

Straubing, October 16, 2000

TEST - REPORT

No. 50118-00241-2

for

WIMAN II

FHSS RF Modem

Applicant: Airdata WIMAN Systems Inc.

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

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
<hr/>	
Applicant: (full address)	Airdata WIMAN Systems Inc. 2180 Immokalee Road, Suite 201 Naples, FL 34110
Contract identification:	---
Contact person:	Mr. Andreas Brauer
Manufacturer:	Airdata WIMAN Systems Inc.
<hr/>	
Receipt of EUT:	April 26, 2000
Date of test:	May 2000
Note:	---
<hr/>	
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

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

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

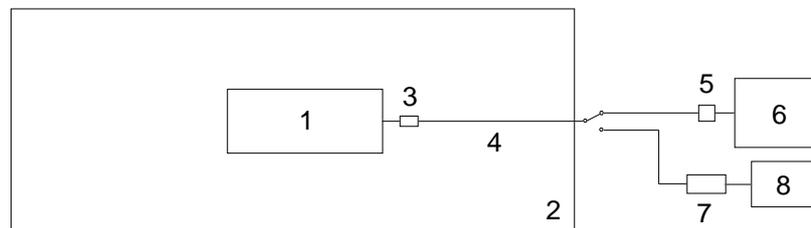


Figure 0: Measurement setup for testing on antenna connector

- | | |
|---------------------|---------------------|
| 1 Transmitter (EUT) | 3 DC-block |
| 2 Wooden table | 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

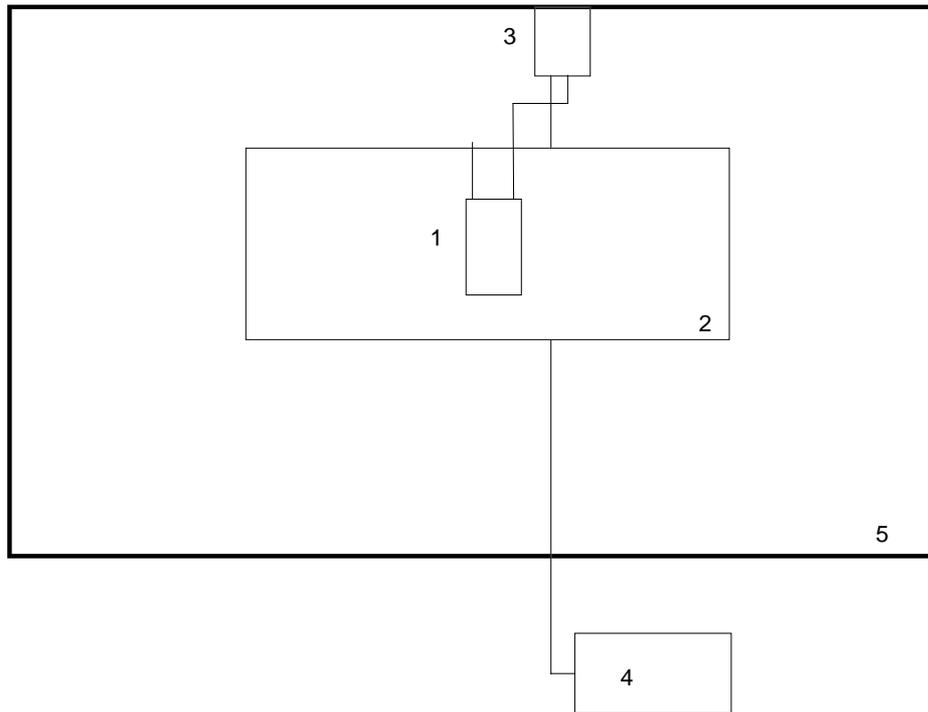


Figure 1: Measurement setup for conducted emission test

- | | |
|------------------------|---------------------|
| 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

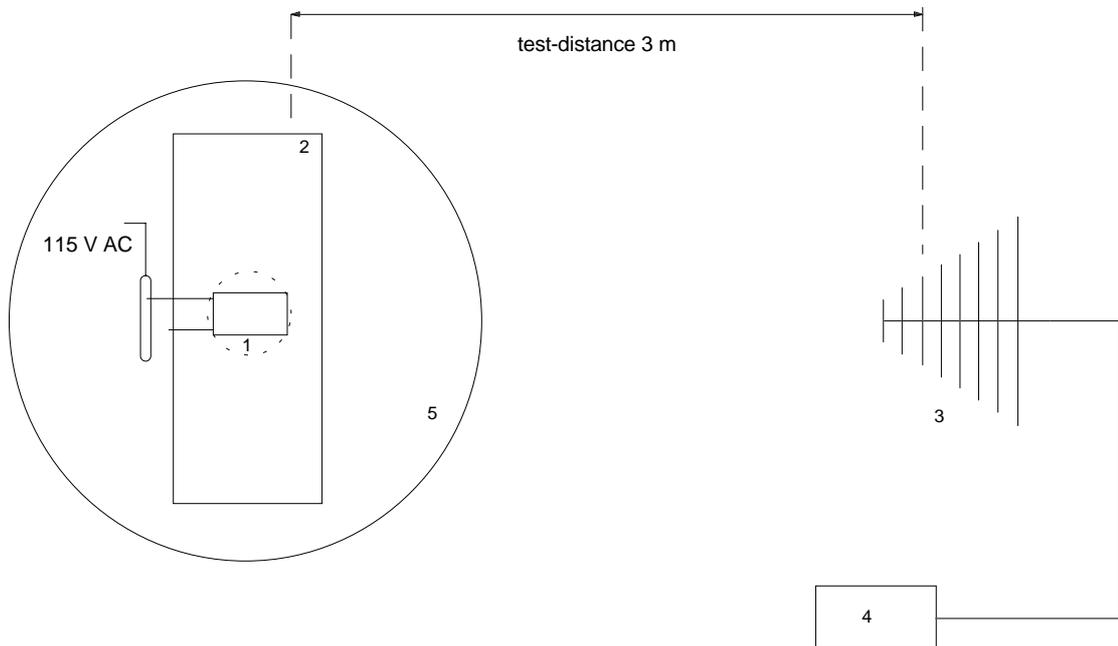


Figure 2: Measurement setup for radiated emission test below 1 GHz

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

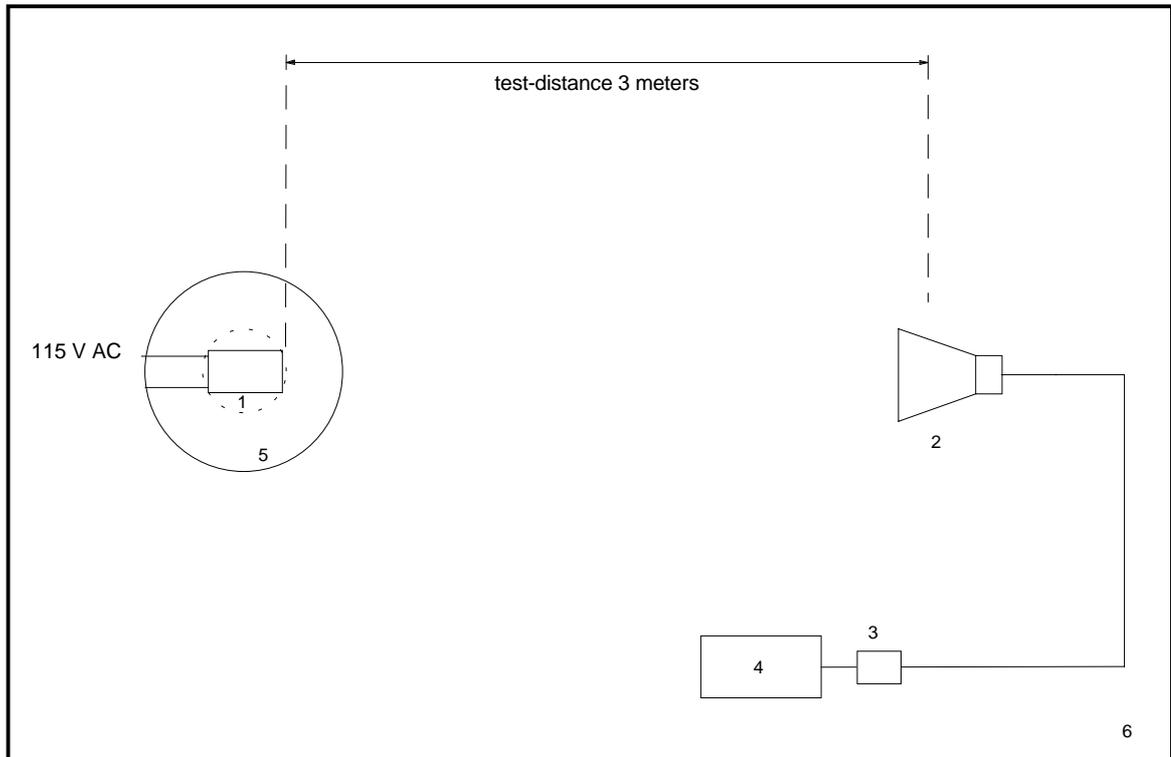


Figure 3: Measurement setup for radiated emission test above 1 GHz

- | | |
|------------------|--------------------------------|
| 1 Computer (EUT) | 5 Measurement antenna |
| 2 RF-modem | 6 Preamplifier (if applicable) |
| 3 Keyboard | 7 Spectrum analyzer |
| 4 Mouse | 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

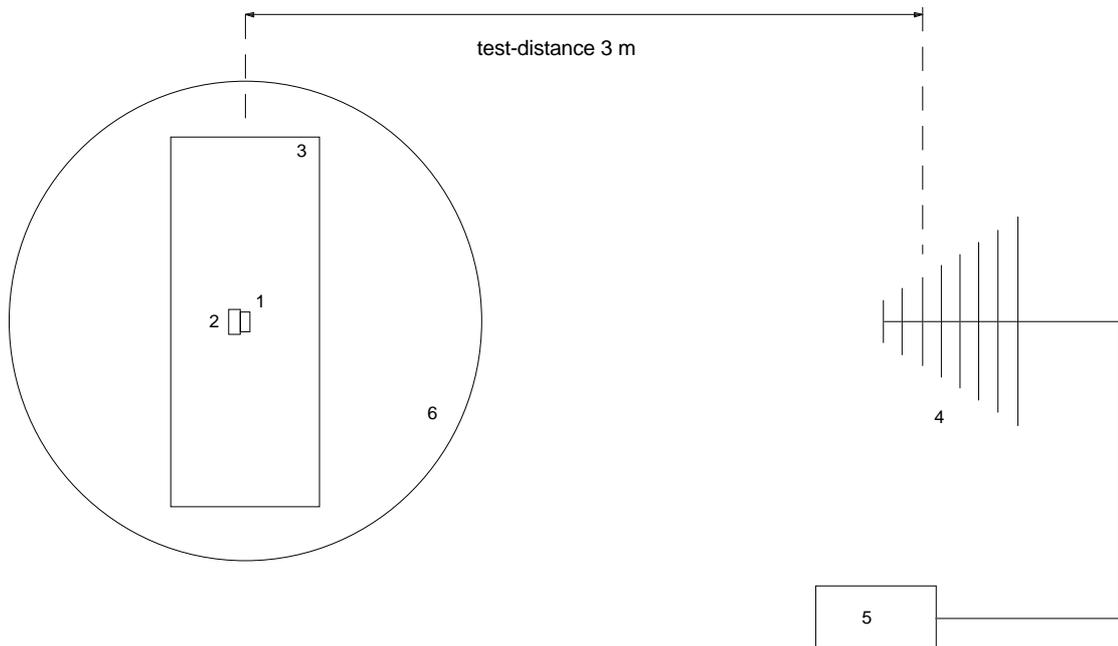


Figure 2: Measurement setup for radiated emission test below 1 GHz

- | | |
|---|------------------------------|
| 1 Transmitter (EUT) | 4 Measurement antenna |
| 2 Wooden pedestal (if necessary) | 5 Test receiver |
| 3 Wooden table | 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

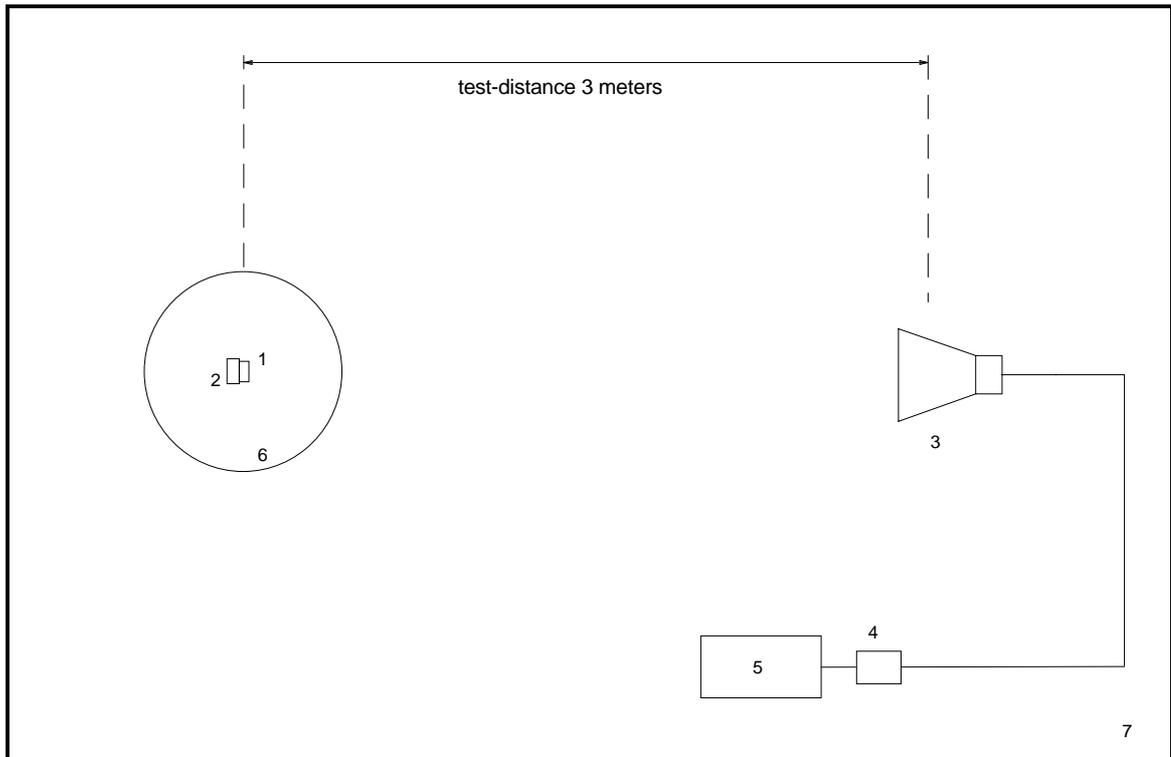


Figure 3: Measurement setup for radiated emission test above 1 GHz

- | | |
|----------------------------------|--------------------------------|
| 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 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

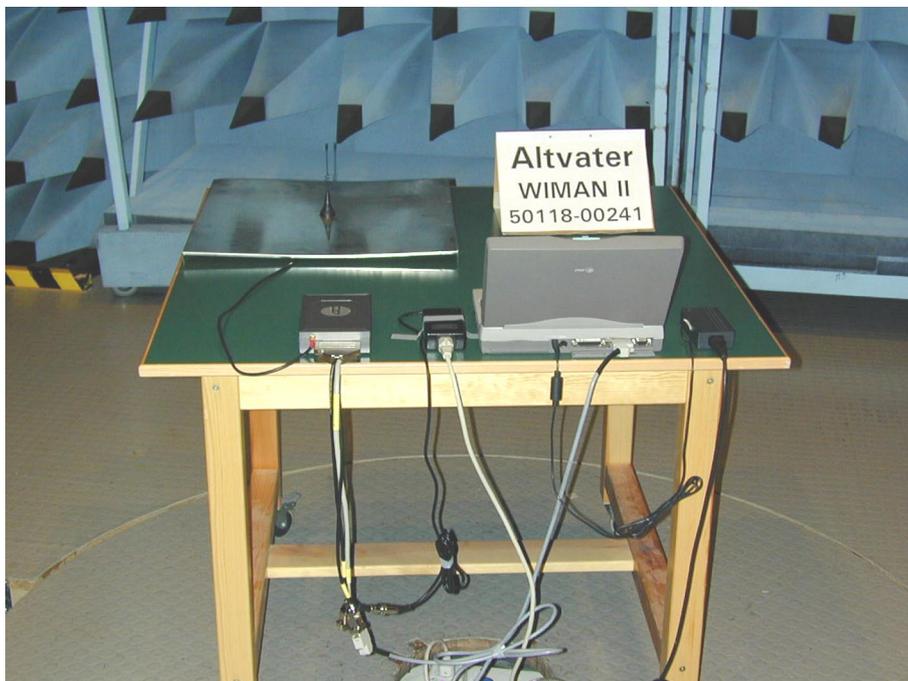
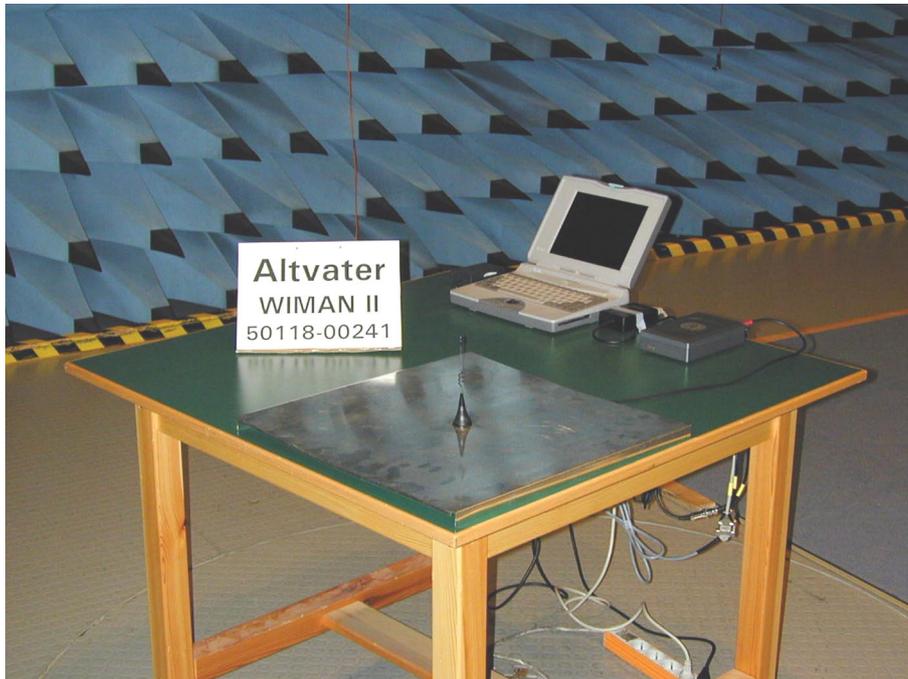
Test setup for conducted emission test 450 kHz - 30 MHz



Photos No. 9.3**Test setup for conducted emission test 450 kHz - 30 MHz
(continued)**

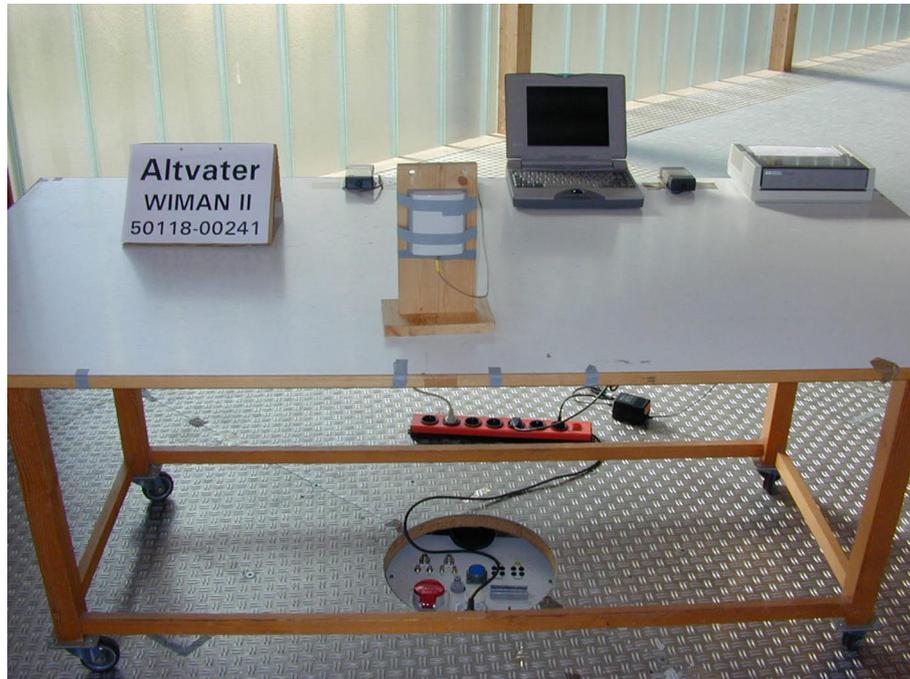
Photos No. 9.4 - 9.5

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



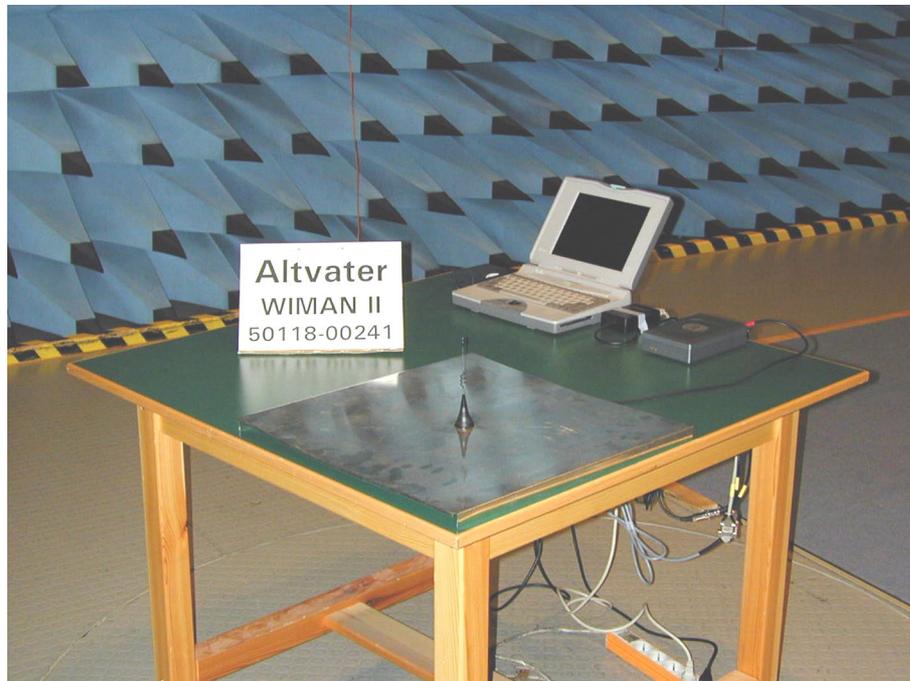
Photos No. 9.6

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

FCC Part 15 Subpart C			
Section(s):	Test	Page(s)	Result
15.31 (m)	Number of operating frequencies to be examined		Passed
15.203	Requirement that antenna is permanently attached or unique antenna connector		Passed
15.204	Information on antennae proposed for use with the EUT		Passed
15.207	Conducted emission test 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		Passed
	Number of Hopping Frequencies		Passed
	Time of Occupancy		Passed
	20 dB Bandwidth		Passed
	Pseudorandom Frequency Hopping Sequence		See Supplement F
	Equal Hopping Frequency Use		See Supplement F
	System Receiver Input Bandwidth		See Supplement F
	System Receiver Hopping Capability		See Supplement F
15.247 (b)	Maximum peak output power		Passed
	De Facto EIRP Limit		Passed
	Point-to-Point Operation		See Supplement F
	RF Exposure Compliance Statement		See Supplement F
	Installation/Operation Manual Requirements		See Supplement F

§15.247 (c)	Band-edge Compliance of Conducted Emissions		Passed
	Spurious RF Conducted Emissions		Passed
15.247 (g)	Description how the EUT complies with the requirement of this section	---	Test performed by applicant
15.247 (h)	Requirement to avoid frequency coordination of multiple FHSS systems		Passed

	Receive mode (RX):		
§15.207	Conducted emission test 450 kHz - 30 MHz		Passed
§15.209	Radiated emission test	-	Passed

11. List of Measurements

Section(s):	Test	Page(s)	Result

Section 15.31 (m)	Number of operating frequencies to be examined	N/A	Passed
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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.

