



## Exhibit H

### EMI test report

Straubing, October 26, 1998

**TEST - REPORT**

**No. 51118-80914**

**for**

**Immobilizer II, Article No. 05 0470 10, Index 4**

**Electronic Immobilizer**

**Applicant:** Leopold Kostal GmbH & Co. KG

**Purpose of testing:** To show compliance with

FCC Code of Federal Regulations,  
Part 15 Subpart C, Sections §15.207  
and §15.209

Industry Canada Radio Standards  
Specification RSS-210 Issue 2,  
Sections 6.2.1, 6.6, 7.3 and 7.4

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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): Immobilizer II, Article No. 05 0470 10, Index 4

Serial number: 01

Type of equipment: Electronic Immobilizer

Parts/accessories: ---

FCC-ID: NET05047000

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Applicant: Leopold Kostal GmbH & Co. KG  
(full address) An der Bellmerei 10  
D-58513 Lüdenscheid  
Germany

Contract identification: ---

Contact person: Mr Roy Haasler

Manufacturer: Leopold Kostal GmbH & Co. KG

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Receipt of EUT: October 8, 1998

Date of test: October 9, 1998

Note: ---

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

Contact person: Mr. Johann Roidt

FCC file number: 31040/SIT 1300F2

Industry Canada file number: IC 3050

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Responsible for testing: Frank Scharnowski

Responsible for test report: Rainer Heller

## 2. Summary of Test Results

The tested sample complies with the requirements set forth in the

**Code of Regulations Part 15 Subpart C, Sections §15.207 and §15.209  
(intentional radiators) of the Federal Communication Commission (FCC)**

and the

**Radio Standards Specification RSS-210 Issue 2, Sections 6.2.1, 6.6, 7.3 and  
7.4 for Low Power Licence-Exempt Radiocommunication Devices of Industry  
Canada.**



Johann Roidt

Technical Manager



Frank Scharnowski

Test Engineer

### 3. Operation Mode of EUT

- reading with transponder continuously
- DC power supply

#### **4. Configuration of EUT and Peripheral Devices**

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

Reading transponder continuously

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

Unshielded wires connected (including DC supply lines)

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

DC power supply 12 V

## 5. Measuring Methods

### 5.1. Radiated Emission 9 kHz - 30 MHz (§15.209, §15.205 a,b / RSS-210 Sections 6.2.1, 6.3)

Radiated emissions were measured over the frequency range from 9 kHz to 30 MHz. The bandwidth of the EMI-receiver was set to 200 Hz below 150 kHz and to 10 kHz above 150 kHz. According to section §15.209 (d) final measurements were performed with the detector set to CISPR quasi-peak except for the frequency bands 9 - 90 kHz and 110 - 490 kHz where average detector is employed.

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

Preliminary scans were taken in a shielded room with a test-distance of 3 meters and detector-function of EMI-receiver set to peak to determine the radiated EMI-profile of the EUT. EUT was rotated all around and cables and equipment were placed and moved within the range of positions likely to find their maximum emissions. Final test was performed using an open-area test-site with a test-distance of 30 meters. In cases the regulation requires testing at 300 meters distance the results are extrapolated by using either an inverse linear distance extrapolation factor of 40 dB/decade or the extrapolation factor is determined by making a second measurement at 10 meters distance. The provisions of §15.31 (d) and §15.31 (f) apply.

See figure 2 for the measurement setup.

