

**KTL Test Report:** 9R02321

**Applicant:** EXI Wireless Systems Inc.  
Suite 100-13551 Commerce Parkway  
Richmond, BC  
V6V 2L1

**Equipment Under Test:  
(E.U.T.)** Infant Tag

**FCC ID:** HE7ETG

**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:** KTL Ottawa Inc.  
3325 River Road, R.R. 5  
Ottawa, Ontario K1V 1H2

**Authorized By:**

R. Grant, Wireless Group Manager

**Date:**

**Total Number of Pages:** 18

*EQUIPMENT: Patient Tag*  
*FCC ID: HE7ETG*

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## **Table of Contents**

<b>Section 1.</b>	<b>Summary of Test Results.....</b>	<b>3</b>
<b>Section 2.</b>	<b>Equipment Under Test (E.U.T.).....</b>	<b>5</b>
<b>Section 3.</b>	<b>Occupied Bandwidth.....</b>	<b>9</b>
<b>Section 4.</b>	<b>Periodic Alternate Field Strength Requirements .....</b>	<b>11</b>
<b>Section 5.</b>	<b>Block Diagrams.....</b>	<b>14</b>
<b>Section 6.</b>	<b>Test Equipment List.....</b>	<b>16</b>
<b>Annex A</b>	<b>Restricted Bands.....</b>	<b>A1</b>

EQUIPMENT: Patient Tag  
FCC ID: HE7ETG

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## Section 1. Summary of Test Results

Manufacturer: EXI Wireless Systems Inc.

Model No.: None

Serial No.: None

Date Received In Laboratory: March 22, 2000

KTL Identification No.: Item #9 & #10

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



Equipment Code

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: \_\_\_\_\_ DATE: \_\_\_\_\_  
Kevin Carr, Technologist

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This report applies only to the items tested.

*EQUIPMENT: Patient Tag*  
*FCC ID: HE7ETG*

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**Summary Of Test Data**

<b>Name of Test</b>	<b>Paragraph Number</b>	<b>Results</b>
Transmission Requirements	15.231(a)	Not Applicable
Radiated Emissions	15.231(b)	Not Applicable
Occupied Bandwidth	15.231(c)	Complies
Frequency Tolerance	15.231(d)	Not Applicable
Periodic Alternate Field Strength Requirements	15.231(e)	Complies
Powerline Conducted Emissions	15.207	Not Applicable

**Footnotes For N/A's:**

15.207 Battery Powered  
15.231(d) Does Not Operate In 40.66-40.70 MHz Band  
15.231(b)(a) Applicant Meets 15.231(e) Requirements

**Test Conditions:**

**Indoor** Temperature: 27 °C  
Humidity: 35 %

**Outdoor** Temperature: 20 °C  
Humidity: 35 %

*EQUIPMENT: Patient Tag*  
*FCC ID: HE7ETG*

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## **Section 2.        Equipment Under Test (E.U.T.)**

