

**Test Report:**

1W03767

**Applicant:**

Desa International  
2701 Industrial Avenue  
Bowling Green, KY  
42101-9004

**Equipment Under Test:  
(EUT)**

WB-SAW-TX  
Wireless Remote Doorbell Transmitter

**FCC ID:**

BJ4-62WDB93TX

**In Accordance With:**

**FCC Part 15, Subpart C**  
For Low Power Transmitters Operating Periodically  
In The Band 40.66 - 40.77 MHz And Above 70 MHz

**Tested By:**

Nemko Canada Inc.  
(Formerly KTL Ottawa Inc.)  
3325 River Road, R.R. 5  
Ottawa, Ontario K1V 1H2

**Authorized By:**



G. Westwell, Wireless Technologist

**Date:**

April 30, 2001

**Total Number of Pages:**

21

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*EQUIPMENT: WB-SAW-TX, Wireless Remote Doorbell Transmitter*  
*FCC ID: BJ4-62WDB93TX*

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*EQUIPMENT: WB-SAW-TX, Wireless Remote Doorbell Transmitter*  
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**Section 1. Summary of Test Results**

**General**

**All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C, Paragraph 15.231. All tests were conducted using measurement procedure ANSI C63.4-1992. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

New Submission

Production Unit

Class II Permissive Change

Pre-Production Unit

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

See " Summary of Test Data".



**NVLAP LAB CODE: 100351-0**

TESTED BY:

Russell Grant, Wireless Group Manager

DATE: April 30, 2001

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This report applies only to the items tested.

*EQUIPMENT: WB-SAW-TX, Wireless Remote Doorbell Transmitter*  
*FCC ID: BJ4-62WDB93TX*

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**Summary Of Test Data**

<b>Name of Test</b>	<b>Para. Number</b>	<b>Results</b>
Transmission Requirements	15.231(a)	Complies
Radiated Emissions	15.231(b)	Complies
Occupied Bandwidth	15.231(c)	Complies
Frequency Tolerance	15.231(d)	N/A
Periodic Alternate Field Strength Requirements	15.231(e)	N/A
Powerline Conducted Emissions	15.207	N/A

*EQUIPMENT: WB-SAW-TX, Wireless Remote Doorbell Transmitter*  
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## **Section 2. Equipment Under Test (EUT)**

