



TESTING LABORATORY  
CERTIFICATE # 4821.01



## FCC PART 90

## TEST REPORT

For

### CALTTA TECHNOLOGIES CO., LTD.

Floor12, Building G2, international E-City Nanshan District, Shenzhen, China

**FCC ID: 2AQV7PH6X0U1**

|                                                                                                                                                                                                                                                                                                                     |                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| <b>Report Type:</b><br>Class II Permissive Change                                                                                                                                                                                                                                                                   | <b>Product Type:</b><br>Digital Portable Radio |
| <b>Report Number:</b> RSZ210401010-00AA1                                                                                                                                                                                                                                                                            |                                                |
| <b>Report Date:</b> 2021-04-28                                                                                                                                                                                                                                                                                      |                                                |
| Jacob Kong                                                                                                                                                                                                                                                                                                          |                                                |
| <b>Reviewed By:</b> RF Engineer                                                                                                                                                                                                                                                                                     |                                                |
| <b>Prepared By:</b> Bay Area Compliance Laboratories Corp. (Shenzhen)<br>5F(B-West) ,6F,7F,the 3rd Phase of Wan Li Industrial<br>Building D,Shihua Rd, FuTian Free Trade Zone, Shenzhen,<br>China<br>Tel: +86-755-33320018<br>Fax: +86-755-33320008<br><a href="http://www.baclcorp.com.cn">www.baclcorp.com.cn</a> |                                                |

**Note:** This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "★".

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk '\*'. Customer model name, addresses, names, trademarks etc. are not considered data.

This report cannot be reproduced except in full, without prior written approval of the Company. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

## **TABLE OF CONTENTS**

|                                                                      |          |
|----------------------------------------------------------------------|----------|
| <b>GENERAL INFORMATION.....</b>                                      | <b>3</b> |
| PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) .....             | 3        |
| OBJECTIVE .....                                                      | 3        |
| TEST METHODOLOGY .....                                               | 4        |
| MEASUREMENT UNCERTAINTY .....                                        | 4        |
| TEST FACILITY .....                                                  | 4        |
| <b>SYSTEM TEST CONFIGURATION.....</b>                                | <b>5</b> |
| DESCRIPTION OF TEST CONFIGURATION .....                              | 5        |
| EUT EXERCISE SOFTWARE .....                                          | 5        |
| SPECIAL ACCESSORIES.....                                             | 5        |
| EQUIPMENT MODIFICATIONS .....                                        | 5        |
| SUPPORT EQUIPMENT LIST AND DETAILS .....                             | 5        |
| BLOCK DIAGRAM OF TEST SETUP .....                                    | 5        |
| <b>SUMMARY OF TEST RESULTS .....</b>                                 | <b>6</b> |
| <b>TEST EQUIPMENT LIST .....</b>                                     | <b>7</b> |
| <b>FCC §1.1307(b) &amp; §2.1093 - RF EXPOSURE INFORMATION .....</b>  | <b>8</b> |
| APPLICABLE STANDARD .....                                            | 8        |
| TEST RESULT .....                                                    | 8        |
| <b>FCC §2.1053 &amp; §90.210 - RADIATED SPURIOUS EMISSIONS .....</b> | <b>9</b> |
| APPLICABLE STANDARD .....                                            | 9        |
| TEST PROCEDURE .....                                                 | 9        |
| TEST DATA .....                                                      | 9        |

## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

|                       |                                                                                        |
|-----------------------|----------------------------------------------------------------------------------------|
| Product               | Digital Portable Radio                                                                 |
| Tested Model          | PH600 U(1), PH660 U(1)                                                                 |
| Multiple Model        | PH690 UHF, PH660 UHF, PH600 UHF                                                        |
| Model Differences     | Refer to the DoS letter                                                                |
| Frequency Range       | 400-470MHz                                                                             |
| Rated Transmit Power  | 4Watts(High),1Watt(Low)                                                                |
| Channel separation    | 12.5kHz                                                                                |
| Modulation Technique  | 4FSK/FM                                                                                |
| Antenna Specification | SMA External Antenna                                                                   |
| Voltage Range         | DC 7.4 V from battery or DC 12.0V from adapter                                         |
| Date of Test          | 2021-04-22                                                                             |
| Sample serial number  | RSZ210401010-RF-S1 & RSZ210401010-RF-S2(Assigned by BACL, Shenzhen)                    |
| Received date         | 2021-04-01                                                                             |
| Sample/EUT Status     | Good condition                                                                         |
| Adapter information   | Model: ES085H-X120100XYF<br>Input: AC 100-240V~50/60Hz, 0.5A<br>Output: DC 12.0V, 1.0A |

### Objective

This test report is prepared on behalf in accordance with Part 2, and Part 90 of the Federal Communication Commissions rules.

