



## EMISSION -- TEST REPORT

Test Report File No. : **T 22734-02-16 HU** Date : June 24, 2003  
of issue

Type Designation : Liberty TR4024

Family variations : GX PAB, GX SAB, PX PAB, PX SAB, QX PAB, QX SAB, ILX-A PAB, ILX-A SAB, ILX- A Short PAB, ILX- A Short SAB, ILX-B PAB, ILX-B SAB, ILX- B Short PAB, ILX- B Short SAB

Kind of Product : Electronic Article Surveillance Detection System

Applicant : Checkpoint Systems, Inc.

Manufacturer : Pikatron Feinwerktechnik GmbH&Co. KG

Licence holder : Checkpoint Systems, Inc.

Address : 101 Wolf Drive, Thorofare  
New Jersey 08086

**Test result** accdg. to the : **Positive**  
regulation(s) at page 3

This test report with attachment consists of **70** pages.  
The test result only corresponds to the tested sample. It is not permitted  
to copy this report, in part or in full, without the permission of the test laboratory.

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FCC ID: DO4LIB24

## TEST REGULATIONS

The tests were performed according to following regulations :

- o - EN 50081-1 / 2.1991
- o - EN 50081-2 / 7.1993

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o - EN 55011	/ 3.1991	o - Group 1	o - Group 2
		o - class A	o - class B
o - EN 55014	/ 4.1993	o - Household appliances and similar	
		o - tools	
		o - Semiconductor devices	
o - EN 55014	/ A2:1990		
o - EN 55104	/ 5.1995	Category:	
o - EN 55015	/ A1:1990		
o - EN 55015	/ 12.1993		
o - EN 55022	/ 5.1995	o - class A	o - class B
o - prEN 55103-1	/ 3.1995		
o - prEN 50121-3-2	/ 3.1995		
o - EN 60601-1-2	/ 4.1994		
o - VCCI		o - class 1	o - class 2
■ - Part 15 Subpart C (15.223)			
o - Part 15 Subpart C (15.231)			

FCC ID: DO4LIB24

### **ADDRESS OF THE TEST LABORATORY**

- - MIKES BABT PRODUCT SERVICE GmbH  
Ohmstrasse 2-4  
D - 94342 Strasskirchen

o -  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### **ENVIRONMENTAL CONDITIONS**

Temperature:	<u>15-35 ° C</u>
Humidity	<u>45-60 %</u>
Atmospheric pressure	<u>860-1060 mbar</u>

### **POWER SUPPLY SYSTEM UTILIZED**

Power supply system	<input checked="" type="checkbox"/> 110V/60 Hz / 1φ	<input type="checkbox"/> V DC
	<input type="checkbox"/> 400V/50 Hz 3PE	<input type="checkbox"/> 400V/50 Hz 3NPE

### **STATEMENT OF MEASUREMENT UNCERTAINTY**

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report accdg. to UKAS LAB34 and is documented in the MIKES BABT Product Service quality system accdg. to EN ISO/IEC 17025:2000. 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.

### **SHORT DESCRIPTION OF THE EQUIPMENT UNDER TEST (EuT)**

The LIBERTY Family are an Electronic Article Surveillance System (EAS). The system detects target tags attached to merchandise. The targets resonate in the region of 8.2 MHz or 9.5MHz. When an article of merchandise is purchased, the target is deactivated which causes it to no longer resonate. The LIBERTY Family system monitors an area 3-feet on either side of the antenna in the 7.4 to 9.8 MHz range, and triggers an alarm when a non-deactivated target is detected.

Number of received/tested samples: **7 / 7**

Serial Number: **see attachment D1**

### **DEFINITIONS FOR SYMBOLS USED IN THIS TEST REPORT**

- The black square indicates that the listed condition, standard or equipment is applicable for this report.
- o Blank box indicates that the listed condition, standard or equipment was not applicable for this report.

## **MEASUREMENT PROTOCOL FOR FCC, VCCI AND AUSTEL**

### **Test Methodology**

Conducted and radiated emission testing is performed according to the procedures in International Special Committee on Radio Interference (CISPR) Publication 22 (1993), European Standard EN 55022 and Australian Standard AS 3548 (which are based on CISPR 22).

The Japanese standard, "Voluntary Control Council for Interference (VCCI) by Data Processing Equipment and Electronic Office Machines, Technical Requirements" is technically equivalent to CISPR 22 (1993). For official compliance, a conformance report must be sent to and accepted by the VCCI.

In compliance with FCC Docket 92-152, "Harmonization of Rules for Digital Devices Incorporate International Standards", testing for FCC compliance may be done following the ANSI C63.4-1992 procedures and using the FCC limits or the CISPR 22 Limits.

### **Measurement Uncertainty**

The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. These test systems have a measurement uncertainty of  $\pm 4.5$  dB. The equipment comprising the test systems are calibrated on an annual basis.

### **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 into its characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

### **General Standard Information**

The test methods used comply with CISPR Publication 22 (1993), EN 55022 (1987) and AS 3548 (1992) - "Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment" and with ANSI C63.4-1992 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

For detailed description of each measurement please refer to section test results.

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### **DISCOVERY OF WORST CASE MEASUREMENT CONDITION:**

The model Liberty TR4024 consists of 7 different versions LIBERTY GX, LIBERTY PX, LIBERTY QX, LIBERTY ILX-A, LIBERTY ILX-A Short, LIBERTY ILX-B, LIBERTY ILX-B Short.

All 7 versions are technically identical expect the following items:

- different type of antennas GX, PX, QX, ILX-A, ILX-A Short, ILX-B, ILX-B Short
- two different type of power supply units ( Worldwide 224 Module and Worldwide 425 Module)
- ILX-A, ILX-A Short have additional a matching board. For more detailed information,
- please see technical documentation set.

To find out the worst case conditions for the complete measurements the following tests have been performed:

- Measurement of the conducted emissions of the 7 versions. This measurement have been performed in order to find out the maximum spurious emissions of the transmitter (antenna).
- Measurement of the radiated fieldstrength of the operating frequency of the 7 versions. This measurement have been performed in order to find out the transmitter (antenna) with the maximum fieldstrength.
- Measurement of the radiated spurious emissions of the 7 versions. This measurement have been performed in order to find out the maximum spurious emissions of the transmitter (antenna).

#### **Summarizing:**

- ⇒ maximum conducted emission: LIBERTY PX (difference to LIBERTY GX: 3.5 dB)
- ⇒ maximum fieldstrength: LIBERTY ILX-B (difference to LIBERTY GX: 0.2 dB)
- ⇒ maximum spurious emission: LIBERTY GX
- ⇒ bandwith plots: no essential differences on the 7 versions

Based on this test results, the measurements have been performed completely on the version: LIBERTY GX with power supply worldwide 425 Module. This test results are documented in the following sections of the testreport.

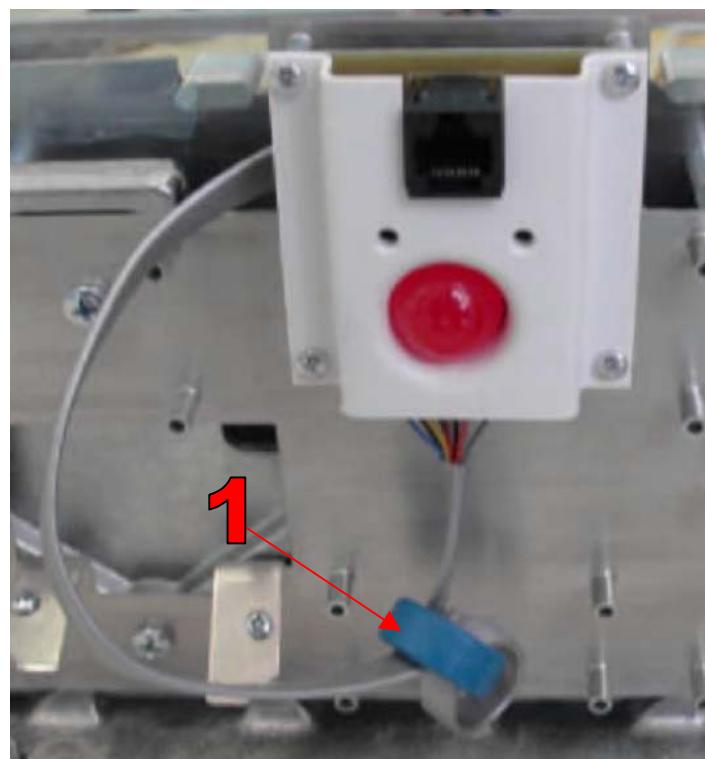
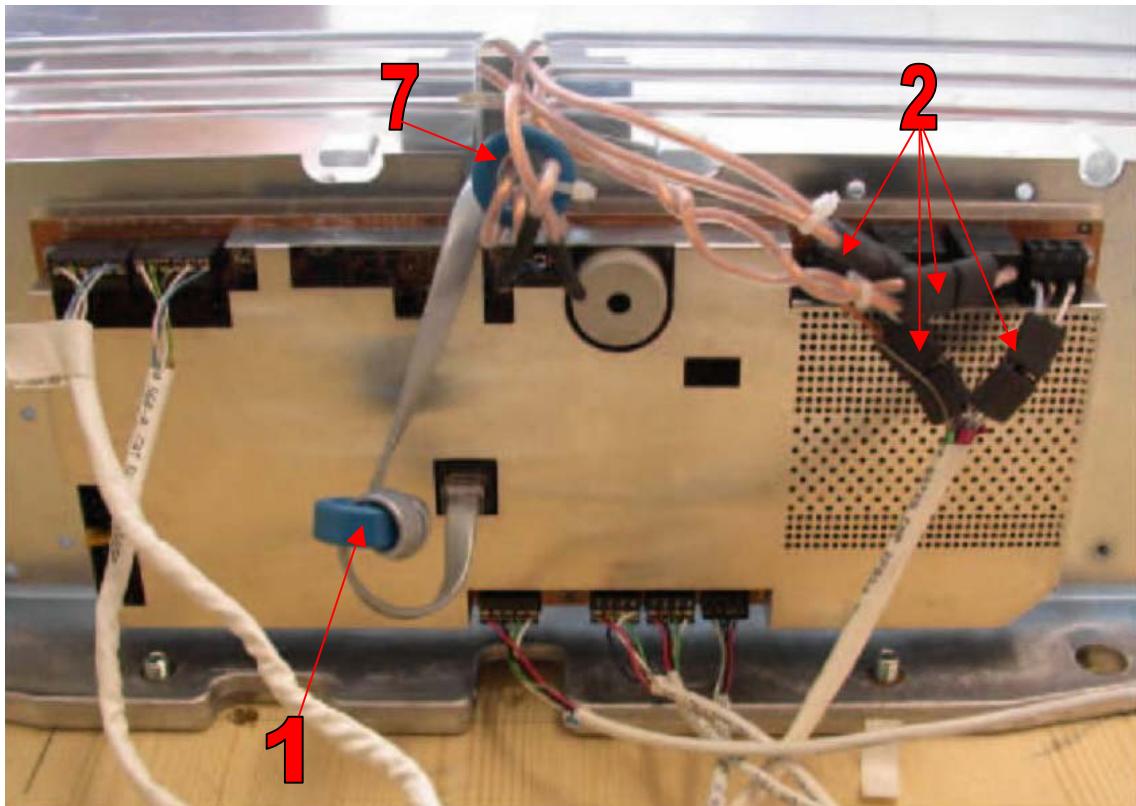
FCC ID: DO4LIB24

