



**JAPAN QUALITY ASSURANCE ORGANIZATION**

21-25, KINUTA 1-CHOME, SETAGAYA-KU, TOKYO 157-8573 JAPAN  
PHONE (03) 3416-0111, TELEX 242-2531 JQA J FAX (03) 3416-9691

JQA APPLICATION NO.: 400-10614

Issue Date : February 4, 2002

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**EMI TEST REPORT**

JQA APPLICATION NO. : 400-10614

Model No. : SWU-R1-01

Type of Equipment : Silwatch

Regulations Applied : CFR 47 FCC Rules and Regulations Part 15

FCC ID : P5NSWU-R1-01

Applicant : Tokyo Shinyu Co., Ltd.

Address : Shinjuku KM Building, 1-14-5 Shinjuku, Shinjuku-ku,  
Tokyo 160-0022, Japan

Manufacture : Tokyo Shinyu Co., Ltd.

Address : Shinjuku KM Building, 1-14-5 Shinjuku, Shinjuku-ku,  
Tokyo 160-0022, Japan

Received date of EUT : December 7, 2001

**Final Judgment : Passed**

Test results in this report are obtained in use of equipment that is traceable to National Institute of Advanced Industrial Science and Technology (AIST) of Japan and Communication Research Laboratory (CRL) of Japan.

The test results only respond to the tested sample.

This report should not be reproduced except in full, without the written approval of JQA EMC Engineering Dept. Testing Div.

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## **1 DOCUMENTATION**

### **1.1 TEST REGULATION**

FCC Rules and Regulations Part 15 Subpart A and B (June 23, 1989) All other receivers subject to part 15

#### **Test procedure :**

AC power line conducted emission and radiated emission tests were performed according to the procedures in ANSI C63.4-1992.

### **1.2 GENERAL INFORMATION**

#### **1.2.1 Test facility :**

1) Test Facility located at EMC Engineering Dept. Testing Div. :

- No.2 and 3 Anechoic Chambers( 3 meters Site ).
- Shielded Enclosure.

Expiration date of FCC test facility filing : June 04, 2002

2) EMC Engineering Dept. Testing Div. is recognized under the National Voluntary Laboratory accreditation Program for satisfactory compliance established in title 15, Part 285 Code of Federal Regulations.

NVLAP Lab Code : 200189-0 (Effective through : June 30, 2002)

#### **1.2.2 Description of the Equipment Under Test (EUT) :**

- |                                      |                                          |
|--------------------------------------|------------------------------------------|
| 1) Type of Equipment                 | : Silwatch                               |
| 2) Product Type                      | : Production                             |
| 3) Category                          | : All other receivers subject to part 15 |
| 4) EUT Authorization                 | : Certification                          |
| 5) FCC ID                            | : P5NSWU-R1-01                           |
| 6) Trade Name                        | : Silwatch                               |
| 7) Model No.                         | : SWU-R1-01                              |
| 8) Tuning Frequency Range            | : 426.05 MHz                             |
| 9) Highest Frequency Used in the EUT | : 425.6 MHz                              |
| 10) Serial No.                       | : 00064                                  |
| 11) Date of Manufacture              | : None                                   |
| 12) Power Rating                     | : DC 3.0V                                |
| 13) EUT Grounding                    | : None                                   |

#### **1.2.3 Definitions for symbols used in this test report :**

- x   - indicates that the listed condition, standard or equipment is applicable for this report.
- indicates that the listed condition, standard or equipment is not applicable for this report.

### 1.3 TEST CONDITION

#### 1.3.1 The measurement of the AC Power Line Conducted Emission

☐ - was performed in the following test site.

☒ - was not applicable.

