



## **EMI TEST REPORT**

JQA APPLICATION NO. : 400-30209

Model No. : TP7570

Type of Equipment : Radio Controlled Toy  
(Transmitter)

Regulations Applied : CFR 47 FCC Rules and Regulations Part 15

FCC ID : CVTTP7570

Applicant : NIKKO CO., LTD.

Address : 1-7-14, Mizumoto, Katsushika-ku,  
Tokyo 125-0032, Japan

Manufacturer : NIKKO TEC INTERNATIONAL LTD.

Address : Room 182, Houston Center, 63 Mody Road,  
Tsimshatsui, Kowloon, Hong Kong

Received date of EUT : June 13, 2003

**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) Superregenerative Receiver

#### **Test procedure :**

AC power line conducted emission, radiated emission and antenna conducted power 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 : May 27, 2005

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, 2004)

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

- |                                      |                                              |
|--------------------------------------|----------------------------------------------|
| 1) Type of Equipment                 | : Radio Controlled Toy                       |
| 2) Product Type                      | : Pre-Production                             |
| 3) Category                          | : Low Power Communication Device Transmitter |
| 4) EUT Authorization                 | : Certification                              |
| 5) FCC ID                            | : CVTTP7570                                  |
| 6) Trade Name                        | : NIKKO                                      |
| 7) Model No.                         | : TP7570                                     |
| 8) Operating Frequency Range         | : 27.145 MHz                                 |
| 9) Highest Frequency Used in the EUT | : 27.145 MHz                                 |
| 10) Serial No.                       | : None                                       |
| 11) Date of Manufacture              | : June 2003                                  |
| 12) Power Rating                     | : 3.0 VDC(Battery)                           |
| 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

##### Number of test instruments (Refer to Appendix)

Test Receiver

Spectrum Analyzer

Cable

AMN(for EUT)

AMN(for Peripheral)

Termination

### 1.3.2 The measurement of the Radiated Emission(9 kHz - 30 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 : N/A

2) Interval : N/A

#### Used test instruments :

##### Type

Test Receiver

Antenna

Cable

##### Number of test instruments (Refer to Appendix)

TR07

AN01

CA06

COPY

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

  x   - 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)

  x   - Anechoic Chamber No. 3 (3 meters)

#### Validation of Site Attenuation :

1) Last Confirmed Date :March, 2003

2) Interval :1 year

#### Used test instruments :

##### Type

Test Receiver

Antenna

Cable

RF Amplifier

##### Number of test instruments (Refer to Appendix)

TR06

AN07, AN09

CA02

N/A

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

\_\_\_ - was performed in the following test site.

x - 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

Test Receiver

Spectrum Analyzer

Cable

Antenna

RF Amplifier

Band Reject Filter

High Pass Filter

Number of test instruments  
(Refer to Appendix)

### 1.3.5 The measurement of the Frequency Stability

- ☐ - was performed.  
☒ - was not applicable.

#### Used test instruments :

| Type              | Number of test instruments<br>(Refer to Appendix) |
|-------------------|---------------------------------------------------|
| Frequency Counter |                                                   |
| Oven              |                                                   |
| DC Power Supply   |                                                   |

### 1.3.6 The measurement of the Occupied Bandwidth

- ☒ - was performed.  
☐ - was not applicable.

#### Used test instruments :

| Type              | Number of test instruments<br>(Refer to Appendix) |
|-------------------|---------------------------------------------------|
| Test Receiver     | N/A                                               |
| Spectrum Analyzer | SA04                                              |
| Cable             | CA10                                              |
| Antenna           | AN02                                              |

**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

**AC Power Line Conducted Emission**      - Applicable   x   - NOT Applicable

The requirements are      - PASSED      - NOT PASSED

Remarks :

**Radiated Emission [§15.227]**   x   - Applicable      - NOT Applicable

The requirements are   x   - PASSED      - NOT PASSED

Remarks:

**Frequency Stability**      - Applicable   x   - NOT Applicable

The requirements are      - PASSED      - NOT PASSED

Remarks:

**Occupied Bandwidth [§15.215(c)]**   x   - Applicable      - NOT Applicable

The requirements are   x   - PASSED      - NOT PASSED

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;

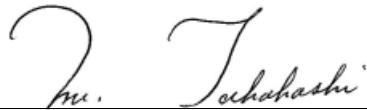
- x   - fulfill the test requirements of the regulation mentioned on clause 1.1.
- fulfill the test requirements of the regulation mentioned on clause 1.1, but with certain qualifications.
- doesn't fulfill the test regulation mentioned on clause 1.1.

Begin of testing : June 25, 2003

End of testing : June 30, 2003

**- 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      | Radio Controlled Toy | NIKKO TEC<br>INTERNATIONAL LTD. | TP7570    | CVTTP7570 | None       |

### 1.7.2 Operating condition

Power supply Voltage : 3.0 VDC(Battery)

The tests have been carried out the following mode.

- 1) TX mode (27.145 MHz)

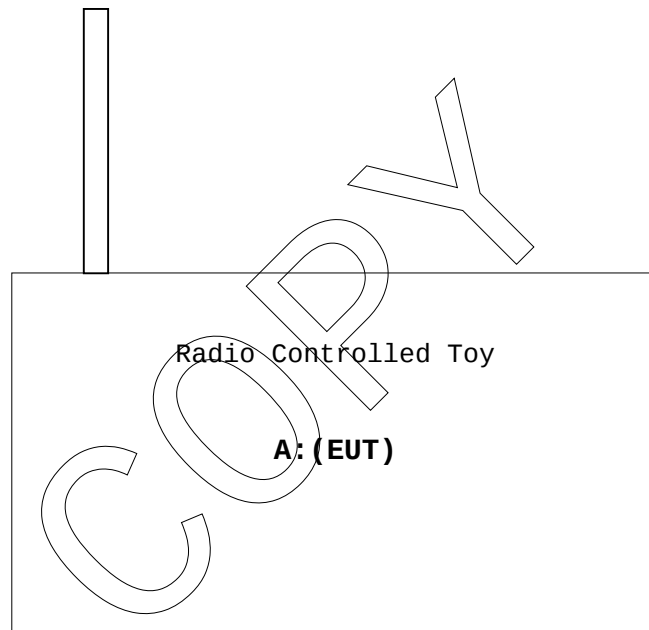
### 1.7.3 Generating and Operating frequency of EUT

27.145 MHz

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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 ( 150 kHz - 30 MHz ) :

According to description of ANSI C63.4-1992 sec.13.1.3.1, the AC power line preliminary conducted emissions measurements were carried out.

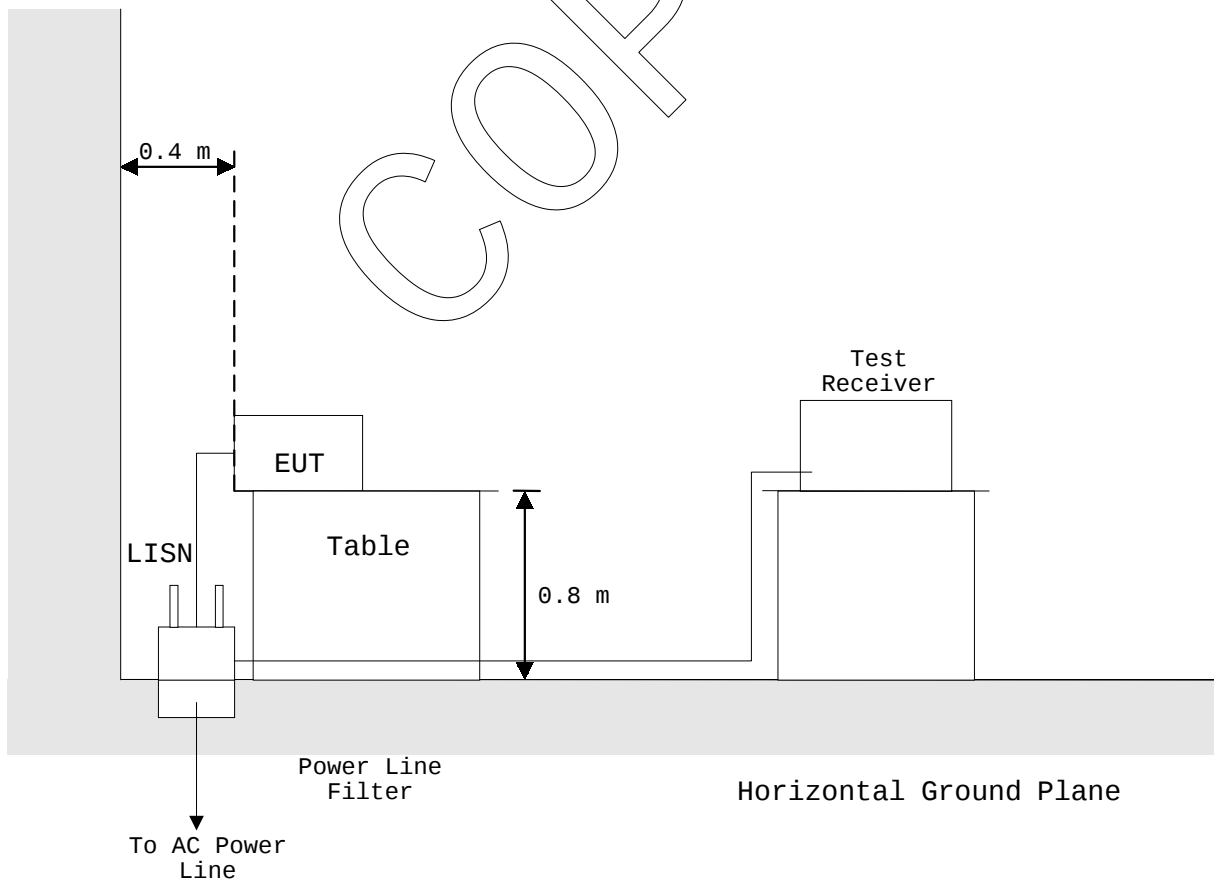
The preliminary conducted measurements were performed using the spectrum analyzer to observe the emission characteristics of the EUT.