**Ferrite Locations:**

1. Fair Rite P/N 7118986 (Order No B64290-L618-X35) – Add 1 on the ends of the patch board cable with three turns through the ferrite.
2. Fair Rite P/N 734020 (Order No 2865-000-202) – Add each 2 on the ends of the Tx1, Tx2, RX3 and RX4 connection with one turn through the ferrite.
3. Fair Rite P/N 734020 (Order No 2865-000-202) – Add 1 on the end of the lamp connection with two turns through the ferrite.
4. Fair Rite P/N 284760 (Order No 0443806406) – Add 1 on each data communication cables with four turns through the ferrite.
5. Fair Rite P/N 284760 (Order No 0443806406) – Add 1 on each sync cable with three turns through the ferrite.
6. Fair Rite P/N 284760 (Order No 0443806406) – Add 1 on each data communication cables with three turns through the ferrite.
7. Fair Rite P/N 7118986 (Order No B64290-L618-X35) – Add 1 on the end of L+ of the lamp connection with 4 turns through the ferrite.

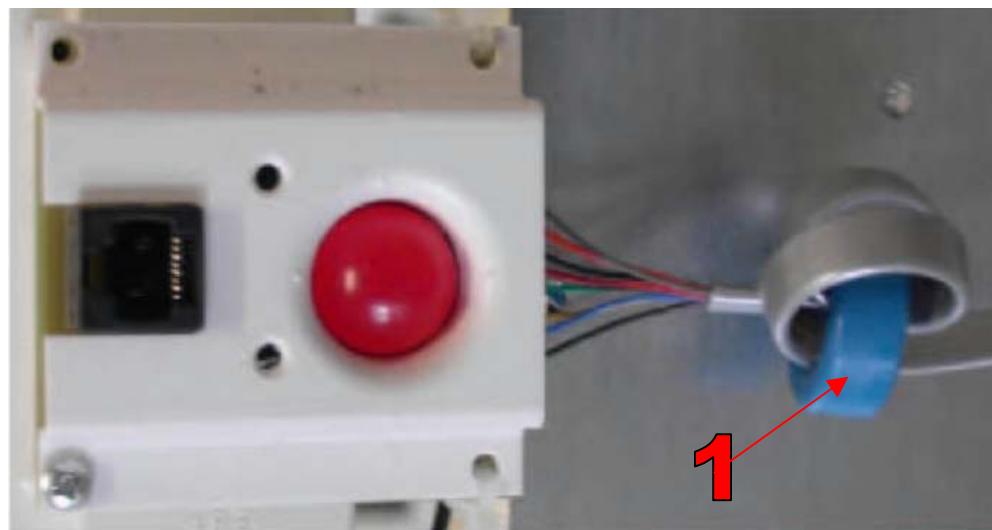
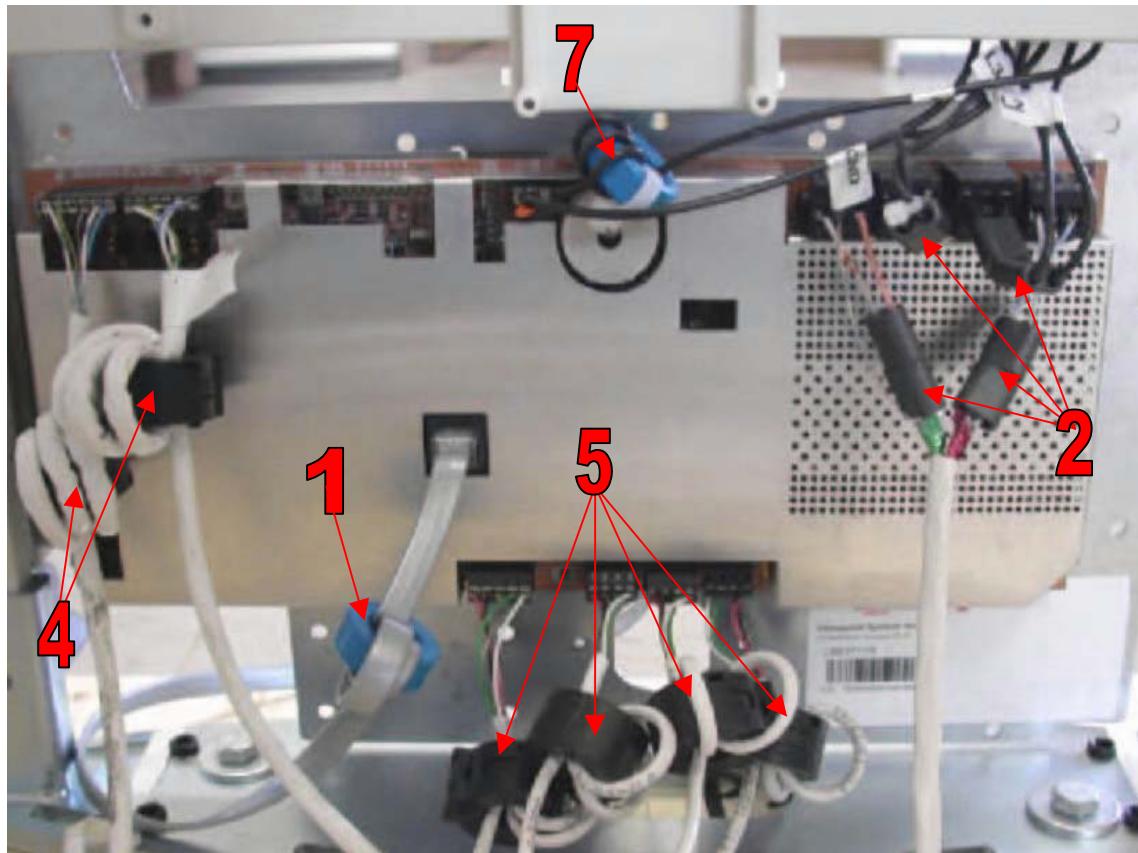
FCC ID: DO4LIB24

Liberty GX:



