



**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
INTENTIONAL RADIATOR CERTIFICATION TO
FCC PART 15 SUBPART C REQUIREMENT**

**TEST REPORT
FOR
900MHz CORDLESS HANDS FREE MINI PHONE**

FCC ID: O6JWHF7000

MODEL NO: WHF7000

REPORT NO: 00I0230-1

ISSUE DATE: MAY 10, 2000

Prepared for
OPERNERS CO., LTD.
3RD FL. SUNGJI BLDG.
499 WOLPYUNG 1-DONG
SEO-KU, TAEJON 302-281, KOREA

Prepared by
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NVLAP[®]
LAB CODE:200065-0

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1. VERIFICATION OF COMPLIANCE

COMPANY NAME : OPENERS CO., LTD.
 3RD FL. SUNGJI BLDG., 499 WOLPYUNG 1-DONG
 SEO-KU, TAEJON 302-281, KOREA

CONTACT PERSON : JUN SANGYOUNG / MANAGING DIRECTOR

TELEPHONE NO : 82-42-487-1117

EUT DESCRIPTION : 900MHZ CORDLESS HANDS FREE MINI PHONE

MODEL NAME : WHF7000

DATE TESTED : MAY 10, 2000

LIMITS APPLY TO: FCC PART 15 SECTION 15.249	
TECHNICAL LIMITS	TEST RESULT
Radiated Emission of fundamental Frequency	PASSED
Radiated Emission of Harmonic Frequency	PASSED
Radiated Emission Outside the Band	PASSED
LIMITS APPLY TO: FCC PART 15 SECTION 15.209	
Radiated Emission Digital Device	PASSED
LIMITS APPLY TO: FCC PART 15 SECTION 15.207	
AC Line Conducted Emission	PASSED

The above equipment was tested by Compliance Certification Services Inc. for compliance with the requirements set forth in CFR 47 PART 15 SUBPART C. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

T.N. COKENIAS / ENGINEERING DIRECTOR
 COMPLIANCE CERTIFICATION SERVICES, INC.

Warning : This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document.

2. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

CHASSIS TYPE	PLASTIC
Frequency Range base station	902.80~904.75 MHz
Frequency Range mobile handset	925.30~927.25 MHz
Antenna Requirement	Permanently Attached
Power requirement base station	115Vac, 60Hz
Power requirement mobile handset	9Vdc rechargeable battery
Emission Designator	F3E

3. TEST LOCATION

All emissions tests were performed at:

Compliance Consulting Services
561F Monterey Road
Morgan Hill, CA 95087

CCS has site descriptions on file with the FCC for 10 and 3 meter site configurations. CCS is a NVLAP accredited facility.

4. EQUIPMENT MODIFICATIONS

To achieve compliance Levels, the following change(s) were made during compliance testing:

Mod.#1 BASE STATION-Added a wire (approximately 12mm long) with ferrite bead (FAIR-RITE, part: 2643022401) between antenna and PCB to reduce power output.

HANDSET-Added a ferrite bead (FAIR-RITE, part: 2643022401) onto wire between antenna and PCB.

5. TEST RESULT SUMMARY

Radiated Emissions

Test Requirement: 15.249(A)(B)

Measurement Equipment Used:

HP Spectrum Analyzer/8566B (Cal Due: 12/00)

HP Spectrum Display/85662A (Cal Due: 12/00)

HP Quasi-Peak Detector/85650A (Cal Due: 12/00)

HP Pre-Amp(P1)/8447D (Cal Due: 10/00)

CHASE Bilog Antenna/CBL6112 (Cal Due: 11/00)

