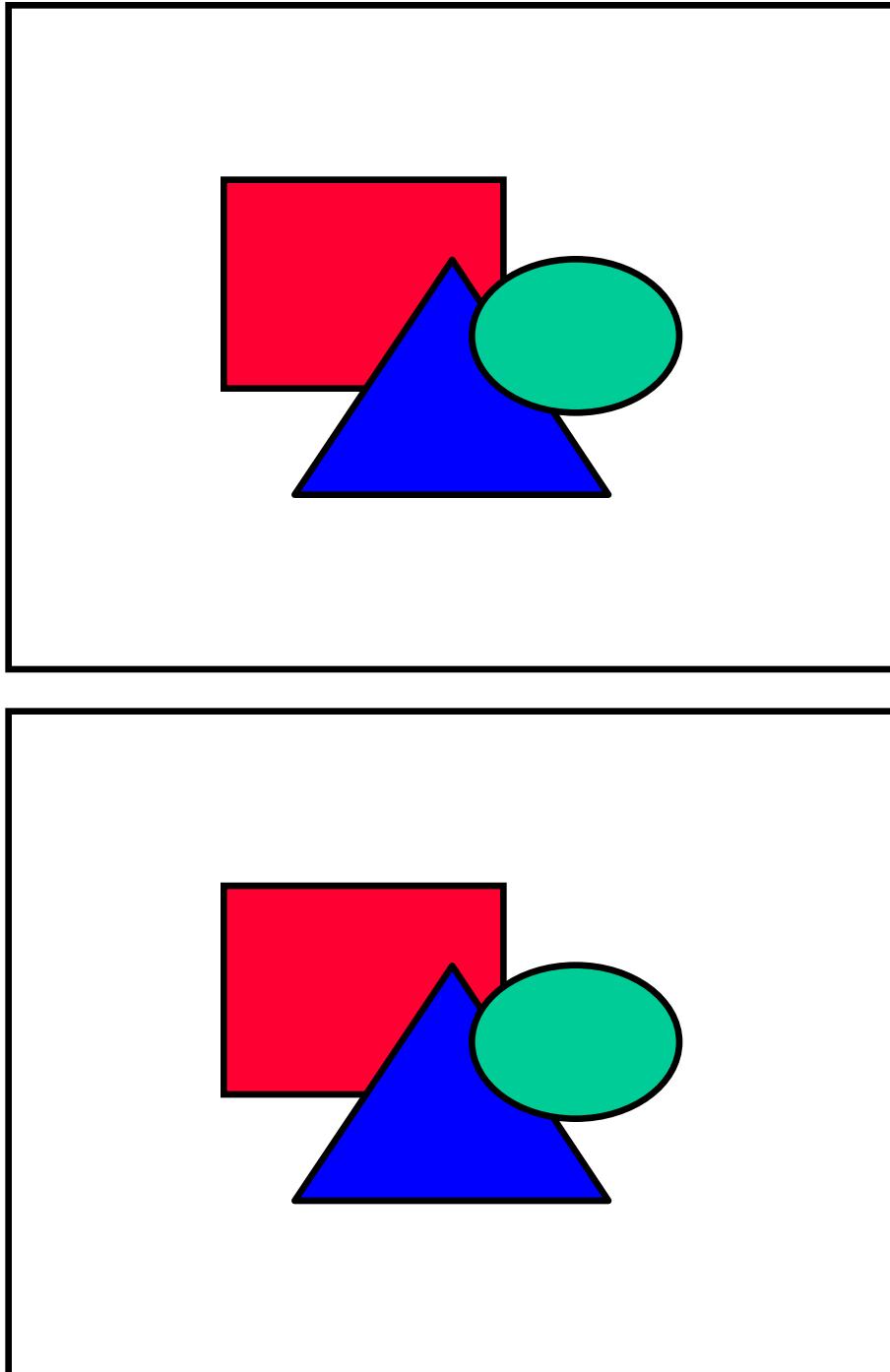
## 8. Equipment List

To facilitate reference to test equipment used for related tests, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory.