### **General Equipment Information**

**Date Received In Laboratory:** April 19, 2001

**Nemko Identification No.:** Item #1

**Frequency Range:** 315MHz

**Emission Designator:** 82K0L1D

**Supply Power Requirement:** Batteries

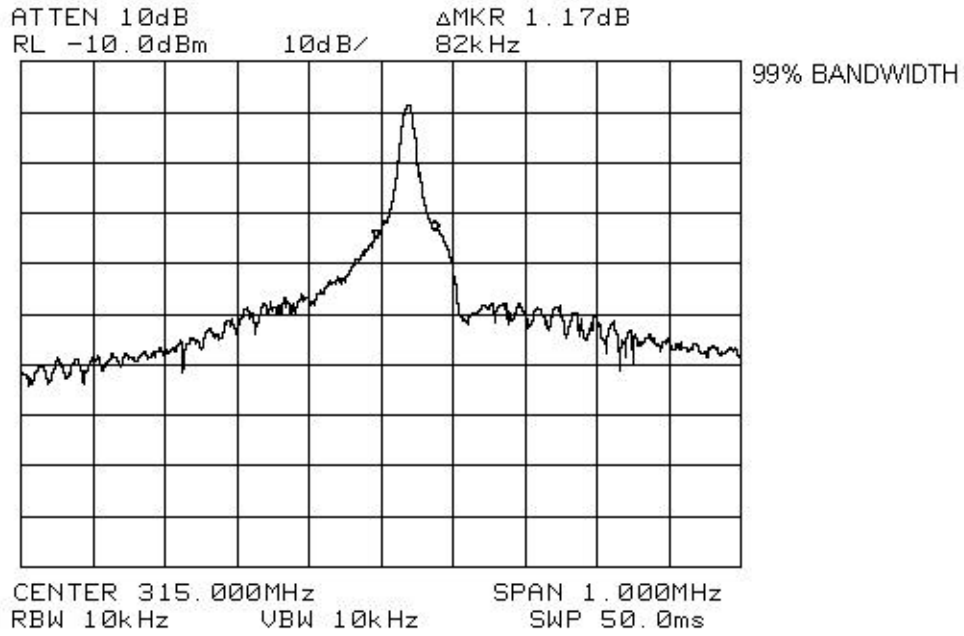
**Duty Cycle Calculation:** Worst Case

$$4 \times 13 + 5 = 57 \text{ Long Pulse In } 100\text{ms}$$

$$20 \text{ Log} \left( \frac{57 \times 0.667}{100} \right) = -8.4\text{dB}$$

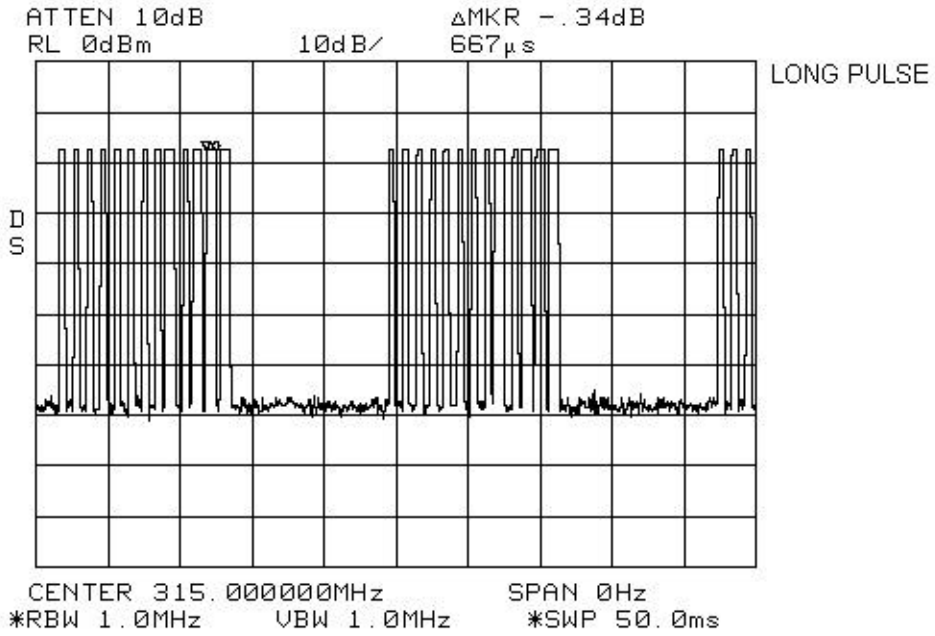
EQUIPMENT: WB-SAW-TX, Wireless Remote Doorbell Transmitter  
FCC ID: BJ4-62WDB93TX

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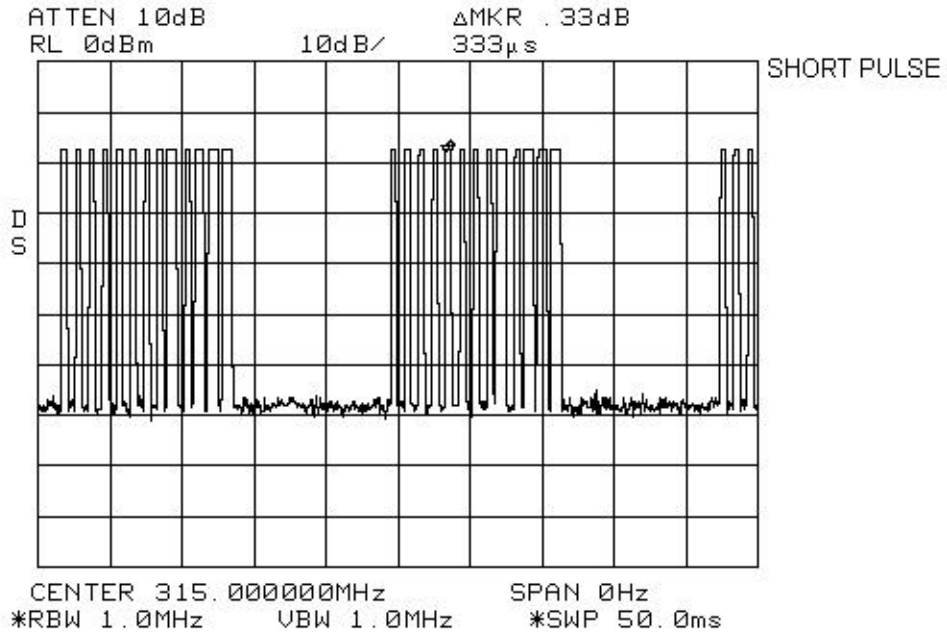
EQUIPMENT: WB-SAW-TX, Wireless Remote Doorbell Transmitter  
FCC ID: BJ4-62WDB93TX