#### Test location :

Safety & EMC Center EMC Engineering Dept. Testing Div.  
 21-25, Kinuta 1-chome, Setagaya-ku, Tokyo 157-8573, Japan

☐ - Shielded Enclosure

☐ - Anechoic Chamber No. 2 (portable Type)

#### Used test instruments :

| Type                                            | Model No. | Manufacturer        | Serial No.   | Last Cal. | Interval |
|-------------------------------------------------|-----------|---------------------|--------------|-----------|----------|
| <input type="checkbox"/> - Test Receiver        | ESH-2     | Rohde & Schwarz     | 880370/016   | June 2001 | 1 Year   |
| <input type="checkbox"/> - Test Receiver        | ESH-3     | Rohde & Schwarz     | 881460/030   | May 2001  | 1 Year   |
| <input type="checkbox"/> - Test Receiver        | ESHS10    | Rohde & Schwarz     | 835871/004   | Aug. 2001 | 1 Year   |
| <input type="checkbox"/> - LISN(for Peripheral) | KNW-407   | Kyoritsu Electrical | 8-833-6      | Apr. 2001 | 1 Year   |
| <input type="checkbox"/> - LISN(for EUT)        | KNW-407   | Kyoritsu Electrical | 8-855-2      | Apr. 2001 | 1 Year   |
| <input type="checkbox"/> - LISN                 | KNW-407   | Kyoritsu Electrical | 8-757-1      | Apr. 2001 | 1 Year   |
| <input type="checkbox"/> - RF Cable             | 3D-2W     | Fujikura            | 155-21-006E0 | Apr. 2001 | 1 Year   |
| <input type="checkbox"/> - RF Cable             | 3D-2W     | Fujikura            | 155-21-007E0 | Apr. 2001 | 1 Year   |
| <input type="checkbox"/> - 50ohm Termination    | -         | SUHNER              | 154-06-501E0 | Jan. 2002 | 1 Year   |
| <input type="checkbox"/> - 50ohm Termination    | -         | SUHNER              | 154-06-502E0 | Jan. 2002 | 1 Year   |

### 1.3.2 The measurement of the Radiated Emission(30 MHz - 1000 MHz)

- ☒ - was performed in the following test site.  
☐ - was not applicable.

#### Test location :

Safety & EMC Center EMC Engineering Dept. Testing Div.  
 21-25, Kinuta 1-chome, Setagaya-ku, Tokyo 157-8573, Japan

- ☒ - Anechoic Chamber No. 2 (3 meters)  
☐ - Anechoic Chamber No. 3 (3 meters)

#### Validation of Site Attenuation :

- 1) Last Confirmed Date :March, 2001  
 2) Interval :1 year

#### Used test instruments :

| Type                                                       | Model No. | Manufacturer        | Serial No.   | Last Cal. | Interval |
|------------------------------------------------------------|-----------|---------------------|--------------|-----------|----------|
| <input type="checkbox"/> - Spectrum Analyzer               | 8560E     | Hewlett Packard     | 3240A00189   | Nov. 2001 | 1 Year   |
| <input type="checkbox"/> - Spectrum Analyzer               | 8566B     | Hewlett Packard     | 2140A01091   | Apr. 2001 | 1 Year   |
| <input type="checkbox"/> - RF Pre-selector                 | 85685A    | Hewlett Packard     | 2648A00522   | Apr. 2001 | 1 Year   |
| <input type="checkbox"/> - Spectrum Analyzer               | 8566B     | Hewlett Packard     | 2747A05855   | June 2001 | 1 Year   |
| <input type="checkbox"/> - RF Pre-selector                 | 85685A    | Hewlett Packard     | 2091A00933   | June 2001 | 1 Year   |
| <input type="checkbox"/> - Test Receiver                   | ESV       | Rohde & Schwarz     | 872148/039   | June 2000 | 1 Year   |
| <input checked="" type="checkbox"/> - Test Receiver        | ESVS10    | Rohde & Schwarz     | 826148/002   | May 2001  | 1 Year   |
| <input type="checkbox"/> - Test Receiver                   | ESVS10    | Rohde & Schwarz     | 832699/001   | May 2001  | 1 Year   |
| <input type="checkbox"/> - Antenna                         | KBA-511   | Kyoritsu Electrical | 0-170-1      | Nov. 2001 | 1 Year   |
| <input type="checkbox"/> - Antenna                         | KBA-511A  | Kyoritsu Electrical | 0-201-13     | Nov. 2001 | 1 Year   |
| <input type="checkbox"/> - Antenna                         | KBA-611   | Kyoritsu Electrical | 0-147-14     | Nov. 2001 | 1 Year   |
| <input type="checkbox"/> - Antenna                         | KBA-611   | Kyoritsu Electrical | 0-210-5      | Nov. 2001 | 1 Year   |
| <input checked="" type="checkbox"/> - Biconical Antenna    | BBA9106   | Schwarzbeck         | VHA91031150  | Nov. 2001 | 1 Year   |
| <input type="checkbox"/> - Biconical Antenna               | BBA9106   | Schwarzbeck         | 11905078E0   | Nov. 2001 | 1 Year   |
| <input checked="" type="checkbox"/> - Log-Periodic Antenna | UHALP9107 | Schwarzbeck         | 11905079E0   | Nov. 2001 | 1 Year   |
| <input type="checkbox"/> - Log-Periodic Antenna            | UHALP9107 | Schwarzbeck         | 11905110     | Nov. 2001 | 1 Year   |
| <input checked="" type="checkbox"/> - RF Cable             | 5D-2W     | Fujikura            | 155-21-001E0 | Feb. 2001 | 1 Year   |
| <input type="checkbox"/> - RF Cable                        | 5D-2W     | Fujikura            | 155-21-002E0 | Feb. 2001 | 1 Year   |