Section 15.203	Requirement that antenna is permanently attached or unique antenna connector	N/A	Passed
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A reverse SMA connector was used to meet the requirement for an unique antenna connector according to section 15.203 of the rules

Section 15.204	Information on antennae proposed for use with the EUT	N/A	N/A
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The following antennas are proposed for use with the EUT and are covered by this report:

Model Name	Matchcode	Description
Colinear Mobile Whip Antenna	AN-24-2MN360-FMEM	Omni-Antenna, 2 dBi
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

15.207	Conducted emission test 450 kHz – 30 MHz		Passed
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15.247 (a)	Description how the EUT meets the definition of a frequency hopping spread spectrum system		Passed
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See Annex X for details

	Carrier Frequency separation		Passed
--	-------------------------------------	--	--------

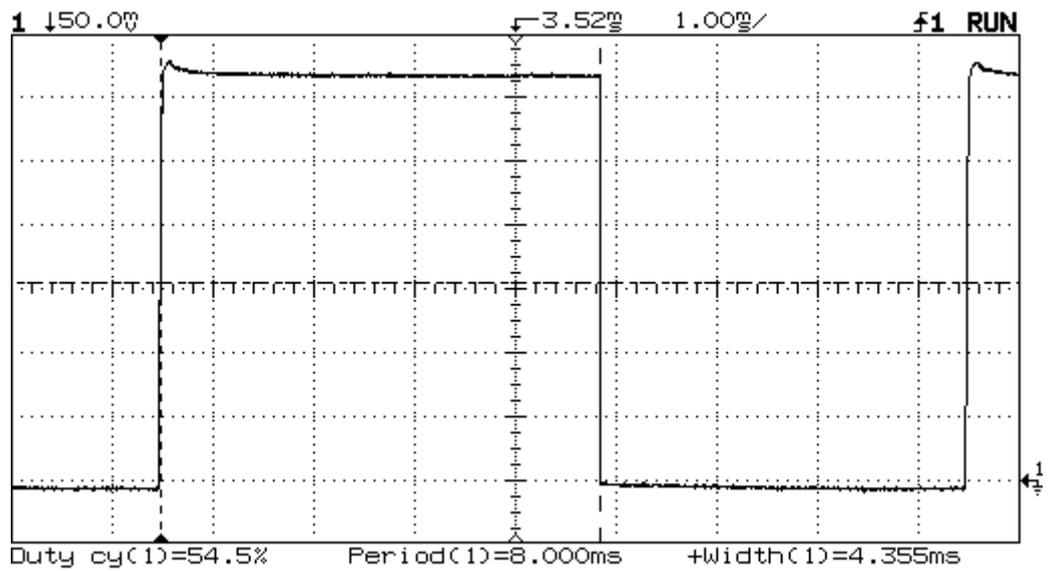
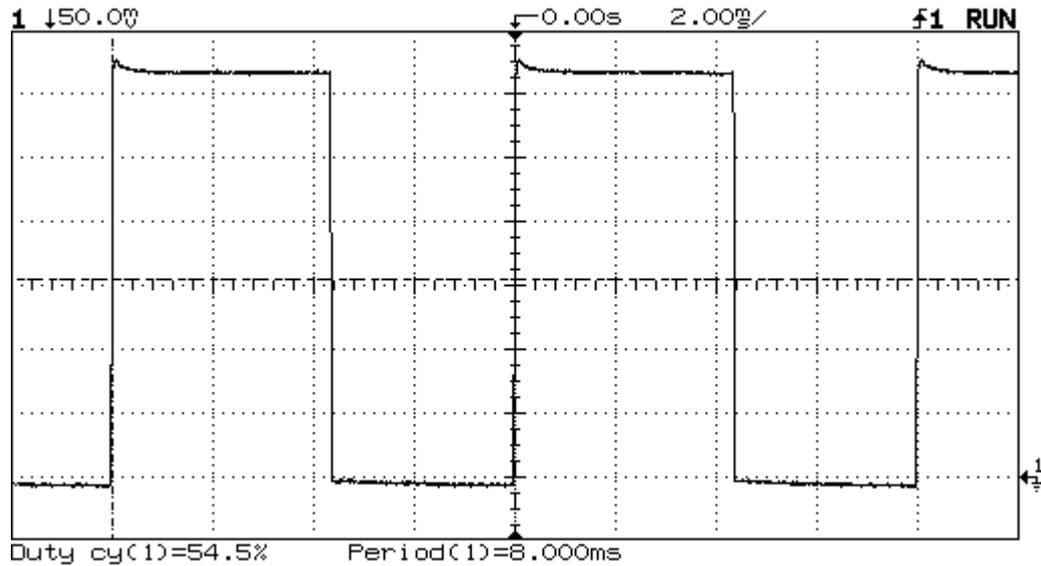
Carrier frequency separation is 1 MHz, see page x of the report for details

	Number of Hopping Frequencies		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



	20 dB Bandwidth		Passed
--	------------------------	--	--------

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

	Pseudorandom Frequency Hopping Sequence		
--	--	--	--

	Equal Hopping Frequency Use		
--	------------------------------------	--	--

	System Receiver Input Bandwidth		
--	--	--	--

	System Receiver Hopping Capability		
--	---	--	--

15.247 (b)	Maximum peak output power		Passed
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The maximum peak output power is 30 dBm, see test charts enclosed

	De Facto EIRP Limit		Passed
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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.

Model Name	Matchcode	Description	TX power setting
Colinear Mobile Whip Antenna	AN-24-2MN360-FMEM	Omni-Antenna, 2 dBi	28
MFB Omni-Directional Antenna	AN-24-8MN360-NM3	Omni-antenna, 8 dBi,	27
SPA 2400/75/9/0/V	AN-24-8PL76-SMAF	Planar Antenna, 8.5 dBi	26
Microceptor Antenna	AN-24-16PL24-NF	Planar Antenna, 16 dBi	20
SPA 2400/85/17/0/V	AN-24-16PL85-NF	Planar Antenna, 16.5 dBi, 85 Degree	19
Conifer 26T-2400F	AN-24-24PF8-NF	Paraflector Antenna, 24 dBi	12

	Point-to-Point Operation		Not applicable
--	---------------------------------	--	----------------

	RF Exposure Compliance Statement		Passed
--	---	--	--------

	Installation/Operation Manual Requirements		Passed
--	---	--	--------

§15.247 (c)	Band-edge Compliance of Conducted Emissions		Passed
--------------------	--	--	--------

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

	Spurious RF Conducted Emissions		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) Semi-anechoic chamber (>1GHz)
Distance:	3 Meter
Date of test:	April 2000

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

	Spurious Radiated Emissions		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) Semi-anechoic chamber (>1GHz)
Distance:	3 Meter
Date of test:	April 2000

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

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

15.247 (g)	Description how the EUT complies with the requirement of this section	---	Test performed by applicant
15.247 (h)	Requirement to avoid frequency coordination of multiple FHSS systems		

	Receive mode (RX):		
Section 15.207	Conducted emission test 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 μ V)	Limit (dB μ V/m)	Margin (dB)
0.202	Quasipeak	43.4	48.0	4.6
19.56	Quasipeak	39.7	48.0	8.3
27.715	Quasipeak	40.1	48.0	7.9
28.041	Quasipeak	40.5	48.0	7.5

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) Semi-anechoic chamber (>1GHz)
Distance:	3 Meter
Date of test:	April 2000

Frequency (MHz)	Detector	Antenna Polarization	Analyzer Reading (dBµV)	Correction Factor (dB)	Field Strength (dBµV/m)
49.67	Quasi Peak	Horizontal	18.6	15.7	34.3
629.0	Quasi Peak	Horizontal	9.9	30.4	40.3

Sample calculation of field strength values:

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

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
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
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
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

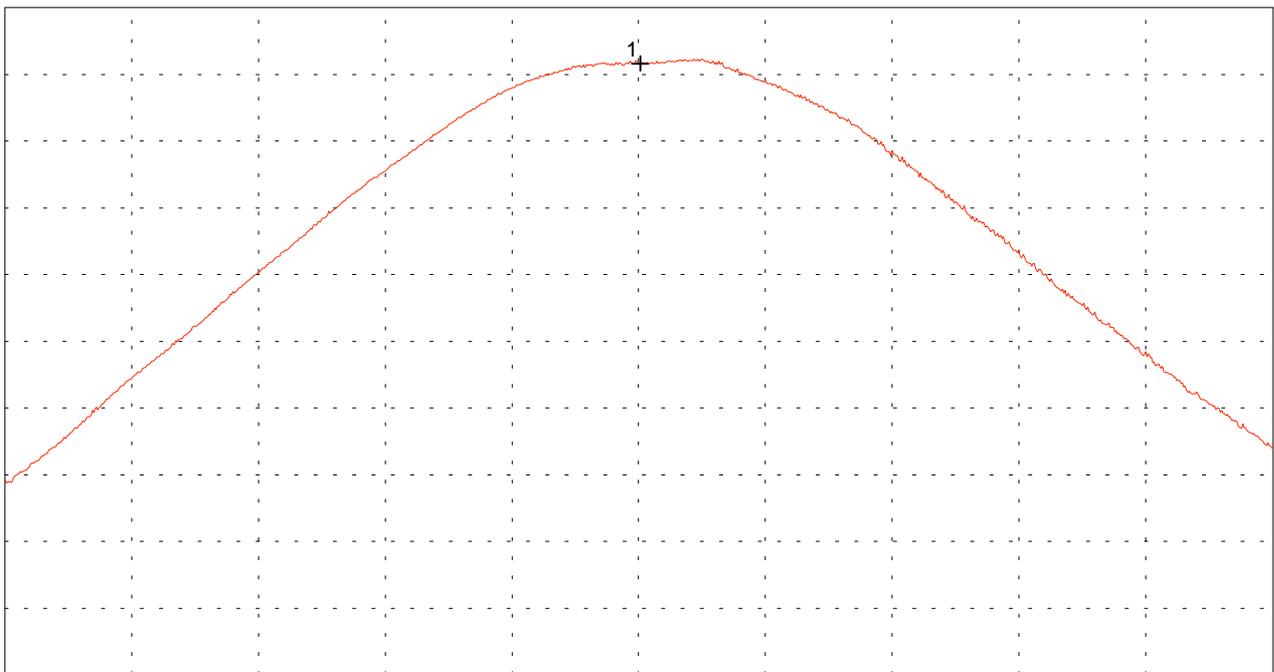
Peak Output Power acc. to Section 15.247 (b)

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected - TX power setting 28 (maximum) - Modulation 4FSK, default data pattern - Conducted Measurement
Serial No.: ---	
Applicant: Altwater Airdata Systems GmbH & Co. KG	

Ref.Level 31 dBm
5 dB/Div.

ATT 40 dB

Ref. Offset 21 dB



Start 2.4785 GHz
RBW 1 MHz

VBW 1 MHz

Stop 2.4835 GHz
SWP 20 ms

Multi Marker List		
No. 1	2.481006 GHz	26.82 dBm

Tested by: Johann Roidt
Date: May 29, 2000

Project-No.: 50118-00241-2
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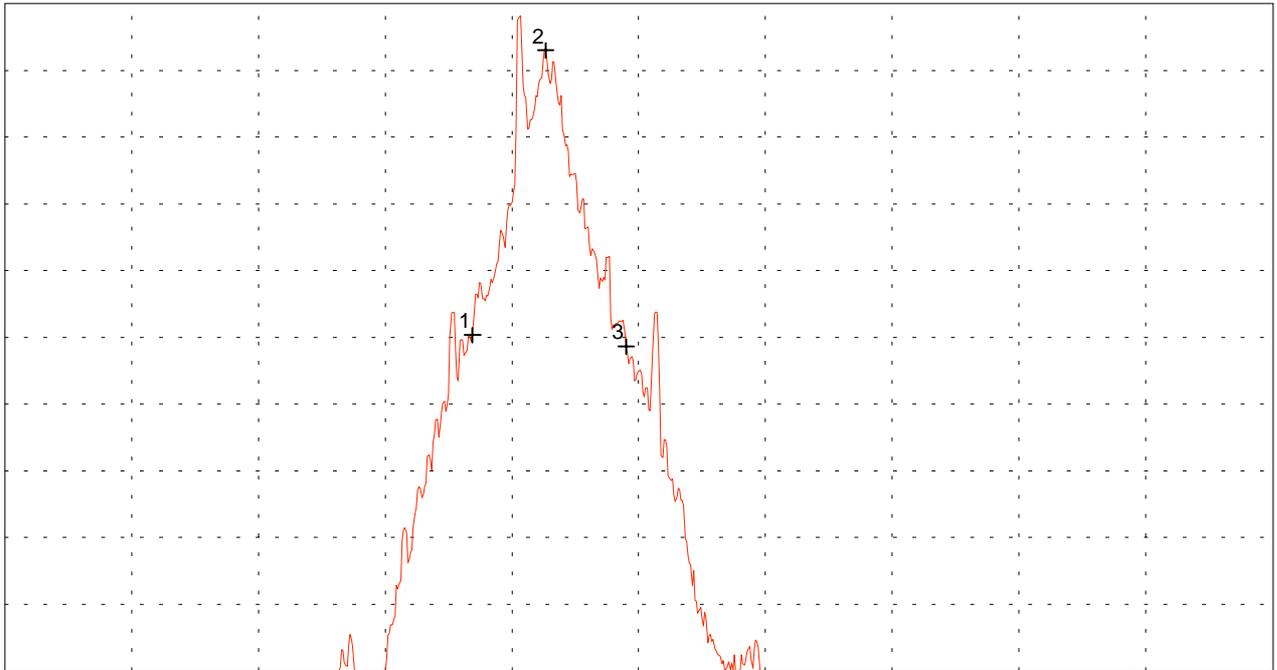
20 dB Bandwidth according to FCC Rules, Section 15.247

Model: WIMAN II	Mode: - Conducted Measurement
Serial No.: 0001	- Lowest channel selected
Applicant: Altwater Airdata Systems GmbH	- TX power setting 28 (maximum)
	- 20 dB Bandwidth = 708.3 kHz

Ref.Level 25 dBm
5 dB/Div.

ATT 35 dB

Ref. Offset 20 dB



Start 2.399319444 GHz
RBW 10 kHz

VBW 10 kHz

Stop 2.405569444 GHz
SWP 200 ms

Multi Marker List

No. 1	2.401625 GHz	0.17 dBm
No. 2	2.401986 GHz	21.50 dBm
No. 3	2.402382 GHz	-0.69 dBm

Tested by: Johann Roidt
Date: May 22, 2000

Project-No.: 50118-00241-2
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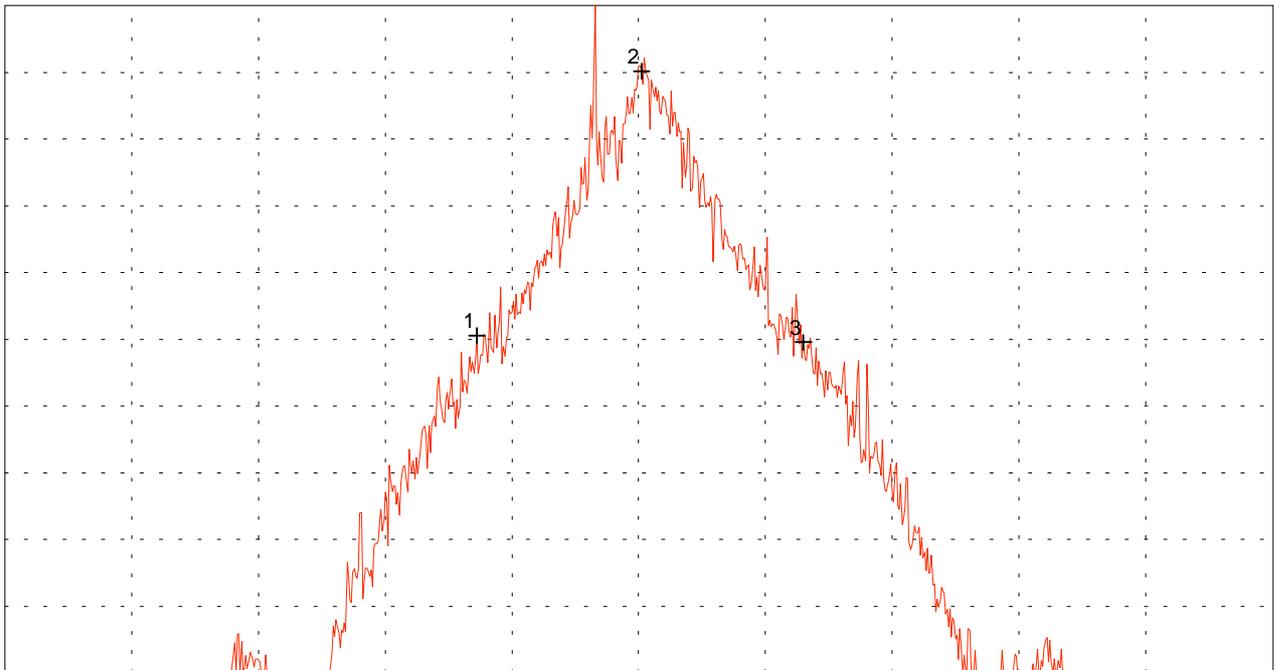
20 dB Bandwidth according to FCC Rules, Section 15.247

Model: WIMAN II	Mode: - Conducted Measurement
Serial No.: 0001	- Middle channel selected
Applicant: Altwater Airdata Systems GmbH	- TX power setting 28 (maximum)
	- 20 dB Bandwidth = 784.7 kHz

Ref.Level 25 dBm
5 dB/Div.

ATT 35 dB

Ref. Offset 20 dB



Start 2.439409722 GHz
RBW 10 kHz

VBW 10 kHz

Stop 2.442534722 GHz
SWP 100 ms

Multi Marker List

No. 1	2.440573 GHz	0.27 dBm
No. 2	2.440979 GHz	20.08 dBm
No. 3	2.441378 GHz	-0.22 dBm

Tested by: Johann Roidt
Date: May 22, 2000

Project-No.: 50118-00241-2
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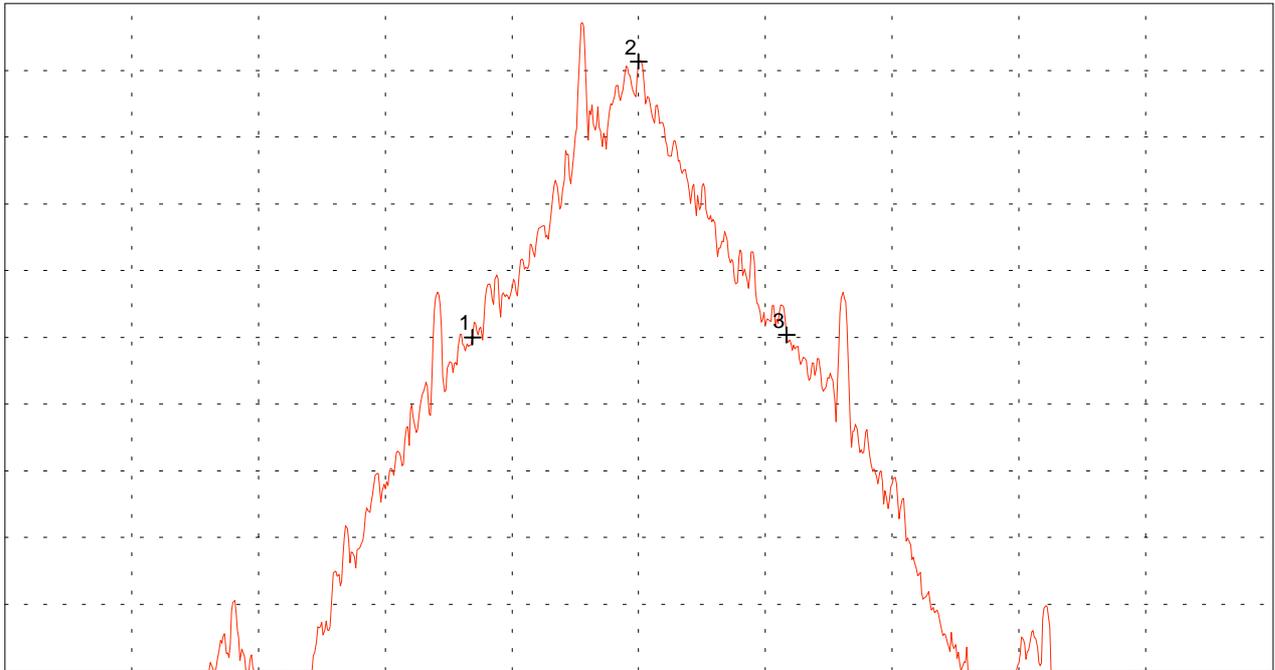
20 dB Bandwidth according to FCC Rules, Section 15.247

Model: WIMAN II	Mode: - Conducted Measurement
Serial No.: 0001	- Highest channel selected
Applicant: Altwater Airdata Systems GmbH	- TX power setting 28 (maximum)
	- 20 dB Bandwidth = 774.3 kHz

Ref.Level 25 dBm
5 dB/Div.

ATT 35 dB

Ref. Offset 20 dB



Start 2.479444444 GHz
RBW 10 kHz

VBW 10 kHz

Stop 2.482569444 GHz
SWP 100 ms

Multi Marker List

No. 1	2.480597 GHz	-0.01 dBm
No. 2	2.481007 GHz	20.68 dBm
No. 3	2.481372 GHz	0.18 dBm

Tested by: Johann Roidt
Date: May 22, 2000

Project-No.: 50118-00241-2
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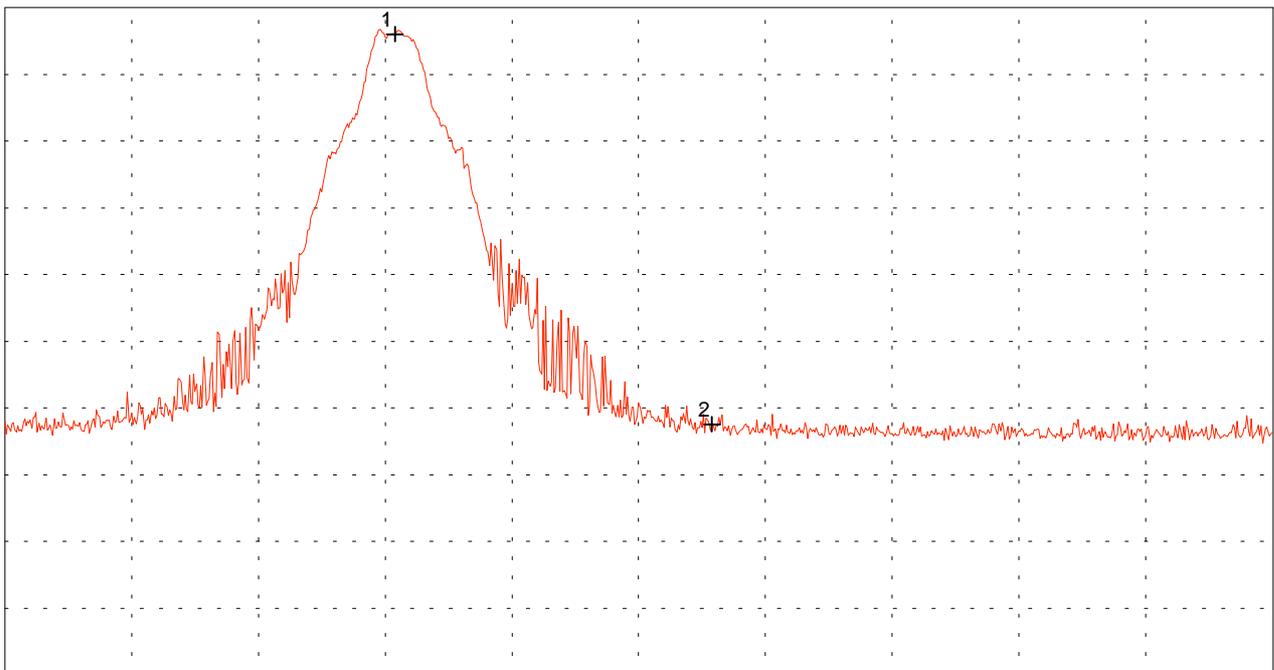
Band-edge Compliance of conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected
Serial No.: ---	- TX power setting 28 (maximum)
Applicant: Altwater Airdata GmbH	- Modulation 4FSK, default data pattern
	- Conducted Measurement

Ref.Level 30 dBm
10 dB/Div.

