

KTL Test Report: 9R05173

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

**Equipment Under Test:
(E.U.T.)** Patient "TAG"

FCC ID: HE7PTG

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: 20

EQUIPMENT: Patient "TAG"
FCC ID: HE7PTG

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EQUIPMENT: Patient "TAG"
FCC ID: HE7PTG

Section 1. Summary of Test Results

Manufacturer: EXI Wireless Systems Inc.

Model No.: TAG

Serial No.: C04124

Date Received In Laboratory: November 5, 1999

KTL Identification No.: Item #1

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



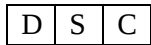
Production Unit



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: _____
Glen Westwell, Technologist

TESTED BY: _____ DATE: _____
Kevin Rose, Test Technician

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*EQUIPMENT: Patient "TAG"**FCC ID: HE7PTG*

Summary Of Test Data

Name of Test	Paragraph Number	Results
Transmission Requirements	15.231(a)	Complies
Radiated Emissions	15.231(b)	Complies
Occupied Bandwidth	15.231(c)	Complies

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

Indoor Temperature: 22 °C
 Humidity: 32 %

Outdoor Temperature: 10 °C
 Humidity: 34 %

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

General Equipment Information

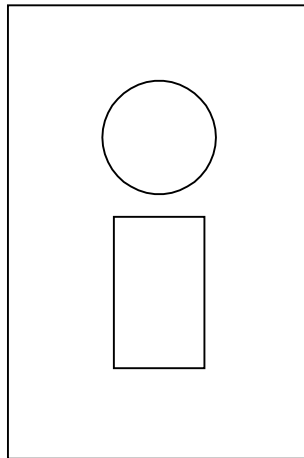
Frequency Range:	433.92 MHz
Operating Frequency(ies) of Sample:	433.92 MHz
Type of Emission:	Pulse Width Modulation (PWM)
Emission Designator:	79K17F1D
Supply Power Requirement:	3 Vdc Battery Cell
Duty Cycle Calculation:	(1) Transmission Pulse Width = 50µS (2) 30 Pulses in a 100 mSec Period $\therefore 30 \times 500 \mu S = 15mSec$ (3) $20 \text{ Log } \frac{15}{100} = -16.5 \text{ dB}\mu V$

EQUIPMENT: Patient "TAG"

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Configuration of the Equipment Under Test

Patient "TAG"



EQUIPMENT: Patient "TAG"
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Section 3. Transmission Requirements

NAME OF TEST: Transmission Requirements	PARA. NO.: 15.231(a)
TESTED BY: Glen Westwell	DATE: November 11, 1999

- 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: Patient "TAG"

