

# TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: DT05-US

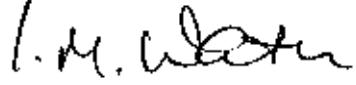
FCC ID: UOJ-DG04T

To: FCC Parts 15.107 & 15.109: 2010

**Test Report Serial No:**  
RFI-RPT-RP81704JD01C

**This Test Report Is Issued Under The Authority  
Of Chris Guy, Head of Global Approvals:**



<b>Checked By:</b>	Ian Watch
<b>Signature:</b>	
<b>Date of Issue:</b>	26 August 2011

This report is issued in Adobe Acrobat portable document format (PDF). It is only a valid copy of the report if it is being viewed in PDF format with the following security options not allowed: Changing the document, Selecting text and graphics, Adding or changing notes and form fields.

This report may not be reproduced other than in full, except with the prior written approval of RFI Global Services Ltd. The results in this report apply only to the sample(s) tested.

This page has been left intentionally blank.

**Table of Contents**

<b>1. Customer Information .....</b>	<b>4</b>
<b>2. Summary of Testing .....</b>	<b>5</b>
2.1. General Information	5
2.2. Summary of Test Results	5
2.3. Methods and Procedures	5
2.4. Deviations from the Test Specification	5
<b>3. Equipment Under Test (EUT) .....</b>	<b>6</b>
3.1. Identification of Equipment Under Test (EUT)	6
3.2. Description of EUT	6
3.3. Modifications Incorporated in the EUT	6
3.4. Additional Information Related to Testing	6
3.5. Support Equipment	7
<b>4. Operation and Monitoring of the EUT during Testing .....</b>	<b>8</b>
4.1. Operating Modes	8
4.2. Configuration and Peripherals	8
<b>5. Measurements, Examinations and Derived Results .....</b>	<b>9</b>
5.1. General Comments	9
5.2. Test Results	10
5.2.1. Idle Mode AC Conducted Spurious Emissions	10
5.2.2. Idle Mode Radiated Spurious Emissions	13
<b>6. Measurement Uncertainty .....</b>	<b>17</b>
<b>Appendix 1. Test Equipment Used.....</b>	<b>18</b>

## **1. Customer Information**

<b>Company Name:</b>	Comfort Audio AB
<b>Address:</b>	Slottsmallan Halmstad 302 31 Sweden

## 2. Summary of Testing

### 2.1. General Information

<b>Specification Reference:</b>	47CFR15
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart B (Unintentional Radiators) - Sections 15.107 and 15.109
<b>Site Registration:</b>	FCC: 209735
<b>Location of Testing:</b>	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
<b>Test Date:</b>	23 August 2011

### 2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 15.107	Idle Mode AC Conducted Emissions	✓
Part 15.109	Idle Mode Radiated Spurious Emissions	✓
<b>Key to Results</b>		
 = Complied		 = Did not comply

### 2.3. Methods and Procedures

<b>Reference:</b>	ANSI C63.4 (2009)
<b>Title:</b>	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
<b>Reference:</b>	ANSI C63.10 (2009)
<b>Title:</b>	American National Standard for Testing Unlicensed Wireless Devices

### 2.4. Deviations from the Test Specification

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specification identified above.

### **3. Equipment Under Test (EUT)**

#### **3.1. Identification of Equipment Under Test (EUT)**

<b>Brand Name:</b>	Comfort Audio
<b>Model Name or Number:</b>	Programmer DT05-US
<b>Serial Number:</b>	SN00017941
<b>Hardware Version Number:</b>	I9
<b>Software Version Number:</b>	1.00
<b>FCC ID:</b>	UOJ-DG04T

#### **3.2. Description of EUT**

The equipment under test was a programmer for transmitting setup information to a receiver DT-10.

#### **3.3. Modifications Incorporated in the EUT**

No modifications were applied to the EUT during testing.

