Nemko Test Report:	112163-1TRFWL
Applicant:	Bellman & Symfon AB Sodra Langebergsgatan 30 Vastra Frolunda 421 32 Sweden
Apparatus:	Door Transmitter (BE1023)
FCC ID:	WMSBETX
In Accordance With:	FCC Part 15 Subpart C, 15.231 Periodic operation in the band 40.66-40.70MHz and above 70 MHz.
Authorized By:	 Sim Jagpal, Resource Manager
Date:	September 2, 2008
Total Number of Pages:	16

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Report Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C. Radiated tests were conducted in accordance with ANSI C63.4-2003. OATS registration number 90493.

The assessment summary is as follows:

Apparatus Assessed: Door Transmitter (BE1023)

Specification: Part 15.231

Compliance Status: Complies

Exclusions: None

Non-compliances: None

Report Release History: Original Release

Author: Jason Nixon, Telecom Specialist

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025.

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Section 1 : Equipment Under Test

1.1 Product Identification

The Equipment Under Test was identified as follows:

Door Transmitter (BE1023)

1.2 Samples Submitted for Assessment

The following samples of the apparatus have been submitted for type assessment:

Sample No.	Description	Serial No.
18	Door Transmitter (BE1023)	BE1023055300263

The first samples were received on: August 28, 2006

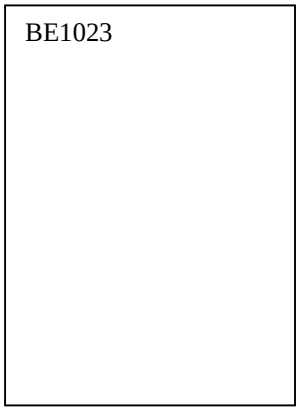
1.3 Theory of Operation

The apparatus is used to transmit an indication to receivers for the hearing impaired. The apparatus detects the sound of a doorbell and sends the indication to the receivers.

1.4 Technical Specifications of the EUT

Manufacturer:	Bellman & Symfon AB
Operating Frequency:	433.92MHz
Emission Designator:	L1D
Modulation:	Pulse width modulation
Antenna Data:	Integral
Power Source:	9VDC Battery

1.5 Block Diagram of the EUT



Section 2 : Test Conditions

2.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 15 Subpart C, 15.231
Periodic operation in the band 40.66-40.70 MHz and above 70 MHz.

2.2 Deviations From Laboratory Test Procedures

No deviations were made from laboratory test procedures.

2.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	15 – 30 ^{o}C
Humidity range	:	20 - 75 %
Pressure range	:	86 - 106 kPa
Power supply range	:	+/- 5% of rated voltages

2.4 Test Equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Next Cal.
Biconical (1) Antenna	EMCO	3109	FA000805	May 03/07
Log Periodic Antenna #2	EMCO	3148	FA001355	May 16/07
Horn Antenna #1	EMCO	3115	FA000649	Jan. 12/07
1.0 – 2.0 GHz Amplifier	JCA	12-400	FA001498	Aug. 02/07
2.0 – 4.0 GHz Amplifier	JCA	24-600	FA001496	Aug. 02/07
4.0 – 8.0 GHz Amplifier	JCA	48-600	FA001497	Aug. 02/07
Spectrum Analyzer	Rohde & Schwarz	FSP	FA001920	March 17/07

COU – Calibrate on Use
NCR – No Calibration Required

Section 3 : Observations

3.1 Modifications Performed During Assessment

No modifications were performed during assessment.

3.2 Record Of Technical Judgements

No technical judgements were made during the assessment.

3.3 EUT Parameters Affecting Compliance

The user of the apparatus could not alter parameters that would affect compliance.

3.4 Test Deleted

No Tests were deleted from this assessment.

3.5 Additional Observations

There were no additional observations made during this assessment.

Section 4 : Results Summary

This section contains the following:

FCC Part 15 Subpart C : Test Results

The column headed 'Required' indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

N No : not applicable / not relevant.