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

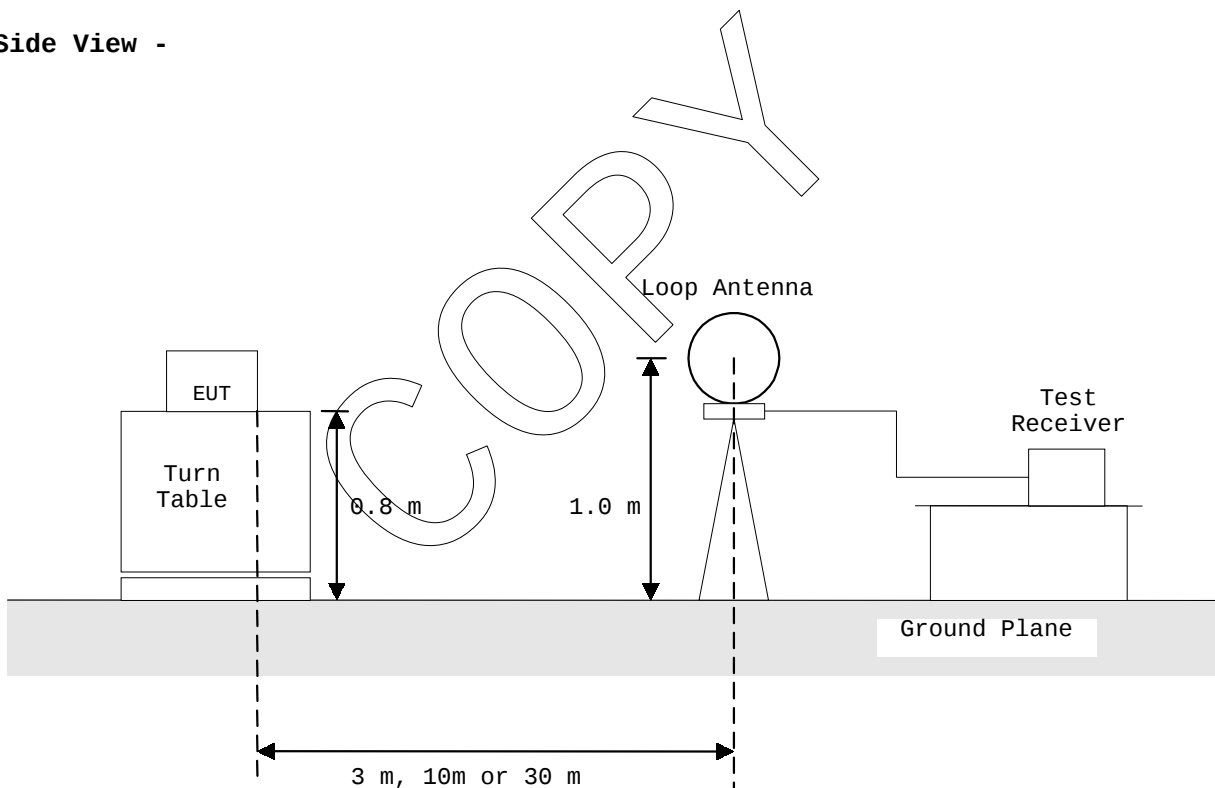


### 1.9.2 Radiated Emission ( 9 kHz - 30 MHz ) :

According to description of ANSI C63.4-1992 sec.13.1.4.1, the preliminary radiated emissions measurement 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.

- Side View -



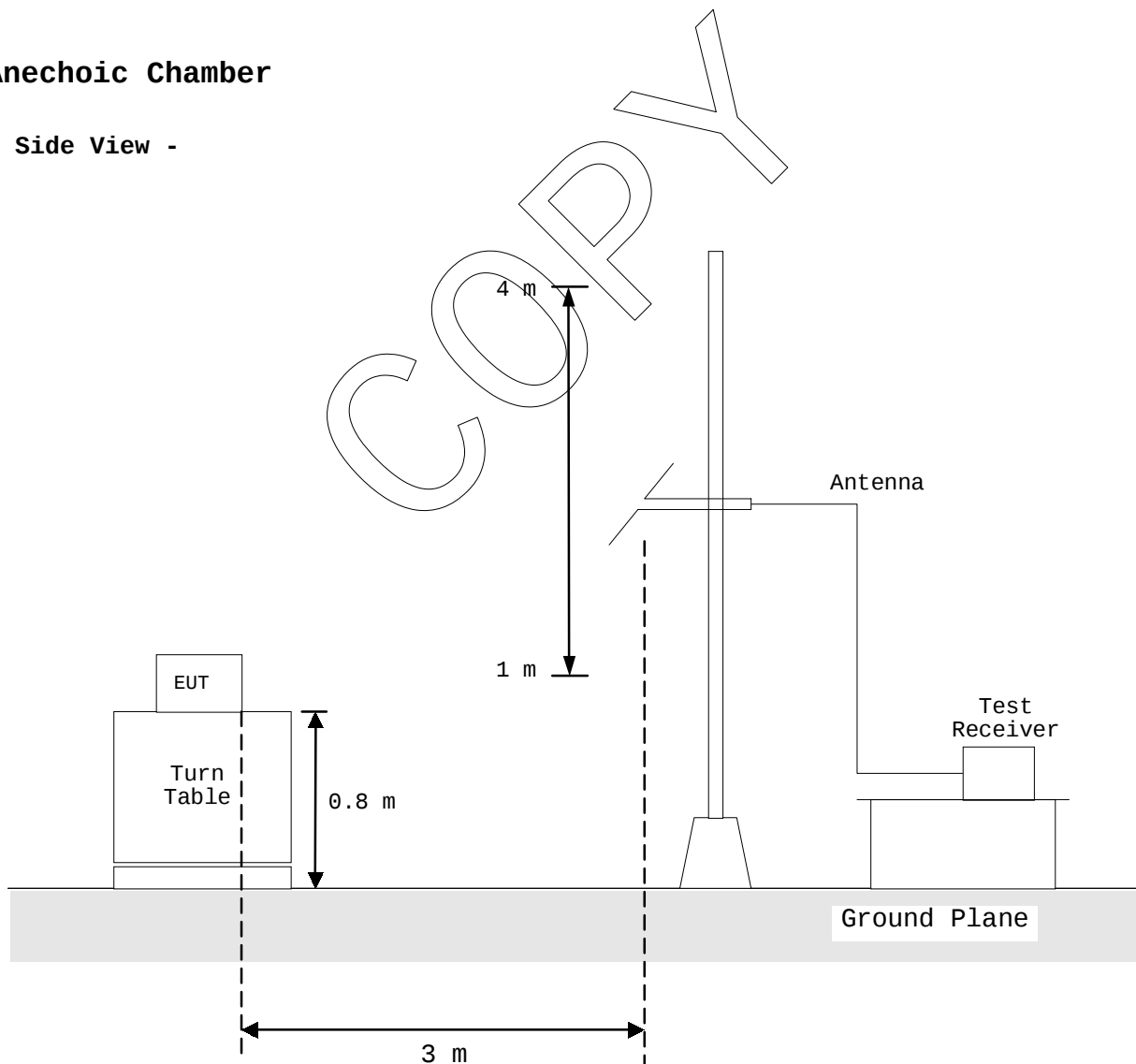
### 1.9.3 Radiated Emission ( 30 MHz - 1000 MHz ) :

According to description of ANSI C63.4-1992 sec.13.1.4.1, the preliminary radiated emissions measurement 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 -