FCC ID: HE7PTG

Rationale for Compliance with Transmission Requirements

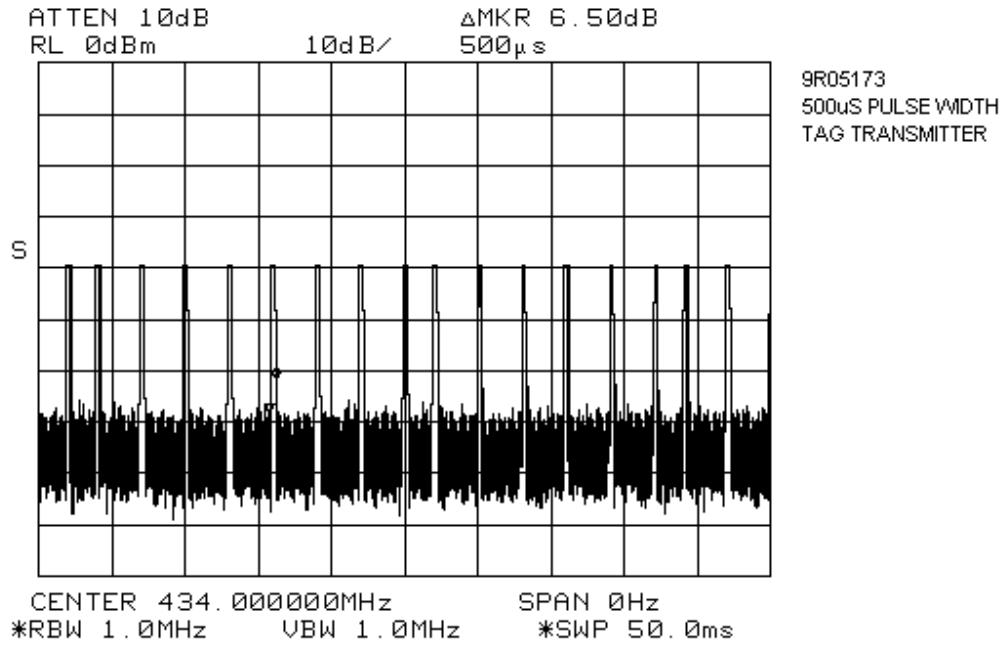
15.231(a)(1) : Not Applicable

15.231(a)(2) : Transmit Burst Duration = 83.3 mSec

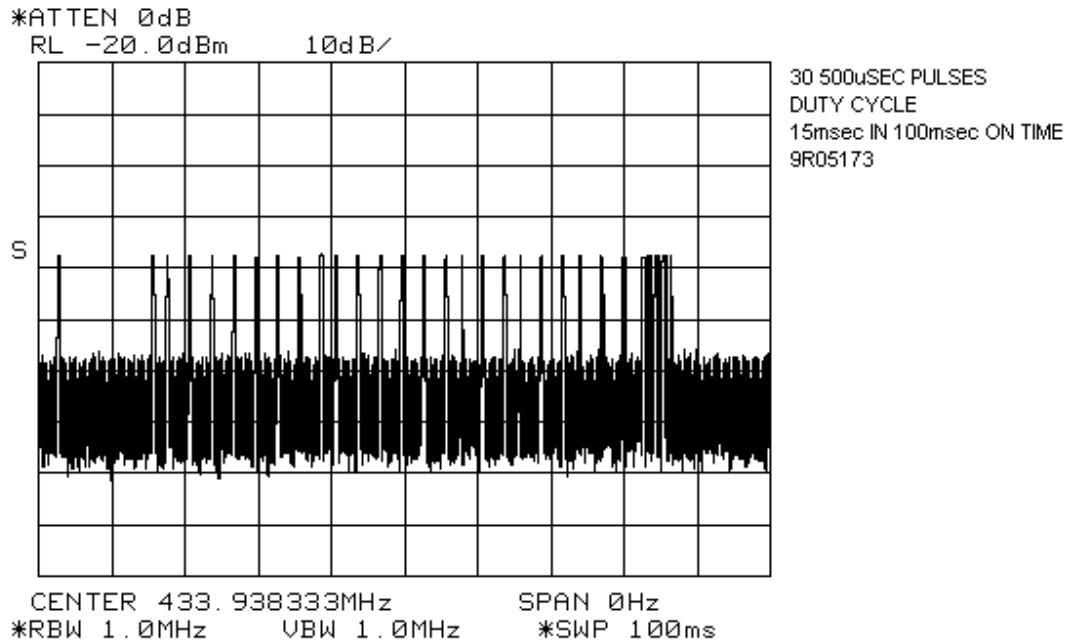
15.231(a)(3) : This equipment has no provision for periodic transmissions at regular predetermined intervals.

15.231(a)(4) : Not Applicable

EQUIPMENT: Patient "TAG"
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EQUIPMENT: Patient "TAG"
FCC ID: HE7PTG**Section 4. Radiated Emissions**

NAME OF TEST: Radiated Emissions	PARA. NO.: 15.231(b)
TESTED BY: Kevin Rose	DATE: November 10, 1999

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 (microvolts/m) = (56.82 x F) - 6136
* Linear interpolation with frequency F in MHz	For 260 - 470 MHz: FS (microvolts/m) = (41.67 x F) - 7083

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

Frequency (MHz)	Field Strength (μV/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 33.4 dBμV/m @ 3m at 867.85 MHz. This is 12.6 dB 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 E.U.T. is rotated in three planes to obtain worst-case results.