### 1.3.3 The measurement of the Radiated Emission(Above 1000 MHz)

- ☐ - was performed in the following test site.  
☒ - was not applicable.

#### Test location :

Safety & EMC Center EMC Engineering Dept. Testing Div.  
 21-25, Kinuta 1-chome, Setagaya-ku, Tokyo 157-8573, Japan

- ☐ - No. 2 site (3 meters)  
☐ - No. 3 site (3 meters)

#### Validation of Site Attenuation :

- 1) Last Confirmed Date :N/A  
 2) Interval :N/A

#### Used test instruments :

| Type                                            | Model No.         | Manufacturer       | Serial No.   | Last Cal. | Interval |
|-------------------------------------------------|-------------------|--------------------|--------------|-----------|----------|
| <input type="checkbox"/> - Spectrum Analyzer    | 8560E             | Hewlett Packard    | 3240A00189   | Nov. 2001 | 1 Year   |
| <input type="checkbox"/> - Spectrum Analyzer    | 8566B             | Hewlett Packard    | 2140A01091   | Apr. 2001 | 1 Year   |
| <input type="checkbox"/> - RF Pre-selector      | 85685A            | Hewlett Packard    | 2648A00522   | Apr. 2001 | 1 Year   |
| <input type="checkbox"/> - Spectrum Analyzer    | 8566B             | Hewlett Packard    | 2747A05855   | June 2001 | 1 Year   |
| <input type="checkbox"/> - RF Pre-selector      | 85685A            | Hewlett Packard    | 2091A00933   | June 2001 | 1 Year   |
| <input type="checkbox"/> - Log-Periodic Antenna | HL 025            | Rohde & Schwarz    | 340182/015   | Nov. 2001 | 1 Year   |
| <input type="checkbox"/> - RF Amplifier         | DBP-0102N5334272B | DBS Microwave Inc. | 012          | Mar. 2001 | 1 Year   |
| <input type="checkbox"/> - RF Amplifier         | WJ-6882-814       | Watkins-Johnson    | 0414         | June 2001 | 1 Year   |
| <input type="checkbox"/> - RF Amplifier         | WJ-5315-556       | Watkins-Johnson    | 106          | June 2001 | 1 Year   |
| <input type="checkbox"/> - RF Amplifier         | WJ-5320-307       | Watkins-Johnson    | 645          | June 2001 | 1 Year   |
| <input type="checkbox"/> - RF Cable(10m)        | S 04272B          | Suhner             | 155-21-011E0 | May 2001  | 1 Year   |
| <input type="checkbox"/> - RF Cable(2m)         | SUCOFLEX 104      | Suhner             | 155-21-012E0 | May 2001  | 1 Year   |
| <input type="checkbox"/> - RF Cable(1m)         | SUCOFLEX 104      | Suhner             | 155-21-013E0 | May 2001  | 1 Year   |
| <input type="checkbox"/> - RF Cable(1m)         | S 04272B          | Suhner             | 155-21-015E0 | June 2001 | 1 Year   |