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EQUIPMENT: WB-SAW-TX, Wireless Remote Doorbell Transmitter  
FCC ID: BJ4-62WDB93TX

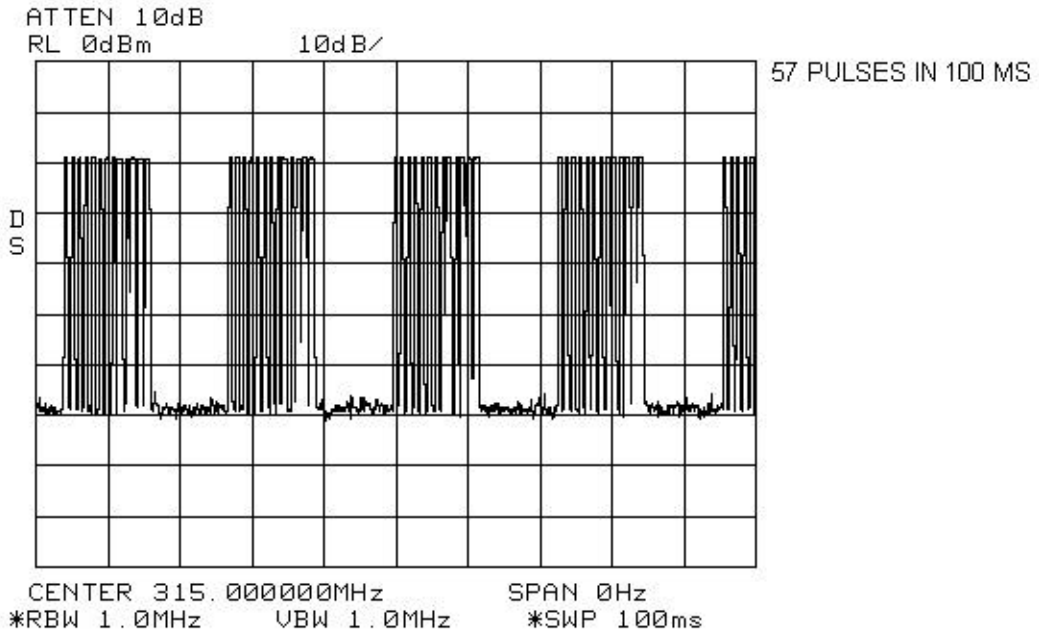
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EQUIPMENT: WB-SAW-TX, Wireless Remote Doorbell Transmitter  
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### Section 3. Transmission Requirements

Para. No.: 15.231(a)

<b>Test Performed By:</b> Russell Grant	<b>Date of Test:</b> April 29, 2001
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**Minimum Standard:** 15.231(a) Continuous transmissions such as voice, video or data transmissions are not permitted.

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

15.231(a)(2) A transmitter activated automatically shall cease transmission within 5 seconds of activation.

15.231(a)(3) Periodic transmissions at regular pre-determined intervals are not permitted. However polling or supervisory transmissions to determine system integrity of transmitters used in security or safety applications are allowed if the periodic rate of transmission does not exceed one transmission of not more than one second duration per hour for each transmitter.

15.231(a)(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.

**Test Results:** Complies.

**Test Data:** Compliance was determined by verification of technical specifications and a functional test on the equipment.

