KTL Test Report:	8R1099
Applicant:	Paradox Security Systems 780 Industrial Blvd. Ste. Eustache, Quebec J7R 5V3
Equipment Under Test: (E.U.T.)	PARAKEY Receiver
FCC ID:	KDYPARAKEYRX
In Accordance With:	**FCC Part 15, Subpart B** Radio Receivers
Tested By:	KTL Ottawa Inc. 3325 River Road, R.R. 5 Ottawa, Ontario K1V 1H2
Authorized By:	
	T. Tidwell, Laboratory Manager
Date:	
Total Number of Pages:	29

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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 FCC Part 15, Subpart B. Measurement procedure ANSI C63.4-1992 was used for all tests. Radiated Emissions were measured on an open area test site.

☒	New Submission	☒	Production Unit
☐	Class II Permissive Change	☐	Pre-Production Unit

C	R	R	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

Summary Of Test Data

Name Of Test	Para. No.	Results
Antenna Conducted Emissions	15.111	Not Applicable
Radiated Emissions	15.109	Complies
Powerline Conducted Emissions	15.107	Not Applicable

Footnotes For N/A's:

Test Conditions:

Indoor	Temperature:	21 °C
	Humidity:	31 %
Outdoor	Temperature:	15 °C
	Humidity:	31 %

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

Manufacturer: Paradox Security Systems

Model No.: PARAKEY

Serial No.: None

Equipment Details

Frequency Range:	318 MHz
Number of Channels:	1
Operating Frequency(ies) of Sample:	318 MHz
Crystal Frequency(ies):	318 MHz SAW Resonator
Primary Power Requirement:	12 Vdc
Intermediate Frequency(ies):	Not Applicable

Description of E.U.T.

The E.U.T. is a 318 MHz Supergenerative Receiver that connects to a home alarm system enabling remote arming and disarming.

Modifications Incorporated in E.U.T.

The EUT has not been modified from what is described by the brand name and unique type identification stated above.

Theory of Operation

The PARAKEY Receiver operates with the PARAKEY Remote Arming RF Transmitter. The receiver can use up to 8 remote transmitters.

Justification

The E.U.T. was configured for testing as per typical installation. Position and bundling of cables were investigated to establish maximum amplitude of emissions.

The following combinations were investigated to establish worst case configuration:

(1) Receiver mounted as prescribed by mounting bracket.

Exercise Program

The E.U.T. exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to typical use.

Exercise Mode:

(1) Receiver cohered with CW signal at 318 MHz.

Section 3. Equipment Configuration

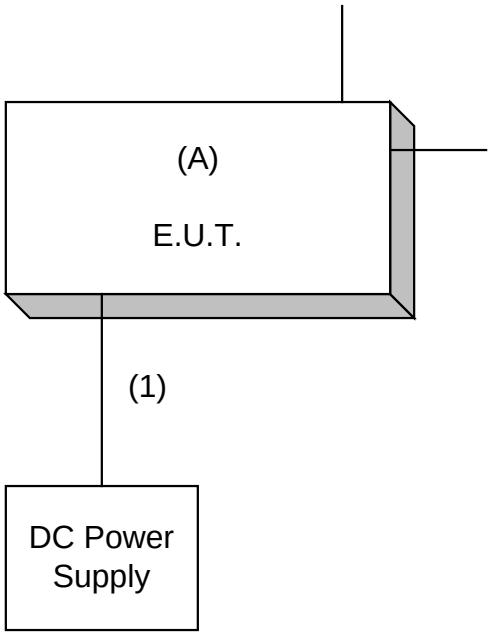
Equipment Configuration List:

Item	Description	Model No.	Serial.	Rev.
(A)	Receiver Module	PARAKEY	None	

Inter-connection Cables:

Item	Description	Length (m)
(1)	2 Conductor Bell Wire	1.5

Configuration of the Equipment Under Test (E.U.T)



Section 4. Receiver Antenna Conducted Emissions

NAME OF TEST: Receiver Antenna Conducted Emissions	PARA. NO.: 15.111
TESTED BY:	DATE:

Test Results: Complies/Does Not Comply. See attached graphs and table.

Measurement Data: See attached graphs and table.

