KTL Test Report:	9R01692.1
Applicant:	VTECH Engineering Canada Ltd. 200 – 7671 Alderbridge Way Richmond, BC V6X 1Z9
Equipment Under Test: (E.U.T.)	VT1964 / AM1963 Telephone
FCC ID:	EW780-4282-00
In Accordance With:	**FCC Part 15, Subpart C, 15.249** For 900 MHz Cordless Telephones
Tested By:	KTL Ottawa Inc. 3325 River Road, R.R. 5 Ottawa, Ontario K1V 1H2
Authorized By:	
	R. Grant, Senior RF Specialist
Date:	
Total Number of Pages:	25

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Section 1. Summary Of Test Results

Manufacturer: VTECH Engineering Ltd.

Model No.: VT 1964 / AM1963

Serial No.: None

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 15.249. All tests were conducted using measurement procedure ANSI C63.4-1992. Radiated Emissions were made on an open area test site.

☐ New Submission ☒ Production Unit

☒ Class II Permissive Change Base ☐ Pre-Production Unit

D	X	T

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: _____
Chris Maidens, Test Technician

Summary Of Test Data

Base:

NAME OF TEST	PARA. NO.	RESULT
Conducted Emissions	15.207	Complies
Radiated Emissions	15.249	Complies

Handset:

NAME OF TEST	PARA. NO.	RESULT
Radiated Emissions	15.249	Not Applicable

Footnotes For N/A's:

Test Conditions:

Indoor	Temperature:	25 °C
	Humidity:	50 %
Outdoor	Temperature:	31 °C
	Humidity:	60 %

Section 2A. General Equipment Specification

Base:

Frequency Range:	902.3 to 906.65 MHz
Tunable Bands:	1
Number of Channels:	30
Channel Spacing:	150 kHz
Emission Designator:	108KF1D
Crystal Frequencies:	18.25 MHz Ref
User Frequency Adjustment:	Not Applicable

	Yes	**No**
Integral Antenna	☒	☐

Note: *If antenna is not integral to transmitter explain method of attachment and type of unique connector:*

Section 2B. General Equipment Specification

Handset

Frequency Range:

Tunable Bands:

Number of Channels:

Channel Spacing:

Emission Designator:

Crystal Frequencies:

User Frequency Adjustment:

Integral Antenna **Yes** ☐ **No** ☐

NOT APPLICABLE

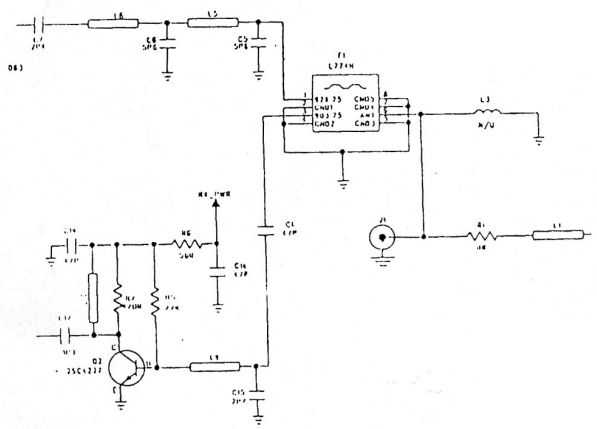
Note: *If antenna is not integral to transmitter explain method of attachment and type of unique connector:*

Description of Modification for Class II Permissive Change

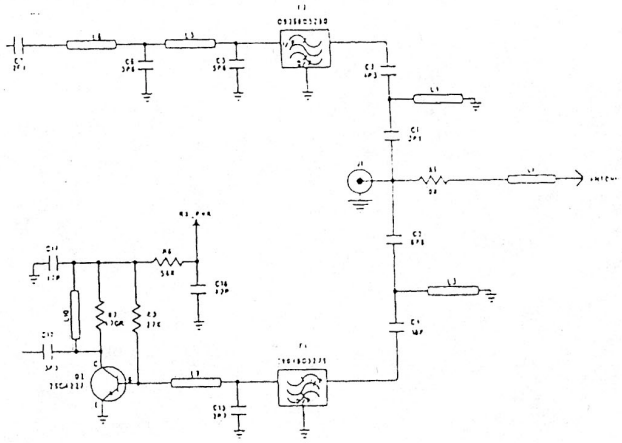
The E.U.T. was modified by the customer by replacing the saw duplexer with 2 ceramic filters (see schematic) for Class II permissive change.

