

***June 30,2000***

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

***Dear Ms. Cindy Ng:***

***Enclosed you will find your file copy of a Part 15 report (FCC ID: MVAR992W-001R).  
We have forwarded the original, along with your check for \$365.00, to FCC.***

***For your reference, FCC will normally take another 40 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,***

***Daniel Yau  
Technical Manager***

***Enclosure***

***FCC ID: MVAR992W-001R***

**Uni-Art Precise Products Ltd.**

Application  
For  
Certification  
**(FCC ID: MVAR992W-001R)**  
  
Superheterodyne Receiver

WO# 0004225

DY/sa

June 30,2000

- 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 RS992W**  
**FCC ID: MVAR992W-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:

Daniel Yau  
Intertek Testing Services  
Hong Kong Ltd.  
2/F., Garment Centre,  
576, Castle Peak Road,  
Kowloon, Hong Kong  
Phone:      852-2173-8502  
Fax:      852-2745-8306

---

# INTERTEK TESTING SERVICES

---

## Table of Contents

<b>1.0 <u>General Description</u></b>	2
1.1 Product Description	2
1.2 Related Submittal(s) Grants	2
1.3 Test Methodology	3
1.4 Test Facility	3
<b>2.0 <u>System Test Configuration</u></b>	5
2.1 Justification	5
2.2 EUT Exercising Software	5
2.3 Special Accessories	5
2.4 Equipment Modification	6
2.5 Support Equipment List and Description	6
<b>3.0 <u>Emission Results</u></b>	8
3.1 Field Strength Calculation	9
3.2 Radiated Emission Configuration Photograph	10
3.3 Radiated Emission Data	11
3.4 Conducted Emission Configuration Photograph	14
3.5 Conducted Emission Data	15
<b>4.0 <u>Equipment Photographs</u></b>	17
<b>5.0 <u>Product Labelling</u></b>	19
<b>6.0 <u>Technical Specifications</u></b>	21
<b>7.0 <u>Instruction Manual</u></b>	23
<b>8.0 <u>Miscellaneous Information</u></b>	25
8.1 Discussion of Pulse Desensitization	26
8.2 Calculation of Average Factor	27
8.3 Emissions Test Procedures	28
8.3 Emissions Test Procedures (Cont'd)	29

## INTERTEK TESTING SERVICES

---

### List of attached file

Exhibit type	File Description	filename
Cover Letter	Letter of Agency	letter.pdf
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 and conduct3.jpg
Test Report	Conducted Emission Test Result	conduct.pdf
External Photo	External Photo	ophoto1.jpg to ophoto2.jpg
Internal Photo	Internal Photo	iphoto1.jpg to iphoto8.jpg
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

# **INTERTEK TESTING SERVICES**

---

## **EXHIBIT 1**

### **GENERAL DESCRIPTION**

## **INTERTEK TESTING SERVICES**

---

### **1.0    General Description**

#### **1.1    Product Description**

The equipment under test (EUT) is a 900MHz wireless receiver operating at 911.5-913.5 MHz. The EUT is powered by 120VAC to 9VDC adaptor or six 1.5V size D batteries. There are volume on/off control knob, auto tuning and boost bass button at the front panel of EUT. Turn on the associated transmitter and the EUT, press the auto-tuning key of the EUT and it will automatically search for the same frequency as transmitter and receive the RF signal continuously.

The Model : RCA WSP170 is the same as the Model : ARKON RS992W in hardware aspect. The difference in model number serves as marketing strategy.

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

#### **1.2    Related Submittal(s) Grants**

This is an application for Certification of a receiver. The transmitter for this receiver is authorized by Certification procedure. The FCC ID for the transmitter is MVAR950-001T and has been granted on February 4, 2000.



## INTERTEK TESTING SERVICES

---

### 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**

## INTERTEK TESTING SERVICES

---

### 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 was powered by 120V to 9V AC/DC adapter or size 1.5V six D 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.

## INTERTEK TESTING SERVICES

---

### 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.

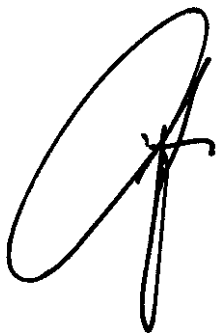
### 2.5 Support Equipment List and Description

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

\_\_\_\_\_  
June 30, 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.