### **General Equipment Information**

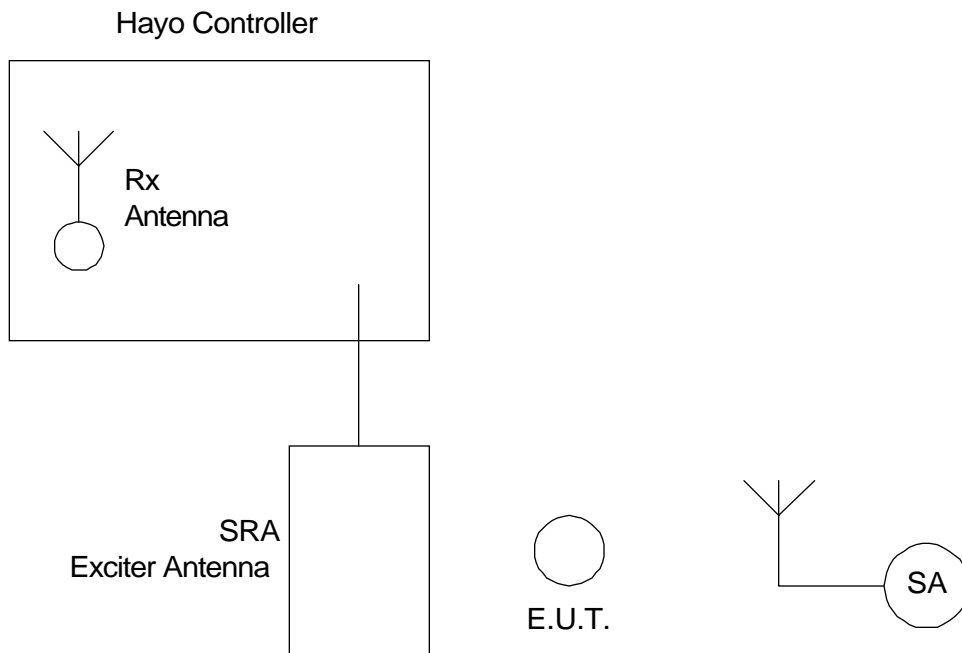
<b>Frequency Range:</b>	433.92 (Fixed)
<b>Operating Frequency(ies) of Sample:</b>	433.92 (Fixed)
<b>Type of Emission:</b>	Pulse Amplitude Modulation
<b>Emission Designator:</b>	69K2K1D
<b>Supply Power Requirement:</b>	3 Vdc Battery
<b>Duty Cycle Calculation:</b>	$20 \text{ Log } \left( \frac{0.340 \times 28}{100} \right) = 20.4 \text{ dB}$

*EQUIPMENT: Patient Tag*  
*FCC ID: HE7ETG*

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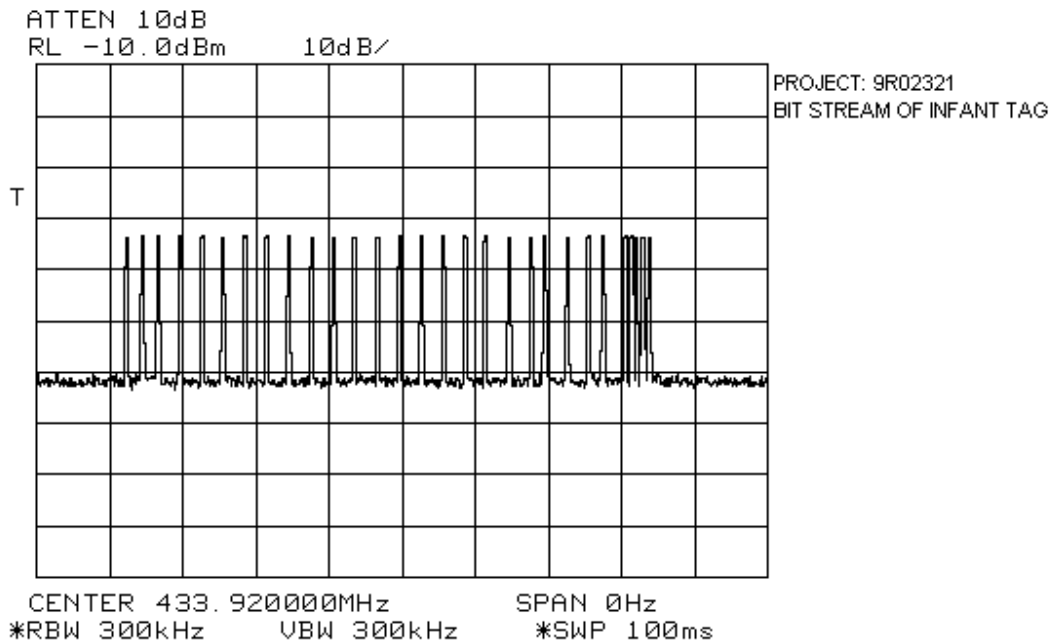
## Configuration of the Equipment Under Test