Test equipment used (see equipment list for details):  
03, 04, 37, 60, 63, 66

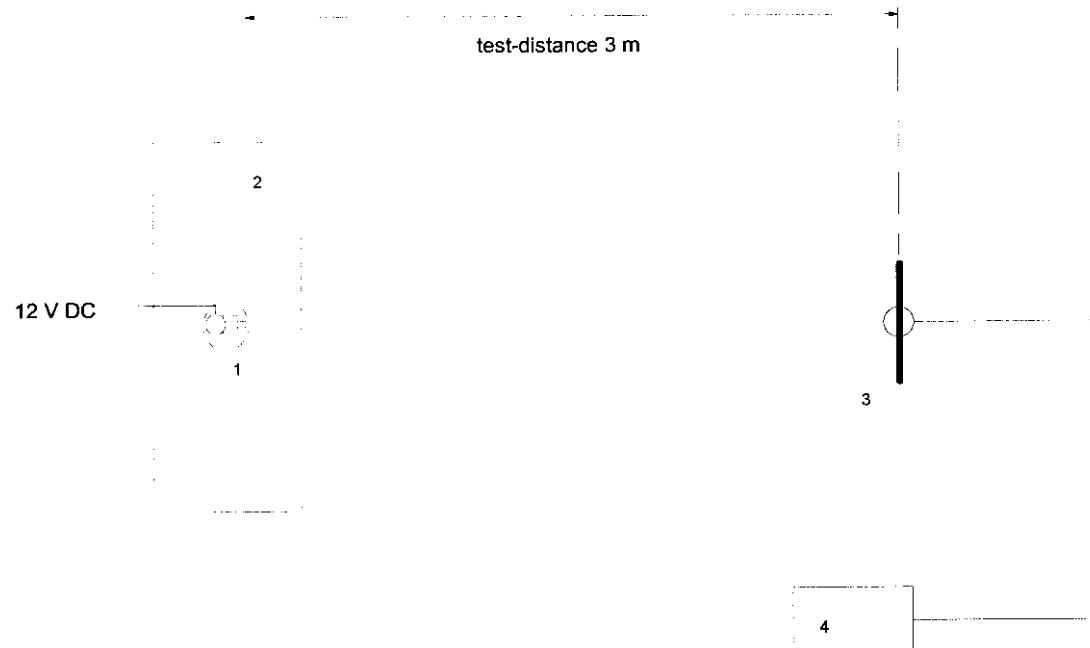


Figure 1: Measurement setup for radiated emission test below 30 MHz

1 Immobilizer (EUT)  
2 Wooden table

3 Measurement antenna  
4 Test receiver

## **5.2. Radiated Emission 30 MHz - 1 GHz (FCC §15.209 / RSS-210 Sections 6.2.1, 7.3)**

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

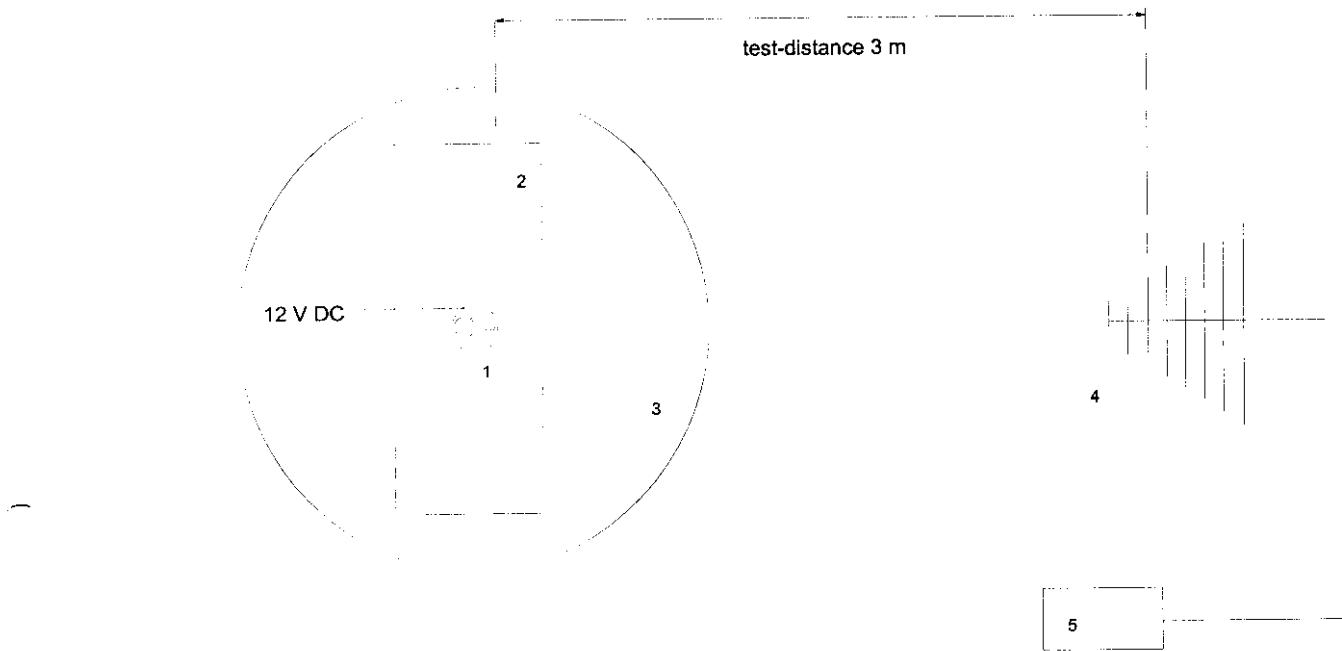


Figure 2: Measurement setup for radiated emission test 30 MHz - 1 GHz

1 Immobilizer (EUT)  
2 Wooden table  
3 Turn table

4 Measurement antenna  
5 Test receiver

## 6. 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

**7. Photographs Taken During Testing**

**8. List of Measurements**

### 8.1. List of Measurements According To FCC Part 15 Subpart C

FCC Part 15 Subpart C			
Section(s):	Test	Page(s)	Result
§15.207	Conducted emission test 450 kHz - 30 MHz	---	not applicable (dc supply)
§15.209	Radiated emission test 9 kHz - 30 MHz	23 - 26	passed
§15.209	Radiated emission test 30 MHz - 1 GHz	27 - 34	passed

**Note:** Radiated emissions measurement in the frequency range 0.009 - 30 MHz have been performed at a test distance of 3 meters. Because of sufficient margin of test results to appropriate limits (using an inverse linear distance factor of 40 dB/decade) retesting at 300 meter test distance was not necessary.

**8.2. List of Measurements According To Industry Canada RSS-210**

<b>Industry Canada RSS-210 Issue 2</b>			
<b>Section(s):</b>	<b>Test</b>	<b>Page(s)</b>	<b>Result</b>
<b>6.6, 7.4</b>	Conducted emission test 450 kHz - 30 MHz	---	not applicable (dc supply)
<b>6.2.1</b>	Radiated emission test 9 kHz - 30 MHz	23 - 26	passed
<b>6.2.1, 7.3</b>	Radiated emission test 30 MHz - 1 GHz	27 - 34	passed

**Note:** Radiated emissions measurement in the frequency range 0.009 - 30 MHz have been performed at a test distance of 3 meters. Because of sufficient margin of test results to appropriate limits (using an inverse linear distance factor of 40 dB/decade) retesting at 300 meter test distance was not necessary.