ATT 40 dB

Ref. Offset 21 dB



Start 2.477922105 GHz
RBW 100 kHz

VBW 100 kHz

Stop 2.487922105 GHz
SWP 20 ms

Multi Marker List

No. 1	2.480998 GHz	26.04 dBm
No. 2	2.483500 GHz	-32.46 dBm

Tested by: Johann Roidt
Date: May 29, 2000

Project-No.: 50118-00241-2
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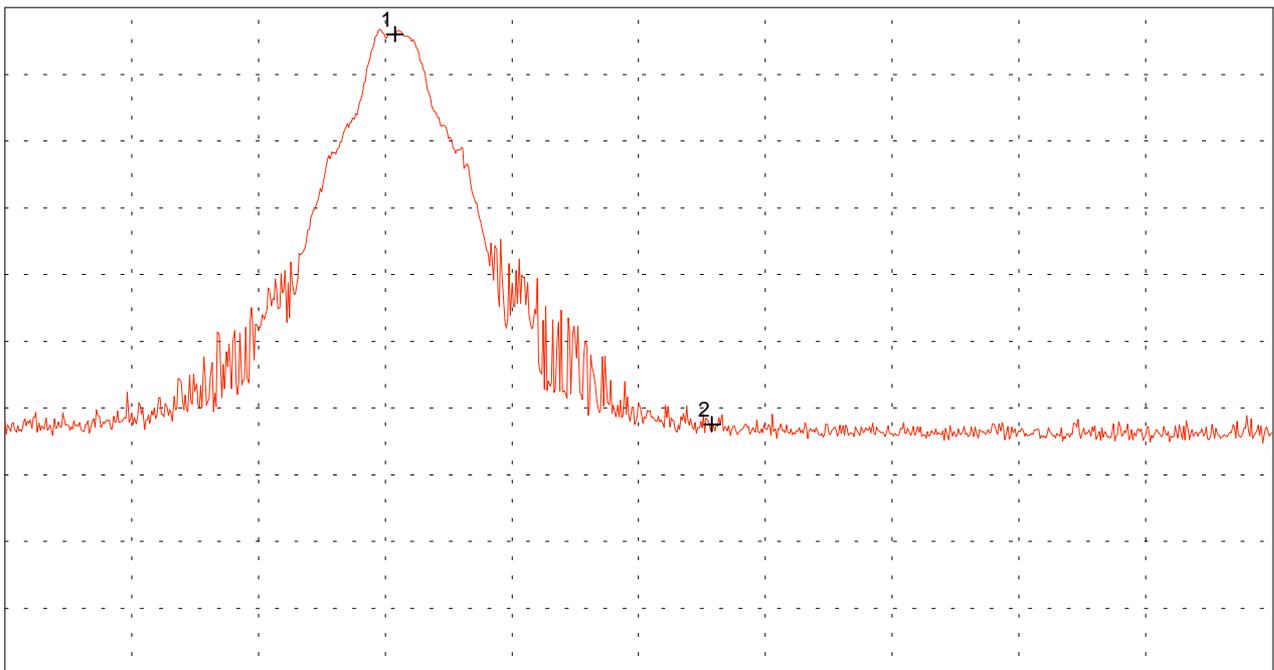
Band-edge Compliance of conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected - TX power setting 28 (maximum) - Modulation 4FSK, default data pattern - Conducted Measurement
Serial No.: ---	
Applicant: Altwater Airdata GmbH	

Ref.Level 30 dBm
10 dB/Div.

ATT 40 dB

Ref. Offset 21 dB



Start 2.477922105 GHz
RBW 100 kHz

VBW 100 kHz

Stop 2.487922105 GHz
SWP 20 ms

Multi Marker List

No. 1	2.480998 GHz	26.04 dBm
No. 2	2.483500 GHz	-32.46 dBm

Tested by:
Johann Roidt

Date:
May 29, 2000

Project-No.:
50118-00241-2

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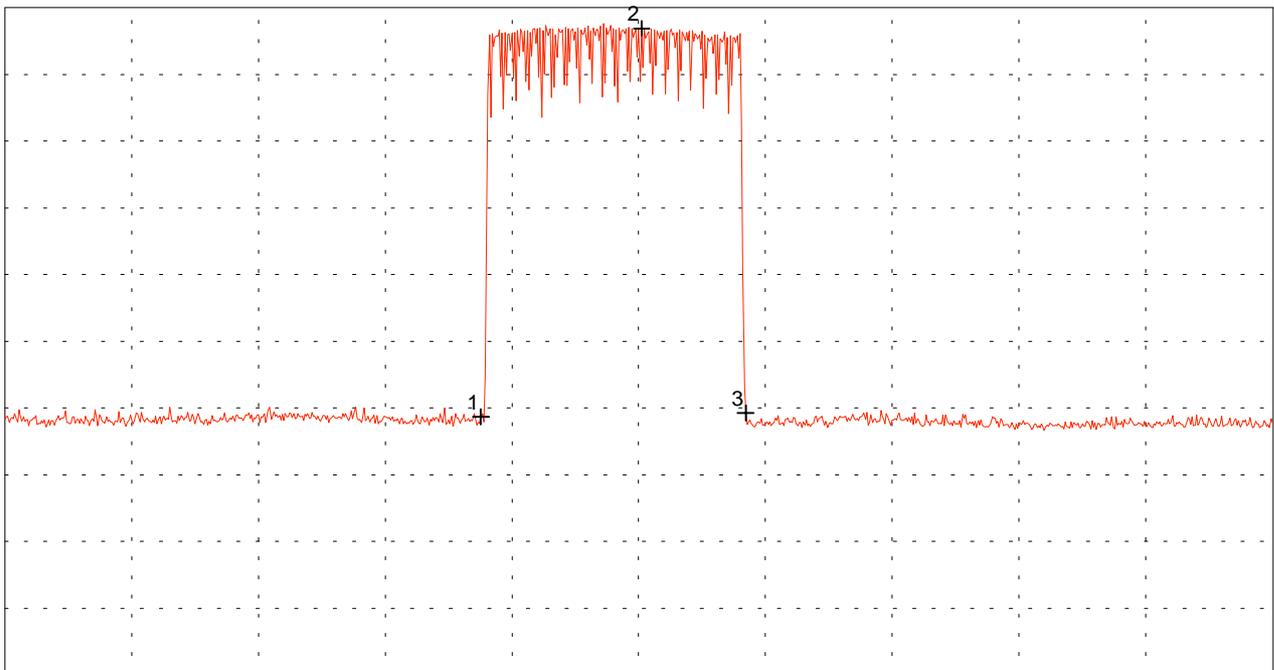
Band-edge Compliance of conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Hopping Mode, Full operating band - TX power setting 28 (maximum) - Modulation 4FSK, default data pattern - Conducted Measurement
Serial No.: ---	
Applicant: Altwater Airdata GmbH	

Ref.Level 30 dBm
10 dB/Div.

ATT 40 dB

Ref. Offset 21 dB



Start 2.250 GHz
RBW 100 kHz

VBW 100 kHz

Stop 2.650 GHz
SWP 120 ms

Multi Marker List

No. 1	2.400222 GHz	-31.32 dBm
No. 2	2.450889 GHz	26.88 dBm
No. 3	2.483778 GHz	-30.74 dBm

Tested by:
Johann Roidt

Date:
May 29, 2000

Project-No.:
50118-00241-2

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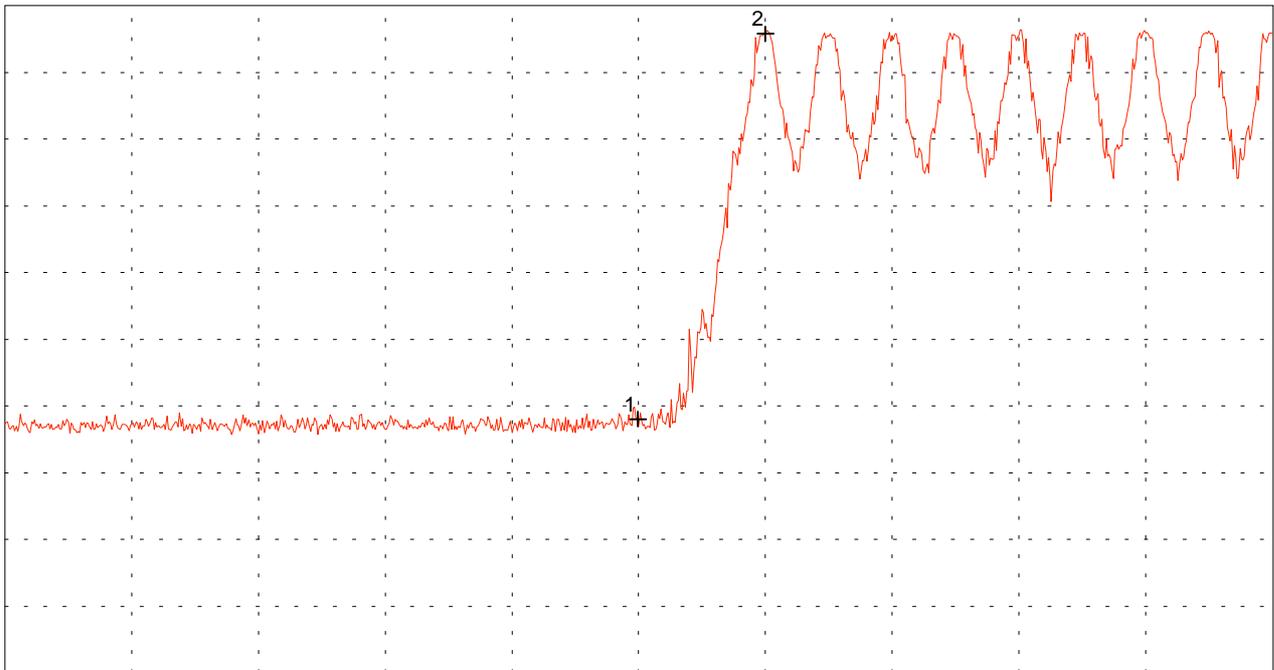
Band-edge Compliance of conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Hopping Mode, Low end of operating band
Serial No.: ---	- TX power setting 28 (maximum)
Applicant: Altwater Airdata GmbH	- Modulation 4FSK, default data pattern
	- Conducted Measurement

Ref.Level 30 dBm
10 dB/Div.

ATT 40 dB

Ref. Offset 21 dB



Start 2.390 GHz
RBW 100 kHz

VBW 100 kHz

Stop 2.410 GHz
SWP 20 ms

Multi Marker List

No. 1	2.399989 GHz	-31.96 dBm
No. 2	2.402000 GHz	25.79 dBm

Tested by: Johann Roidt
Date: May 29, 2000

Project-No.: 50118-00241-2
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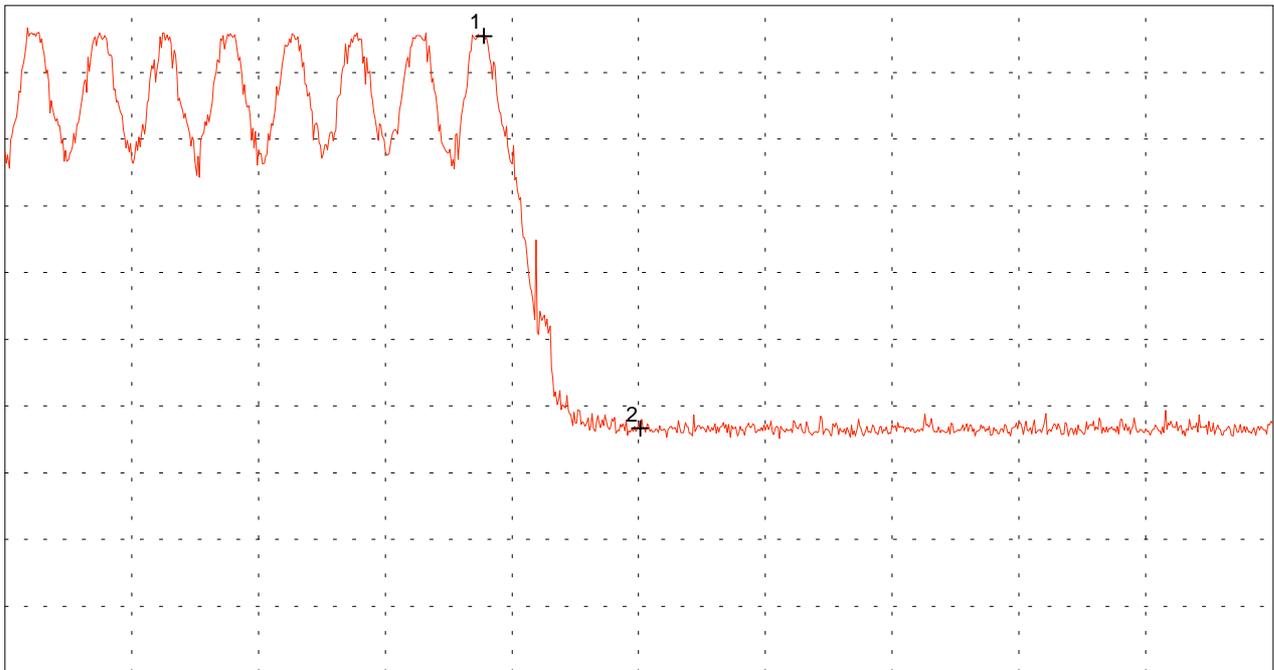
Band-edge Compliance of conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Hopping Mode, High end of operating band
Serial No.: ---	- TX power setting 28 (maximum)
Applicant: Altwater Airdata GmbH	- Modulation 4FSK, default data pattern
	- Conducted Measurement

Ref.Level 30 dBm
10 dB/Div.

ATT 40 dB

Ref. Offset 21 dB



Start 2.4735 GHz
RBW 100 kHz

VBW 100 kHz

Stop 2.4935 GHz
SWP 20 ms

Multi Marker List

No. 1	2.481056 GHz	25.46 dBm
No. 2	2.483522 GHz	-33.35 dBm

Tested by:
Johann Roidt

Date:
May 29, 2000

Project-No.:
50118-00241-2

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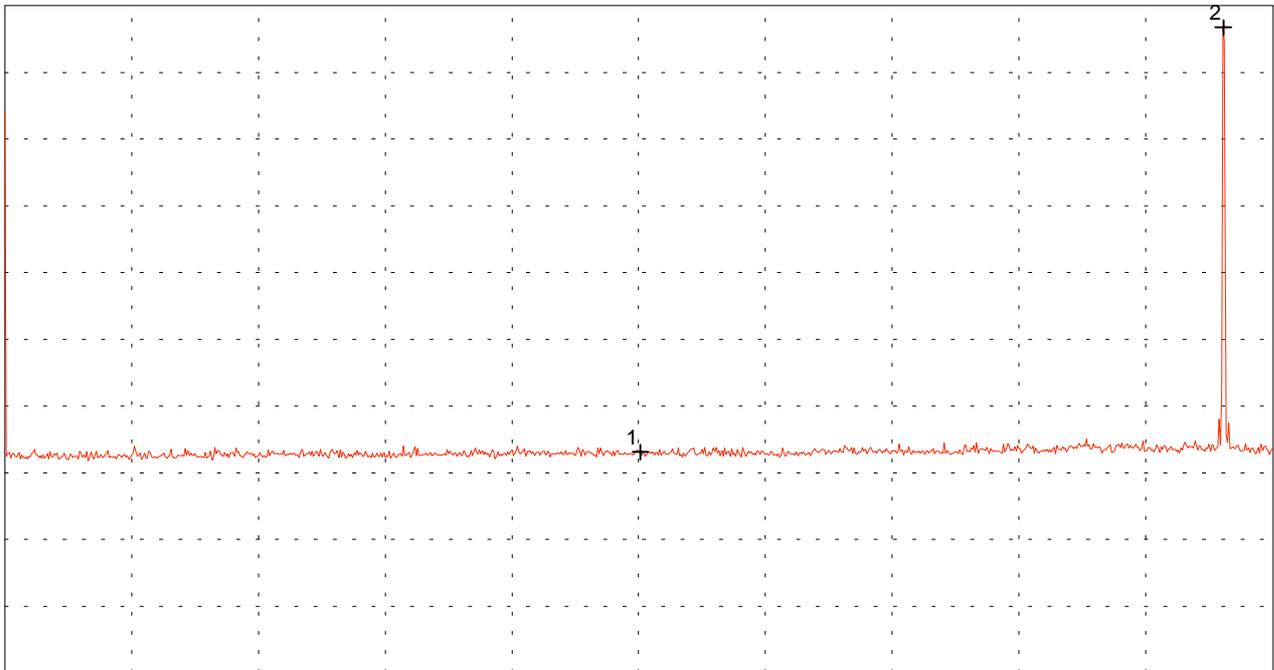
Spurious RF Conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Static Mode, Channel 01 selected
Serial No.: ---	- TX power setting 28 (maximum)
Applicant: Altwater Airdata GmbH	- Modulation 4FSK, default data pattern
	- Conducted Measurement

Ref.Level 30 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 21 dB



Start 100.000 kHz
RBW 100 kHz

VBW 100 kHz

Stop 2.500 GHz
SWP 760 ms

Multi Marker List

No. 1	1.253271 GHz	-36.93 dBm
No. 2	2.403225 GHz	26.75 dBm

Tested by: Johann Roidt
Date: May 29, 2000

Project-No.: 50118-00241-2
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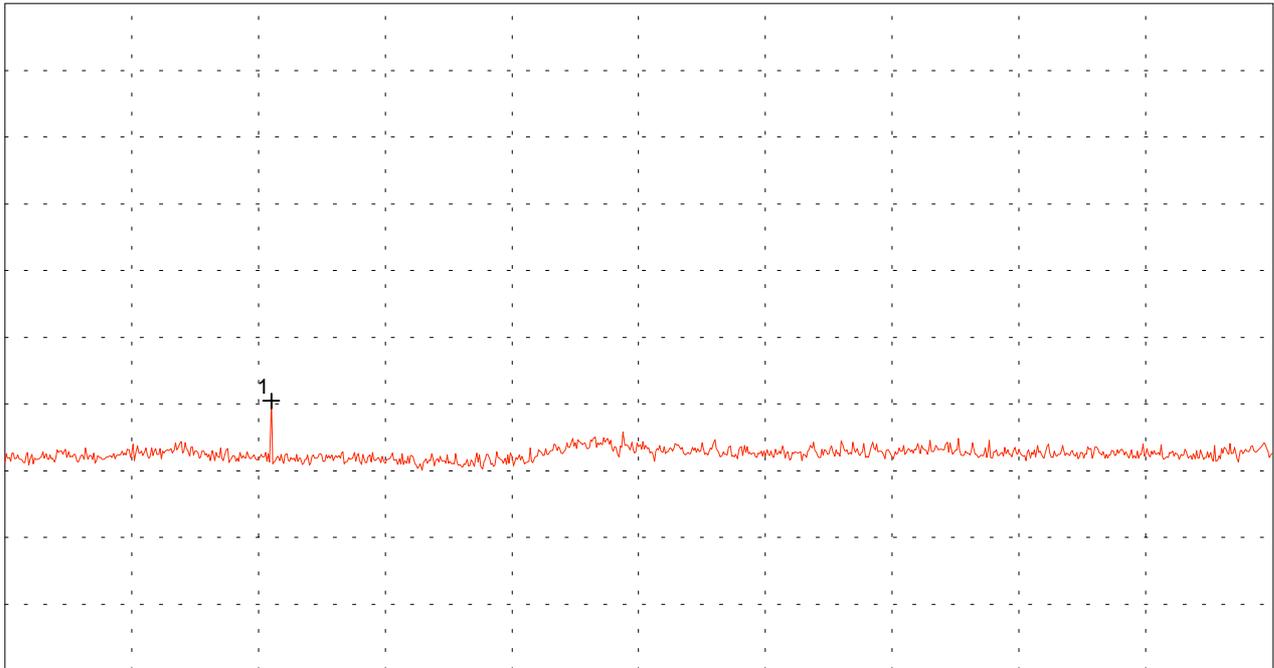
Spurious RF Conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Static Mode, Channel 01 selected
Serial No.: ---	- TX power setting 28 (maximum)
Applicant: Altwater Airdata GmbH	- Modulation 4FSK, default data pattern
	- Conducted Measurement

Ref.Level 30 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 21 dB



Start 2.500 GHz
RBW 100 kHz

VBW 100 kHz

Stop 25.000 GHz
SWP 6.80 s

Multi Marker List		
No. 1	7.225000 GHz	-29.52 dBm

Tested by: Johann Roidt
Date: May 29, 2000

Project-No.: 50118-00241-2
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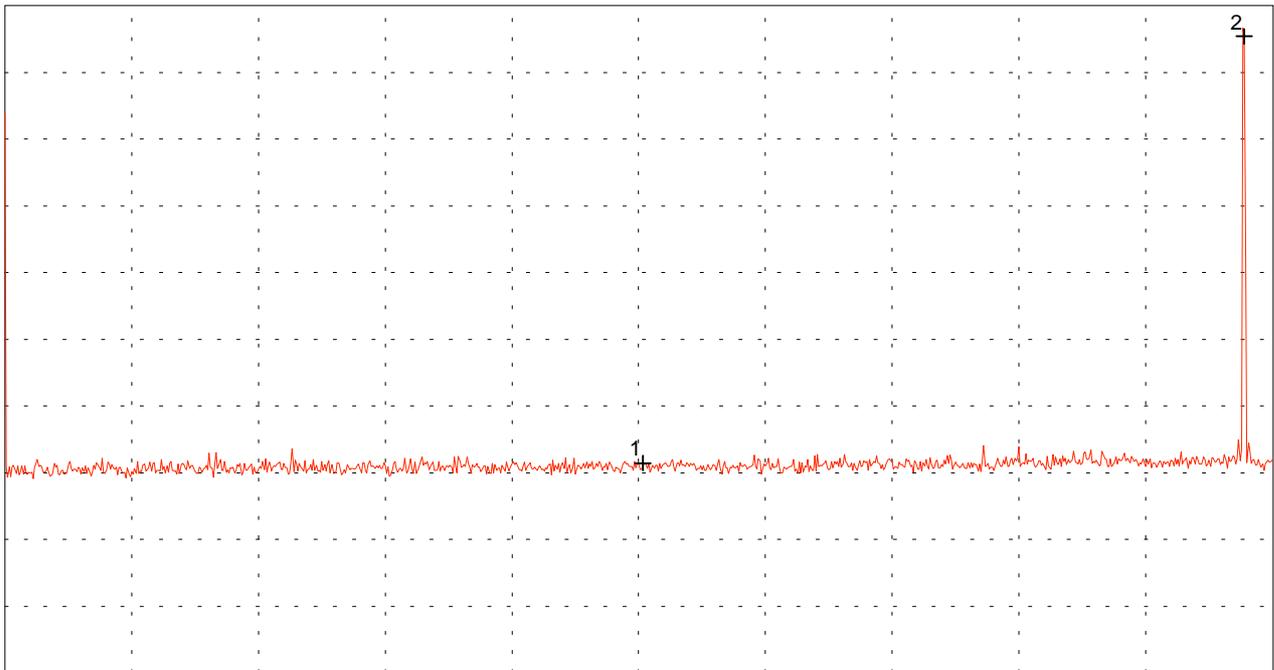
Spurious RF Conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Static Mode, Channel 40 selected - TX power setting 28 (maximum) - Modulation 4FSK, default data pattern - Conducted Measurement
Serial No.: ---	
Applicant: Altwater Airdata GmbH	

Ref.Level 30 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 21 dB



Start 100.000 kHz
RBW 100 kHz

VBW 100 kHz

Stop 2.500 GHz
SWP 760 ms

Multi Marker List		
No. 1	1.258383 GHz	-38.56 dBm
No. 2	2.444447 GHz	25.38 dBm

Tested by: Johann Roidt
Date: May 29, 2000

Project-No.: 50118-00241-2
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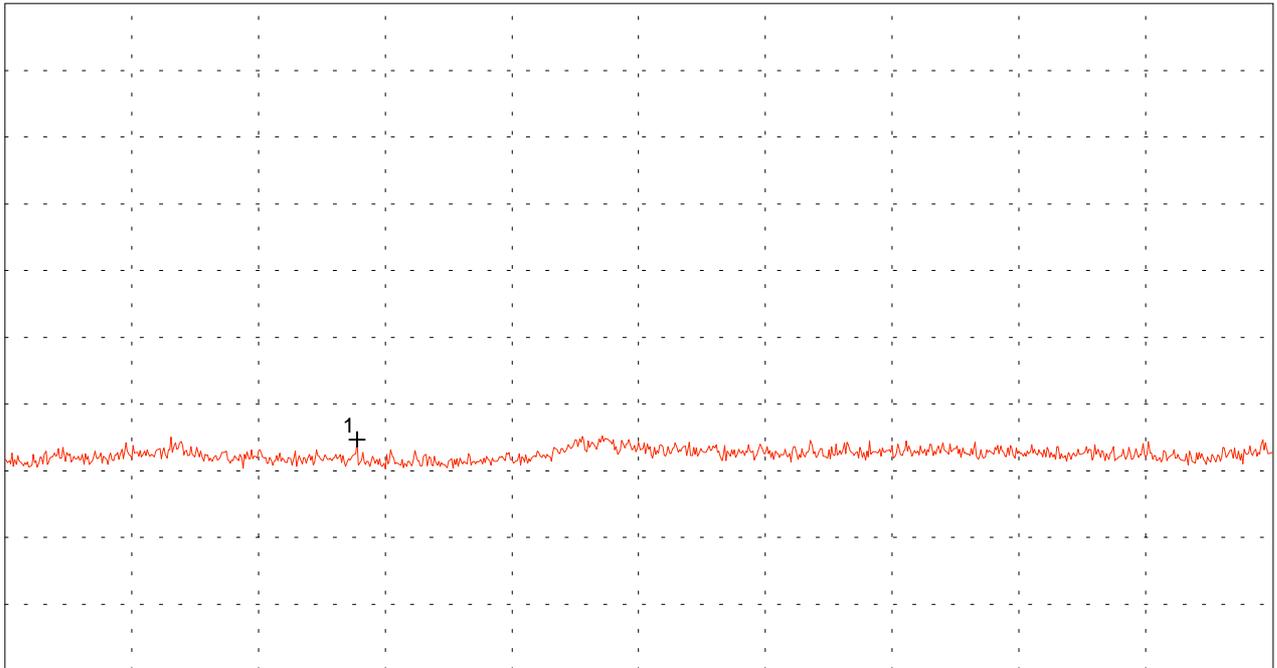
Spurious RF Conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Static Mode, Channel 40 selected - TX power setting 28 (maximum) - Modulation 4FSK, default data pattern - Conducted Measurement
Serial No.: ---	
Applicant: Altwater Airdata GmbH	

