Capital Prospect Ltd.

Application
For
Certification
(FCC ID: KUTAM001)

Transceiver

0507018
TL/ Sandy Lee
May 30, 2005

Intertek Testing Services Hong Kong Ltd.
2/F., Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong.
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MEASUREMENT/TECHNICAL REPORT

Capital Prospect Ltd. - MODEL: AM-001, AM-002

FCC ID: KUTAM001

May 30, 2005

This report concerns (check one:) Original Grant X Class II Change _____

Equipment Type: DSR - Low Power Transceiver (example: computer, printer, modem, etc.)

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes ___ No X

If yes, defer until: _____ date

Company Name agrees to notify the Commission by: _____ date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes ___ No X

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [12-08-03 Edition] provision.

Report prepared by:

Tommy Leung
Intertek Testing Services
2/F., Garment Center,
576, Castle Peak Road,
Kowloon, Hong Kong.
Phone: 852-2173-8538
Fax: 852-2741-1693

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List of attached file

Exhibit type	File Description	filename
Test Report	Test Report	report.pdf
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission	config photos.doc
Test Setup Photo	Conducted Emission	config photos.doc
Test Report	Conducted Emission Test Result	conduct.pdf
Test Report	Bandwidth Plot	bw.pdf
External Photo	External Photo	external photos.doc
Internal Photo	Internal Photo	internal photos.doc
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Test Report	Timing Diagram	timing.pdf
Cover Letter	Confidentiality Request	request.pdf

EXHIBIT 1

GENERAL DESCRIPTION

1.0 General Description

1.1 Product Description

The Equipment Under Test (EUT) is a Transceiver operating at 433.920MHz. The EUT is powered by a 120VAC to 12VDC 200mA adaptor. It is a control panel of Wireless Alert System, and it also is a home automation center which allows a user to remotely control household appliances or lightings. It transmits a control signal to the corresponding receiver to perform a variety of operations after entering control button, phone command, or programming control. On the other hand, it also receives a signal from the corresponding sensor after triggering the sensor. The transmitter will automatically cease transmission within 1.7 sec of being released the button, command, or control.

Antenna Type : Internal, Integral

The model AM-002 is the same as the model AM-001 in hardware aspect except difference in enclosure, receiving antenna type, and backup battery type. The model AM-001 uses a spiral antenna and 4 x 1.5V “AAA” battery for backup purpose, but the model AM-002 uses a soft wire antenna and 6V Lead-Acid rechargeable battery.

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

1.2 Related Submittal(s) Grants

This is a certification application for the transmitter of the EUT. The receiver is subjected to the verification authorization process, in accordance with 15.101(b). A verification report has been prepared for the receiver sections of this device. The receivers, associated with this transmitter, has FCC ID: KUTSW100R and will be filed later.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2001). All measurements were performed in Open Area Test Sites. Preliminary scans were performed in the Open Area Test Sites only to determine worst case modes. For each scan, the procedure for maximizing emissions in Appendices D and E were followed. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the **"Justification Section"** of this Application.

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the emission data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC.

EXHIBIT 2

SYSTEM TEST CONFIGURATION

2.0 System Test Configuration

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2001).

Both models were powered from 120VAC to 12VDC 200mA adaptor, but the models AM-001 and AM-002 were also powered 4 x 1.5V “AAA” size battery and 6V Lead-Acid rechargeable battery respectively.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The unit was operated standalone and placed in the center of the turntable.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes. For simplicity of testing, the unit was wired to transmit continuously.

The frequency range from 433.920MHz to 4.34GHz was searched for spurious emissions from the device. Only those emissions reported were detected. All other emissions were at least 20 dB below the applicable limits.

2.2 EUT Exercising Software

There was no special software to exercise the device. Once the button is depressed, the unit transmits the typical signal. For simplicity of testing, the unit was wired to transmit continuously.

2.3 Special Accessories

There are no special accessories necessary for compliance of this product.