| No. | Type                 | Model        | Serial Number            | Manufacturer    |
|-----|----------------------|--------------|--------------------------|-----------------|
| 01  | Spectrum Analyzer    | R 3271       | 05050023                 | Advantest       |
| 02  | EMI Test Receiver    | ESMI         | 839379/013<br>839587/006 | Rohde & Schwarz |
| 03  | Test Receiver        | ESH 3        | 880112/032               | Rohde & Schwarz |
| 04  | Test Receiver        | ESHS 10      | 860043/016               | Rohde & Schwarz |
| 05  | Test Receiver        | ESV          | 881414/009               | Rohde & Schwarz |
| 06  | Test Receiver        | ESVP         | 881120/024               | Rohde & Schwarz |
| 07  | Audio Analyzer       | UPA          | 862954                   | Rohde & Schwarz |
| 08  | Power Meter          | NRVS         | 836856/015               | Rohde & Schwarz |
| 09  | Power Sensor         | NRV-Z52      | 837901/030               | Rohde & Schwarz |
| 10  | Power Sensor         | NRV-Z4       | 863828/015               | Rohde & Schwarz |
| 11  | Preamplifier         | ESV-Z3       | 860907/004               | Rohde & Schwarz |
| 12  | Preamplifier         | R14601       |                          | Advantest       |
| 13  | Preamplifier         | ACX/080-3030 | 32640                    | CTT             |
| 14  | Preamplifier         | ACO/180-3530 | 32641                    | CTT             |
| 15  | Signal Generator     | SMS          | 872166/039               | Rohde & Schwarz |
| 16  | Signal Generator     | HP 8673 D    | 2930A00966               | Hewlett Packard |
| 17  | Waveform Generator   | HP 33120 A   | US34005375               | Hewlett Packard |
| 18  | Attenuator 20 dB     | 4776-20      | 9503                     | Narda           |
| 19  | Attenuator 10 dB     | 4776-10      | 9412                     | Narda           |
| 20  | Pulse Limiter        | ESH 3-Z2     | 1144                     | Rohde & Schwarz |
| 21  | Pulse Limiter        | 11947 A      | 3107A00566               | Hewlett Packard |
| 22  | V-Network            | ESH 3-Z5     | 862770/018               | Rohde & Schwarz |
| 23  | V-Network            | ESH 3-Z5     | 894785/005               | Rohde & Schwarz |
| 24  | V-Network            | ESH 3-Z5     | 830952/025               | Rohde & Schwarz |
| 25  | V-Network            | ESH 3-Z6     | 830722/010               | Rohde & Schwarz |
| 26  | V-Network            | NSLK 8127    | 8127152                  | Schwarzbeck     |
| 27  | V-Network            | NNLA 8119    | 8119148                  | Schwarzbeck     |
| 28  | V-Network            | SE 01        | 01                       | Senton          |
| 29  | T-Network            | ESH 3-Z4     | 890602/011               | Rohde & Schwarz |
| 30  | T-Network            | ESH 3-Z4     | 890602/012               | Rohde & Schwarz |
| 31  | High Impedance Probe | TK 9416      | 01                       | Schwarzbeck     |
| 32  | High Impedance Probe | TK 9416      | 02                       | Schwarzbeck     |
| 33  | Current Probe        | ESH 2-Z1     | 863366/18                | Rohde & Schwarz |
| 34  | Current Probe        | ESV-Z1       | 862553/3                 | Rohde & Schwarz |

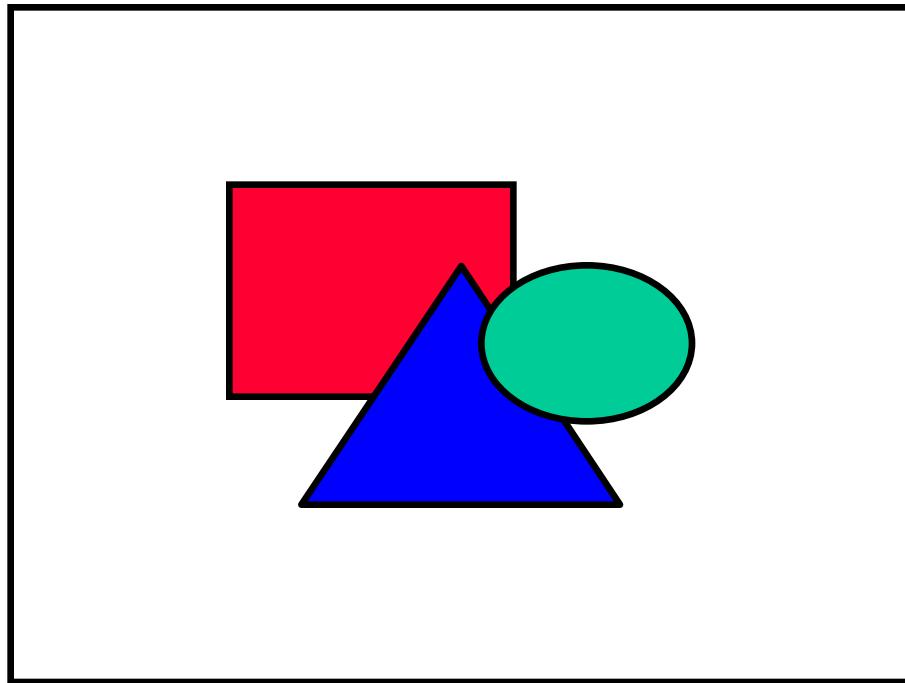
| No. | Type                     | Model      | Serial Number | Manufacturer    |
|-----|--------------------------|------------|---------------|-----------------|
| 35  | Absorbing Clamp          | MDS 21     | 80911         | Lüthi           |
| 36  | Absorbing Clamp          | MDS 21     | 79690         | Lüthi           |
| 37  | Loop Antenna             | HFH2-Z2    | 882964/1      | Rohde & Schwarz |
| 38  | Biconical Antenna        | HK 116     | 842204/001    | Rohde & Schwarz |
| 39  | Biconical Antenna        | HK 116     | 836239/02     | Rohde & Schwarz |
| 40  | Log. Periodic Antenna    | HL 223     | 841516/023    | Rohde & Schwarz |
| 41  | Log. Periodic Antenna    | HL 223     | 834408/12     | Rohde & Schwarz |
| 42  | Horn Antenna             | 3115       | 9508-4553     | Emco            |
| 43  | Horn Antenna             | 3160-03    | 9112-1003     | Emco            |
| 44  | Horn Antenna             | 3160-04    | 9112-1001     | Emco            |
| 45  | Horn Antenna             | 3160-05    | 9112-1001     | Emco            |
| 46  | Horn Antenna             | 3160-06    | 9112-1001     | Emco            |
| 47  | Horn Antenna             | 3160-07    | 9112-1008     | Emco            |
| 48  | Horn Antenna             | 3160-08    | 9112-1002     | Emco            |
| 49  | Horn Antenna             | 3160-09    | 9403-1025     | Emco            |
| 50  | Digital multimeter       | 199        | 463386        | Keithley        |
| 51  | DC Power Supply          | NGSM 32/10 | 203           | Rohde & Schwarz |
| 52  | DC Power Supply          | NGB        | 2455          | Rohde & Schwarz |
| 53  | DC Power Supply          | NGA        | 386           | Rohde & Schwarz |
| 54  | Temperature Test Chamber | HT4010     | 07065550      | Heraeus         |
| 55  | Cable                    | RG214      | 1309          | Senton          |
| 56  | Cable                    | 200CM_001  | 1357          | Rosenberger     |
| 57  | Cable                    | 150CM_001  | 1479          | Rosenberger     |
| 58  | Cable Set EG1            | RG214      | 1189 - 1191   | Senton          |
| 59  | Cable Set Cabine 1       | RG214      |               | Senton          |
| 60  | Cable Set Cabine 2       | RG214      |               | Senton          |
| 61  | Cable Set Cabine 3       | RG214      |               | Senton          |
| 62  | Shielded Room            | No. 1      | 1451          | Senton          |
| 63  | Shielded Room            | No. 2      | 1452          | Senton          |
| 64  | Semi-anechoic Chamber    | No. 3      | 1453          | Siemens         |
| 65  | Shielded Room            | No. 4      | 1454          | Euroshield      |
| 66  | Open Area Test Site      | EG 1       |               | Senton          |
| 67  | Test fixture             |            |               | Senton          |

