Cybiotronics Limited

Application
For
Class II Permissive Change

2.4GHz Frequency Hopping Spread Spectrum Cordless Phone with Caller ID, Speakerphone and DSL Filter

(FCC ID: CAC386001)

05089441
TL/Ann Choy
October 18, 2005

Intertek Testing Services Hong Kong Ltd.
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LIST OF EXHIBITS

MEASUREMENT/TECHNICAL REPORT

Cybiotronics Limited- MODEL: CY-386(XXX), MI-386(XXX), BS-386(XXX), SBC 386(XXX), CYBIOLINK 386(XXX), CY-386B(XXX), MI-386B(XXX), BS-386B(XXX), SBC 386B(XXX), CYBIOLINK 386B(XXX), CY-381(XXX), MI-381(XXX), BS-381(XXX), SBC 381(XXX), CYBIOLINK 381(XXX), CY-380(XXX), MI-380(XXX), BS-380(XXX), CYBIOLINK 380(XXX)

FCC ID: CAC386001

This report concerns (check one) Original Grant_____ Class II Change_X___

Equipment Type: DSS-Part 15 Spread Spectrum Transmitter

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 [10-01-04 Edition] provision.

Report prepared by: Tommy Leung
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2/F., Garment Centre,
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Test Setup Photo	Radiated Emission for Base	config photos.doc
Test Report	Out Band Antenna Conducted Emission Plot	obantcon.pdf
Test Report	Duty Cycle Calculation and Measurement	dcc.pdf
Test Setup Photo	Conducted Emission	config photos.doc
Test Report	Conducted Emission Test Result	conduct.pdf
External Photo	External Photo	external photos.doc
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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
User Manual	FCC Information	FCC information.pdf

EXHIBIT 1
SUMMARY OF TEST RESULTS

1.0 Summary of Test

Cybiotronics Limited- MODEL: CY-386(XXX), MI-386(XXX), BS-386(XXX), SBC 386(XXX), CYBIOLINK 386(XXX), CY-386B(XXX), MI-386B(XXX), BS-386B(XXX), SBC 386B(XXX), CYBIOLINK 386B(XXX), CY-381(XXX), MI-381(XXX), BS-381(XXX), SBC 381(XXX), CYBIOLINK 381(XXX), CY-380(XXX), MI-380(XXX), BS-380(XXX), CYBIOLINK 380(XXX)

FCC ID: CAC386001

TEST	REFERENCE	RESULTS
Out of Band Antenna Conducted Emission	15.247(d)	Pass
Radiated Emission in Restricted Bands	15.247(d)	Pass
AC Conducted Emission	15.207	Pass
Radiated Emission from Digital Part	15.109	Pass
Antenna Requirement	15.203	Pass (See Notes)

Notes: The EUT uses a permanently attached antenna which, in accordance to Section 15.203, is considered sufficient to comply with the provisions of this section.

EXHIBIT 2
GENERAL DESCRIPTION

2.0 **General Description**

2.1 Product Description

The CY-386 is a 2.4GHz Frequency Hopping Spread Spectrum Cordless Phone with Caller ID, Speakerphone and DSL Filter. It operates at frequency range of 2401.808MHz to 2479.399MHz with 88 physical hopping frequencies and 75 logical hopping frequencies. The unit is capable of either tone or pulse dialing. The internal power supply's isolation is accomplished through a power transformer having an adequate dielectric rating. The circuit wiring is consistent under the requirement of part 68.

The base unit has a page key, which is used to communicate with handset unit.

The antennas used in base unit and handset are integral, and the test sample is a prototype.

The Model: CY-386 is one of the Model: CY-386(XXX), and the Models: MI-386(XXX), BS-386(XXX), SBC 386(XXX), and CYBIOLINK 386(XXX) are the same as the Model: CY-386 in hardware aspect. The Models: CY-386B(XXX), MI-386B(XXX), BS-386B(XXX), SBC 386B(XXX), and CYBIOLINK 386B(XXX) have one base plus two handsets with a charger, and the Models: CY-381(XXX), MI-381(XXX), BS-381(XXX), SBC 381(XXX), CYBIOLINK 381(XXX), CY-380(XXX), MI-380(XXX), BS-380(XXX), and CYBIOLINK 380(XXX) are an additional identical handset with an extra charger for selling handset standalone. The suffix, (XXX), followed by the model number stands for color difference and different packaging. The model numbers are identical in electrical, mechanical, and physical design. The difference in model number serves as marketing strategy.