NOT APPLICABLE

Section 5(A). Radiated Emissions

NAME OF TEST: Radiated Emissions	PARA. NO.: 15.109(a)
TESTED BY: Kevin Carr	DATE: March 10, 1999

Minimum Standard:

Frequency(MHz)	Field Strength (dBμV/m @ 3m)
30 - 88	40.0
88 - 216	43.5
216 - 960	46.0
Above 960	54.0

Test Results: Complies. The worst-case emission level is 41.5 dBμV/m @ 3m at 317.5 MHz. This is 4.5 dB below the specification limit.

Measurement Data: See attached table.

For super-regenerative receivers the receiver is cohered using a signal generator and dipole antenna.

Handheld equipment and equipment not designed to be mounted in any fixed orientation, the E.U.T. is tested in three orthogonal axis to obtain worst case results.

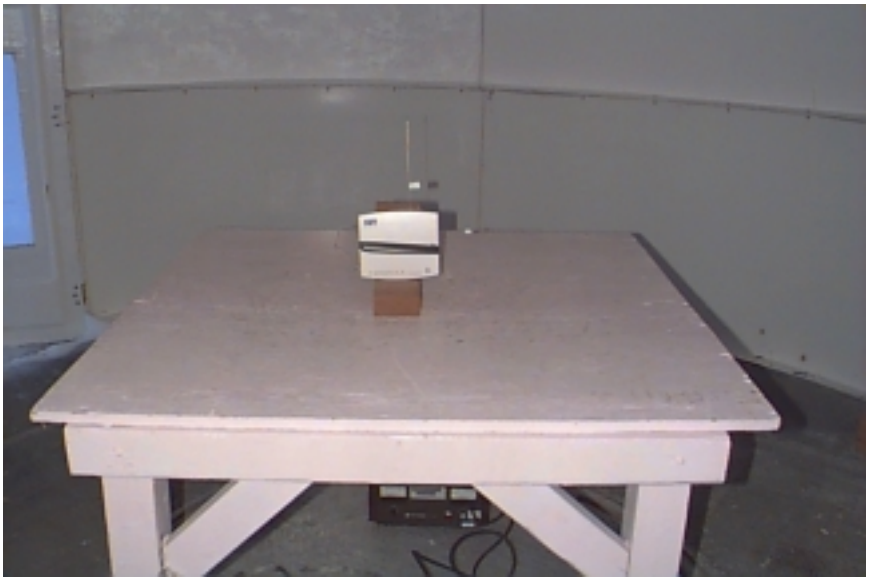
Test Data - Radiated Emissions

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)
635.0	Hrn2	V			6.3	26.0			32.3	46.0	13.7
635.0	Hrn2	H			6.4	26.0			32.4	46.0	13.6
952.48	Hrn2	V			4.6	31.1			35.7	46.0	10.3
952.48	Hrn2	H			2.4	31.1			33.5	46.0	12.5
1270.0	Hrn2	V			-1.8	27.9			26.1	54.0	27.9
1270.0	Hrn2	H			-0.7	27.9			27.2	54.0	26.8
1587.5	Hrn2	V			39.8	28.9	-40.3		28.4	54.0	25.6
1587.5	Hrn2	H			45.9	28.9	-40.3		34.5	54.0	19.5
1905.0	Hrn2	V			44.5	30.6	-45.4		29.7	54.0	24.3
1905.0	Hrn2	H			45.8	30.6	-45.4		31.0	54.0	23.0
2222.5	Hrn2	V			46.2	31.1	-46.5		30.8	54.0	23.2
2222.5	Hrn2	H			46.3	31.1	-46.5		30.9	54.0	23.1
2540.0	Hrn2	V			42.0	31.3	-45.8		27.5	54.0	26.5
2540.0	Hrn2	H			45.2	31.3	-45.8		30.7	54.0	23.3
2857.0	Hrn2	V			40.3	32.3	-44.7		27.9	54.0	26.1
2857.0	Hrn2	H			41.1	32.3	-44.7		28.7	54.0	25.3
3175.0	Hrn2	V			42.0	33.6	-43.5		32.1	54.0	21.9
3175.0	Hrn2	H			42.4	33.6	-43.5		32.5	54.0	21.5
317.5	E/D3	V			18.4	23.1			41.5	46.0	4.5
317.5	E/D3	H			14.0	23.1			37.1	46.0	8.9