**9. Photographs Taken During Testing**

**Photo No. 9.1 - 9.2****Test setup for conducted emission test 450 kHz - 30 MHz**

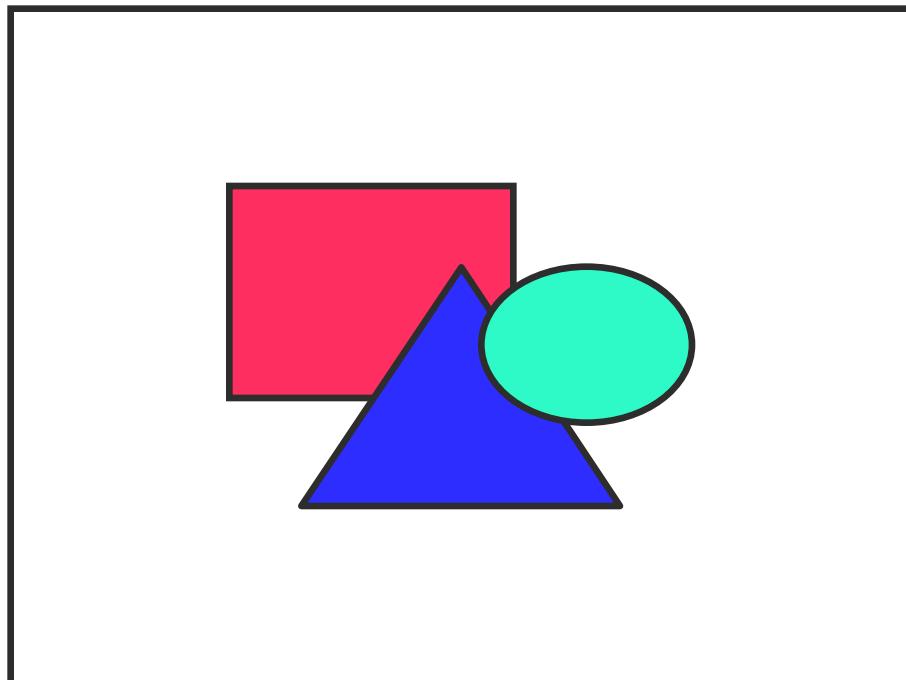
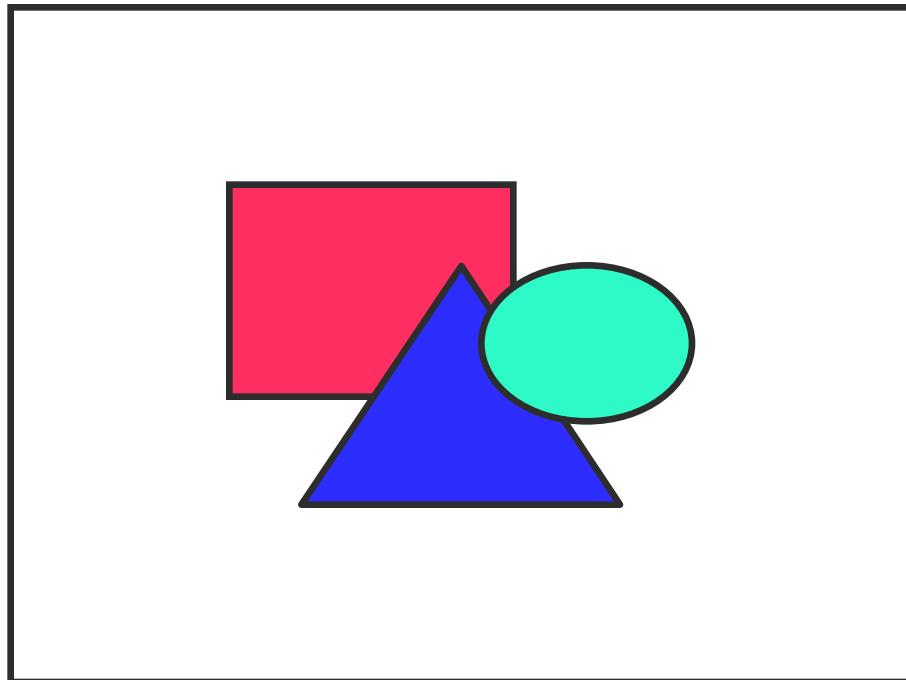
**Photos No. 9.3**