TEST SETUP FOR MEASUREMENT OF FUNDAMENTAL FREQUENCY

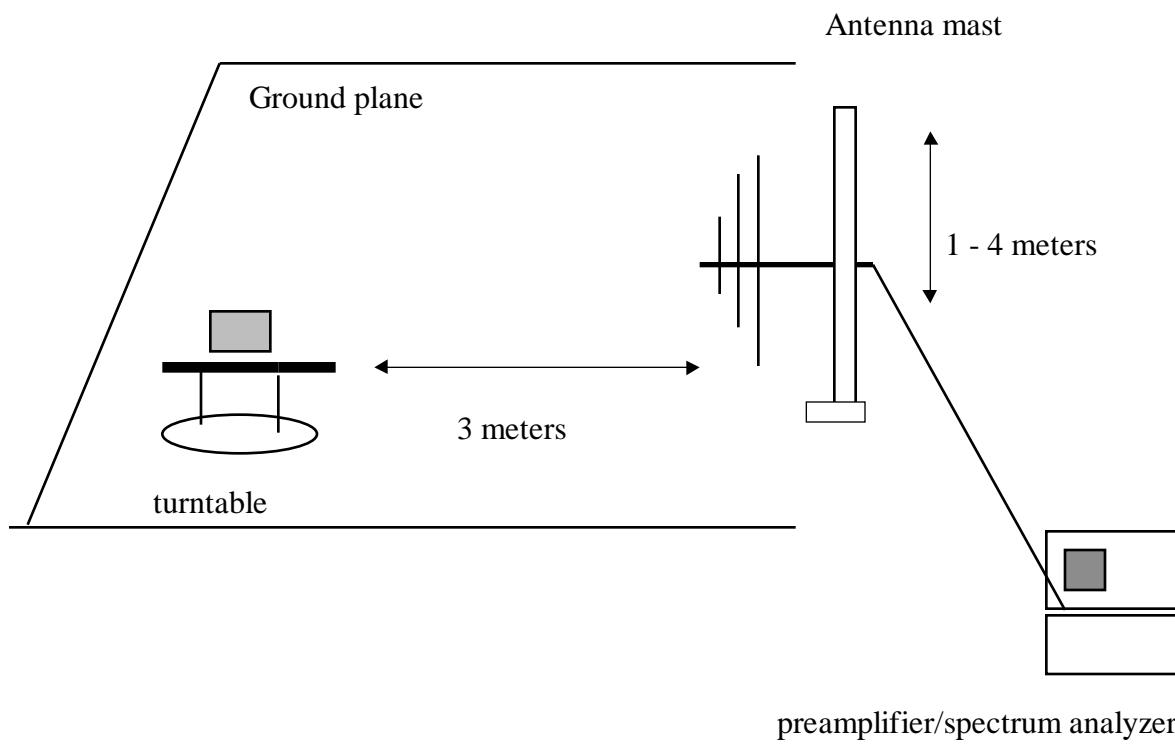


Fig.1(a)

Test Procedures

- 1) Place the EUT on the turntable as shown. The EUT was placed as close as possible to the center of the turntable with the axis of rotation going through the EUT antenna when in vertical or horizontal polarization. Activated Eut to transmit.
- 2) The Bilog search antenna was place at a distance of 3 meters. The antenna was raised and lowered and the EUT rotated on the turntable to produce maximum emission levels on the spectrum analyzer.
- 3) The EUT (HANDSET) was placed standing-up (x-axis), laying down right side (y-axis) and laying down facing up (z-axis). Step (1) and (2) were repeated for each orientation.

The EUT (BASE STATION) antenna was placed vertical and horizontal. Step (1) and (2) were repeated for each orientation.

Test Results:

Please refer to attached data.