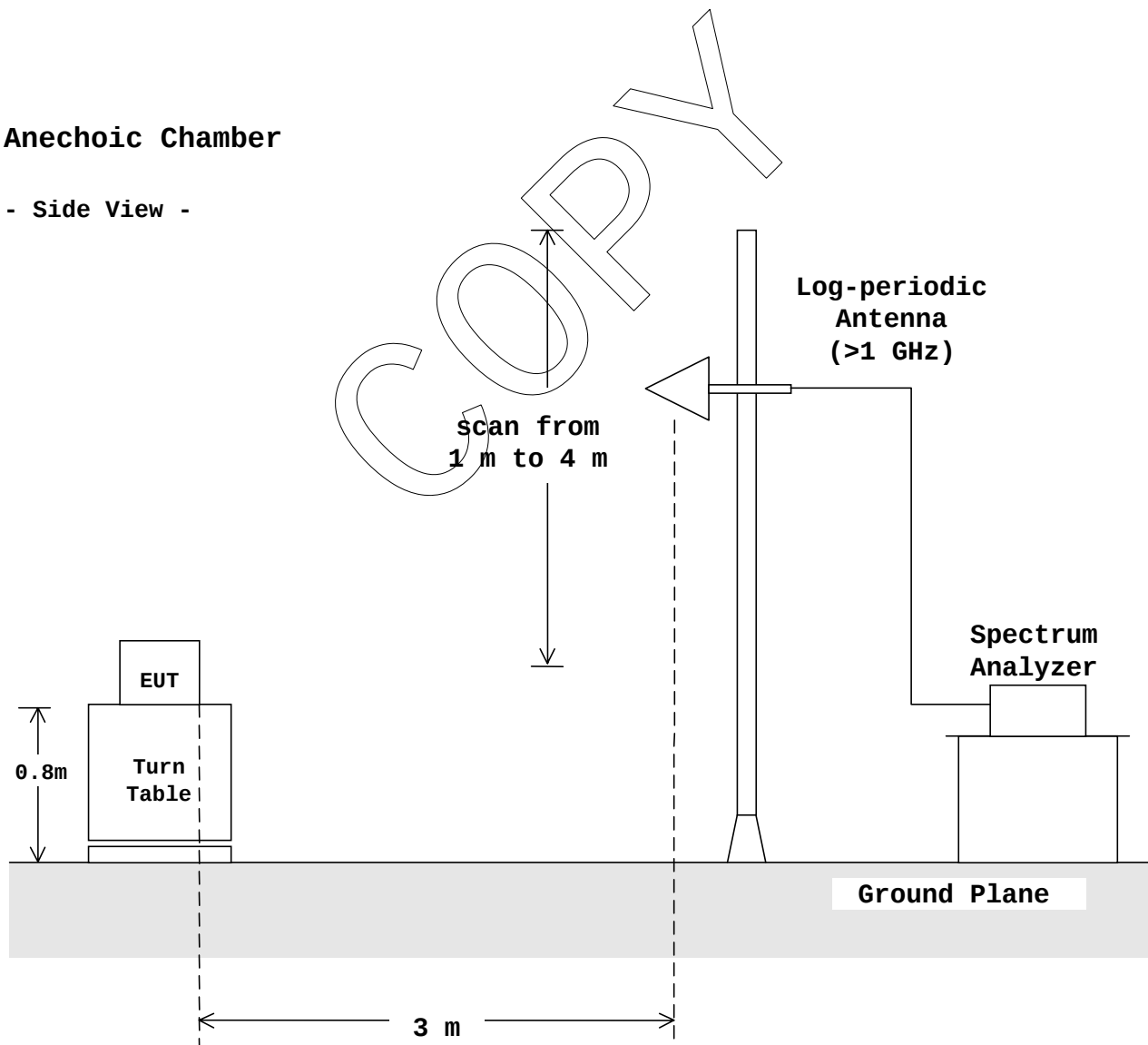
#### 1.9.4 Radiated Emission (Above 1 GHz) :

According to description of ANSI C63.4-1992 sec.13.1.4.1, 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

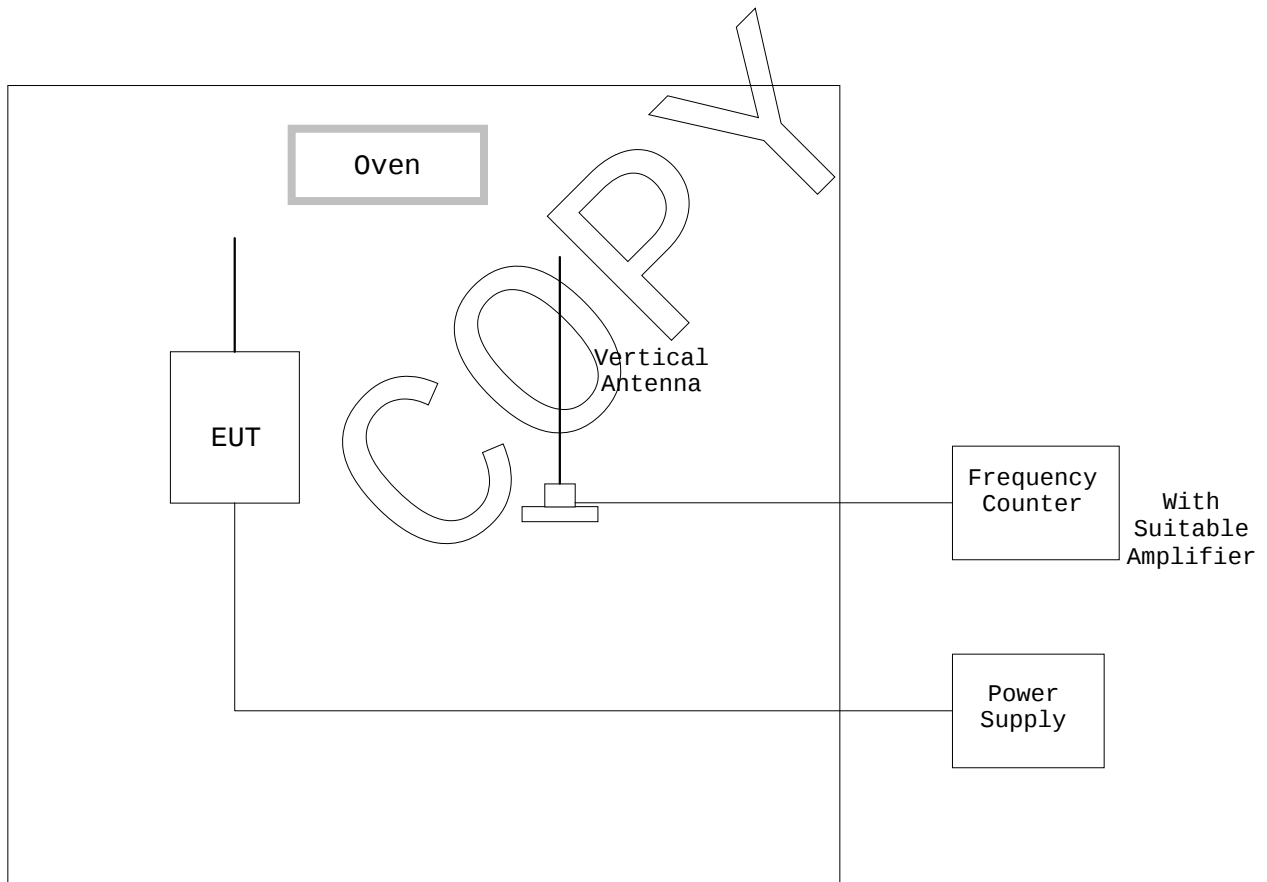
- Side View -



### 1.9.5 Frequency Stability :

According to description of ANSI C63.4-1992 sec.13.1.5 and sec.13.1.6, the frequency stability measurements were carried out. By using frequency counter with suitable RF amplifier, the carrier frequency of the transmitter under test was measured with a temperature variation of  $-20^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  at the normal supply voltage, and if required, with a variation in the primary voltage from 85 % to 115 % the rated supply voltage at the temperature of  $+20^{\circ}\text{C}$ .

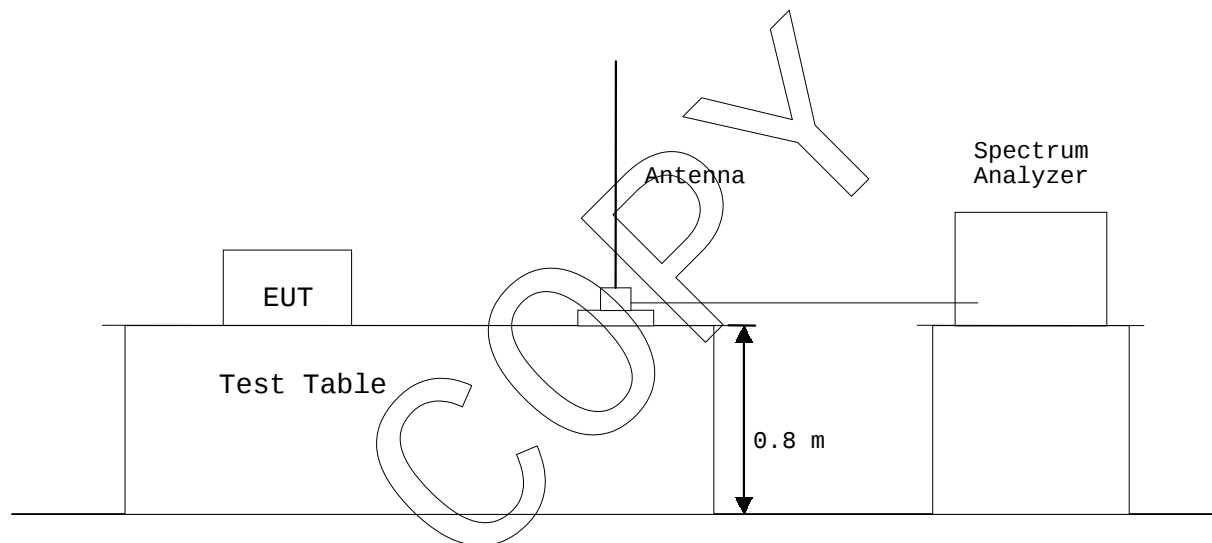
These measurements were carried out after allow sufficient time (approximately 1 hour) for the temperature of the chamber to stabilize.