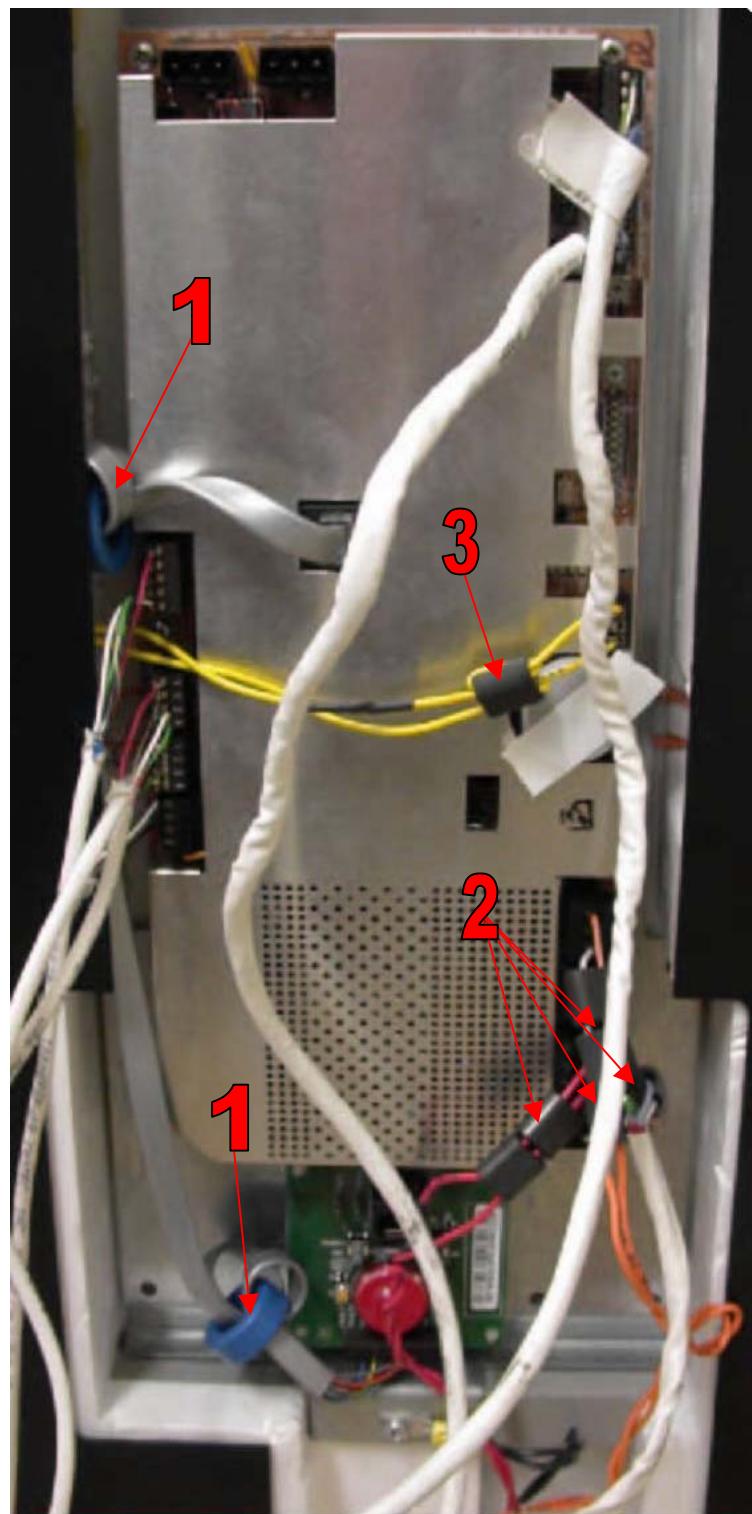
FCC ID: DO4LIB24

Liberty PX:



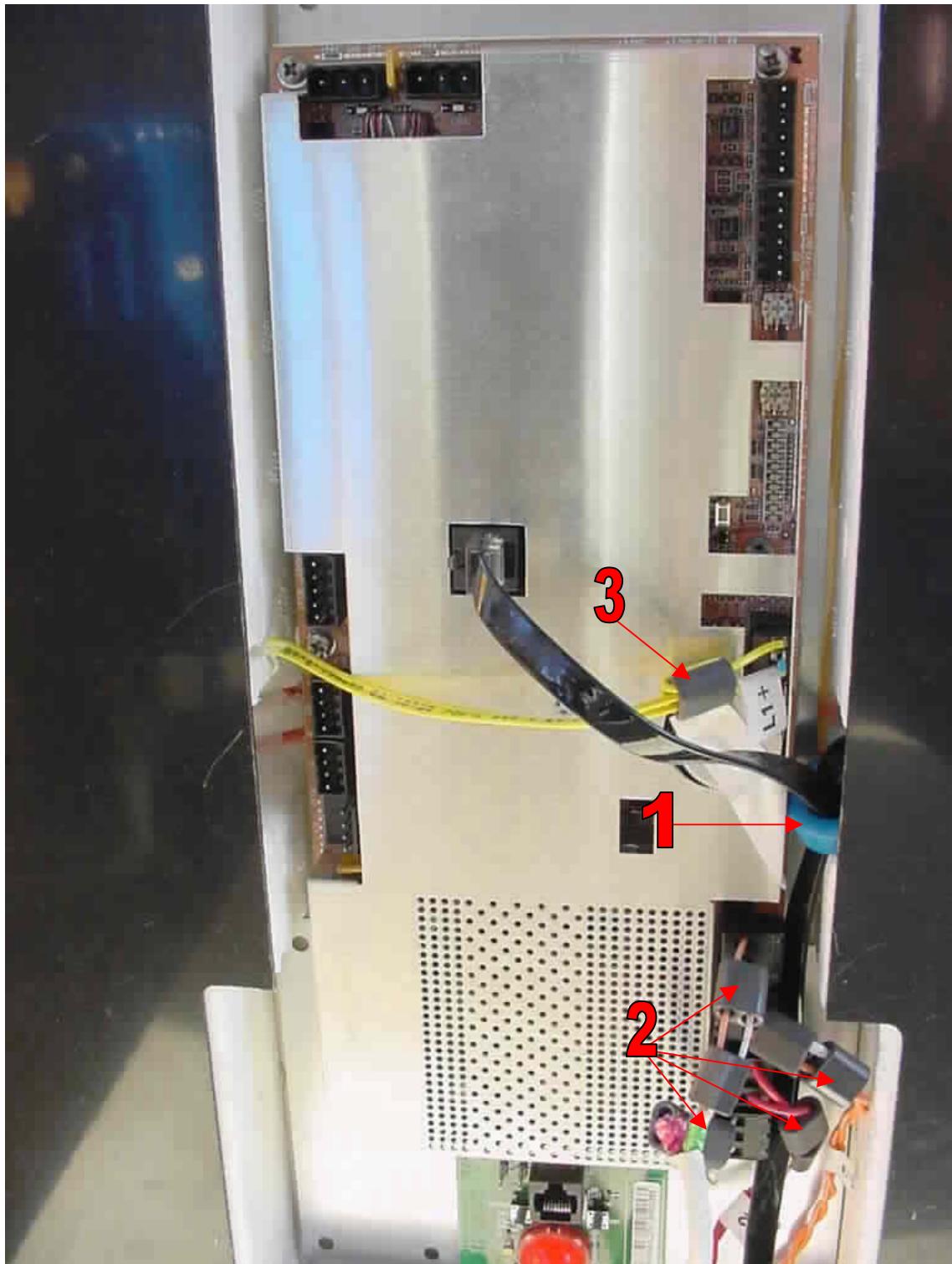
FCC ID: DO4LIB24

Liberty ILX-B Short:



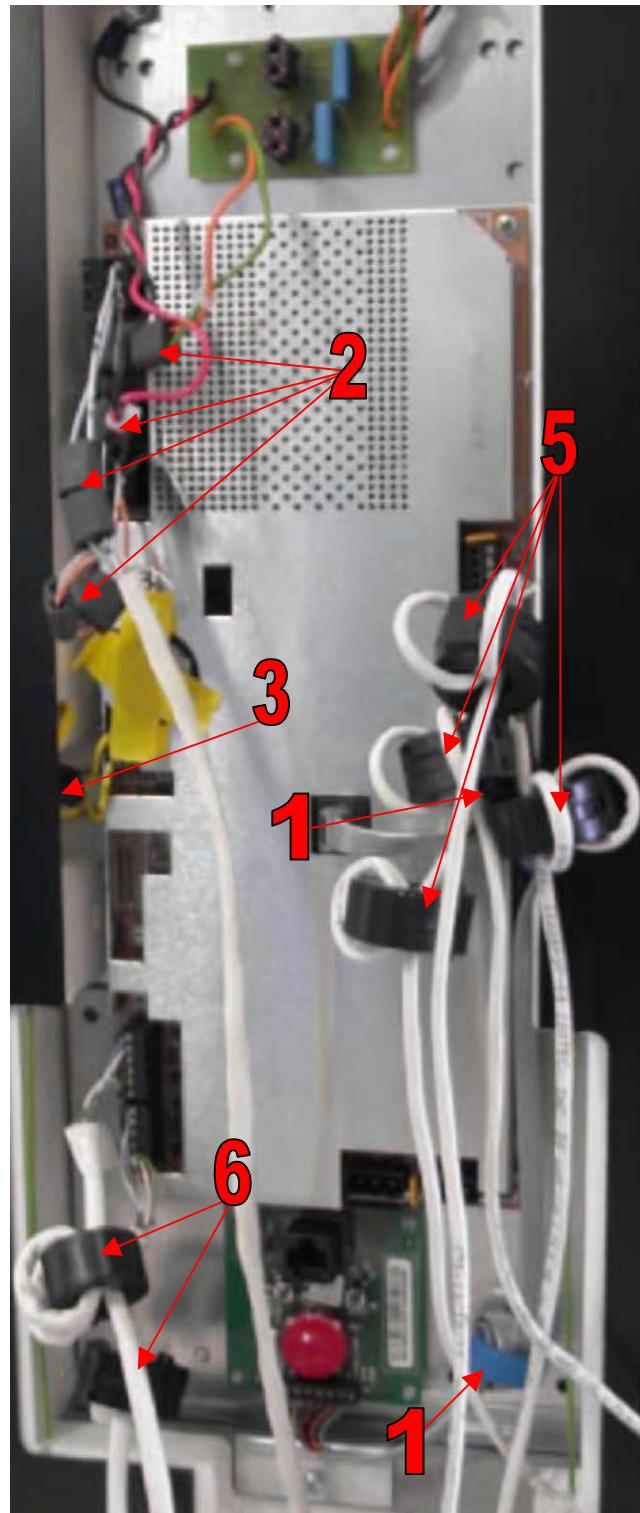
FCC ID: DO4LIB24

Liberty ILX-B:



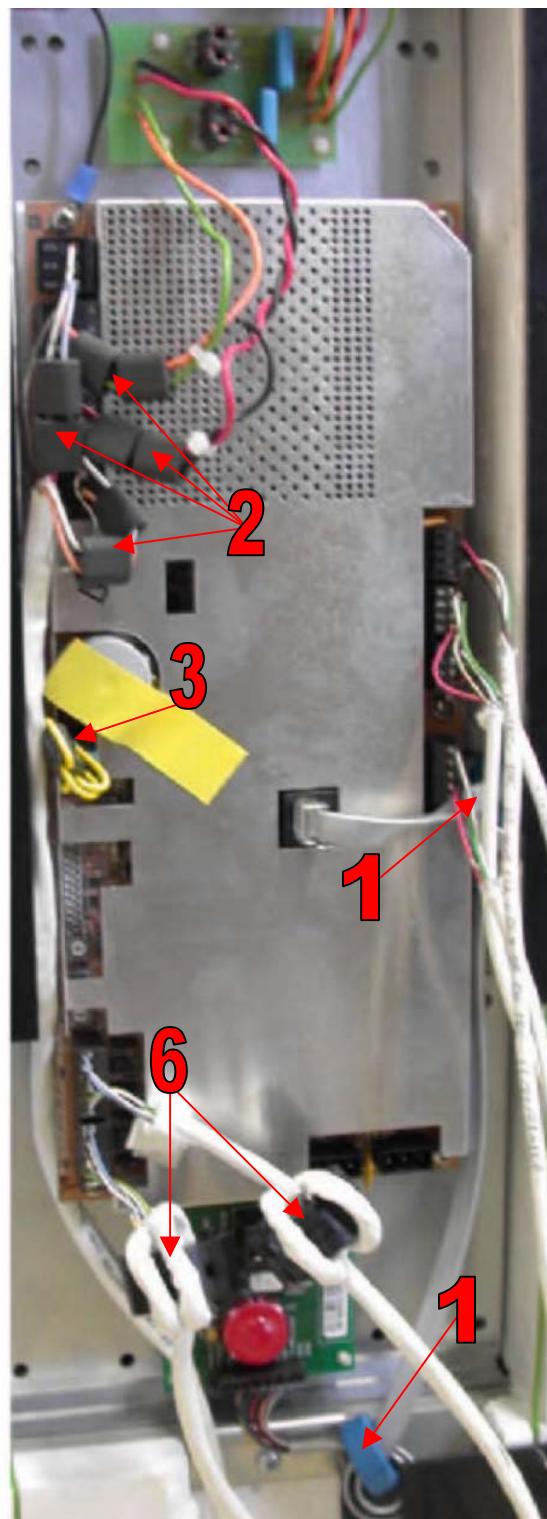
FCC ID: DO4LIB24

Liberty ILX-A Short:



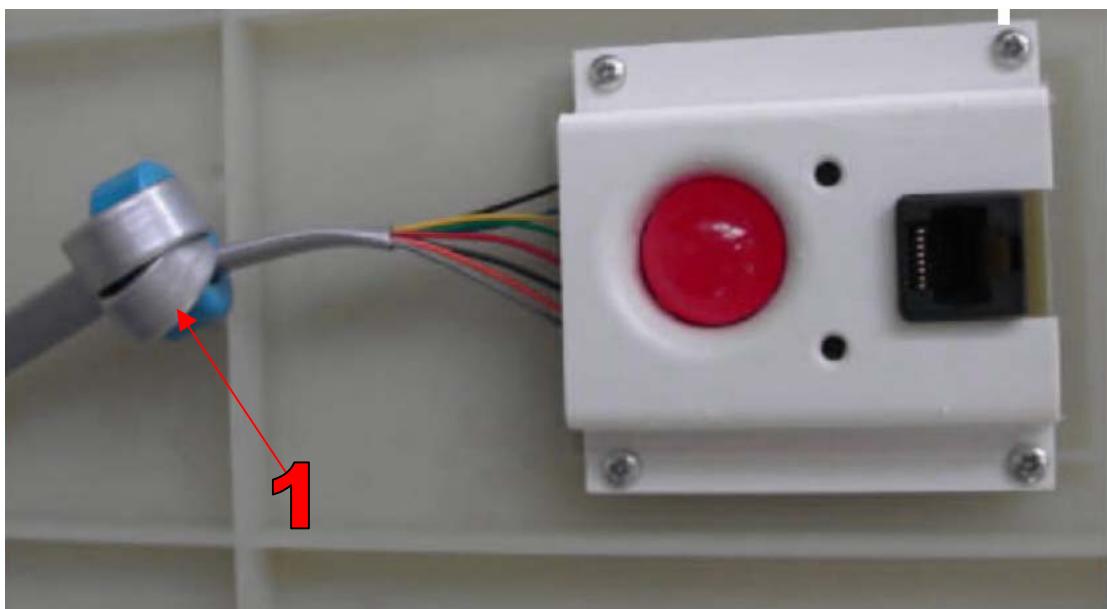
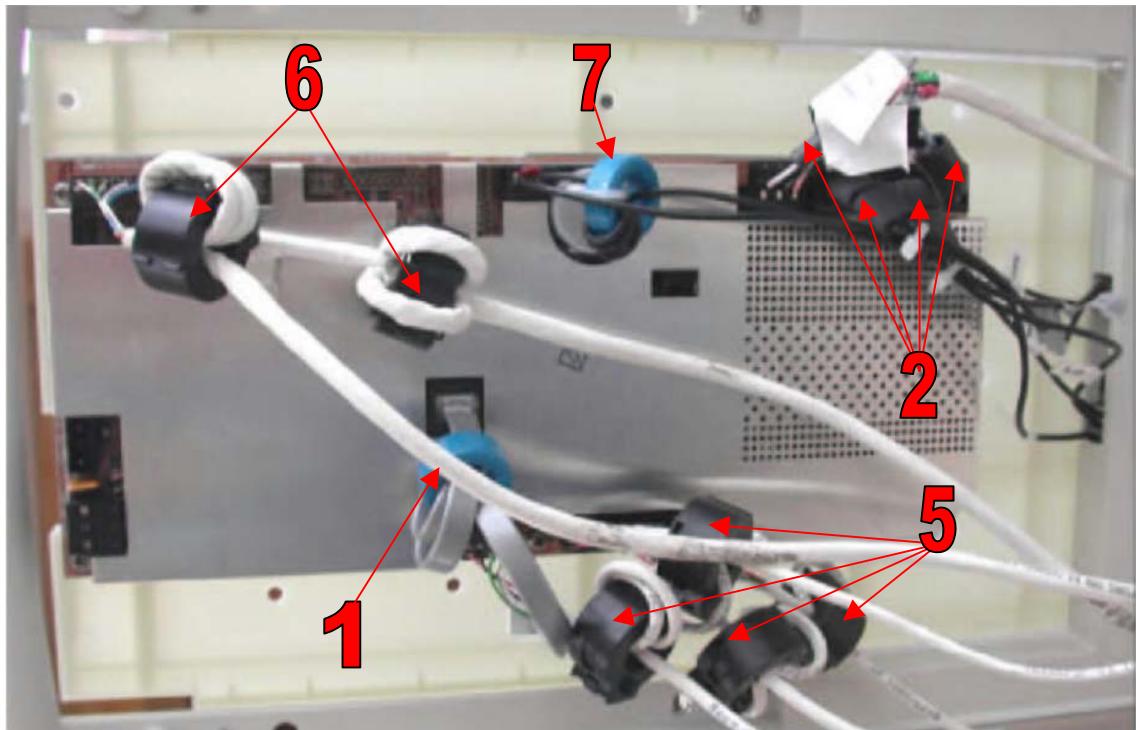
FCC ID: DO4LIB24

Liberty ILX A:



FCC ID: DO4LIB24

Liberty QX:



**TEST RESULT****CONDUCTED EMISSIONS - 10/150 kHz - 30 MHz**

- Test not applicable

**Test location :**

- Shielded room no. 1
- Shielded room no. 2
- Shielded room no. 3
- Shielded room no. 4
- Shielded room no. 5
- Shielded room no. 6
- Shielded room no. 7
- Anechoic chamber
- Full compact chamber

For test instruments and test accessories used please see attachment B A4

**Description of Measurement**

The final level, expressed in dB $\mu$ V, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the FCC Limit or to the CISPR limit, which is equivalent to the Australian AS 3548 limit.

To convert between dB $\mu$ V and  $\mu$ V, the following conversions apply:

$$\begin{aligned} \text{dB}\mu\text{V} &= 20(\log \mu\text{V}) \\ \mu\text{V} &= \text{Inverse log}(\text{dB}\mu\text{V}/20) \end{aligned}$$

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EuT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection, and a Line Impedance Stabilization Network (LISN), with 50 $\Omega$ /50  $\mu$ H (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeter's above the floor and is positioned 40 centimeter's from the vertical ground plane (wall) of the screen room. If the minimum passing margin appears to be less than 20 dB with a peak mode measurement, the emissions are remeasured using a tuned receiver with quasi-peak and average detection and recorded on the data sheets.

**Test result:**

The requirements are

**■ - MET**

**o - NOT MET**

Min. limit margin 14.8 dB at 7.47 MHz

Max. limit exceeding    dB at    MHz

Remarks: The limits are met.

For more detailed informations, please see page A1 to A2.

## **SPURIOUS EMISSION**

Spurious emissions from the EuT are measured in the frequency range of 9 kHz to 30 MHz using a tuned receiver and a shielded loop antenna. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. Measurements have been made in all three orthogonal axes and the shielded loop antenna was rotated to locate the maximum of the emissions.

Spurious emissions from the EuT are measured in the frequency range of 30 MHz to 10 times the highest used frequency using a tuned receiver and appropriate broadband linearly polarized antennas.

Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and peak detection, remeasurement of results which may be critical will be repeated in average mode. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarization's and the EuT are rotated 360 degrees.

### **SPURIOUS EMISSION (MAGNETIC FIELD) 9 kHz - 30 MHz**

**- Test not applicable**

- in a shielded room
- at a non - reflecting open-site and
- in a test distance of 3 meters.
- in a test distance of 30 meters.