This is a CIIPC application of the device; the differences between the original device and the current one are as follows:

1. Changing the company address to “Floor12, Building G2, international E-City Nanshan District, Shenzhen, China”.
2. Changing the product name to “Digital Portable Radio”.
3. Adding the model names “PH600 U(1), PH660 U(1), PH690 UHF, PH660 UHF, PH600 UHF”.
4. For PH660 U(1), change the screen and keypad.
5. For PH600 U(1), remove the screen and keypad.
6. Adding the adapter for added models.

Based on above differences, we added the test item of “RADIATED SPURIOUS EMISSIONS” for added models and related photos, the other photos and data please refer to the original report.

## Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of federal Regulations Title 47 Part 2, Sub-part J as well as the following individual parts:

Part 90 – Private Land Mobile Radio Service

Applicable Standards: ANSI C63.26-2016.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

## Measurement Uncertainty

| Parameter                        |            | Uncertainty |
|----------------------------------|------------|-------------|
| Occupied Channel Bandwidth       |            | ±5%         |
| RF Output Power with Power meter |            | ±0.73dB     |
| RF conducted test with spectrum  |            | ±1.6dB      |
| Emissions,<br>Radiated           | Below 1GHz | ±4.75dB     |
|                                  | Above 1GHz | ±4.88dB     |
| Temperature                      |            | ±1°C        |
| Humidity                         |            | ±6%         |
| Supply voltages                  |            | ±0.4%       |

*Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.*

## Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 5F(B-West) ,6F,7F,the 3rd Phase of Wan Li Industrial Building D,Shihua Rd, FuTian Free Trade Zone, Shenzhen, China

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 342867,the FCC Designation No. : CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The system was configured for testing in a test mode which has been done in the factory.

### EUT Exercise Software

No exercise software was used.

### Special Accessories

No special accessory was used.

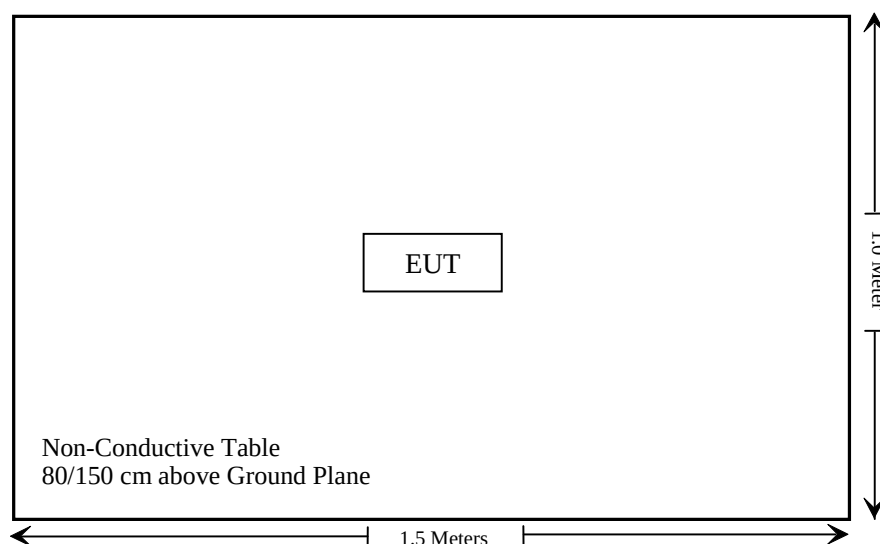
### Equipment Modifications

No modification was made to the EUT tested.

### Support Equipment List and Details

| Manufacturer | Description | Model      | Serial Number |
|--------------|-------------|------------|---------------|
| Unknown      | Load        | 50ohm/100W | Unknown       |

### Block Diagram of Test Setup



**SUMMARY OF TEST RESULTS**

| FCC Rules        | Description of Test                   | Results     |
|------------------|---------------------------------------|-------------|
| §1.1307, §2.1093 | RF Exposure (SAR)                     | Compliance  |
| §2.1046; §90.205 | RF Output Power                       | Compliance* |
| §2.1047; §90.207 | Modulation Characteristic             | Compliance* |
| §2.1049; §90.210 | Occupied Bandwidth & Emission Mask    | Compliance* |
| §2.1051;§90.210  | Spurious Emission at Antenna Terminal | Compliance* |
| §2.1053;§90.210  | Spurious Radiated Emissions           | Compliance  |
| §2.1055;§90.213  | Frequency Stability                   | Compliance* |
| §90.214          | Transient Frequency Behavior          | Compliance* |

Compliance\*: Please refer to original report RSZ190325001-00D.

