ITS Intertek Testing Services
ETL SEMKO

8 January, 2003

Uni-Art Precise Products Ltd.
12/F., Yue Xiu Ind'l Bldg.,
87 Hung To Road,
Kwun Tong, Hong Kong.

Dear Mr. Eric Chan:

Enclosed you will find your file copy of a Part 15 report (FCC ID: MVASP492-001R).

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: MVASP492-001R

Intertek Testing Services Hong Kong Ltd.
2/F., Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong.
Tel: (852) 2173 8888 Fax: (852) 2745 8306

Intertek Testing Services
ETL SEMKO

Uni-Art Precise Products Ltd.

Application
For
Certification
(FCC ID: MVASP492-001R)

Scanning Receiver

WO# 0210331
LC/sa
8 January, 2003

FCC ID: MVASP492-001R

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Intertek Testing Services Hong Kong Ltd.
2/F., Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong.
Tel: (852) 2713 8888 Fax: (852) 2745 8306

LIST OF EXHIBITS

MEASUREMENT/TECHNICAL REPORT

Uni-Art Precise Products Ltd - MODEL: ARKON SP492
FCC ID: MVASP492-001R

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

Equipment Type: Scanning Receiver (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 B for unintentional 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,
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Kowloon, Hong Kong
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Table of Contents

List of attached file

Exhibit type	File Description	filename
Test Report	Test Report	report.pdf
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission	radiated.pdf
Test Setup Photo	Conducted Emission	conduct.pdf
Test Report	Conducted Emission Test Result	conduct.pdf
External Photo	External Photo	ophoto.pdf
Internal Photo	Internal Photo	iphoto.pdf
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
Attestation Statements	Attestation Statements	attestation.pdf

EXHIBIT 1

GENERAL DESCRIPTION

1.0 General Description

1.1 Product Description

This EUT is a pair of 900MHz receiver (stereo wireless speaker (L & R) system for audio usage) that would be operated with its associated transmitter, and they are powered by two identical AC/DC adaptors UD-1204B(120VAC to 12VDC, 450mA) or 6 pieces of "AA" size battery (for each speaker). The main function of this EUT is receiving of RF signal from associated transmitter, demodulate the received signal and then express in audio sound via the loudspeaker. The actual frequency range of this EUT is 910.5-912.5MHz and the receiving frequency can be selected by pressing the SCAN button which was equipped at the side of the EUT's body. That means the receiving frequency of receiver will be locked to it's transmitted frequency after the scan button has been pressed.

On the other hand, there have a volume control for adjusting the output volume; and ON/OFF, BASS BOOST buttons for activation other operational features. Moreover, there are bi-color LED which will be turn on in "red" color for power plug in and turn form "red" to "green" when the frequency is locked. Furthermore, it was equipped with the 13cm bare wire antenna which was attached along the plastic case firmly (see the internal photo on the following pages).

For electronic filing, the brief circuit description is saved with filename: descri.pdf

1.2 Related Submittal(s) Grants

This is a single application for certification of a scanning receiver.

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 measurement was performed in an Open Area Test Site and Conducted Emission measurement was performed in Shield Room. Preliminary scans were performed in the Open Area Test Site 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 placed on file with the FCC.

EXHIBIT 2

SYSTEM TEST CONFIGURATION

2.0 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 ANSI C63.4 (1992).

The EUT is powered by AC/DC adaptor (UD-1204B), 120VAC to 12V, 450mA

The unit was operated standalone and placed in the center of the turntable.

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.

2.2 EUT Exercising Software

There was no special software to exercise the device. Once the unit is powered up, it received the RF Signal continuously.

2.3 Special Accessories

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

2.4 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 Measurement Uncertainty

When determining of the test conclusion, the measurement uncertainty of test has been considered.

2.6 Support Equipment List and Description

All the items listed under section 2.0 of this report are c*onfirmed by:*

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

_____Signature

8 January, 2003 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 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

3.1 Field Strength Calculation (cont'd)

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

3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
at
1932.613 MHz

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

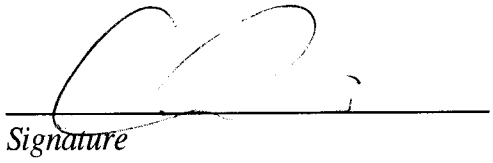
3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance.

Judgement: Passed by 6.4 dB margin

The radiated emissions test was observed up to 5GHz.

TEST PERSONNEL:



Signature

Lawrence H. C. Chow, Compliance Engineer
Typed/Printed Name

8 January, 2003
Date

Company: Uni-Art Precise Products Ltd.
Model: ARKON SP492
Worst case operating mode: Receiving (Left)

Date of Test: 8 August, 2002

Table 1

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
H	966.321	27.2	23.9	16	35.1	54.0	-18.9
H	1932.613	55.1	26.5	34	47.6	54.0	-6.4
H	2898.934	43.3	29.1	34	38.4	54.0	-15.6
H	3865.255	39.2	32.8	34	38.0	54.0	-16.0
H	4831.576	35.4	34.0	34	35.4	54.0	-18.6

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.

The corresponding limit as per 15.109 is based on Quasi peak detector data for frequencies below 1000 MHz and average detector data for frequencies over 1000 MHz.