Y Yes : Mandatory i.e. the apparatus shall conform to these tests.

N/T Not Tested, mandatory but not assessed. (See section 3.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus as originally submitted.

4.1 FCC Part 15 Subpart C : Test Results

Part 15	Test Description	Required	Result
15.31(e)	Variation of Power source	N	
15.207(a)	Powerline Conducted Emissions	N	
15.209(a)	Radiated Emissions within Restricted Bands	Y	PASS
15.231(a)(1)	Manually operated transmitter	N	
15.231(a)(2)	Automatically activated transmitter	Y	PASS
15.231(a)(3)	Periodic transmissions at regular predetermined intervals	N	
15.231(a)(4)	Radiators used in cases of emergency	N	
15.231(a)(5)	Set-up information for security systems	N	
15.231(b)	Radiated Emissions	Y	PASS
15.231(c)	20dB Bandwidth	Y	PASS
15.231(d)	Devices operating within the frequency band 40.66-40.70 MHz	N	
15.231(e)	Radiated emissions for Periodic radiators	N	

Notes:

Appendix A : Test Results

Clause 15.231(a) Conditions for intentional radiators to comply with periodic operation

The provisions of this section are restricted to periodic operation within the band 40.66-40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Continuous transmissions, voice, video and the radio control of toys are not permitted. Data is permitted to be sent with a control signal. The following conditions shall be met to comply with the provisions for this periodic operation:

(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

(2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

(3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

(4) Intentional radiators, which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.

(5) Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.

Test Conditions:

Sample Number:	18	**Temperature (°C):**	23
Date:	September 15, 2006	**Humidity (%):**	48
Modification State:	0	**Tester:**	Jason Nixon
		Laboratory:	Wireless

Test Results:

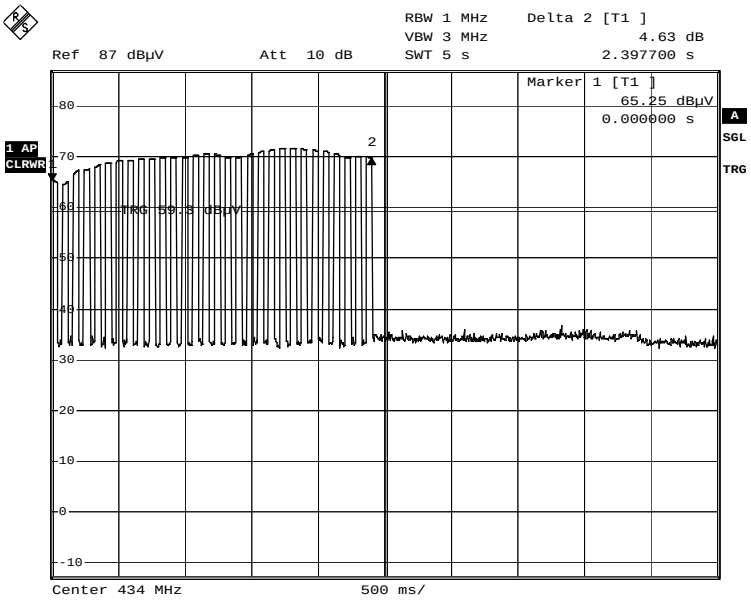
1) The apparatus is not manually operated.

2) The apparatus turns off within 2.4seconds of being activated.

3) The apparatus does not periodically transmit.

4) The apparatus is not a safety of life device.

5) The apparatus is not part of a security system.