*EQUIPMENT: WB-SAW-TX, Wireless Remote Doorbell Transmitter*  
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**Rationale for Compliance with Transmission Requirements**

**15.231(a)(1) :** Manual Activation. Will deactivate immediately when switch is released.

**15.231(a)(2) :** N/A

**15.231(a)(3) :** N/A

**15.231(a)(4) :** N/A

EQUIPMENT: WB-SAW-TX, Wireless Remote Doorbell Transmitter  
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**Section 4. Radiated Emissions**

Para. No.: 15.231(b)

<b>Test Performed By:</b> Russell Grant	<b>Date of Test:</b> April 24, 2001
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**Minimum Standard:**

**Permissible Field Strength Limits (Momentarily Operated Devices)**

Fundamental Frequency (MHz)	Field Strength of Fundamental Microvolts/Meter at 3 meters; (watts)	Field Strength of Unwanted Emissions Microvolts/Meter at 3 meters; (watts)
40.66 - 40.70	2,250	225
70-130	1, 250	125
130-174	1,250 to 3,750*	125 to 375
174-260 (note 1)	3,750	375
260-470 (note 1)	3,750 to 12,500*	375 to 1,250
Above 470	12,500	1,250

**Notes:**

# Use quasi-peak or averaging meter.	For 130 - 174 MHz: $FS \text{ (microvolts/m)} = (56.82 \times F) - 6136$
* Linear interpolation with frequency $F$ in MHz	For 260 - 470 MHz: $FS \text{ (microvolts/m)} = (41.67 \times F) - 7083$

Any emissions that fall within the restricted bands of 15.205 shall not exceed the following limits:

Frequency (MHz)	Field Strength ( $\mu\text{V/m}$ @ 3m)	Field Strength (dB @ 3m)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

**Test Results:** Complies. The worst-case emission level is 55.2 dB $\mu\text{V/m}$  @ 3m at 630 MHz. This is 0.4dB below the specification limit.

**Test Data:** See attached table.

Above 1 GHz a spectrum analyzer and low noise amplifier are used to measure emission levels. The spectrum analyzer resolution bandwidth was set to 1 MHz and video bandwidth was 3 MHz.

In the case of handheld equipment, the EUT is rotated in three planes to obtain worst-case results.

EQUIPMENT: WB-SAW-TX, Wireless Remote Doorbell Transmitter  
 FCC ID: BJ4-62WDB93TX

**Test Data - Radiated Emissions**

Test Distance (meters) : 3		Range: A Tower		Receiver: ESVS		RBW(kHz): 1000		Detector: Peak	
Freq. (MHz)	Ant. *	Pol. (V/H)	RCVD Signal (dBµV/m)	Ant. Factor (dB)**	Amp. Gain (dB)***	Dist. Corr. (dB)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
315.0	E/D3	V	58.6	20.9		-8.4	71.1	75.6	4.5
315.0	E/D3	H	44.7	20.9		-8.4	57.2	75.6	18.4
630.0	E/D4	V	35.1	28.5		-8.4	55.2	55.6	0.4
630.0	E/D4	H	22.4	28.5		-8.4	42.5	55.6	13.1
945.0	E/D4	V	11.1	32.7		-8.4	35.4	55.6	20.2
945.0	E/D4	H	8.0	32.7		-8.4	32.3	55.6	23.3
1260.0	Hrn1	V	59.8	30.5	-48.0	-8.4	33.9	55.6	21.7
1260.0	Hrn1	H	59.3	30.5	-48.0	-8.4	33.4	55.6	22.2
1575.0	Hrn1	V	53.7	31.4	-47.8	-8.4	28.9	54.0	25.1
1575.0	Hrn1	H	64.8	31.4	-47.8	-8.4	40.0	54.0	14.0
1890.0	Hrn1	V	56.0	33.4	-48.2	-8.4	32.8	55.6	22.8
1890.0	Hrn1	H	64.5	33.4	-48.2	-8.4	41.3	55.6	14.3
2205.0	Hrn1	V	62.0	35.3	-58.7	-8.4	30.2	54.0	23.8
2205.0	Hrn1	H	62.2	35.3	-58.7	-8.4	30.4	54.0	23.6
2520.0	Hrn1	V	61.5	37.2	-60.0	-8.4	30.3	55.6	25.3
2520.0	Hrn1	H	68.0	37.2	-60.0	-8.4	36.8	55.6	18.8
2835.0	Hrn1	V	73.0	38.2	-59.8	-8.4	43.0	54.0	11.0
2835.0	Hrn1	H	67.5	38.2	-59.8	-8.4	37.5	54.0	16.5
3150.0	Hrn1	V	62.7	39.1	-59.4	-8.4	34.0	55.6	21.6
3150.0	Hrn1	H	61.2	39.1	-59.4	-8.4	32.5	55.6	23.1