2.4 Equipment Modification

Any modifications installed previous to testing by Capital Prospect Ltd. will be incorporated in each production model sold/leased in the United States.

No modifications were installed by Intertek Testing Services.

2.5 Measurement Uncertainty

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

2.6 Support Equipment List and Description

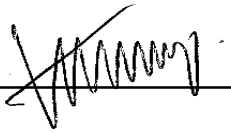
CABLES:
(1) Telecommunication cable with RJ11C connectors (1m, unshielded), terminated.

OTHERS:
(1) Simple Corded Phone, Model: FC2548W, FCC Part 15 Verification (Supplied by Intertek)

All the items listed under section 2.0 of this report are

Confirmed by:

Tommy Leung
Assistant Manager
Intertek Testing Services Hong Kong Ltd.
Agent for Capital Prospect Ltd.



Signature

May 30, 2005 Date

EXHIBIT 3

EMISSION RESULTS

3.0 Emission Results

Data is included worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

3.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD + AV

where FS = Field Strength in dBµV/m
RA = Receiver Amplitude (including preamplifier) in dBµV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB
AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD + AV

3.1 Field Strength Calculation (cont'd)

Example

Assume a receiver reading of 62.0 dBµV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dBµV/m. This value in dBµV/m was converted to its corresponding level in µV/m.

RA = 62.0 dBµV
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0 dB

AV = -10 dB

FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 dBµV/m

Level in µV/m = Common Antilogarithm [(32 dBµV/m)/20] = 39.8 µV/m

3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
at
433.920 MHz

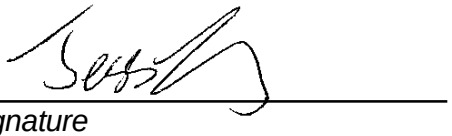
For electronic filing, the worst case radiated emission configuration photograph is saved with filename: config photos.doc.

3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 6.2 dB and 9.7 dB
on models AM-001 and AM-002 respectively

TEST PERSONNEL:



Signature

Jess Tang, Engineer
Typed/Printed Name

May 30, 2005
Date

Applicant: Capital Prospect Ltd. Date of Test: 15 April - 7 May, 2005
Model: AM-001

Table 1

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
H	433.920	69.5	16	25.0	3.9	74.6	80.8	-6.2
H	867.840	33.9	16	31.0	3.9	45.0	60.8	-15.8
H	*1301.760	55.9	34	26.1	3.9	44.1	54.0	-9.9
H	1735.680	52.9	34	27.2	3.9	42.2	60.8	-18.6
H	2169.600	48.3	34	29.4	3.9	39.8	60.8	-21.0
H	2603.520	46.6	34	30.4	3.9	39.1	60.8	-21.7

Notes: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna is used for the emission over 1000MHz.

* Emission within the restricted band fulfil the requirement of 15.209.

Test Engineer: Jess Tang

Applicant: Capital Prospect Ltd. Date of Test: 15 April - 7 May, 2005
Model: AM-002

Table 2

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	433.920	66.0	16	25.0	3.9	71.1	80.8	-9.7
V	867.840	31.7	16	31.0	3.9	42.8	60.8	-18.0
V	*1301.760	49.2	34	26.1	3.9	37.4	54.0	-16.6
V	1735.680	49.4	34	27.2	3.9	38.7	60.8	-22.1
V	2169.600	48.3	34	29.4	3.9	39.8	60.8	-21.0
V	2603.520	46.6	34	30.4	3.9	39.1	60.8	-21.7

Notes: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna is used for the emission over 1000MHz.

* Emission within the restricted band fulfil the requirement of 15.209.

Test Engineer: Jess Tang

3.4 Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration

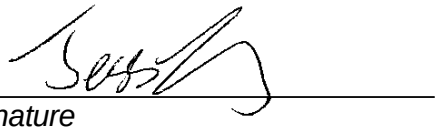
For electronic filing, the worst case line-conducted configuration photograph are saved with filename: config photos.doc.