Ref.Level 30 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 21 dB



Start 2.500 GHz
RBW 100 kHz

VBW 100 kHz

Stop 25.000 GHz
SWP 6.80 s

Multi Marker List		
No. 1	8.750000 GHz	-35.33 dBm

Tested by: Johann Roidt
Date: May 29, 2000

Project-No.: 50118-00241-2
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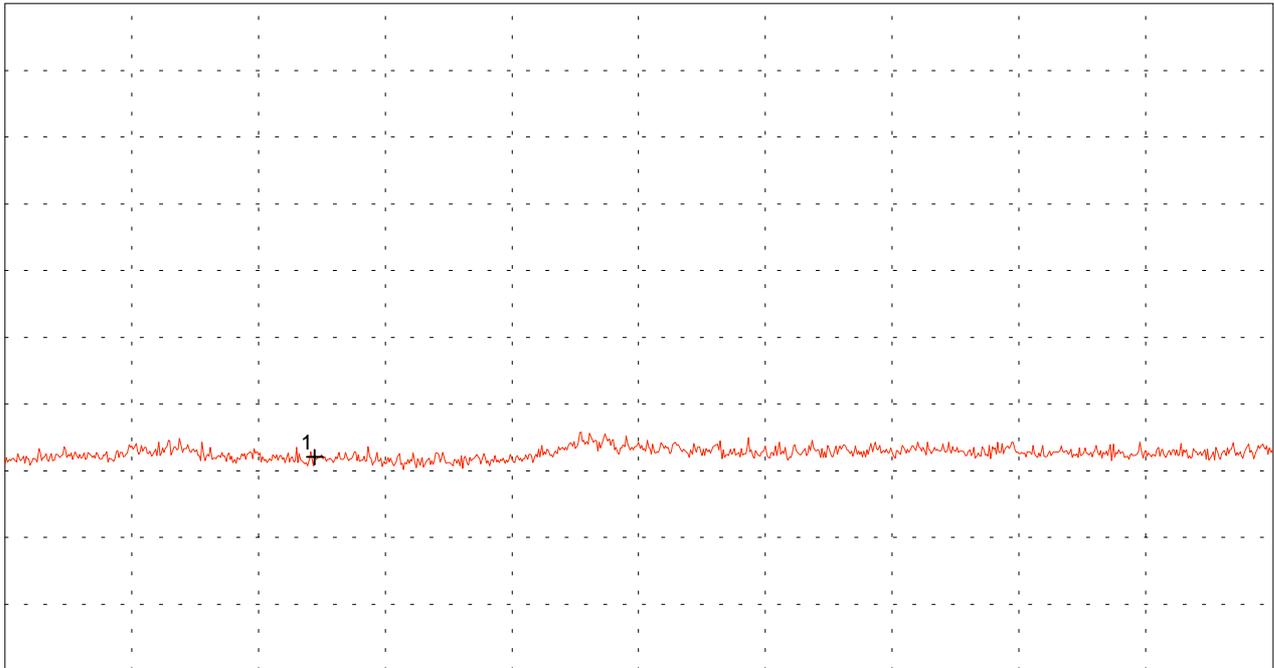
Spurious RF Conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Static Mode, Channel 80 selected - TX power setting 28 (maximum) - Modulation 4FSK, default data pattern - Conducted Measurement
Serial No.: ---	
Applicant: Altwater Airdata GmbH	

Ref.Level 30 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 21 dB



Start 2.500 GHz
RBW 100 kHz

VBW 100 kHz

Stop 25.000 GHz
SWP 6.80 s

Multi Marker List		
No. 1	8.000000 GHz	-37.95 dBm

Tested by: Johann Roidt
Date: May 29, 2000

Project-No.: 50118-00241-2
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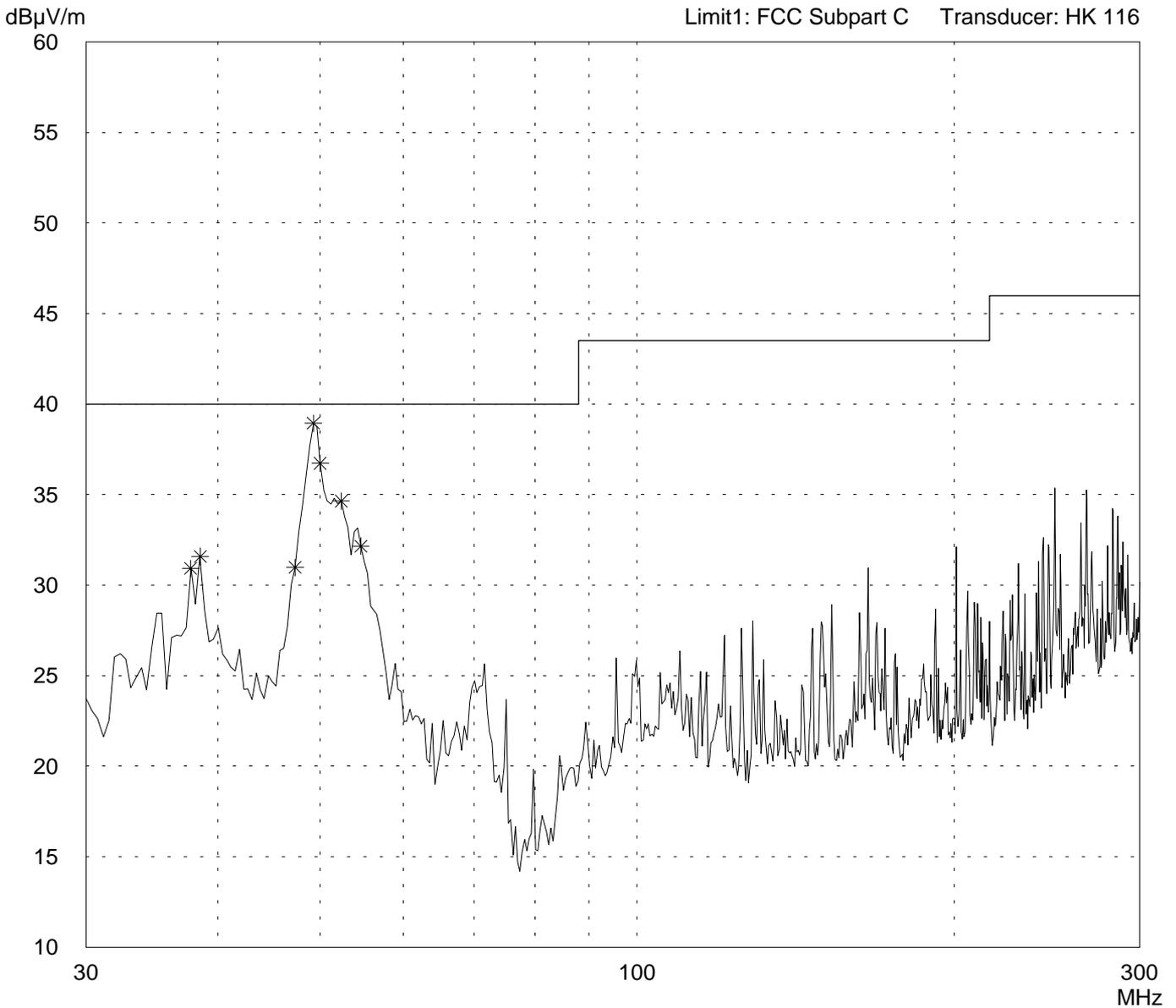
Radiated Emission Test 30 MHz - 300 MHz according to FCC Part 15 Subpart C

Model: WIMAN II	
Serial no.: ---	
Applicant: Altwater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Horizontal Polarization	
Date of test: 05/17/2000	Operator: J. Roidt
Test performed: automatically	File name:

Mode: with Procom Antenna Transmit Mode at Channel 01	
---	--

Detector: Peak

List of values: 10 dB Margin	50 Subranges
--	---------------------



Result: Prescan

Project file: 50118-00241-2	Page 59 of 122 Pages
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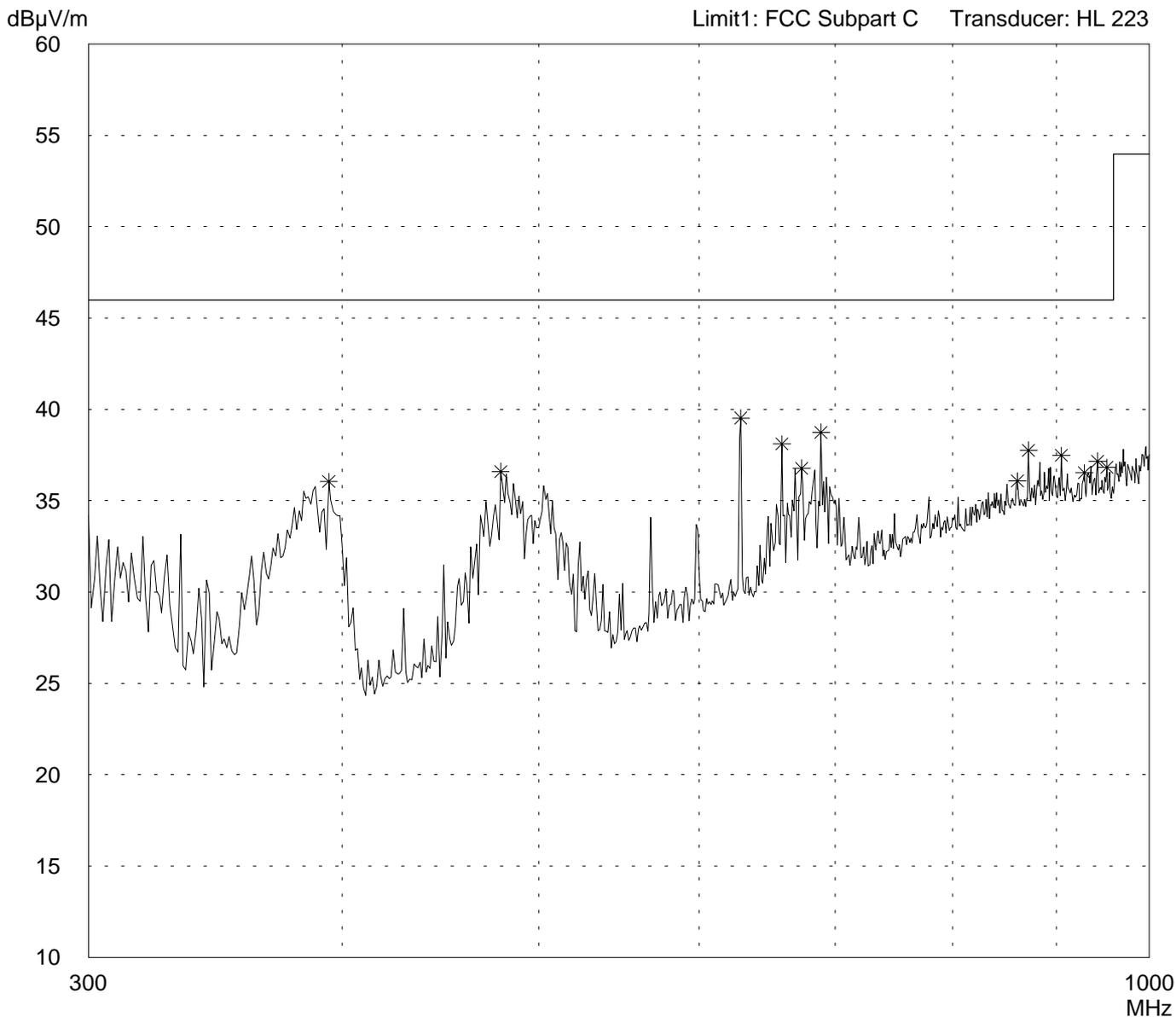
Radiated Emission Test 300 MHz - 1 GHz according to FCC Part 15 Subpart C

Model: WIMAN II	
Serial no.: ---	
Applicant: Altwater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Horizontal Polarization	
Date of test: 05/17/2000	Operator: J. Roidt
Test performed: automatically	File name:

Mode: with Procom Antenna Transmit Mode at Channel 01	
---	--

Detector: Peak

List of values: 10 dB Margin	50 Subranges
--	---------------------



Result: Prescan

Project file: 50118-00241-2	Page 60 of 122 Pages
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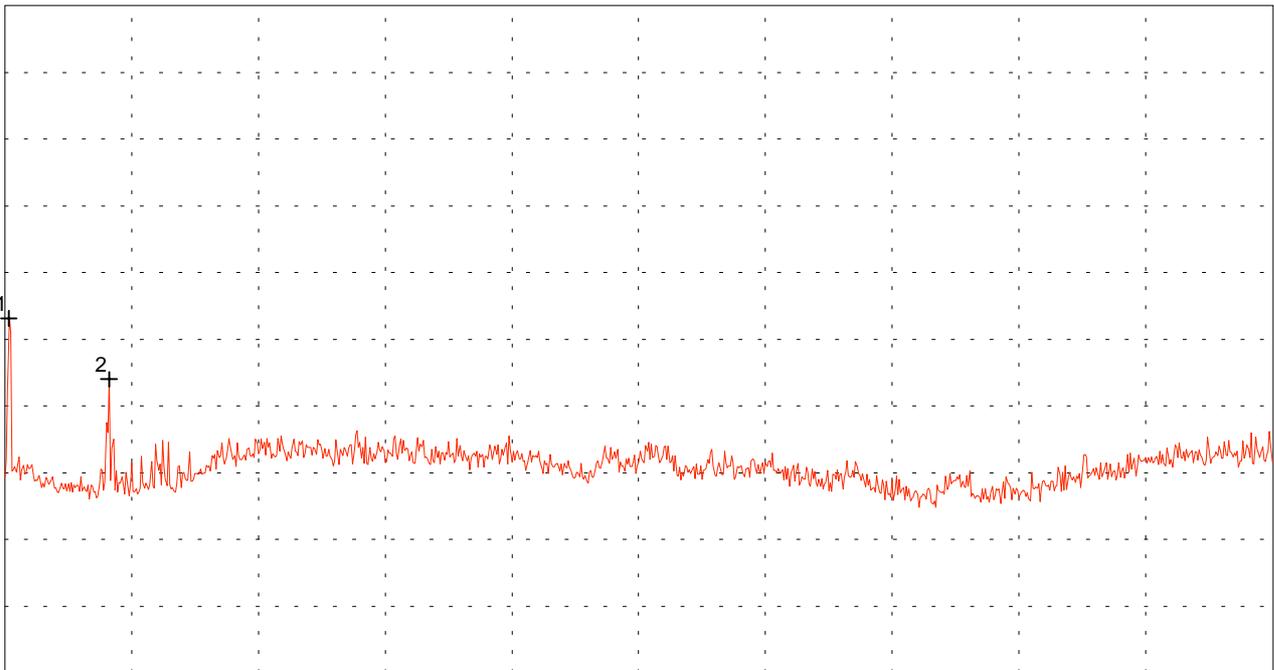
Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected
Serial No.: ---	- TX power setting 28 (Procom Antenna, 2 dBi)
Applicant: Altwater Airdata Systems GmbH & Co. KG	- Modulation 4FSK, default data pattern
	- Horizontal Polarisation, Peak Detector
	- Notch Filter for fundamental frequency

Ref.Level 40 dB μ V
5 dB/Div.

ATT 0 dB

Ref. Offset -30.5 dB



Start 2.400 GHz
RBW 1 MHz

VBW 1 MHz

Stop 3.950 GHz
SWP 20 ms

Multi Marker List		
No. 1	2.404722 GHz	16.57 dB μ V
No. 2	2.527000 GHz	12.01 dB μ V

Tested by: Johann Roidt
Date: May 29, 2000

Project-No.: 50118-00241-2
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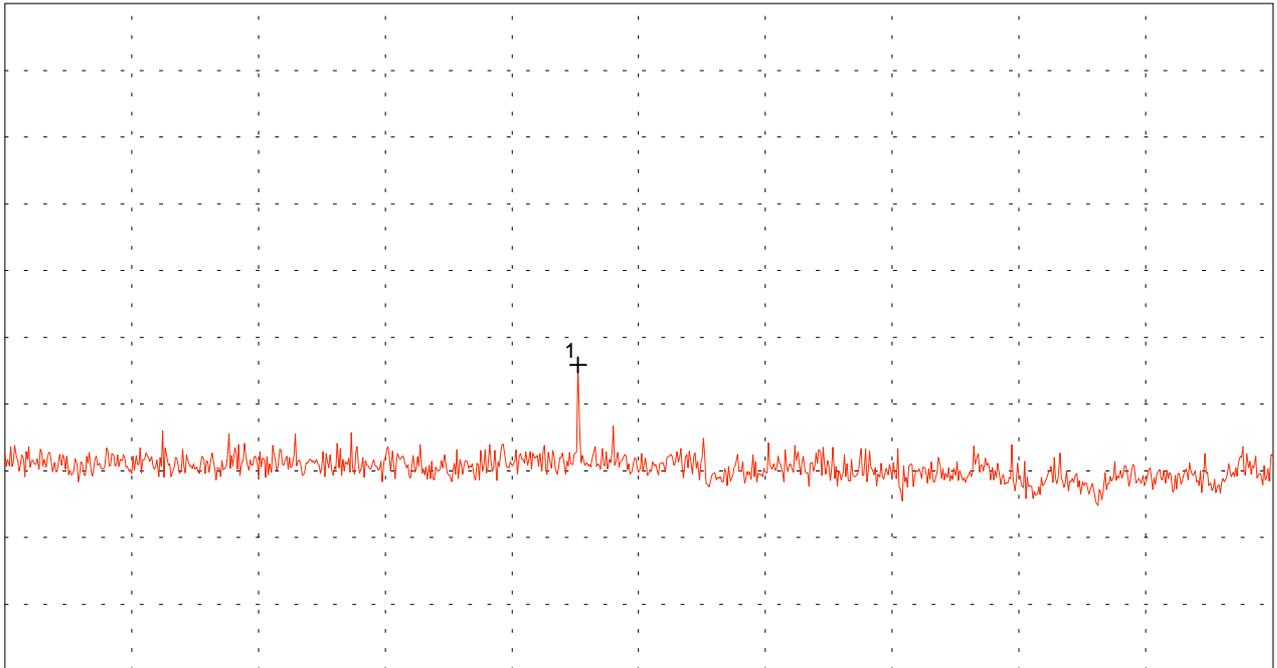
Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected
Serial No.: ---	- TX power setting 28 (Procom Antenna, 2 dBi)
Applicant: Altwater Airdata Systems GmbH & Co. KG	- Modulation 4FSK, default data pattern
	- Horizontal Polarisation, Peak Detector

Ref.Level 40 dBµV
5 dB/Div.

ATT 0 dB

Ref. Offset -30.5 dB



Start 3.950 GHz
RBW 1 MHz

VBW 1 MHz

Stop 5.850 GHz
SWP 20 ms

Multi Marker List		
No. 1	4.809222 GHz	12.92 dBµV

Tested by: Johann Roidt
Date: May 29, 2000

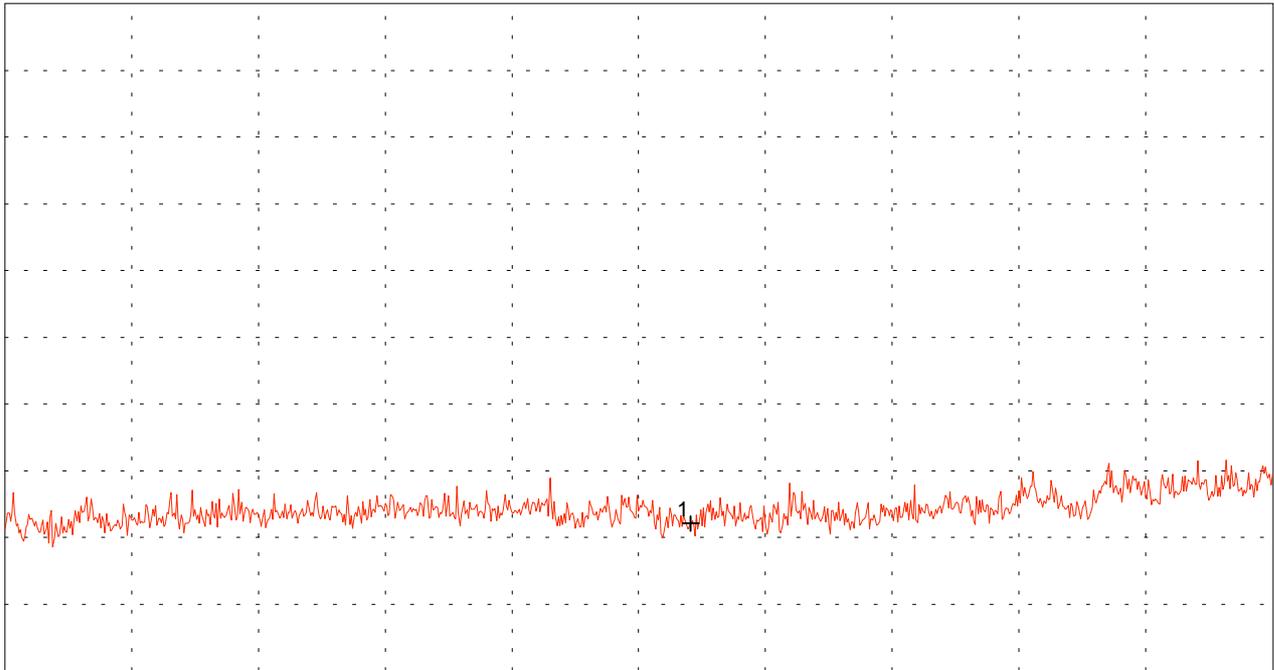
Project-No.: 50118-00241-2
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Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected
Serial No.: ---	- TX power setting 28 (Procom Antenna, 2 dBi)
Applicant: Altwater Airdata Systems GmbH & Co. KG	- Modulation 4FSK, default data pattern
	- Horizontal Polarisation
	- Test Distance : 1 meter

Ref.Level 47 dB μ V
5 dB/Div.

