

10 June, 2002

***Uni-Art Precise Products Ltd.
11/F&12/F., Yue Xiu Ind. Bldg.,
87 Hung To Rd., Kwun Tong,
Kowloon, Hong Kong.***

Dear Mr. Eric Chan:

Enclosed you will find your file copy of a Part 15 report (FCC ID: MVAHP191-001T).

***For your reference, TCB will normally take another 15-20 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,

***Alfred Lo
Senior Technical Supervisor***

Enclosure

FCC ID: MVAHP191-001T

Uni-Art Precise Products Ltd.

Application
For
Certification
(FCC ID: MVAHP191-001T)
Transmitter

WO# 0204530

AL/sc

10 June, 2002

FCC ID: MVAHP191-001T

- The test results reported in this test 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 Hong Kong Limited
- For Terms And Conditions of the services, it can be provided upon request.

LIST OF EXHIBITS

INTRODUCTION

<i>EXHIBIT 1:</i>	General Description
<i>EXHIBIT 2:</i>	System Test Configuration
<i>EXHIBIT 3:</i>	Emission Results
<i>EXHIBIT 4:</i>	Equipment Photographs
<i>EXHIBIT 5:</i>	Product Labelling
<i>EXHIBIT 6:</i>	Technical Specifications
<i>EXHIBIT 7:</i>	Instruction Manual
<i>EXHIBIT 8:</i>	Miscellaneous Information

INTERTEK TESTING SERVICES

MEASUREMENT/TECHNICAL REPORT

Uni-Art Precise Products Ltd. - MODEL: ARKON HP191
FCC ID: MVAHP191-001T

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

Equipment Type: Low Power Transmitter (example: computer, printer, modem, etc.)

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

If yes, defer until: _____
date

Company Name agrees to notify the Commission by: _____
date

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

Transition Rules Request per 15.37? Yes _____ No X _____

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [12-18-01 Edition] provision.

Report prepared by:

Alfred Lo
Intertek Testing Services
Hong Kong Ltd.
2/F., Garment Centre,
576, Castle Peak Road,
Kowloon, Hong Kong
Phone: 852-2173-8545
Fax: 852-2371-0914

INTERTEK TESTING SERVICES

Table of Contents

1.0 <u>General Description</u>	3
1.1 Product Description.....	3
1.2 Related Submittal(s) Grants.....	3
1.3 Test Methodology.....	4
1.4 Test Facility	4
2.0 <u>System Test Configuration</u>	6
2.1 Justification.....	6
2.2 EUT Exercising Software	6
2.3 Special Accessories	6
2.4 Equipment Modification.....	7
2.5 Support Equipment List and Description	7
3.0 <u>Emission Results</u>	9
3.1 Field Strength Calculation	10
3.1 Field Strength Calculation (cont'd)	11
3.2 Radiated Emission Configuration Photograph	12
3.3 Radiated Emission Data	13
3.4 Conducted emission Configuration Photograph.....	15
3.5 Conducted Emission Data	17
4.0 <u>Equipment Photographs</u>	19
5.0 <u>Product Labelling</u>	21
6.0 <u>Technical Specifications</u>	23
7.0 <u>Instruction Manual</u>	25
8.0 <u>Miscellaneous Information</u>	27
8.1 Measured Bandwidth.....	28
8.2 Discussion of Pulse Desensitization	29
8.3 Calculation of Average Factor	30
8.4 Emissions Test Procedures	31
8.4 Emissions Test Procedures (cont'd).....	32

INTERTEK TESTING SERVICES

List of attached file

Exhibit type	File Description	filename
Test Report	Test Report	report.doc
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission	radiated.doc
Test Setup Photo	Conduct Emission	conduct.doc
Test Report	Conducted Emission Test Result	conduct.pdf
Test Report	Bandwidth Plot	bw1.pdf to bw2.pdf
External Photo	External Photo	ophoto.doc
Internal Photo	Internal Photo	ipphoto1.doc, ipphoto2.doc
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Approval Instruction for Antenna	Antenna Specification	antenna.pdf

EXHIBIT 1

GENERAL DESCRIPTION

INTERTEK TESTING SERVICES

1.0 General Description.0 General Description

1.1 Product Description.1 Product Description

The equipment under test (EUT) is a transmitter for wireless headphone operating at 900MHz. The EUT is powered by AC/DC adaptor that provided by the applicant (Model PC-1230-DUL; 120V AC/19VDC). It consists the power on indicating light (colour in red during transmitting or colour in green during charging). On the other hand, the DC jack and the audio in jacks are used for DC power connection and connecting to an audio source respectively. Moreover, this transmitter includes an additional jack for headphone's batteries charging which located at the back of EUT. The mains function of this product is use to transmit the modulated signal to it's corresponding receiver.