**Test setup for conducted emission test 450 kHz - 30 MHz  
(continued)**



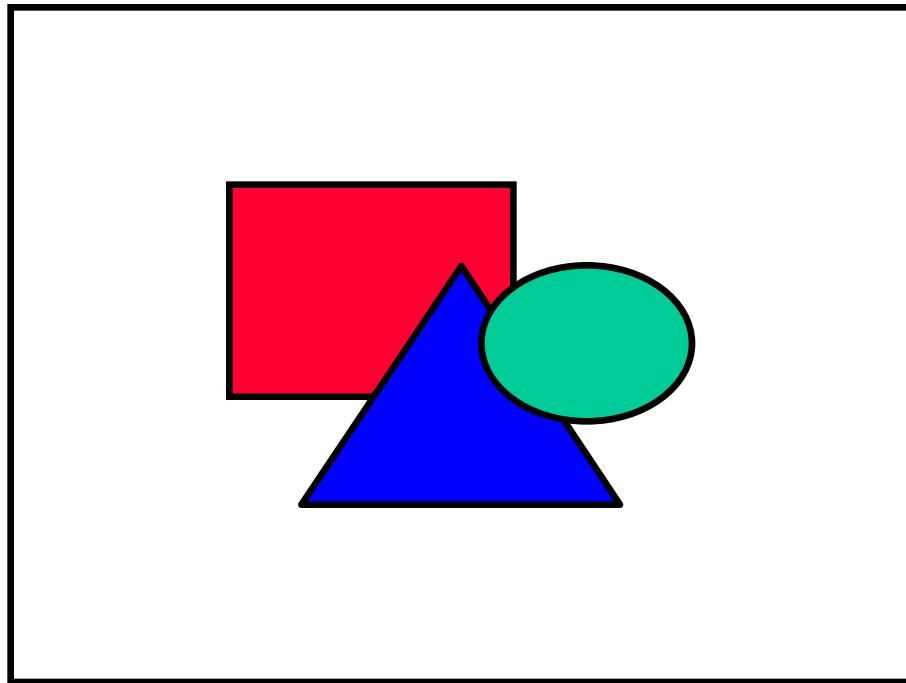
**Photos No. 9.4 - 9.5**

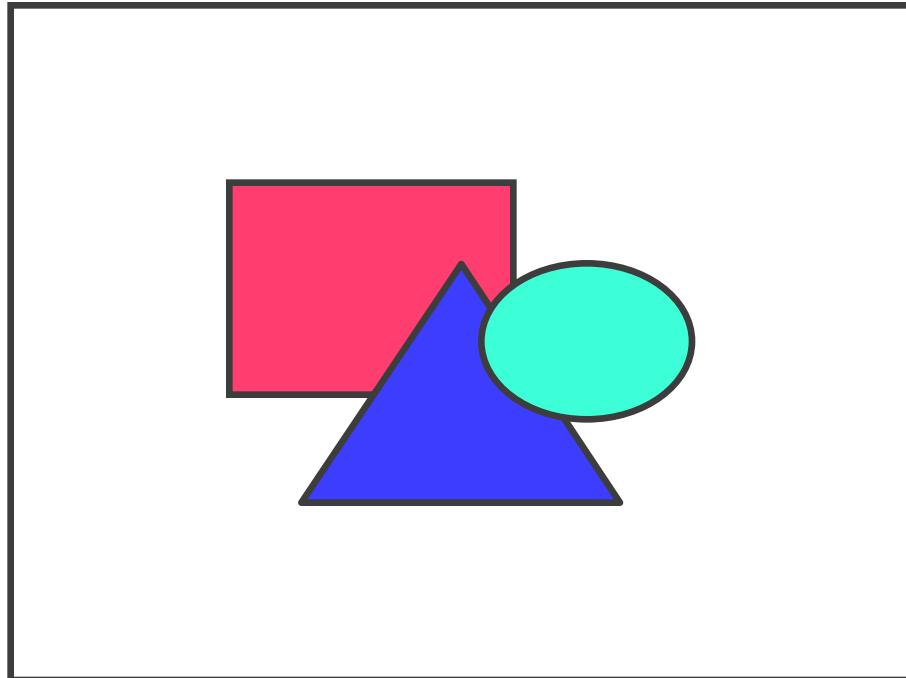
**Test setup for radiated emission pre-test 30 MHz - 1 GHz  
(semi anechoic room)**



