MEASUREMENT/TECHNICAL REPORT

Continental Conair Limited - MODEL: South Western Bell Freedom Phone® FF680
FCC ID: LBBFF680

This report concerns (check one:) Original Grant__X__ Class II Change_____

Equipment Type: Cordless Telephone (example: computer, modem, transmitter, 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 [10-1-96 Edition] provision.

Report prepared by:

C. K. Lam
Intertek Testing Services.
2/F., Garment Centre,
576 Castle Peak Road,
Kowloon, Hong Kong.
Phone: 852-2746-8211
Fax: 852-2785-5487

Table of Contents

Table of Contents (Cont'd...)

List of Figures

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 dBμV/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.

2.4 Equipment Modification

Any modifications installed previous to testing by Continental Conair 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 2.0 of this report are confirmed by:

Confirmed by:

C. K. Lam
Assistant Manager
Intertek Testing Services
Agent for Continental Conair Limited

_____ Signature

April 20, 1998
_____ 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 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

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 dBμV/m
RR = RA - AG in dBμV
LF = CF + AF in dB

Assume a receiver reading of 52.0 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, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV/m
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
FS = RR + LF
FS = 23 + 9 = 32 dBμV/m

RR = 23.0 dBμV
LF = 9.0 dB

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

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 3.3 dB

****

TEST PERSONNEL:

Tester Signature

Kenneth H. M. Lam, Engineer
Typed/Printed Name

April 20, 1998
Date

Company: Continental Conair Limited
Model: South Western Bell Freedom Phone® FF680
Mode : TX-Channel 1

Date of Test: March 4, 1998

Table 1, Base unit

Radiated Emissions

Polarity	Frequency (MHz)	Reading (dBμV)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dBμV/m)	Limit (dBμV/m)	Margin (dB)
V	43.720	67.2	10	16	61.2	80.0	-18.8
V	38.064	40.8	10	16	34.8	40.0	-5.2
V	76.128	34.6	6	16	24.6	40.0	-15.4
V	87.440	33.8	9	16	26.8	40.0	-13.2
V	131.157	35.3	13	16	32.3	43.5	-11.2
V	174.872	37.2	19	16	40.2	43.5	-3.3
V	262.315	20.6	21	16	25.6	46.0	-20.4

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: Kenneth H. M. Lam

Company: Continental Conair Limited
Model: South Western Bell Freedom Phone® FF680
Mode : TX-Channel 15

Date of Test: March 4, 1998

Table 2. Base unit

Radiated Emissions

Polarity	Frequency (MHz)	Reading (dBμV)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dBμV/m)	Limit (dBμV/m)	Margin (dB)
V	44.480	63.2	10	16	57.2	80.0	-22.8
V	38.804	42.0	10	16	36.0	40.0	-4.0
V	77.608	35.6	6	16	25.6	40.0	-14.4
V	88.960	33.3	9	16	26.3	43.5	-17.2
V	133.438	34.0	13	16	31.0	43.5	-12.5
H	177.918	36.9	19	16	39.9	43.5	-3.6
H	222.396	30.7	18	16	32.7	46.0	-13.3
H	266.877	26.7	21	16	31.7	46.0	-14.3

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: Kenneth H. M. Lam

Company: Continental Conair Limited
Model: South Western Bell Freedom Phone® FF680
Mode : TX-Channel 25

Date of Test: March 4, 1998

Table 3, Base unit

Radiated Emissions

Polarity	Frequency (MHz)	Reading (dBμV)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dBμV/m)	Limit (dBμV/m)	Margin (dB)
V	46.970	63.5	11	16	58.5	80.0	-21.5
V	39.274	37.2	10	16	31.2	40.0	-8.8
V	78.548	32.7	6	16	22.7	40.0	-17.3
V	93.940	34.7	10	16	28.7	43.5	-14.8
V	140.910	34.2	13	16	31.2	43.5	-12.3
H	187.880	35.6	16	16	35.6	43.5	-7.9
H	234.846	35.7	16	19	32.7	46.0	-13.3

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: Kenneth H. M. Lam

Company: Continental Conair Limited
Model: South Western Bell Freedom Phone® FF680
Mode : Stand by

Date of Test: March 4, 1998

Table 4, Base unit

Radiated Emissions

Polarity	Frequency (MHz)	Reading (dBμV)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dBμV/m)	Limit (dBμV/m)	Margin (dB)
H	36.029	31.4	10	16	25.4	40	-14.6
V	38.067	41.1	10	16	35.1	40	-4.9
H	48.027	32.4	11	16	27.4	40	-12.6
H	60.041	33.5	10	16	27.5	40	-12.5

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: Kenneth H. M. Lam

Company: Continental Conair Limited
Model: South Western Bell Freedom Phone® FF680
Mode : Charging

Date of Test: March 4, 1998

Table 5, Base unit

Radiated Emissions

Polarity	Frequency (MHz)	Reading (dBμV)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dBμV/m)	Limit (dBμV/m)	Margin (dB)
H	36.029	31.4	10	16	25.4	40	-14.6
V	38.067	41.1	10	16	35.1	40	-4.9
H	48.027	32.4	11	16	27.4	40	-12.6
H	60.041	33.5	10	16	27.5	40	-12.5

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: Kenneth H. M. Lam

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 13.9 dB

****

TEST PERSONNEL:

Tester Signature

Kenneth H. M. Lam, Engineer
Typed/Printed Name

April 20, 1998
Date

Company: Continental Conair Limited
Model: South Western Bell Freedom Phone® FF680
Mode : TX-Channel 1

Date of Test: March 4, 1998

Table 6, Handset

Radiated Emissions

Polarity	Frequency (MHz)	Reading (dBμV)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dBμV/m)	Limit (dBμV/m)	Margin (dB)
V	48.760	69.8	11	16	64.8	80.0	-15.2
V	97.520	25.6	11	16	20.6	43.5	-22.9
V	146.280	25.7	13	16	22.7	43.5	-20.8

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: Kenneth H. M. Lam

Company: Continental Conair Limited
Model: South Western Bell Freedom Phone® FF680
Mode : TX-Channel 12

Date of Test: March 4, 1998

Table 7, Handset

Radiated Emissions

Polarity	Frequency (MHz)	Reading (dBμV)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dBμV/m)	Limit (dBμV/m)	Margin (dB)
V	49.360	71.1	11	16	66.1	80.0	-13.9
V	98.750	32.9	11	16	27.9	43.5	-15.6
V	148.125	31.6	13	16	28.6	43.5	-14.9

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: Kenneth H. M. Lam

Company: Continental Conair Limited
Model: South Western Bell Freedom Phone® FF680
Mode : TX-Channel 24

Date of Test: March 4, 1998

Table 8, Handset

Radiated Emissions

Polarity	Frequency (MHz)	Reading (dBμV)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dBμV/m)	Limit (dBμV/m)	Margin (dB)
V	49.990	67.6	11	16	62.6	80.0	-17.4
V	99.980	30.6	11	16	25.6	43.5	-17.9
V	149.970	25.3	13	16	22.3	43.5	-21.2

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: Kenneth H. M. Lam

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 20 dB margin

* All readings are peak unless stated otherwise.

