

*June 22, 1999*

*GuangDong (Bao An) Communication Co. Ltd.  
Blk 27, Chentian Indl. Park,  
Xixian, Baoan, Shenzhen,  
China.*

*Tel. : 86-755-793-6202*

*Fax. : 86-755-793-6962*

*Dear Dan Corona:*

*Enclosed you will find your file copy of a Part 15 Certification (FCC ID: NS233030N). We have forwarded the original, along with your check for \$940.00, to the FCC.*

*For your reference, FCC will normally take 60 days for reviewing the report. Approval will then be granted when no query is sorted.*

*Please contact me if you have any questions regarding the enclosed material.*

*Sincerely,*

A handwritten signature in black ink, appearing to read 'Alfred Lo', with a stylized flourish at the end.

*Alfred Lo  
Technical Supervisor*

*Enclosure*

FCC ID: NS233030N

**GuangDong (Bao An) Communication Co. Ltd.**

Application  
For  
Certification

43/49MHz 25 Channel Analog Modulation Cordless Telephone

**(FCC ID: NS233030N)**

WO# 9904580  
CKL/at  
June 22, 1999

- The test results reported in this report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.
- This report shall not be reproduced except in full without prior authorization from Intertek Testing Services Limited

FCC ID: NS233030N

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*INTRODUCTION*

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INTERTEK TESTING SERVICES

MEASUREMENT/TECHNICAL REPORT

**GuangDong (Bao An) Communication Co. Ltd. - MODEL: BellSouth 33030**  
**Unisonic TP9015**  
**Unisonic 9076**

**FCC ID: NS233030N**

This report concerns (check one:)		Original Grant <u> X </u>	Class II Change _____
Equipment Type: <u> Cordless Telephone </u> (example: computer, modem, transmitter, etc.)			
Deferred grant requested per 47 CFR 0.457(d)(1)(ii)?		Yes _____	No <u> X </u>
		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 <u> X </u>
If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-1-96 Edition] provision.			
Report prepared by:		Alfred Lo Intertek Testing Services. 2/F., Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. Phone: 852-2173-8530 Fax: 852-2785-5487	

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### List of attached file

Exhibit type	File Description	filename
Cover Letter	Letter of Agency	letter.pdf
Test Report	Test Report	report.doc
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission for Base	base1.jpg, base2.jpg
Test Setup Photo	Radiated Emission for Handset	handset1.jpg, handset2.jpg
Test Setup Photo	Conducted Emission	conduct1.jpg to conduct3.jpg
Test Report	Conducted Emission Test Result	conduct.pdf
Test Report	Base Bandwidth Plot	bsbw.pdf
Test Report	Handset Bandwidth Plot	hsbw.pdf
External Photo	External Photo	ophoto1.jpg, ophoto2.jpg
Internal Photo	Internal Photo	iphoto1.jpg to iphoto7.jpg
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	Auto Channel Selection Mechanism	auto.pdf

**EXHIBIT 1**  
**GENERAL DESCRIPTION**

1.0 **General Description**

1.1 Product Description

The BellSouth 33030 is a 43/49MHz 25 Channel Analog Modulation Cordless Telephone. 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.

Models: 9076 & TP9015 are identical to Model: 33030 as far as hardware, software, features and functionality. Their difference lies in cosmetics only.

The handset unit consists of a keypad with twelve standard keys (0,...9,\*,#), five function keys (Memo, Flash, Vol, Pause and Redial), and one channel switch key. A Talk key is provided to control pick/release telephone line in a toggle base.

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

The circuit description 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.



### 1.2 Related Submittal(s) Grants

This is an Application for Certification of a cordless telephone system. Two transmitters are included in this Application. This specific report details the emission characteristics of each transmitter. The receivers are subject to the verification authorization process, in accordance with 15.101(b). A verification report has been prepared for the receiver sections of each device. The device is also subject to Part 68 Registration.

### 1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (1992). 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 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 2**  
**SYSTEM TEST CONFIGURATION**

## 2.0 System Test Configuration

### 2.1 Justification

For emission testing, the equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). 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 cardboard box 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. All emissions greater than 20 dB $\mu$ V/m are recorded.