### Occupied Bandwidth & Duty Cycle



*EQUIPMENT: Patient Tag*  
*FCC ID: HE7ETG*

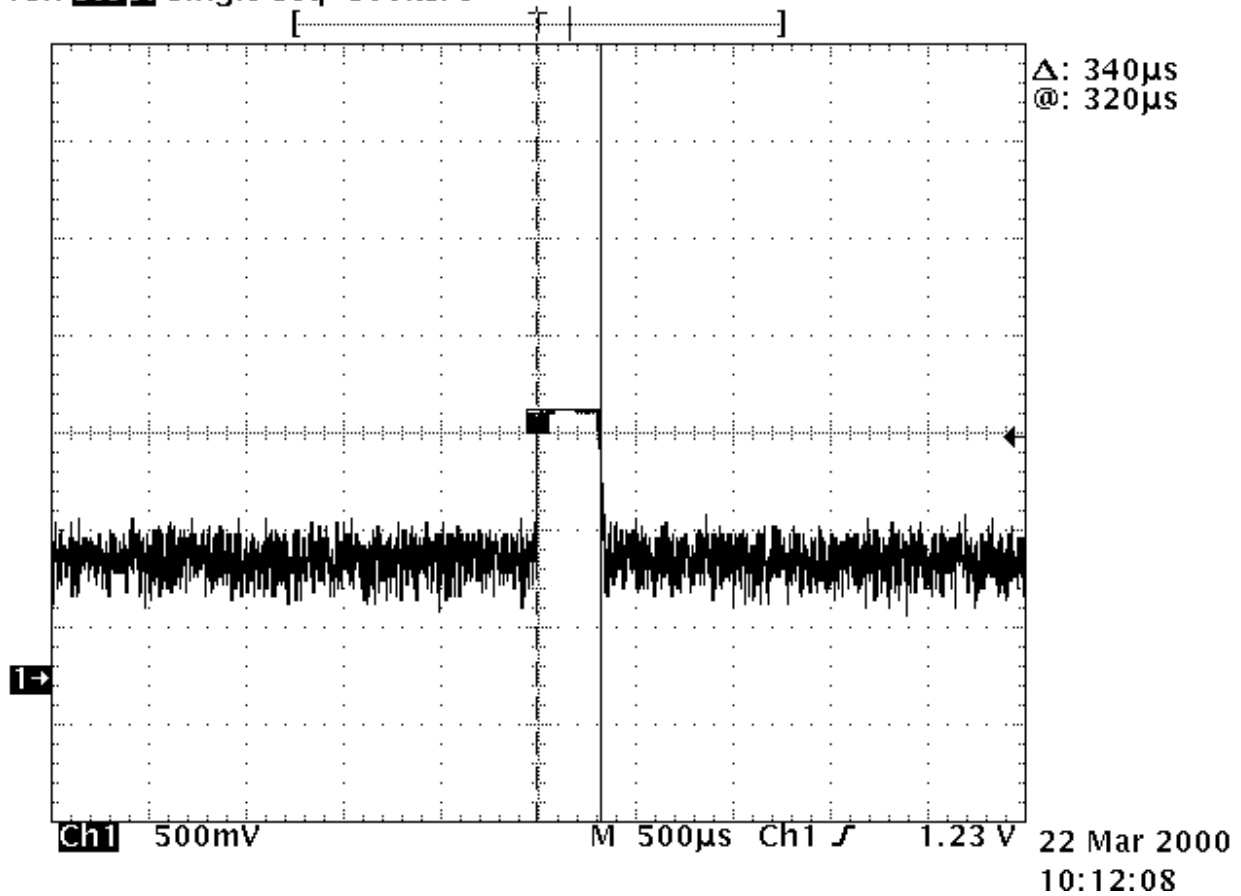
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EQUIPMENT: Patient Tag  
FCC ID: HE7ETG

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Tek **Stop:** Single Seq 500kS/s





*EQUIPMENT: Patient Tag*  
*FCC ID: HE7ETG*

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**Section 3.        Occupied Bandwidth**