## 9. Referenced Regulations

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

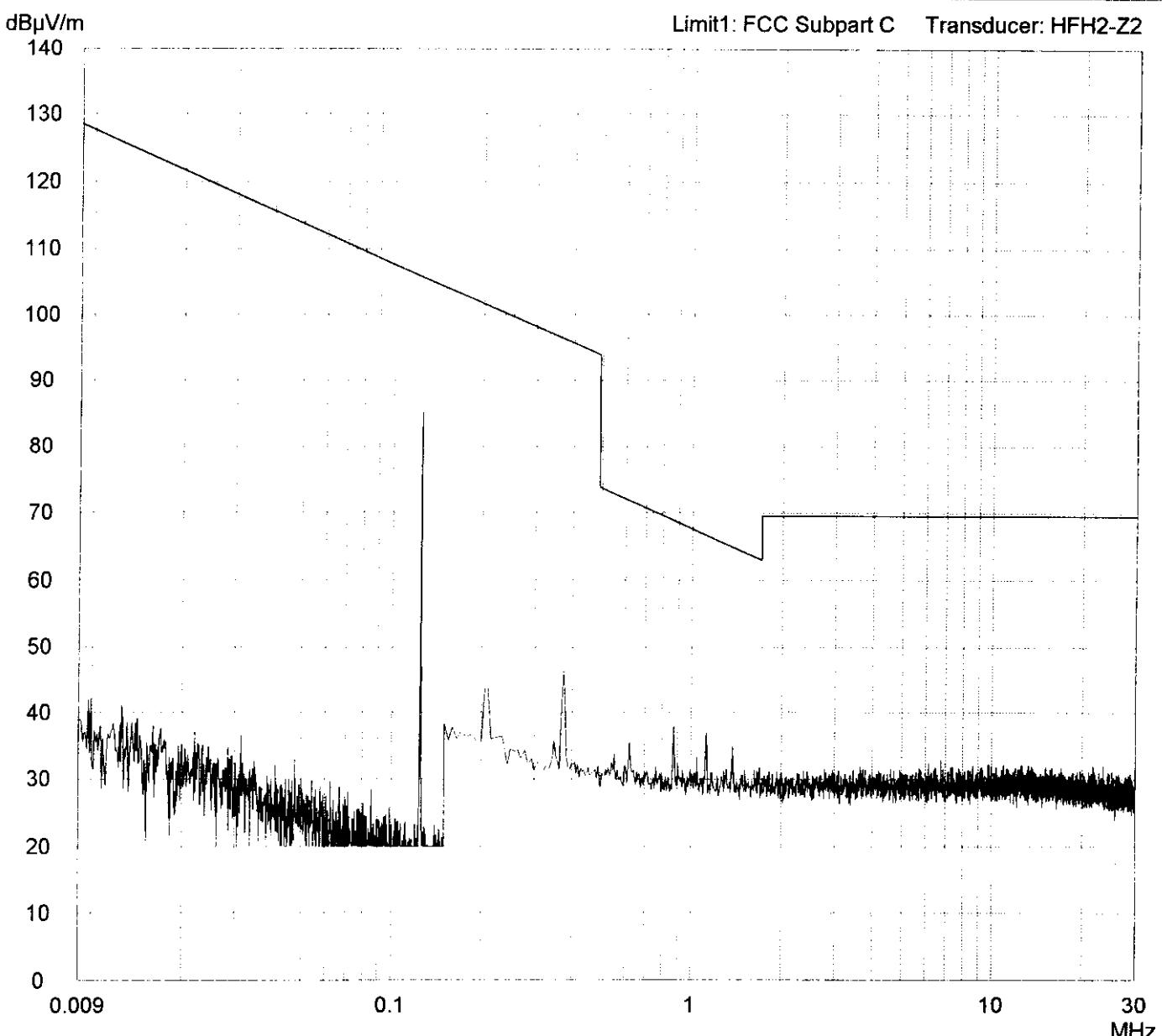
<input checked="" type="checkbox"/>	FCC Part 15 Subpart A	Code of Regulations Part 15 (Radio Frequency Devices), Subpart A (General) of the Federal Communication Commission (FCC)	October 20, 1997
<input type="checkbox"/>	FCC Part 15 Subpart B	Code of Regulations Part 15 (Radio Frequency Devices), Subpart 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 checked="" type="checkbox"/>	RSS-210	Radio Standards Specification RSS-210 Issue 2 for Low Power Licence-Exempt Radiocommunication Devices of Industry Canada	February 24, 1996

## 10. Test Results

# Radiated Emission Test 9 kHz - 30 MHz according to FCC Part 15 Subpart C

Model: Immobilizer II	Mode: - reading with transponder continuously
Serial no.: 01	- DC power supply
Applicant: Leopold Kostal GmbH & Co KG	
Test site: Shielded room, cabin no. 2	
Tested on: Test distance 3 metres	
Date of test: 10/09/1998	Operator: F. Scharnowski
Test performed: automatically	File name:

Detector: Peak / Final Results: QP	Final results: 20 dB Margin	25 Subranges
dB $\mu$ V/m		



**Radiated Emission Test 9 kHz - 30 MHz**  
**according to FCC Part 15 Subpart C**

Model:  
**Immobilizer II**

Serial no.:  
**01**

Applicant:  
**Leopold Kostal GmbH & Co KG**

Test site:  
**Shielded room, cabin no. 2**

Tested on:  
**Test distance 3 metres**

Mode:  
**- reading with transponder continuously**

**- DC power supply**

Date of test:  
**10/09/1998**

Operator:  
**F. Scharnowski**

Test performed:  
**automatically**

File name:

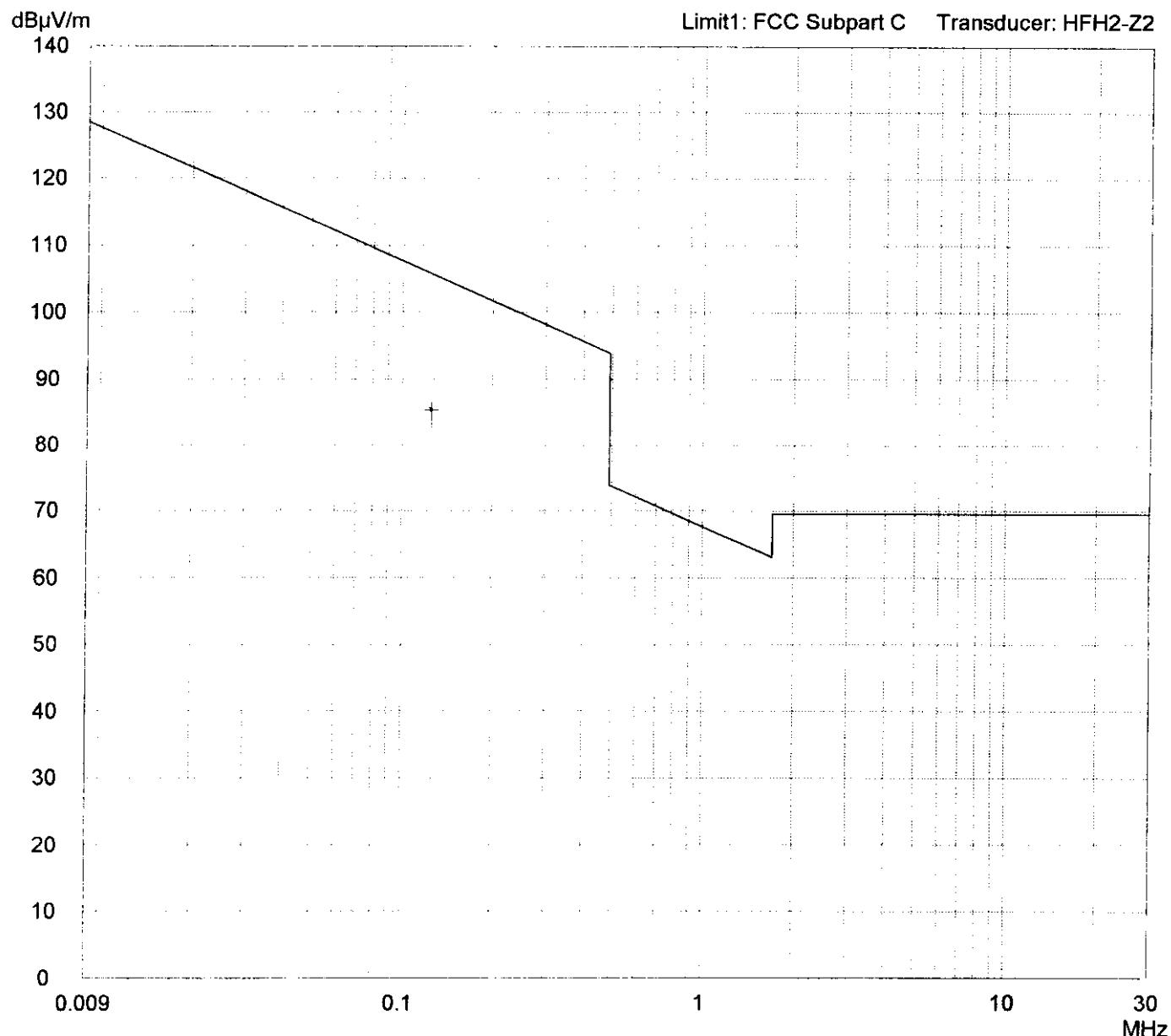
Detector:  
**Peak / Final Results: QP**