#### 1.9.6 Occupied Bandwidth :

According to description of ANSI C63.4-1992 sec.13.1.7, the occupied bandwidth measurements were carried out. By using a spectrum analyzer with a vertical antenna for picking up the signal, the measurements of the emission were made under the transmitting modes of the EUT.

The resolution bandwidth of spectrum analyzer was set to the value specified in sec.13.1.7.



## 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

### 2.1 AC Power Line Conducted Emissions

Note : This test was not applicable.

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## 2.2 Radiated Emissions Measurement

Operating Frequency : 27.145 MHz

Distance of Measurement : 3.0 meters

Date : June 25, 2003

Temp. : 22 °C Humi. : 70 %

| Frequency<br>(MHz) | P-A<br>Factor<br>(dB) | Antenna Factor<br>(dB) | Polarization | Meter Reading<br>(dBuV) |      |      | Limits<br>(dBuV/m) |       | Emission Levels<br>(dBuV/m) |      | Margins<br>(dB) |      |
|--------------------|-----------------------|------------------------|--------------|-------------------------|------|------|--------------------|-------|-----------------------------|------|-----------------|------|
|                    |                       |                        |              | QP                      | AV   | Peak | QP/AV              | Peak  | QP/AV                       | Peak | QP/AV           | Peak |
| 27.1               | 0.0                   | 1.5                    |              | -                       | 66.1 | 71.3 | 80.0               | 100.0 | 67.6                        | 72.8 | 12.4            | 27.2 |
| 54.3               | 0.0                   | 9.9                    | H            | 12.5                    | -    | -    | 40.0               | -     | 22.4                        | -    | 17.6            | -    |
| 81.4               | 0.0                   | 7.9                    | V            | 18.1                    | -    | -    | 40.0               | -     | 26.0                        | -    | 14.0            | -    |
| 108.6              | 0.0                   | 12.3                   | V            | 10.5                    | -    | -    | 43.5               | -     | 22.8                        | -    | 20.7            | -    |
| 135.7              | 0.0                   | 15.0                   | H            | 10.9                    | -    | -    | 43.5               | -     | 25.9                        | -    | 17.6            | -    |
| 162.9              | 0.0                   | 16.5                   | H            | 6.9                     | -    | -    | 43.5               | -     | 23.4                        | -    | 20.1            | -    |
| 190.0              | 0.0                   | 17.5                   | H            | 12.2                    | -    | -    | 43.5               | -     | 29.7                        | -    | 13.8            | -    |
| 217.2              | 0.0                   | 18.5                   | H            | 6.4                     | -    | -    | 46.0               | -     | 24.9                        | -    | 21.1            | -    |
| 244.3              | 0.0                   | 19.4                   | H            | 9.5                     | -    | -    | 46.0               | -     | 28.9                        | -    | 17.1            | -    |
| 271.5              | 0.0                   | 20.2                   | H            | 8.8                     | -    | -    | 46.0               | -     | 29.0                        | -    | 17.0            | -    |
| 298.6              | 0.0                   | 21.7                   | H            | 6.2                     | -    | -    | 46.0               | -     | 27.9                        | -    | 18.1            | -    |
| 325.7              | 0.0                   | 18.1                   | H            | 7.0                     | -    | -    | 46.0               | -     | 25.1                        | -    | 20.9            | -    |
| 352.9              | 0.0                   | 18.3                   | H            | 3.4                     | -    | -    | 46.0               | -     | 21.7                        | -    | 24.3            | -    |
| 380.0              | 0.0                   | 18.7                   | H            | 2.8                     | -    | -    | 46.0               | -     | 21.5                        | -    | 24.5            | -    |
| 407.2              | 0.0                   | 19.2                   | H            | 2.0                     | -    | -    | 46.0               | -     | 21.2                        | -    | 24.8            | -    |
| 434.3              | 0.0                   | 19.8                   | H            | 2.5                     | -    | -    | 46.0               | -     | 22.3                        | -    | 23.7            | -    |
| 461.5              | 0.0                   | 20.5                   | H            | 1.5                     | -    | -    | 46.0               | -     | 22.0                        | -    | 24.0            | -    |

Notes :

- The spectrum was checked from 30 MHz to 1000 MHz.
- The cable loss is included in the antenna factor.
- The symbol of "<" means "or less".
- The symbol of ">" means "or greater".
- A sample calculation(QP/AV) was made at 27.145 (MHz).  
 $PA + Af + Mr = 0 + 1.5 + 66.1 = 67.6 \text{ (dBuV/m)}$   
 $PA = \text{Peak to Average Factor(P-A Factor)}$   
 $Af = \text{Antenna Factor}$   
 $Mr = \text{Meter Reading}$

### 6) Measuring Instrument Setting :

| Detector function | Resolution Bandwidth | Video Bandwidth |
|-------------------|----------------------|-----------------|
| Quasi-peak(QP)    | 120 kHz              | -               |
| Average(AV)       | 120 kHz              | -               |
| Peak              | 120 kHz              | -               |

Tested by :



Yoichi Nakajima

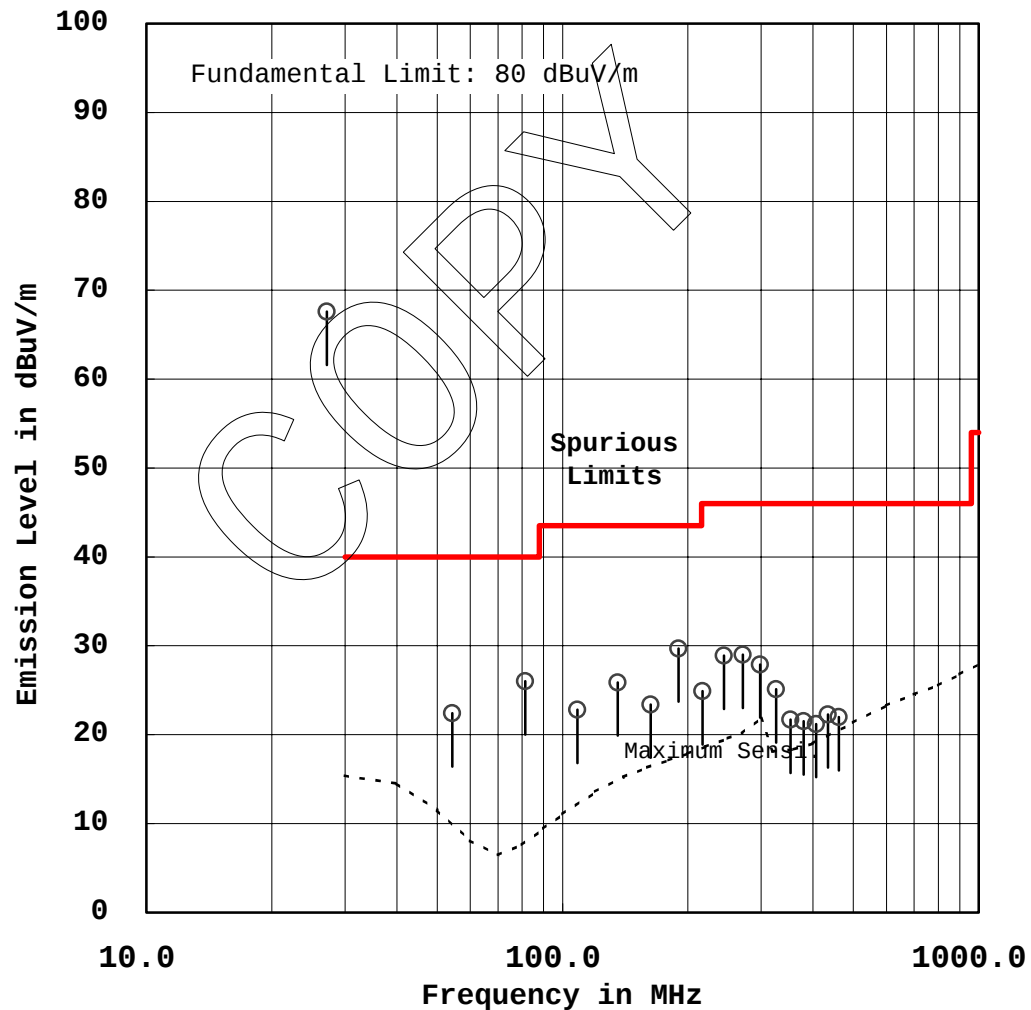
Testing Engineer

## RADIATED EMISSION MEASUREMENT

Model No. : TP7570

Standard : CFR 47 FCC Rules Part 15 0 QP/AV

Operating Frequency(MHz) : 27.145



### 2.3 Frequency Stability

Note : This test was not applicable.

### 2.4 Occupied Bandwidth Measurement

Date : June 30, 2003

Temp.: 22 °C Humi.: 70 %

#### Measurements Results :

Refer to the attached graphs.

