

## EMI - TEST REPORT

## - Human exposure -

Test Report No. :	T40171-00-01KJ	04. March 2016 Date of issue
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**Type / Model Name** : COR PT-3A-913-469 & COR PT-3B-913-469

**Product Description** : Mobile device for recording and transmitting  
leak noises

**Applicant** : Seba Dynatronic Mess- und Ortungstechnik GmbH

Address : Dr.-Herbert-Iann-Str. 6  
96148 BAUNACH, GERMANY

**Manufacturer** : Seba Dynatronic Mess- und Ortungstechnik GmbH

Address : Dr.-Herbert-Iann-Str. 6  
96148 BAUNACH, GERMANY

**Licence holder** : Seba Dynatronic Mess- und Ortungstechnik GmbH

Address : Dr.-Herbert-Iann-Str. 6  
96148 BAUNACH, GERMANY

<b>Test Result</b> according to the standards listed in clause 1 test standards:	<b>POSITIVE</b>
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The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

## Contents

<b>1 TEST STANDARDS</b>	<b>3</b>
<b>2 EQUIPMENT UNDER TEST</b>	<b>4</b>
2.1 Photo documentation of the EUT – Detailed photos see ATTACHMENT A	4
2.2 Short description of the equipment under test (EUT)	4
2.3 Variants of the EUT	4
2.4 Operation frequency range	5
2.5 Antennas	5
2.6 Power supply system utilised	5
2.7 Determination of worst case conditions for final calculations	5
<b>3 FINAL ASSESSMENT</b>	<b>6</b>
<b>4 TEST ENVIRONMENT</b>	<b>7</b>
4.1 Address of the test laboratory	7
4.2 Environmental conditions	7
4.3 Statement of the measurement uncertainty	7
4.4 Measurement protocol for FCC and IC	8
<b>5 HUMAN EXPOSURE</b>	<b>9</b>
5.1 Maximum permissible exposure (MPE)	9
5.2 Co-location and Co-transmission	11
5.3 SAR test exclusion considerations	12
<b>ATTACHMENT (PHOTO DOCUMENTATION OF THE EUT)</b>	<b>A</b>

Attachment A as separately supplement

## 1 TEST STANDARDS

The tests were performed according to following standards:

**FCC Rules and Regulations Part 1, Subpart I - Procedures Implementing the National Environmental Policy Act of 1969**

Part 1, Subpart I, Section 1.1310	Radiofrequency radiation exposure limits
Part 1, Subpart 2, Section 2.1093	Radiofrequency radiation exposure evaluation: portable device

**OET Bulletin 65, 65A, 65B Edition 97-01, August 1997 – Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.**

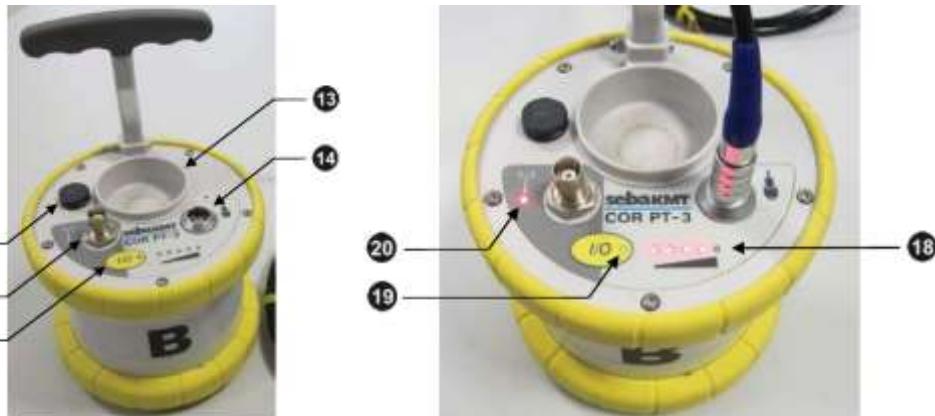
KDB 447498 D01 v06	RF exposure procedures and equipment authorization policies for mobile and portable devices, October 23, 2015.
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ANSI C95.1: 2005	IEEE Standard for Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
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CISPR 16-4-2: 2013	Uncertainty in EMC measurement
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## 2 EQUIPMENT UNDER TEST

### 2.1 Photo documentation of the EUT – Detailed photos see ATTACHMENT A



Item	Description
13	<b>Sensor storage place</b>
14	<b>Sensor socket</b> for connecting the microphone / hydrophone
15	<b>I/O pushbutton</b> short pressing ... switches the device on long pressing ... switches the device off
16	<b>Ventilation / venting membrane</b>
17	<b>Antenna socket</b> for connecting the analog radio antenna
18	<b>Row of LEDs</b> lit green ... represents the current battery level lit red ... represents the noise level

Item	Description
19	<b>Radio LED</b> lit green ... the device is switched on flashing ... the device is charging not lit ... the device is switched off
20	<b>I/O LED</b> lit red ... the device is in "Active" mode, noise measurement in progress measurement data is being sent to the correlator not lit ... the device is in "Stand-by" mode, no measurement in progress, no radio traffic

### 2.2 Short description of the equipment under test (EUT)

The COR PT-3 is a portable device which is recording noise data for leak detection in water pipes. It has a socket for connecting an external microphone.