Radiated emission measurement were performed from 30 MHz to 1000 MHz.

### 2.2 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.

For emissions testing, the units were setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing.

### 2.3 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 (provided with the unit) was used to power the device. Its description is listed below.

- (1) AC adapter with two meter unshielded power cord permanently affixed.

*CABLES:*

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

*OTHERS:*

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

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### 2.4 Equipment Modification

Any modifications installed previous to testing by GuangDong (BaoAn) Communication Co. Ltd. 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 2.0 of this report are confirmed by:

*Confirmed by:*

*Alfred Lo  
Technical Supervisor  
Intertek Testing Services  
Agent for GuangDong (Bao An) Communication Co. Ltd.*



\_\_\_\_\_  
Signature

\_\_\_\_\_  
22 June, 1999 Date

**EXHIBIT 3**  
**EMISSION RESULTS**

3.0 **Emission Results**

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.

### 3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

where            FS = Field Strength in dB $\mu$ V/m  
                    RA = Receiver Amplitude (including preamplifier) in dB $\mu$ V  
                    CF = Cable Attenuation Factor in dB  
                    AF = Antenna Factor in dB  
                    AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:-

$$FS = RR + LF$$

where            FS = Field Strength in dB $\mu$ V/m  
                    RR = RA - AG in dB $\mu$ V  
                    LF = CF + AF in dB

Assume a receiver reading of 52.0 dB $\mu$ V 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, giving a field strength of 32 dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

$$\begin{array}{ll} RA = 52.0 \text{ dB}\mu\text{V/m} & \\ AF = 7.4 \text{ dB} & RR = 23.0 \text{ dB}\mu\text{V} \\ CF = 1.6 \text{ dB} & LF = 9.0 \text{ dB} \\ AG = 29.0 \text{ dB} & \\ FS = RR + LF & \\ FS = 23 + 9 = 32 \text{ dB}\mu\text{V/m} & \end{array}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$



3.2 Radiated Emission Configuration Photograph - Base Unit

Worst Case Radiated Emission

at 43.720 MHz

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: base1.jpg and base2.jpg

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3.3 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 6.8 dB

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**TEST PERSONNEL:**



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*Tester Signature*

H. Y. Vu, Engineer  
*Typed/Printed Name*

22 June, 1999  
*Date*

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Company: GuangDong (Bao An) Communication Co. Ltd.  
Model: BellSouth 33030  
Mode : TX-Channel 1

Date of Test: June 11, 1999

Table 1, Base unit

**Radiated Emissions**

Polarity	Frequency (M H z)	Reading (dB $\mu$ V)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dB $\mu$ V /m )	Lim it (dB $\mu$ V /m )	M argin (dB)
V	43.720	79.2	10	16	73.2	80.0	-6.8
H	87.440	40.0	9	16	33.0	40.0	-7.0
H	131.160	34.2	13	16	31.2	43.5	-12.3
V	174.880	31.2	19	16	34.2	43.5	-9.3
H	218.600	31.9	17	16	32.9	46.0	-13.1

- NOTES:
1. Peak Detector data
  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 signs (-) in the margin column signify levels below the limits.

Test Engineer: H. Y. Vu

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Company: GuangDong (Bao An) Communication Co. Ltd.  
Model: BellSouth 33030  
Mode : TX-Channel 25

Date of Test: June 11, 1999

Table 2, Base unit

**Radiated Emissions**

Polarity	Frequency (M H z)	Reading (dB $\mu$ V)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dB $\mu$ V /m )	Lim it (dB $\mu$ V /m )	M argin (dB)
V	46.970	75.0	11	16	70.0	80.0	-10.0
H	93.940	40.7	10	16	34.7	43.5	-8.8
H	140.910	36.9	13	16	33.9	43.5	-9.6
V	187.880	36.3	16	16	36.3	43.5	-7.2
H	234.850	29.4	19	16	32.4	46.0	-13.6
H	281.820	29.4	22	16	35.4	46.0	-10.6

- NOTES:
1. Peak Detector data
  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 signs (-) in the margin column signify levels below the limits.