Tested by :

*Y. Nakajima*

Yoichi Nakajima

Testing Engineer

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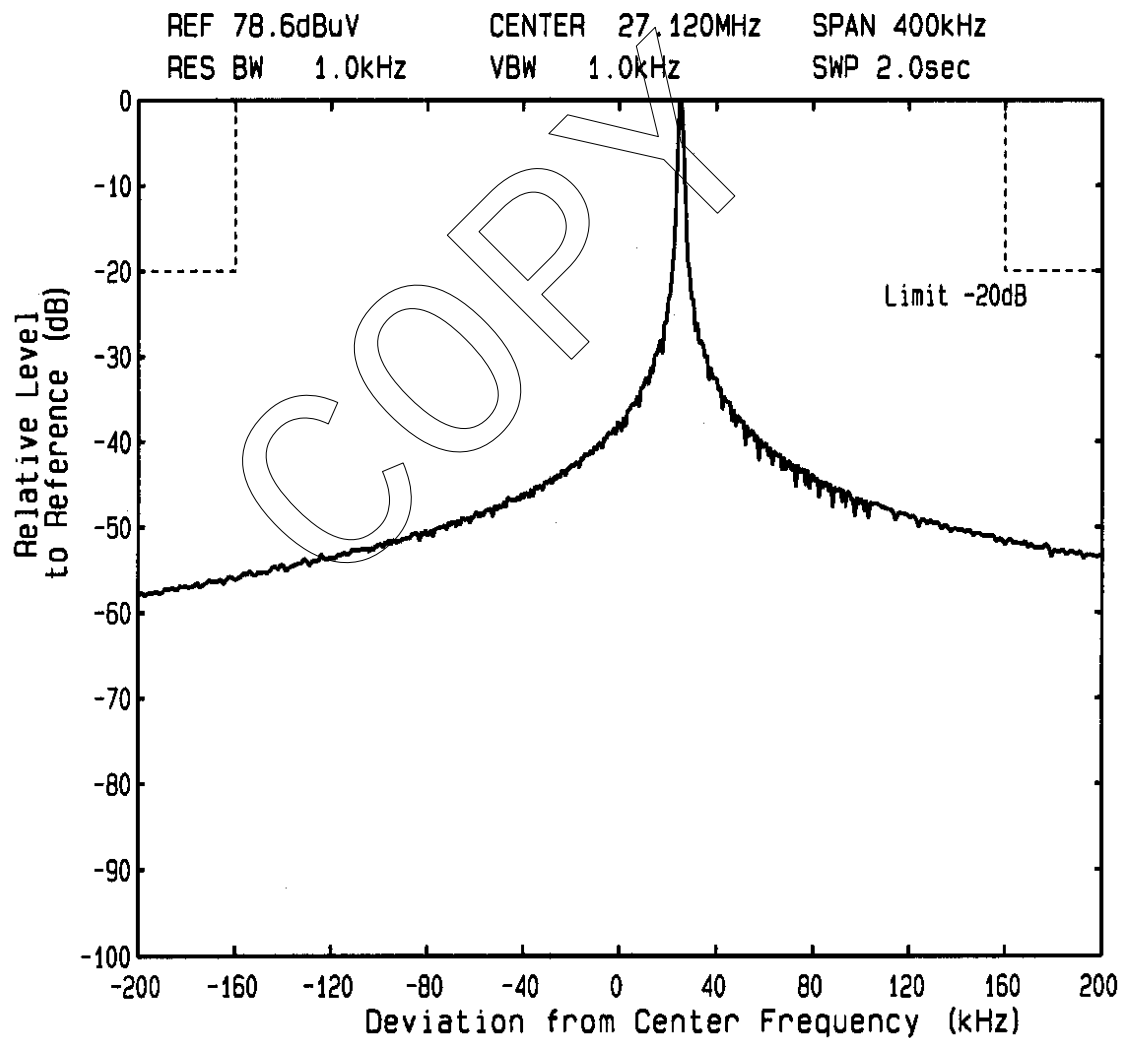
## Emission Limitation