EQUIPMENT: Patient "TAG"

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Test Data - Radiated Emissions

Test Distance (meters) : 3		Range: A Tower		Receiver: ESVP		RBW(kHz): 120		Detector: Q-Peak			
Freq. (MHz)	Ant. *	Pol. (V/H)	Ant. HGT. (m)	Table (deg.)	RCVD Signal (dBµV/m)	Ant. Factor (dB)**	Amp. Gain (dB)***	Dist. Corr. (dB)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
433.92	E/D4	V			30.8	25.9		-16.5	40.2	81.0	40.8
433.92	E/D4	H			40.6	25.9		-16.5	50.0	81.0	31.0
867.85	E/D4	V			10.9	34.4		-16.5	28.8	46.0	17.2
867.85	E/D4	H			15.5	34.4		-16.5	33.4	46.0	12.6
1301.8	Hrn2	V			19.0	27.9		-16.5	30.4	54.0	23.6
1301.8	Hrn2	H			22.3	27.9		-16.5	33.7	54.0	20.3
1735.7	Hrn2	V			40.0	29.7	-42.7	-16.5	10.5	54.0	43.5
1735.7	Hrn2	H			44.3	29.7	-42.7	-16.5	14.8	54.0	39.2
2169.6	Hrn2	V			46.8	31.1	-46.6	-16.5	14.8	54.0	39.2
2169.6	Hrn2	H			54.6	31.1	-46.6	-16.5	22.6	54.0	31.4
2603.5	Hrn2	V			46.5	31.5	-45.6	-16.5	15.9	54.0	38.1
2603.5	Hrn2	H			52.5	31.5	-45.6	-16.5	21.9	54.0	32.1
3037.4	Hrn2	V			48.0	32.8	-44.1	-16.5	20.2	54.0	33.8
3037.4	Hrn2	H			49.6	32.8	-44.1	-16.5	21.8	54.0	32.2
3471.4	Hrn2	V			47.1	35.1	-42.3	-16.5	23.4	54.0	30.6
3471.4	Hrn2	H			49.8	35.1	-42.3	-16.5	26.1	54.0	27.9
3905.3	Hrn2	V			36.3	36.0	-42.6	-16.5	13.2	54.0	40.8
3905.3	Hrn2	H			38.1	36.0	-42.6	-16.5	15.0	54.0	39.0
4339.2	Hrn2	V			38.3	37.0	-43.1	-16.5	15.7	54.0	38.3
4339.2	Hrn2	H			39.5	37.0	-43.1	-16.5	16.9	54.0	37.1

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.

EQUIPMENT: Patient "TAG"
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Radiated Photographs (Worst Case Configuration)

Front View



EQUIPMENT: Patient "TAG"
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Section 5. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 15.231(c)
TESTED BY: Glen Westwell	DATE: November 11, 1999

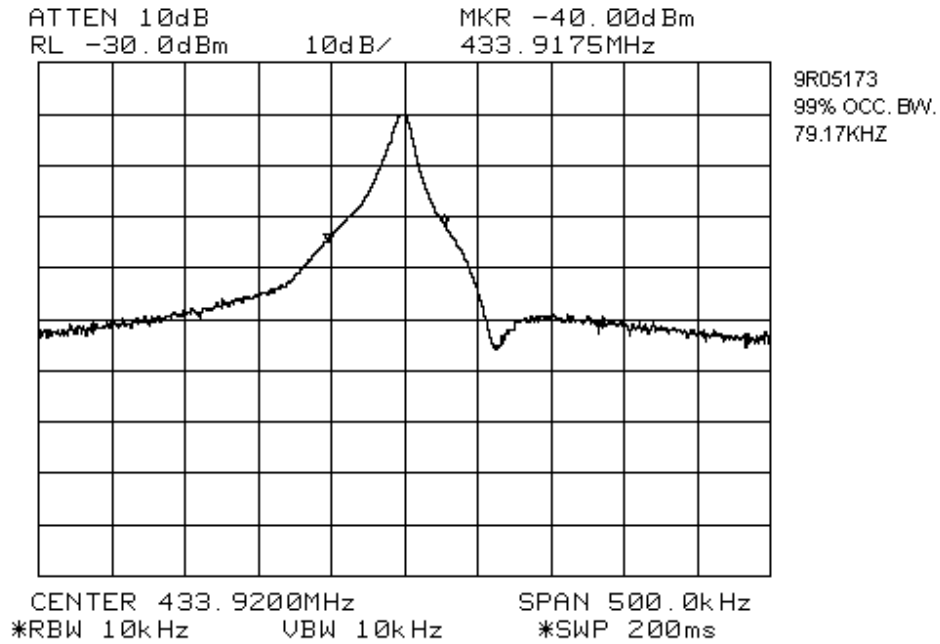
Minimum Standard: 15.231(c) The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points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

Test Results: Complies. See attached graph.