The device can be configured and readout via digital radio by Correlator C-3. Integrated is an already approve radio module (FCC ID: X7J-A10040601), which has an internal antenna and operate at 913 MHz (bidirectional radio), which is integrated on the mainboard.

It also can transmit real-time audio data via analogue radio at 469 MHz. Therefore a lambda/2 antenna is used. The COR PT-3 is powered by an internal lithium-ion rechargeable battery, charged wireless in the transport case.

### 2.3 Variants of the EUT

- There are no other variants.

## 2.4 Operation frequency range

Equipment category	Range
PLMR (469 MHz)	406 MHz – 512 MHz
PLMR (913 MHz)	902 MHz – 928 MHz

## 2.5 Antennas

Items	Description
PLMR	Private land mobile radio services module @ 913.02 MHz Anaren, Inc. – Type: A1101R09A (FCC ID: X7J-A10040601)
Antenna type	PCB antenna
Antenna gain	2 dBi
PLMR	Private land mobile radio services module @ 468 MHz and 469.6 MHz Radiometrix – Type: HMT2-469-5-SKMT
Antenna type	Procom FSP 70/460 - lambda ½
Antenna connector	BNC
Antenna gain	7 dBi

## 2.6 Power supply system utilised

Power supply voltage,  $V_{\text{nom}}$  : 7.2 V DC (Battery powered)

## 2.7 Determination of worst case conditions for final calculations

### Note:

No separate measurement was performed to generate test results for the present document. This test report is based on the results of the test reports **T40171-00-00KJ** from CSA Group Bayern. Else the PLMR 913 MHz-Section was already certified with **FCC ID: X7J-A10040601**. In this case only worst case considerations for the highest radiated output power of all emitters are taken into consideration to calculate the maximum permissible exposure for fixed equipment devices.

### **3 FINAL ASSESSMENT**

The equipment under test fulfills the EMI requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 14 September 2015

Testing concluded on : 02 November 2015

Checked by:

Tested by:

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Klaus Gegenfurtner  
Teamleader Radio

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Josef Knab  
Radio Team

## 4 TEST ENVIRONMENT

### 4.1 Address of the test laboratory

**CSA Group Bayern GmbH**  
Ohmstrasse 1-4  
94342 STRASSKIRCHEN  
GERMANY

### 4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature: 15-35 °C

Humidity: 30-60 %

Atmospheric pressure: 86-106 kPa

### 4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. It is noted that the expanded measurement uncertainty corresponds to the measurement results from the standard measurement uncertainty multiplied by the coverage factor  $k = 2$ . The true value is located in the corresponding interval with a probability of 95 %. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4-2 / 11.2003 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements“ and is documented in the quality system acc. to DIN EN ISO/IEC 17025. For all measurements shown in this report, the measurement uncertainty of the test laboratory, CSA Group Bayern GmbH, is below the measurement uncertainty as defined by CISPR. Therefore, no special measures must be taken into consideration with regard to the limits according to CISPR. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

## **4.4 Measurement protocol for FCC and IC**

### **4.4.1 General information**

#### **4.4.1.1 Test methodology**

The Open Area test site is a listed Open Site under the Canadian Test-Sites File-No:

**IC 3009A**

In compliance with RSS 210 testing for RSS compliance may be achieved by following the procedures set out in ANSI C63.4 and applying the CISPR 22 limits.

#### **4.4.1.2 Justification**

The equipment under test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral using the appropriate impedance characteristic or left unterminated. Where appropriate, cables are manually manipulated with respect to each other thus obtaining maximum disturbances from the unit.

#### **4.4.1.3 Details of test procedures**

In compliance with 47 CFR Part 15 Subpart A, Section 15.38 testing for FCC compliance may be achieved by following the procedures set out in ANSI C63.4 and applying the CISPR 22 limits.

## 5 HUMAN EXPOSURE

### 5.1 Maximum permissible exposure (MPE)

For test instruments and accessories used see section 6 Part **CPC 3**.