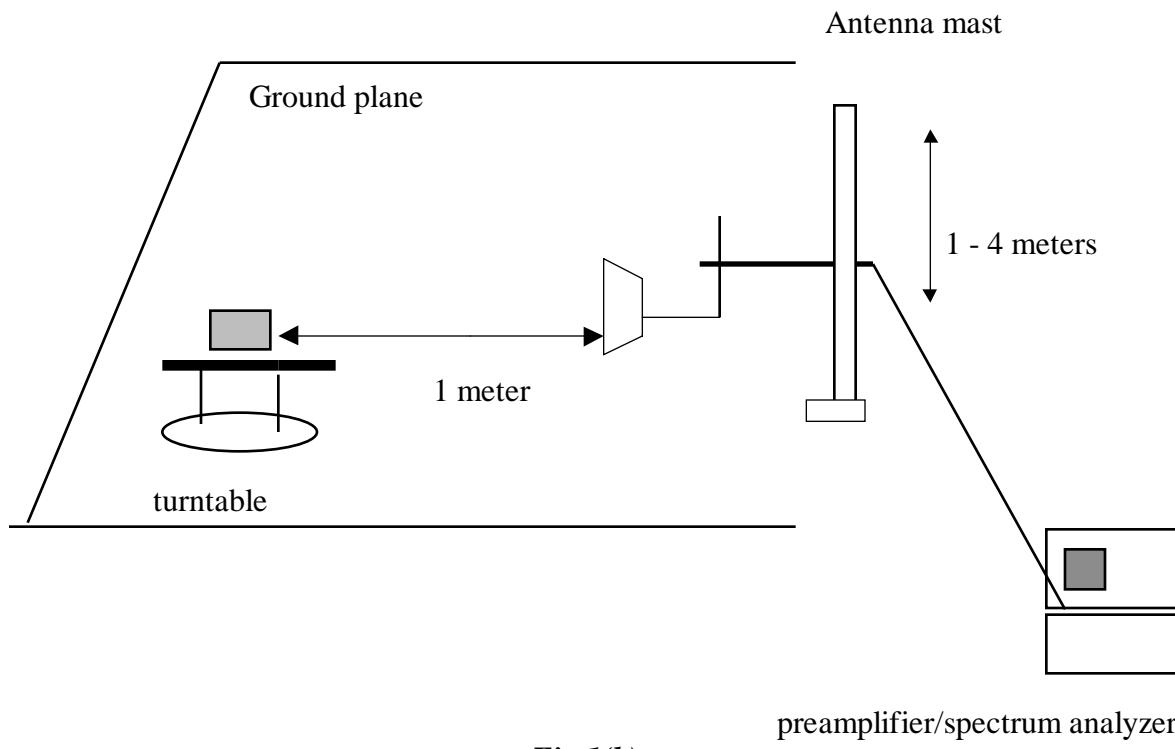
Radiated Emissions**Test Requirement: 15.249(A)(B)****Measurement Equipment Used:****Emco Horn Antenna/3115 (Cal Due: 09/00)****HP Pre-Amp (1 – 26.5 GHz)/8449B (Cal Due: 04/01)****HP Spectrum Analyzer/8593EM (Cal Due: 05/28/00)****High Pass Filter FSY(1.802GHz)/001 & FSY(4.6 GHz)/001****FLEXCO cable/20761; 18ft. coaxial cable (loss: .9dB/ft @ 26GHz)**TEST SETUP FOR MEASUREMENT OF FUNDAMENTAL HARMONICS ABOVE 1GHz

Fig.1(b) preamplifier/spectrum analyzer

Test Procedures

1. The EUT was placed on a wooden turntable. The search antenna was placed at 1 meter from the EUT.
2. The turntable was slowly rotated to locate the direction of maximum emission. Once maximum direction was determined, the search antenna was raised and lowered in both vertical and horizontal polarizations.
3. The EUT (HANDSET) was placed standing-up (x-axis), laying down right side (y-axis) and laying down facing up (z-axis). Step (1) and (2) were repeated for each orientation.

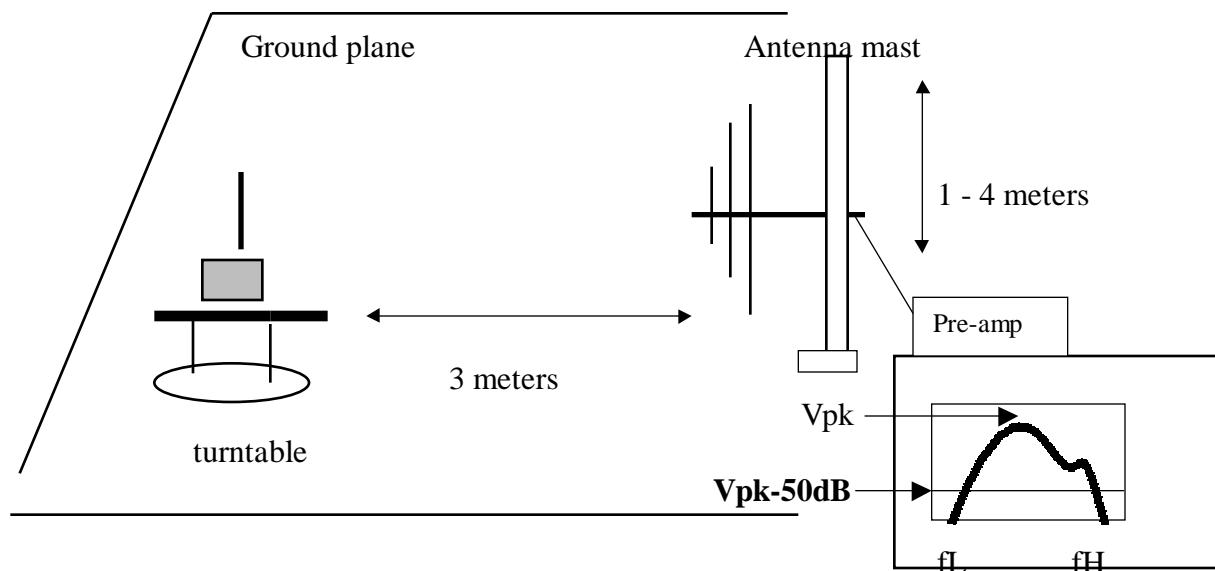
The EUT (BASE STATION) antenna was placed vertical and horizontal. Step (1) and (2) were repeated for each orientation.