**Photos No. 9.6**

**Test setup for radiated emission final test 30 MHz - 1 GHz  
(open area test site)**



**Photos No. 9.7****Test setup for radiated emission test above 1 GHz**

**10. List of Measurements**

| <b>FCC Part 15 Subpart C</b> |  |                |               |
|------------------------------|--|----------------|---------------|
| <b>Section(s):</b>           | <b>Test</b>  | <b>Page(s)</b> | <b>Result</b> |
| 15.31 (m)                    | Number of operating frequencies to be examined   |                |               |
| 15.203                       | Requirement that antenna is permanently attached or unique antenna connector               |                |               |
| 15.204                       | Information on antennae proposed for use with the EUT                                      |                |               |
| 15.207                       | Conducted emission test<br>450 kHz - 30 MHz  |                | Passed        |
| 15.247 (a)                   | Description how the EUT meets the definition of a frequency hopping spread spectrum system |                | Passed        |
|                              | Carrier Frequency separation   |                |               |
|                              | Number of Hopping Frequencies  |                |               |
|                              | Time of Occupancy  |                |               |
|                              | 20 dB Bandwidth  |                |               |
|                              | Pseudorandom Frequency Hopping Sequence  |                |               |
|                              | Equal Hopping Frequency Use  |                |               |
|                              | System Receiver Input Bandwidth  |                |               |
|                              | System Receiver Hopping Capability   |                |               |
| 15.247 (b)                   | Maximum peak output power  |                | Passed        |
|                              | De Facto EIRP Limit  |                |               |
|                              | Point-to-Point Operation   |                |               |
|                              | RF Exposure Compliance Statement   |                |               |
|                              | Installation/Operation Manual Requirements   |                |               |
| §15.247 (c)                  | Band-edge Compliance of Conducted Emissions  |                | Passed        |

|                   |   |     |                             |
|-------------------|---|-----|-----------------------------|
|                   | Spurious RF Conducted Emissions                                       |     |                             |
| <b>15.247 (g)</b> | Description how the EUT complies with the requirement of this section | --- | Test performed by applicant |
| <b>15.247 (h)</b> | Requirement to avoid frequency coordination of multiple FHSS systems  |     |                             |

|                | <b>Receive mode (RX):</b>                   |   |        |
|----------------|---|---|--------|
| <b>§15.207</b> | Conducted emission test<br>450 kHz - 30 MHz |   | Passed |
| <b>§15.209</b> | Radiated emission test                      | - |        |
|                |   |   |        |

## 11. List of Measurements

| Section(s): | Test | Page(s) | Result |
|-------------|------|---------|--------|
|             |      |         |        |

|                              |   |     |        |
|------------------------------|---|-----|--------|
| <b>Section<br/>15.31 (m)</b> | <b>Number of operating frequencies to be<br/>examined</b> | N/A | Passed |
|------------------------------|---|-----|--------|

All transmitter related test were performed at the lowest, middle and highest RF channel of the device under test.

Receiver related tests were performed at the center frequency of the device under test.

|                           |   |     |        |
|---------------------------|---|-----|--------|
| <b>Section<br/>15.203</b> | <b>Requirement that antenna is<br/>permanently attached or unique<br/>antenna connector</b> | N/A | Passed |
|---------------------------|---|-----|--------|

A reverse SMA connector was used to meet the requirement for an unique antenna connector according to section 15.203 of the rules

|                           |  |     |     |
|---------------------------|--|-----|-----|
| <b>Section<br/>15.204</b> | <b>Information on antennae proposed for<br/>use with the EUT</b> | N/A | N/A |
|---------------------------|--|-----|-----|

The following antennas are proposed for use with the EUT and are covered by this report:

| <b>Model Name</b>               | <b>Matchcode</b>  | <b>Description</b>                  |
|---------------------------------|-------------------|-------------------------------------|
| Colinear Mobile Whip<br>Antenna | AN-24-2MN360-FMEM | Omni-Antenna, 2 dBi                 |
| MFB Omni-Directional<br>Antenna | AN-24-8MN360-NM3  | Omni-antenna, 8 dBi,                |
| SPA 2400/75/9/0/V               | AN-24-8PL76-SMAF  | Planar Antenna, 8.5 dBi             |
| Microceptor Antenna             | AN-24-16PL24-NF   | Planar Antenna, 16 dBi              |
| SPA 2400/85/17/0/V              | AN-24-16PL85-NF   | Planar Antenna, 16.5 dBi, 85 Degree |
| Conifer 26T-2400F               | AN-24-24PF8-NF    | Paraflector Antenna, 24 dBi         |

|        |   |  |        |
|--------|---|--|--------|
| 15.207 | Conducted emission test<br>450 kHz – 30 MHz |  | Passed |
|--------|---|--|--------|

|            |   |  |        |
|------------|---|--|--------|
| 15.247 (a) | <b>Description how the EUT meets the definition of a frequency hopping spread spectrum system</b> |  | Passed |
|------------|---|--|--------|

|                         |
|-------------------------|
| See Annex X for details |
|-------------------------|

|  |                                     |  |        |
|--|-------------------------------------|--|--------|
|  | <b>Carrier Frequency separation</b> |  | Passed |
|--|-------------------------------------|--|--------|