For test instruments and test accessories used please see attachment B SER1

### **Description of Measurement**

The final level, expressed in dB $\mu$ V/m, is arrived at by taking the reading from the EMI receiver (Level dB $\mu$ V) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has to be compared with the relevant FCC limit.

The resolution bandwidth during the measurement is as follows:

9 kHz – 150 kHz: ResBW: 200 Hz

150 kHz – 30 MHz: ResBW: 10 kHz

Example:

Frequency (MHz)	Level (dB $\mu$ V)	+	Factor (dB)	=	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	=	Delta (dB)
1.705	5	+	20	=	25	30	=	5

**Testresult in detail:**

Liberty GX – 8.2 MHz

Distance: 30m

Frequency [MHz]	L: PK [dB $\mu$ V]	L: AV [dB $\mu$ V]	L: QP [dB $\mu$ V]	Correct. [dB]	L: PK [dB $\mu$ V/m]	L: AV [dB $\mu$ V/m]	L: QP [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]
-	-	-	-	20	-	-	-	-

Liberty GX – 8.2 MHz

Distance: 3m

Frequency [MHz]	L: PK [dB $\mu$ V]	L: AV [dB $\mu$ V]	L: QP [dB $\mu$ V]	Correct. [dB]	L: PK [dB $\mu$ V/m]	L: AV [dB $\mu$ V/m]	L: QP [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]
16.4	37.5	12.0	32.1	20	57.5	32.0	52.1	69.5
24.6	17.2	-1.0	11.5	20	37.2	19.0	31.5	69.5

Liberty GX – 9.5 MHz

Distance: 30m

Frequency [MHz]	L: PK [dB $\mu$ V]	L: AV [dB $\mu$ V]	L: QP [dB $\mu$ V]	Correct. [dB]	L: PK [dB $\mu$ V/m]	L: AV [dB $\mu$ V/m]	L: QP [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]
-	-	-	-	20	-	-	-	-

Liberty GX – 9.5 MHz

Distance: 30m

Frequency [MHz]	L: PK [dB $\mu$ V]	L: AV [dB $\mu$ V]	L: QP [dB $\mu$ V]	Correct. [dB]	L: PK [dB $\mu$ V/m]	L: AV [dB $\mu$ V/m]	L: QP [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]
19.0	37.5	11.3	31.8	20	57.5	51.3	51.8	69.5

The requirements are

**■ - MET****o - NOT MET**

Min. limit margin

15.2 dB at 16.4 MHz

Max. limit exceeding

dB at MHz

Remarks: The limits are kept.

FCC ID: DO4LIB24

**SPURIOUS EMISSIONS (electric field) 30 MHz - 1000 MHz**

- Test not applicable

**Test location :**

- Open-site 1
- Open-site 2
- 3 meters
- 10 meters
- 30 meters

For test instruments and test accessories used please see attachment B SER2

**Description of Measurement**

The final level, expressed in dB $\mu$ V/m, is arrived by taking the reading from the EMI receiver (Level dB $\mu$ V) and adding the correction factors and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factors are stored. This result then has the FCC or CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets at this page. The CISPR 22 limit is equivalent to the Australian AS 3548 limit.

Example:

Frequency (MHz)	Level (dB $\mu$ V)	+	Factor (dB)	=	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	=	Delta (dB)
719	75	+	32.6	=	107.6	110	=	-2.4

**Testresult in detail:**

Liberty GX

Frequency [MHz]	L: PK [dB $\mu$ V]	L: AV [dB $\mu$ V]	L: QP [dB $\mu$ V]	Correct. [dB]	L: PK [dB $\mu$ V/m]	L: AV [dB $\mu$ V/m]	L: QP [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]
33.92	27.4	-5.3	12.7	19.2	46.6	13.9	31.9	40
43.47	32.6	-1.1	22.6	14.9	47.5	13.8	37.5	40
49.05	36.4	2.1	21.2	11.8	48.2	13.9	33.0	40
237.48	22.3	-8.8	15.4	23.3	45.6	14.5	38.7	46
250.00	19.1	8.7	18.6	23.0	42.1	31.7	41.6	46
331.25	23.9	20.9	16.5	22.0	45.9	42.9	38.5	46
406.25	24.0	17.3	19.4	25.5	49.5	42.8	44.9	46
456.25	21.9	15.2	13.2	26.5	48.4	41.7	39.7	46

**Test result:**

The requirements are

- MET

- NOT MET

Min. limit margin

1.1 dB at 406.25 MHz

Max. limit exceeding

dB at MHz

Remarks: The limits are met.

**SPURIOUS EMISSION 1 GHz - 18 GHz**

■ - Test not applicable
-------------------------

**Testlocation :**

- - Open-site 1
- - Open-site 2
- - Anechoic chamber
- - Full compact chamber
  
- - 1 meters
- - 3 meters
- - 10 meters

For test instruments and test accessories used please see attachment B SER3

**Description of Measurement**

The final level, expressed in dB $\mu$ V/m, is arrived by taking the reading from the Spectrumanalyzer in dB $\mu$ V and adding the correction factors of the test setup incl. cables.

Example of the correction value at 1.8 GHz

Level reading at 1.8 GHz	Correction EMCO 3115	correction Amplifier AWT 4534 + cable	Correction factor (summarized)	corrected level
56 dB $\mu$ V	+27.3 dB	-41.2 dB	-15.8 dB	42.1 dB $\mu$ V/m

**Testresult in detail:**

Frequency [MHz]	L: PK [dB $\mu$ V]	L: AV [dB $\mu$ V]	L: QP [dB $\mu$ V]	Correct. [dB]	L: PK [dB $\mu$ V/m]	L: AV [dB $\mu$ V/m]	L: QP [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]

**Testresult**

The requirements are

**o - MET**

**o - NOT MET**

Min. limit margin

\_\_\_\_\_ dB at \_\_\_\_\_ MHz

Max. limit exceeding

\_\_\_\_\_ dB at \_\_\_\_\_ MHz

Remarks: \_\_\_\_\_ Not applicable

(Transmission frequencies: 8.2 MHz, 9.5 MHz)

**FIELD STRENGTH OF THE FUNDAMENTAL WAVE****o - Test not applicable**

- - Open-site 1
- o - Open-site 2
- - 3 meters
- o - 10 meters
- - 30 meters

For test instruments and test accessories used please see attachment B CPR1

**Description of Measurement**

The final level, expressed in dB $\mu$ V/m, is arrived by taking the reading from the EMI receiver (Level dB $\mu$ V) and adding the correction factors and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factors are stored. This result then has the FCC or CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets at this page. The CISPR 22 limit is equivalent to the Australian AS 3548 limit.

Example:

$$\begin{array}{ccccccccc}
 \text{Frequency} & \text{Level} & + & \text{Factor} & = & \text{Level} & - & \text{Limit} & = & \text{Delta} \\
 (\text{MHz}) & (\text{dB}\mu\text{V}) & & (\text{dB}) & & (\text{dB}\mu\text{V}/\text{m}) & & (\text{dB}\mu\text{V}/\text{m}) & & (\text{dB}) \\
 315 & 45 & + & 22.5 & = & 67.5 & - 74.3 & = & -6.8
 \end{array}$$

**Testresult in detail:**

Liberty GX – 8.2 MHz

Distance: 30m

Frequency [MHz]	L: PK [dB $\mu$ V]	L: AV [dB $\mu$ V]	L: QP [dB $\mu$ V]	Correct. [dB]	L: PK [dB $\mu$ V/m]	L: AV [dB $\mu$ V/m]	L: QP [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]
8.2	39.8	22.1	33.9	20	59.8	42.1	53.9	60

Liberty GX – 9.5 MHz

Distance: 30m

Frequency [MHz]	L: PK [dB $\mu$ V]	L: AV [dB $\mu$ V]	L: QP [dB $\mu$ V]	Correct. [dB]	L: PK [dB $\mu$ V/m]	L: AV [dB $\mu$ V/m]	L: QP [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]
9.5	39.6	21.6	33.6	20	59.6	41.6	53.6	60

**Testresult**

The requirements are

**■ - MET**

**o - NOT MET**

Min. limit margin

0.2 dB at 8.2 MHz

Max. limit exceeding

       dB at        MHz

Remarks:        The limits are kept.

**CONDUCTED POWER OF THE FUNDAMENTAL WAVE MEASURED ON THE  
ANTENNA TERMINALS**

- Test not applicable

**Testlocation :**

- Shielded room no. 1
- Shielded room no. 2
- Shielded room no. 3
- Shielded room no. 4
- Shielded room no. 5
- Shielded room no. 6
- Shielded room no. 7
- Anechoic chamber
- Full compact chamber
- Climatic test chamber VLK

For test instruments and test accessories used please see attachment B CPC2

**Description of Measurement**

The conducted power of the fundamental wave measured on the antenna terminals in a climatic test chamber. The antenna jack was connected to the input of a communication test receiver. The internal batteries have been removed also and a variable DC power supply was used instead. The measurements have been made with the EuT unmodulated. During the test the supply voltage and the temperature were varied and applied simultaneously. The lower supply voltage was given by the manufacturer. In case the equipment was switching off before, the switch off voltage was used instead.

**Testresult**

The requirements are

**o - MET**

**o - NOT MET**

<b>Frequency range of equipment</b>								
<b>Temperature °C</b>	<b>DC supply voltage V</b>	<b>Power dBm</b>						
-30								
-20								
-10								
0								
+10								
+20								
+30								
+40								
+50								

Remarks: Not applicable

FCC ID: DO4LIB24

**EQUIPMENT UNDER TEST**

**Operation - mode of the EuT.:**

The equipment under test was operated during the measurement under following conditions:

- o - Standby
- o - Test program (H - Pattern)
- o - Test program (colour bar)
- - Test program (customer specific)
  - Operating mode. A security tag was swept through the field of the Liberty GX
  - antenna every 2 seconds to initiate a verification cycle.