Test result:

Please refer to attached spreadsheets.

Out-of-Band Emissions**Test Requirement: 15.249(C)****Measurement Equipment Used:**

HP Spectrum Analyzer/8566B (Cal Due: 12/00)
 HP Spectrum Display/85662A (Cal Due: 12/00)
 HP Quasi-Peak Detector/85650A (Cal Due: 12/00)
 HP Pre-Amp(P1)/8447D (Cal Due: 10/00)
 CHASE Bilog Antenna/CBL6112 (Cal Due: 11/00)

Test Set-Up**fig.2**

spectrum analyzer

Test Procedures

1. The EUT was configured on wooden turntable as shown on figure 2. The Bilog search antenna was place at a distance of 3 meters. The antenna was raised and lowered, the EUT rotated on the turntable, until the EUT azimuth, antenna elevation, and antenna polarity were found which yielded maximum received emission levels on the spectrum analyzer.
2. Spectrum analyzer START and STOP frequencies are set to the limits of the specified frequency band under which the EUT is operating, f_L being the low end of the band, f_H being the high end of the band. The DISPLAY LINE was set 50dB below the maximum peak of the signal. The EUT was set to operate on its lowest frequency.
3. While the transmitter is operating, the analyzer MAX HOLD function was used to capture the envelope of the transmitters occupied bandwidth.

Test Results:

All signals outside 902MHz and 928MHz were at least 50 dB below the fundamental. Refer to attached spectrum analyzer charts.

Radiated Emissions**Test Requirement: 15.209****Measurement Equipment Used:**

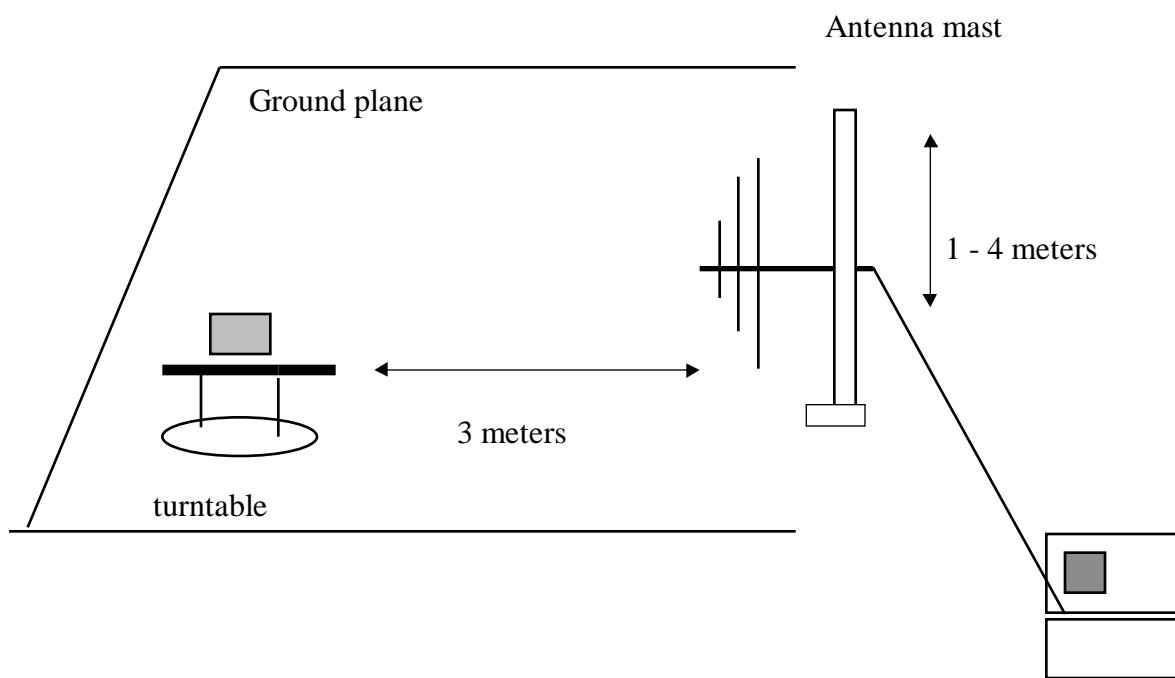
HP Spectrum Analyzer/8566B (Cal Due: 12/00)

