# Uni-Art Precise Products Ltd.

Application
For
Certification
**(FCC ID: MVARS960-001R)**

Superheterodyne Receiver

WO# 0006931
DY/sa
August 22, 2000

FCC ID: MVARS960-001R




**Intertek Testing Services Hong Kong Ltd.**
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# LIST OF EXHIBITS

# MEASUREMENT/TECHNICAL REPORT

## Uni-Art Precise Products Ltd. - MODEL: ARKON RS962
## FCC ID: MVARS960-001R

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

Equipment Type: Superheterodyne 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 [10-1-96 Edition] provision.

Report prepared by:

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| Test Report | Test Report | report.doc |
| Operation Description | Technical Description | descri.pdf |
| Test Setup Photo | Radiated Emission | radiated1.jpg, radiated2.jpg |
| Test Setup Photo | Conducted Emission | conduct1.jpg, conduct2.jpg, conduct3.jpg |
| Test Report | Conducted Emission Test Result | conduct.pdf |
| External Photo | External Photo | ophoto1.jpg, ophoto2.jpg |
| Internal Photo | Internal Photo | iphoto1.jpg, iphoto2.jpg, iphoto3.jpg, iphoto4.jpg, iphoto5.jpg, iphoto6.jpg, iphoto7.jpg, iphoto8.jpg, iphoto9.jpg, |
| Block Diagram | Block Diagram | block.pdf |
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# EXHIBIT 1

# GENERAL DESCRIPTION

## 1.0 General Description

### 1.1 Product Description

The equipment under test (EUT) is a 900MHz stereo wireless speaker operating at 912.0 - 913.0MHz. The EUT is powered by 120VAC to 12VDC adaptor or six 'AA' size 1/5V battereis. Volume/on-off control knob and boost bass button are on the front panel, dc power jack is on the rear side of EUT. Turn on this EUT and the associated transmitter, then it will receive the RF signal continuously from the transmitter.

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

The Model : RCA WSP175 is the same as the Model : ARKON RS962 in hardware aspect. The difference in model number serves as marketing strategy.

### 1.2 Related Submittal(s) Grants

This is a single application for certification of a receiver. The FCC ID of the associated transmitter is MVARS960-001T 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 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 ANSIC63.4 (1992).

The EUT is powered by 120VAC to 12VDC adaptor or six 'AA' size 1.5V batteries.

The unit was 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.

### 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 Support Equipment List and Description

This product was tested in standalone configuration.

All the items listed under section 2.0 of this report are

*Confirmed by:*

*Daniel Yau*
*Technical Manager - Home Entertainment Electronics*
*Intertek Testing Services Hong Kong Ltd.*
*Agent for Uni-Art Precise Products Ltd.*

_____Signature

August 22, 2000 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
136.923 MHz

For electronic filing, the front view and back view of the test configuration photographs are saved with filename: radiated1.jpg and radiated2.jpg respectively.

3.3 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 11.1 dB margin

***TEST PERSONNEL:***

_____
*Signature*

Prudence S. M. Poon, Compliance Engineer
*Typed/Printed Name*

August 22, 2000
Date

Company: Uni-Art Precise Products Ltd. Date of Test: June 17, 2000
Model: ARKON RS962 (Left Speaker)

**Table 1**

**Radiated Emissions**

| Polarity | Frequency (MHz) | Reading (dBµV) | Antenna Factor (dB) | Pre-Amp Gain (dB) | Net at 3m (dBµV/m) | Limit at 3m (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| H | 136.923 | 28.3 | 16 | 11.9 | 32.4 | 43.5 | -11.1 |
| H | 274.134 | 27.4 | 16 | 12.4 | 31.0 | 46.0 | -15.0 |
| H | 968.339 | 43.4 | 16 | 22.2 | 37.2 | 54.0 | -16.8 |
| H | 970.941 | 43.0 | 16 | 22.2 | 36.8 | 54.0 | -17.2 |
| H | 1941.762 | 29.4 | 34 | 26.5 | 36.9 | 54.0 | -17.1 |

NOTES:
1. Peak Detector Data 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: Prudence S. M. Poon

Company: Uni-Art Precise Products Ltd. Date of Test: June 17, 2000
Model: ARKON RS962 (Right Speaker)

**Table 2**

**Radiated Emissions**

| Polarity | Frequency (MHz) | Reading (dBµV) | Antenna Factor (dB) | Pre-Amp Gain (dB) | Net at 3m (dBµV/m) | Limit at 3m (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| H | 133.147 | 27.3 | 16 | 12.3 | 31.0 | 43.5 | -12.5 |
| H | 266.804 | 26.0 | 16 | 12.4 | 29.6 | 46.0 | -16.4 |
| H | 966.428 | 45.1 | 16 | 23.2 | 37.9 | 54.0 | -16.1 |
| H | 970.511 | 43.6 | 16 | 23.2 | 36.4 | 54.0 | -17.6 |
| H | 1940.364 | 27.7 | 34 | 26.5 | 35.2 | 54.0 | -18.8 |

NOTES: 1. Peak Detector Data 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.

Emission within the restricted band meets the requirement of part 15.205. 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: Prudence S. M. Poon

3.4 Conducted Emission Configuration Photograph

Worst Case Conducted Emission

For electronic filing, the front view, rear view and side view of the test configuration photographs are saved with filename: conduct1.jpg, conduct2.jpg and conduct3.jpg.

Company: Uni-Art Precise Products Ltd. Date of Test: June 17, 2000
Model: ARKON RS962

**Conducted Emissions**
**Section 15.107 Requirements**

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

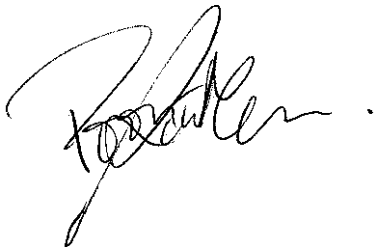
3.5 Conducted Emission Data

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 more than 20 dB margin

* Peak Detector Data Unless otherwise stated.

***TEST PERSONNEL:***



*Signature*

Prudence S. M. Poon, Compliance Engineer
*Typed/Printed Name*

August 22, 2000
Date

# EXHIBIT 4

# EQUIPMENT PHOTOGRAPHS

## 4.0 Equipment Photographs

For electronic filing, photographs of the tested EUT are saved with filename: ophoto1.jpg, ophoto2.jpg for external photo, and iphoto1.jpg to iphoto9.jpg 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.

8.1 Discussion of Pulse Desensitization

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

This device is a superheterodyne receiver. The emission are continuous, and no desensitization of the measurement equipment occurs.

8.2 Calculation of Average Factor

This device is a superheterodyne receiver and the emission are continuous, so it is not necessary to apply average factor to the measurement results.

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 Superheterodyne 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 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 8.2.

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 40 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.