**Configuration of the equipment under test:** see attachment D

**Following periphery devices and interface cables were connected during the measurement:**

■ - PSU (Power supply unit)	Type : <u>WORLDWIDE 425 MODULE</u>
■ - IMX 04	Type : <u>Filtered and ferrite coated mains cords</u>
o -	Type : _____
■ - unshielded power cable	
o - unshielded cables	
o - shielded cables	MBPS.No.:
■ - customer specific cables	
o -	
o -	

## S U M M A R Y

### **GENERAL REMARKS:**

The product Liberty GX (TR4024 family) has been tested on the following frequency:

TX-Mode: 8.2 MHz  
9.5 MHz

This model was defined as the worst condition model of all 7 versions:

Liberty GX PAB, GX SAB,  
Liberty PX PAB, PX SAB,  
Liberty QX PAB, QX SAB, I  
Liberty LX-A PAB, ILX-A SAB,  
Liberty ILX- A Short PAB, ILX- A Short SAB,  
Liberty ILX-B PAB, ILX-B SAB,  
Liberty ILX- B Short PAB, ILX- B Short SAB

the bandwidth requirements are kept.

### **FINAL JUDGEMENT:**

The requirements according to the technical regulations and tested operation modes are

- - met.
- - **not** met.

The Equipment Under Test

- - **Fulfils** the general approval requirements according to page 3.
- - **Does not** fulfil the general approval requirements according to page 3.

Date of receipt of test sample : accdg. to storage record of MBPS

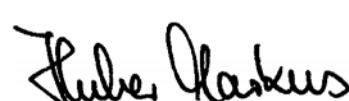
Testing Start Date : January 13, 2003

Testing End Date : January 24, 2003

Checked by:

  
i. A. Günter Mikes  
Dipl.Ing.(FH)

Tested by:

  
Markus Huber

FCC ID: DO4LIB24

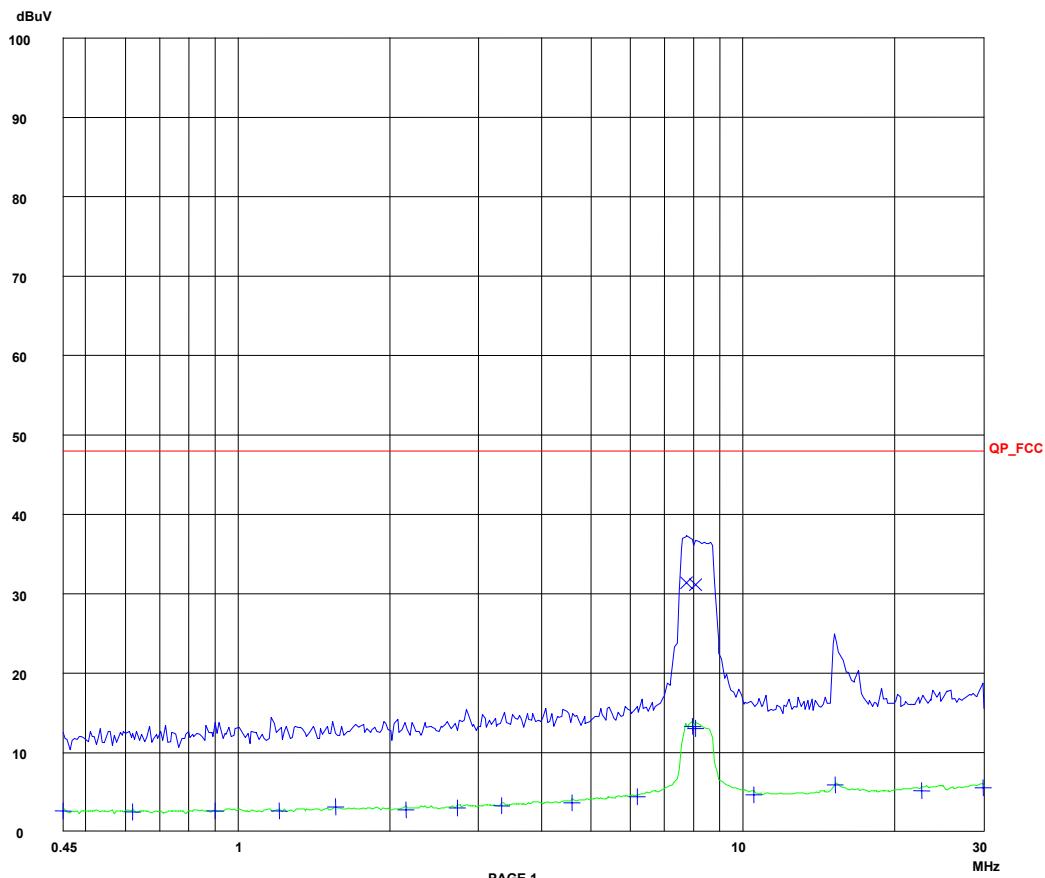
## Conducted

EUT: Liberty GX with 4024 electronic  
Manuf: Checkpoint Systems, Inc.  
Op Cond: TX (8.2 MHz)  
Operator: KJ  
Test Spec: FCC Part 15.207  
Comment: L1 - PDA Settings = 18  
W425 / IMX04 power cord  
File name: CH\_7\_L1.RES

Scan Settings (1 Range)  
|----- Frequencies -----||----- Receiver Settings -----|  
Start Stop Step IF BW Detector M-Time Atten Preamp  
450k 30M 5k 9k PK+AV 20ms AUTO LN OFF

Final Measurement: x QP / + AV

Meas Time: 1 s  
Subranges: 16  
Acc Margin: 15dB



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MIKES BABT PRODUCT SERVICE GmbH Ohmstrasse 2-4 94342 Strasskirchen Tel.:+9424-9407-0 Fax:+9424-9407-60 Rev. No. 9.2

FCC ID: DO4LIB24

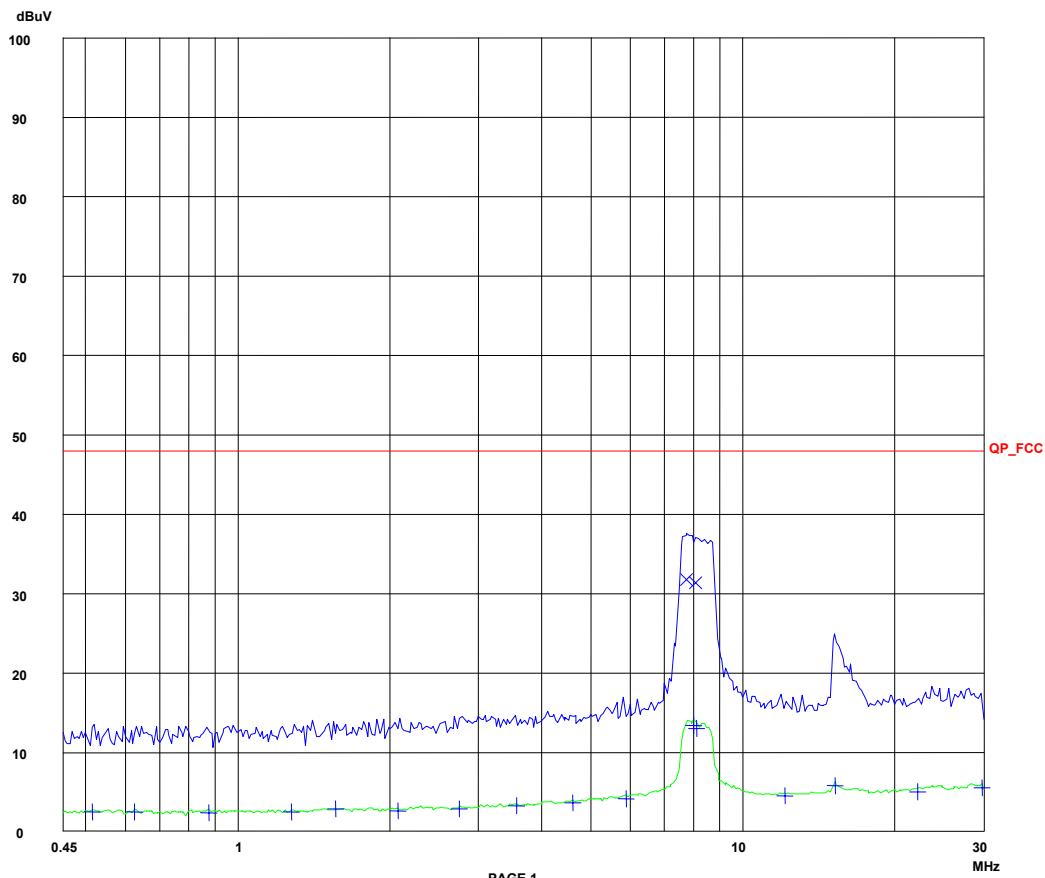
## Conducted

EUT: Liberty GX with 4024 electronic  
Manuf: Checkpoint Systems, Inc.  
Op Cond: TX (8.2 MHz)  
Operator: KJ  
Test Spec: FCC Part 15.207  
Comment: N - PDA Settings = 18  
W425 / IMX04 power cord  
File name: CH\_7\_N.RES

Scan Settings (1 Range)  
|----- Frequencies -----||----- Receiver Settings -----|  
Start Stop Step IF BW Detector M-Time Atten Preamp  
450k 30M 5k 9k PK+AV 20ms AUTO LN OFF