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 15.231(c)
TESTED BY: Kevin Carr	DATE: March 22, 2000

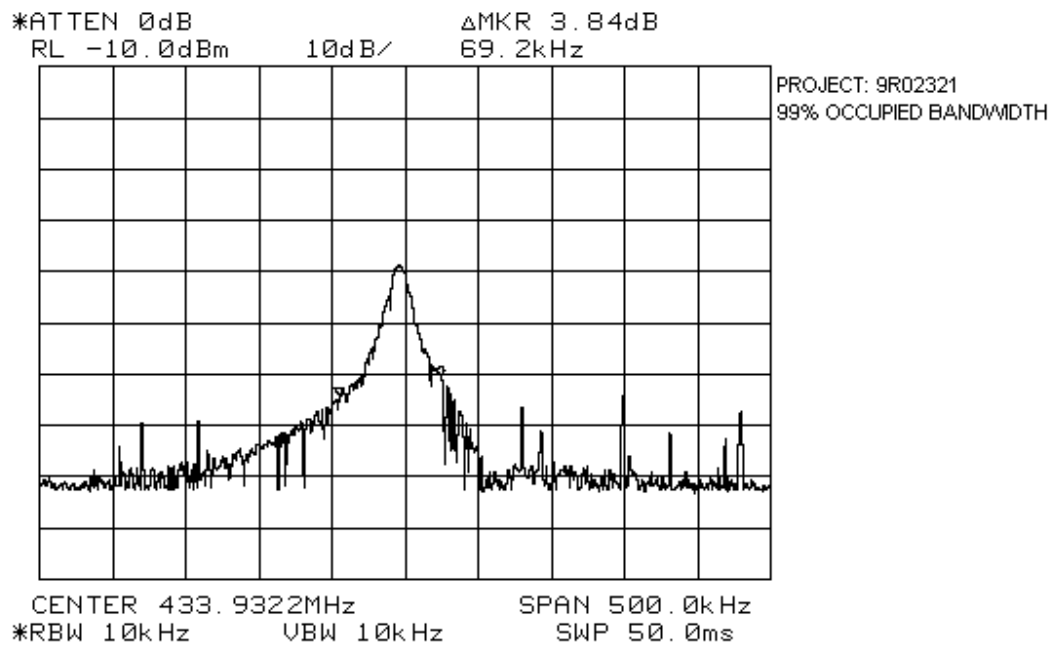
**Minimum Standard:**        15.231(c) The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

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

**Test Data:**                    See attached graph.

EQUIPMENT: Patient Tag  
FCC ID: HE7ETG

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**Section 4. Periodic Alternate Field Strength Requirements**

NAME OF TEST: Periodic Alternate Field Strength Requirements      PARA. NO.: 15.231(e)

TESTED BY: Kevin Carr

DATE: March 22, 2000

**Minimum Standard:**

15.231(e) Intentional radiators may operate at a periodic rate exceeding that specified in paragraph (a) of this section and may be employed for any type of operation, including operation prohibited in paragraph (a) of this section, provided the intentional radiator complies with the provisions of paragraphs (b) through (d) of this section, except the field strength table in paragraph (b) of this section is replaced by the following.

<b>Fundamental Frequency (MHz)</b>	<b>Field Strength of Fundamental (microvolts/meter)</b>	<b>Field Strength of Spurious Emissions (microvolts/meter)</b>
40.66 - 40.70	1,000	100
70 - 130	500	50
130 - 174	500 to 1,500	50 to 150
174 - 260	1,500	150
260-470	1,500 to 5,000	150 to 500
Above 470	5,000	500

In addition, devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

**Test Results:**

Complies.

The worst case emission is 34.4 dB $\mu$ V/m @ 3m at 867.77 MHz.  
This is 18.5 dB below the specification limit.

**Test Data:**

See attached table.