Final results:  
**20 dB Margin**      **25 Subranges**

<i>Frequency MHz</i>	<i>Reading dB<math>\mu</math>V</i>	<i>Correction factor dB</i>	<i>Value dB<math>\mu</math>V/m</i>	<i>Limit dB<math>\mu</math>V/m</i>	<i>Limit exceeded</i>
<b>no results</b>					

**Radiated Emission Test 9 kHz - 30 MHz  
according to FCC Part 15 Subpart C**

Model: <b>Immobilizer II</b>	Mode: - reading with transponder continuously
Serial no.: <b>01</b>	- DC power supply
Applicant: <b>Leopold Kostal GmbH &amp; Co KG</b>	
Test site: <b>Shielded room, cabin no. 2</b>	
Tested on: <b>Test distance 3 metres</b>	
Date of test: <b>10/09/1998</b>	Operator: <b>F. Scharnowski</b>
Test performed: <b>by hand</b>	File name:
Detector: <b>Quasi-Peak</b>	List of values: <b>Selected by hand</b>



**Radiated Emission Test 9 kHz - 30 MHz  
according to FCC Part 15 Subpart C**

Model: Immobilizer II		Mode: - reading with transponder continuously			
Serial no.: 01		- DC power supply			
Applicant: Leopold Kostal GmbH & Co KG					
Test site: Shielded room, cabin no. 2					
Tested on: Test distance 3 metres					
Date of test: 10/09/1998	Operator: F. Scharnowski				
Test performed: by hand	File name:				
Detector: Quasi-Peak	List of values: Selected by hand				
Frequency MHz	Reading dB $\mu$ V	Correction factor dB	Value dB $\mu$ V/m	Limit dB $\mu$ V/m	Limit exceeded
0.125	65.3	20.0	85.3	105.7	

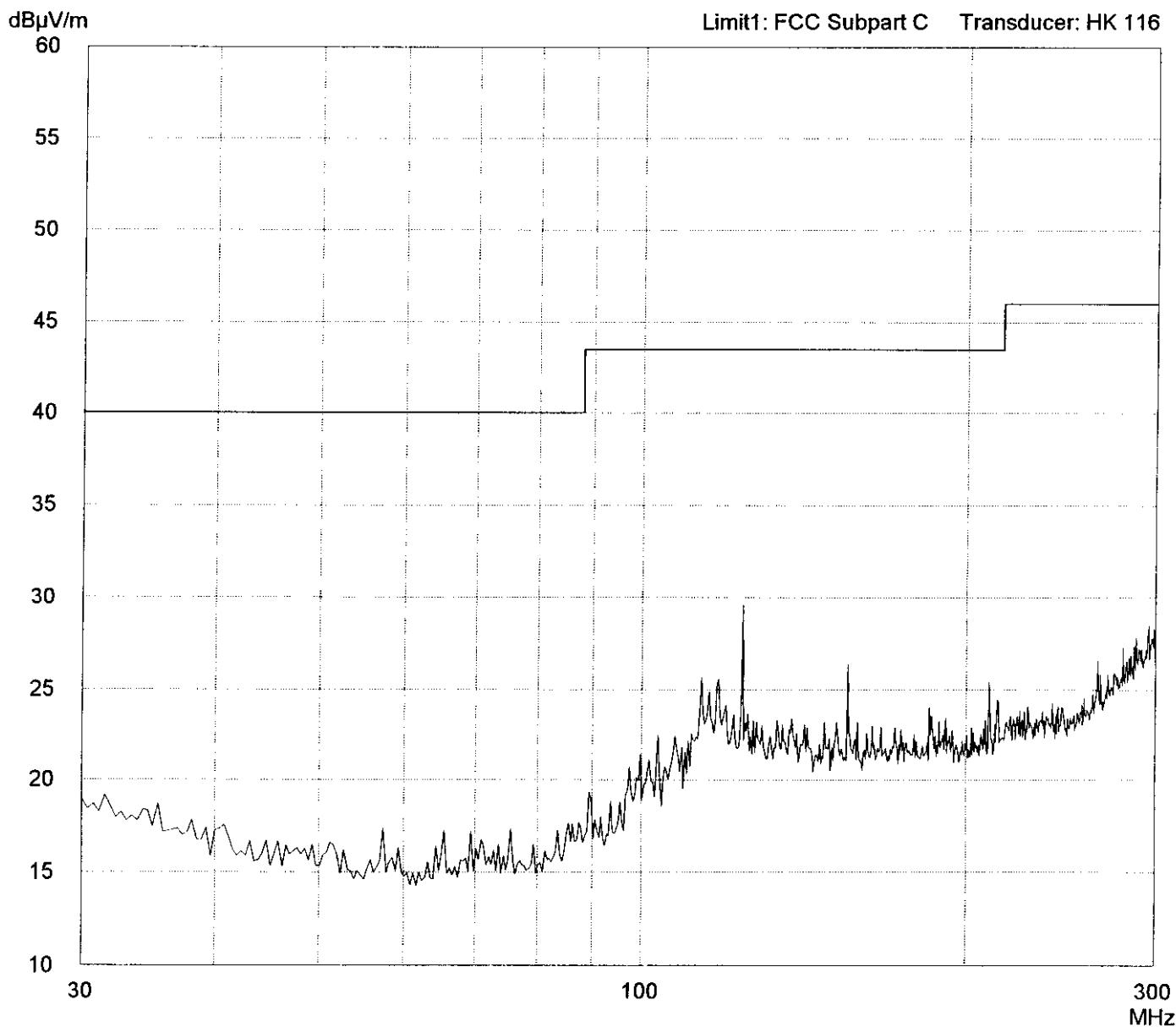
# Radiated Emission Test 30 MHz - 300 MHz according to FCC Part 15 Subpart C