**TEST EQUIPMENT LIST**

| Manufacturer                  | Description        | Model           | Serial Number | Calibration Date | Calibration Due Date |
|-------------------------------|--------------------|-----------------|---------------|------------------|----------------------|
| <b>Radiated Emission Test</b> |                    |                 |               |                  |                      |
| R&S                           | EMI Test Receiver  | ESR3            | 102455        | 2020/08/04       | 2021/08/03           |
| Sonoma instrument             | Pre-amplifier      | 310 N           | 186238        | 2020/08/04       | 2021/08/03           |
| Sunol Sciences                | Broadband Antenna  | JB1             | A040904-2     | 2020/12/22       | 2023/12/21           |
| COM-POWER                     | Dipole Antenna     | AD-100          | 721027        | NCR              | NCR                  |
| Unknown                       | Cable 2            | RF Cable 2      | F-03-EM197    | 2020/11/29       | 2021/11/28           |
| Unknown                       | Cable              | Chamber Cable 1 | F-03-EM236    | 2020/11/29       | 2021/11/28           |
| Unknown                       | Cable              | Chamber Cable 4 | EC-007        | 2020/11/29       | 2021/11/28           |
| Rohde & Schwarz               | Auto test software | EMC 32          | V9.10         | NCR              | NCR                  |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

---

## **FCC §1.1307(b) & §2.1093 - RF EXPOSURE INFORMATION**

---

### **Applicable Standard**

FCC§1.1310 and §2.1093.

### **Test Result**

Compliance, please refer to the SAR report: RSZ210401010-20A1.

## **FCC §2.1053 & §90.210 - RADIATED SPURIOUS EMISSIONS**

### **Applicable Standard**

FCC §2.1053 and §90.210

### **Test Procedure**

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load, which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to teeth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 lg (TXpwr in Watts/0.001)-the absolute level

Spurious attenuation limit in dB = 50 + 10 Log<sub>10</sub> (power out in Watts) for EUT with a 12.5 kHz channel bandwidth.

### **Test Data**

#### **Environmental Conditions**

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 26 °C     |
| <b>Relative Humidity:</b> | 56 %      |
| <b>ATM Pressure:</b>      | 101.0 kPa |

*The testing was performed by Andy Yu on 2021-04-22.*

*Test Mode: Transmitting(worst case at high power level)*

*Note: For above 1GHz, please refer to original report.*

Test Model: PH600 U(1)

| Frequency<br>(MHz)                      | Receiver<br>Reading<br>(dBμV) | Turn<br>Table<br>Angle<br>Degree | Rx Antenna    |                | Substituted    |                       |                         | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|-----------------------------------------|-------------------------------|----------------------------------|---------------|----------------|----------------|-----------------------|-------------------------|----------------------------|----------------|----------------|
|                                         |                               |                                  | Height<br>(m) | Polar<br>(H/V) | Level<br>(dBm) | Cable<br>Loss<br>(dB) | Antenna<br>Gain<br>(dB) |                            |                |                |
| Analog Modulation 400.0125MHz-12.5 kHz  |                               |                                  |               |                |                |                       |                         |                            |                |                |
| 800.025                                 | 30.28                         | 284                              | 1.5           | H              | -63.9          | 1.30                  | 0.0                     | -65.20                     | -20            | 45.20          |
| 800.025                                 | 29.42                         | 143                              | 1.8           | V              | -65.6          | 1.30                  | 0.0                     | -66.90                     | -20            | 46.90          |
| Analog Modulation 453.2125MHz-12.5 kHz  |                               |                                  |               |                |                |                       |                         |                            |                |                |
| 906.425                                 | 32.59                         | 70                               | 2.2           | H              | -63.8          | 1.33                  | 0.0                     | -65.13                     | -20            | 45.13          |
| 906.425                                 | 33.24                         | 198                              | 2.0           | V              | -62.8          | 1.33                  | 0.0                     | -64.13                     | -20            | 44.13          |
| Analog Modulation 469.9875MHz-12.5 kHz  |                               |                                  |               |                |                |                       |                         |                            |                |                |
| 939.975                                 | 33.65                         | 147                              | 1.6           | H              | -62.9          | 1.36                  | 0.0                     | -64.26                     | -20            | 44.26          |
| 939.975                                 | 34.25                         | 315                              | 1.3           | V              | -59.8          | 1.36                  | 0.0                     | -61.16                     | -20            | 41.16          |
| Digital Modulation 400.0125MHz-12.5 kHz |                               |                                  |               |                |                |                       |                         |                            |                |                |
| 800.025                                 | 31.45                         | 23                               | 1.8           | H              | -65.7          | 1.30                  | 0.0                     | -67.00                     | -20            | 47.00          |
| 800.025                                 | 30.21                         | 345                              | 1.8           | V              | -64.8          | 1.30                  | 0.0                     | -66.10                     | -20            | 46.10          |
| Digital Modulation 453.2125MHz-12.5 kHz |                               |                                  |               |                |                |                       |                         |                            |                |                |
| 906.425                                 | 33.26                         | 80                               | 2.2           | H              | -63.1          | 1.33                  | 0.0                     | -64.43                     | -20            | 44.43          |
| 906.425                                 | 32.48                         | 91                               | 1.2           | V              | -63.6          | 1.33                  | 0.0                     | -64.93                     | -20            | 44.93          |
| Digital Modulation 469.9875MHz-12.5 kHz |                               |                                  |               |                |                |                       |                         |                            |                |                |
| 939.975                                 | 32.14                         | 150                              | 1.7           | H              | -64.4          | 1.36                  | 0.0                     | -65.76                     | -20            | 45.76          |
| 939.975                                 | 31.57                         | 207                              | 1.4           | V              | -62.5          | 1.36                  | 0.0                     | -63.86                     | -20            | 43.86          |