For electronic filing, the brief circuit description and the approval instruction of antenna are saved with filename: descri.pdf and antenna.pdf respectively.

The Model: RCA WHP130 is the same as the Model: ARKON HP191 in hardware aspect. The difference in model number serves as marketing strategy.

1.2 Related Submittal(s) Grants

The receiver for this transmitter was authorized by Certification procedure. The FCC ID of the associated receiver is MVAHP192-001R and has been filed at the same time as this application.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (1992). Radiated Emission measurement was performed in Open Area Test Sites and Conducted Emission was performed in shield room. 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 .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 placed on file with the FCC.

EXHIBIT 2
SYSTEM TEST CONFIGURATION

INTERTEK TESTING SERVICES

2.0 System Test Configuration.0 System Test Configuration

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSIC63.4 (1992).

The EUT was powered by AC/DC Adaptor which provided by the applicant. The unit was operated standalone and place in the center of the turntable.

For simplifying of test, the unit was operated to transmit continuously.

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

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes. The worst case bit sequence was applied during test.

For simplicity of testing, the unit was operated to transmit continuously.

2.2 EUT Exercising Software .2 EUT Exercising Software

There was no special software to exercise the device. Once the unit is powered up, it transmits the typical signal continuously.

2.3 Special Accessories

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

INTERTEK TESTING SERVICES

2.4 Equipment Modification .4 Equipment Modification

Any modifications installed previous to testing by Uni-Art Precise Products Ltd. will be incorporated in each production model sold/leased in the United States.

No modifications were installed by Intertek Testing Services.

2.5 Support Equipment List and Description

1. Auxiliary input of EUT connected to a walkman through 1.8meter cable
(Provided by ITS)
2. AC/DC Adaptor
Model: PC-1230-DUL
Input: AC 120V ~ 60Hz
Output: DC 19V 80mA
(Provided by applicant)

All the items listed under section 2.0 of this report are:

Confirmed by:

*Alfred Lo
Senior Technical Supervisor - Home Entertainment Electronics
Intertek Testing Services Hong Kong Ltd.
Agent for Uni-Art Precise Products Ltd.*

Signature

10 June, 2002 Date

EXHIBIT 3

EMISSION RESULTS

3.0 Emission Results.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 23.1 Field Strength Calculation

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

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

where FS = Field Strength in dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

PD = Pulse Desensitization in dB

AV = Average Factor in -dB

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

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

3.1 Field Strength Calculation (cont'd) 3.1 Field Strength Calculation (cont)

Example

Assume a receiver reading of 62.0 dB μ 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. 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 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$RA = 62.0 \text{ dB}\mu\text{V}$$

$$AF = 7.4 \text{ dB}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$PD = 0 \text{ dB}$$

$$AV = -10 \text{ dB}$$

$$FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 \text{ dB}\mu\text{V/m}$$

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

INTERTEK TESTING SERVICES

- 3.2 Radiated Emission Configuration Photograph
.2 Radiated Emission Configuration Photograph
Worst Case Radiated Emission
at
911.564 MHz

For electronic filing, the front view and back view of the test configuration photographs are saved with filename: radiated.doc respectively.