HP Spectrum Display/85662A (Cal Due: 12/00)

HP Quasi-Peak Detector/85650A (Cal Due: 12/00)

HP Pre-Amp(P1)/8447D (Cal Due: 10/00)

CHASE Bilog Antenna/CBL6112 (Cal Due: 11/00)

TEST SETUP FOR MEASUREMENT OF DIGITAL DEVICE*Fig.3*

Test Procedures

- 1) Place the EUT on the turntable as shown. The EUT was placed as close as possible to the center of the turntable with the axis of rotation going through the EUT antenna when in vertical or horizontal polarization. Activated Eut to transmit.
- 2) The Bilog search antenna was place at a distance of 3 meters. The antenna was raised and lowered and the EUT rotated on the turntable to produce maximum emission levels on the spectrum analyzer.
- 3) The EUT (HANDSET) was placed standing-up (x-axis), laying down right side (y-axis) and laying down facing up (z-axis). Step (1) and (2) were repeated for each orientation.

The EUT (BASE STATION) antenna was placed vertical and horizontal. Step (1) and (2) were repeated for each orientation.

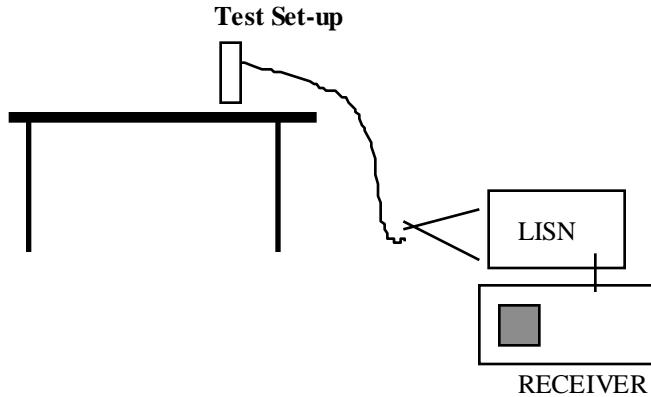
Test Results:

Please refer to attached data.

AC Line Conducted Emissions**Test Requirement: 15.207****Measurement Equipment Used:**

Rhode & Schwarz EMI Receiver ESHS-20 (Cal Due: 2/01)

Fischer Custom Communication LISN, FCC-LISN-50/250-25-2 (Cal Due: 10/00)

**Fig. 4****Test Procedure**

1. The DC is supplied by a AC adapter. The EUT was placed on a wooden table 40 cm from a vertical ground plane and approximately 80 cm above the horizontal ground plane on the floor. The EUT was set to transmit in a normal tone and charge the battery at the same time.
2. Line conducted data was recorded for both NEUTRAL and HOT lines.

Test Results

Refer to attached graph.

6. EUT SETUP PHOTOS



BASE UNIT



HANDSET

RADIATED EMISSION SETUP

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**HIGH FREQUENCY SETUP****CONDUCTED EMISSION SETUP**