Test Model: PH660 U(1)

| Frequency<br>(MHz)                      | Receiver<br>Reading<br>(dBμV) | Turn<br>Table<br>Angle<br>Degree | Rx Antenna    |                | Substituted    |                       |                         | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|-----------------------------------------|-------------------------------|----------------------------------|---------------|----------------|----------------|-----------------------|-------------------------|----------------------------|----------------|----------------|
|                                         |                               |                                  | Height<br>(m) | Polar<br>(H/V) | Level<br>(dBm) | Cable<br>Loss<br>(dB) | Antenna<br>Gain<br>(dB) |                            |                |                |
| Analog Modulation 400.0125MHz-12.5 kHz  |                               |                                  |               |                |                |                       |                         |                            |                |                |
| 800.025                                 | 37.63                         | 340                              | 2.0           | H              | -56.5          | 1.30                  | 0.0                     | -57.80                     | -20            | 37.80          |
| 800.025                                 | 38.59                         | 87                               | 1.0           | V              | -56.4          | 1.30                  | 0.0                     | -57.70                     | -20            | 37.70          |
| Analog Modulation 453.2125MHz-12.5 kHz  |                               |                                  |               |                |                |                       |                         |                            |                |                |
| 906.425                                 | 37.85                         | 127                              | 1.7           | H              | -58.5          | 1.33                  | 0.0                     | -59.83                     | -20            | 39.83          |
| 906.425                                 | 39.48                         | 205                              | 2.2           | V              | -56.6          | 1.33                  | 0.0                     | -57.93                     | -20            | 37.93          |
| Analog Modulation 469.9875MHz-12.5 kHz  |                               |                                  |               |                |                |                       |                         |                            |                |                |
| 939.975                                 | 42.15                         | 54                               | 1.7           | H              | -54.4          | 1.36                  | 0.0                     | -55.76                     | -20            | 35.76          |
| 939.975                                 | 43.21                         | 140                              | 2.0           | V              | -50.8          | 1.36                  | 0.0                     | -52.16                     | -20            | 32.16          |
| Digital Modulation 400.0125MHz-12.5 kHz |                               |                                  |               |                |                |                       |                         |                            |                |                |
| 800.025                                 | 37.68                         | 152                              | 1.5           | H              | -56.5          | 1.30                  | 0.0                     | -57.80                     | -20            | 37.80          |
| 800.025                                 | 39.54                         | 282                              | 1.3           | V              | -55.4          | 1.30                  | 0.0                     | -56.70                     | -20            | 36.70          |
| Digital Modulation 453.2125MHz-12.5 kHz |                               |                                  |               |                |                |                       |                         |                            |                |                |
| 906.425                                 | 35.54                         | 243                              | 2.1           | H              | -60.8          | 1.33                  | 0.0                     | -62.13                     | -20            | 42.13          |
| 906.425                                 | 36.17                         | 293                              | 1.9           | V              | -59.9          | 1.33                  | 0.0                     | -61.23                     | -20            | 41.23          |
| Digital Modulation 469.9875MHz-12.5 kHz |                               |                                  |               |                |                |                       |                         |                            |                |                |
| 939.975                                 | 40.15                         | 179                              | 1.9           | H              | -56.4          | 1.36                  | 0.0                     | -57.76                     | -20            | 37.76          |
| 939.975                                 | 40.55                         | 164                              | 1.7           | V              | -53.5          | 1.36                  | 0.0                     | -54.86                     | -20            | 34.86          |

**Note:**

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

\*\*\*\*\* END OF REPORT \*\*\*\*\*