TEST PERSONNEL:

Tester Signature

Kenneth H. M. Lam, Engineer
Typed/Printed Name

April 20, 1998
Date

Company: Continental Conair Limited
Model: South Western Bell Freedom Phone® FF680
Mode : TX

Date of Test: March 4, 1998

Graph 1, Base Unit

Conducted Emissions

Report No.: 9709379

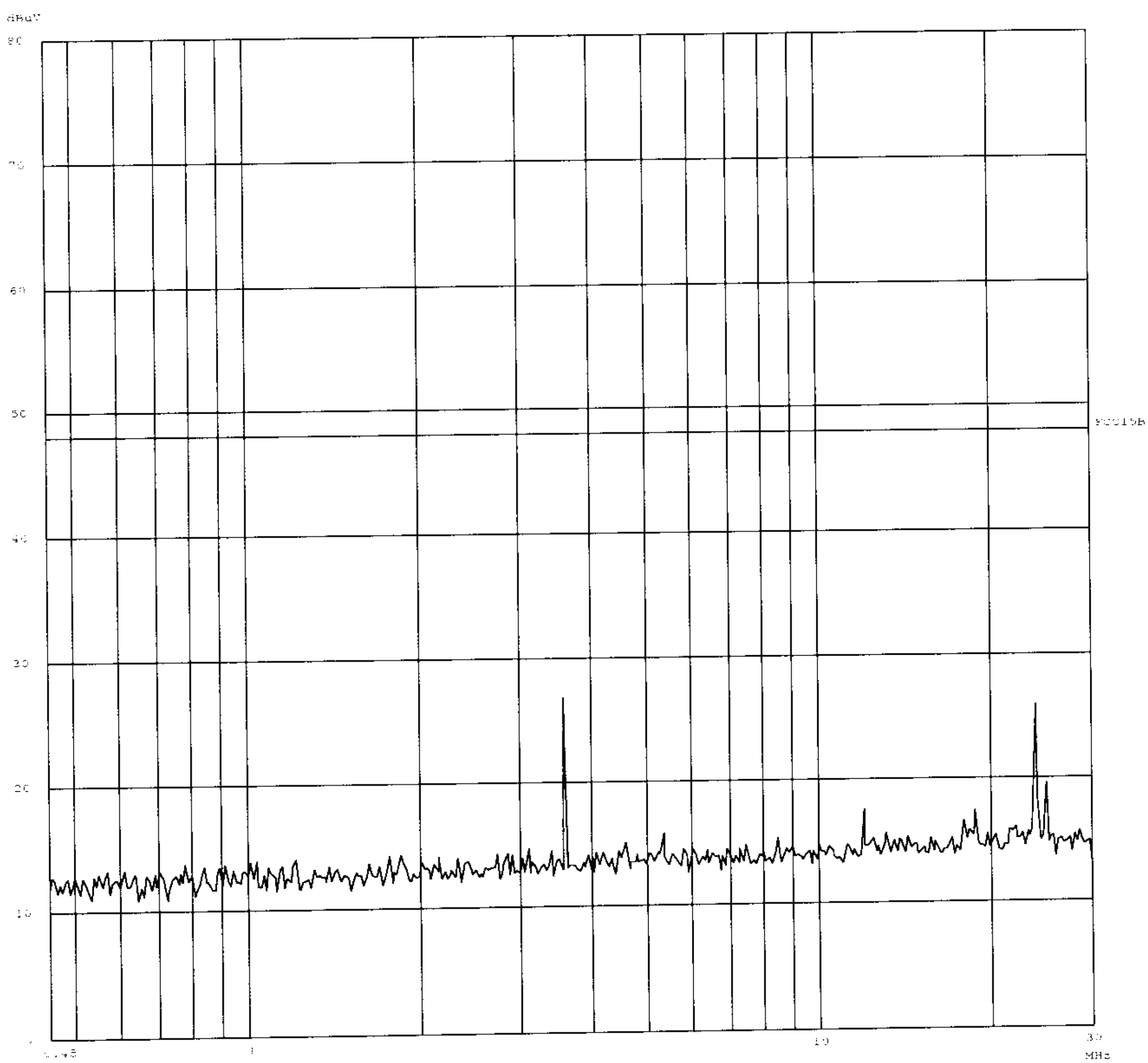
Mode: Tx

Tested By:Hong, Report No.:9709379
Scan Settings (1 Range)

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	30M	5k	10k	PK	20ms	AUTO 10	OFF	60dB

Transducer No.	Start	Stop	Name
2	9k	30M	EI078

Final Measurement: x QP
Meas Time: 1 s
Subranges: 16
Acc Margin: 20dB



Ctrl. No.: N/A

Company: Continental Conair Limited
Model: South Western Bell Freedom Phone® FF680
Mode : TX

Date of Test: March 4, 1998

Table 9, Base Unit

Conducted Emissions

Report No.: 9709379

Mode: TX

Tested By:Hong, Report No.:9709379
Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	30M	5k	10k	PK	20ms	AUTO	LN OFF	60dB

Final Measurement Results:

no Results

Ctrl. No.: N/A

Company: Continental Conair Limited
Model: South Western Bell Freedom Phone® FF680
Mode : Charging