Model: <b>Immobilizer II</b>	
Serial no.: <b>01</b>	
Applicant: <b>Leopold Kostal GmbH &amp; Co. KG</b>	
Test site: <b>Semi anechoic room, cabin no. 3</b>	
Tested on: <b>Test distance 3 meters Horizontal Polarization</b>	
Date of test: <b>10/09/1998</b>	Operator: <b>F. Scharnowski</b>
Test performed: <b>automatically</b>	File name:

Mode:  
- reading with transponder continuously  
- DC power supply

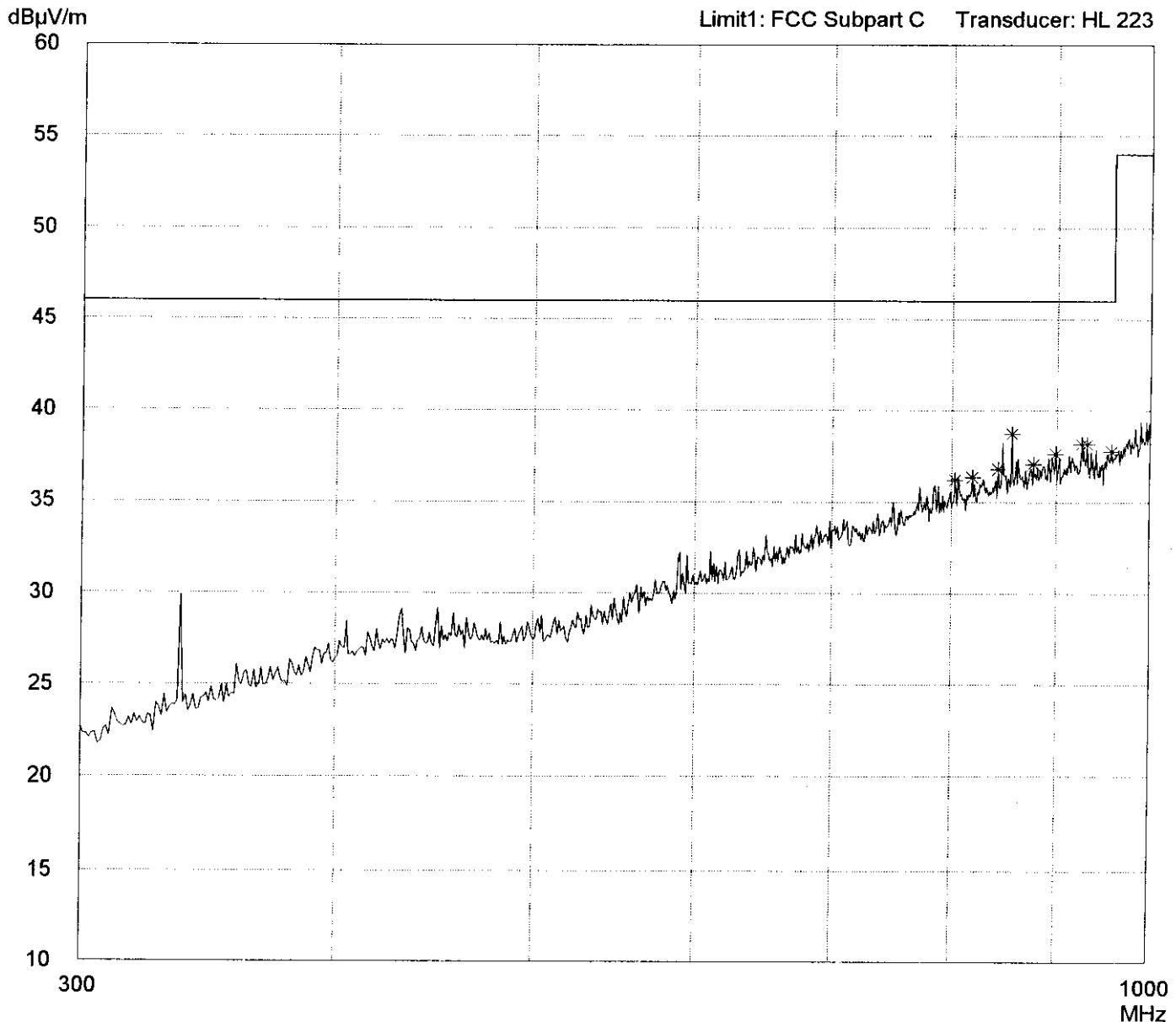
Detector: <b>Peak</b>
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List of values:  
**10 dB Margin**      **50 Subranges**



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

Model: <b>Immobilizer II</b>	Mode: - reading with transponder continuously - DC power supply
Serial no.: <b>01</b>	
Applicant: <b>Leopold Kostal GmbH &amp; Co. KG</b>	
Test site: <b>Semi anechoic room, cabin no. 3</b>	
Tested on: <b>Test distance 3 meters</b> <b>Horizontal Polarization</b>	
Date of test: <b>10/09/1998</b>	Operator: <b>F. Scharnowski</b>
Test performed: <b>automatically</b>	File name:
Detector: <b>Peak</b>	List of values: <b>10 dB Margin</b> <b>50 Subranges</b>