FCC ID : CVTTP7570

Model : TP7570

Mode of EUT : Transmit

Forward Position

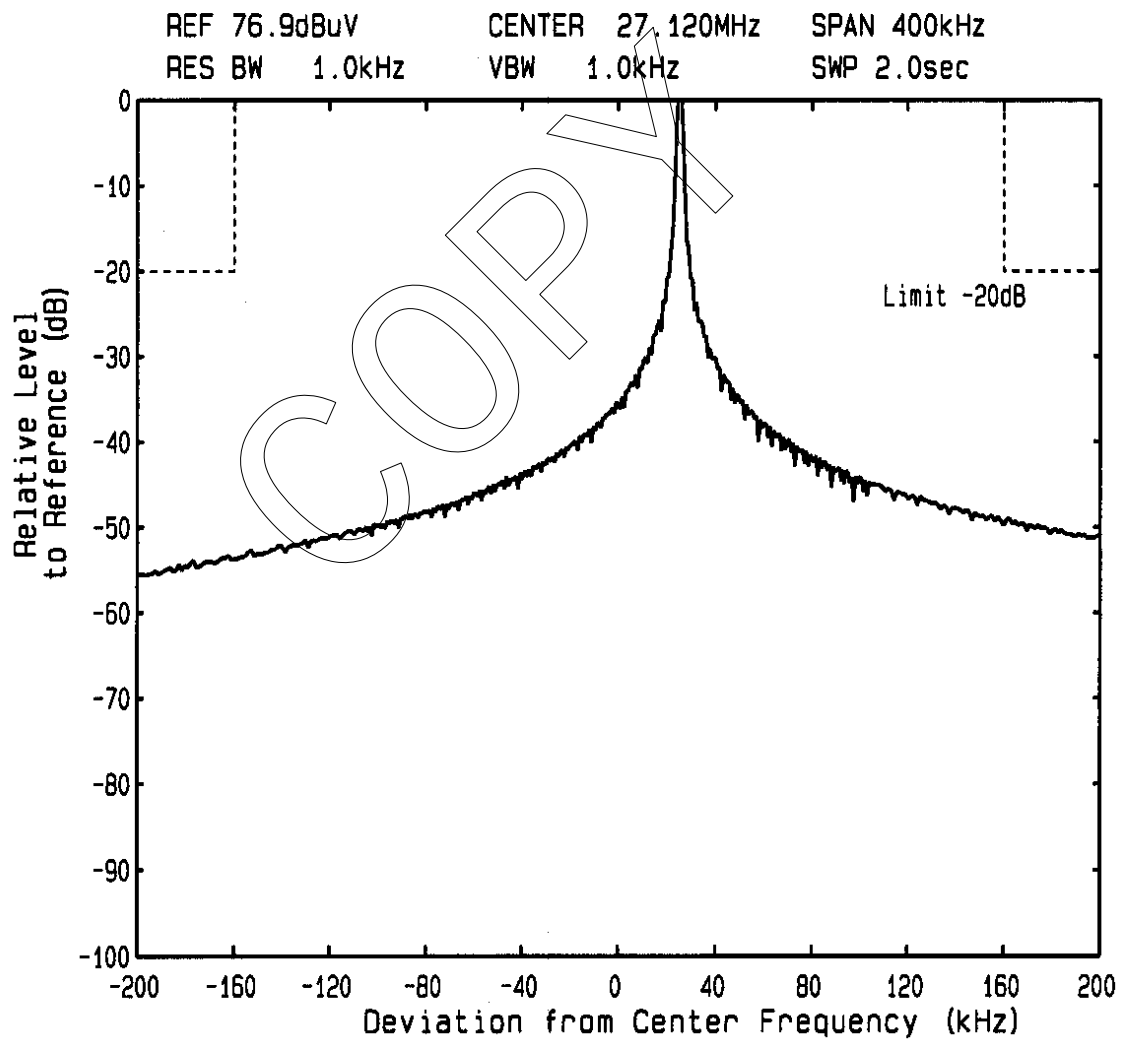


## Emission Limitation

FCC ID : CVTTP7570

Model : TP7570

Mode of EUT : Transmit  
Reverse Position



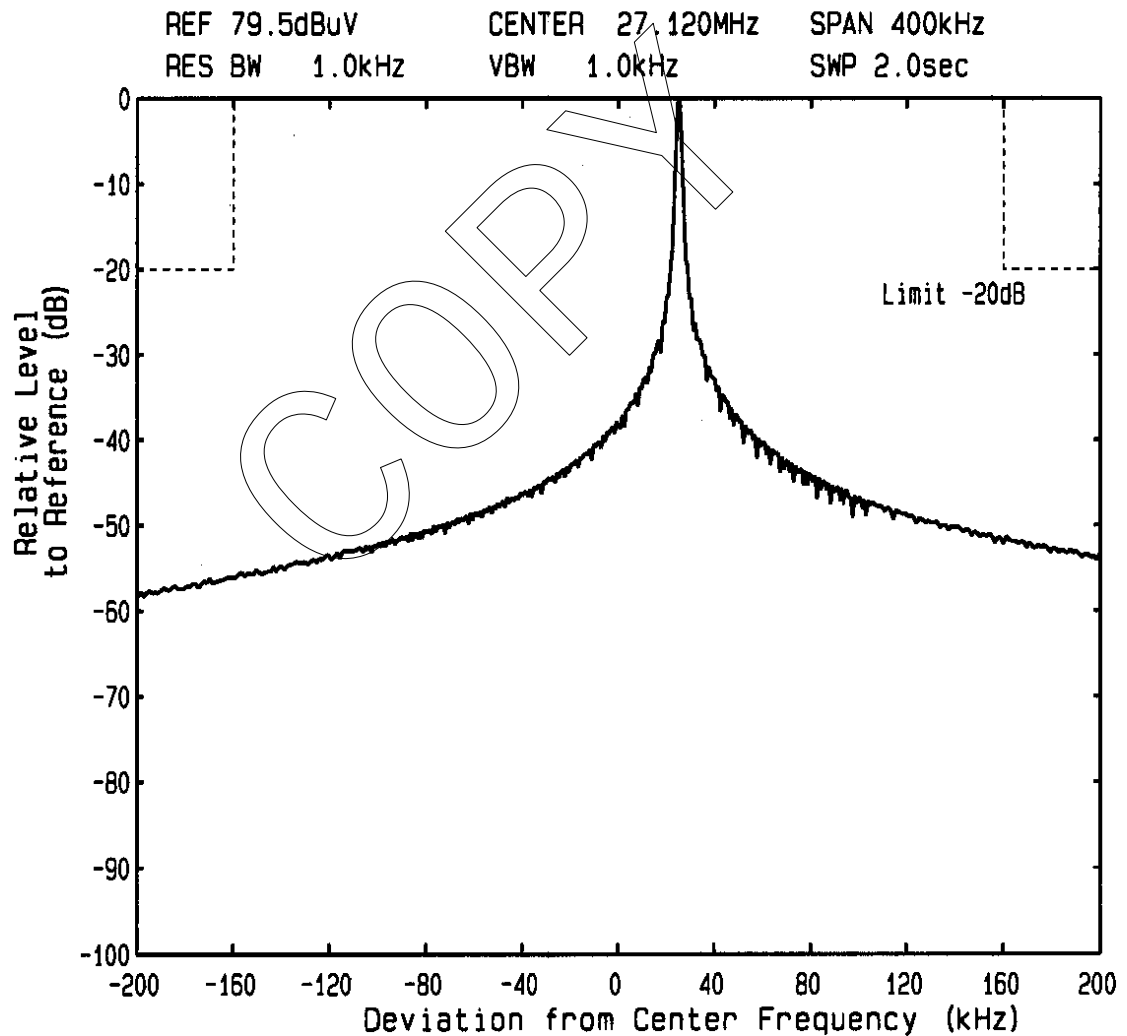
## Emission Limitation

FCC ID : CVTTP7570

Model : TP7570

Mode of EUT : Transmit

Forward Right Position



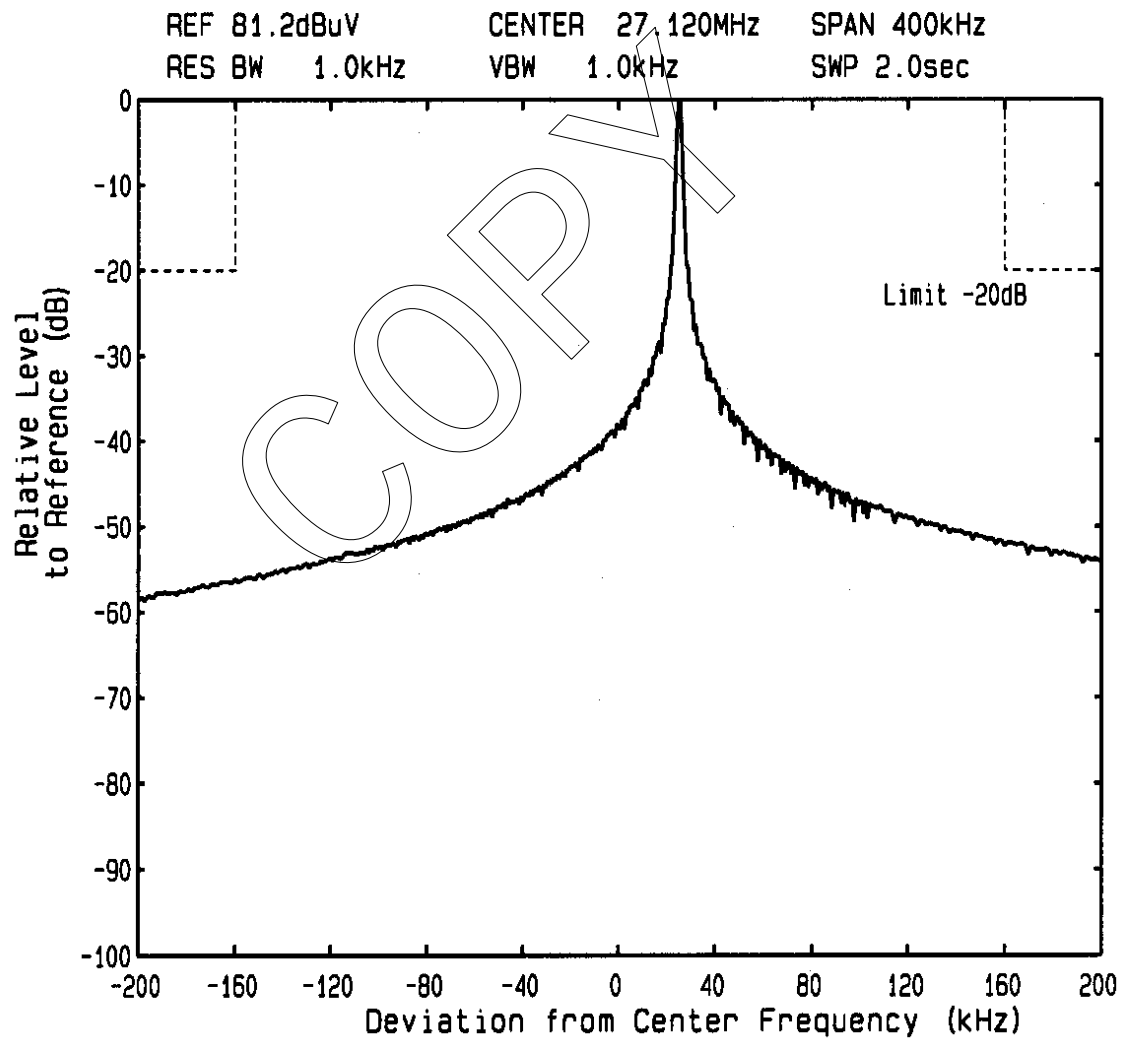
## Emission Limitation

FCC ID : CVTTP7570

Model : TP7570

Mode of EUT : Transmit

Forward Left Position



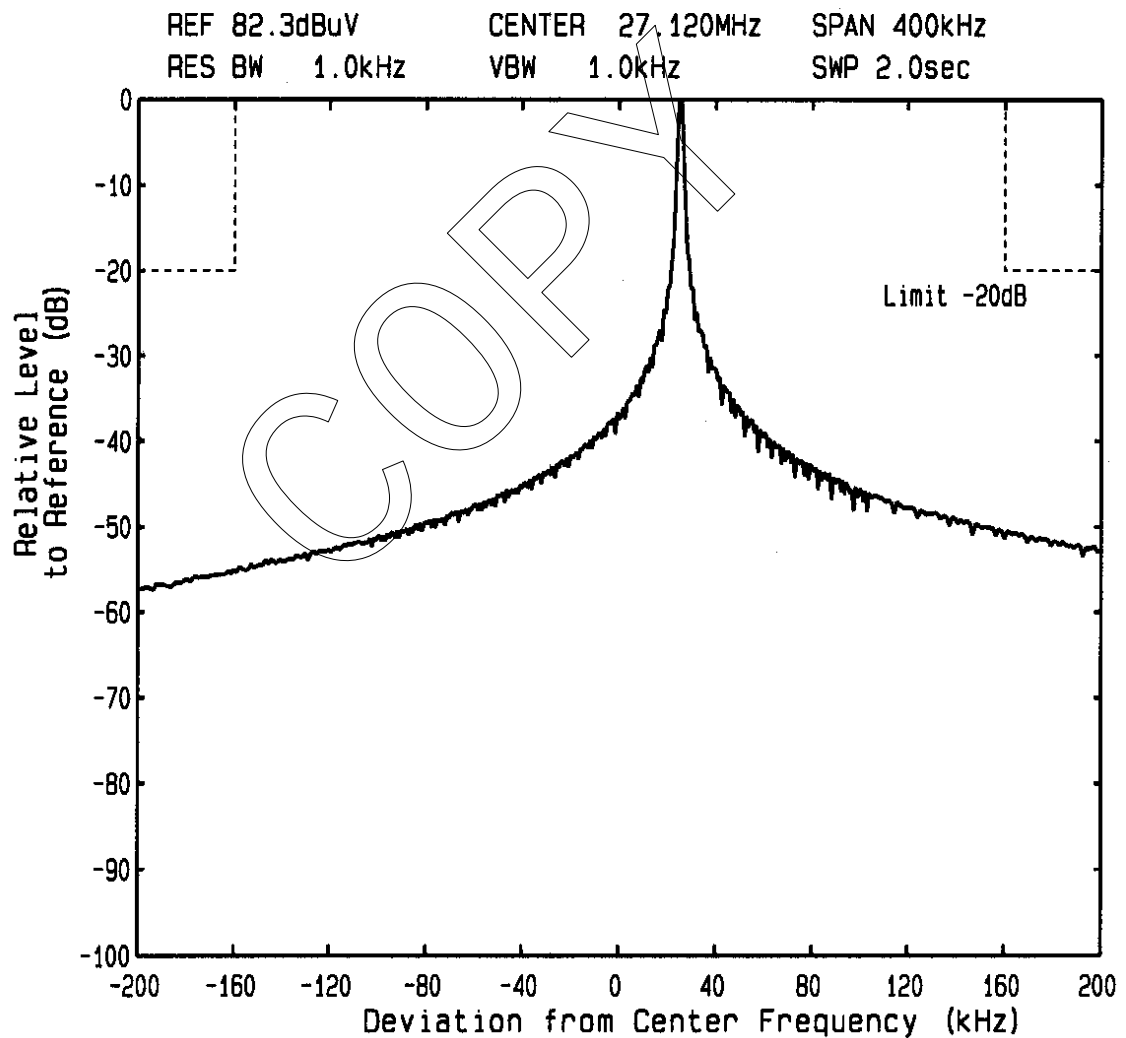
## Emission Limitation

FCC ID : CVTTP7570

Model : TP7570

Mode of EUT : Transmit

Reverse Right Position



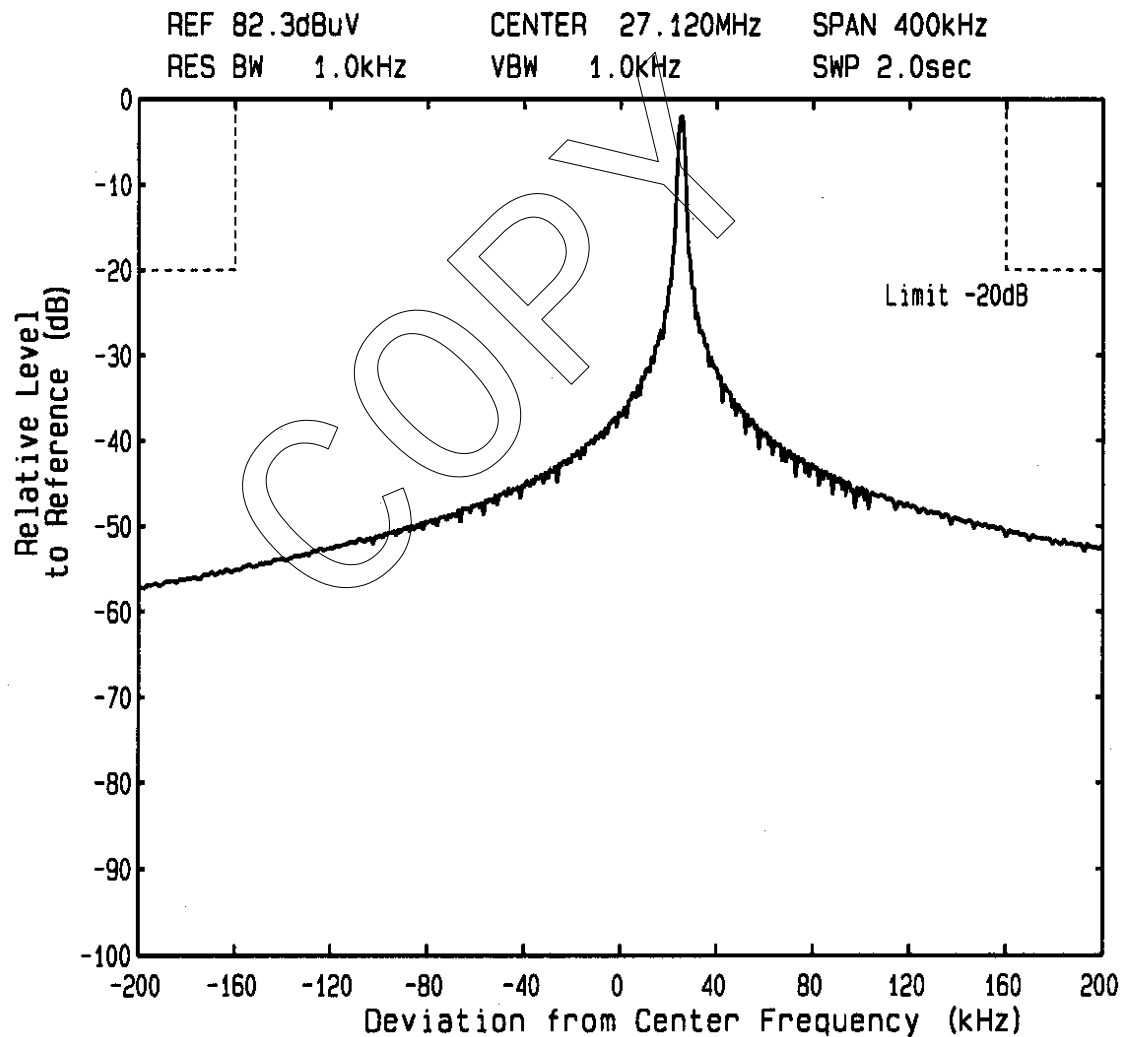
## Emission Limitation

FCC ID : CVTTP7570

Model : TP7570

Mode of EUT : Transmit

Reverse Left Position



# Appendix

## Test Instruments List

COPY

June 18, 2003

## Test Receivers

| No.  | Type          | Model  | Manufacturer    | Serial     | ID           | Last Cal. | Interval |
|------|---------------|--------|-----------------|------------|--------------|-----------|----------|
| TR01 | Test Receiver | ESH2   | Rohde & Schwarz | 880370/016 | 119-01-503E0 | May 2003  | 1 Year   |
| TR02 | Test Receiver | ESH3   | Rohde & Schwarz | 881460/030 | 119-01-023E0 | May 2003  | 1 Year   |
| TR03 | Test Receiver | ESHS10 | Rohde & Schwarz | 835871/004 | 119-01-505E0 | May 2003  | 1 Year   |
| TR04 | Test Receiver | ESV    | Rohde & Schwarz | 872148/039 | 119-03-008E0 | May 2003  | 1 Year   |
| TR05 | Test Receiver | ESVS10 | Rohde & Schwarz | 826148/002 | 119-03-504E0 | May 2003  | 1 Year   |
| TR06 | Test Receiver | ESVS10 | Rohde & Schwarz | 832699/001 | 119-03-506E0 | May 2003  | 1 Year   |
| TR07 | Test Receiver | ESI26  | Rohde & Schwarz | 100043     | 119-04-511E0 | Aug. 2002 | 1 Year   |

## Spectrum Analyzers

| No.  | Type              | Model  | Manufacturer    | Serial     | ID           | Last Cal. | Interval |
|------|-------------------|--------|-----------------|------------|--------------|-----------|----------|
| SA01 | Spectrum Analyzer | 8560E  | Hewlett Packard | 3240A00189 | 122-02-504E0 | Oct. 2002 | 1 Year   |