3.5 Conducted Emission Data

For electronic filing, the graph and data table of conducted emission is saved with filename: conduct.pdf.

Judgement: Passed by more than 20 dB

TEST PERSONNEL:



Signature

Jess Tang, Engineer
Typed/Printed Name

May 30, 2005
Date

EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

4.0 Equipment Photographs

For electronic filing, the photographs of the tested EUT are saved with filename: external photos.doc & internal photos.doc.

EXHIBIT 5

PRODUCT LABELLING

5.0 **Product Labelling**

For electronic filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

EXHIBIT 6

TECHNICAL SPECIFICATIONS

6.0 Technical Specifications

For electronic filing, the block diagram and schematics of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

EXHIBIT 7

INSTRUCTION MANUAL

7.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

EXHIBIT 8

MISCELLANEOUS INFORMATION

8.0 Miscellaneous Information

This miscellaneous information includes details of the measured bandwidth, the test procedure and calculation of factors such as pulse desensitization and averaging factor.

8.1 Measured Bandwidth

For electronic filing, the plots show the fundamental emission when modulated is saved with filename: bw.pdf. From the plots, the bandwidth of models AM-001 and AM-002 is observed to be 415 kHz and 413 kHz respectively, at 20 dBc where the bandwidth limit is 1084.8 kHz.

Therefore, the unit meets the requirement of section 15.231(c).

Figure 8.1 Bandwidth

8.2 Discussion of Pulse Desensitization

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis ... Pulsed RF.*

The effective period (T_{eff}) was approximately 1.25 ms for a digital "1" bit, as shown in the plots of Exhibit 8.3. With a resolution bandwidth (3 dB) of 100 kHz, the pulse desensitivity factor was 0 dB.

8.3 Calculation of Average Factor

Averaging factor in dB = 20 log (duty cycle)

The specification for output field strengths in accordance with the FCC rules specify measurements with an average detector. During testing, a spectrum analyzer incorporating a peak detector was used. Therefore, a reduction factor can be applied to the resultant peak signal level and compared to the limit for measurement instrumentation incorporating an average detector.

The time period over which the duty cycle is measured is 100 milliseconds, or the repetition cycle, whichever is a shorter time frame. The worst case (highest percentage on) duty cycle is used for the calculation. The duty cycle is measured by placing the spectrum analyzer in zero scan (receiver mode) and linear mode at maximum bandwidth (3 MHz at 3 dB down) and viewing the resulting time domain signal output from the analyzer on a Tektronix oscilloscope. The oscilloscope is used because of its superior time base and triggering facilities.

The duty cycle is simply the on-time divided by the period:

The duration of one cycle = 100 ms
Effective period of the cycle = (3.25 + 1.25 + 4 + 1.25 x 44) ms = 63.5 ms

DC = 63.5 ms / 100 ms = 0.635

Therefore, the averaging factor is found by $20 \log_{10} 0.635 = -3.9$ dB

For electronic filing, the plot shows the transmission timing is saved with filename: timing.pdf.

8.4 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of transmitters operating under Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 - 2001.

The transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjusted through all three orthogonal axes to obtain maximum emission levels. The antenna height and polarization are varied during the testing to search for maximum signal levels. The height of the antenna is varied from one to four meters.

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in Exhibit 8.3.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower. For line conducted emissions, the range scanned is 150 kHz to 30 MHz.

8.4 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements are made as described in ANSI C63.4 - 2001.

The IF bandwidth used for measurement of radiated signal strength was 100 kHz or greater when frequency is below 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. A discussion of whether pulse desensitivity is applicable to this unit is included in this report (See Exhibit 8.2). Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the forbidden bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, unless otherwise reported. Measurements taken at a closer distance are so marked.

EXHIBIT 9

CONFIDENTIALITY REQUEST

9.0 **Confidentiality Request**

The applicant would like to have confidential protection of the following documents:

- Schematic
- Block Diagram
- Operation Description

For electronic filing, the request letter is saved with filename: request.pdf.