Schematic

OLD DESIGN



NEW DESIGN



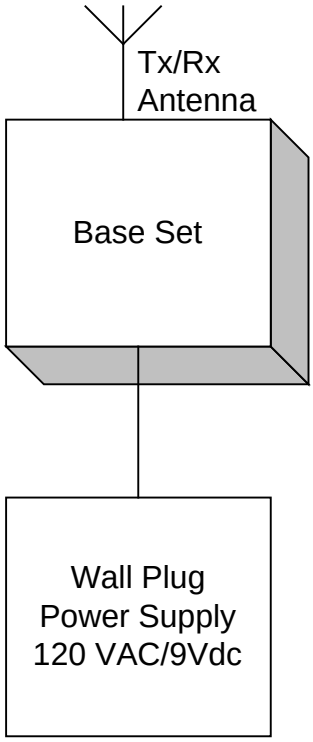
Modifications Made During Testing

NOT APPLICABLE

Theory of Operation

The E.U.T. is a 900 MHz cordless telephone base.

System Diagram



Section 3. Powerline Conducted Emissions

NAME OF TEST: Powerline Conducted Emissions	PARA. NO.: 15.207
TESTED BY: Chris Maidens	DATE: July 15, 1999

Minimum Standard:

Frequency (MHz)	Maximum Powerline Conducted RF Voltage (μV)	(dBμV)
0.45 - 30.0	250	48

Test Results: Complies. See attached graph(s).

Measurement Data: See table and attached graph(s).

Conductor	Frequency (MHz)	CISPR (dBμ47.7V)	Average (dBμV)	BB/NB	BB Correction (dB)	Result (dBμV)
Neutral	18.401	47.7	47.4	NB	0.0	0.3
Phase	18.401	46.3	45.3	NB	0.0	1.7

Method of Measurement: (Procedure ANSI C63.4-1992)

Measurements were made using a spectrum analyzer with 10 kHz RBW, Peak Detector. Any emissions that are close to the limit are measured using a test receiver with 10 kHz bandwidth, CISPR Quasi-Peak Detector.

Conducted Photographs (Worst Case Configuration)

Front View

Rear View

Section 4A. Radiated Emissions (Base)

NAME OF TEST: Radiated Emissions (Base)	PARA. NO.: 15.249
TESTED BY: Chris Maidens	DATE: July 15, 1999

Minimum Standard: Para no. 15.249

(a) The field strengths shall not exceed the following:

Fundamental (MHz)	Field Strength (mV/m)	Field Strength (dBµV)	Harmonic (mV/m)	Harmonic (dBµV)
902-928	50	94	0.5	54

(b) Field strength limits are specified at a distance of 3 metres.

(c) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated limits of 15.209 whichever is the less attenuation.

(d) The emission limits shown above are based on measurement instrumentation employing a CISPR quasi-peak detector below 1000 MHz and an averaging detector above 1000 MHz. However, the peak field strength of any emission shall not exceed the average limit by more than 20 dB.

Test Results: Complies. The worst-case emission level is 83.3 dBµV/m @ 3m at 902.35 MHz. This is 10.7 dB below the specification limit.

Measurement Data: See attached table.

Maximizing Emission Levels:

For hand held equipment or equipment that may be mounted in a variety of positions, the E.U.T. was tested on three orthogonal axis to determine orientation of worst-case emission levels.

Test Data - Radiated Emissions (Base)

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)
902.35	L/P	V			53.1	30.2			83.3	94.0	10.7
902.35	L/P	H			49.0	30.2			79.2	94.0	14.8
904.45	L/P	V			49.7	30.2			79.9	94.0	14.1
904.45	L/P	H			47.9	30.2			78.1	94.0	15.9
906.55	L/P	V			49.3	30.2			79.5	94.0	14.5
906.55	L/P	H			45.1	30.2			75.3	94.0	18.7

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.