| SA02 | Spectrum Analyzer | 8566B  | Hewlett Packard | 2140A01091 | 122-02-501E0 | Oct. 2002 | 1 Year   |
| SA03 | RF Pre-selector   | 85685A | Hewlett Packard | 2648A00522 | 122-02-503E0 | Oct. 2002 | 1 Year   |
| SA04 | Spectrum Analyzer | 8566B  | Hewlett Packard | 2747A05855 | 122-02-517E0 | Apr. 2003 | 1 Year   |
| SA05 | RF Pre-selector   | 85685A | Hewlett Packard | 2901A00933 | 122-02-519E0 | Apr. 2003 | 1 Year   |
| SA06 | Spectrum Analyzer | R3132  | ADVANTEST       | 120500072  | 122-02-520E0 | Sep. 2002 | 1 Year   |
| SA07 | Spectrum Analyzer | R3182  | ADVANTEST       | 120600581  | 122-02-521E0 | Feb. 2003 | 1 Year   |

## Antennas

| No.  | Type              | Model     | Manufacturer     | Serial      | ID           | Last Cal. | Interval |
|------|-------------------|-----------|------------------|-------------|--------------|-----------|----------|
| AN01 | Loop Antenna      | HFH2-Z2   | Rohde & Schwarz  | 881058/62   | 119-05-033E0 | Jun. 2003 | 1 Year   |
| AN02 | Dipole Antenna    | KBA-511   | Kyoritsu         | 0-170-1     | 119-05-506E0 | Nov. 2002 | 1 Year   |
| AN03 | Dipole Antenna    | KBA-511A  | Kyoritsu         | 0-201-13    | 119-05-504E0 | Nov. 2002 | 1 Year   |
| AN04 | Dipole Antenna    | KBA-611   | Kyoritsu         | 0-147-14    | 119-05-507E0 | Nov. 2002 | 1 Year   |
| AN05 | Dipole Antenna    | KBA-611   | Kyoritsu         | 0-201-5     | 119-05-505E0 | Nov. 2002 | 1 Year   |
| AN06 | Biconical Antenna | BBA9106   | Schwarzbeck      | VHA91031150 | 119-05-111E0 | Nov. 2002 | 1 Year   |
| AN07 | Biconical Antenna | BBA9106   | Schwarzbeck      | -           | 119-05-078E0 | Nov. 2002 | 1 Year   |
| AN08 | Log-peri. Antenna | UHALP9107 | Schwarzbeck      | -           | 119-05-079E0 | Nov. 2002 | 1 Year   |
| AN09 | Log-peri. Antenna | UHALP9107 | Schwarzbeck      | -           | 119-05-110E0 | Nov. 2002 | 1 Year   |
| AN10 | Log-peri. Antenna | HL025     | Rohde & Schwarz  | 340182/015  | 119-05-100E0 | Jan. 2003 | 1 Year   |
| AN11 | Horn Antenna      | 3115      | EMC Test Systems | 6442        | 119-05-514E0 | Jan. 2003 | 1 Year   |
| AN12 | Horn Antenna      | 3116      | EMC Test Systems | 2547        | 119-05-515E0 | May 2003  | 1 Year   |