#### 5.1.1 Description of the test location

Test location:                    **NONE**

#### 5.1.2 Applicable standard

The test methods used comply with ANSI/IEEE C95.1, "IEEE Standard for Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz".

This test report shows the compliance with the limits for Maximum Permissible Exposure (MPE) specified in FCC Part 1, Section 1.1310 and the criteria to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in FCC Part 1, Section 1.1307(b).

#### 5.1.3 Description of Measurement

The maximum total power input to the antenna has been measured conducted as described in clause 5.3 of this document. Through the Friis transmission formula, the known maximum gain of the antenna and the maximum power, can be calculated the MPE in a defined distance away from the product.

Friis transmission formula:

$$P_d = \frac{P_{out} * G}{4 * \Pi * r^2}$$

Where:

$P_d$  = power density (mW/cm<sup>2</sup>)

$P_{out}$  = output power to antenna (mW)

G = gain of antenna (linear scale)

r = distance between antenna and observation point (cm)

According to FCC Rules 47CFR 2.1093(b) the EUT is not a portable device. The EUT is designed to be used that radiating structures are **30 cm** outside of the body of the user. (**r = 30 cm**)

#### 5.1.4 Test result

System 1: PLMR

(radiated power = 13.3 dBm  $\pm$  3 dB)

Channel frequency (MHz)	P (dBm)	Antenna gain (dBi)	P <sub>EIRP</sub> (dBm)	P (mW)	P (W)	P <sub>d</sub> (mW/cm <sup>2</sup> )	Limit P <sub>d</sub> (mW/cm <sup>2</sup> )	Exposure ratio (%)
913.02	16.3	0.0	16.3	43	0.04	0.0038	0.6087	0.6

System 2: PLMR

(rated power = 27 dBm +1 dB / -2 dB)

Channel frequency (MHz)	P (dBm)	Antenna gain (dBi)	P <sub>EIRP</sub> (dBm)	P (mW)	P (W)	P <sub>d</sub> (mW/cm <sup>2</sup> )	Limit P <sub>d</sub> (mW/cm <sup>2</sup> )	Exposure ratio (%)
468.5	28.0	7.0	35.0	3162	3.16	0.2796	0.3123	89.5
469.6	28.0	7.0	35.0	3162	3.16	0.2796	0.3131	89.3

**FCC ID: OV8-CORPT3**

Limits for maximum permissible exposure (MPE):

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(B) Limits for General Population / Uncontrolled Exposure</b>				
0.3 – 3.0	614	1.63	100	30
3.0 – 30	824/f	2.19/f	180/ f <sup>2</sup>	30
30 - 300	27.5	0.073	0.2	30
<b>300-1500</b>	---	---	<b>f/1500</b>	<b>30</b>
1500-100000	---	---	1.0	30

*f* = Frequency in MHz

The requirements are **FULFILLED**.

**Remarks:** The equipment under test is for mobile use.

In the PLMR mode (468.5 MHz and 469.6 MHz) only one frequency is active.

## 5.2 Co-location and Co-transmission

### Applicable standard:

OET Bulletin 65, Edition 97-01, Section 2: Multiple-transmitter sites and Complex Environments

The FCC's MPE limits vary with frequency. Therefore, in mixed or broadband RF fields where several sources and frequencies are involved, the fraction of the recommended limit (in terms of power density or square of the electric or magnetic field strength) incurred within each frequency interval should be determined, and the sum of all fractional contributions should not exceed 1.0, or 100 % in terms of percentage.

1. MPE of System 1:	$P_d = 0.0038 \text{ mW/cm}^2$ Limit: <b>0.61</b> mW/cm <sup>2</sup> Fraction of MPE: 0.6 %
2. MPE of System 2:	$P_d = 0.28 \text{ mW/cm}^2$ Limit: <b>0.31</b> mW/cm <sup>2</sup> Fraction of MPE: 89.5%

### 5.2.1 Test result

System 1 Maximum power density ratio PMLR (%)	System 2 Maximum power density ratio PMLR (%)	Sum of exposure ratios (%)	Limit of exposure ratios (%)
0.6	89.5	90.1	100

The requirements are **FULFILLED**.

**Remarks:** The equipment under test is for mobile use.

In the PLMR mode (468.5 MHz and 469.6 MHz) only one frequency is active.

FCC ID: OV8-CORPT3

### 5.3 SAR test exclusion considerations

#### 5.3.1 Applicable standard

According to RF exposure guidance:

Systems operating under the provisions of this section shall be operated in a manner that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.

**Remarks:** Not applicable because in normal use, the distance is greater than 30 cm.

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