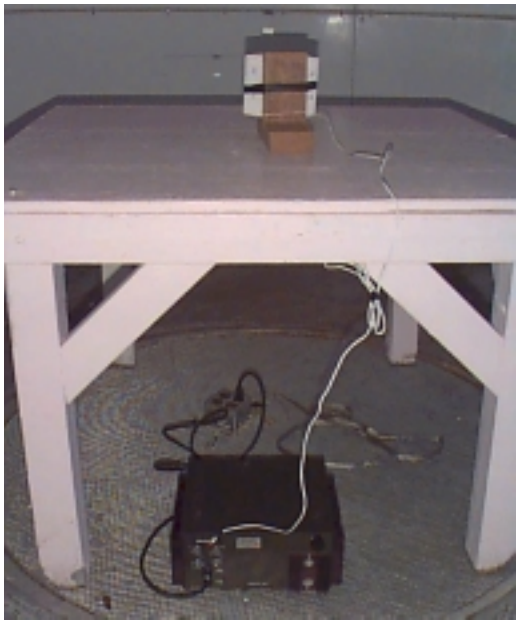
Notes:
B/C = Biconical, B/L = Biconilog, L/P = Log-Periodic, H = Horn, D/P = Dipole
* Re-measured using dipole antenna. ( ) Denotes failing emission level.
(1) 120 kHz, Q-Peak, (2) 10 kHz, Peak, (3) 100 kHz RGW, 300 kHz VBW, Peak,
(4) 300 kHz RBW, 1 MHz VBW, Peak, (5) 1 MHz RBW, 3 MHz VBW, Peak, (6) 1 MHz RBW, 10 Hz VBW, Peak

Radiated Photographs (Worst Case Configuration)

Front View



Rear View



Prescan Data

Project Number : 8R01099
Project Filename : 8R1099R.LST
Date : March 10, 1999
Start Frequency : 30 MHz
Stop Frequency : 1000 MHz
Display Line Value: 24 (30-300 MHz), 16 (300-1000MHz) dBuV

Vertical Prescan

Top Emissions below 300 MHz from the vertical prescan list:

Full Emission List below 300 MHz:

Top Emissions above 300 MHz from the vertical prescan list:

Full Emission List above 300 MHz:

Horizontal Prescan

Top Emissions below 300 MHz from the horizontal prescan list:

Full Emission List below 300 MHz:

Top Emissions above 300 MHz from the horizontal prescan list:

Full Emission List above 300 MHz:

Section 5(B). Radiated Emissions

NAME OF TEST: Radiated Emissions	PARA. NO.: 15.109(b)
TESTED BY:	DATE:

NOT APPLICABLE

Minimum Standard: Equipment manufactured or imported before June 23, 1999 is permitted the following limits:

Frequency (MHz)	**Field Strength (dBµV/m @ 3m)**
30-70	320 (50.1 dBµV/m)
70-130	500 (54.0 dBµV/m)
130-174	500 - 1500 dBµV/m)
174-260	1500 (63.5 dBµV/m)
260-470	1500 - 5000 (linear interpolation)
Above 470	5000 (74.0 dBµV/m)

Test Results: Complies / Does Not Comply. The worst-case emission level is _____ dBµV/m @ 3m at _____ MHz. This is _____ dB above/below the specification limit.

Measurement Data: See attached table.

Test Data - Radiated Emissions

Test Distance (meters) :		Range:		Receiver:		RBW(kHz):		Detector:			
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)

NOT APPLICABLE

Notes:
B/C = Biconical, B/L = Biconilog, L/P = Log-Periodic, H = Horn, D/P = Dipole
* Re-measured using dipole antenna. ( ) Denotes failing emission level.
(1) 120 kHz, Q-Peak, (2) 10 kHz, Peak, (3) 100 kHz RBW, 300 kHz VBW, Peak,
(4) 300 kHz RBW, 1 MHz VBW, Peak, (5) 1 MHz RBW, 3 MHz VBW, Peak, (6) 1 MHz RBW, 10 Hz VBW, Peak

Radiated Photographs (Worst Case Configuration)

FRONT VIEW

NOT APPLICABLE

REAR VIEW

Section 6. Powerline Conducted Emissions

NAME OF TEST: Powerline Conducted Emissions	PARA. NO.: 15.107
TESTED BY:	DATE:

Minimum Standard: The RF energy feed back into the power lines shall not exceed 48 dBµV on any frequency between 0.45 MHz and 30 MHz inclusive.