#### **3.4. Additional Information Related to Testing**

<b>Tested Technology:</b>	Part 15 Low Power Communication Device Transmitter	
<b>Power Supply Requirement:</b>	Nominal	3.7 V
<b>Type of Unit:</b>	Transmitter	
<b>Modulation:</b>	FSK	
<b>Maximum Conducted Output Power:</b>	-26.7 dBm	
<b>Transmit Frequency Range:</b>	904.05 MHz	
<b>Transmit Channel Tested:</b>	<b>Channel Frequency (MHz)</b>	
	904.05 MHz	

### **3.5. Support Equipment**

The following support equipment was used to exercise the EUT during testing:

<b>Description:</b>	Headphones
<b>Brand Name:</b>	Comfort Audio
<b>Model Name or Number:</b>	Not marked or stated
<b>Serial Number:</b>	Not marked or stated

<b>Description:</b>	Neck Loop
<b>Brand Name:</b>	Comfort Audio
<b>Model Name or Number:</b>	None stated
<b>Serial Number:</b>	None stated

<b>Description:</b>	AC adaptor
<b>Brand Name:</b>	Comfort Audio
<b>Model Name or Number:</b>	FW7600/05
<b>Serial Number:</b>	1108B

## **4. Operation and Monitoring of the EUT during Testing**

### **4.1. Operating Modes**

The EUT was tested in the following operating mode(s):

- Transmitter mode. The EUT was in idle mode, active but not transmitting.

### **4.2. Configuration and Peripherals**

The EUT was tested in the following configuration(s):

- Powered by an AC adaptor which was plugged into the Europlug socket on the Comfort Audio Programmer.
- All ports were terminated with neck loop, headphones and DT10-US receiver.

## **5. Measurements, Examinations and Derived Results**

### **5.1. General Comments**

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to *Section 6. Measurement Uncertainty* for details.

## **5.2. Test Results**

### **5.2.1. Idle Mode AC Conducted Spurious Emissions**

#### **Test Summary:**

<b>Test Engineer:</b>	Andrew Edwards	<b>Test Date:</b>	23 August 2011
<b>Test Sample Serial No:</b>	SN0017941		

<b>FCC Part:</b>	15.107(a)
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Section 6.2 referencing ANSI C63.4

#### **Environmental Conditions:**

<b>Temperature (°C):</b>	24
<b>Relative Humidity (%):</b>	33

#### **Results: Live Quasi Peak**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.370500	Live	31.7	58.5	26.8	Complied
3.502500	Live	26.6	56.0	29.4	Complied
3.777000	Live	27.4	56.0	28.6	Complied
4.020000	Live	27.6	56.0	28.4	Complied
4.492500	Live	27.3	56.0	28.7	Complied
4.983000	Live	27.0	56.0	29.0	Complied

#### **Results: Live Average**

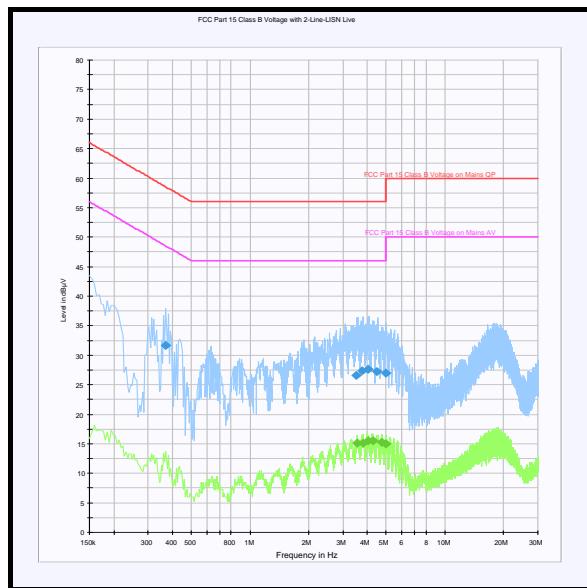
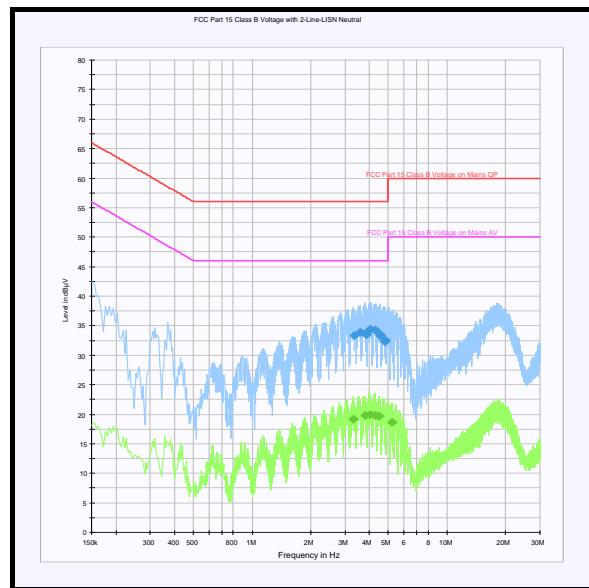
Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
3.538500	Live	15.1	46.0	30.9	Complied
3.799500	Live	15.1	46.0	30.9	Complied
4.011000	Live	15.5	46.0	30.5	Complied
4.249500	Live	15.5	46.0	30.5	Complied
4.758000	Live	15.2	46.0	30.8	Complied
4.987500	Live	15.0	46.0	31.0	Complied