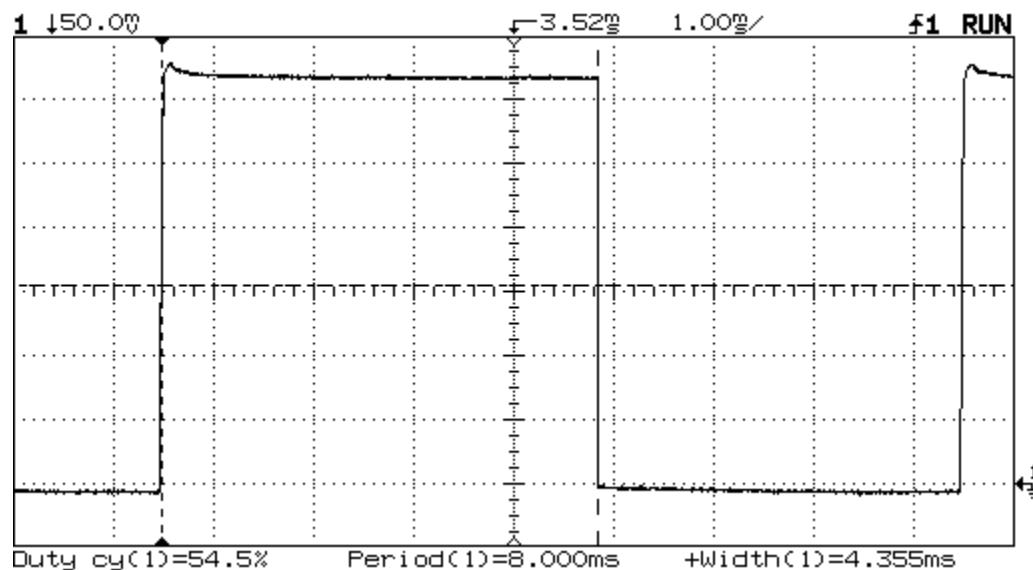
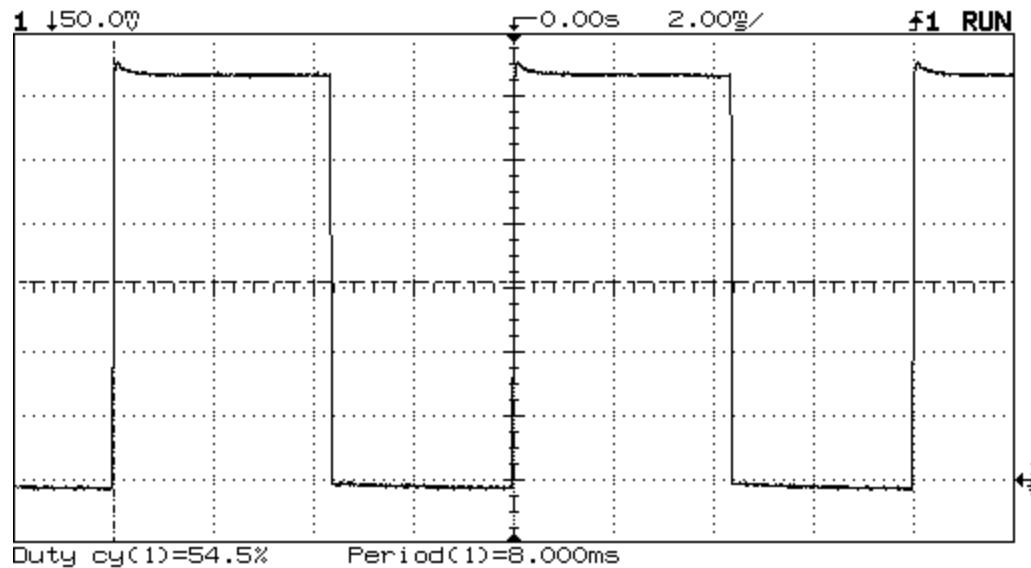
|   |
|---|
| Carrier frequency separation is 1 MHz, see page x of the report for details |
|---|

|  |                                      |  |        |
|--|--------------------------------------|--|--------|
|  | <b>Number of Hopping Frequencies</b> |  | Passed |
|--|--------------------------------------|--|--------|

|  |
|--|
| There are 80 hopping frequencies, see page x of the report for details |
|--|

|  |                   |  |        |
|--|-------------------|--|--------|
|  | Time of Occupancy |  | Passed |
|--|-------------------|--|--------|

The dwell time per channel is **4.355 milliseconds**, see following test chart for details



|  |                        |  |        |
|--|------------------------|--|--------|
|  | <b>20 dB Bandwidth</b> |  | Passed |
|--|------------------------|--|--------|

The average 20 dB Bandwidth is 780 kHz, see test charts enclosed.

|  |  |  |  |
|--|--|--|--|
|  | <b>Pseudorandom Frequency Hopping Sequence</b> |  |  |
|--|--|--|--|

|  |                                    |  |  |
|--|------------------------------------|--|--|
|  | <b>Equal Hopping Frequency Use</b> |  |  |
|--|------------------------------------|--|--|

|  |  |  |  |
|--|--|--|--|
|  | <b>System Receiver Input Bandwidth</b> |  |  |
|--|--|--|--|

|  |   |  |  |
|--|---|--|--|
|  | <b>System Receiver Hopping Capability</b> |  |  |
|--|---|--|--|

|                   |                                  |  |        |
|-------------------|----------------------------------|--|--------|
| <b>15.247 (b)</b> | <b>Maximum peak output power</b> |  | Passed |
|-------------------|----------------------------------|--|--------|