Radiated Photographs - Base (Worst Case Configuration)

Front View

Rear View

Section 4B. Radiated Emissions (Handset)

NAME OF TEST: Radiated Emissions (Handset)	PARA. NO.: 15.249
TESTED BY:	DATE:

Minimum Standard: Para no. 15.249

(a) The field strengths shall not exceed the following:

Fundamental (MHz)	Field Strength (mV/m)	Field Strength (dBµV)	Harmonic (mV/m)	Harmonic (dBµV)
902-928	50	94	0.5	54

NOT APPLICABLE

(b) Field strength limits are specified at a distance of 3 metres.

(c) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated limits of 15.209 whichever requires less attenuation.

(d) The emission limits shown above are based on measurement instrumentation employing a CISPR quasi-peak detector below 1000 MHz and an averaging detector above 1000 MHz. However, the peak field strength of any emission shall not exceed the average limit by more than 20 dB.

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.

Maximizing Emission Levels:

For hand held equipment or equipment that may be mounted in a variety of positions, the E.U.T. was tested on three orthogonal axis to determine orientation of worst-case emission levels.

Test Data - Radiated Emissions (Handset)

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.
** Includes cable loss when amplifier is not used.
*** Includes cable loss.
( ) Denotes failing emission level.

Radiated Photographs - Handset (Worst Case Configuration)

FRONT VIEW

NOT APPLICABLE

REAR VIEW

Section 5. Test Equipment List

Equipment List - Conducted Emissions - Shielded Room #1

CAL Cycle	Equipment	Manufacturer	Model #	Serial/Asset #	Last Cal.	Next Cal.
1Year	LISN	Rohde & Schwarz	ESH2-Z5	890485/017	July 23/98	July 23/99
1Year	Spectrum analyzer	Hewlett-Packard	8566B	2311A02238	Oct. 22/98	Oct. 22/99
1Year	Spectrum analyzer display	Hewlett-Packard	8566B	2314A04759	Oct. 22/98	Oct. 22/99
	Plotter	Hewlett-Packard	7550A	28484 15123	N/A	N/A
1 Year	Transient Limiter	Hewlett-Packard	1194 7A	3107A01766	July 21/98	July 21/99

Equipment List - Radiated Emissions

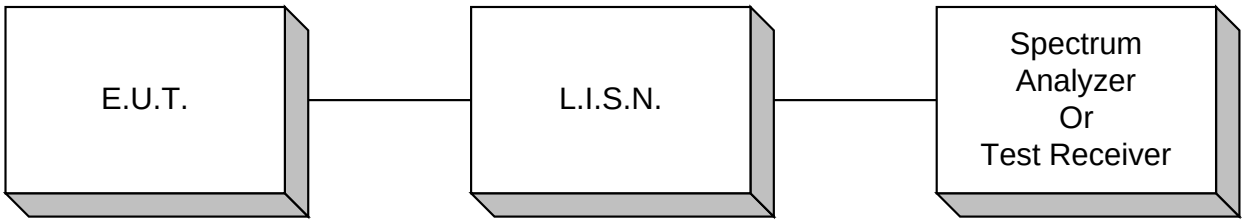
CAL Cycle	Equipment	Manufacturer	Model #	Serial/Asset #	Last Cal.	Next Cal.
	Biconilog Antenna	EMCO	3143	9404-1039	NCR	NCR
1Year	Receiver	Rohde & Schwarz	ESVP	892661/014	July 23/98	July 23/99
1Year	Spectrum Analyzer	Hewlett-Packard	8566B	2311A02238	Oct. 22/98	Oct. 22/99
1Year	Spectrum Analyzer Display	Hewlett-Packard	8566B	2314A04759	Oct. 22/98	Oct. 22/99
	Plotter	Hewlett-Packard	7550A	28484 15123	N/A	N/A
2 Year	Horn Antenna	EMCO	3115	3132	Feb. 9/98	Feb.9/00
1 Year	Log Periodic Antenna	EMCO	LPA-25	1141	July 27/98	July 27/99