Date of Test: March 4, 1998

Graph 2, Base Unit

Conducted Emissions

Report No.: 9109379

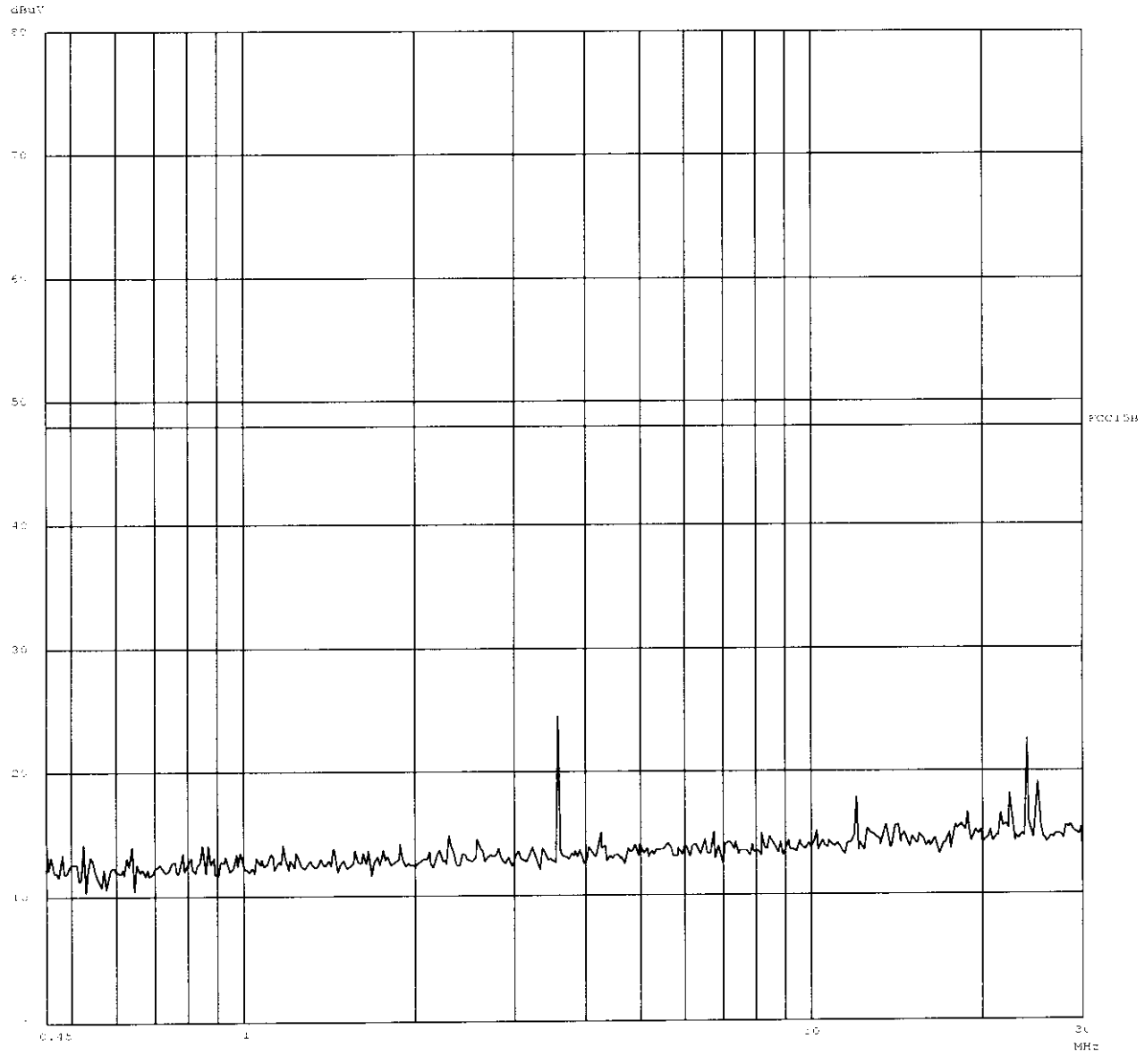
Mode: Charging

Tested By:Hong, Report No.:9109379
Scan Settings (1 Range):

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	30M	9k	120k	PK	10ms	AUTO	Off	AutoRange

Transducer No.	Start	Stop	Name
3	9k	30M	ET076

Final Measurement: 4 PK
Meas Time: 1 s
Subranges: 16
Acc Margin: 20dB



Ctrl. No.: N/A

FCC ID: LBBFF680

Company: Continental Conair Limited
Model: South Western Bell Freedom Phone® FF680
Mode : Charging

Date of Test: March 4, 1998

Table 10, Base Unit

Conducted Emissions

Report No.: 9709379

Mode: Charging

Tested By:Hong, Report No.:9709379
Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	30M	5k	10k	PK	20ms	AUTO	LN OFF	60dB

Final Measurement Results:

no Results

Ctrl. No.: N/A

Company: Continental Conair Limited
Model: South Western Bell Freedom Phone® FF680
Mode : Stand by

Date of Test: March 4, 1998

Graph 3, Base Unit

Conducted Emissions

Intertek Testing Services
ETL Testing Laboratories

Report No.: 9709379

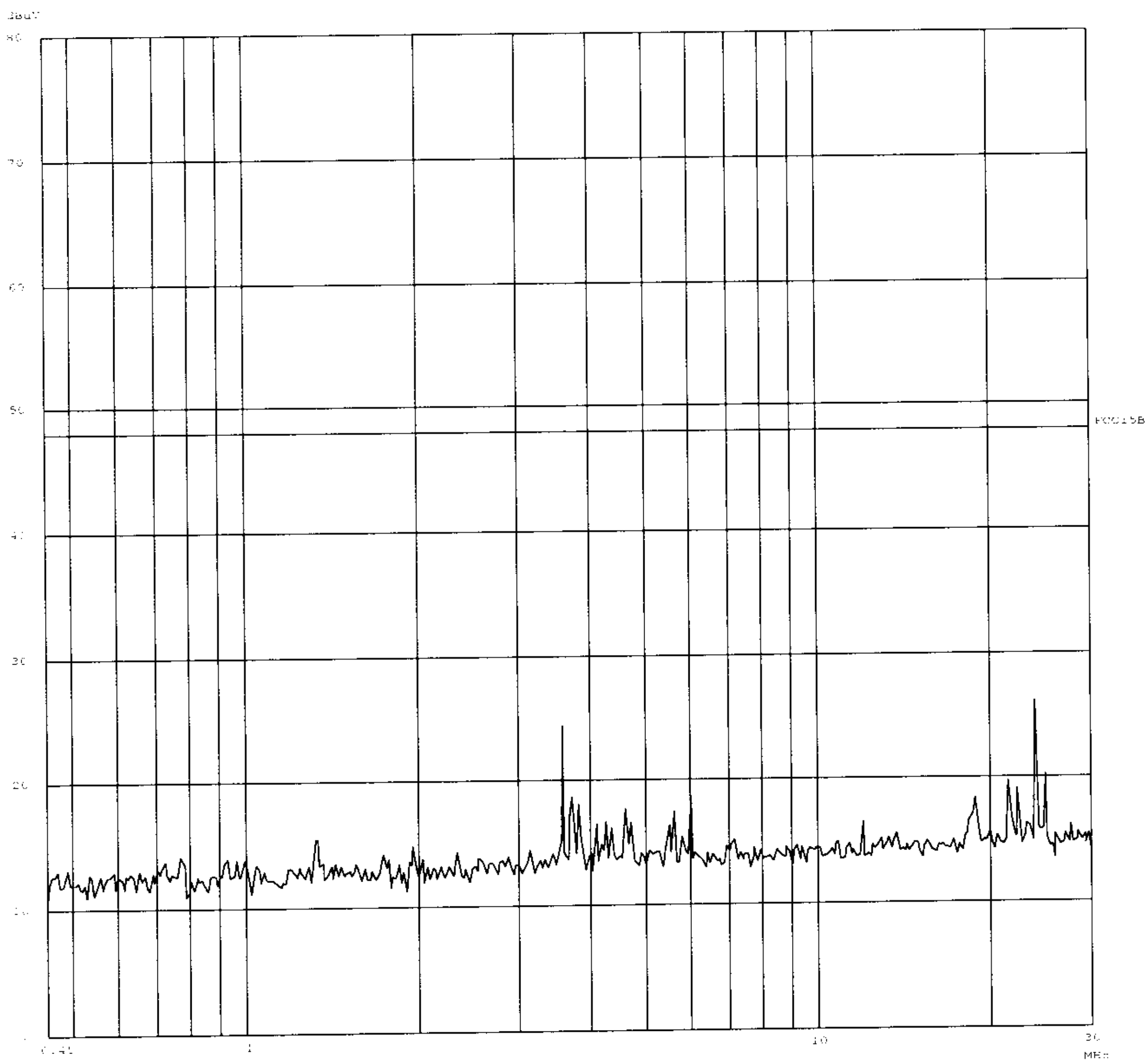
Mode: Stand by

Tested by:Hong, Report No.:9709379
Scan Settings (1 Range)

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	30M	5k	10k	PK	20ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
3	9k	30M	EI078

Final Measurement: x QP
Meas Time: [illegible]
Subranges: 10
Acc Margin: [illegible]



PAGE 1

Ctrl. No.: N/A

FCC ID: LBBFF680

Company: Continental Conair Limited
Model: South Western Bell Freedom Phone® FF680
Mode : Stand by

Date of Test: March 4, 1998

Table 11, Base Unit

Conducted Emissions

Mode : Stand by

Tested By:Hong, Report No.:9709379
Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	30M	5k	10k	PK	20ms	AUTO	LN OFF	60dB

Final Measurement Results:

no Results

Ctrl. No.: N/A

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.