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Model No. :SWU-R1-01

Standard :CFR 47 FCC Rules Part 15

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## 1.4 EUT MODIFICATION / Deviation from Standard

### 1.4.1 EUT MODIFICATION

- ☒ - No modifications were conducted by JQA to achieve compliance to Class B levels.  
☐ - To achieve compliance to Class B levels, the following changes were made by JQA during the compliance test.

The modifications will be implemented in all production models of this equipment.

Applicant :

Date :

Typed Name :

Position :

### 1.4.2 Deviation from Standard:

- ☒ - No deviations from the standard described in clause 1.1.  
☐ - The following deviations were employed from the standard described in clause 1.1:

\_\_\_\_\_  
\_\_\_\_\_



## 1.5 TEST RESULTS / UNCERTAINTY

### AC Power Line Conducted Emission

☐ - Applicable ☒ - NOT Applicable

The requirements are

☐ - PASSED ☐ - NOT PASSED

Min. Limit Margin

dB at MHz

Max. Limit Exceeding

dB at MHz

Uncertainty of Measurement Results +/- 2.4 dB (level of confidence:95%)

Remarks :

### Radiated Emission [§15.109(a)]

☒ - Applicable ☐ - NOT Applicable

The requirements are

☒ - PASSED ☐ - NOT PASSED

Min. Limit Margin

24.1 dB at 70.9 MHz

Max. Limit Exceeding

dB at MHz

Uncertainty of Measurement Results

Biconical Antenna

+/- 3.8 dB (level of confidence:95%)

Log-Periodic Antenna

+/- 4.7 dB (level of confidence:95%)

Half Wave Dipole Antenna

+/- 3.4 dB (level of confidence:95%)

Remarks:

## 1.6 SUMMARY

### General Remarks :

The EUT was tested according to the requirements of FCC Rules and Regulations Part 15 Subpart A and B (June 23, 1989) under the test configuration, as shown in clause 1.7 to 1.10.

The conclusion for the test items which are required by the applied regulation is indicated under the final judgment.

### Final Judgment :

The "as received" sample;

- x   - fulfill the test requirements of the regulation mentioned on clause 1.1.
- fulfill the test requirements of the regulation mentioned on clause 1.1, but with certain qualifications.
- doesn't fulfill the test regulation mentioned on clause 1.1.

Begin of testing : December 12, 2001

End of testing : December 12, 2001

- JAPAN QUALITY ASSURANCE ORGANIZATION -  
Approved by:

  
Masaaki Takahashi  
Senior Manager  
JQA EMC Engineering Dept.

Signatories:  
Issued by:

  
Shigeru Osawa  
Assistant Manager  
JQA EMC Engineering Dept.

## 1.7 TEST CONFIGURATION / OPERATION OF EUT

### 1.7.1 Test Configuration

The equipment under test (EUT) consists of :

| Symbol | Item                   | Manufacturer              | Model No. | FCC ID       | Serial No. |
|--------|------------------------|---------------------------|-----------|--------------|------------|
| A      | Silwatch<br>(Receiver) | Tokyo Shinyu<br>Co., Ltd. | SWU-R1-01 | P5NSWU-R1-01 | None       |

### 1.7.2 Operating condition

Power supply Voltage : DC 3V(Battery)

The tests have been carried out under the receiving condition.