Time to clear transmission
Date: 15.SEP.2006 21:30:53

Clause 15.231(b) Radiated Emissions

In addition to the provisions of 15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	1,250 to 3,750	125 to 375
174-260	3,750	375
260-470	3,750 to 12,500	375 to 1,250
Above 470	12,500	1,250

Test Conditions:

Sample Number:	18	**Temperature (°C):**	18
Date:	September 16, 2006	**Humidity (%):**	82
Modification State:	0	**Tester:**	Jason Nixon
		Laboratory:	OATS

Test Results:

See Attached Table for Results

Average

Freq. (MHz)	Ant	Pol. V/H	RCVD Signal (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	Duty Cycle Corr. (dB)	Cable Loss (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)
434.0520	LP2	V	60.5	16.6	N/A	-7.1	3.1	73.1	80.8	7.7
434.0520	LP2	H	52.0	17.2	N/A	-7.1	3.1	65.2	80.8	15.6
868.1040	LP2	V	16.8	22.7	N/A	-7.1	4.3	36.7	60.8	24.1
868.1040	LP2	H	18.3	23.5	N/A	-7.1	4.3	39.0	60.8	21.8
1736.2080	Horn1	V	63.3	27.2	49.0	-7.1	4.0	38.5	60.8	22.3
1736.2080	Horn1	H	58.5	27.3	49.0	-7.1	4.0	33.8	60.8	27.0
2604.3120	Horn1	V	68.3	30.2	59.8	-7.1	5.3	36.9	60.8	23.9
2604.3120	Horn1	H	67.7	30.2	59.8	-7.1	5.3	36.2	60.8	24.6

Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole

Peak

Freq. (MHz)	Ant	Pol. V/H	RCVD Signal (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	Cable Loss (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)
434.0520	LP2	V	60.5	16.6	N/A	3.1	80.2	100.8	20.6
434.0520	LP2	H	52.0	17.2	N/A	3.1	72.3	100.8	28.5
868.1040	LP2	V	16.8	22.7	N/A	4.3	43.8	80.8	37.0
868.1040	LP2	H	18.3	23.5	N/A	4.3	46.1	80.8	34.7
1736.2080	Horn1	V	63.3	27.2	49.0	4.0	45.6	80.8	35.2
1736.2080	Horn1	H	58.5	27.3	49.0	4.0	40.9	80.8	39.9
2604.3120	Horn1	V	68.3	30.2	59.8	5.3	44.0	80.8	36.8
2604.3120	Horn1	H	67.7	30.2	59.8	5.3	43.3	80.8	37.5

Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole

Additional Observations:

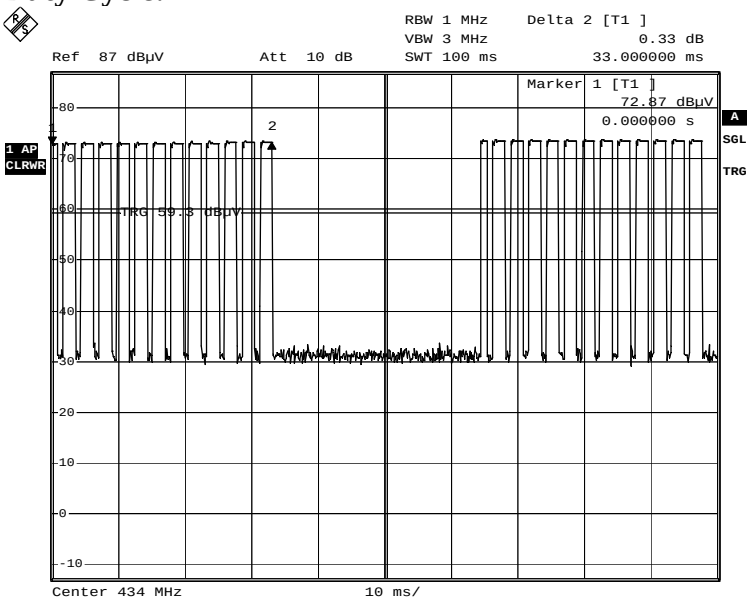
The Spectrum was searched from 30MHz to 5GHz.

The EUT was measured with fresh new batteries.

All measurements were performed using a Peak Detector with 100kHz RBW below 1GHz and a 1MHz RBW above 1GHz at a distance of 3 meters.