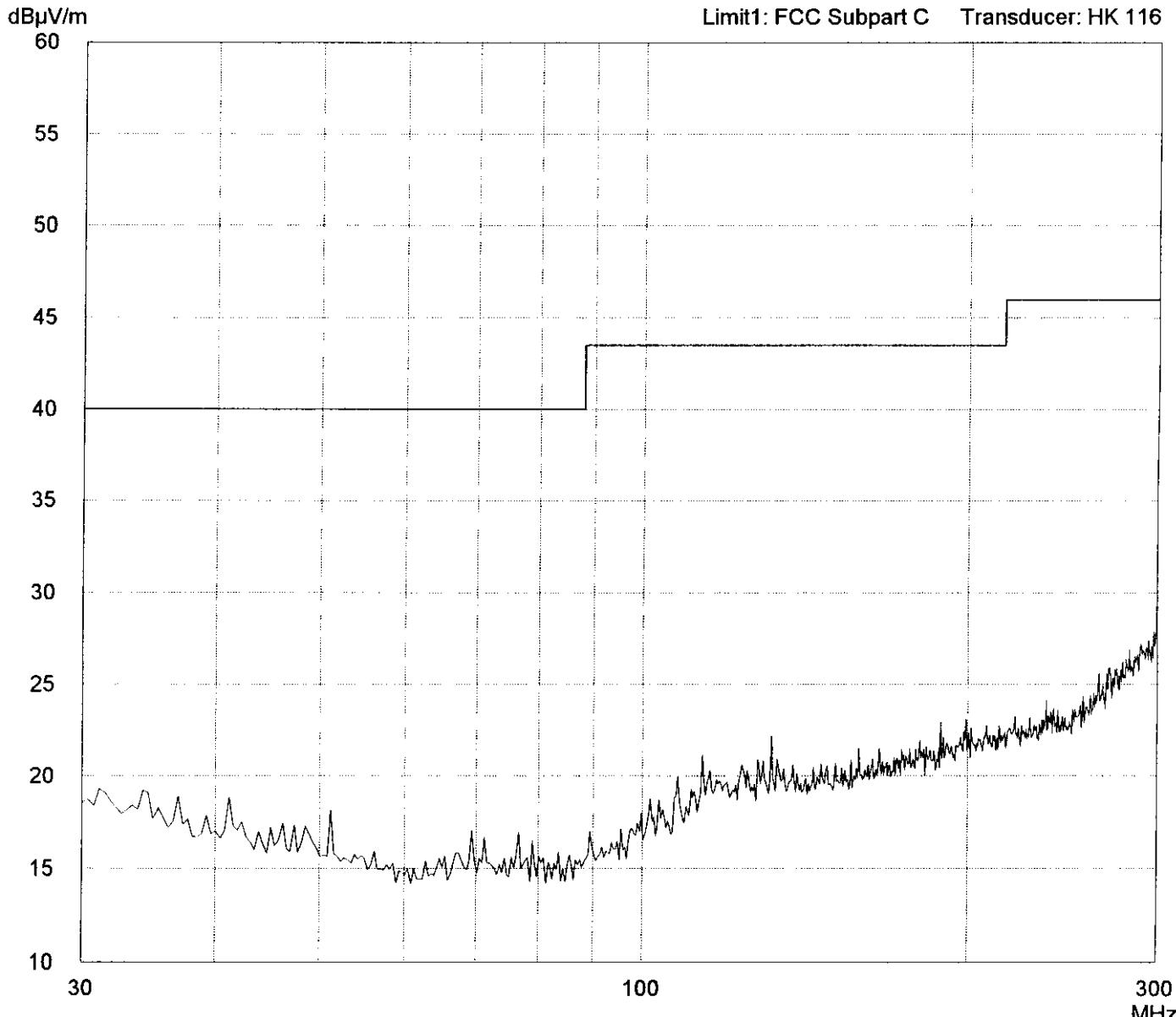
# Radiated Emission Test 30 MHz - 300 MHz according to FCC Part 15 Subpart C

Model: Immobilizer II	
Serial no.: 01	
Applicant: Leopold Kostal GmbH & Co. KG	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 10/09/1998	Operator: F. Scharnowski
Test performed: automatically	File name:

Mode: - reading with transponder continuously - DC power supply
-----------------------------------------------------------------------

Detector: Peak
-------------------

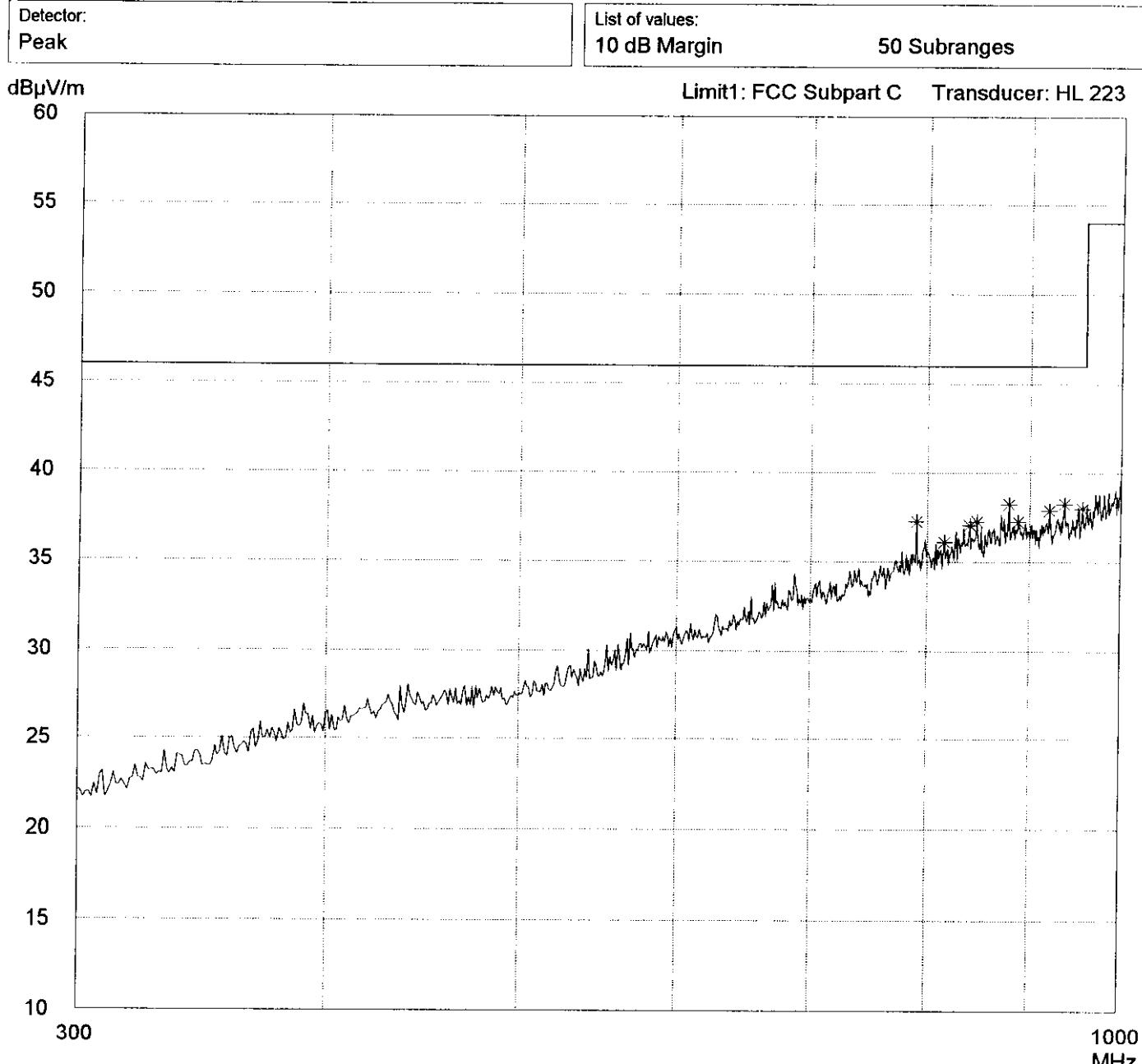
List of values: 10 dB Margin	50 Subranges
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# Radiated Emission Test 300 MHz - 1 GHz according to FCC Part 15 Subpart C