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

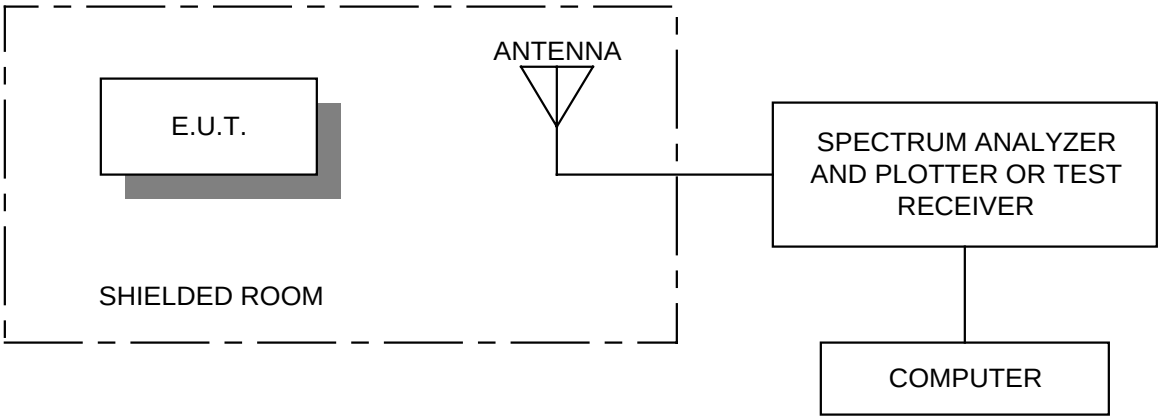
ANNEX A

TEST DIAGRAMS

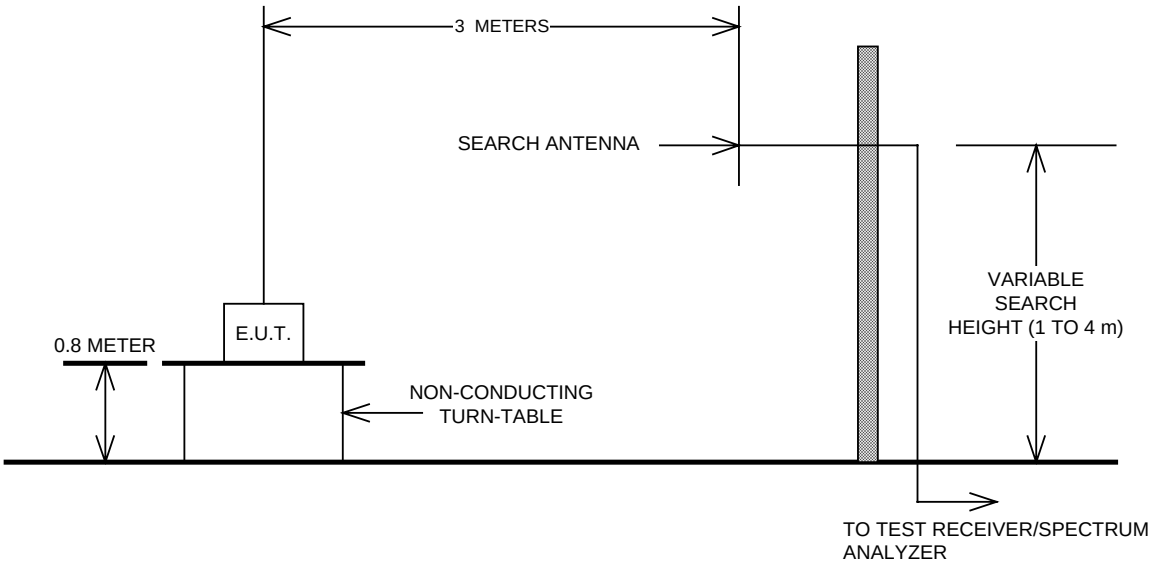
Conducted Emissions



Radiated Prescan



Test Site For Radiated Emissions



ANNEX B

RESTRICTED BANDS OF OPERATION

Section B 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			