**Notes:**  
 B/C = Biconical, B/L = Biconilog, L/P = Log-Periodic, H = Horn, D/P = Dipole  
 \* Re-measured using dipole antenna.  
 \*\* Includes cable loss when amplifier is not used.  
 \*\*\* Includes cable loss.  
 ( ) Denotes failing emission level.  
 N.D. = Not Detected

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**Radiated Photographs (Worst Case Configuration)**

**Front View**



*EQUIPMENT: WB-SAW-TX, Wireless Remote Doorbell Transmitter*  
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**Section 5. Occupied Bandwidth**

**Para. No.: 15.231(c)**

<b>Test Performed By:</b> Russell Grant	<b>Date of Test:</b> April 24, 2001
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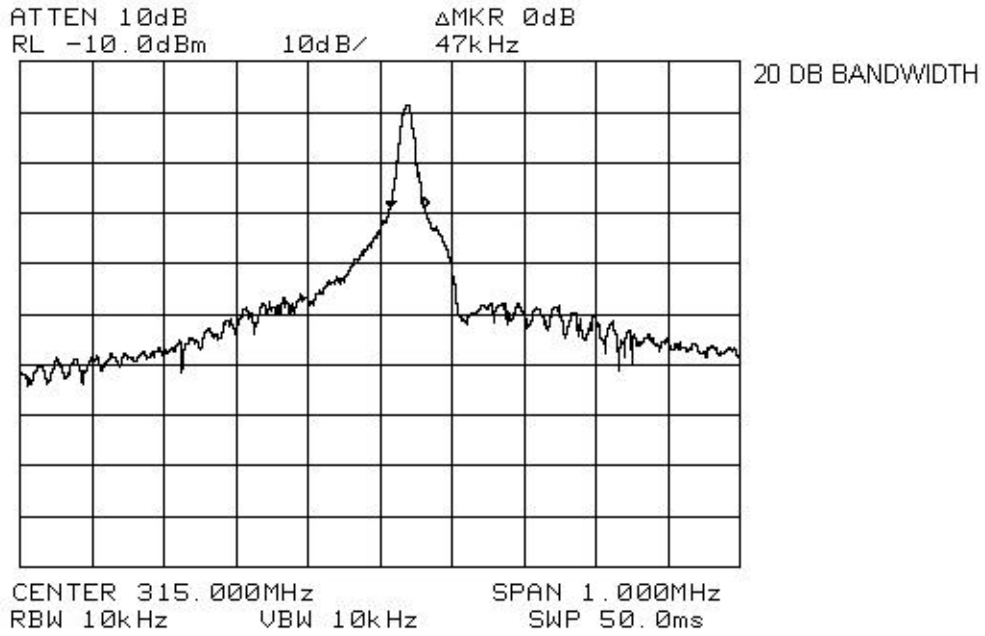
**Minimum Standard:** 15.231(c) The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