## Networks

| No.  | Type | Model    | Manufacturer | Serial   | ID           | Last Cal. | Interval |
|------|------|----------|--------------|----------|--------------|-----------|----------|
| NE01 | LISN | KNW-407  | Kyoritsu     | 8-833-6  | 149-04-052E0 | Apr. 2003 | 1 Year   |
| NE02 | LISN | KNW-407  | Kyoritsu     | 8-855-2  | 149-04-055E0 | Apr. 2003 | 1 Year   |
| NE03 | LISN | KNW-407  | Kyoritsu     | 8-1130-6 | 149-04-062E0 | Apr. 2003 | 1 Year   |
| NE04 | LISN | KNW-242C | Kyoritsu     | 8-837-13 | 149-04-054E0 | Apr. 2003 | 1 Year   |

## Cables

| No.  | Type               | Model         | Manufacturer    | Serial   | ID           | Last Cal. | Interval |
|------|--------------------|---------------|-----------------|----------|--------------|-----------|----------|
| CA01 | RF Cable           | 5D-2W         | Fujikura        | -        | 155-21-001E0 | Feb. 2003 | 1 Year   |
| CA02 | RF Cable           | 5D-2W         | Fujikura        | -        | 155-21-002E0 | Feb. 2003 | 1 Year   |
| CA03 | RF Cable           | 3D-2W         | Fujikura        | -        | 155-21-005E0 | Apr. 2003 | 1 Year   |
| CA04 | RF Cable           | 3D-2W         | Fujikura        | -        | 155-21-006E0 | Apr. 2003 | 1 Year   |
| CA05 | RF Cable           | 3D-2W         | Fujikura        | -        | 155-21-007E0 | Apr. 2003 | 1 Year   |
| CA06 | RF Cable           | RG-213/U      | Rohde & Schwarz | -        | 155-21-010E0 | Apr. 2003 | 1 Year   |
| CA07 | RF Cable(10m)      | S 04272B      | Suhner          | -        | 155-21-011E0 | May 2003  | 1 Year   |
| CA08 | RF Cable(2m 18GHz) | SUCOFLEX 104  | Suhner          | -        | 155-21-012E0 | May 2003  | 1 Year   |
| CA09 | RF Cable(1m 18GHz) | SUCOFLEX 104  | Suhner          | -        | 155-21-013E0 | May 2003  | 1 Year   |
| CA10 | RF Cable(1m N)     | S 04272B      | Suhner          | -        | 155-21-015E0 | May 2003  | 1 Year   |
| CA11 | RF Cable(1m 26GHz) | SUCOFLEX 104  | Suhner          | 182811/4 | 155-21-016E0 | Dec. 2002 | 1 Year   |
| CA12 | RF Cable(4m 26GHz) | SUCOFLEX 104  | Suhner          | 190630   | 155-21-017E0 | Dec. 2002 | 1 Year   |
| CA13 | RF Cable(10m)      | F130-S1S1-394 | MEGA PHASE      | 10510    | 155-21-018E0 | Dec. 2002 | 1 Year   |

## Amplifiers

| No.  | Type         | Model                  | Manufacturer    | Serial     | ID           | Last Cal. | Interval |
|------|--------------|------------------------|-----------------|------------|--------------|-----------|----------|
| AM01 | AF Amplifier | P-500L                 | Accuphase       | BOY806     | 127-01-501E0 | Feb. 2003 | 1 Year   |
| AM02 | RF Amplifier | 8447D                  | Hewlett Packard | 1937A02168 | 127-01-065E0 | May 2003  | 1 Year   |
| AM03 | RF Amplifier | 8447D                  | Hewlett Packard | 2944A07289 | 127-01-509E0 | May 2003  | 1 Year   |
| AM05 | RF Amplifier | DBP-0102N553           | DBS Microwave   | 012        | 127-02-504E0 | Jun. 2003 | 1 Year   |
| AM06 | RF Amplifier | WJ-6882-814            | Watkins-Johnson | 0414       | 127-04-017E0 | Jun. 2003 | 1 Year   |
| AM07 | RF Amplifier | WJ-5315-556            | Watkins-Johnson | 106        | 127-04-006E0 | Jun. 2003 | 1 Year   |
| AM08 | RF Amplifier | WJ-5320-307            | Watkins-Johnson | 645        | 127-04-005E0 | Jun. 2003 | 1 Year   |
| AM09 | RF Amplifier | JS4-00102600<br>-28-5A | MITEQ           | 669167     | 127-04-502E0 | Apr. 2003 | 1 Year   |

## Signal Generators

| No.  | Type               | Model    | Manufacturer             | Serial     | ID           | Last Cal. | Interval |
|------|--------------------|----------|--------------------------|------------|--------------|-----------|----------|
| SG01 | Function Generator | 3325B    | Hewlett Packard          | 2847A03284 | 118-08-124E0 | Jul. 2002 | 1 Year   |
| SG02 | Function Generator | VP-7422A | Matsushita Communication | 050351E122 | 118-08-503E0 | Jul. 2002 | 1 Year   |
| SG03 | Signal Generator   | 8664A    | Hewlett Packard          | 3035A00140 | 118-03-014E0 | Jun. 2002 | 1 Year   |
| SG04 | Signal Generator   | 8664A    | Hewlett Packard          | 3438A00756 | 118-04-502E0 | Jun. 2002 | 1 Year   |
| SG05 | Signal Generator   | 6061A    | Gigatronics              | 5130593    | 118-04-024E0 | Mar. 2003 | 1 Year   |

## Auxiliary Equipment

| No.  | Type                | Model          | Manufacturer    | Serial     | ID           | Last Cal. | Interval |
|------|---------------------|----------------|-----------------|------------|--------------|-----------|----------|
| AU01 | Termination(50)     | -              | Suhner          | -          | 154-06-501E0 | Jan. 2003 | 1 Year   |
| AU02 | Termination(50)     | -              | Suhner          | -          | 154-06-502E0 | Jan. 2003 | 1 Year   |
| AU03 | Power Meter         | 436A           | Hewlett Packard | 1725A01930 | 100-02-501E0 | Apr. 2003 | 1 Year   |
| AU04 | Power Sensor        | 8482A          | Hewlett Packard | 1551A01013 | 100-02-501E0 | Apr. 2003 | 1 Year   |
| AU05 | Power Sensor        | 8485A          | Hewlett Packard | 2942A08969 | 100-04-021E0 | Apr. 2003 | 1 Year   |
| AU06 | FM Linear Detector  | MS61A          | Anritsu         | M77486     | 123-02-008E0 | Oct. 2002 | 1 Year   |
| AU07 | Level Meter         | ML422C         | Anritsu         | M87571     | 114-02-501E0 | Jun. 2002 | 1 Year   |
| AU08 | Measuring Amplifier | 2636           | B & K           | 1614851    | 082-01-502E0 | Jun. 2002 | 1 Year   |
| AU09 | Microphone          | 4134           | B & K           | 1269477    | 147-01-503E0 | May 2003  | 1 Year   |
| AU10 | Preamplifier        | 2639           | B & K           | 1268763    | 127-01-504E0 | May 2003  | 1 Year   |
| AU11 | Pistonphone         | 4220           | B & K           | 1165008    | 147-02-501E0 | Mar. 2003 | 1 Year   |
| AU12 | Artificial Mouth    | 4227           | B & K           | 1274869    | -            | N/A       | N/A      |
| AU13 | Frequency Counter   | 53131A         | Hewlett Packard | 3546A11807 | 102-02-075E0 | May 2003  | 1 Year   |
| AU14 | Oven                | -              | Ohnishi         | -          | 023-02-018E0 | May 2003  | 1 Year   |
| AU15 | DC Power Supply     | 6628A          | Hewlett Packard | 3224A00284 | 072-05-503E0 | Jun. 2002 | 1 Year   |
| AU16 | Band Reject Filter  | BRM12294       | Micro-tronics   | 003        | 149-01-501E0 | Jan. 2003 | 1 Year   |
| AU17 | High Pass Filter    | F-100-4000-5-R | RLC Electronics | 0149       | 149-01-502E0 | Feb. 2003 | 1 Year   |
| AU18 | Attenuator          | 43KC-10        | Anritsu         | -          | 148-03-506E0 | Feb. 2003 | 1 Year   |
| AU19 | Attenuator          | 43KC-20        | Anritsu         | -          | 148-03-507E0 | Feb. 2003 | 1 Year   |
| AU20 | Attenuator          | 355D           | Hewlett Packard | 219-10782  | 148-03-065E0 | Apr. 2003 | 1 Year   |
| AU21 | FFT Analyzer        | R9211C         | Advantest       | 02020253   | 122-02-506E0 | June 2002 | 1 Year   |
| AU22 | Noise Meter         | MN-446         | Meguro          | 53030478   | 082-01-144E0 | Apr. 2003 | 1 Year   |