4.1.1 Measurement Data - Base Unit

Channel Frequency

Channel	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance %
1	43.72000	43.71953	-0.00108
2	43.74000	43.73953	-0.00107
3	43.82000	43.81953	-0.00107
4	43.84000	43.83953	-0.00107
5	43.92000	43.91953	-0.00107
6	43.96000	43.95953	-0.00107
7	44.12000	44.11953	-0.00107
8	44.16000	44.15953	-0.00106
9	44.18000	44.17952	-0.00109
10	44.20000	44.19953	-0.00106
11	44.32000	44.31953	-0.00106
12	44.36000	44.35952	-0.00108
13	44.40000	44.39952	-0.00108

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

Channel Frequency

Channel	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance %
14	44.46000	44.45952	-0.00108
15	44.48000	44.47952	-0.00108
16	46.61000	46.60950	-0.00107
17	46.63000	46.62950	-0.00107
18	46.67000	46.66949	-0.00109
19	46.71000	46.70949	-0.00109
20	46.73000	46.72950	-0.00107
21	46.77000	46.76950	-0.00107
22	46.83000	46.82950	-0.00107
23	46.87000	46.86952	-0.00102
24	46.93000	46.92950	-0.00107
25	46.97000	46.96953	-0.00100

4.1.2 Measurement Data - Base Unit - Channel 1

Frequency Stability

Frequency Stability versus Source Voltage

	Voltage (Vac)	Assigned Frequency (kHz)	Measured Frequency (kHz)	Frequency deviation (kHz)	Tolerance % (x 10^{-3})
Nominal	120	43,720.00	43,719.53	-0.47	-1.08
85 %	102	43,720.00	43,719.53	-0.47	-1.08
115 %	138	43,720.00	43,719.57	-0.43	-0.98

Frequency Stability versus Temperature

Temperature (°C)	Assigned Frequency (kHz)	Measured Frequency (kHz)	Frequency deviation (kHz)	Tolerance (%) (x 10^{-3})
-20	43,720.00	43,720.72	0.72	1.65
25	43,720.00	43,719.53	-0.47	-1.08
50	43,720.00	43,719.54	-0.46	-1.05

Notes: All readings taken at base of antenna.

Legend (where appropriate)

* No emission was recorded at this environment. Thus, no frequency deviation can be found.

4.1.2 Measurement Data - Base Unit - Channel 25

Frequency Stability

Frequency Stability versus Source Voltage

	Voltage (Vac)	Assigned Frequency (kHz)	Measured Frequency (kHz)	Frequency deviation (kHz)	Tolerance % (x 10^{-3})
Nominal	120	46,970.00	46,969.53	-0.47	-1.00
85 %	102	46,970.00	46,969.53	-0.47	-1.00
115 %	138	46,970.00	46,969.58	-0.42	-0.89

Frequency Stability versus Temperature

Temperature (°C)	Assigned Frequency (kHz)	Measured Frequency (kHz)	Frequency deviation (kHz)	Tolerance (%) (x 10^{-3})
-20	46,970.00	46,970.77	0.77	1.64
25	46,970.00	46,969.53	-0.47	-1.00
50	46,970.00	46,969.49	-0.51	-1.09

Notes: All readings taken at base of antenna.

Legend (where appropriate)

* No emission was recorded at this environment. Thus, no frequency deviation can be found.

Test Results : From the two sets of tables for Base Unit - channel 1 & channel 25, the largest deviation from nominal frequency was 720 Hz, which was 0.00165% compared to the standard test frequency. The required minimum standard is 0.01% in §15.233(g)

4.2.1 Measurement Data - Handset

Channel Frequency

Channel	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance %
1	48.76000	48.75968	-0.00066
2	48.84000	48.83968	-0.00066
3	48.86000	48.85966	-0.00070
4	48.92000	48.91968	-0.00065
5	49.02000	49.01968	-0.00065
6	49.08000	49.07967	-0.00067
7	49.10000	49.09968	-0.00065
8	49.16000	49.15967	-0.00067
9	49.20000	49.19967	-0.00067
10	49.24000	49.23967	-0.00067
11	49.28000	49.27967	-0.00067
12	49.36000	49.35967	-0.00067
13	49.40000	49.39967	-0.00067

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

Channel Frequency

Channel	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance %
14	49.46000	49.45967	-0.00067
15	49.50000	49.49967	-0.00067
16	49.67000	49.66967	-0.00066
17	49.84500	49.84467	-0.00066
18	49.86000	49.85966	-0.00068
19	49.77000	49.76967	-0.00066
20	49.87500	49.87467	-0.00066
21	49.83000	49.82967	-0.00066
22	49.89000	49.88966	-0.00068
23	49.93000	49.92966	-0.00068
24	49.99000	49.98966	-0.00068
25	49.97000	49.96967	-0.00066

4.2.2 Measurement Data - Handset - Channel 1

Frequency Stability

Frequency Stability versus Source Voltage

	Voltage (Vdc)	Assigned Frequency (kHz)	Measured Frequency (kHz)	Frequency deviation (kHz)	Tolerance % (x 10^{-3})
Nominal	3.6	48,760.00	48,759.68	-0.32	-0.66
85 %	3.06	48,760.00	*	*	*
115 %	4.14	48,760.00	48,759.76	-0.24	-0.49

Frequency Stability versus Temperature

Temperature (°C)	Assigned Frequency (kHz)	Measured Frequency (kHz)	Frequency deviation (kHz)	Tolerance (%) (x 10^{-3})
-20	48,760.00	48,760.44	0.44	0.90
25	48,760.00	48,759.68	-0.32	-0.66
50	48,760.00	48,759.36	-0.64	-1.31

Notes: All readings taken at base of antenna.

Legend (where appropriate)

* No emission was recorded at this environment. Thus, no frequency deviation can be found.

4.2.2 Measurement Data - Handset - Channel 25

Frequency Stability

Frequency Stability versus Source Voltage

	Voltage (Vdc)	Assigned Frequency (kHz)	Measured Frequency (kHz)	Frequency deviation (kHz)	Tolerance % (x 10^{-3})
Nominal	3.6	49,970.00	49,969.67	-0.33	-0.66
85 %	3.06	49,970.00	*	*	*
115 %	4.14	49,970.00	49,969.77	-0.23	-0.46

Frequency Stability versus Temperature

Temperature (°C)	Assigned Frequency (kHz)	Measured Frequency (kHz)	Frequency deviation (kHz)	Tolerance (%) (x 10^{-3})
-20	49,970.00	49,970.47	0.47	0.94
25	49,970.00	49,969.67	-0.33	-0.66
50	49,970.00	49,969.33	-0.67	-1.34

Notes: All readings taken at base of antenna.

Legend (where appropriate)

* No emission was recorded at this environment. Thus, no frequency deviation can be found.