---

## INTERTEK TESTING SERVICES

---

### 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 dB $\mu$ V/m

RA = Receiver Amplitude (including preamplifier) in dB $\mu$ 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:

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

#### Example

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

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

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

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

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

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

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

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

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

## **INTERTEK TESTING SERVICES**

---

### 3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission  
at  
971.649 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.



## INTERTEK TESTING SERVICES

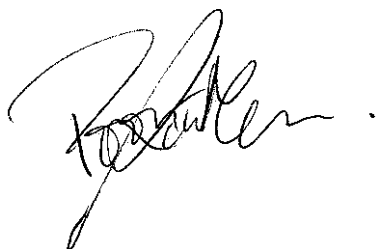
---

### 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 15.4 dB margin

#### **TEST PERSONNEL:**



---

*Signature*

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

June 30,2000

---

Date

## INTERTEK TESTING SERVICES

Company: Uni-Art Precise Products Ltd.  
Model: ARKON RS992W (Left Speaker)

Date of Test: May 8, 2000

**Table 1**

### **Radiated Emissions**

Polarity	Frequency (M H z)	Reading (dB $\mu$ V )	Antenna Factor (dB )	Pre-Amp Gain (dB )	Net at 3m (dB $\mu$ V /m )	Lim it at 3m (dB $\mu$ V /m )	M argin (dB )
H	425.012	30.8	16	16.3	30.5	46.0	-15.5
V	971.649	45.8	16	23.2	38.6	54.0	-15.4
H	1947.092	22.0	34	26.5	29.5	54.0	-24.5
H	2914.947	33.6	34	29.1	38.5	54.0	-15.5
H	3886.596	37.2	34	32.8	38.4	54.0	-15.6
H	4858.245	37.1	34	34.0	37.1	54.0	-16.9

- 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: May 8, 2000

FCC ID: MVAR992W-001R

---

## INTERTEK TESTING SERVICES

---

Model: ARKON RS992W (Right Speaker)

**Table 2**

**Radiated Emissions**

Polarity	Frequency (M H z)	Reading (dB $\mu$ V )	Antenna Factor (dB )	Pre-Amp Gain (dB )	Net at 3m (dB $\mu$ V /m )	L i m i t at 3m (dB $\mu$ V /m )	M a r g i n (dB )
V	969.472	38.2	16	16.3	37.9	54.0	-16.1
H	1938.944	37.0	16	23.2	29.8	54.0	-24.2
H	2907.386	30.9	34	26.5	38.4	54.0	-15.6
H	3877.416	33.6	34	29.1	38.5	54.0	-15.5
H	4846.888	35.7	34	32.8	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

## INTERTEK TESTING SERVICES

---

### 3.4 Conducted Emission Configuration Photograph

Worst Case Conducted Emission  
at  
0.45MHz

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.

## INTERTEK TESTING SERVICES

---

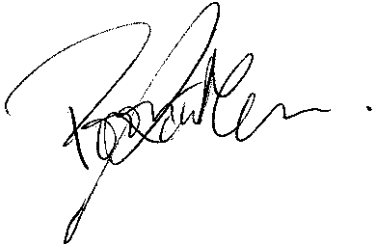
### 3.5 Conducted Emission Data

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 11.9 dB margin

\* Peak Detector Data Unless otherwise stated.

#### **TEST PERSONNEL:**



---

*Signature*

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

June 30,2000

---

*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, iphoto8.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

The emission limits are specified using spectrum analyzers or receivers which incorporate quasi-peak detectors. Typical measurements are made using peak detectors, however, emissions which approach the respective emission limit are measured using a quasi-peak detector.

For measurements above 1 GHz, spectrum analyzers or receivers using average detectors are employed, or the appropriate average factor can be applied.

Measurements using spectrum analyzers with filters other than peak detectors are recorded in the data table section of this report.

This device is a superheterodyne receiver.

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.

## INTERTEK TESTING SERVICES

---

### 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.