**Idle Mode AC Conducted Spurious Emissions (continued)****Results: Neutral Quasi Peak**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
3.349500	Neutral	33.3	56.0	22.7	Complied
3.574500	Neutral	33.9	56.0	22.1	Complied
3.826500	Neutral	33.8	56.0	22.2	Complied
3.835500	Neutral	33.5	56.0	22.5	Complied
4.047000	Neutral	34.4	56.0	21.6	Complied
4.285500	Neutral	34.3	56.0	21.7	Complied
4.542000	Neutral	33.5	56.0	22.5	Complied
4.546500	Neutral	33.3	56.0	22.7	Complied
4.789500	Neutral	32.6	56.0	23.4	Complied
4.798500	Neutral	32.3	56.0	23.7	Complied

**Results: Neutral Average**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
3.313500	Neutral	19.2	46.0	26.8	Complied
3.786000	Neutral	19.7	46.0	26.3	Complied
4.011000	Neutral	19.9	46.0	26.1	Complied
4.263000	Neutral	19.8	46.0	26.2	Complied
4.497000	Neutral	19.6	46.0	26.4	Complied
5.226000	Neutral	18.6	50.0	31.4	Complied

**Idle Mode AC Conducted Spurious Emissions (continued)****Live****Neutral**

*Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.*

### **5.2.2. Idle Mode Radiated Spurious Emissions**

#### **Test Summary:**

<b>Test Engineer:</b>	Andrew Edwards	<b>Test Date:</b>	23 August 2011
<b>Test Sample Serial No:</b>	SN0017941		

<b>FCC Part:</b>	15.109
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Sections 6.3 and 6.5 referencing ANSI C63.4
<b>Frequency Range:</b>	30 MHz to 1000 MHz

#### **Environmental Conditions:**

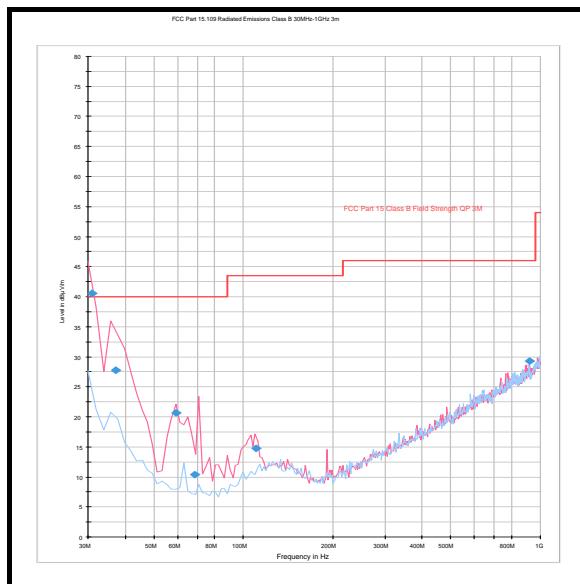
<b>Temperature (°C):</b>	27
<b>Relative Humidity (%):</b>	34

#### **Results: Quasi-Peak**

<b>Frequency (MHz)</b>	<b>Antenna Polarity</b>	<b>Level (dB<math>\mu</math>V/m)</b>	<b>Limit (dB<math>\mu</math>V/m)</b>	<b>Margin (dB)</b>	<b>Result</b>
30.875	Vertical	39.8	40.0	0.2	Complied
37.077	Vertical	27.7	40.0	12.3	Complied
59.268	Vertical	20.6	40.0	19.4	Complied
68.450	Vertical	10.4	40.0	29.6	Complied
109.973	Vertical	14.7	43.5	28.8	Complied
916.032	Vertical	29.3	46.0	16.7	Complied

#### **Note(s):**

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

**Idle Mode Radiated Spurious Emissions (continued)**

**Idle Mode Radiated Spurious Emissions (continued)****Test Summary:**

<b>Test Engineer:</b>	Andrew Edwards	<b>Test Date:</b>	23 August 2011
<b>Test Sample Serial No:</b>	S0001152		