The circuit description and frequency hopping algorithm is saved with filename: descri.pdf

Connection between the device and the telephone network is accomplished through the use of USOC RJ11C in the 2-wire loop calling central office line.

2.2 Purpose of Application

The purpose of application is saved with filename: product change.pdf.

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2003). 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. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

2.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated 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 3
SYSTEM TEST CONFIGURATION

3.0 **System Test Configuration**

3.1 Justification

For emissions testing, the equipment under test (EUT) was setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. The handset was powered by a fully charged battery.

For the measurements, the EUT is attached to a plastic stand if necessary and placed on the wooden turntable. If the base unit attaches to peripherals, they are connected and operational (as typical as possible). The handset is remotely located as far from the antenna and the base as possible to ensure full power transmission from the base. Else, the base is wired to transmit full power without modulation.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Detector function is in peak mode. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000MHz. The resolution is 1MHz or greater for frequencies above 1000MHz.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9kHz to 25GHz.

As the base unit has 2 antennas, both have been tested while conducting the test on one of antennas, another one is being disable its transmission. The data in this report represents the worst-case.

3.2 EUT Exercising Software

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

3.3 Support Equipment List and Description

The FCC ID's for all equipment, plus descriptions of all cables used in the tested system (included inserted cards, which have grants) are:

HARDWARE:

The unit was operated standalone. An AC adapter and a battery (provided with the unit) were used to power the device. Their description are listed below.

(1) Base Unit: An AC adaptor (120VAC to 9VDC 500mA, Model: AD-0950)
(2) Handset: A “Ni-MH” type rechargeable battery (3.6V 750mAh)

CABLES:

(1) 2 x Telecommunication cable with RJ11C connectors (1m, unshielded), terminated

OTHERS:

(1) A headset for telephone use with 1.2m unshielded cable permanently affixed. (Supplied by Intertek)
(2) Recharge Cradle of Base Unit: A “Ni-MH” type rechargeable spare battery (3.6V 750mAh)

3.4 Measurement Uncertainty

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

3.5 Equipment Modification

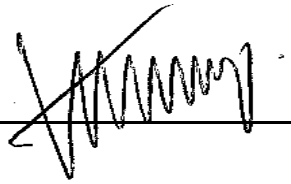
Any modifications installed previous to testing by Cybiotronics Limited will be incorporated in each production model sold/leased in the United States.

No modifications were installed by ETL Division, Intertek Testing Services Hong Kong Ltd.

All the items listed under section 3.0 of this report are confirmed by:

Confirmed by:

Tommy Leung
Assistant Manager
Intertek Testing Services Hong Kong Ltd.
Agent for Cybiotronics Limited



Signature

Oct 18, 2005 Date

EXHIBIT 4
MEASUREMENT RESULTS

Company: Cybiotronics Limited Date of Test: May 10-September 29, 2005
Model: CY-386

4.0 Measurement Results

4.1 Out of Band Conducted Emissions, FCC Rule 15.247(d):

In any 100 kHz bandwidth outside the EUT passband, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, or else shall meet the general limits for radiated emissions at frequencies outside the passband, whichever results in lower attenuation.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

Refer to the following plots for out of band conducted emissions data:

Plot B6A.1 - B6A.2: Low Channel Emissions
Plot B6B.1 - B6B.2: Middle Channel Emissions
Plot B6C.1 - B6C.2: High Channel Emissions
Plot B6D.1 - B6D.2: Modulation Products Emissions*

The plots showed the 2nd harmonic and modulation products at the band edges of 2400 MHz and 2483.5 MHz. In addition, all spurious emission and up to the tenth harmonic was measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

Furthermore, delta measurement technique for measuring bandedge emissions was incorporated in the test of the edge at 2483.5MHz.

*These 2 plots are shown the worst-case which has been already considered between enable and disable the hopping function of the EUT.