Test Results: Complies / Does Not Comply. See attached graphs.

Measurement Data: See attached graphs.

NOT APPLICABLE

Powerline Conducted Photographs (Worst Case Configuration)

FRONT VIEW

NOT APPLICABLE

REAR VIEW

Section 7. Sample Calculations

Conducted Emissions:

If the Quasi-Peak to Average ratio is greater than 6 dB, then the emission is classified as broadband and its Quasi-Peak level is reduced by 13 dB for comparison to the limit.

i.e. Quasi-Peak level = 40 dBµV
Average level = 34 dBµV
Corrected level = 40 - 13 = 27 dBµV

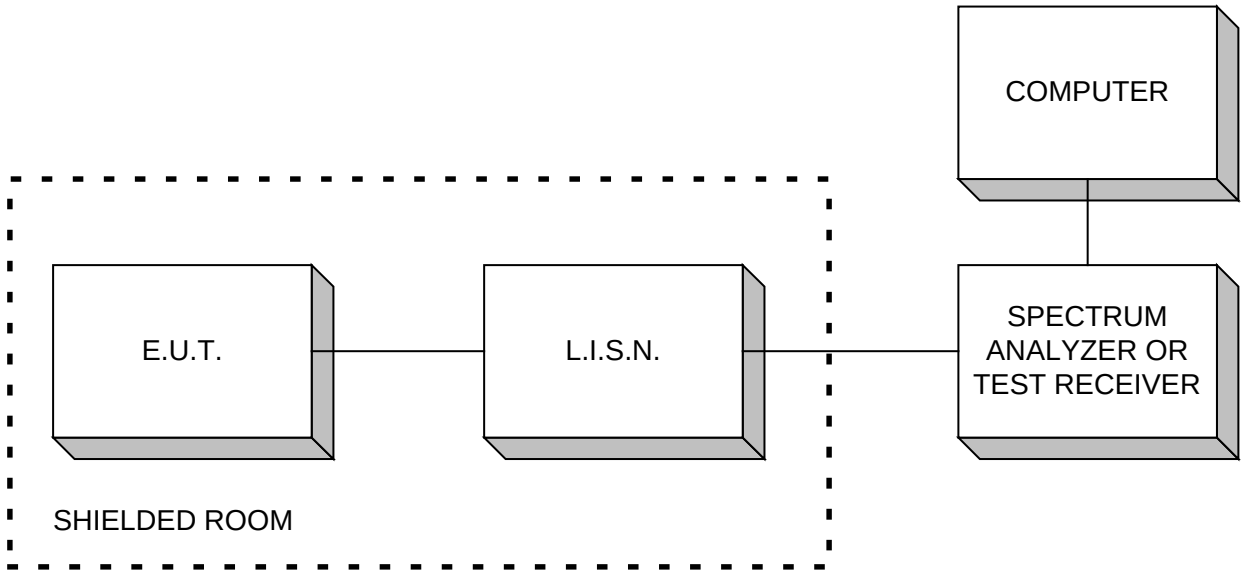
Radiated Emissions

Emissions are measured at a distance of 3 meters and corrected for antenna factor and cable loss.

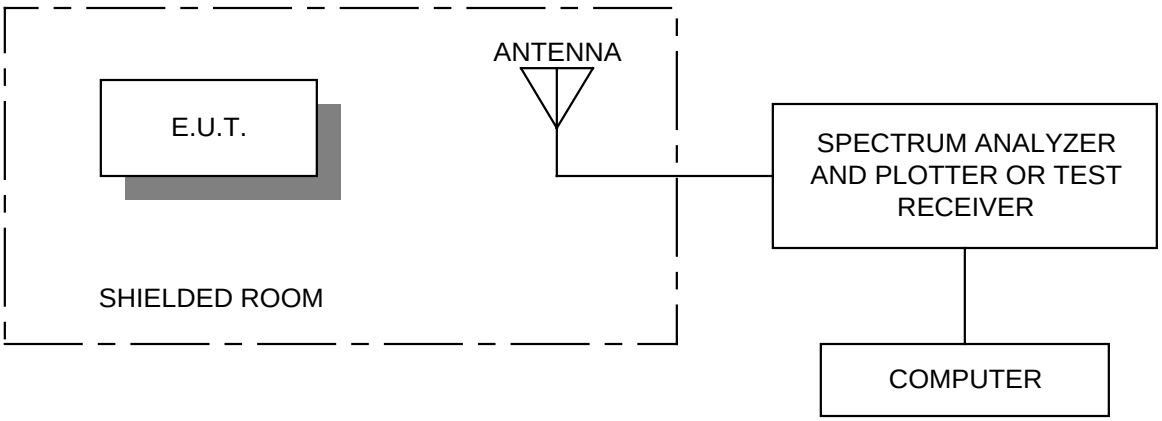
i.e. Received Signal = 25 dBµV @ 100 MHz
Antenna Factor & Cable Loss = 9.8 dB
Field Intensity = 25 + 9.8 = 34.8 dBµV/m @ 3 m