Final Measurement: x QP / + AV

Meas Time: 1 s  
Subranges: 16  
Acc Margin: 15dB

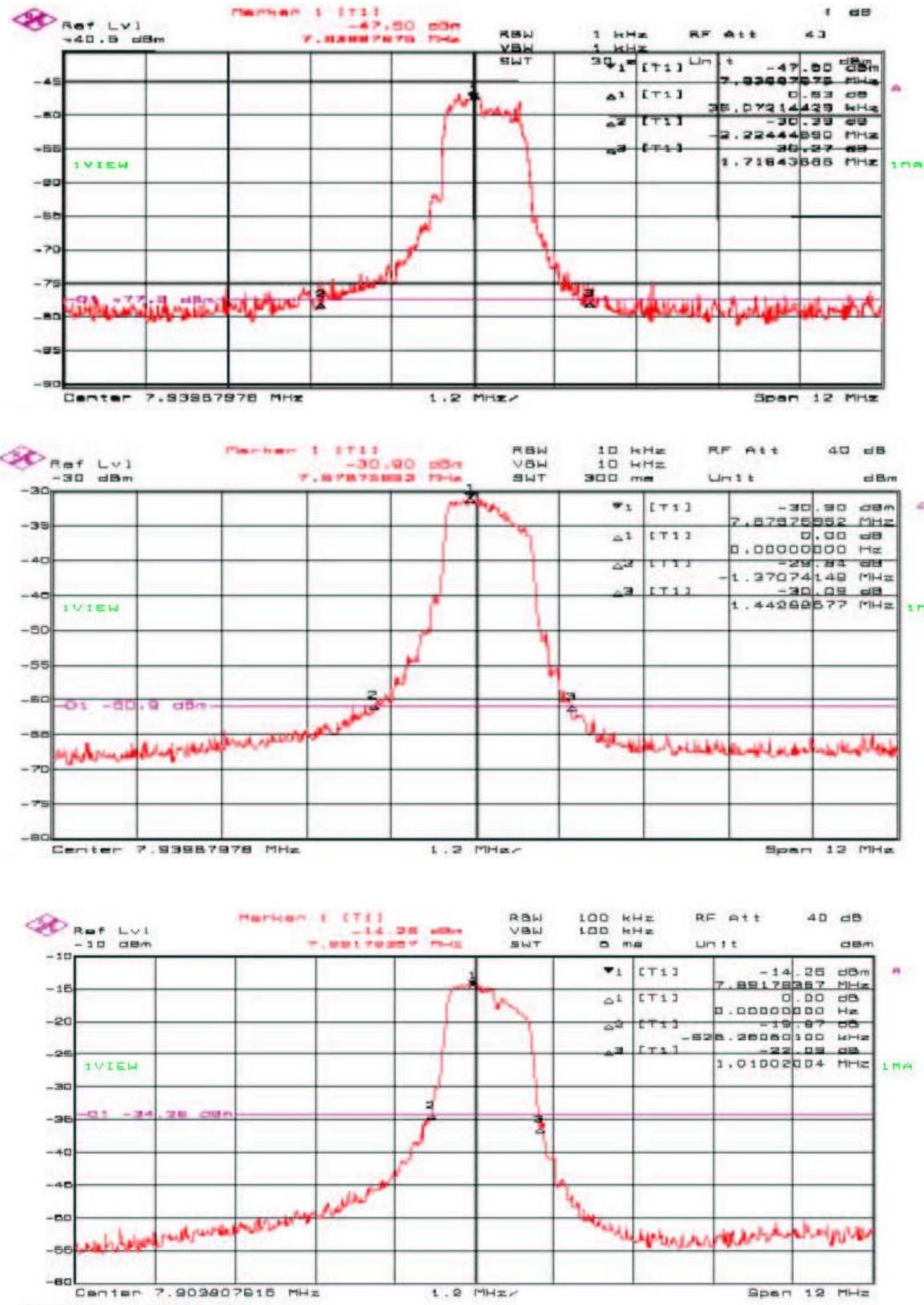


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FCC ID: DO4LIB24

## Bandwidth plots

Liberty GX – TX 8.2MHz:

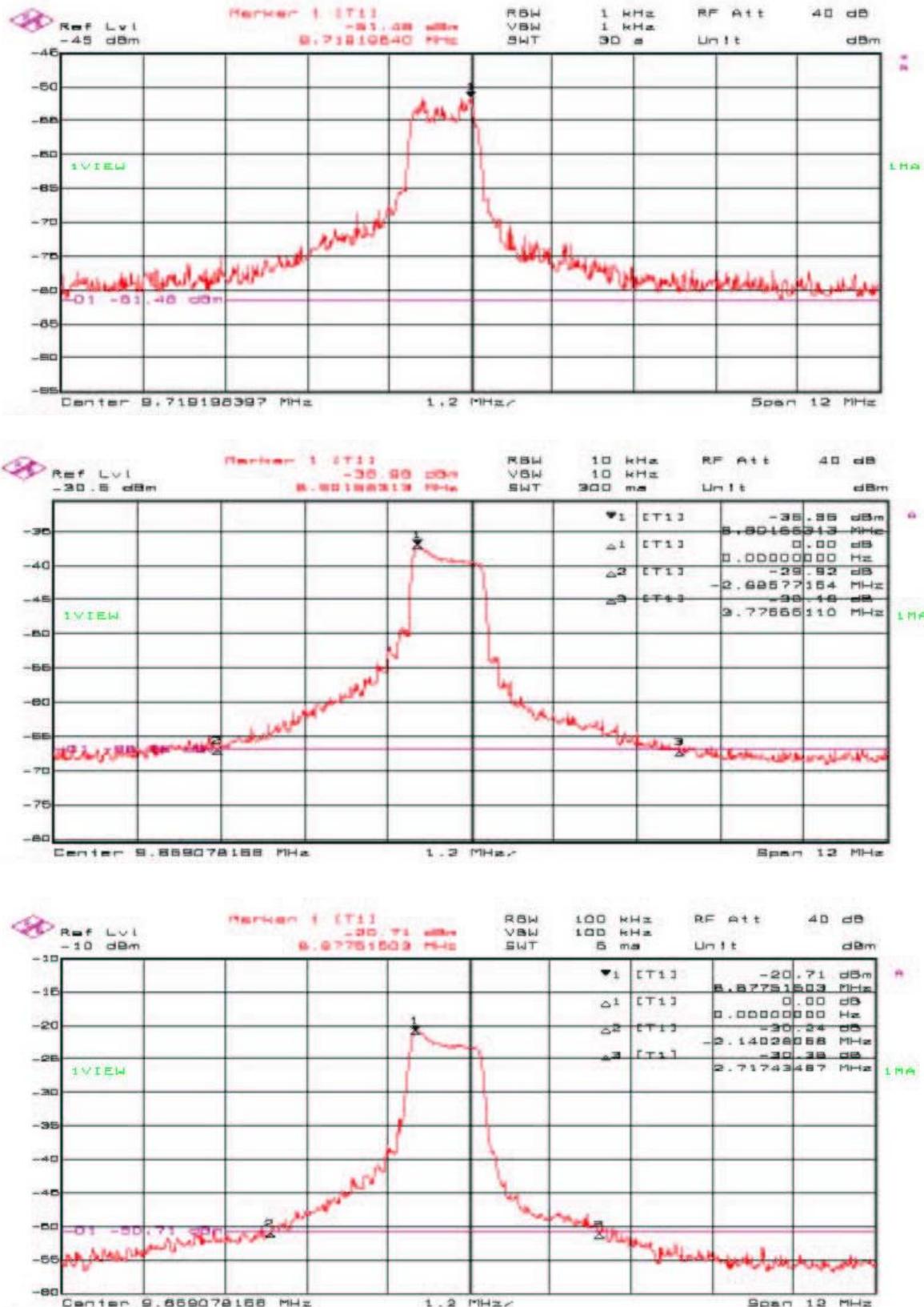


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FCC ID: DO4LIB24

## Bandwidth plots

Liberty GX – TX 9.5MHz:



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Test Report No: T 22734-02-16 HU  
 Beginning of Testing: 13 Januar 2003  
 End of Testing: 24 Januar 2003

## Attachment : B

### List of Test Equipment

All test instruments used, in addition to the test accessories, are calibrated and verified regularly.