For electronic filing, the above plots are saved with filenames: obantcon.pdf

Company: Cybiotronics Limited Date of Test: May 10-September 29, 2005
Model: CY-386

4.2 Out of Band Radiated Emissions (for emissions in 4.1 above that are less than 20 dB below carrier), FCC Rule 15.247(d):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

[×] Not required, all emissions more than 20dB below fundamental
[ ] See attached data sheet

Company: Cybiotronics Limited Date of Test: May 10-September 29, 2005
Model: CY-386

4.3 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b), (c):

Data is included of the 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. All measurements were performed with peak detection unless otherwise specified.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

Company: Cybiotronics Limited Date of Test: May 10-September 29, 2005
Model: CY-386

4.4 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

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

Company: Cybiotronics Limited Date of Test: May 10-September 29, 2005
Model: CY-386

4.5 Radiated Emission Configuration Photograph - Base Unit

Worst Case Radiated Emission
at
7438.197 MHz

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

Company: Cybiotronics Limited Date of Test: May 10-September 29, 2005
Model: CY-386

4.6 Radiated Emission Data - Base Unit

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

Judgement : Passed by 7.9 dB compare with the peak limit

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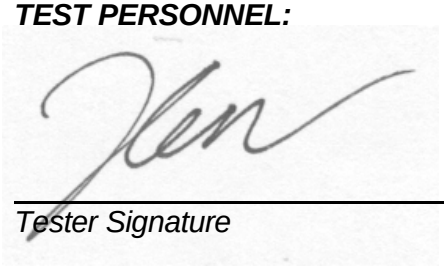
TEST PERSONNEL:



Tester Signature

Kenneth C. C. Lam, Senior Lead Engineer
Typed/Printed Name

October 18, 2005
Date

Company: Cybiotronics Limited
Model: CY-386
Mode : TX-Channel 1

Date of Test: May 10-September 29, 2005

Table 1, Base Unit

Radiated Emissions

Polari-zation	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Average Factor (-dB)	Calculated at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
H	*4803.616	58.2	34	34.0	58.2	28.1	30.1	54	-23.9
H	*12009.041	48.1	34	40.2	54.3	28.1	26.2	54	-27.8
V	*19214.466	31.1	34	45.3	42.4	28.1	14.3	54	-39.7

NOTES: 1. Peak detector is used for the emission measurement.

2. All measurements were made at 3 meters. 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 used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Kenneth C. C. Lam

Company: Cybiotronics Limited
Model: CY-386
Mode : TX-Channel 44

Date of Test: May 10-September 29, 2005

Table 2, Base unit

Radiated Emissions

Polari-zation	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Average Factor (-dB)	Calculated at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
H	*4880.314	55.9	34	34.0	55.9	28.1	27.8	54	-26.2
H	*7320.470	62.0	34	37.0	65.0	28.1	36.9	54	-17.1
H	*12200.783	48.6	34	40.2	54.8	28.1	26.7	54	-27.3
V	*19521.253	31.8	34	45.3	43.1	28.1	15.0	54	-39.0

NOTES: 1. Peak detector is used for the emission measurement.

2. All measurements were made at 3 meters. 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 used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Kenneth C. C. Lam

Company: Cybiotronics Limited
Model: CY-386
Mode : TX-Channel 88

Date of Test: May 10-September 29, 2005

Table 3, Base unit

Radiated Emissions

Polari-zation	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Average Factor (-dB)	Calculated at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
H	**2479.399	119.5	34	29.1	114.6	28.1	86.5	---	---
H	*4958.798	58.0	34	34.0	58.0	28.1	29.9	54	-24.1
H	*7438.197	63.1	34	37.0	66.1	28.1	38.0	54	-16.0
H	*12396.995	48.8	34	40.2	55.0	28.1	26.9	54	-27.1
V	*19835.191	31.9	34	45.3	43.2	28.1	15.1	54	-38.9
V	*22314.590	31.8	34	45.3	43.1	28.1	15.0	54	-39.0

NOTES: 1. Peak detector is used for the emission measurement.

2. All measurements were made at 3 meters. 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 used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function, and this is the worst-case of 7.9dB margin at 7438.197MHz.