Test Results : From the two sets of tables for Handset - channel 1 & channel 25, the largest deviation from nominal frequency was 670 Hz, which was 0.00134% 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

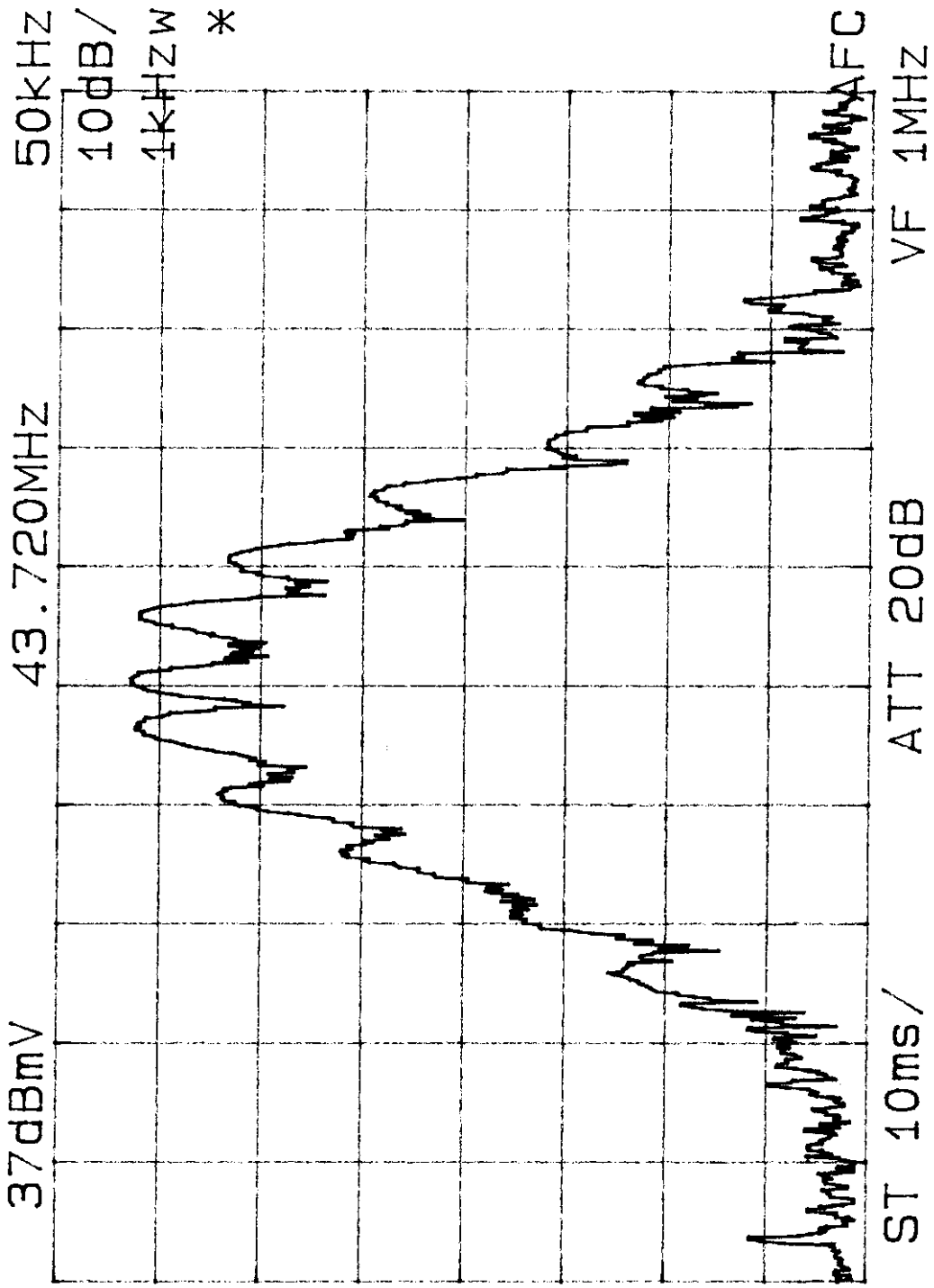
kHz from Carrier	Amplitude Down from Carrier (dB)	Limit (kHz)
-7.43/6.57	26	±10
- 20	72.00	N/A
+ 20	71.30	N/A

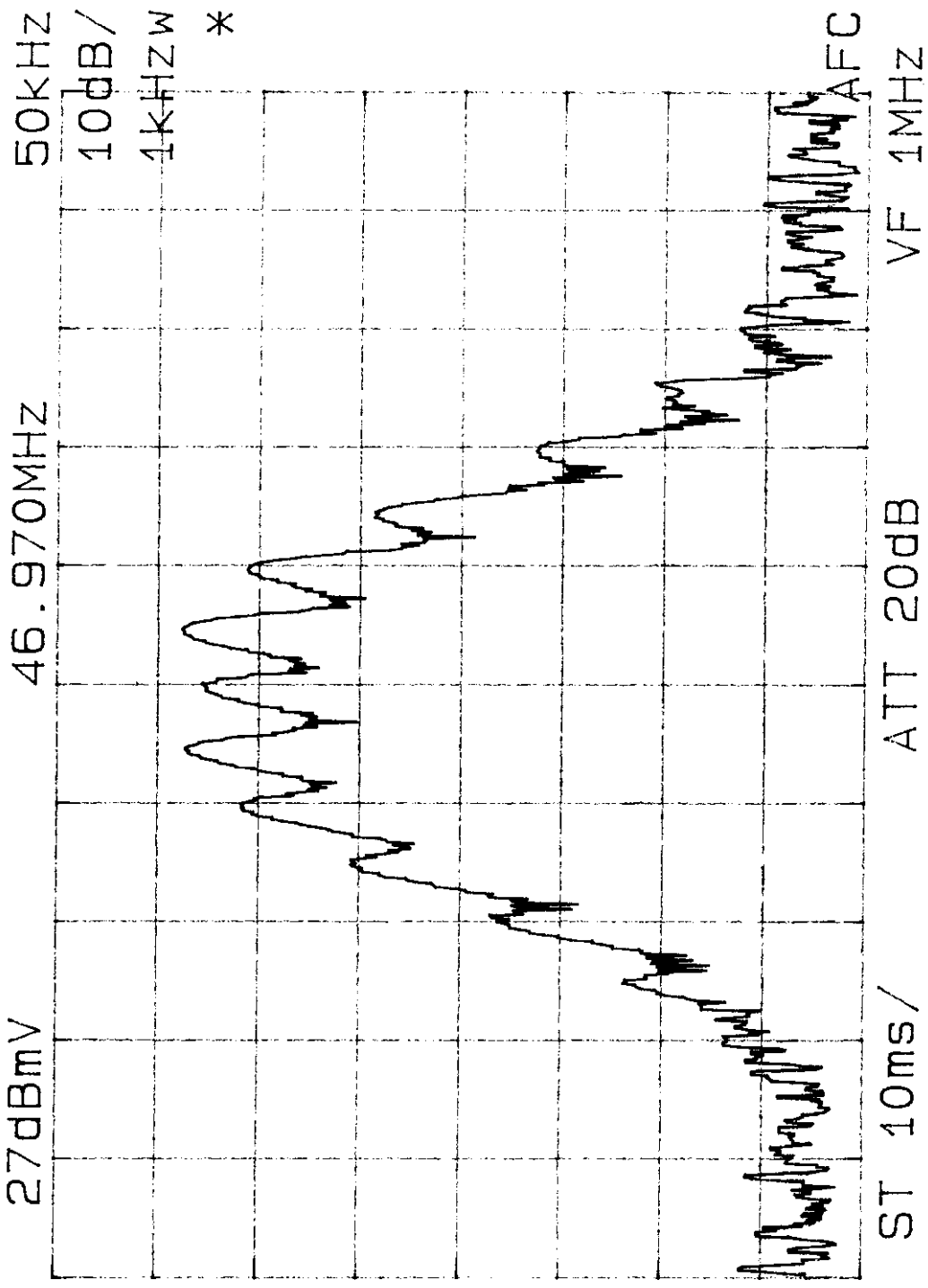
Base Unit - Channel 25

kHz from Carrier	Amplitude Down from Carrier (dB)	Limit (kHz)
-8.00/7.71	26	±10
- 20	66.00	N/A
+ 20	66.60	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 2.00 kHz above the lower band edge 46.960 MHz according to §15.233(d)