ATT 0 dB



Start 18.000 GHz
RBW 300 kHz

VBW 300 kHz

Stop 25.000 GHz
SWP 240 ms

Multi Marker List			
No. 1	21.787778 GHz	8.05 dB μ V	

Tested by: Johann Roidt
Date: May 30, 2000

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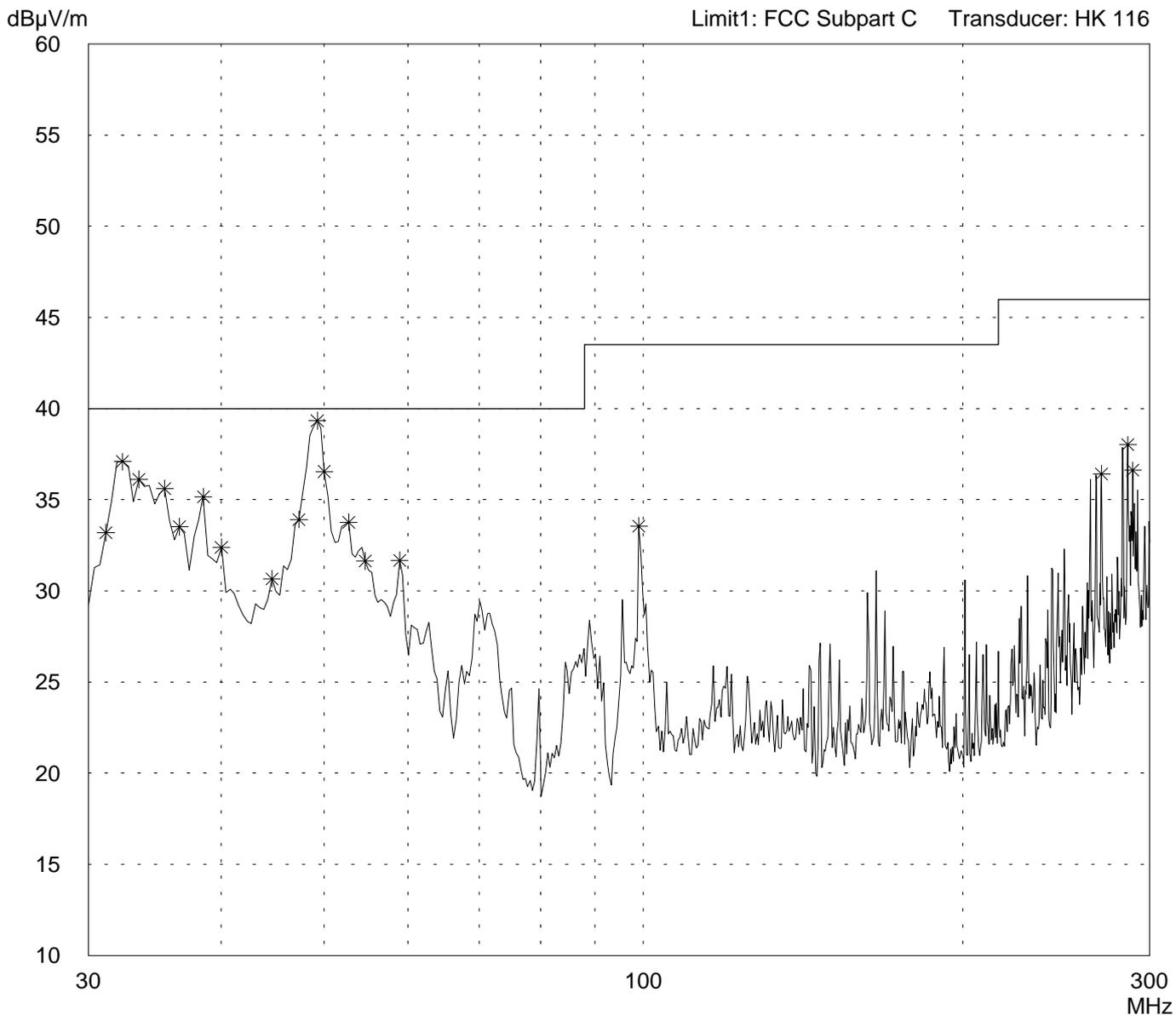
Radiated Emission Test 30 MHz - 300 MHz according to FCC Part 15 Subpart C

Model: WIMAN II	
Serial no.: ---	
Applicant: Altwater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 05/17/2000	Operator: J. Roidt
Test performed: automatically	File name:

Mode: with Procom Antenna Transmit Mode at Channel 01	
---	--

Detector: Peak

List of values: 10 dB Margin	50 Subranges
--	---------------------



Result: Prescan

Project file: 50118-00241-2	Page 68 of 122 Pages
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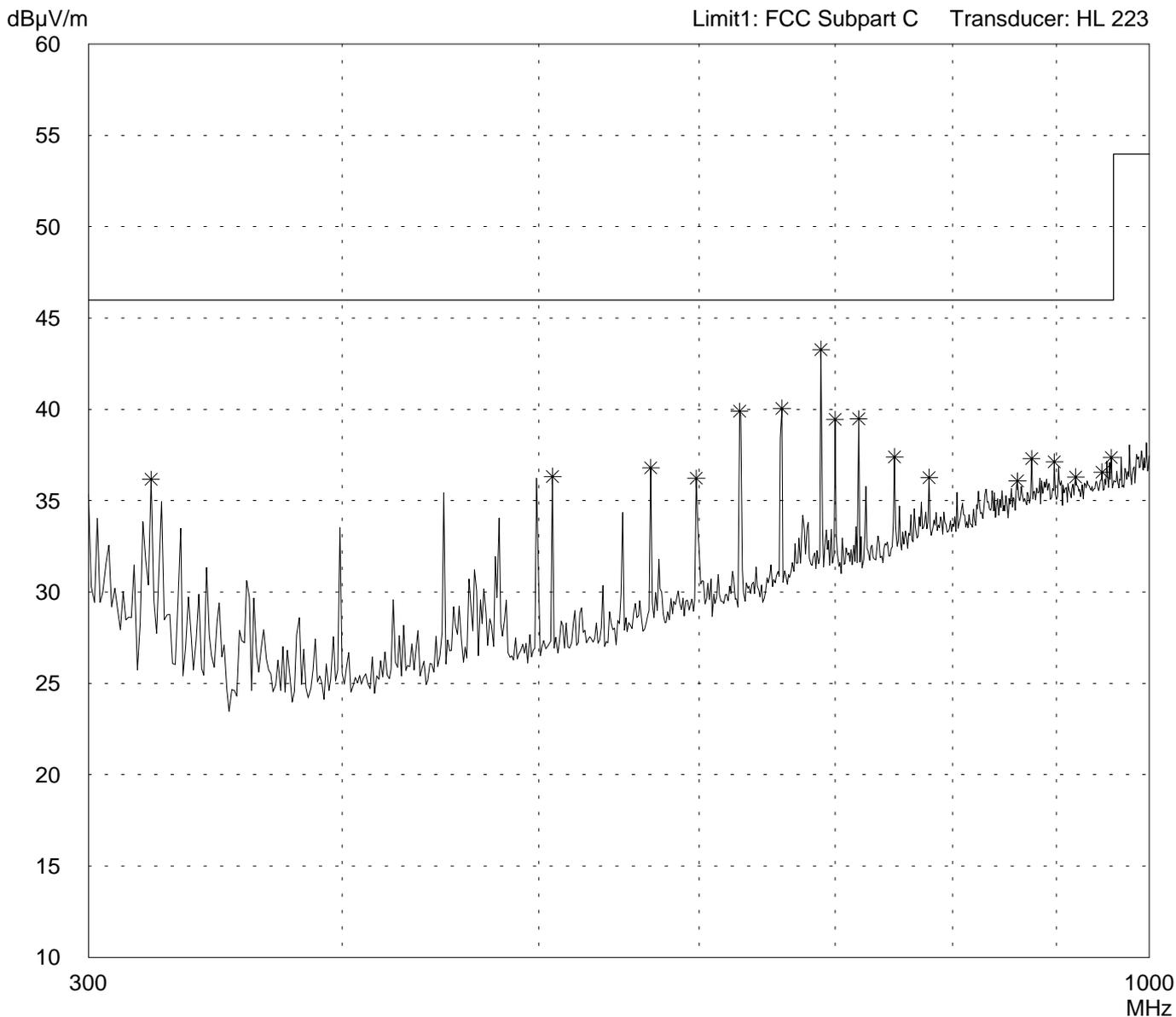
Radiated Emission Test 300 MHz - 1 GHz according to FCC Part 15 Subpart C

Model: WIMAN II	
Serial no.: ---	
Applicant: Altwater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 05/17/2000	Operator: J. Roidt
Test performed: automatically	File name:

Mode: with Procom Antenna Transmit Mode at Channel 01	
---	--

Detector: Peak

List of values: 10 dB Margin	50 Subranges
--	---------------------



Result: Prescan

Project file: 50118-00241-2	Page 69 of 122 Pages
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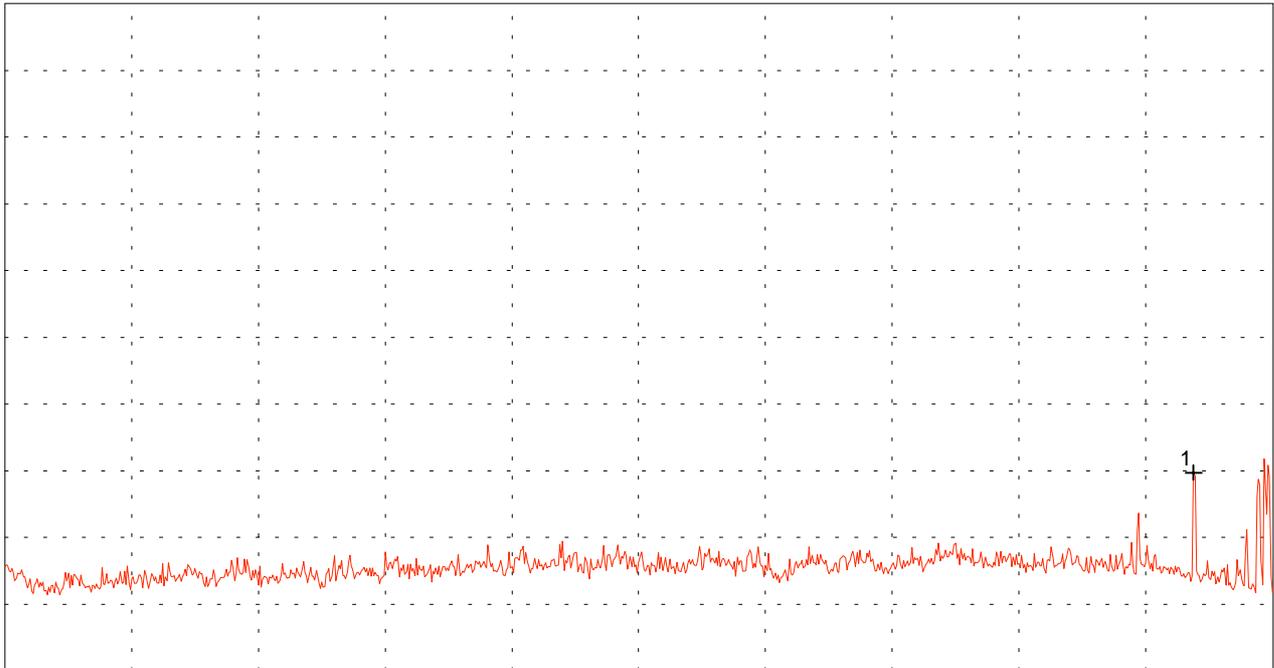
Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected
Serial No.: ---	- TX power setting 28 (Procom Antenna, 2 dBi)
Applicant: Altwater Airdata Systems GmbH & Co. KG	- Modulation 4FSK, default data pattern
	- Vertical Polarisation
	- Notch Filter for fundamental frequency

Ref.Level 50 dB μ V
5 dB/Div.

ATT 0 dB

Ref. Offset -30.5 dB



Start 1.000 GHz
RBW 1 MHz

VBW 1 MHz

Stop 2.500 GHz
SWP 20 ms

Multi Marker List		
No. 1	2.406667 GHz	14.86 dB μ V

Tested by: Johann Roidt
Date: May 29, 2000

Project-No.: 50118-00241-2
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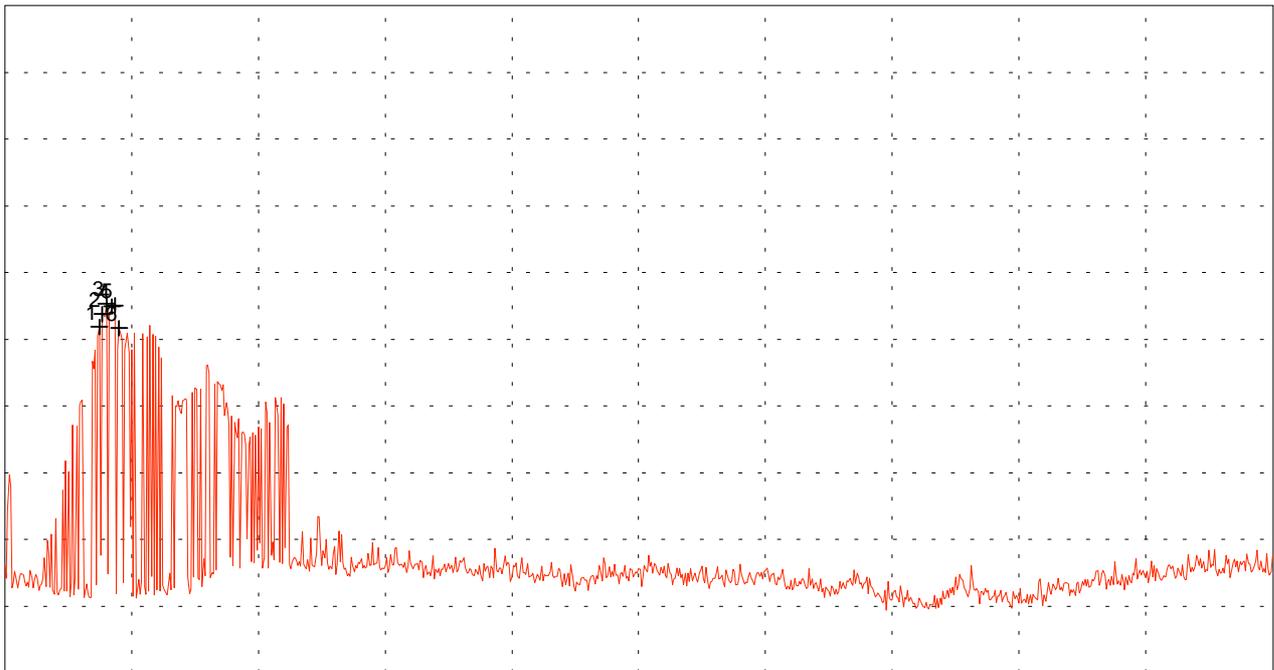
Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected
Serial No.: ---	- TX power setting 28 (Procom Antenna, 2 dBi)
Applicant: Altwater Airdata Systems GmbH & Co. KG	- Modulation 4FSK, default data pattern
	- Vertical Polarisation, Peak Detector
	- Notch Filter for fundamental frequency

Ref.Level 50 dB μ V
5 dB/Div.

ATT 0 dB

Ref. Offset -30.5 dB



Start 2.400 GHz
RBW 1 MHz

VBW 1 MHz

Stop 3.950 GHz
SWP 20 ms

Multi Marker List

No. 1	2.515389 GHz	25.93 dB μ V
No. 2	2.518833 GHz	26.88 dB μ V
No. 3	2.524000 GHz	27.66 dB μ V
No. 4	2.530889 GHz	27.46 dB μ V
No. 5	2.534333 GHz	27.54 dB μ V
No. 6	2.539500 GHz	25.83 dB μ V

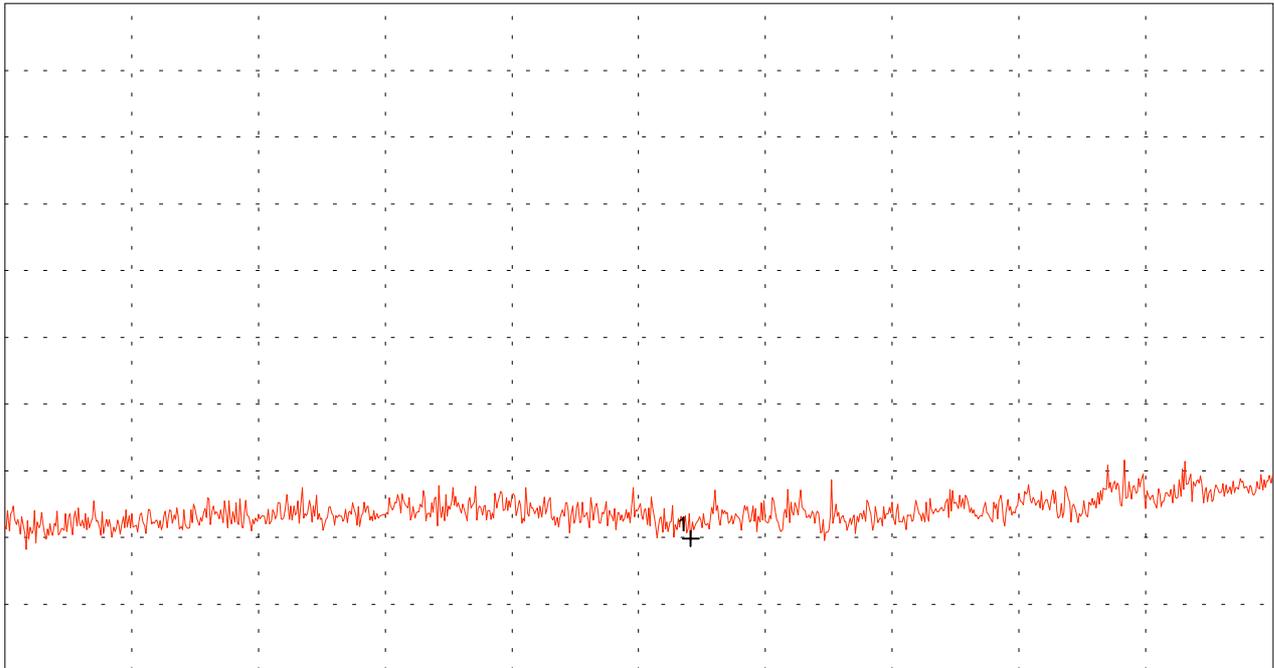
Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 71 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected
Serial No.: ---	- TX power setting 28 (Procom Antenna, 2 dBi)
Applicant: Altwater Airdata Systems GmbH & Co. KG	- Modulation 4FSK, default data pattern
	- Vertical Polarisation
	- Test Distance : 1 meter

Ref.Level 47 dB μ V
5 dB/Div.

ATT 0 dB



Start 18.000 GHz
RBW 300 kHz

VBW 300 kHz

Stop 25.000 GHz
SWP 240 ms

Multi Marker List

No. 1	21.787778 GHz	6.91 dB μ V
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Tested by: Johann Roidt
Date: May 30, 2000

Project-No.: 50118-00241-2
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Radiated Emission Test 30 MHz - 300 MHz according to FCC Part 15 Subpart C

Model:
WIMAN II

Serial no.:

Applicant:
Altwater Airdata Systems GmbH

Test site:
Semi anechoic room, cabin no. 3

Tested on:
**Test distance 3 meters
Horizontal Polarization**

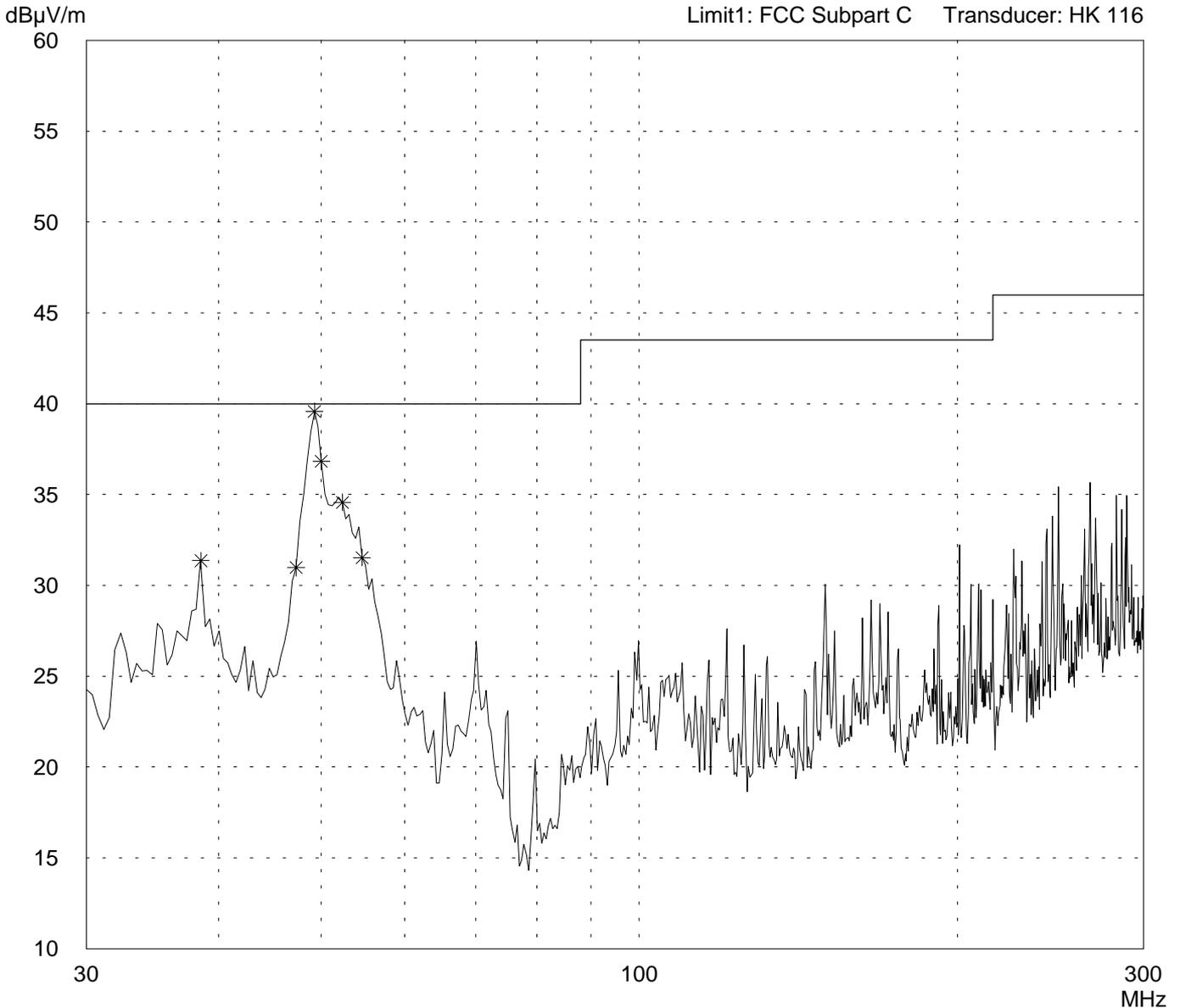
Date of test: **05/17/2000** Operator:
J. Roidt

Test performed: **automatically** File name:

Mode:
**with Procom Antenna
Transmit Mode at Channel 40**

Detector:
Peak

List of values:
10 dB Margin 50 Subranges



Result:
Prescan

Project file:
50118-00241-2 **Page 77 of 122 Pages**

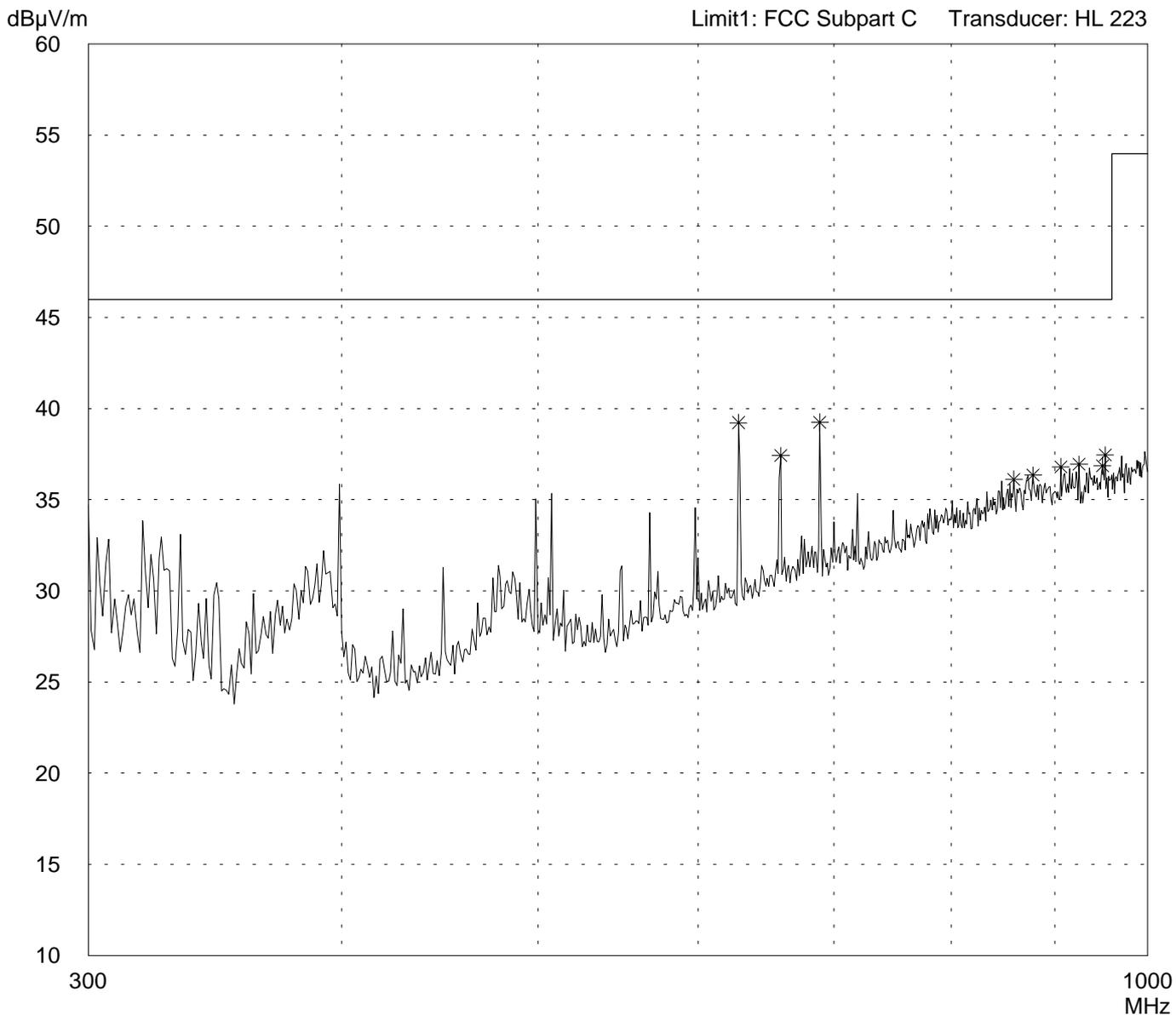
Radiated Emission Test 300 MHz - 1 GHz according to FCC Part 15 Subpart C

Model: WIMAN II	
Serial no.: ---	
Applicant: Altwater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Horizontal Polarization	
Date of test: 05/17/2000	Operator: J. Roidt
Test performed: automatically	File name:

Mode: with Procom Antenna Transmit Mode at Channel 40	
---	--

Detector: Peak

List of values: 10 dB Margin	50 Subranges
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Result: Prescan

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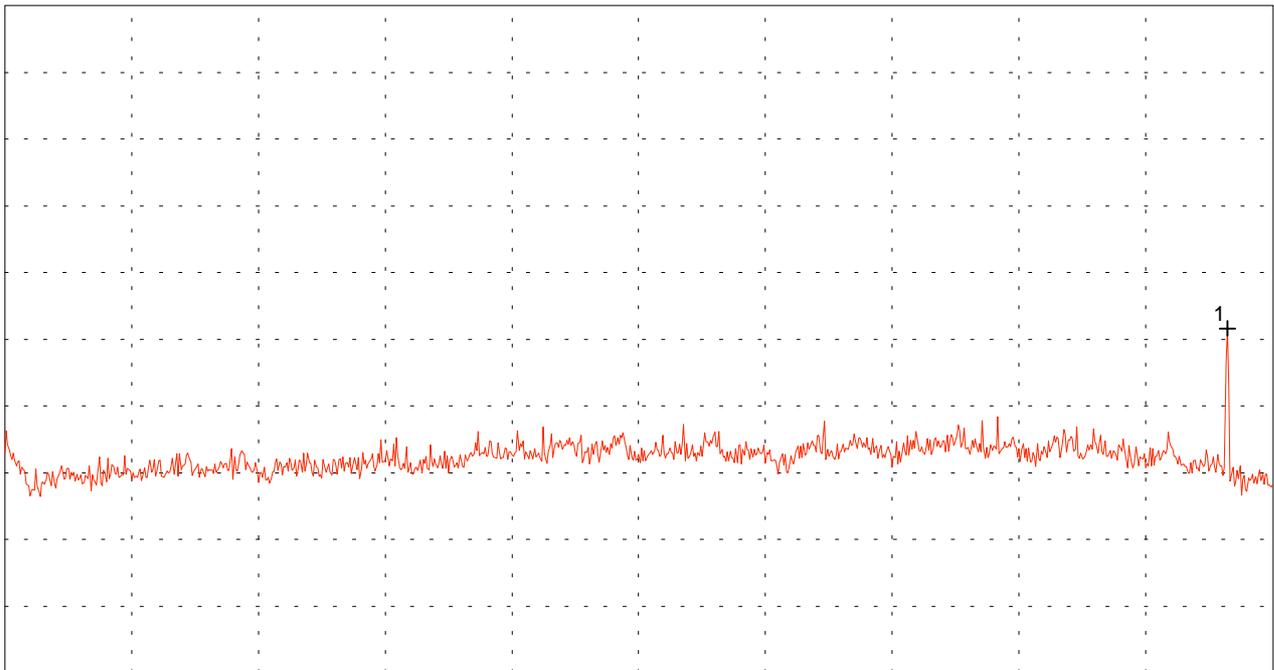
Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected
Serial No.: ---	- TX power setting 28 (Procom Antenna, 2 dBi)
Applicant: Altwater Airdata Systems GmbH & Co. KG	- Modulation 4FSK, default data pattern
	- Horizontal Polarisation, Peak Detector
	- Notch Filter for fundamental frequency

Ref.Level 40 dB μ V
5 dB/Div.