Model: <b>Immobilizer II</b>	
Serial no.: <b>01</b>	
Applicant: <b>Leopold Kostal GmbH &amp; Co. KG</b>	
Test site: <b>Semi anechoic room, cabin no. 3</b>	
Tested on: <b>Test distance 3 meters Vertical Polarization</b>	
Date of test: <b>10/09/1998</b>	Operator: <b>F. Scharnowski</b>
Test performed: <b>automatically</b>	File name:

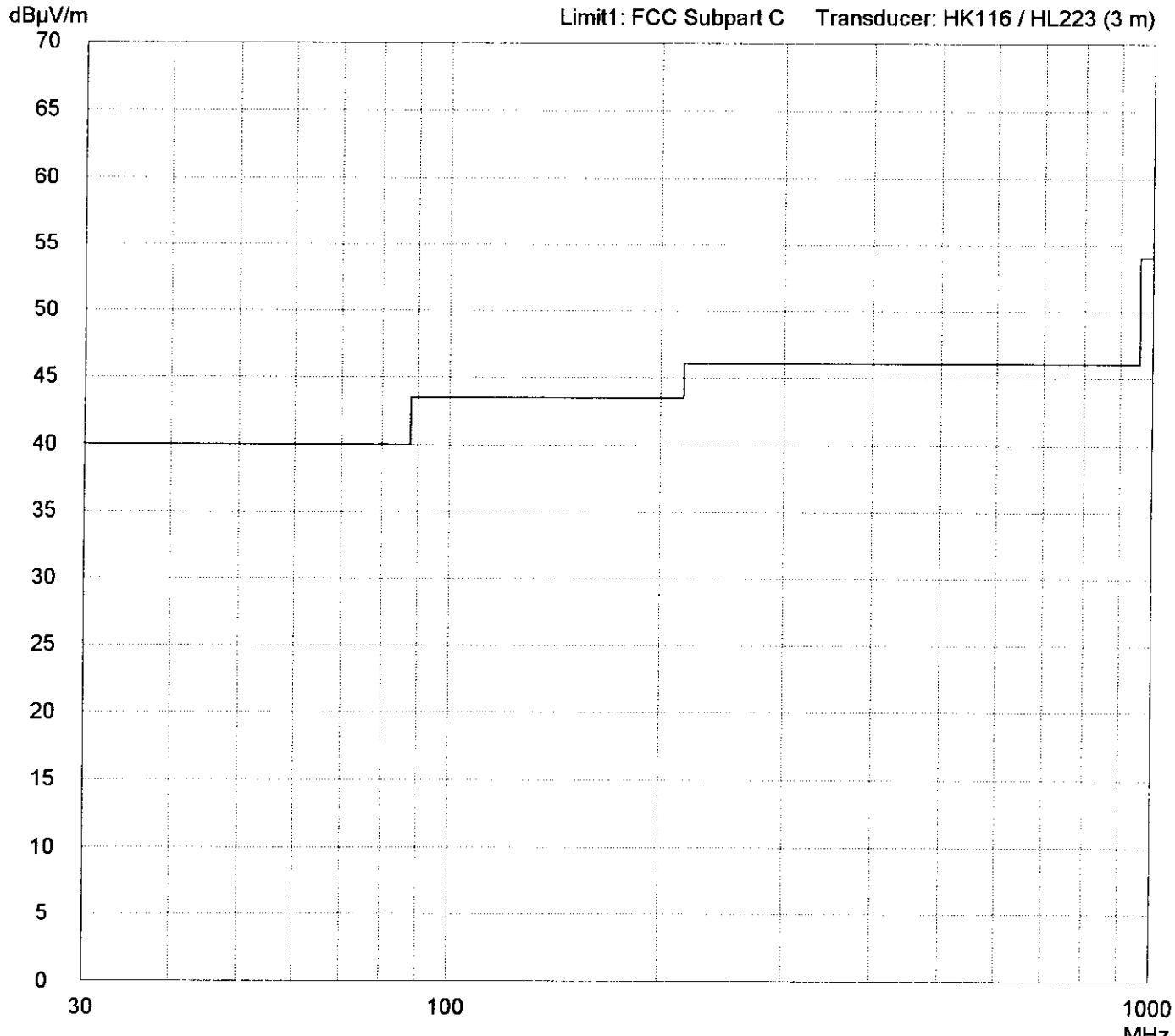
Mode: <ul style="list-style-type: none"><li>- reading with transponder continuously</li><li>- DC power supply</li></ul>
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# Radiated Emission Test 30 MHz - 1 GHz according to FCC Part 15 Subpart C