Bandwidth Plot - Base Unit


50kHz
10dB/
1kHzw
*
43.720MHz
37dBmV
ST 10ms/
ATT 20dB
VF 1MHz
AFC


50kHz
10dB/
1kHzw
*
AFC
VF 1MHz
46.970MHz
ATT 20dB
27dBmV
ST 10ms/

5.2 Handset - Channel 1

Operating Bandwidth

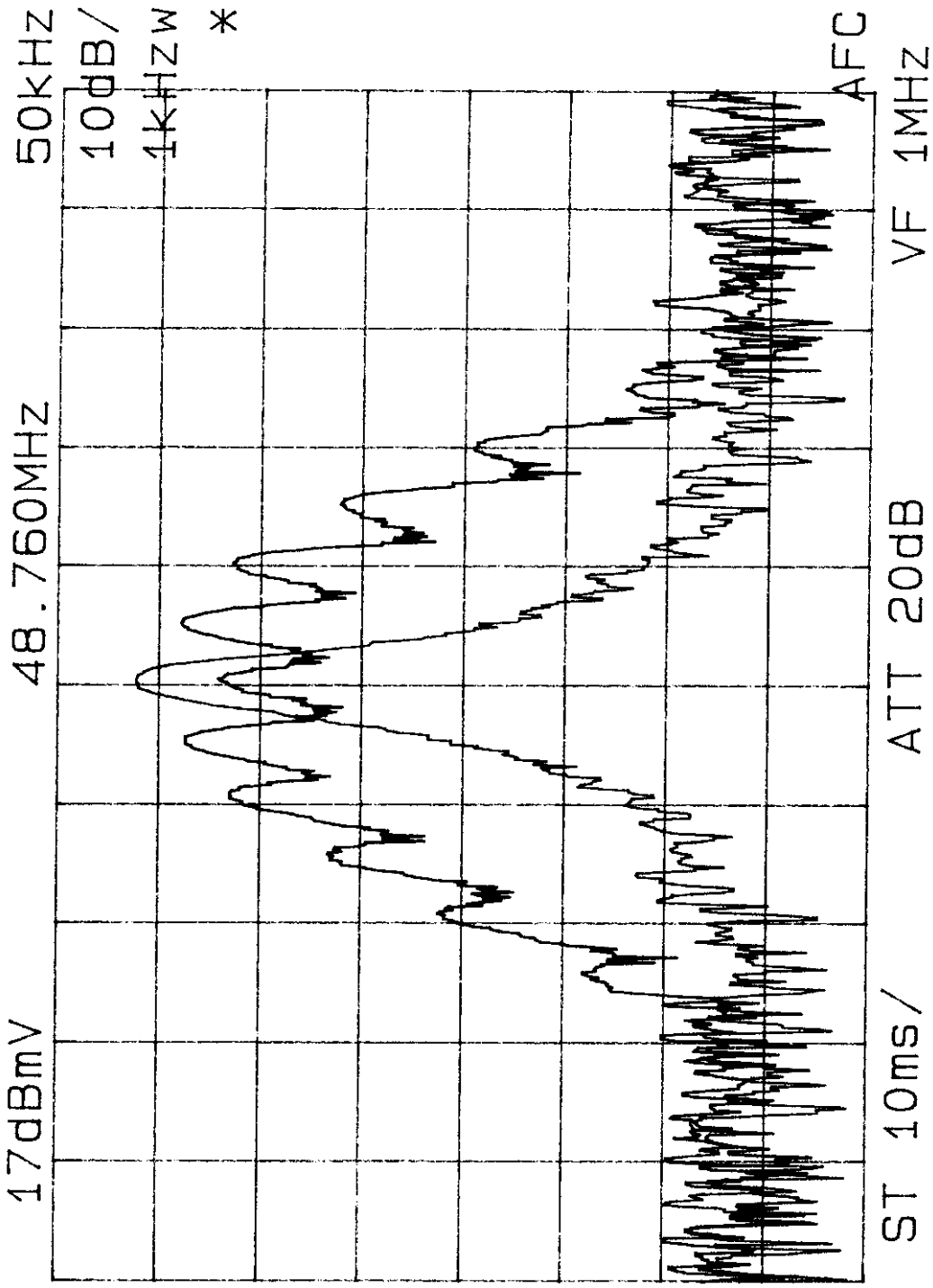
kHz from Carrier	Amplitude Down from Carrier (dB)	Limit (kHz)
-7.86/8.29	26	±10
- 20	51.30	N/A
+ 20	52.70	N/A

Handset - Channel 25

kHz from Carrier	Amplitude Down from Carrier (dB)	Limit (kHz)
-8.00/8.42	26	±10
- 20	51.30	N/A
+ 20	52.70	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 1.58 kHz below the upper band edge 49.980 MHz according to §15.233(d)