Test Engineer: H. Y. Vu

3.4 Radiated Emission Configuration Photograph - Handset

Worst Case Radiated Emission

at 49.990 MHz

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: handset1.jpg and handset2.jpg

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3.5 Radiated Emission Data - Handset

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

Judgement : Passed by 7.5 dB

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**TEST PERSONNEL:**



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*Tester Signature*

H. Y. Vu, Engineer  
*Typed/Printed Name*

22 June, 1999  
*Date*

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Company: GuangDong (Bao An) Communication Co. Ltd.  
Model: BellSouth 33030  
Mode : TX-Channel 1

Date of Test: June 11, 1999

Table 3, Handset

**Radiated Emissions**

Polarity	Frequency (M H z)	Reading (dB $\mu$ V)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dB $\mu$ V /m )	Lim it (dB $\mu$ V /m )	M argin (dB)
V	48.760	73.2	11	16	68.2	80.0	-11.8
H	146.280	29.9	13	16	26.9	43.5	-16.6
V	341.320	28.5	24	16	36.5	46.0	-9.5

- NOTES:
1. Peak Detector data
  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 signs (-) in the margin column signify levels below the limits.

Test Engineer: H. Y. Vu

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Company: GuangDong (Bao An) Communication Co. Ltd.  
Model: BellSouth 33030  
Mode : TX-Channel 24

Date of Test: June 11, 1999

Table 4, Handset

**Radiated Emissions**

Polarity	Frequency (M H z)	Reading (dB $\mu$ V)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dB $\mu$ V /m )	Lim it (dB $\mu$ V /m )	M argin (dB)
V	49.990	77.5	11	16	72.5	80.0	-7.5
H	149.970	30.2	13	16	27.2	43.5	-16.3
H	349.930	29.2	24	16	37.2	46.0	-8.8

- NOTES:
1. Peak Detector data
  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 signs (-) in the margin column signify levels below the limits.

Test Engineer: H. Y. Vu



3.6 Line Conducted Configuration Photograph - Base Unit

Worst Case Line-Conducted Configuration

For electronic filing, the worst case line-conducted configuration photographs are saved with filename: conduct1.jpg to conduct3.jpg

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### 3.7 Line Conducted Emission Configuration Data

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

Judgement : Passed by more than 20dB margin

\* All readings are peak unless stated otherwise.

#### ***TEST PERSONNEL:***



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*Tester Signature*

H. Y. Vu, Engineer  
*Typed/Printed Name*

22 June, 1999  
*Date*

## INTERTEK TESTING SERVICES

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Company: GuangDong (Bao An) Communication Co. Ltd.  
Model: BellSouth 33030

Date of Test: June 11, 1999

### **Conducted Emissions**

For electronic filing, the conducted emission test result is saved with filename:  
conduct.pdf

**EXHIBIT 4**  
**FREQUENCY DEVIATION**

#### 4.0 Frequency Deviation

Two stability tests were performed -- Frequency stability versus input voltage and frequency stability versus temperature. For both measurements, a 1 GHz frequency counter with temperature controlled time base is used.

The counter is coupled to the transmitter by coiling a pickup wire over the transmitter antenna or directly attaching it to the antenna, assuming a 50Ω antenna is used.

The frequency stability is measured at room temperature by varying the supply voltage (AC or DC, as required) from 85% through 115% of normal operating voltage. This test is not applicable if the unit uses battery power. For battery powered equipment, the batteries are new and fully charged.

Stability versus temperature testing is carried out with the aid of a Tabai Espec Corp, Model PR-3F(W) environmental chamber. The following procedure is followed during testing:

1. Cool the device to -20°C and allow it to stabilize for 30 minutes. Record the frequency.
2. Heat the oven to +50°C and allow it to stabilize for 30 minutes. Record the frequency of operation.
3. Compare the measurements and a room temperature measurement against the assigned frequency tolerance.

The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency.