**Test Results:** Complies. See attached graph.

**Test Data:** See attached graph.

EQUIPMENT: WB-SAW-TX, Wireless Remote Doorbell Transmitter  
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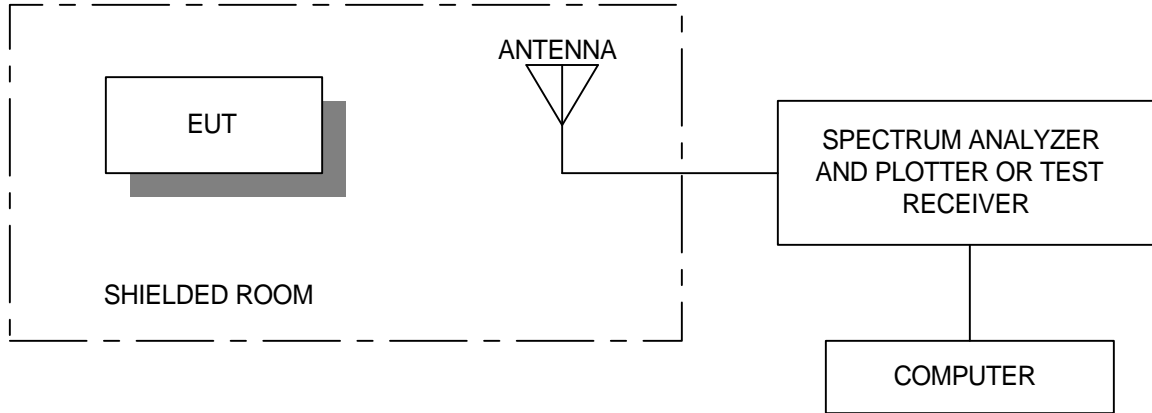


EQUIPMENT: WB-SAW-TX, Wireless Remote Doorbell Transmitter  
FCC ID: BJ4-62WDB93TX

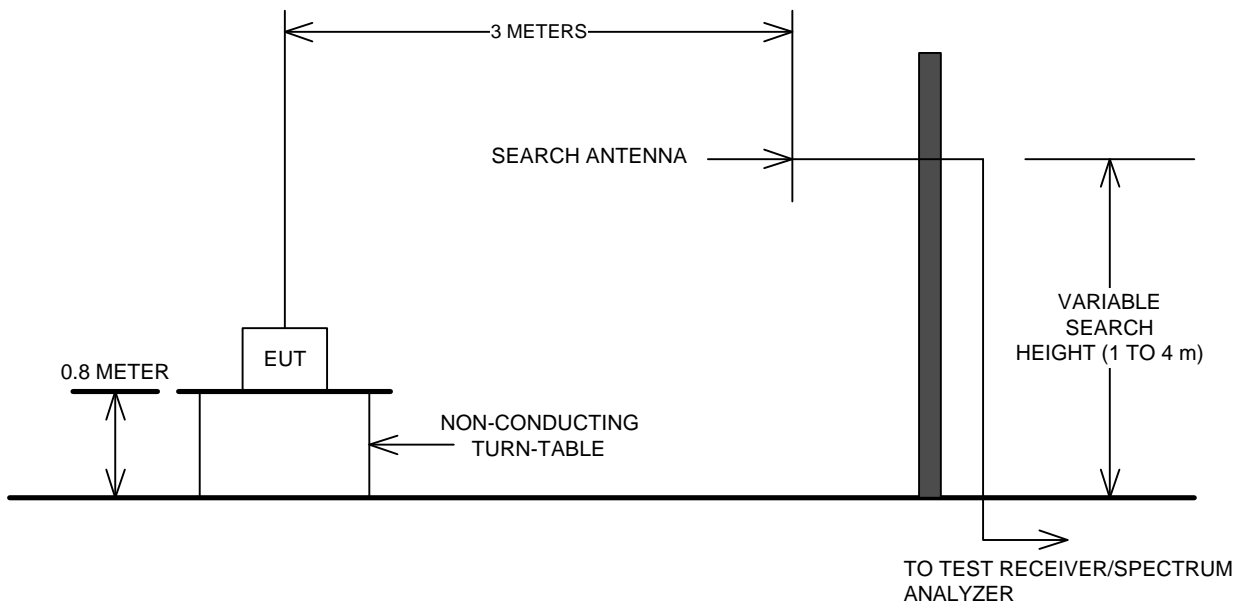
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## Section 6. Block Diagrams