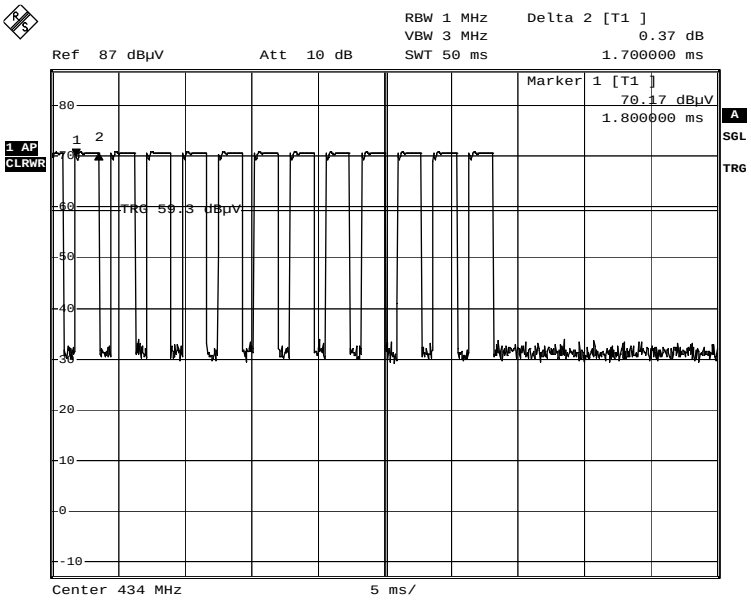
Any emissions contained within the restricted bands of 15.205 were assessed to the limits on 15.209.

Duty Cycle:



On-time in 100msec

Date: 15.SEP.2006 20:25:36



Long pulse

Date: 15.SEP.2006 20:27:15

Worst Case duty cycle = 20log(((13x1.7)x2)/100) = -7.1dB

Clause 15.231(c) 20dB Bandwidth

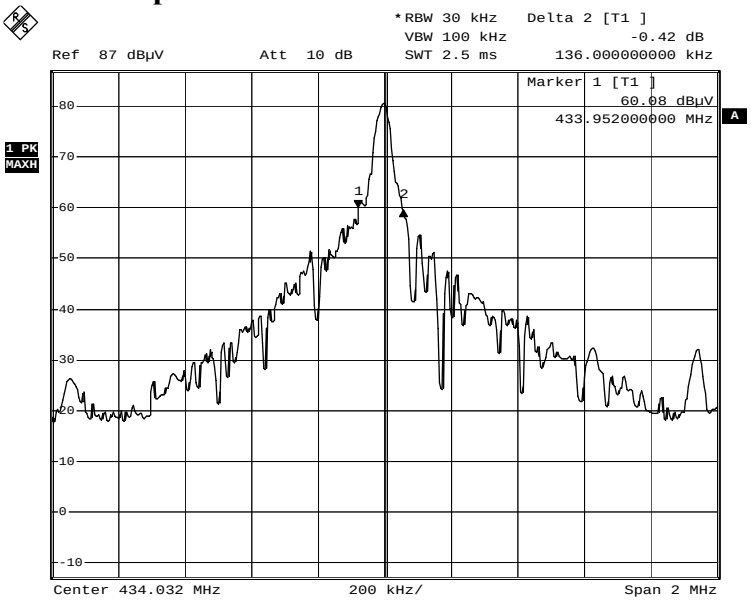
The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Test Conditions:

Sample Number:	18	**Temperature (°C):**	25
Date:	September 18, 2006	**Humidity (%):**	55
Modification State:	0	**Tester:**	Jason Nixon
		Laboratory:	Wireless

Test Results:

20dB Occupied Bandwidth:



20dB Bandwidth
Date: 18.SEP.2006 20:55:20

Appendix B : Setup Photographs

Spurious Emissions Setup:

Appendix C : Block Diagram of Test Setups

Test Site For Radiated Emissions