Bandwidth Plot - Handset


50kHz
10dB/
1kHzW
*
AFC
VF 1MHz
48.760MHz
ATT 20dB
17dBmV
ST 10ms/

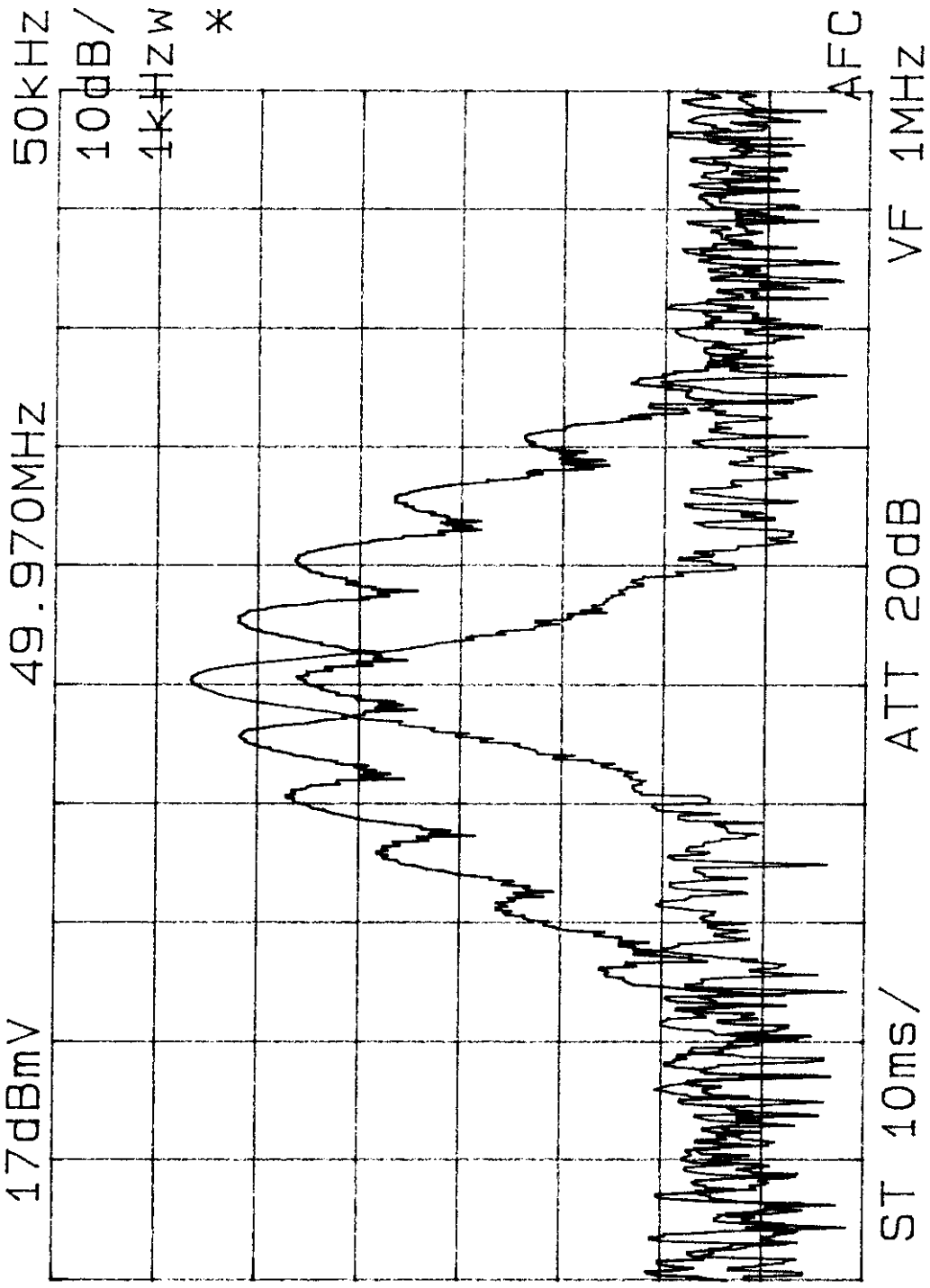

50kHz
10dB/
1kHzW
*
AFC
VF 1MHz
49.970MHz
ATT 20dB
17dBmV
ST 10ms/

EXHIBIT 6
EQUIPMENT PHOTOGRAPHS

6.0 **Equipment Photographs**

Photographs of the tested EUT are attached.

EXHIBIT 11
AUTOMATIC CHANNEL SELECTION

11.0 Automatic Channel Selection

The mechanism of automatic channel selection is attached in the following page.

CHANNEL SCANNING METHOD

When the base unit is power up and after initialisation, the Tx channel no. is decided by the RAM content. If the RAM content holds a value over 25, the unit will preset to channel 25 for communication. The Rx channel will be scan from CH1 to CH25 by one channel step and then repeat.

When handset is power up, the channel assignment is used the same method as those of Base Unit, its Tx and Rx channel stays at the current channel and will not scan. When handset request to talk, it will scan the Rx channel and then try to communicate at current channel first. If the communication is not successful, it will try another two clear channels. If the communication still fails, an error tone of three beeps will be generated.

If for some reasons the unit losses communication, place the Handset to the cradle for a while, the Base Unit will initiate a new security code with a channel no. to the Handset Unit.

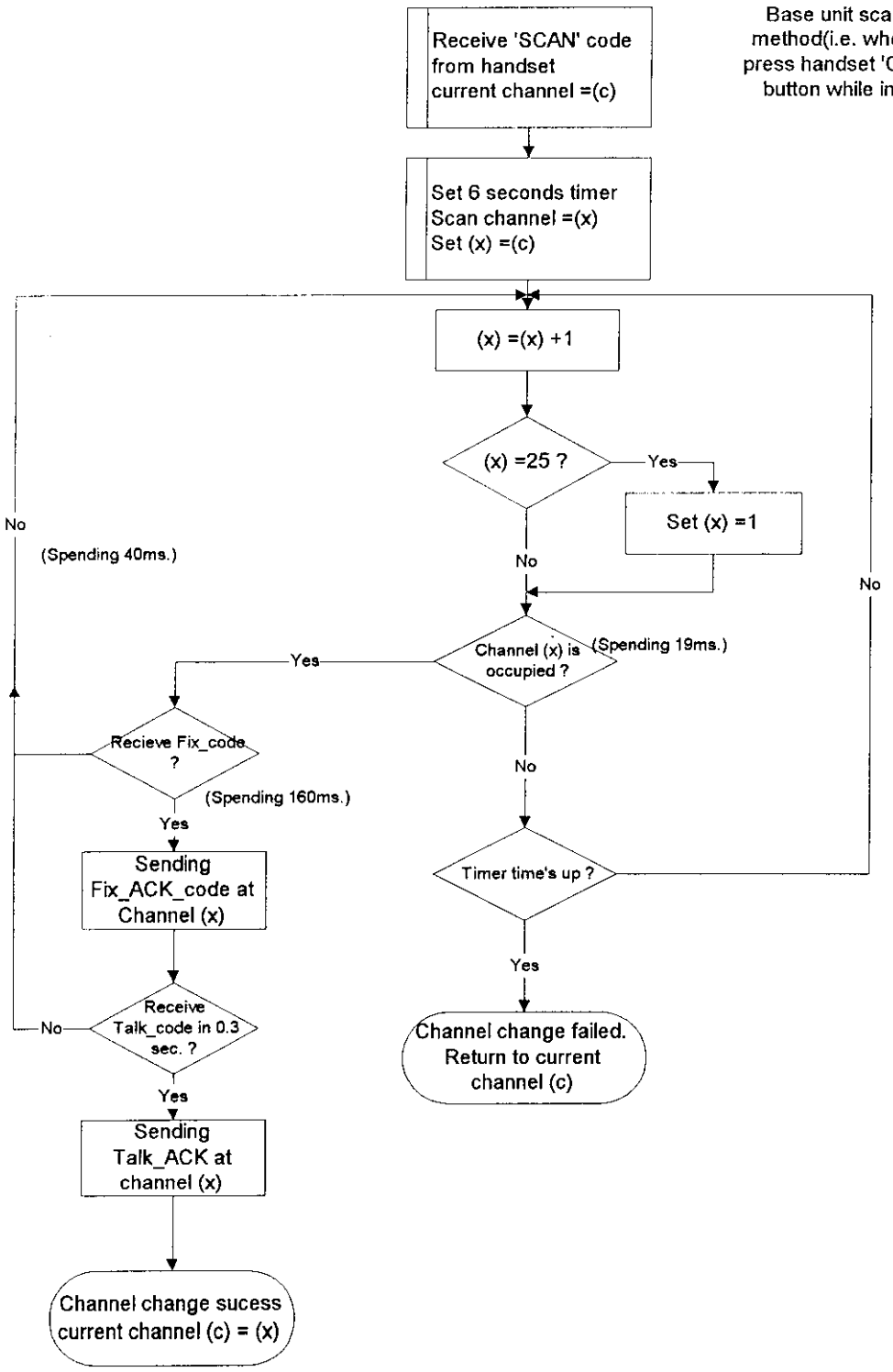
For manual channel change, Handset will send a channel change command to the Base Unit, and then start scanning the next free channel. After receiving the channel change command, the base unit will be scan from CH1 to CH25 and then repeat. If a free channel is found, the handset will stay at the channel and initiate request talk on command and the base will acknowledge the command and stay at the free channel. The channel change process is completed. If they can not communicate at the 1st free channel, the handset will start scanning another free channel and initiate request talk on command again. If they can not communicate at the 3rd free channel, the unit will go back to current channel and an error tone of three beeps will be generated from handset to indicate the channel change process is failure.