### 1.7.3 Generating and Operating frequency of EUT

32.768 kHz, 70.9333 MHz and 425.6 MHz



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Standard :CFR 47 FCC Rules Part 15

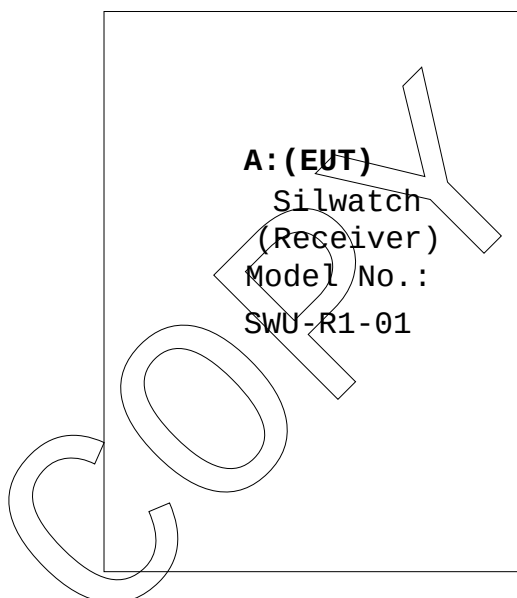
FCC ID :P5NSWU-R1-01

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## 1.8 EUT ARRANGEMENT (DRAWINGS)



## 1.9 PRELIMINARY TEST AND TEST-SETUP (DRAWINGS)

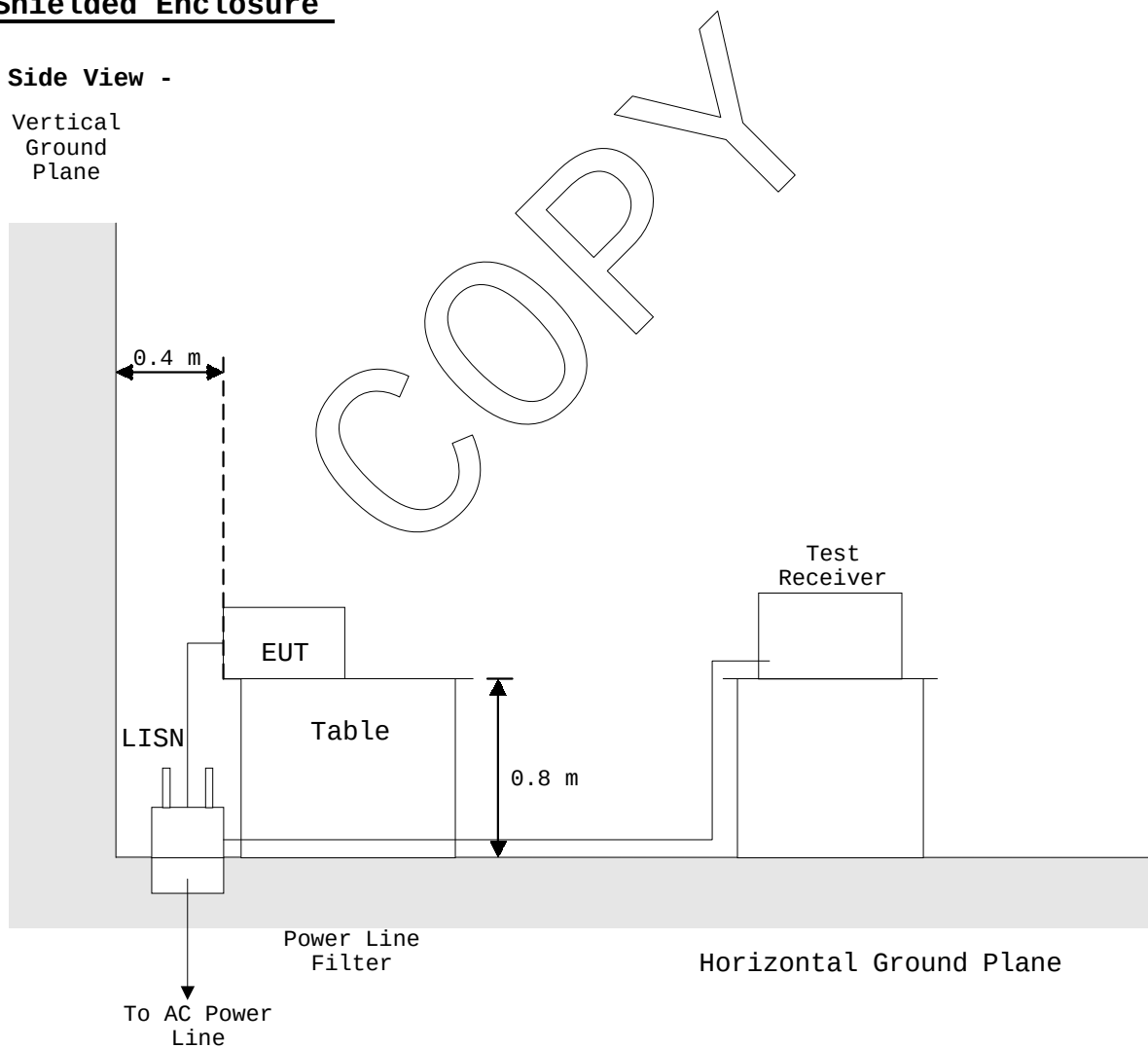
### 1.9.1 AC Power Line Conducted Emission ( 450 kHz - 30 MHz ) :