The maximum peak output power is 30 dBm, see test charts enclosed

|  |                            |  |        |
|--|----------------------------|--|--------|
|  | <b>De Facto EIRP Limit</b> |  | Passed |
|--|----------------------------|--|--------|

An individual TX power level has been given for every antenna covered by this report. This power level will be selected during installation of the unit.

| <b>Model Name</b>            | <b>Matchcode</b>  | <b>Description</b>                  | <b>TX power setting</b> |
|------------------------------|-------------------|-------------------------------------|-------------------------|
| Colinear Mobile Whip Antenna | AN-24-2MN360-FMEM | Omni-Antenna, 2 dBi                 | <b>28</b>               |
| MFB Omni-Directional Antenna | AN-24-8MN360-NM3  | Omni-antenna, 8 dBi,                |                         |
| SPA 2400/75/9/0/V            | AN-24-8PL76-SMAF  | Planar Antenna, 8.5 dBi             |                         |
| Microceptor Antenna          | AN-24-16PL24-NF   | Planar Antenna, 16 dBi              |                         |
| SPA 2400/85/17/0/V           | AN-24-16PL85-NF   | Planar Antenna, 16.5 dBi, 85 Degree |                         |
| Conifer 26T-2400F            | AN-24-24PF8-NF    | Paraflector Antenna, 24 dBi         |                         |

|  |                                 |  |                |
|--|---------------------------------|--|----------------|
|  | <b>Point-to-Point Operation</b> |  | Not applicable |
|--|---------------------------------|--|----------------|

|  |   |  |        |
|--|---|--|--------|
|  | <b>RF Exposure Compliance Statement</b> |  | Passed |
|--|---|--|--------|

|  |   |  |        |
|--|---|--|--------|
|  | <b>Installation/Operation Manual Requirements</b> |  | Passed |
|--|---|--|--------|

|                    |  |  |        |
|--------------------|--|--|--------|
| <b>§15.247 (c)</b> | <b>Band-edge Compliance of Conducted Emissions</b> |  | Passed |
|--------------------|--|--|--------|

|                          |
|--------------------------|
| See test charts enclosed |
|--------------------------|

|  |                                       |  |        |
|--|---------------------------------------|--|--------|
|  | <b>Spurios RF Conducted Emissions</b> |  | Passed |
|--|---------------------------------------|--|--------|

**Spurious RF conducted Emissions according to FCC Rules,  
Part 15, Subpart C, Section 15.247**

|               |  |
|---------------|--|
| Model:        | WIMAN II   |
| Type:         | FHSS RF Modem  |
| Serial No.:   | 0001   |
| Applicant:    | Airdata WIMAN Systems Inc                                      |
| Test Site:    | Open Field Test Site (< 1GHz)<br>Semi-anechoic chamber (>1GHz) |
| Distance:     | 3 Meter  |
| Date of test: | April 2000   |

| Frequency<br>(MHz) | Detector | Analyzer<br>Reading<br>(dBm) | Correction<br>Factor<br>(dB) | Power Level<br>(dBm) |
|--------------------|----------|------------------------------|------------------------------|----------------------|
| 7225.0             | Peak     | -29.52                       | N/A                          | <b>-29.52</b>        |
|                    |          |                              |                              |                      |
|                    |          |                              |                              |                      |
|                    |          |                              |                              |                      |
|                    |          |                              |                              |                      |
|                    |          |                              |                              |                      |
|                    |          |                              |                              |                      |
|                    |          |                              |                              |                      |

|  |                                    |  |        |
|--|------------------------------------|--|--------|
|  | <b>Spurious Radiated Emissions</b> |  | Passed |
|--|------------------------------------|--|--------|

**Field Strength of Emissions according to FCC Rules,  
Part 15, Subpart C, Section 15.247**

|               |  |
|---------------|--|
| Model:        | WIMAN II   |
| Type:         | FHSS RF Modem  |
| Serial No.:   | 0001   |
| Applicant:    | Airdata WIMAN Systems Inc                                      |
| Test Site:    | Open Field Test Site (< 1GHz)<br>Semi-anechoic chamber (>1GHz) |
| Distance:     | 3 Meter  |
| Date of test: | April 2000   |

| Frequency (MHz) | Detector   | Antenna Polarization | Analyzer Reading (dB $\mu$ V) | Correction Factor (dB) | Field Strength (dB $\mu$ V/m) |
|-----------------|------------|----------------------|-------------------------------|------------------------|-------------------------------|
| 49.67           | Quasi Peak | Horizontal           | 18.6                          | 15.7                   | <b>34.3</b>                   |
| 629.0           | Quasi Peak | Horizontal           | 9.9                           | 30.4                   | <b>40.3</b>                   |
| 2406.6          | Peak       | Horizontal           | 15.37                         | 31.0                   | <b>46.37</b>                  |
| 4809.2          | Peak       | Vertical             | 15.02                         | 28.2                   | <b>43.22</b>                  |
| 7207.7          | Peak       | Vertical             | 19.91                         | 31.0                   | <b>50.91</b>                  |
| 9604.6          | Peak       | Horizontal           | 18.01                         | 34.7                   | <b>52.8</b>                   |
| 14416.0         | Peak       | Vertical             | 14.74                         | 37.0                   | <b>51.4</b>                   |

**Sample calculation of field strength values:**

$$\text{Field Strength (dB}\mu\text{V/m)} = \text{Analyzer Reading (dB}\mu\text{V)} + \text{Correction Factor (dB)}$$