Section 8. Block Diagrams

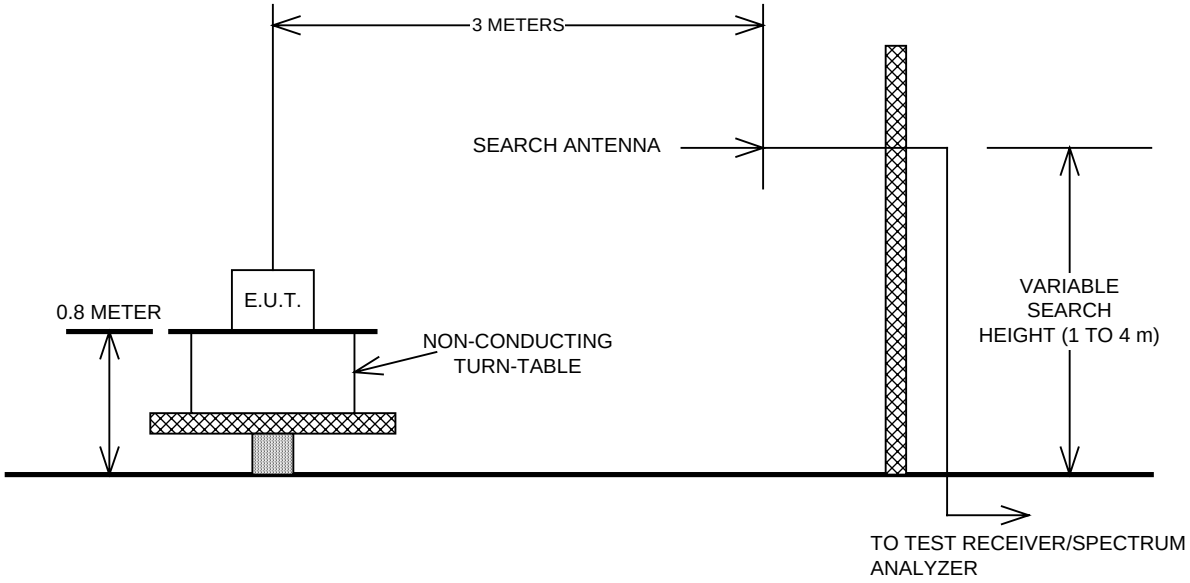
Conducted Emissions



Radiated Prescan



Outdoor Test Site For Radiated Emissions



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

Section 9. Test Equipment List

Equipment List - Radiated Emissions

CAL Cycle	Equipment	Manufacturer	Model #	Serial/Asset #	Last Cal.	Next Cal.
	Biconilog Antenna	EMCO	3143	9404-1039	NCR	NCR
1Year	Dipole Antenna Set	EMCO	3121C	1029	Nov. 18/98	Nov. 18/99
1Year	Receiver	Rohde & Schwarz	ESVS-30	843710/002	Oct. 27/98	Oct. 27/99
1Year	Spectrum Analyzer	Hewlett-Packard	8565E	FA000981	May 20/98	May 20/99
1 Year	Biconical (2) Antenna	EMCO	3109	9503-2894	June 2/98	June 2/99
2 Year	Horn Antenna	EMCO	3115	4336	Oct. 30/97	Oct. 30/99
1 Year	Log Periodic Antenna	EMCO	LPA-25	1141	July 27/98	July 27/99
1 Year	Low Noise Amplifier	Avantek	AWT-8035	1005	Aug. 4/98	Aug. 4/99
1 Year	Low Noise Amplifier	DBS Microwave	DWT-13035	9623	Aug. 4/98	Aug. 4/99

Note: N/A = Not Applicable
NCR = No Cal Required