According to description of ANSI C63.4-1992 sec.7.2.3, the AC power line preliminary conducted emissions measurements were carried out.  
 The preliminary conducted measurements were performed using the spectrum analyzer to observe the emission characteristics of the EUT.  
 The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions. These configurations were used for final AC power line conducted emissions measurements.

### Shielded Enclosure

#### - Side View -

Vertical  
Ground  
Plane



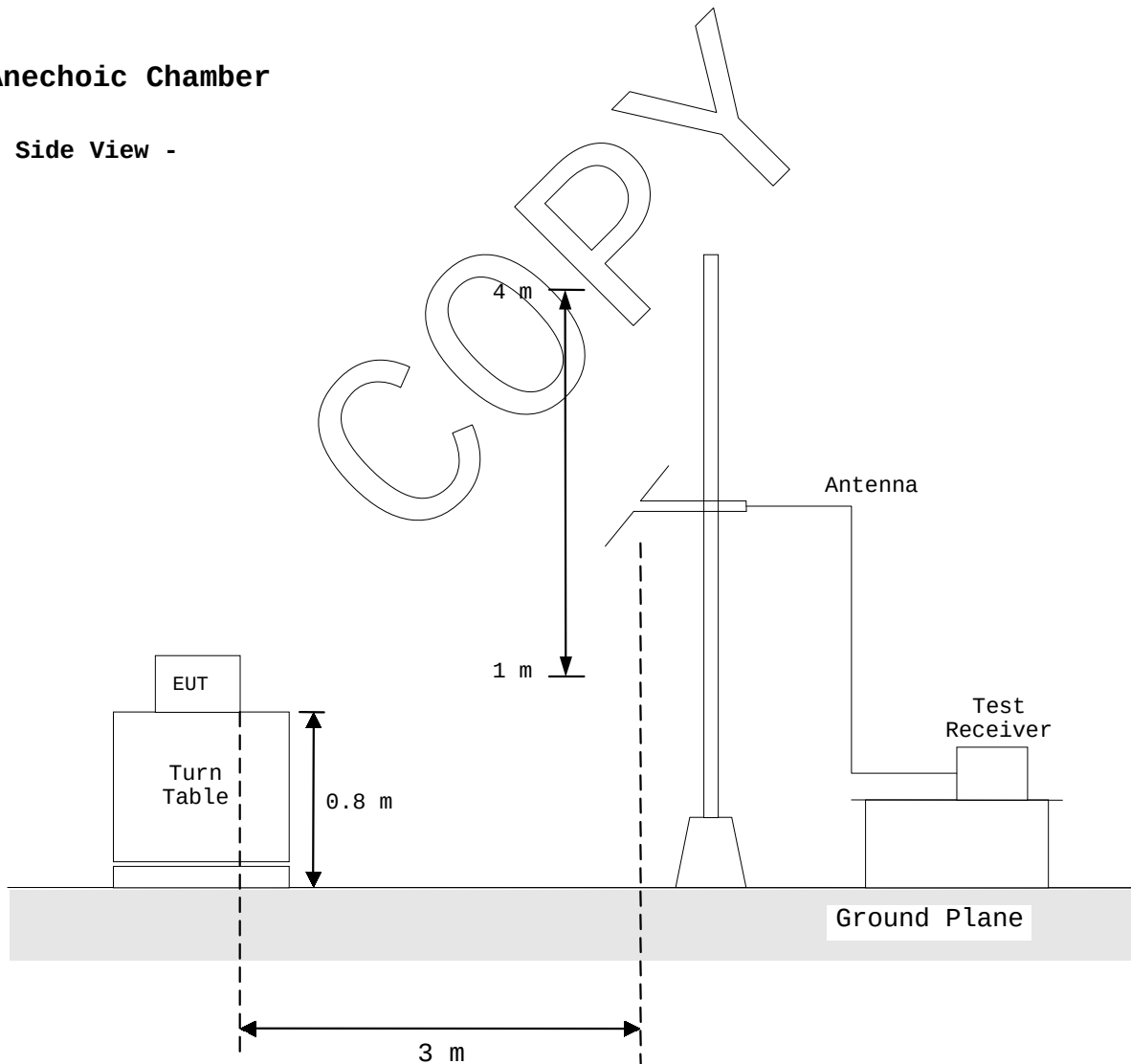
### 1.9.2 Radiated Emission ( 30 MHz - 1000 MHz ) :