INTERTEK TESTING SERVICES

3.3 Radiated Emission Data .3 Radiated Emission Data

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

Judgement: Passed by 1.8 dB margin

TEST PERSONNEL:

Signature

Terry C. H. Chan, Compliance Engineer
Typed/Printed Name

10 June, 2002
Date

INTERTEK TESTING SERVICES

Company: Uni-Art Precise Products Ltd.
Model: ARKON HP191
Worst Case Operating Mode: Transmitting Mode

Date of Test: 9 May, 2002

Table 1

Radiated Emissions

Polarization	Frequency (M H z)	Reading (dB μ V)	Antenna Factor (dB)	Pre-A m p Gain (dB)	Net at 3m (dB μ V /m)	Lim it at 3m (dB μ V /m)	M argin (dB)
V	911.564	85.6	22.6	16	92.2	94.0	-1.8
V	1823.118	45.3	26.5	34	37.8	54.0	-16.2
V	*2734.692	43.5	29.1	34	38.6	54.0	-15.4
V	*3646.256	41.9	32.8	34	40.7	54.0	-13.3
V	913.016	85.1	22.6	16	91.7	94.0	-2.3
V	1826.032	44.8	26.5	34	37.3	54.0	-16.7
V	*2739.048	42.9	29.1	34	38.0	54.0	-16.0
V	*3652.064	42.3	32.8	34	41.1	54.0	-12.9

- NOTES:
1. Peak Detector is used below 1000MHz unless otherwise stated.
 2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances 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 sign in the column shows value below limit.
 4. Horn antenna and average detector are used for the emission over 1000MHz.
 5. The radiated emission test was observed up to 40GHz.
- * Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak detector data for frequencies below 1000 MHz and average detector data for frequencies over 1000 MHz.

Test Engineer: Terry C. H. Chan

3.4 Conducted Emission Configuration Photograph

Worst Case Conducted Emission
at
0.15 MHz

For electronic filing, the front view, rear view and side view of the test configuration photographs are saved with filename: conduct.doc.

INTERTEK TESTING SERVICES

Company: Uni-Art Precise Products Ltd.
Model: ARKON HP191

Date of Test: 9 May, 2002

Conducted Emissions Section 15.107 Requirements

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

INTERTEK TESTING SERVICES

3.5 Conducted Emission Data

For electronic filing, the graph and data table of conducted emission are saved with filename: conduct.pdf. The data table lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by at least 20 dB margin

* Peak Detector Data Unless otherwise stated.

TEST PERSONNEL:

Signature

Terry C. H. Chan, Compliance Engineer
Typed/Printed Name

10 June, 2002
Date

EXHIBIT 4
EQUIPMENT PHOTOGRAPHS

4.0 Equipment Photographs4.0 Equipment Photographs

For electronic filing, photographs of the tested EUT are saved with filename: ophoto.doc for external photo, and iphoto1.doc to iphoto2.doc for internal photo.

EXHIBIT 5

PRODUCT LABELLING

5.0 **Product Labelling**.0 **Product Labelling**

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

EXHIBIT 6

TECHNICAL SPECIFICATIONS

6.0 Technical Specifications 6.0 Technical Specifications

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

EXHIBIT 7
INSTRUCTION MANUAL

7.0 **Instruction Manual**.0 **Instruction Manual**

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

This manual will be provided to the end-user with each unit sold/leased in the United States. Moreover, it was said that the declaration which mention in following pages will also be committed at the time.

EXHIBIT 8

MISCELLANEOUS INFORMATION

8.0 Miscellaneous Information 8.0 Miscellaneous Information

The miscellaneous information includes details of the measured [bandwidth](#) output signal, the test procedure and calculation of factor such as pulse desensitization and averaging factor.

8.1 Measured Bandwidth.1 Stabilization Waveform

The plot on saved in bw.pdf shows the fundamental emission which are [with/without](#) applying modulation. From the plot, it shows the emission is within the band edge 902MHz and 928MHz. The unit meets the FCC bandwidth requirements.

8.2 Discussion of Pulse Desensitization8.2 Discussion of Pulse Desensitization

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

Pulse desensitivity is not applicable for this device. Since the transmitter transmits the RF signal continuously.

8.3 Calculation of Average Factor.2 Discussion of Pulse Desensitization

Since this device is a transmits signal continuously, it is not necessary to apply average factor to the measurement results.

8.4 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services Hong Kong Ltd. in the measurements of Low Power Transmitter operating under the Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 - 1992.

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

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

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower. For line conducted emissions, the range scanned is 450 kHz to 30 MHz.

8.4 Emissions Test Procedures (cont'd)

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

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

Conducted measurements were made as described in ANSI C63.4 - 1992.

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

Measurements are normally conducted at a measurement distance of three meters. All measurements are extrapolated to three meters using inverse scaling, unless otherwise reported. Measurements taken at a closer distance are so marked.