Test Data: See attached graph.

EQUIPMENT: Patient "TAG"

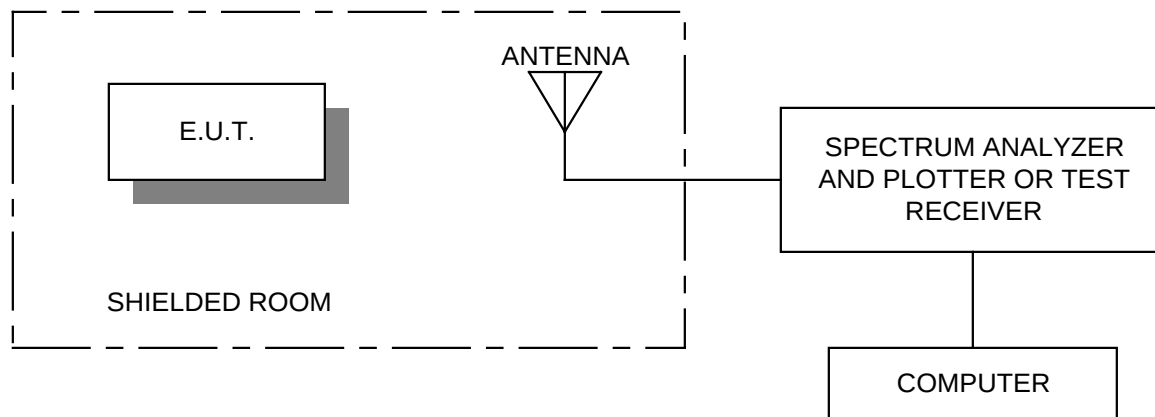
FCC ID: HE7PTG



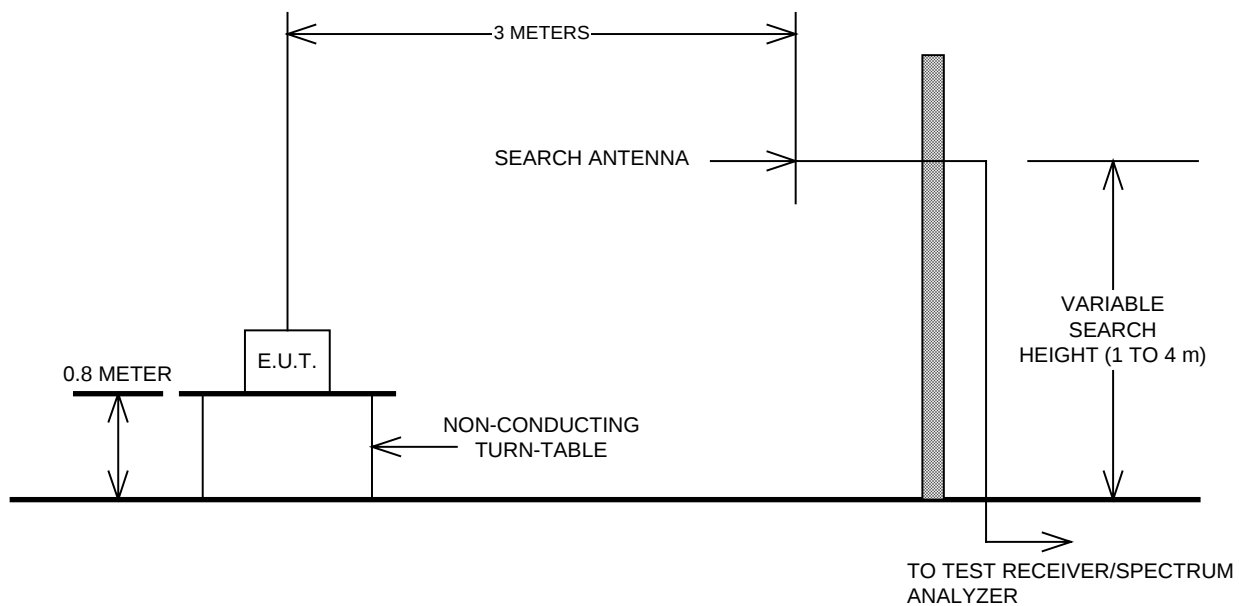
EQUIPMENT: Patient "TAG"
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Section 6. Block Diagrams