According to description of ANSI C63.4-1992 sec.8.3.1.1, the preliminary radiated emissions measurements were carried out. The preliminary radiated measurements were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.

The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions. These configurations were used for the final radiated emissions measurements.

#### Anechoic Chamber

- Side View -



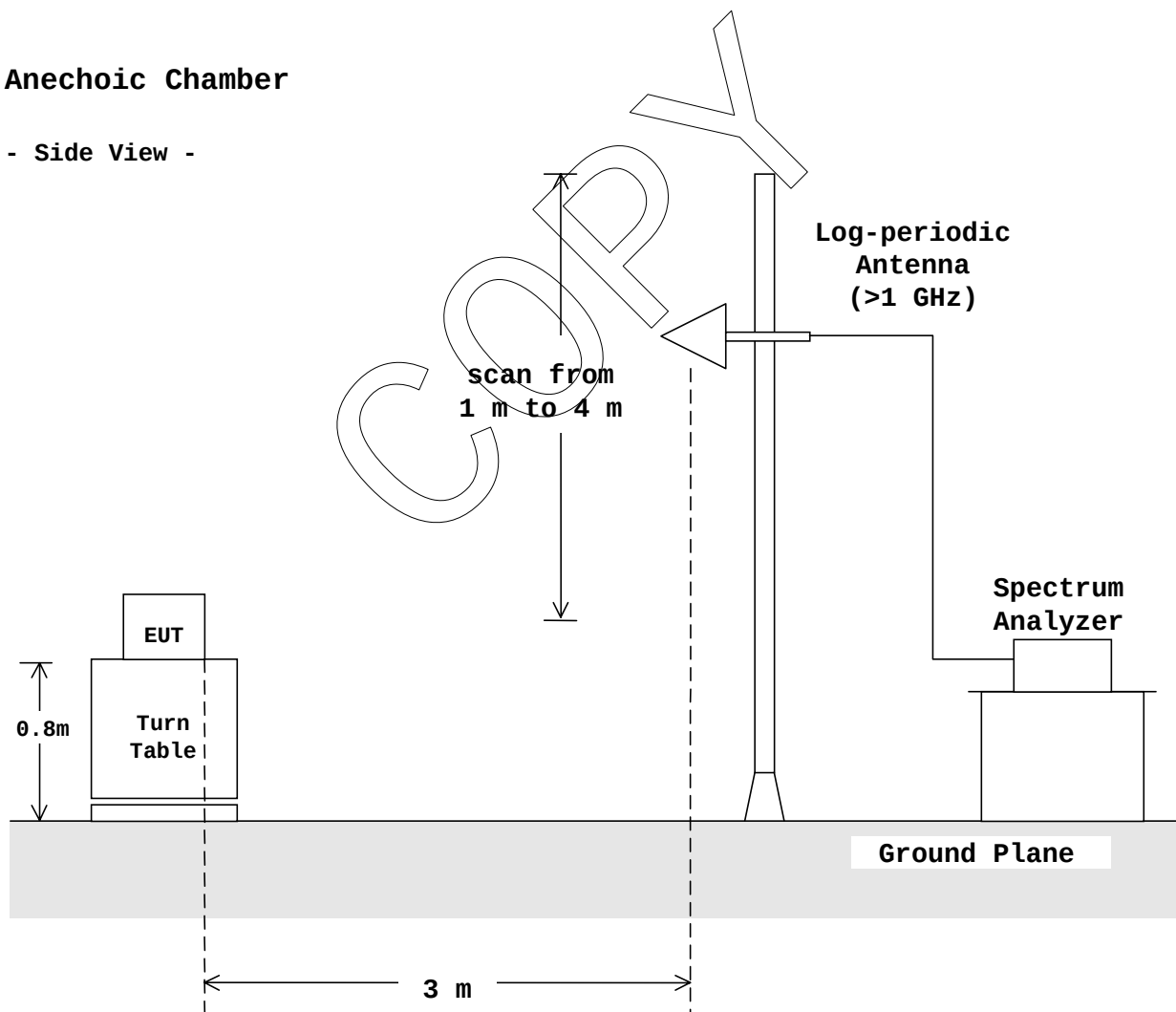
### 1.9.3 Radiated Emission (Above 1 GHz) :