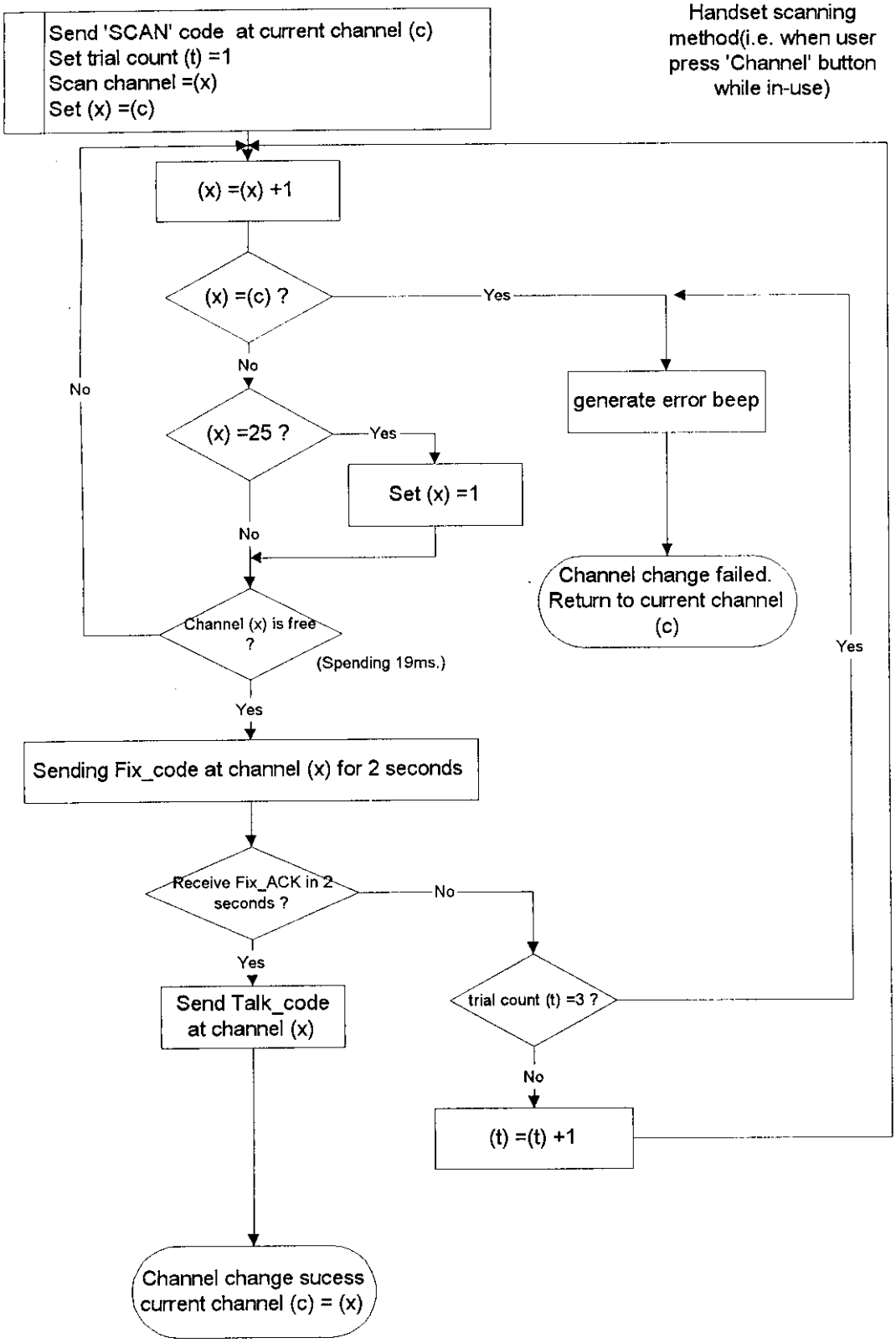
THE TEST CONDITION OF CHANNEL SCANNING

Two signal generators which connected with passive antenna is used to act as another cordless phone that it transmits one pair of the transmission frequency (43.72Mhz, 48.76Mhz). The field strength of these signals set to 5000 microvolt/meter at 3 meters away from the cordless phone and the modulation of these signals is +/- 2.5Khz deviation with 1 Khz tone. The channel scanning operation is under tested.

TESTING PROCEDURE AND RESULT

Once the testing set-up has already prepared, the 25CH cordless phone under test (EUT) is powered on. EUT is switched to 'TALK ON', therefore RF link is established. The 'CH' key is pressed to make a channel scanning operation. The communication frequency of EUT is measured and the receiver output is also monitored to identify existence of the 1Khz tone. The 'CH' key is pressed again and repeat the measuring. After channel scanning operation process more than 30 times, the output signals of the signal generators are changed to another channel frequency, and it will do the channel scanning 30 times again. Finally, it will finish the whole testing after CH1 to CH15 are tested. The result shown that the EUT is never establish a communication channel at the signal generators output frequency and the receiver of the handset keep silence on whole test.


Base unit scanning method(i.e. when user press handset 'Channel' button while in-use)
Receive 'SCAN' code from handset current channel =(c)
Set 6 seconds timer
Scan channel =(x)
Set (x) =(c)
(x) =(x) +1
(x) =25 ?
Yes
Set (x) =1
No
No
(Spending 40ms.)
Channel (x) is occupied ?
(Spending 19ms.)
Yes
No
Recieve Fix_code ?
(Spending 160ms.)
Yes
No
Timer time's up ?
Yes
Sending Fix_ACK_code at Channel (x)
Receive Talk_code in 0.3 sec. ?
No
Yes
Channel change failed. Return to current channel (c)
Sending Talk_ACK at channel (x)
Channel change sucess current channel (c) = (x)


Handset scanning method(i.e. when user press 'Channel' button while in-use)
Send 'SCAN' code at current channel (c)
Set trial count (t) =1
Scan channel =(x)
Set (x) =(c)
(x) =(x) +1
(x) =(c) ?
Yes
No
generate error beep
(x) =25 ?
Yes
Set (x) =1
No
No
Channel change failed. Return to current channel (c)
Channel (x) is free ?
(Spending 19ms.)
Yes
Yes
Sending Fix_code at channel (x) for 2 seconds
Receive Fix_ACK in 2 seconds ?
No
Yes
Send Talk_code at channel (x)
trial count (t) =3 ?
No
(t) =(t) +1
Channel change sucess current channel (c) = (x)