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4.1.1 Measurement Data - Base Unit

**Channel Frequency**

<b>Channel</b>	<b>Assigned Frequency (MHz)</b>	<b>Measured Frequency (MHz)</b>	<b>Tolerance %</b>
1	43.72000	43.71999	-0.00002
2	43.74000	43.73998	-0.00005
3	43.82000	43.81999	-0.00002
4	43.84000	43.84001	0.00002
5	43.92000	43.92004	0.00009
6	43.96000	43.96003	0.00007
7	44.12000	44.11999	-0.00002
8	44.16000	44.15999	-0.00002
9	44.18000	44.18004	0.00009
10	44.20000	44.20001	0.00002
11	44.32000	44.32003	0.00007
12	44.36000	44.35999	-0.00002
13	44.40000	44.40003	0.00007

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4.1.1 Measurement Data - Base Unit (Cont'd...)

**Channel Frequency**

<b>Channel</b>	<b>Assigned Frequency (MHz)</b>	<b>Measured Frequency (MHz)</b>	<b>Tolerance %</b>
14	44.46000	44.46001	0.00002
15	44.48000	44.48004	0.00009
16	46.61000	46.61004	0.00009
17	46.63000	46.62999	-0.00002
18	46.67000	46.67004	0.00009
19	46.71000	46.71003	0.00006
20	46.73000	46.73004	0.00009
21	46.77000	46.76998	-0.00004
22	46.83000	46.82999	-0.00002
23	46.87000	46.87001	0.00002
24	46.93000	46.93001	0.00002
25	46.97000	46.96999	-0.00002

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4.1.2 Measurement Data - Base Unit - Channel 1

**Frequency Stability**

**Frequency Stability versus Source Voltage**

	<b>Voltage (Vac)</b>	<b>Assigned Frequency (kHz)</b>	<b>Measured Frequency (kHz)</b>	<b>Frequency deviation (kHz)</b>	<b>Tolerance % (x 10<sup>-3</sup>)</b>
Nominal	120	43,720.00	43719.99	-0.01	-0.02
85 %	102	43,720.00	43720.18	0.18	0.41
115 %	138	43,720.00	43720.20	0.20	0.46

**Frequency Stability versus Temperature**

<b>Temperature (°C)</b>	<b>Assigned Frequency (kHz)</b>	<b>Measured Frequency (kHz)</b>	<b>Frequency deviation (kHz)</b>	<b>Tolerance (%) (x 10<sup>-3</sup>)</b>
-20	43,720.00	43720.65	0.65	1.49
25	43,720.00	43719.99	-0.01	-0.02
50	43,720.00	43719.36	-0.64	-1.46



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4.1.2 Measurement Data - Base Unit - Channel 25

**Frequency Stability**

**Frequency Stability versus Source Voltage**

	<b>Voltage (Vac)</b>	<b>Assigned Frequency (kHz)</b>	<b>Measured Frequency (kHz)</b>	<b>Frequency deviation (kHz)</b>	<b>Tolerance % (x 10<sup>-3</sup>)</b>
Nominal	120	46,970.00	46969.99	-0.01	-0.02
85 %	102	46,970.00	46970.29	0.29	0.62
115 %	138	46,970.00	46970.21	0.21	0.45

**Frequency Stability versus Temperature**

<b>Temperature (°C)</b>	<b>Assigned Frequency (kHz)</b>	<b>Measured Frequency (kHz)</b>	<b>Frequency deviation (kHz)</b>	<b>Tolerance (%) (x 10<sup>-3</sup>)</b>
-20	46,970.00	46970.66	0.66	1.41
25	46,970.00	46969.99	-0.01	-0.02
50	46,970.00	46969.29	-0.71	-1.51

**Test Results :** From the two sets of tables for Base Unit - channel 1 & channel 25, the largest deviation from nominal frequency was 710 Hz, which was 0.0015% compared to the standard test frequency. The required minimum standard is 0.01% in §15.233(g)

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4.2.1 Measurement Data - Handset

**Channel Frequency**

<b>Channel</b>	<b>Assigned Frequency (MHz)</b>	<b>Measured Frequency (MHz)</b>	<b>Tolerance %</b>
1	48.76000	48.75985	-0.00031
2	48.84000	48.83995	-0.00010
3	48.86000	48.85983	-0.00035
4	48.92000	48.91989	-0.00022
5	49.02000	49.01990	-0.00020
6	49.08000	49.07991	-0.00018
7	49.10000	49.09984	-0.00033
8	49.16000	49.15995	-0.00010
9	49.20000	49.19994	-0.00012
10	49.24000	49.23990	-0.00020
11	49.28000	49.27993	-0.00014
12	49.36000	49.35991	-0.00018
13	49.40000	49.39989	-0.00022

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4.2.1 Measurement Data - Handset (Cont'd...)