Radiated Prescan



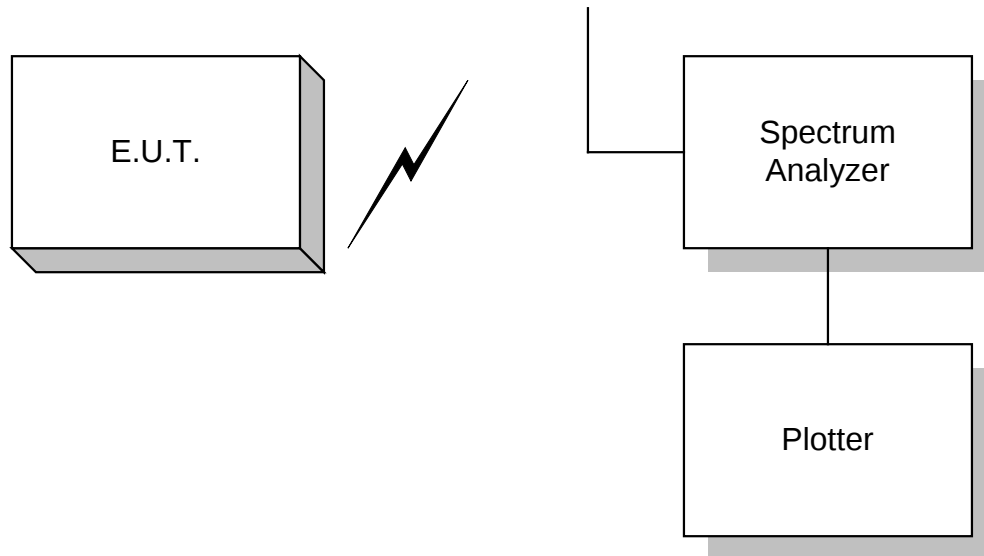
Outdoor Test Site For Radiated Emissions



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

EQUIPMENT: Patient "TAG"
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Occupied Bandwidth



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Section 7. Test Equipment List

CAL CYCLE	EQUIPMENT	MANUFACTURER	MODEL	SERIAL	LAST CAL.	NEXT CAL.
1 Year	Spectrum Analyzer	Hewlett Packard	8564E	3846A01407	May 31/99	May 31/00
1 Year	Spectrum Analyzer-1	Hewlett Packard	8566B	2311A02238	Oct. 22/98	Oct. 22/99
1 Year	Spectrum Analyzer Display-1	Hewlett Packard	8566B	2314A04759	Oct. 22/98	Oct. 22/99
1 Year	Quasi-peak adapter-1	Hewlett-Packard	85650A	2043A00302	Oct. 22/98	Oct. 22/99
1 Year	LISN	Rohde & Schwarz	ESH2-Z5	890485/017	Aug. 24/99	Aug. 24/00
1 Year	Receiver	Rohde & Schwarz	ESH3	872079/053	Oct. 5/99	Oct. 5/00
1 Year	Receiver	Rohde & Schwarz	ESVP	892661/014	Mar. 29/99	Mar. 29/00
1 Year	Plotter	Hewlett Packard	7550A	FA001129	NCR	NCR

NA: Not Applicable

NCR: No Cal Required

COU: CAL On Use

KTL Ottawa

FCC PART 15, SUBPART C
FOR LOW POWER TRANSMITTERS
PROJECT NO.: 9R05173
ANNEX A

EQUIPMENT: Patient "TAG"
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ANNEX A
RESTRICTED BANDS

EQUIPMENT: Patient "TAG"
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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:

MHz	MHz	MHz	GHz
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			