EQUIPMENT: Patient Tag  
FCC ID: HE7ETG

## Test Data - Periodic Alternate Field Strength Requirements

Test Distance (meters) : 3		Range: A Tower		Receiver: ESVP		RBW(kHz): 120		Detector: Peak			
Freq. (MHz)	Ant. *	Pol. (V/H)	Ant. HGT. (m)	Table (deg.)	RCVD Signal (dBµV/m)	Ant. Factor (dB)**	Amp. Gain (dB)***	Duty Cycle (dB)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
433.92	E/D4	V			39.3	25.9		-20	45.2	72.9	27.7
433.88	E/D4	H			43.8	25.9		-20	49.7	72.9	23.2
867.77	E/D4	V			17.3	34.4		-20	31.7	52.9	21.2
867.77	E/D4	H			20.0	34.4		-20	34.4	52.9	18.5
1301.7	Hrn2	V			19.3	29.4		-20	28.7	52.9	24.2
1301.7	Hrn2	H			19.2	29.4		-20	28.6	52.9	24.3
1735.5	Hrn2	V			46.7	32.1	-46.4	-20	12.4	52.9	40.5
1735.5	Hrn2	H			44.2	32.1	-46.4	-20	9.9	52.9	43.0
2169.4	Hrn2	V			48.3	34.4	-47.5	-20	15.2	52.9	37.7
2169.4	Hrn2	H			46.0	34.4	-47.5	-20	12.9	52.9	40.0
2603.3	Hrn2	V			50.8	36.0	-47.8	-20	19.0	52.9	33.9
2603.3	Hrn2	H			48.0	36.0	-47.8	-20	16.2	52.9	36.7
3037.2	Hrn2	V			44.7	37.6	-47.5	-20	14.8	52.9	38.1
3037.2	Hrn2	H			41.3	37.6	-47.5	-20	11.4	52.9	41.5
3471.1	Hrn2	V			55.0	40.4	-47.2	-20	28.2	52.9	24.7
3471.1	Hrn2	H			52.0	40.4	-47.2	-20	25.2	52.9	27.7
3905.0	Hrn2	V			52.7	41.3	-46.6	-20	27.4	52.9	25.5
3905.0	Hrn2	H			51.2	41.3	-46.6	-20	25.9	52.9	27.0
4338.9	Hrn2	V			48.7	41.8	-45.9	-20	24.6	52.9	28.3
4338.9	Hrn2	H			48.5	41.8	-45.9	-20	24.4	52.9	28.5

**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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## **Setup Photographs**