**Channel Frequency**

<b>Channel</b>	<b>Assigned Frequency (MHz)</b>	<b>Measured Frequency (MHz)</b>	<b>Tolerance %</b>
14	49.46000	49.45985	-0.00030
15	49.50000	49.49983	-0.00034
16	49.67000	49.66985	-0.00030
17	49.84500	49.84484	-0.00032
18	49.86000	49.85983	-0.00034
19	49.77000	49.76984	-0.00032
20	49.87500	49.87484	-0.00032
21	49.83000	49.82982	-0.00036
22	49.89000	49.88986	-0.00028
23	49.93000	49.92988	-0.00024
24	49.99000	49.98988	-0.00024
25	49.97000	49.96990	-0.00020

4.2.2 Measurement Data - Handset - Channel 1

**Frequency Stability**

**Frequency Stability versus Source Voltage**

	<b>Voltage (Vdc)</b>	<b>Assigned Frequency (kHz)</b>	<b>Measured Frequency (kHz)</b>	<b>Frequency deviation (kHz)</b>	<b>Tolerance % (x 10<sup>-3</sup>)</b>
Nominal	3.60	48,760.00	48759.85	-0.15	-0.31
85 %	3.06	48,760.00	48759.82	-0.18	-0.37
115 %	4.14	48,760.00	48759.95	-0.05	-0.10

**Frequency Stability versus Temperature**

<b>Temperature (°C)</b>	<b>Assigned Frequency (kHz)</b>	<b>Measured Frequency (kHz)</b>	<b>Frequency deviation (kHz)</b>	<b>Tolerance (%) (x 10<sup>-3</sup>)</b>
-20	48,760.00	48761.06	1.06	2.17
25	48,760.00	48759.85	-0.15	-0.31
50	48,760.00	48759.37	-0.63	-1.29

4.2.2 Measurement Data - Handset - Channel 25

**Frequency Stability**

**Frequency Stability versus Source Voltage**

	<b>Voltage (Vdc)</b>	<b>Assigned Frequency (kHz)</b>	<b>Measured Frequency (kHz)</b>	<b>Frequency deviation (kHz)</b>	<b>Tolerance % (x 10<sup>-3</sup>)</b>
Nominal	3.6	49,970.00	49969.78	-0.22	-0.44
85 %	3.06	49,970.00	49969.90	-0.10	-0.20
115 %	4.14	49,970.00	49970.01	0.01	0.02

**Frequency Stability versus Temperature**

<b>Temperature (°C)</b>	<b>Assigned Frequency (kHz)</b>	<b>Measured Frequency (kHz)</b>	<b>Frequency deviation (kHz)</b>	<b>Tolerance (%) (x 10<sup>-3</sup>)</b>
-20	49,970.00	49971.33	1.33	2.66
25	49,970.00	49969.90	-0.10	-0.20
50	49,970.00	49969.31	-0.69	-1.38

**Test Results :** From the two sets of tables for Handset - channel 1 & channel 25, the largest deviation from nominal frequency was 1330 Hz, which was 0.0027% compared to the standard test frequency. The required minimum standard is 0.01% in §15.233(g)

**EXHIBIT 5**  
**OPERATING BANDWIDTH**

5.0 **Operating Bandwidth**

For measurements of bandwidth, the following procedure was followed by the test engineer:

- (1) Set up the equipment such that the antenna is located close enough to give a full scale deflection of the unmodulated carrier.
- (2) Plot the unmodulated carrier. Any residual guard tones should be left in place, as these will be present at all times in actual operation.
- (3) Plot the bandwidth with all alerting tones active. These include ringing and "call" signals from the base, and any intercom functions available in the handset.
- (4) Determine the worst case bandwidth using the following procedure:
  - (a) Disable all internal modulations, if possible.
  - (b) Apply a 2500 Hz signal to the audio input.
  - (c) Vary the input signal level and observe on the spectrum analyzer the waveform. Vary unit until a maximum deflection is observed. Record the input signal level. Record and plot the bandwidth deflection (100% modulation) measured at -26 dBC.
  - (d) **FOR A DEVICE WITH MODULATION LIMITING:**  
  
Apply a 2500 Hz signal with the input level 16 dB greater than the level which produces 50% modulation. Plot and record the bandwidth.
  - (e) **FOR A DEVICE WITHOUT MODULATION LIMITING:**  
  
Apply a 2500 Hz signal with the input level set for 85% modulation. If not possible, maximize the modulation percentage. Plot and record bandwidth.
- (5) Complete the tables on the following pages.

5.1 Base Unit - Channel 1

**Operating Bandwidth**

<b>kHz from Carrier</b>	<b>Amplitude Down from Carrier (dB)</b>	<b>Limit (kHz)</b>
-8.25/7.88	26	±10
- 20	55.91	N/A
+ 20	55.45	N/A

Base Unit - Channel 25

<b>kHz from Carrier</b>	<b>Amplitude Down from Carrier (dB)</b>	<b>Limit (kHz)</b>
-8.13/8.26	26	±10
- 20	57.12	N/A
+ 20	57.07	N/A

**Test Result:** From the above two tables for Base Unit-channel 1 & channel 25, the modulated signal from base unit closest to band edge was 1.74 kHz below the upper band edge 46.980 MHz according to §15.233(d)



**Bandwidth Plot - Base Unit**

For electronic filing, the bandwidth plot is saved with filename: bsbw.pdf

5.2 Handset - Channel 1

**Operating Bandwidth**

<b>kHz from Carrier</b>	<b>Amplitude Down from Carrier (dB)</b>	<b>Limit (kHz)</b>
-8.38/8.50	26	±10
- 20	57.57	N/A
+ 20	57.31	N/A

Handset - Channel 25

<b>kHz from Carrier</b>	<b>Amplitude Down from Carrier (dB)</b>	<b>Limit (kHz)</b>
-8.63/8.50	26	±10
- 20	57.85	N/A
+ 20	58.15	N/A

**Test Result:** From the above two tables for Handset-channel 1 & channel 25, the modulated signal from base unit closest to band edge was 1.37 kHz above the lower band edge 46.960 MHz according to §15.233(d)

**Bandwidth Plot - Handset**

For electronic filing, the bandwidth plot is saved with filename: hsbw.pdf

**EXHIBIT 6**  
**EQUIPMENT PHOTOGRAPHS**

6.0 **Equipment Photographs**

For electronic filing, the photographs are saved with filename: ophoto1.jpg to ophoto2.jpg  
& iphoto1.jpg to iphoto7.jpg

**EXHIBIT 7**  
**PRODUCT LABELLING**

7.0 **Product Labelling**

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

**EXHIBIT 8**  
**TECHNICAL SPECIFICATIONS**



8.0 **Technical Specifications**

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

**EXHIBIT 9**  
**INSTRUCTION MANUAL**

9.0 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 can be found on Page 26 and 27 of this manual.

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

**EXHIBIT 10**  
**SECURITY CODE INFORMATION**

### 10.0 Security code information

The telephone has an internal security code with 65,536 possible combinations. Each time you pick up the HANDSET, the code is randomly set to a new combination.

Communication between HANDSET and BASE UNIT may not be possible in any of the following situation:

1. After a power failure.
2. After relocation the BASE UNIT by disconnecting the AC adaptor.
3. After replacing the HANDSET battery.

To reset, place the HANDSET on the BASE UNIT for 2 to 5 seconds.

**EXHIBIT 11**  
**AUTOMATIC CHANNEL SELECTION**

11.0 Automatic Channel Selection

The mechanism of automatic channel selection is saved with filename: auto.pdf