**Test instruments used: (see equipment list for details)**  
02, 13, 14, 16, 38, 40, 42, 57, 64, 67



|                   |  |     |                             |
|-------------------|--|-----|-----------------------------|
| <b>15.247 (g)</b> | <b>Description how the EUT complies with the requirement of this section</b> | --- | Test performed by applicant |
|-------------------|--|-----|-----------------------------|

|                   |   |  |  |
|-------------------|---|--|--|
| <b>15.247 (h)</b> | <b>Requirement to avoid frequency coordination of multiple FHSS systems</b> |  |  |
|-------------------|---|--|--|

| <b>Receive mode (RX):</b> |   |  |        |
|---------------------------|---|--|--------|
| <b>Section 15.207</b>     | Conducted emission test<br>450 kHz - 30 MHz |  | Passed |

**Conducted Power Line Emissions according to FCC Rules,  
Part 15, Subpart C, Section 15.207**  
**- Receive Mode -**

|               |                            |
|---------------|----------------------------|
| Model:        | WIMAN II                   |
| Type:         | FHSS RF Modem              |
| Serial No.:   | 0001                       |
| Applicant:    | Airdata WIMAN Systems Inc. |
| Test Site:    | Shielded Room No. 2        |
| Date of test: | April 2000                 |

| Frequency (MHz) | Detector  | Analyzer Reading (dB $\mu$ V) | Limit (dB $\mu$ V/m) | Margin (dB) |
|-----------------|-----------|-------------------------------|----------------------|-------------|
| 0.202           | Quasipeak | 43.4                          | 48.0                 | <b>4.6</b>  |
| 19.56           | Quasipeak | 39.7                          | 48.0                 | <b>8.3</b>  |
| 27.715          | Quasipeak | 40.1                          | 48.0                 | <b>7.9</b>  |
| 28.041          | Quasipeak | 40.5                          | 48.0                 | <b>7.5</b>  |
|                 |           |                               |                      |             |
|                 |           |                               |                      |             |
|                 |           |                               |                      |             |

**Test instruments used: (see equipment list for details)**  
02, 13, 14, 16, 38, 40, 42, 57, 64, 67



|         |                        |   |  |
|---------|------------------------|---|--|
| §15.209 | Radiated emission test | - |  |
|---------|------------------------|---|--|

**Field Strength of Emissions according to FCC Rules,  
Part 15, Subpart C, Section 15.209**  
**- Receive Mode -**

|               |  |
|---------------|--|
| Model:        | WIMAN II   |
| Type:         | FHSS RF Modem  |
| Serial No.:   | 0001   |
| Applicant:    | Airdata WIMAN Inc.   |
| Test Site:    | Open Field Test Site (< 1GHz)<br>Semi-anechoic chamber (>1GHz) |
| Distance:     | 3 Meter  |
| Date of test: | April 2000   |

| Frequency<br>(MHz) | Detector   | Antenna<br>Polarization | Analyzer<br>Reading<br>(dB $\mu$ V) | Correction<br>Factor<br>(dB) | Field Strength<br>(dB $\mu$ V/m) |
|--------------------|------------|-------------------------|-------------------------------------|------------------------------|----------------------------------|
| 49.67              | Quasi Peak | Horizontal              | 18.6                                | 15.7                         | <b>34.3</b>                      |
| 629.0              | Quasi Peak | Horizontal              | 9.9                                 | 30.4                         | <b>40.3</b>                      |
|                    |            |                         |                                     |                              |                                  |
|                    |            |                         |                                     |                              |                                  |
|                    |            |                         |                                     |                              |                                  |
|                    |            |                         |                                     |                              |                                  |
|                    |            |                         |                                     |                              |                                  |

**Sample calculation of field strength values:**

$$\text{Field Strength (dB}\mu\text{V/m)} = \text{Analyzer Reading (dB}\mu\text{V)} + \text{Correction Factor (dB)}$$

**Test instruments used: (see equipment list for details)**

02, 13, 14, 16, 38, 40, 42, 57, 64, 67

## 12. Referenced Regulations

All tests were performed with reference to the following regulations and standards:

|                                     |                          |  |                   |
|-------------------------------------|--------------------------|--|-------------------|
| <input type="checkbox"/>            | FCC Part 15<br>Subpart A | Code of Regulations Part 15 (Radio Frequency Devices), Subpart A (General) of the Federal Communication Commission (FCC)   | October 20, 1997  |
| <input type="checkbox"/>            | FCC Part 15<br>Subpart B | Code of Regulations Part 15 (Radio Frequency Devices), Subpart B (Unintentional Radiators) of the Federal Communication Commission (FCC)                           | October 20, 1997  |
| <input checked="" type="checkbox"/> | FCC Part 15<br>Subpart C | Code of Regulations Part 15 (Radio Frequency Devices), Subpart C (Intentional Radiators) of the Federal Communication Commission (FCC)                             | October 20, 1997  |
| <input checked="" type="checkbox"/> | ANSI C63.4               | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz - 40 GHz | October, 1992     |
| <input type="checkbox"/>            | RSS-210                  | Radio Standards Specification RSS-210 Issue 2 for Low Power Licence-Exempt Radiocommunication Devices of Industry Canada   | February 24, 1996 |

**13. Test Charts taken during Testing**