ATT 0 dB

Ref. Offset -30.5 dB



Start 1.000 GHz
RBW 1 MHz

VBW 1 MHz

Stop 2.500 GHz
SWP 20 ms

Multi Marker List		
No. 1	2.446667 GHz	15.82 dB μ V

Tested by: Johann Roidt
Date: May 29, 2000

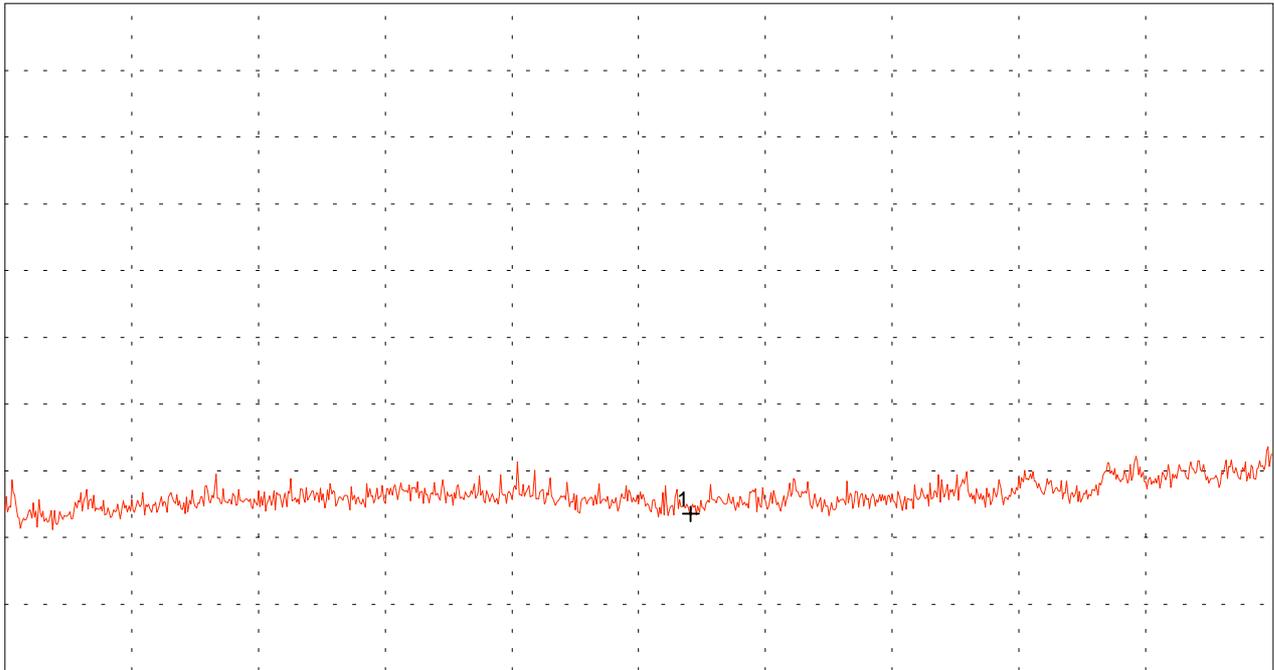
Project-No.: 50118-00241-2
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Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation - Test Distance : 1 meter
Serial No.: ---	
Applicant: Altwater Airdata Systems GmbH & Co. KG	

Ref.Level 47 dB μ V
5 dB/Div.

ATT 0 dB



Start 18.000 GHz
RBW 300 kHz

VBW 300 kHz

Stop 25.000 GHz
SWP 240 ms

Multi Marker List

No. 1	21.787778 GHz	8.77 dB μ V
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Tested by: Johann Roidt
Date: May 30, 2000

Project-No.: 50118-00241-2
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Radiated Emission Test 30 MHz - 300 MHz according to FCC Part 15 Subpart C

Model:
WIMAN II

Serial no.:

Applicant:
Altwater Airdata Systems GmbH

Test site:
Semi anechoic room, cabin no. 3

Tested on:
**Test distance 3 meters
Vertical Polarization**

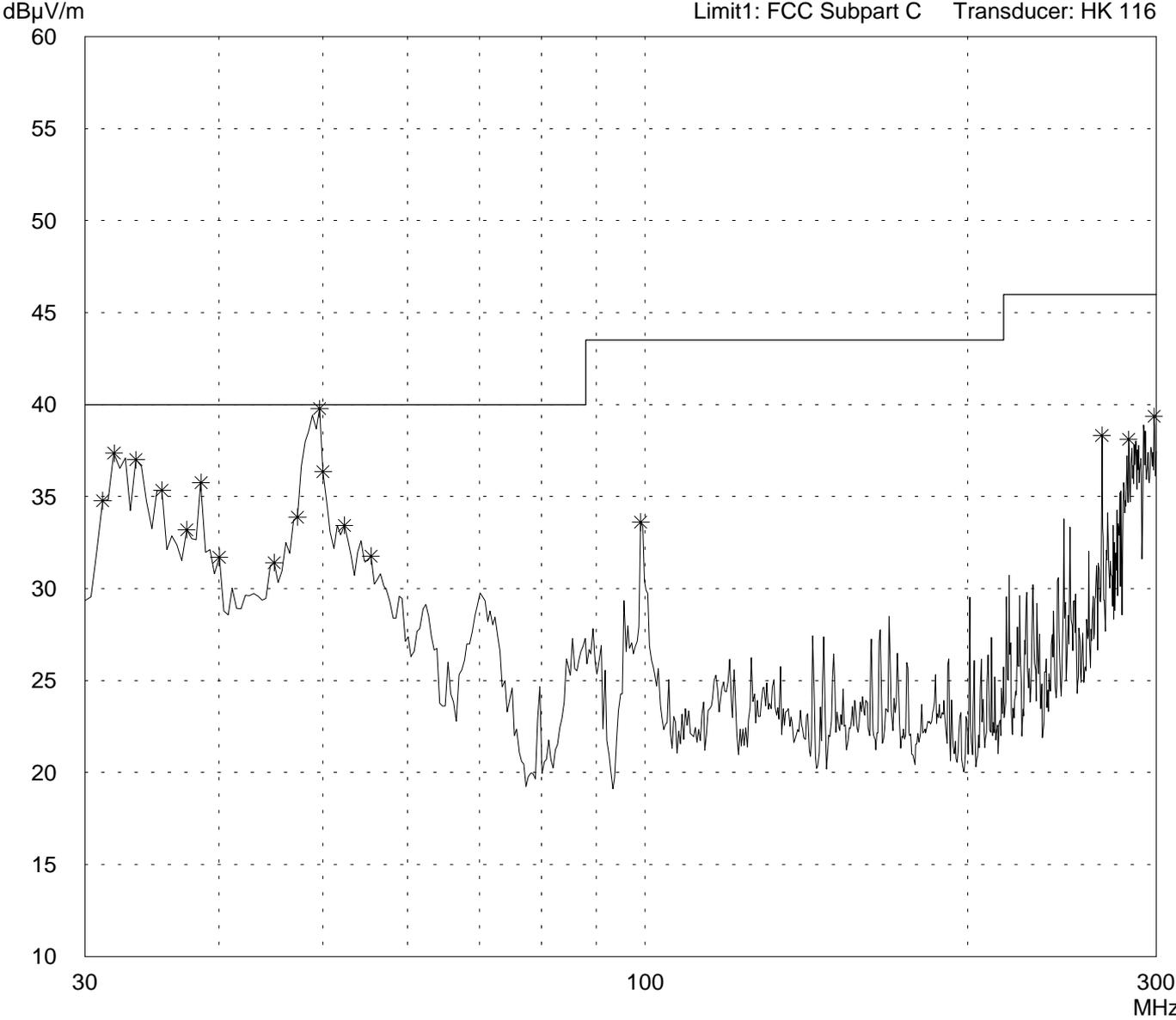
Date of test: **05/17/2000** Operator: **J. Roidt**

Test performed: **automatically** File name:

Mode:
**with Procom Antenna
Transmit Mode at Channel 40**

Detector:
Peak

List of values:
10 dB Margin 50 Subranges



Result:
Prescan

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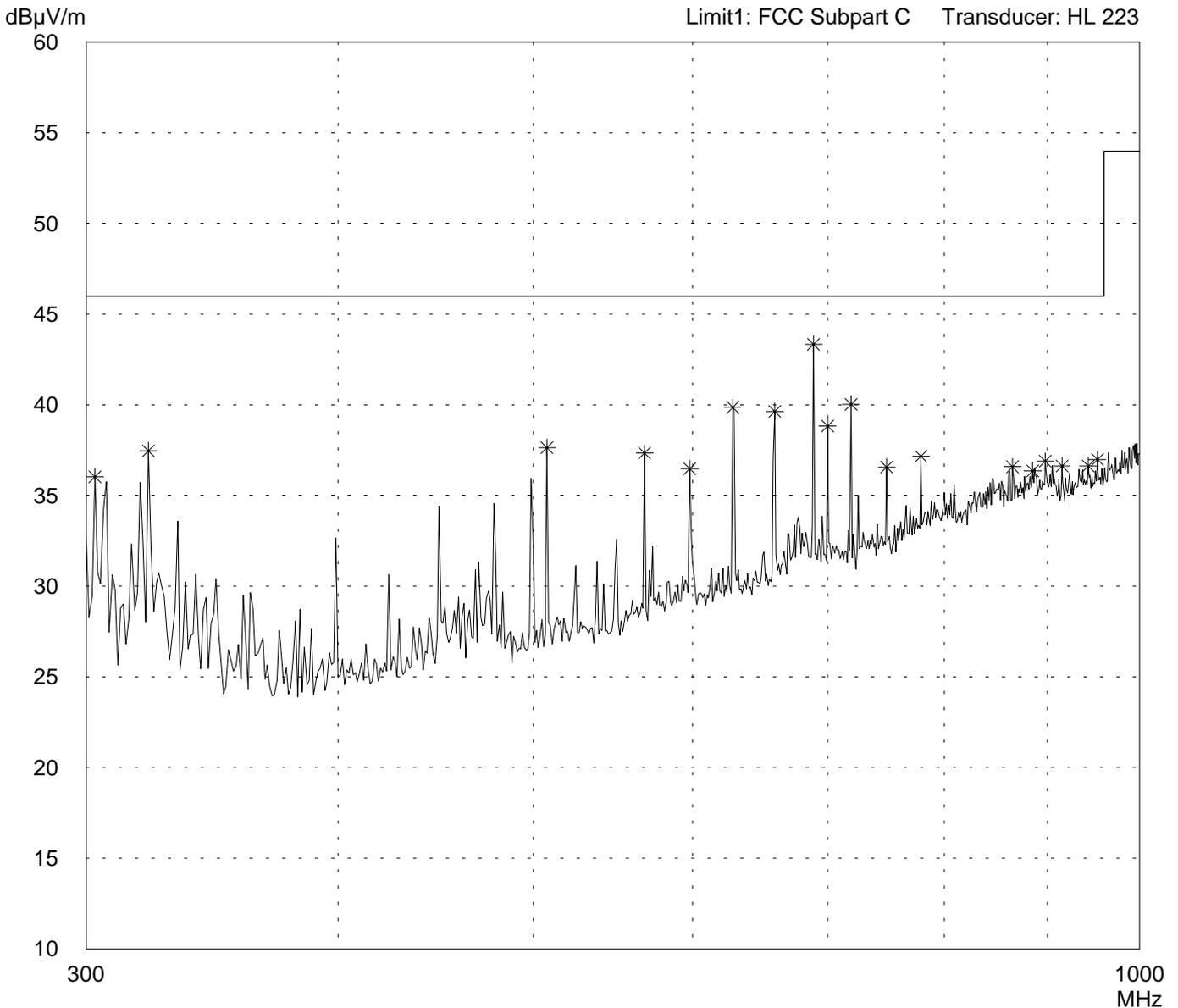
Radiated Emission Test 300 MHz - 1 GHz according to FCC Part 15 Subpart C

Model: WIMAN II	
Serial no.: ---	
Applicant: Altwater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 05/17/2000	Operator: J. Roidt
Test performed: automatically	File name:

Mode: with Procom Antenna Transmit Mode at Channel 40	
---	--

Detector: Peak

List of values: 10 dB Margin	50 Subranges
--	---------------------



Result: Prescan

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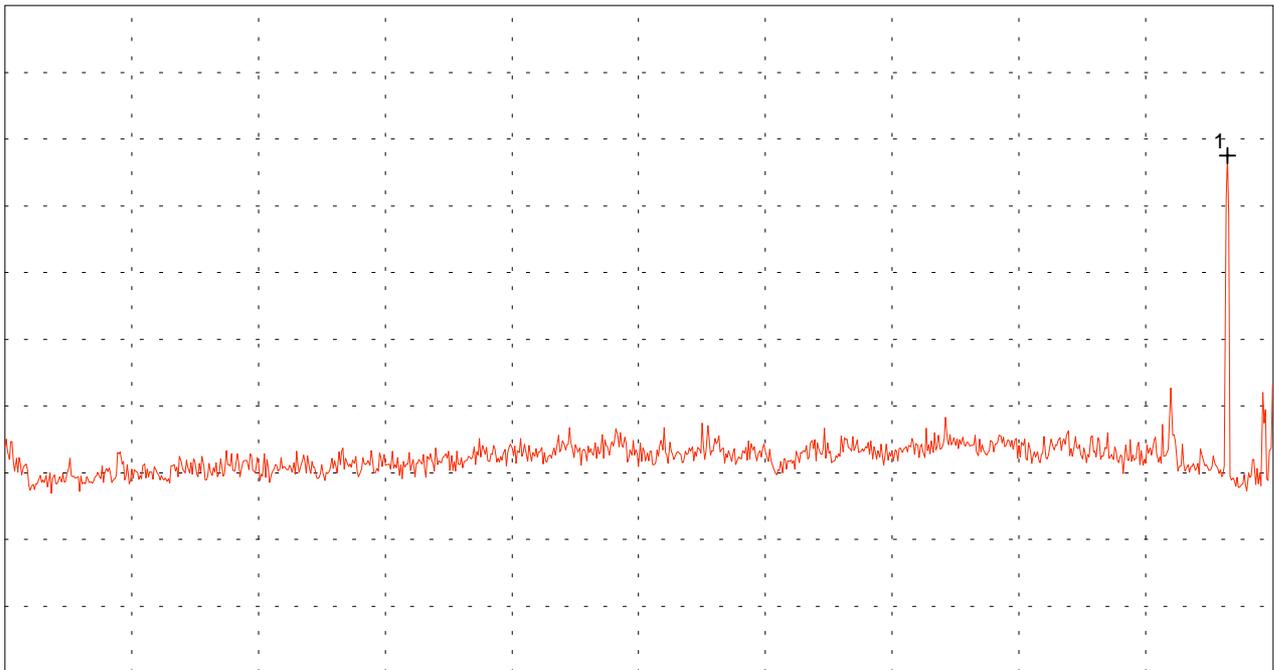
Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected
Serial No.: ---	- TX power setting 28 (Procom Antenna, 2 dBi)
Applicant: Altwater Airdata Systems GmbH & Co. KG	- Modulation 4FSK, default data pattern
	- Vertical Polarisation, Peak Detector
	- Notch Filter for fundamental frequency

Ref.Level 40 dB μ V
5 dB/Div.

ATT 0 dB

Ref. Offset -30.5 dB



Start 1.000 GHz
RBW 1 MHz

VBW 1 MHz

Stop 2.500 GHz
SWP 20 ms

Multi Marker List		
No. 1	2.446667 GHz	28.76 dB μ V

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 88 of 122 Pages

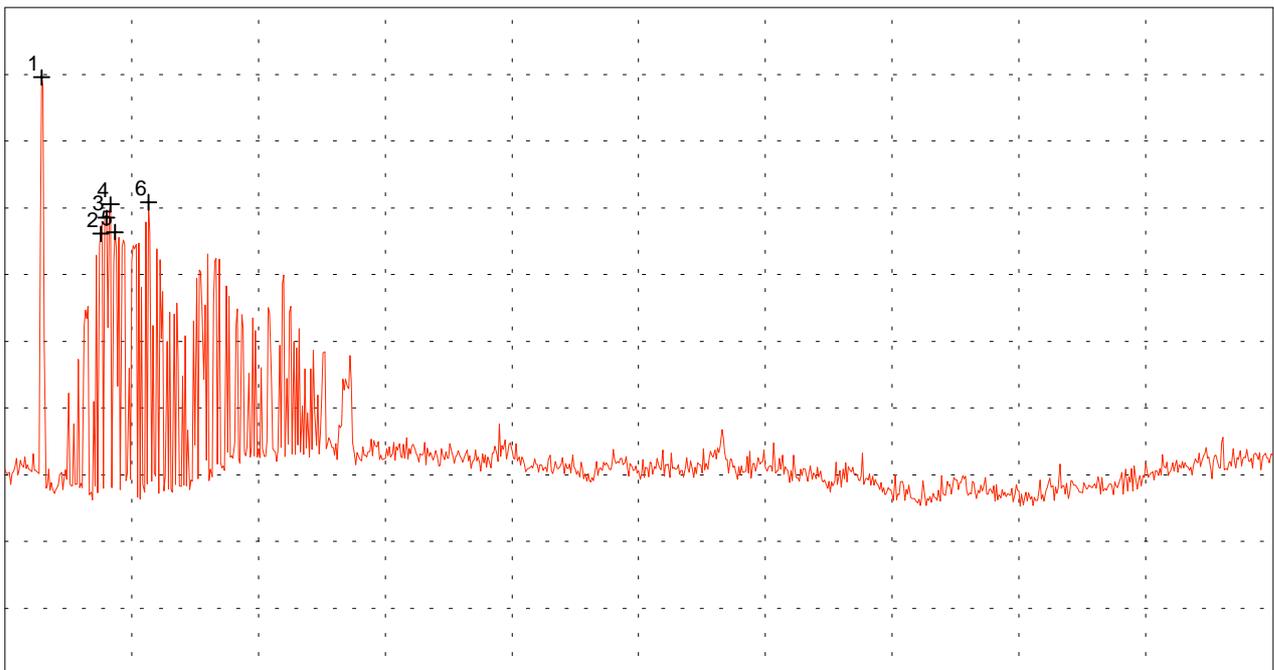
Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected
Serial No.: ---	- TX power setting 28 (Procom Antenna, 2 dBi)
Applicant: Altwater Airdata Systems GmbH & Co. KG	- Modulation 4FSK, default data pattern
	- Vertical Polarisation, Peak Detector
	- Notch Filter for fundamental frequency

Ref.Level 40 dB μ V
5 dB/Div.

ATT 0 dB

Ref. Offset -30.5 dB



Start 2.400 GHz
RBW 1 MHz

VBW 1 MHz

Stop 3.950 GHz
SWP 20 ms

Multi Marker List

No. 1	2.444778 GHz	34.77 dB μ V
No. 2	2.517111 GHz	23.05 dB μ V
No. 3	2.524000 GHz	24.26 dB μ V
No. 4	2.529167 GHz	25.26 dB μ V
No. 5	2.534333 GHz	23.18 dB μ V
No. 6	2.575667 GHz	25.42 dB μ V

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 89 of 122 Pages

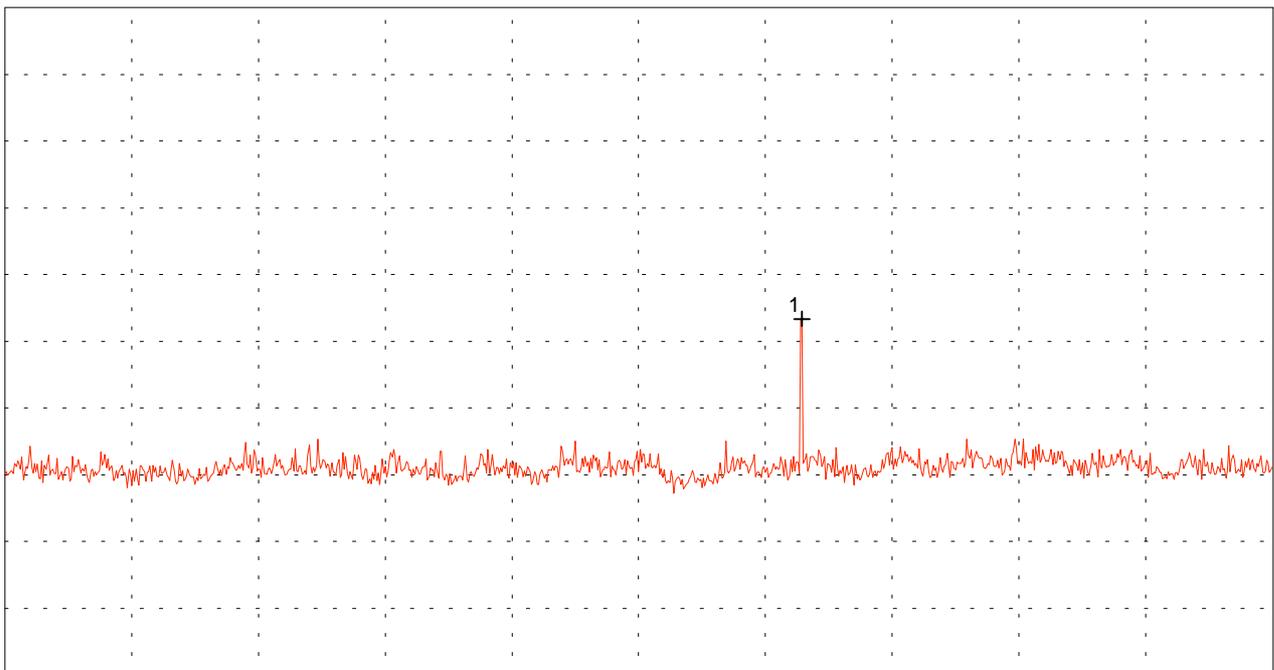
Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected
Serial No.: ---	- TX power setting 28 (Procom Antenna, 2 dBi)
Applicant: Altwater Airdata Systems GmbH & Co. KG	- Modulation 4FSK, default data pattern
	- Vertical Polarisation, Peak Detector

Ref.Level 40 dB μ V
5 dB/Div.