Test ID	Model Type	Kind of Equipment	Manufacturer	Equipment No.
A4	SP 103 3.5-60 RF Cable ESH 2 - Z 5 ESH 3 - Z 2 HF 1/2 inch NM-214-0200-NM ESCS-30	Convertor 220 V / 110 V RF Cable 1 m LISN Pulse Limiter RF Cable Test Cable Test Receiver	MIKES PRODUCT SERVICE Rosenberger HF-Technik Rohde & Schwarz München Rohde & Schwarz München Rosenberger HF-Technik MIKES PRODUCT SERVICE Rohde & Schwarz München	04-07/54-91-053 04-07/60-02-016 04-07/60-90-033 04-07/60-90-140 04-07/60-99-024 04-07/60-99-060 04-07/63-99-001
CPR1	N-10-BNC FMZB 1516 ESCS-30	RF Cable Antenna Test Receiver	MIKES PRODUCT SERVICE Schwarzbeck Mess-Elektronik Rohde & Schwarz München	04-07/60-02-011 04-07/62-90-018 04-07/63-99-001
SER1	N-10-BNC FMZB 1516 ESCS-30	RF Cable Antenna Test Receiver	MIKES PRODUCT SERVICE Schwarzbeck Mess-Elektronik Rohde & Schwarz München	04-07/60-02-011 04-07/62-90-018 04-07/63-99-001
SER2	Controller for Turntable HCC RG 214/U HF 7/8 inch HF 7/8 inch HF 7/8 inch KR - 200 VULB - 9165 ESVP ESVP-EZM Turntable 5 m Antenna Mast	Controller Controller Ant.-Mast RF Cable 2 m Antenna Cable 13 m Antenna Cable 20 m Antenna Cable 40 m Coax Antenna Switch Super Broadband Antenn Test Receiver Spectrum Monitor Turntable Antenna Mast	EMISYS Vertriebs GmbH Rohde & Schwarz München Huber+Suhner Huber+Suhner Huber+Suhner Huber+Suhner Rosenberger HF-Technik Schwarzbeck Mess-Elektronik Rohde & Schwarz München Rohde & Schwarz München EMISYS Vertriebs GmbH Rohde & Schwarz München	04-07/59-89-157 04-07/59-97-001 04-07/60-89-463 04-07/60-99-001 04-07/60-99-002 04-07/60-99-003 04-07/60-99-004 04-07/62-00-001 04-07/63-89-008 04-07/74-86-016 04-07/92-88-155 04-07/92-97-001

# CONSTRUCTIONAL DATAFORM FOR TESTING OF RADIO EQUIPMENT

Licence holder:	Checkpoint Systems, Inc.		
Address:	101 Wolf Drive, Thorofare, New Jersey, USA 08086		
Manufacturer:	Pikatron Feinwerktechnik GmbH & Co. KG		
Address:	Raiffeisenstr. 10, 61250 Usingen, Germany		
Type:	Electronic Article Surveillance Detection Systems		
Model:	Liberty (TR4024 family) Models: GX PAB, GX SAB, PX PAB, PX SAB, QX PAB, QX SAB, ILX-A PAB, ILX-A SAB, ILX- A Short PAB, ILX- A Short SAB, ILX-B PAB, ILX-B SAB, ILX- B Short PAB, ILX- B Short SAB		
Serial-No.:	Liberty GX PAB-SAB S/N 713267500U0102802015 S/N 728223400U0102802028	Liberty PX PAB-SAB S/N 736121600U0091802031 S/N 733759700U0091802077	Liberty QX PAB-SAB S/N 732972500U0091802042 S/N 729580800U0091802081
	Liberty ILX-A PAB-SAB S/N 727766300U0011403001 S/N 711144000U0112302001	Liberty ILX-A Short PAB-SAB S/N 715654900U0102902002 S/N 716874600U0121002002	
	Liberty ILX-B PAB-SAB S/N 730202500U0112302001 S/N 711144000U0112202001	Liberty ILX-B Short PAB-SAB S/N 716874500U0121002001 S/N 716874600U0121002001	

Additional informations to the above named model:

Antenna: transmitter-receiver:	Type: Loop Antennas		
	Length/size: <b>GX</b> <b>W: 440 mm H: 1425 mm</b>	Length/size: <b>PX</b> <b>W: 430 mm H: 1450 mm</b>	Length/size: <b>QX</b> <b>W: 270 mm H: 1545 mm</b>
receiver:	Length/size: <b>ILX-A/B</b> <b>W: 315 mm H: 1245 mm</b>	Length/size: <b>ILX-A/B short</b> <b>W: 315 mm H: 1045 mm</b>	
	Type: <b>N/A</b>	Length/size: <b>N/A</b>	
Power supply of the transmitter: Type:	nominal voltage: <b>24.0</b> <b>V</b>		
	lowest voltage: <b>18.0</b> <b>V</b>		
	highest voltage: <b>25.0</b> <b>V</b>		
	current consumption <b>0.4</b> <b>A</b>		
Power supply of the receiver: Type:	Same as transmitter		
	nominal voltage: <b>V</b>		
	current consumption <b>A</b>		

## Ancillary equipment:

Description: <b>PSU</b>	Type: <b>Worldwide 224 Module</b>	Serial-no.: <b>UZ079</b>
Description: <b>PSU</b>	Type: <b>Worldwide 425 Module</b>	Serial-no.: <b>195682</b>
Description: <b>IMX 04</b>	Type: <b>Filtered and mains cords</b>	Serial-no.:

## Extreme temperature range in which the approval test should be performed:

- Category I: General (-20°C to +55°C)
- Category II: Portable (-10°C to +55°C)
- Category III: Equipment for normal indoor use (0°C to +55°C)

**O If applicable, if necessary complete overleaf**

**Page D1**

**Connectable cables:**

Name of the cable	Digital	Length/m	shielded
<b>DC - Cable</b>	<input type="radio"/> yes <input checked="" type="checkbox"/> no	<b>5.0</b>	<input checked="" type="checkbox"/> yes <input type="radio"/> no

 **If applicable, if necessary complete overleaf****Page D 2**

**Type designation:****Liberty (TR4024 family) Models:****GX, PX, QX, ILX-A, ILX-B, ILX-A Short, ILX-B Short****All models can be either "PAB" (with TR4024) or "SAB" (without TR4024) configurations****Name and type designation of individual units comprising the radio equipment:****PSU, Worldwide 224 Module, CP 683****PSU, Worldwide 425 Module, 11794XA****Type of equipment:**

<input type="checkbox"/> Radiotelephone equipment	<input type="checkbox"/> Remote-control equipment	<input type="checkbox"/> Radiomaritime equipment	<input type="checkbox"/> LPD
<input type="checkbox"/> One-way radiotelephone equipment	<input checked="" type="checkbox"/> Inductive loop system	<input type="checkbox"/> Inland waterways equipment	<input type="checkbox"/> RLAN
<input type="checkbox"/> Personal paging system	<input type="checkbox"/> Radio-relay system	<input type="checkbox"/> Radionavigation equipm.	<input type="checkbox"/>
<input type="checkbox"/> Satellite earth station	<input type="checkbox"/> CB radiotelephone equipment	<input type="checkbox"/> Antenna	<input type="checkbox"/>
<input type="checkbox"/> Data transmission equipment	<input type="checkbox"/> Movement detector	<input type="checkbox"/> Aeronautical equipment	<input type="checkbox"/>

**Technical characteristics:**

	Transmitter-receiver	Transmitter	Receiver
Frequency range	<b>7.4 – 9.8 MHz</b>		
Maximum no. of channels	<b>1</b>		
Channel spacing			
Class of emission (type of modulation)	<b>P0N</b>		
Maximum RF output power			
Maximum effective radiated power (ERP)	<b>100 uV/m at 30 m</b>		
Output power variable	<b>Yes</b>		
Channel switching frequency range			
Method of frequency generation	<input checked="" type="checkbox"/> Synthesizer	<input type="checkbox"/> Crystal	<input type="checkbox"/> Other
Frequency generation TX			
Frequency generation RX			
IF	1st IF	2nd IF	3rd IF
Integral selective calling			
Audio-frequency interface level at external data socket			
Modes of operation	<input type="checkbox"/> Duplex mode	<input type="checkbox"/> Semi-duplex mode	<input checked="" type="checkbox"/> Simplex mode
Power source	<input checked="" type="checkbox"/> Mains	<input type="checkbox"/> Vehicle-regulated	<input type="checkbox"/> Integral
Antenna socket	<input type="checkbox"/> BNC <input type="checkbox"/> M <input checked="" type="checkbox"/> None	<input type="checkbox"/> TNC <input type="checkbox"/> UHF <input type="checkbox"/>	<input type="checkbox"/> N <input type="checkbox"/> Adapter <input type="checkbox"/>
<b>Test specifications:</b>	<b>FCC Part 15 C RSS 210</b>		

**O If applicable, if necessary complete overleaf****Page D 3**

**Declarations:**

- We declare that the above information are correct and the named model was supplied with the maximum configuration to the accredited test laboratory.

*Thorold, NY*, date 6/6/03

place of issue

*Lin White*

Seal and signature of applicant

If applicable, if necessary complete overleaf

Page D 4

## System Setup for FCC / IC - Tests

Antennatype TX	Frequency	PDA Settings TX-Power	PSU - Cable
Liberty ILX A	8.2 MHz	22	PS WW 425 - IMX 04
	9.5 MHz	21	PS WW 224 - IMX 04
Liberty ILX B	8.2 MHz	18	PS WW 425 - IMX 04
	9.5 MHz	23	PS WW 224 - IMX 04
Liberty ILX B Short	8.2 MHz	18	PS WW 425 - IMX 04
	9.5 MHz	23	PS WW 224 - IMX 04
Liberty ILX A Short	8.2 MHz	22	PS WW 425 - IMX 04
	9.5 MHz	23	PS WW 224 - IMX 04
Liberty PX	8.2 MHz	20	PS WW 425 - IMX 04
	9.5 MHz	21	PS WW 224 - IMX 04
Liberty GX	8.2 MHz	18	PS WW 425 - IMX 04
	9.5 MHz	20	PS WW 224 - IMX 04
Liberty QX	8.2 MHz	21	PS WW 425 - IMX 04
	9.5 MHz	22	PS WW 224 - IMX 04

## Cables/Connections:

AC-Cable(to PSU): Both WW425 and WW224 PSUs require shielded filter cordset Eupen IMX 04.

DC-Cable: Shield not connected to TR4024-Electronic, with 2 turns on clip-on Ferrite.

Sync-Cables: Both Slave IN & Slave Out cables (each 14' length) connected, bundled, and terminated into 100 Ohm 1/4 W resistance load. Communications cables not connected (feature not finished being designed yet).

Connecting the sync – cables to the electronic has a negative effect to the spurious emission, but it doesn't influence the Transmitter power.

Aisle width (distance between receiver and transmitter antenna) was between 1 - 2 m

**O If applicable, if necessary complete overleaf**

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