<b>FCC Part:</b>	15.109
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Sections 6.3 and 6.6 referencing ANSI C63.4
<b>Frequency Range:</b>	1 GHz to 5 GHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	27
<b>Relative Humidity (%):</b>	34

**Results: Peak**

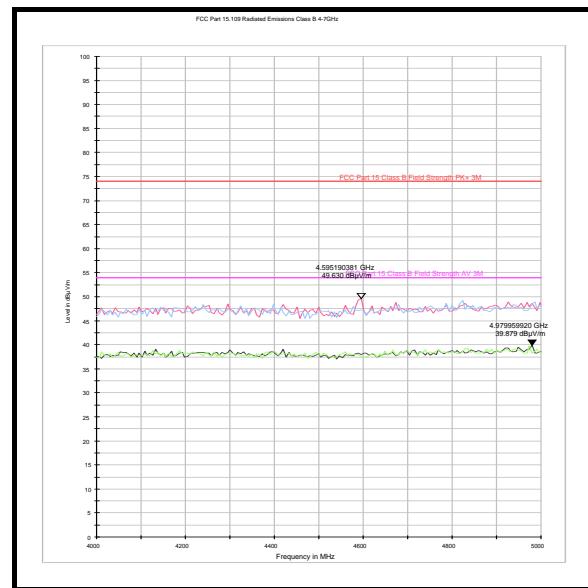
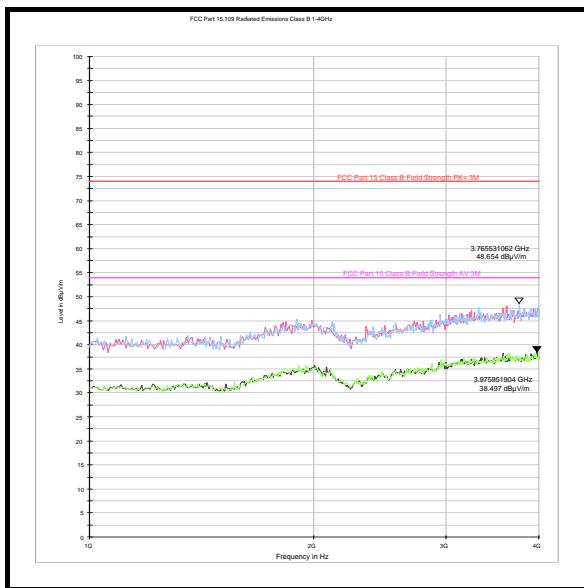
Frequency (MHz)	Antenna Polarity	Peak Level (dB $\mu$ V/m)	Average Limit (dB $\mu$ V/m)	Margin (dB)	Result
4595.190	Vertical	49.6	74.0	24.4	Complied

**Results: Average**

Frequency (MHz)	Antenna Polarity	Peak Level (dB $\mu$ V/m)	Average Limit (dB $\mu$ V/m)	Margin (dB)	Result
4979.960	Vertical	39.9	54.0	14.1	Complied

**Note(s):**

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
3. No spurious emissions were detected above the noise floor of the measuring receiver therefore the highest peak noise floor reading of the measuring receiver was recorded as shown in the table above..

**Idle Mode Radiated Spurious Emissions (continued)**

## **6. Measurement Uncertainty**

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor such that a confidence level of approximately 95% is maintained. For the purposes of this document "approximately" is interpreted as meaning "effectively" or "for most practical purposes".

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±3.25 dB
Radiated Spurious Emissions	30 MHz to 10 GHz	95%	±2.94 dB

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty the published guidance of the appropriate accreditation body is followed.

## Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
A1817	Antenna	EMCO	3115	00075694	03 Feb 2012	12
A1834	Attenuator	Hewlett Packard	8491B	10444	Calibrated before use	-
A1970	Pre-Amp	RFI	N/A	N/A	Calibrated before use	-
A553	Antenna	Chase	CBL6111A	1593	26 Mar 2012	12
G0543	Amplifier	Sonoma	310N	230801	Calibrated before use	-
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	29 May 2012	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	04 Feb 2012	12
A1830	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100668	05 Mar 2012	12
A067	LISN	Rohde & Schwarz	ESH3-Z5	890603/002	02 Jun 2012	12
M1373	Test Receiver	Rohde & Schwarz	ESIB7	890603/002	26 Aug 2011	12

**NB** In accordance with UKAS requirements all the measurement equipment is on a calibration schedule.