Model: <b>Immobilizer II</b>	
Serial no.: <b>01</b>	
Applicant: <b>Leopold Kostal GmbH &amp; Co. KG</b>	
Test site: <b>Open area test-site I</b>	
Tested on: <b>Test distance 3 meters Horizontal Polarization</b>	
Date of test: <b>10/09/1998</b>	Operator: <b>F. Scharnowski</b>
Test performed: <b>by hand</b>	File name:
Detector: <b>Quasi-Peak</b>	

Mode: <b>- reading with transponder continuously - DC power supply</b>
<b>Note: no levels above noise floor detected</b>
List of values: <b>Selected by hand</b>



**Radiated Emission Test 30 MHz - 1 GHz**  
**according to FCC Part 15 Subpart C**

Model: Immobilizer II	Mode: - reading with transponder continuously - DC power supply	
Serial no.: 01	Note: no levels above noise floor detected	
Applicant: Leopold Kostal GmbH & Co. KG		
Test site: Open area test-site I		
Tested on: Test distance 3 meters Horizontal Polarization		
Date of test: 10/09/1998	Operator: F. Scharnowski	
Test performed: by hand	File name:	
Detector: Quasi-Peak		

List of values:  
Selected by hand

Frequency MHz	Reading dB $\mu$ V	Correction factor dB	Value dB $\mu$ V/m	Limit dB $\mu$ V/m	Limit exceeded
no results					

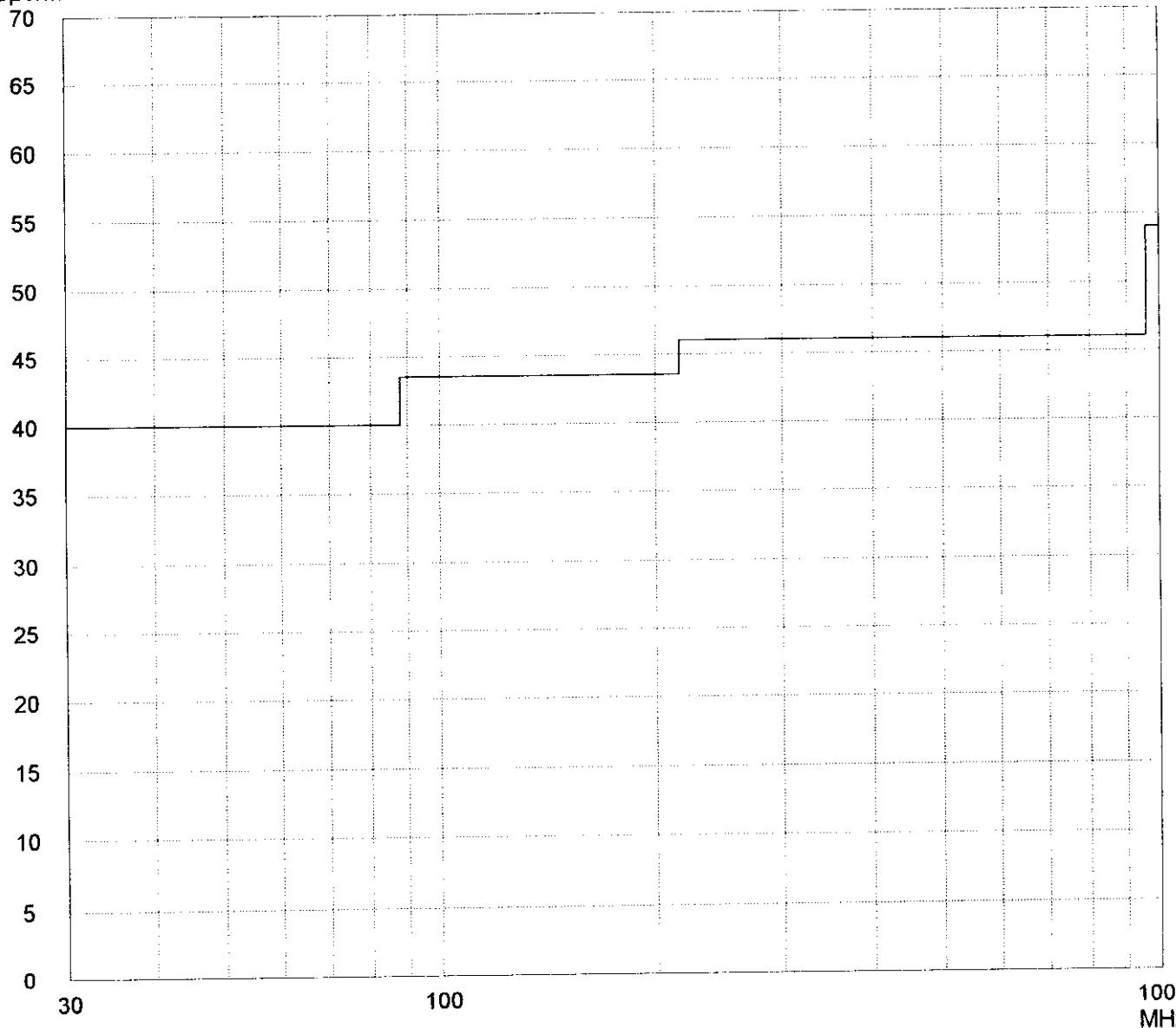
# Radiated Emission Test 30 MHz - 1 GHz according to FCC Part 15 Subpart C

Model: Immobilizer II	Mode: - reading with transponder continuously - DC power supply
Serial no.: 01	Note: no levels above noise floor detected
Applicant: Leopold Kostal GmbH & Co. KG	
Test site: Open area test-site I	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 10/09/1998	Operator: F. Scharnowski
Test performed: by hand	File name:

Detector: Quasi-Peak	List of values: Selected by hand
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dB $\mu$ V/m

Limit1: FCC Subpart C Transducer: HK116 / HL223 (3 m)



**Radiated Emission Test 30 MHz - 1 GHz**  
**according to FCC Part 15 Subpart C**

Model: Immobilizer II	Mode: - reading with transponder continuously - DC power supply
Serial no.: 01	Note: no levels above noise floor detected
Applicant: Leopold Kostal GmbH & Co. KG	
Test site: Open area test-site I	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 10/09/1998	Operator: F. Scharnowski
Test performed: by hand	File name:

Detector: Quasi-Peak	List of values: Selected by hand
-------------------------	-------------------------------------

Frequency MHz	Reading dB $\mu$ V	Correction factor dB	Value dB $\mu$ V/m	Limit dB $\mu$ V/m	Limit exceeded
no results					