ATT 0 dB

Ref. Offset -30.5 dB



Start 5.850 GHz
RBW 1 MHz

VBW 1 MHz

Stop 8.200 GHz
SWP 20 ms

Multi Marker List		
No. 1	7.327889 GHz	16.67 dB μ V

Tested by: Johann Roidt
Date: May 29, 2000

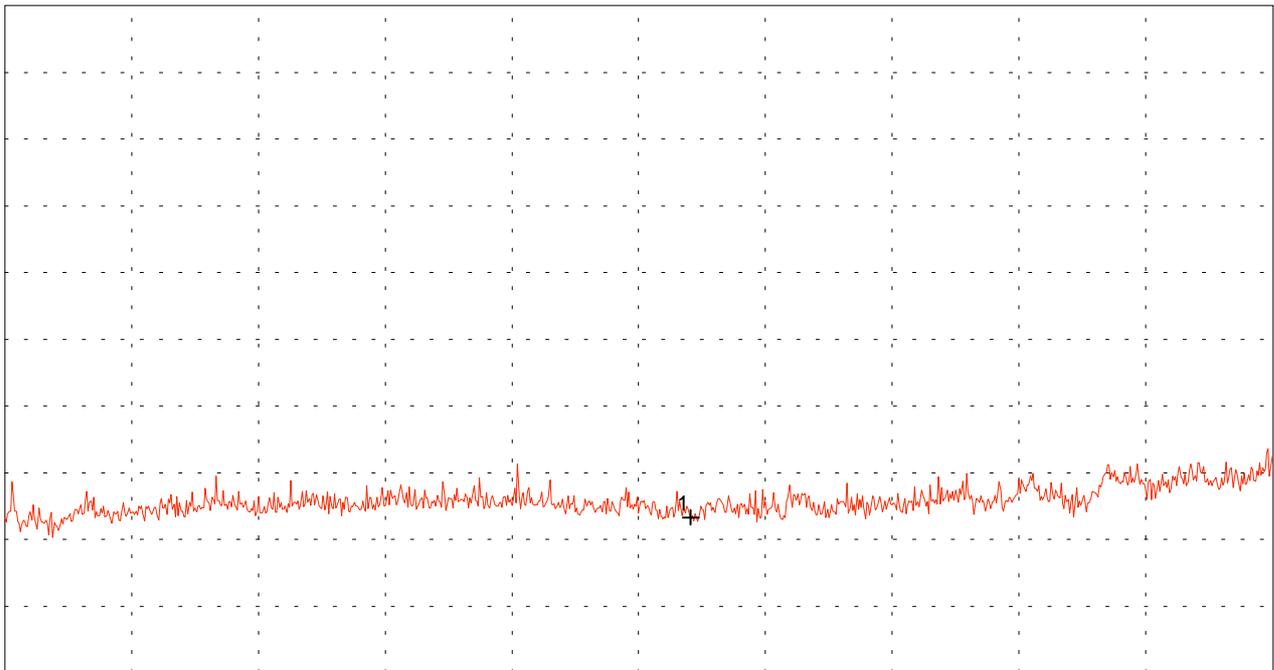
Project-No.: 50118-00241-2
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Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation - Test Distance : 1 meter
Serial No.: ---	
Applicant: Altwater Airdata Systems GmbH & Co. KG	

Ref.Level 47 dB μ V
5 dB/Div.

ATT 0 dB



Start 18.000 GHz
RBW 300 kHz

VBW 300 kHz

Stop 25.000 GHz
SWP 240 ms

Multi Marker List			
No. 1	21.787778 GHz	8.66 dB μ V	

Tested by: Johann Roidt
Date: May 30, 2000

Project-No.: 50118-00241-2
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Radiated Emission Test 30 MHz - 300 MHz according to FCC Part 15 Subpart C

Model:
WIMAN II

Serial no.:

Applicant:
Altwater Airdata Systems GmbH

Test site:
Semi anechoic room, cabin no. 3

Tested on:
**Test distance 3 meters
Horizontal Polarization**

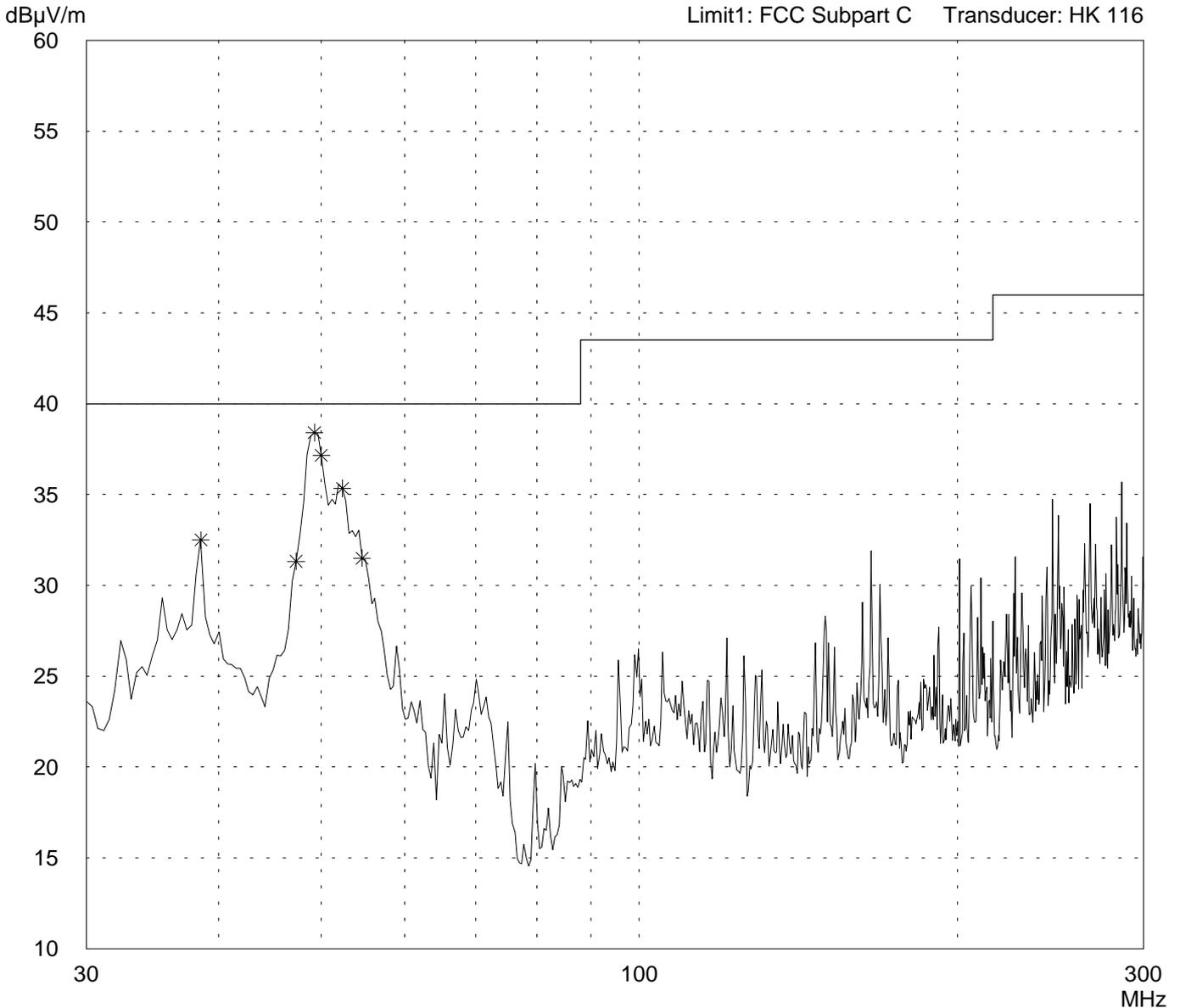
Date of test: **05/17/2000** Operator: **J. Roidt**

Test performed: **automatically** File name:

Mode:
**with Procom Antenna
Transmit Mode at Channel 40**

Detector:
Peak

List of values:
10 dB Margin 50 Subranges



Result:
Prescan

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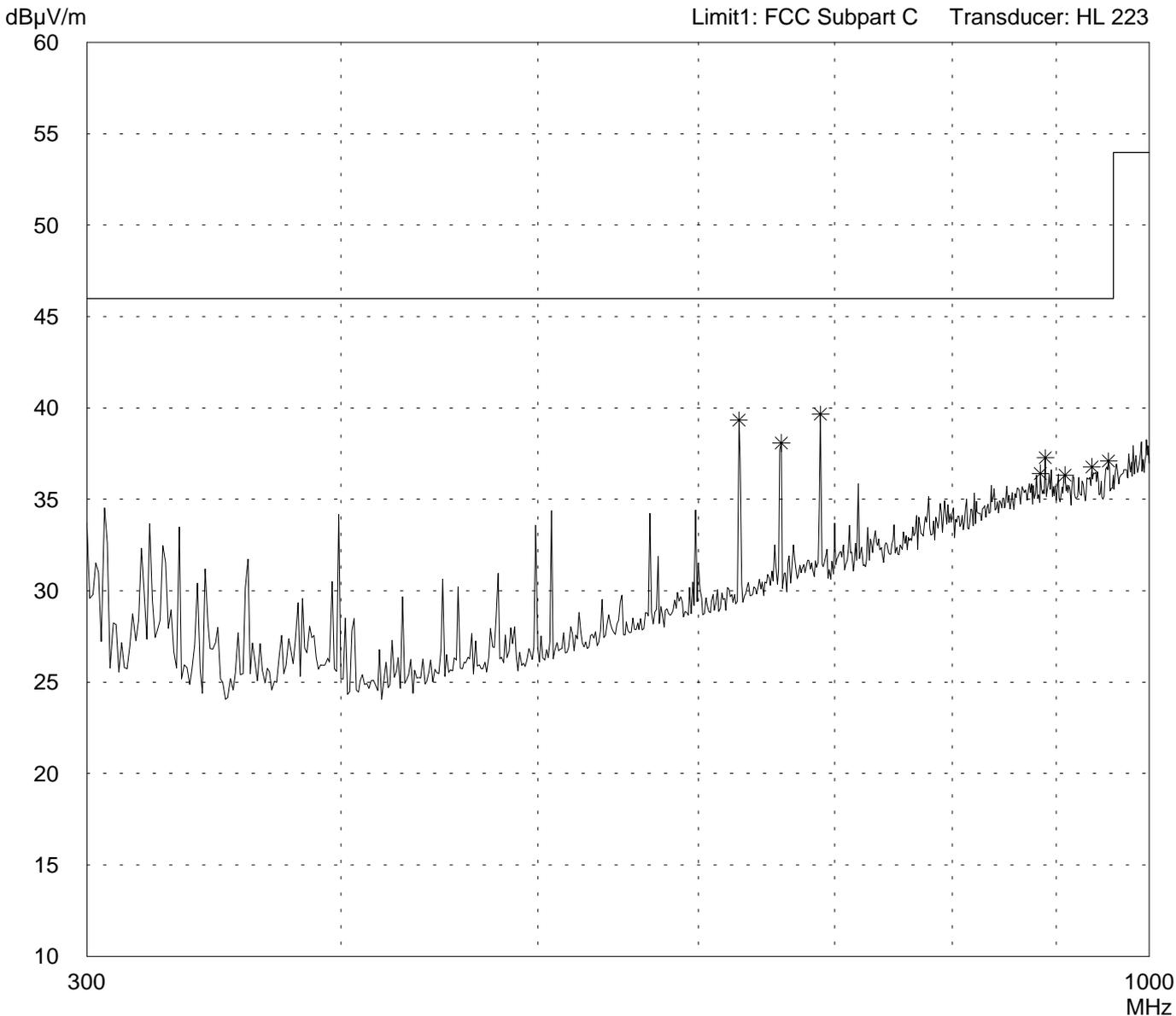
Radiated Emission Test 300 MHz - 1 GHz according to FCC Part 15 Subpart C

Model: WIMAN II	
Serial no.: ---	
Applicant: Altwater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Horizontal Polarization	
Date of test: 05/17/2000	Operator: J. Roidt
Test performed: automatically	File name:

Mode: with Procom Antenna Transmit Mode at Channel 40	
---	--

Detector: Peak

List of values: 10 dB Margin	50 Subranges
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Result: Prescan

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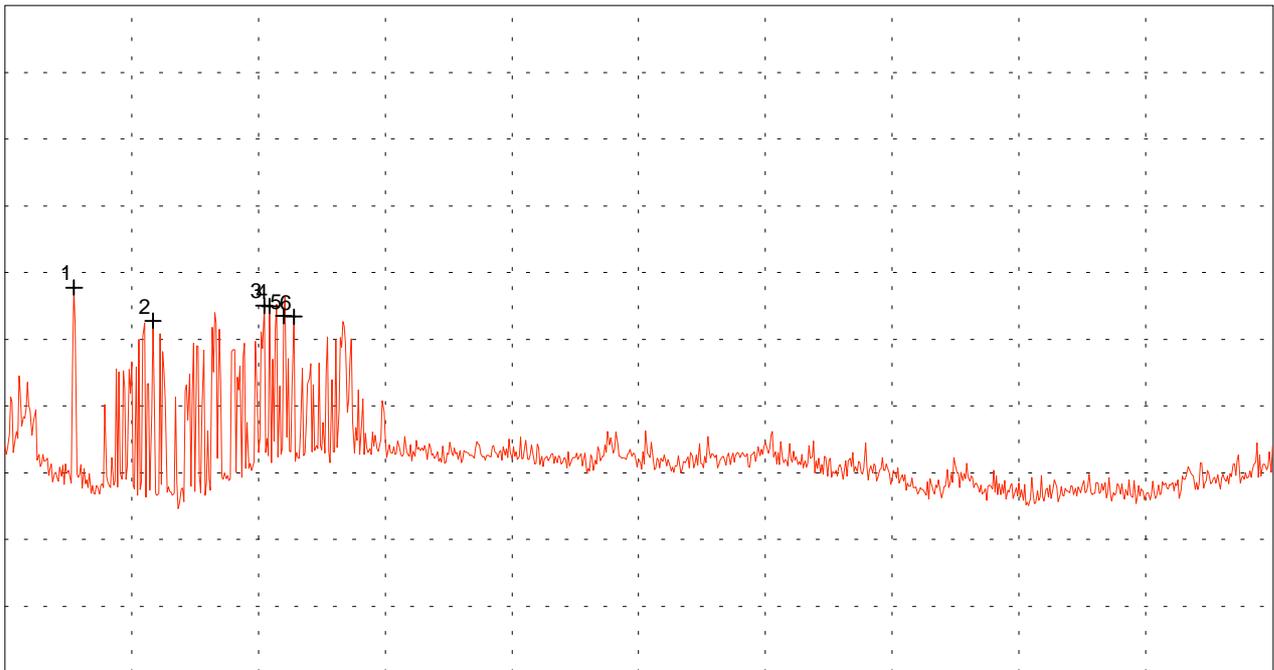
Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected
Serial No.: ---	- TX power setting 28 (Procom Antenna, 2 dBi)
Applicant: Altwater Airdata Systems GmbH & Co. KG	- Modulation 4FSK, default data pattern
	- Vertical Polarisation, Peak Detector
	- Notch Filter for fundamental frequency

Ref.Level 40 dB μ V
5 dB/Div.

ATT 0 dB

Ref. Offset -30.5 dB



Start 2.400 GHz
RBW 1 MHz

VBW 1 MHz

Stop 3.950 GHz
SWP 20 ms

Multi Marker List		
No. 1	2.484389 GHz	18.88 dB μ V
No. 2	2.580833 GHz	16.39 dB μ V
No. 3	2.716889 GHz	17.51 dB μ V
No. 4	2.723778 GHz	17.49 dB μ V
No. 5	2.741000 GHz	16.74 dB μ V
No. 6	2.753056 GHz	16.69 dB μ V

Tested by: Johann Roidt
Date: May 29, 2000

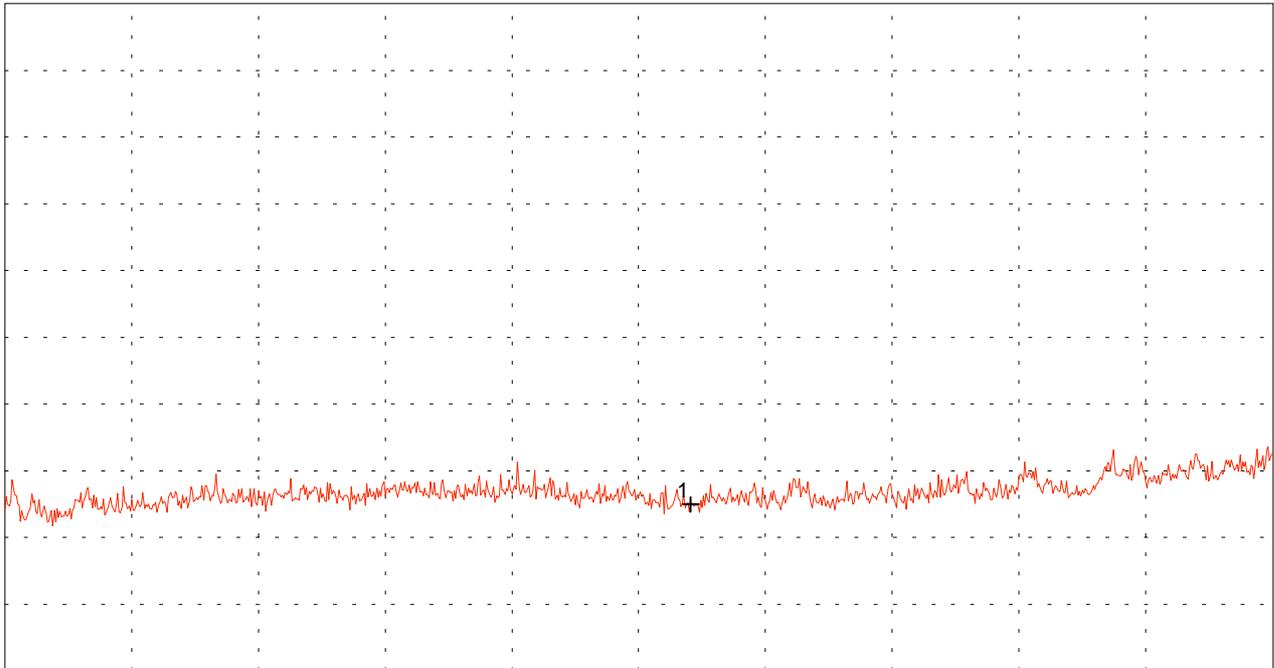
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Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation - Test Distance : 1 meter
Serial No.: ---	
Applicant: Altwater Airdata Systems GmbH & Co. KG	

Ref.Level 47 dB μ V
5 dB/Div.

ATT 0 dB



Start 18.000 GHz
RBW 300 kHz

VBW 300 kHz

Stop 25.000 GHz
SWP 240 ms

Multi Marker List		
No. 1	21.787778 GHz	9.47 dB μ V

Tested by: Johann Roidt
Date: May 30, 2000

Project-No.: 50118-00241-2
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Radiated Emission Test 30 MHz - 300 MHz according to FCC Part 15 Subpart C

Model:
WIMAN II

Serial no.:

Applicant:
Altwater Airdata Systems GmbH

Test site:
Semi anechoic room, cabin no. 3

Tested on:
**Test distance 3 meters
Vertical Polarization**

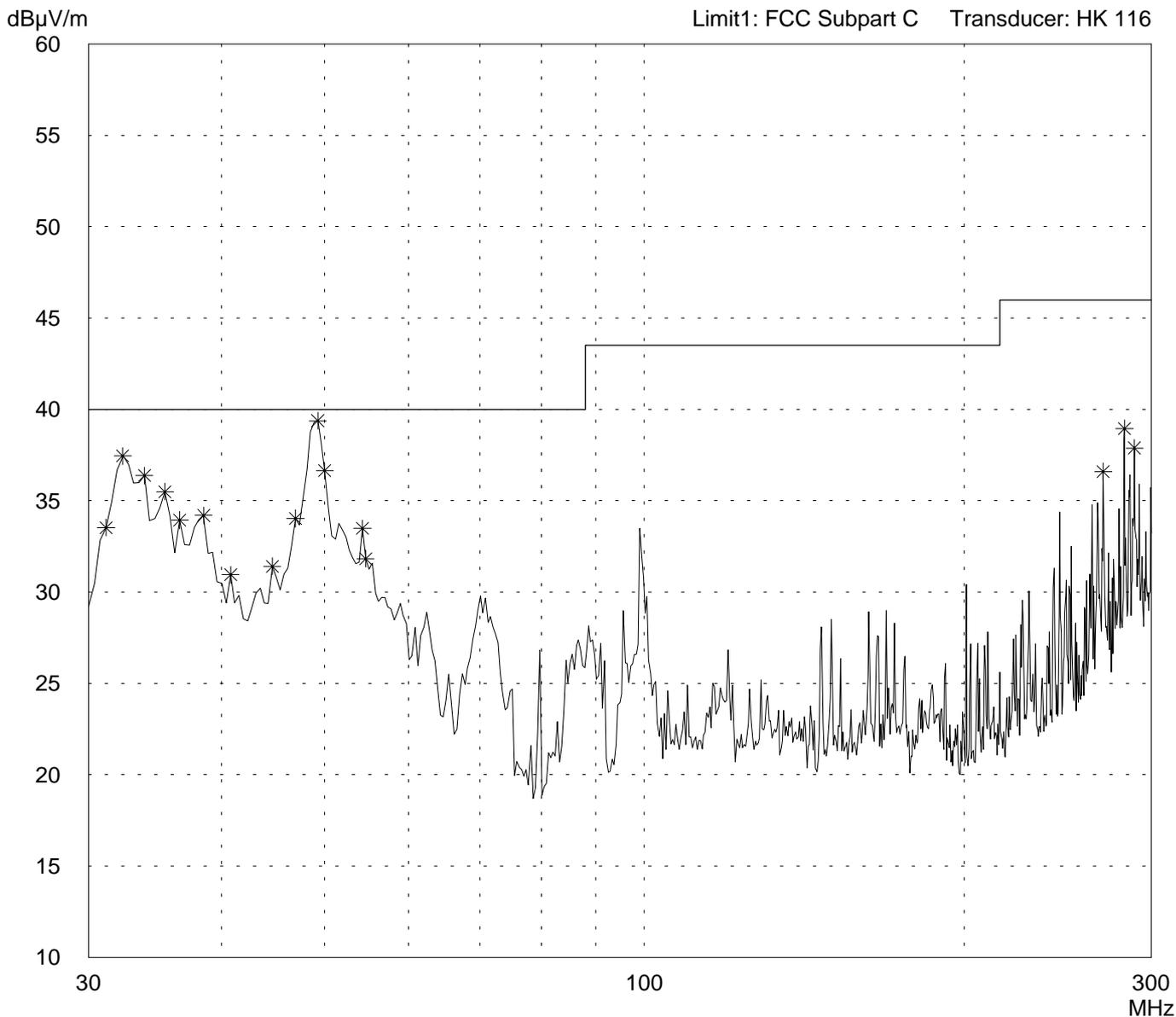
Date of test: **05/17/2000** Operator:
J. Roidt

Test performed: **automatically** File name:

Mode:
**with Procom Antenna
Transmit Mode at Channel 40**

Detector:
Peak

List of values:
10 dB Margin 50 Subranges



Result:
Prescan

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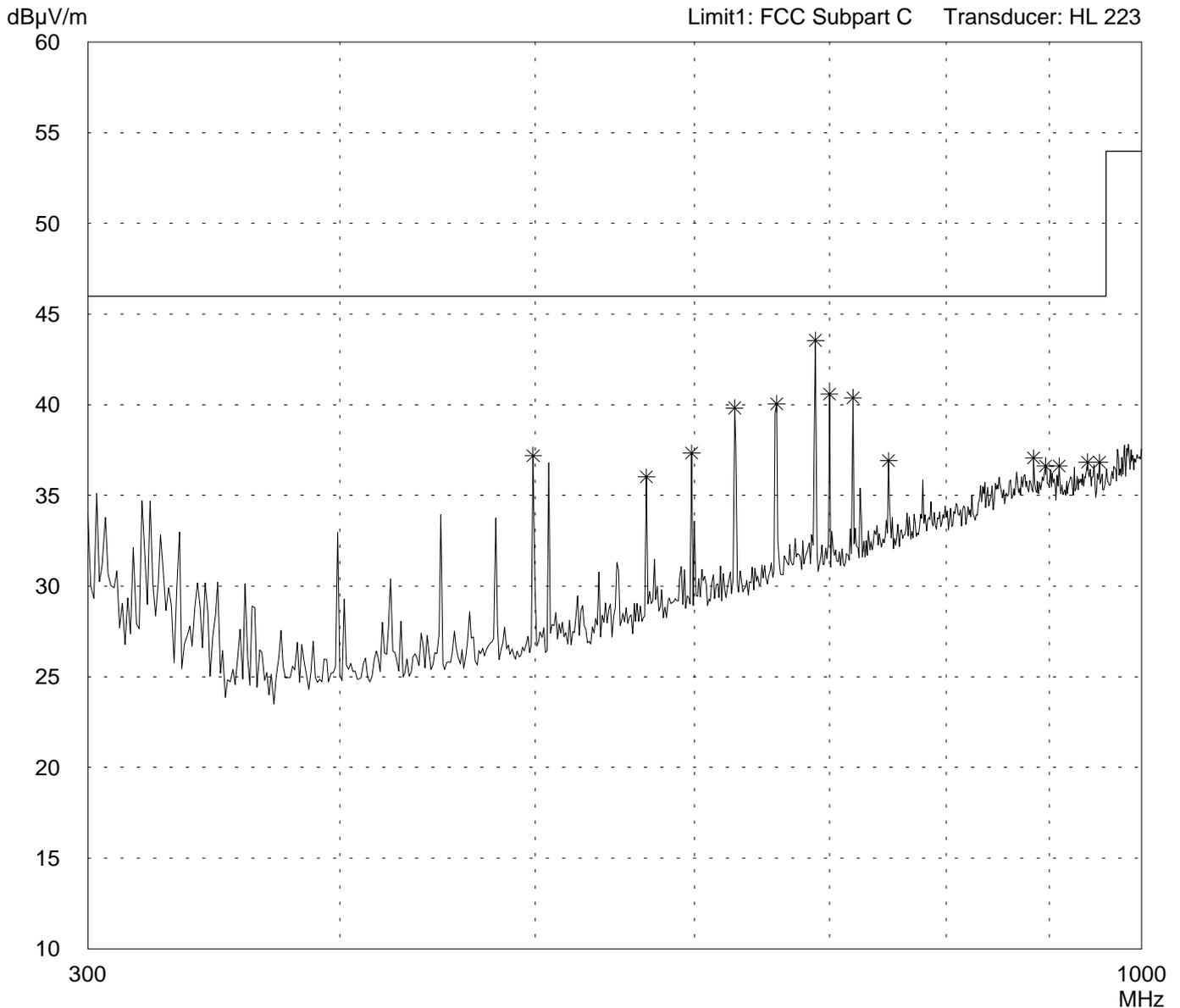
Radiated Emission Test 300 MHz - 1 GHz according to FCC Part 15 Subpart C