### **Front View**

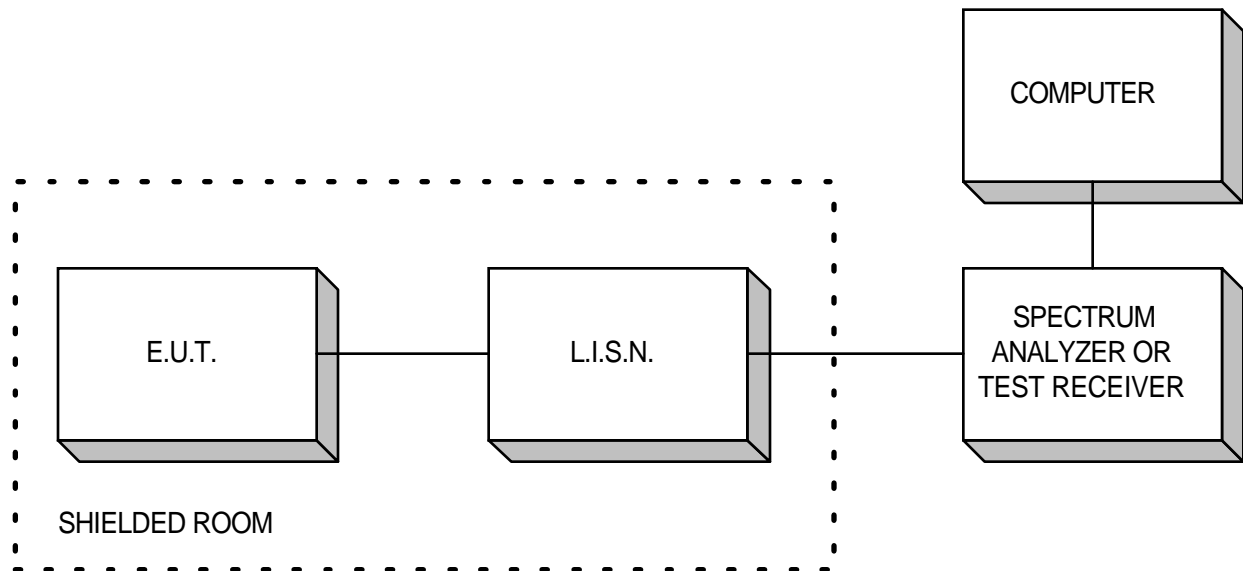


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*FCC ID: HE7ETG*

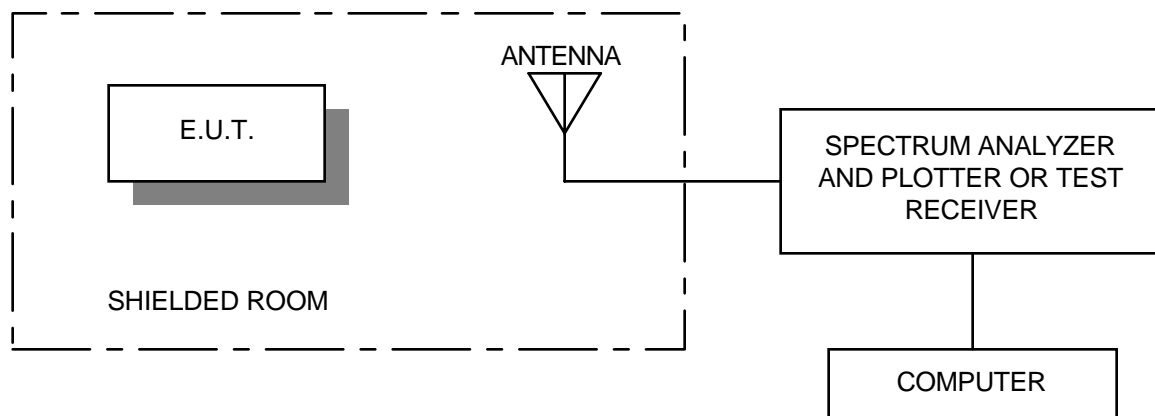
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## Section 5. Block Diagrams