** Fundamental emission was measured for determining band-edge compliance of using delta measurement technique.

Test Engineer: Kenneth C. C. Lam

Company: Cybiotronics Limited Date of Test: May 10-September 29, 2005
Model: CY-386

4.7 AC Line Conducted Emission, FCC Rule 15.207:

[ ] Not required; battery operation only

[×] Test data attached

Company: Cybiotronics Limited Date of Test: May 10-September 29, 2005
Model: CY-386

4.8 Line Conducted Configuration Photograph - Base

Worst Case Line-Conducted Configuration

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

Company: Cybiotronics Limited Date of Test: May 10-September 29, 2005
Model: CY-386

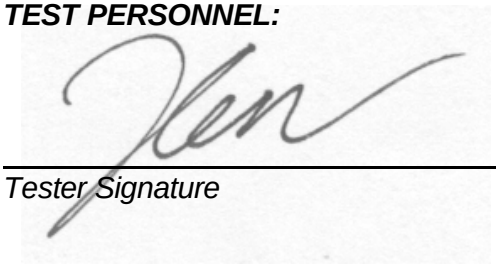
4.9 Line Conducted Emission Data

The data on the following pages list the significant emission frequencies, the limit, and the margin of compliance.

Judgement : Passed by more than 20 dB margin

For electronic filing, the worst case line conducted emission data are saved with filename: conduct.pdf

TEST PERSONNEL:



Tester Signature

Kenneth C. C. Lam, Senior Lead Engineer
Typed/Printed Name

October 18, 2005
Date

Company: Cybiotronics Limited Date of Test: May 10-September 29, 2005
Model: CY-386

4.10 Radiated Emissions from Digital Section of Transceiver (Transmitter), FCC Ref: 15.109

[ ] Not required - No digital part

[×] Test results are attached

[ ] Included in the separated DOC report.

Company: Cybiotronics Limited Date of Test: May 10-September 29, 2005
Model: CY-386

Table 7, Base Unit

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	55.295	30.6	16	11.0	25.6	40.0	-14.4
V	73.720	35.0	16	7.1	26.1	40.0	-13.9
V	82.943	36.3	16	6.7	27.0	40.0	-13.0
V	110.604	30.8	16	12.6	27.4	43.5	-16.1
V	138.244	32.1	16	11.9	28.0	43.5	-15.5
V	147.454	41.7	16	11.6	37.3	43.5	-6.2
V	165.896	31.3	16	13.8	29.1	43.5	-14.4
V	193.517	28.0	16	17.1	29.1	43.5	-14.4
V	221.220	35.5	16	11.8	31.3	46.0	-14.7
V	248.857	34.4	16	11.4	29.8	46.0	-16.2
V	276.495	32.8	16	13.3	30.1	46.0	-15.9
V	294.920	33.7	16	13.3	31.0	46.0	-15.0
V	368.620	32.3	16	14.9	31.2	46.0	-14.8
V	442.391	31.0	16	16.3	31.3	46.0	-14.7
V	497.666	29.9	16	17.3	31.2	46.0	-14.8

NOTES: 1. Quasi-peak detector is used for the emission below or equal to 1000 MHz.

2. All measurements were made at 3 meters. 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.

Test Engineer: Kenneth C. C. Lam

Company: Cybiotronics Limited Date of Test: May 10-September 29, 2005
Model: CY-386

4.11 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The transmitter ON time was determined from the resultant time-amplitude display:

Base Unit:

Duty cycle (DC) = Maximum ON time in 100ms/100ms
= (0.98ms x 4)/100ms for 4 handsets operation

Duty cycle correction, dB = 20* log (DC)
= 20* log (0.0392)
= -28.1 dB

X	See attached spectrum analyzer chart (s) for transmitter timing Base Unit: Plot B7
	See transmitter timing diagram provided by manufacturer
	Not applicable, duty cycle was not used.

For electronic filing, the above plots are saved with filenames: dcc.pdf

EXHIBIT 5
EQUIPMENT PHOTOGRAPHS

5.0 **Equipment Photographs**

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

EXHIBIT 6
PRODUCT LABELLING

6.0 **Product Labelling**

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

EXHIBIT 7
TECHNICAL SPECIFICATIONS

7.0 **Technical Specifications**

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

EXHIBIT 8
INSTRUCTION MANUAL

8.0 **Instruction Manual**

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

Please note that the required FCC Information to the User is saved with filename: FCC information.pdf.

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

EXHIBIT 9
CONFIDENTIALITY REQUEST

9.0 **Confidentiality Request**

For electronic filing, a confidentiality request is saved with filename: request.pdf