Model: WIMAN II	
Serial no.: ---	
Applicant: Altwater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 05/17/2000	Operator: J. Roidt
Test performed: automatically	File name:

Mode: with Procom Antenna Transmit Mode at Channel 40	
---	--

Detector: Peak

List of values: 10 dB Margin	50 Subranges
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Result: Prescan

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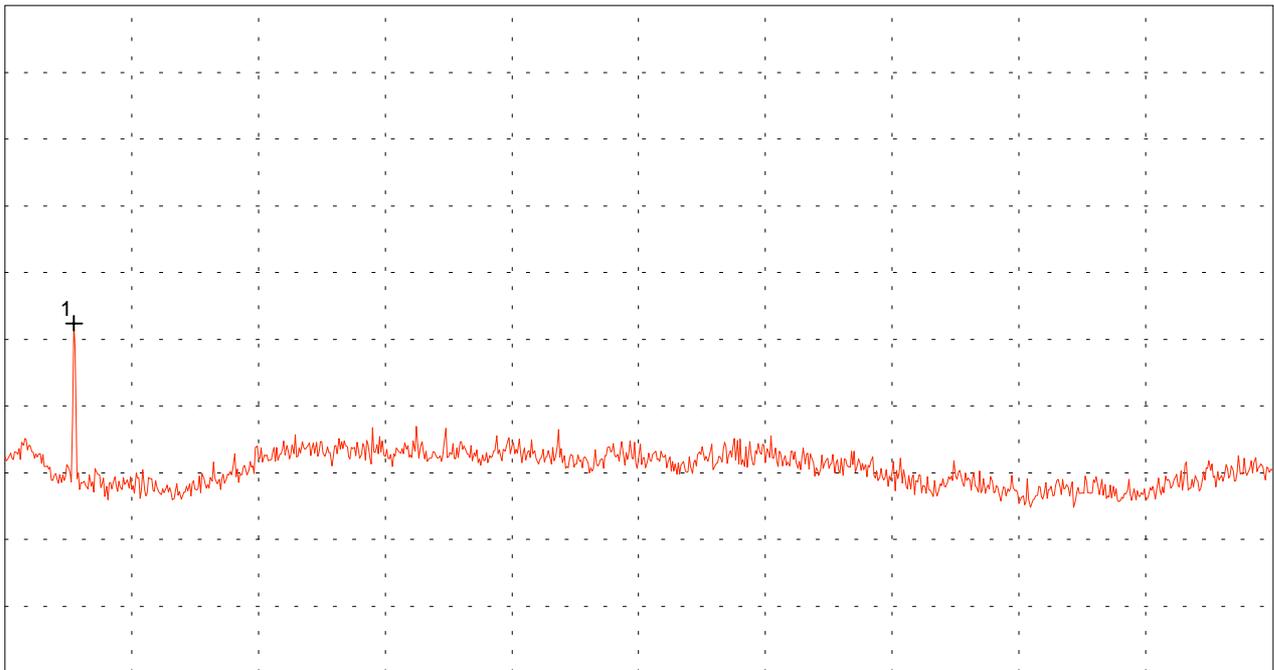
Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected
Serial No.: ---	- TX power setting 28 (Procom Antenna, 2 dBi)
Applicant: Altwater Airdata Systems GmbH & Co. KG	- Modulation 4FSK, default data pattern
	- Horizontal Polarisation, Peak Detector
	- Notch Filter for fundamental frequency

Ref.Level 40 dB μ V
5 dB/Div.

ATT 0 dB

Ref. Offset -30.5 dB



Start 2.400 GHz
RBW 1 MHz

VBW 1 MHz

Stop 3.950 GHz
SWP 20 ms

Multi Marker List		
No. 1	2.484389 GHz	16.19 dB μ V

Tested by: Johann Roidt
Date: May 29, 2000

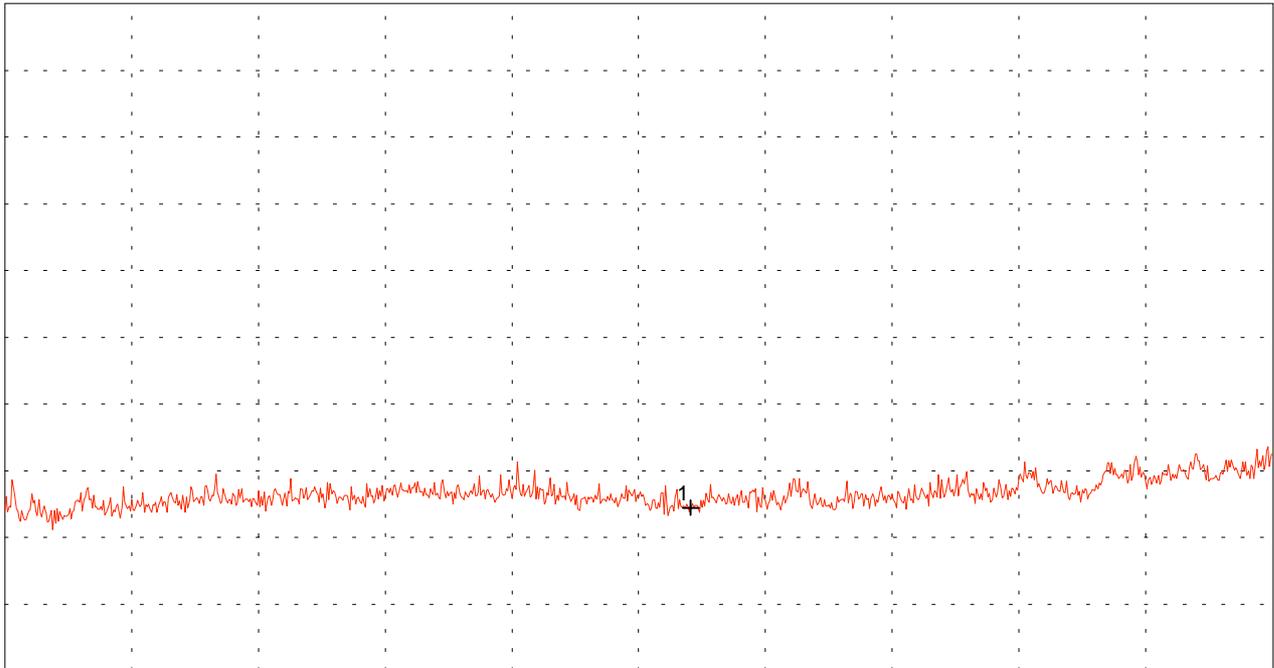
Project-No.: 50118-00241-2
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Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation - Test Distance : 1 meter
Serial No.: ---	
Applicant: Altwater Airdata Systems GmbH & Co. KG	

Ref.Level 47 dB μ V
5 dB/Div.

ATT 0 dB



Start 18.000 GHz
RBW 300 kHz

VBW 300 kHz

Stop 25.000 GHz
SWP 240 ms

Multi Marker List			
No. 1	21.787778 GHz	9.22 dB μ V	

Tested by: Johann Roidt
Date: May 30, 2000

Project-No.: 50118-00241-2
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Radiated Emission Test 30 MHz - 300 MHz according to FCC Part 15 Subpart C

Model:
WIMAN II

Serial no.:

Applicant:
Altwater Airdata Systems GmbH

Test site:
Semi anechoic room, cabin no. 3

Tested on:
**Test distance 3 meters
Horizontal Polarization**

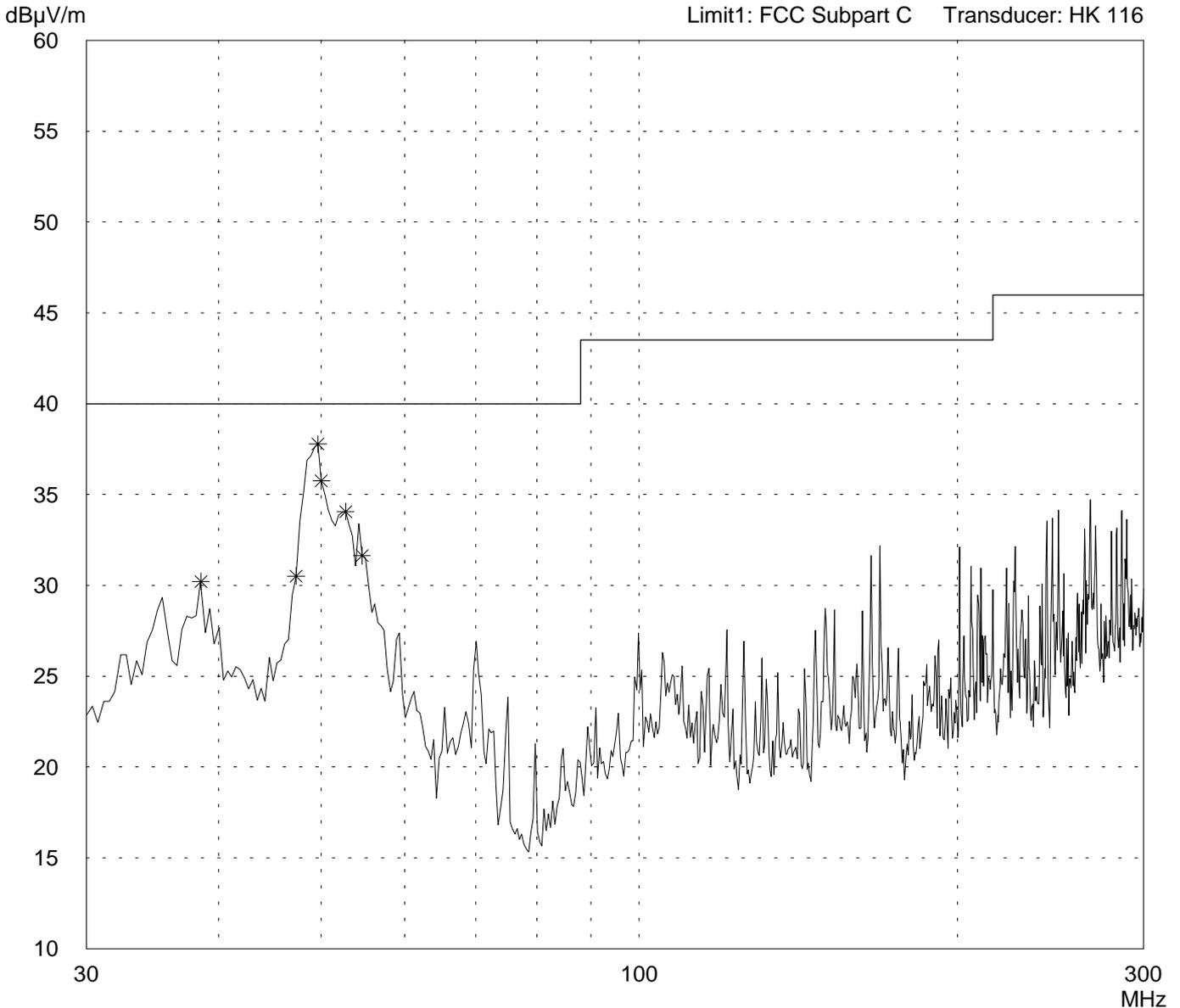
Date of test: **05/17/2000** Operator: **J. Roidt**

Test performed: **automatically** File name:

Mode:
**with Procom Antenna
Receive Mode at Channel 40**

Detector:
Peak

List of values:
10 dB Margin 50 Subranges



Result:
Prescan

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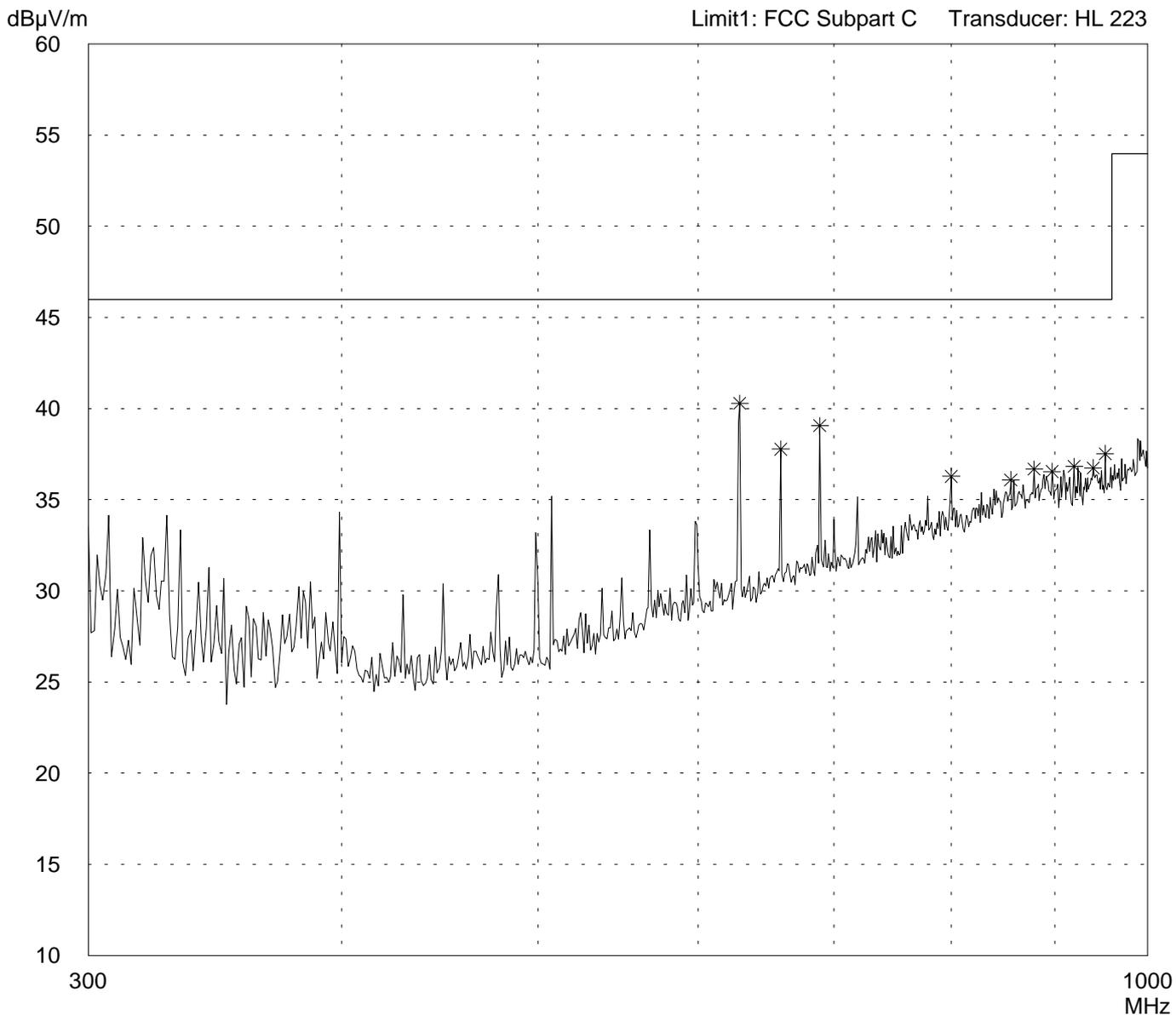
Radiated Emission Test 300 MHz - 1 GHz according to FCC Part 15 Subpart C

Model: WIMAN II	
Serial no.: ---	
Applicant: Altwater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Horizontal Polarization	
Date of test: 05/17/2000	Operator: J. Roidt
Test performed: automatically	File name:

Mode: with Procom Antenna Receive Mode at Channel 40	
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Detector: Peak

List of values: 10 dB Margin	50 Subranges
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Result: Prescan

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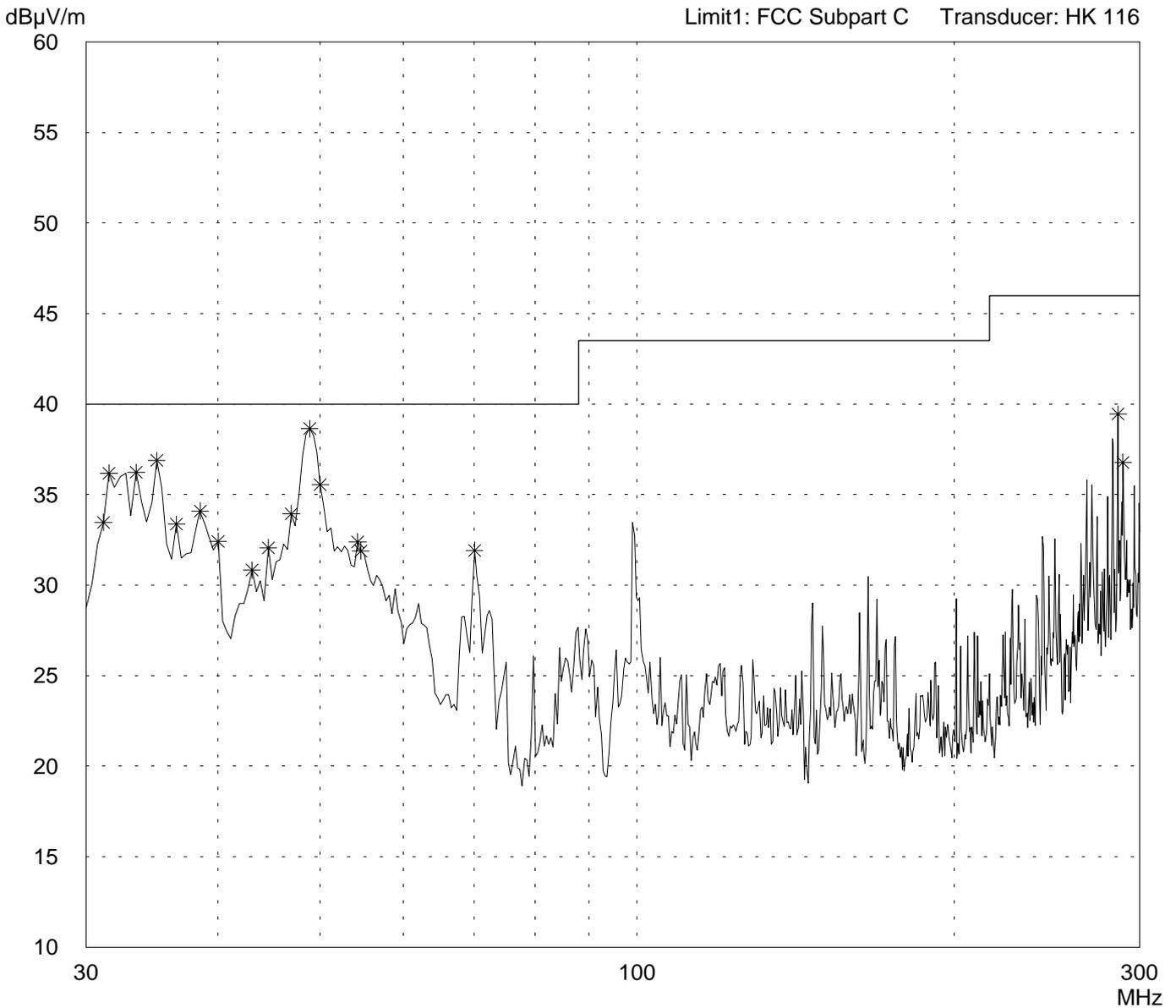
Radiated Emission Test 30 MHz - 300 MHz according to FCC Part 15 Subpart C

Model: WIMAN II	
Serial no.: ---	
Applicant: Altwater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 05/17/2000	Operator: J. Roidt
Test performed: automatically	File name:

Mode: with Procom Antenna Receive Mode at Channel 40	
--	--

Detector: Peak

List of values: 10 dB Margin	50 Subranges
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Result: Prescan

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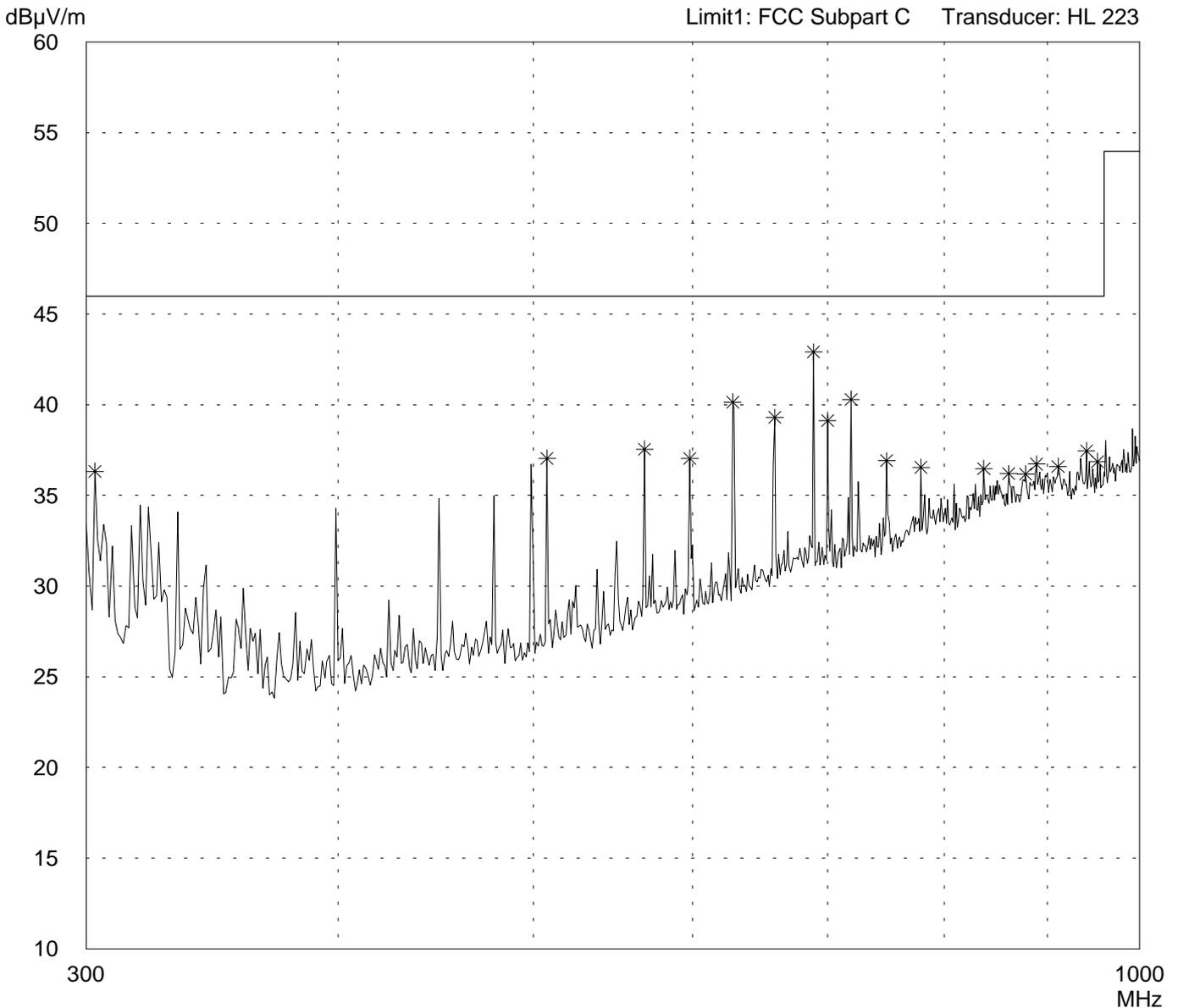
Radiated Emission Test 300 MHz - 1 GHz according to FCC Part 15 Subpart C

Model: WIMAN II	
Serial no.: ---	
Applicant: Altwater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 05/17/2000	Operator: J. Roidt
Test performed: automatically	File name:

Mode: with Procom Antenna Receive Mode at Channel 40	
--	--

Detector: Peak

List of values: 10 dB Margin	50 Subranges
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Result: Prescan

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