### Conducted Emissions



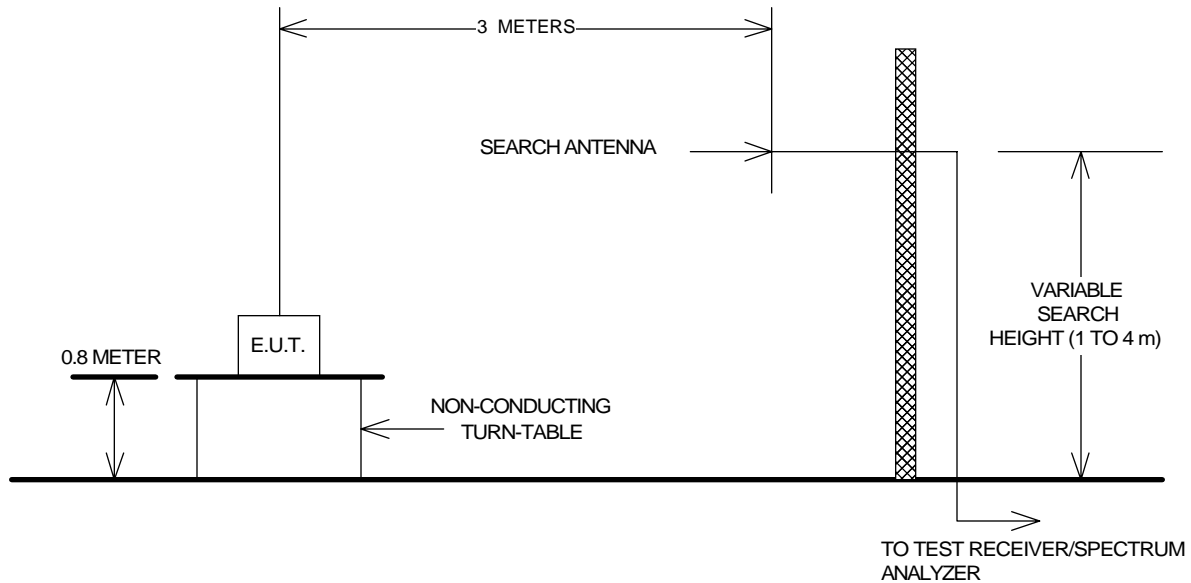
### Radiated Prescan



*EQUIPMENT: Patient Tag*  
*FCC ID: HE7ETG*

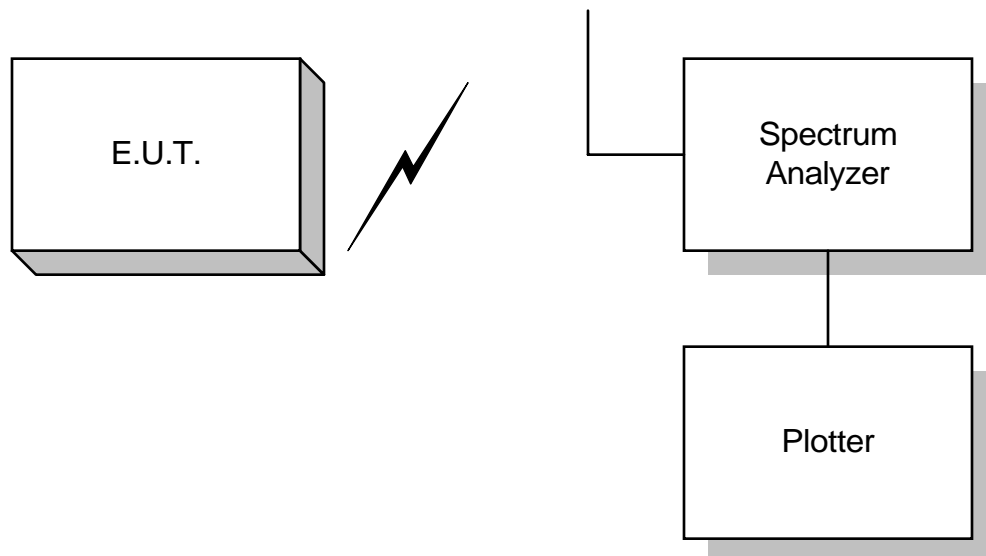
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### Outdoor Test Site For Radiated Emissions



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

### Occupied Bandwidth



*EQUIPMENT: Patient Tag**FCC ID: HE7ETG*

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**Section 6. 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	8565E	FA000981	June 16/99	June 16/00
	Power Supply	Astron	VS-50M	8405071	NCR	NCR
1 Year	Horn Antenna	EMCO #2	3115	4336	Nov. 11/99	Nov. 11/00
1 Year	Dipole Antenna Set	EMCO #2	3121C	FA001349	Apr. 5/99	Apr. 5/00
1 Year	RF AMP	Aventek	AWT-8035	FA001428	Jan. 7/00	Jan. 7/01

NA: Not Applicable

NCR: No Cal Required

COU: CAL On Use



**KTL Ottawa**

FCC PART 15, SUBPART C  
FOR LOW POWER TRANSMITTERS  
PROJECT NO.: 9R02321  
ANNEX A

*EQUIPMENT: Patient Tag*  
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**ANNEX A**

**RESTRICTED BANDS**

*EQUIPMENT: Patient Tag*  
*FCC ID: HE7ETG*

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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			