According to description of ANSI C63.4-1992 sec.8.3.1.1, the preliminary radiated emissions measurements were carried out. The preliminary radiated measurements were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.

The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions. These configurations were used for the final radiated emissions measurements.

#### Anechoic Chamber

- Side View -



**1.10 TEST ARRANGEMENT (PHOTOGRAPHS)****PHOTOGRAPHS OF EUT CONFIGURATION FOR RADIATED EMISSIONS MEASUREMENT**

Photograph present configuration with maximum emission







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## TEST DATA

### 2.2 Radiated Emissions Measurement( 30 MHz - 1000 MHz )

Tuning Frequency : 426.05 MHz

Distance of Measurement : 3.0 meters

Date : December 12, 2001

Temp. : 23 °C Humi. : 43 %

| Frequency<br>(MHz) | Antenna<br>Factor<br>(dB) | Meter Reading<br>(dBuV) |       | Limits<br>(dBuV/m) | Emission Levels<br>(dBuV/m) |       | Margins<br>(dB) |       |
|--------------------|---------------------------|-------------------------|-------|--------------------|-----------------------------|-------|-----------------|-------|
|                    |                           | Horiz.                  | Vert. |                    | Horiz.                      | Vert. | Horiz.          | Vert. |
| 70.9               | 6.5                       | 9.4                     | 9.0   | 40.0               | 15.9                        | 15.5  | 24.1            | 24.5  |
| 141.9              | 15.4                      | 0.4 <                   | 0.0   | 43.5               | 15.8 <                      | 15.4  | 27.7 >          | 28.1  |
| 425.6              | 19.6                      | 0.4 <                   | 0.0   | 46.0               | 20.0 <                      | 19.6  | 26.0 >          | 26.4  |

- Notes :
- 1) The spectrum was checked from 30 MHz to 1000 MHz.
  - 2) The cable loss is included in the antenna factor.
  - 3) The symbol of "<" means "or less".
  - 4) The symbol of ">" means "or greater".
  - 5) A sample calculation was made at 70.93 (MHz).

$$Af + Mr = 6.5 + 9.4 = 15.9 \text{ (dBuV/m)}$$

Af = Antenna Factor

Mr = Meter Reading

6) Measuring Instrument Setting:

Detector function : CISPR Quasi-peak

IF Bandwidth : 120 kHz

Tested by :

*Shigeru Osawa*

Shigeru Osawa

Testing Engineer

## RADIATED EMISSION MEASUREMENT

Model No. : SWU-R1-01

|                                     |   |            |
|-------------------------------------|---|------------|
| Standard : CFR 47 FCC Rules Part 15 | 0 | Horizontal |
| Category : Class B                  | X | Vertical   |