### Radiated Prescan



### Outdoor Test Site For Radiated Emissions

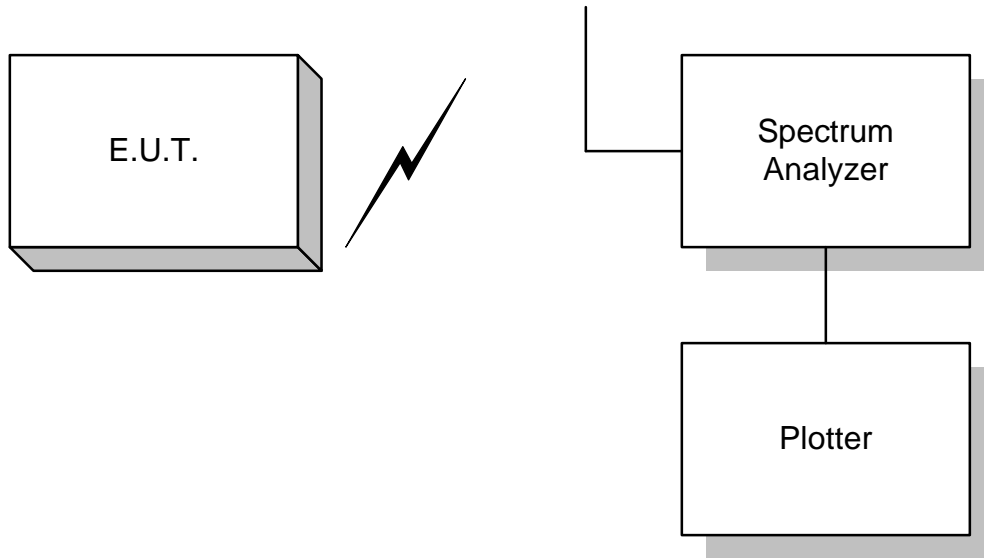


The spectrum was searched up to the 10th harmonic of the fundamental frequency of operation.

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**Occupied Bandwidth**



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**Section 7. Test Equipment List**

<b>CAL CYCLE</b>	<b>EQUIPMENT</b>	<b>MANUFACTURER</b>	<b>MODEL</b>	<b>SERIAL</b>	<b>LAST CAL.</b>	<b>NEXT CAL.</b>
1 Year	Spectrum Analyzer	Hewlett Packard	8564E	3846A01407	May 31/99	Nov. 30/00
EX	Receiver	Rohde & Schwarz	ESVP	892661/014	April 5/00	July 5/5401
1 Year	Horn Antenna	EMCO #1	3115	3132	Dec. 11/00	Dec. 11/01
1 Year	Dipole Antenna Set	EMCO #2	3121C	FA001349	June 27/00	June 27/01

NA: Not Applicable  
NCR: No Cal Required  
COU: CAL On Use

**Nemko Canada Inc.**

FCC PART 15, SUBPART C  
FOR LOW POWER TRANSMITTERS  
PROJECT NO.: 1W03767  
ANNEX A

*EQUIPMENT: WB-SAW-TX, Wireless Remote Doorbell Transmitter*  
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## **Annex A**

### **Restricted Bands**

*EQUIPMENT: WB-SAW-TX, Wireless Remote Doorbell Transmitter*  
*FCC ID: BJ4-62WDB93TX*

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**Section A                      Restricted Bands of Operation**

(a) Except as shown in paragraph (d) of this section , only spurious emissions are permitted in any of the frequency bands listed below:

<b>MHz</b>	<b>MHz</b>	<b>MHz</b>	<b>GHz</b>
0.090 - 0.110	16.42-16.423	399.9-410	4.5-5.15
0.49 - 0.51	16.69475-16.69525	608-614	5.35-5.46
2.1735 - 2.1905	16.80425-16.80475	960-1240	7.25-7.75
3.020 - 3.026	25.5-25.67	1300-1427	8.025-8.5
4.125 - 4.128	37.5-38.25	1435-1626.6	9.0-9.2
4.17725 - 4.17775	73-74.6	1645.5-1646.5	9.3-9.5
4.20725 - 4.20775	74.8-75.2	1660-1710	10.6-12.7
6.215 - 6.218	108-121.94	1718.8-1722.2	13.25-13.4
6.31175 - 6.31225	123-138	2220-2300	14.47-14.5
8.291 - 8.294	149.9-150.05	2310-2390	15.35-16.2
8.362 - 8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625 - 8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425 - 8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29 - 12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975 - 12.52025	240-285	3345.8-3358	36.43-36.5
12.57675 - 12.57725	322-335.4	3600-4400	Above 38.6
13.36 - 13.41			