Test Engineer: Lawrence H. C. Chow

Company: Uni-Art Precise Products Ltd. Date of Test: 22 August, 2002
Model: ARKON SP492
Worst case operating mode: Receiving (Right)

Table 2

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
H	969.644	27.8	23.2	16	35.0	54.0	-19.0
H	1939.288	51.1	26.5	34	43.6	54.0	-10.4
H	2908.932	43.4	29.1	34	38.5	54.0	-15.5
H	3878.576	39.2	32.8	34	38.0	54.0	-16.0
H	4848.220	35.1	34.0	34	35.1	54.0	-18.9

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.

The corresponding limit as per 15.109 is based on Quasi peak detector data for frequencies below 1000 MHz and average detector data for frequencies over 1000 MHz.

Test Engineer: Lawrence H. C. Chow

3.4 Conducted Emission Configuration Photograph

Worst Case Conducted Emission
at
0.450 MHz

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

Company: Uni-Art Precise Products Ltd. Date of Test: 8 August, 2002
Model: ARKON SP492

Conducted Emissions
Section 15.107 Requirements

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

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.

Judgement: Passed by 22 dB margin

TEST PERSONNEL:

Signature

Lawrence H. C. Chow, Compliance Engineer
Typed/Printed Name

8 January, 2003
Date

3.12 38dB Rejection Measurement

3.13 The data on the following page lists the significant rejection frequencies, the limit and the margin of compliance.

Judgement: Passed by no response for the cellular band transmission.

TEST PERSONNEL:

Signature

Lawrence H. C. Chow, Compliance Engineer
Typed/Printed Name

8 January, 2003
Date

3.14 38dB Rejection Measurement Procedures

Step 1

Firstly, the RF generator was connected with the EUT for giving the reference signal to EUT, and then, the output of the receiver was connected to an audio analyzer (R&S radiocommunication monitor) for checking the audio output level is in appropriate level (12 dB SINAD).

The reference signal was constructed with 1k audio, 19kHz pilot signal, 75kHz deviation in FM modulation.

After that, the power level of RF generator was adjusted to produce a 12 dB SINAD on the audio output. This was done across the receiver bands (scanning range) to determine a reference level. The highest sensitivity reference level was recorded for future use.

Step 2

When the reference level was found, the output level of RF generator was risen to 40 dB above the reference level and the output frequency was set to a low, medium and high frequency in both the mobile and base cellular bands (Mobile = 824.04 MHz through 848.97 MHz, Base = 869.04 MHz through 893. 97 MHz).

The scanning process was activated to see whether the cellular bands transmission could be received or not.

If the process stopped in particular frequency/(ies) during the scanning, this/these frequency/(ies) will be noted as a response frequency/(ies).

After all the frequency of response was noted, the RF signal generator was set to measure the sensitivity at each of these response frequencies to do the 38dB rejection test intensively. The power level for this/these response frequency/(ies) then adjusted to appropriate for producing 12dB SINAD on the audio output.

The power level which obtain in step 2 was noted.

P.S.

The difference between the reference power level and the power level in response frequency/(ies) should be 38 dB.

Frequencies used on the Signal Generator were 824.04, 836.50, 848.97 MHz for the Mobile and 869.04, 887.73, 893.97 MHz for the Base.

Company: Uni-Art Precise Products Ltd.
Model: ARKON SP492
Worst case operating mode: Receiving (Left)

Date of Test: 8 August, 2002

Table 3

38dB Rejection

Injected frequency (Cellular) in MHz	Level 12dB SINAD at injected frequency in dBm	Rejection in dB	Limit in dB
824.04	>43	>40	38
836.00	>43	>40	38
848.97	>43	>40	38
869.04	>43	>40	38
881.00	>43	>40	38
893.97	>43	>40	38

NOTES:
1. The reference level of the EUT is -83dBm.
2. The RF reference signal is RF signal modulated with 1kHz audio signal, 19kHz pilot signal, 75k deviation FM signal.
3. The corresponding limit as per 15.121(b).

Test Engineer: Lawrence H. C. Chow

Company: Uni-Art Precise Products Ltd. Date of Test: 8 August, 2002
Model: ARKON SP492
Worst case operating mode: Receiving (Right)

Table 4

38dB Rejection

Injected frequency (Cellular) in MHz	Level 12dB SINAD at injected frequency in dBm	Rejection in dB	Limit in dB
824.04	>43	>40	38
836.00	>43	>40	38
848.97	>43	>40	38
869.04	>43	>40	38
881.00	>43	>40	38
893.79	>43	>40	38

NOTES:
1. The reference level of the EUT is -86dBm.
2. The RF reference signal is RF signal modulated with 1kHz audio signal, 19kHz pilot signal, 75k deviation FM signal.
3. The corresponding limit as per 15.121(b).

Test Engineer: Lawrence H. C. Chow

EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

4.0 Equipment Photographs

For electronic filing, photographs of the tested EUT are saved with filename: ophoto.pdf for external photo, and iphoto.pdf for internal photo.

EXHIBIT 5

PRODUCT LABELLING

5.0 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

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

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.

EXHIBIT 8

MISCELLANEOUS INFORMATION

8.0 Miscellaneous Information

This miscellaneous information includes details of the test procedure and calculation of factors such as pulse desensitization and averaging factor (calculation and timing diagram).

8.1 Discussion of Pulse Desensitization

No desensitization of the measurement equipment is required as this device is a scanning receiver.

8.2 Calculation of Average Factor

This device is a scanning receiver. It is not necessary to apply average factor to the measurement result.

8.3 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services Hong Kong Ltd. in the measurements of Scanning Receivers operating under the Part 15, Subpart B 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 ground plane. 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 8.2.

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 5 GHz, whichever is lower. For line conducted emissions, the range scanned is 450 kHz to 30 MHz.

8.3 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 8.1). 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.