

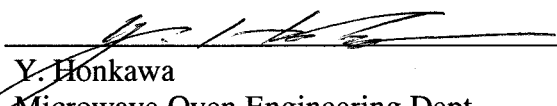
**ENGINEERING TEST RECORD**  
**REPORT OF MEASUREMENTS (MICROWAVE OVEN TEST DATA SHEET)**

FCC ID : APYDMR0125  
Tested Product : Household Microwave Oven, VFA Chassis  
Input Power Rating : 120 V ac, 60 Hz  
Output Power Rating : 1200 W (IEC method)  
Nominal Frequency : 2450 MHz  
Magnetron Type No. : 2M246, mfd by LG Electronics  
Test Date : March 15 – 21, 2000

Tested by;

Tested/Reviewed by;

  
T. Miyamoto  
Microwave Oven Engineering Dept.  
Kitchen Appliance Systems Div.  
Sharp Corp. (Yao Factory)

  
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Microwave Oven Engineering Dept.  
Kitchen Appliance Systems Div.  
Sharp Corp. (Yao Factory)

**DATA SUMMARY (FCC Measurement Procedure MP-5)**

1. Frequency Measurements : See attached data sheet.
2. Radiated Field Strength : See attached data sheet.

Measurement Test Site : Sharp Corporation  
Kitchen Appliance Systems Div.  
Yao Factory, EMI Anechoic Chamber

Note: For further details of Test Site, refer to the attached "Description of Measurement Facilities".

Total Power Input to Oven : 1647 W  
Power Developed in Dummy Load : 894.8 W  
(by calorimetric method with 1500 ml water load,  
well heated microwave oven.)

Supply Voltage : 120 V ac, 60 Hz

**PERMISSIBLE** : **33.44 uV/m at 300 m**

## 1. FREQUENCY MEASUREMENTS

FCC ID : APYDMR0125  
Tested Unit : Microwave Oven, VFA Chassis  
Magnetron Type No. : 2M246, mfd by LG Electronics  
Tested : March 15, 2000

### (1-1) Frequency VS Line Voltage Variation Test

Test Result (Room Temperature: 20 degC)  
Load: 1500 cc water in the glass beaker

| Line Voltage Variation (V) | Frequency                          | Allowed Tolerance for the ISM Band (2450 MHz) |
|----------------------------|------------------------------------|-----------------------------------------------|
| 96 (80%)                   | Lower: 2421 MHz<br>Upper: 2475 MHz | Lower: 2400 MHz<br>Upper: 2500 MHz            |
| 108 (90%)                  | Lower: 2434 MHz<br>Upper: 2476 MHz |                                               |
| 120 (Nominal)              | Lower: 2421 MHz<br>Upper: 2476 MHz |                                               |
| 132 (110%)                 | Lower: 2428 MHz<br>Upper: 2475 MHz |                                               |
| 150 (125%)                 | Lower: 2447 MHz<br>Upper: 2476 MHz |                                               |

### (1-2) Frequency VS Load Variation Test

Test Results (room temperature: 20 degC)  
Initial Load: 1500 cc water in the glass beaker

| Volume of Water (cc) | Frequency                          | Allowed Tolerance for the ISM Band (2450 MHz) |
|----------------------|------------------------------------|-----------------------------------------------|
| 1500                 | Lower: 2421 MHz<br>Upper: 2476 MHz | Lower: 2400 MHz<br>Upper: 2500 MHz            |
| 1200                 | Lower: 2444 MHz<br>Upper: 2477 MHz |                                               |
| 900                  | Lower: 2441 MHz<br>Upper: 2477 MHz |                                               |
| 600                  | Lower: 2443 MHz<br>Upper: 2478 MHz |                                               |
| 300                  | Lower: 2427 MHz<br>Upper: 2478 MHz |                                               |

## 2. RADIATED FIELD STRENGTH

DATA SHEET (FCC Measurement Procedure MP-5)

FCC ID: APYDMR0125

Tested Model: VFA Chassis

Magnetron: 2M246, mfd by LG Electronics

Date: March 16 - 21, 2000

|                           | Frequency<br>(MHz) | Load<br>(ml) | Place of<br>the load | Antenna<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>Data<br>(dBuV @:3m) |         | Radiated<br>Field Strength<br>(uV/m @:300m) |         |
|---------------------------|--------------------|--------------|----------------------|---------------------------|-----------------------|--------------------------------|---------|---------------------------------------------|---------|
|                           |                    |              |                      |                           |                       | Vertical                       | Horizen | Vertical                                    | Horizen |
| Fundamental               | 2464               | 1500         | Center               | 20.70                     | 1.03                  | 73                             | 77      | 347.03                                      | 550.00  |
| 2nd Harmonic              | 4900               | 1050         | Center               | 20.50                     | 1.58                  | 41                             | 43      | 14.26                                       | 17.95   |
|                           | 4888               | 1050         | R.F.Corner           | 20.50                     | 1.58                  | 34                             | 36      | 6.37                                        | 8.02    |
|                           | 4902               | 450          | Center               | 20.50                     | 1.58                  | 44                             | 44      | 20.14                                       | 20.14   |
|                           | 4896               | 450          | R.F.Corner           | 20.50                     | 1.58                  | 38                             | 42      | 10.09                                       | 16.00   |
| 3rd Harmonic              | 7357               | 1050         | Center               | 22.00                     | 2.10                  | 25                             | 31      | 2.85                                        | 5.69    |
|                           | 7334               | 1050         | R.F.Corner           | 22.00                     | 2.10                  | 18                             | 18      | 1.27                                        | 1.27    |
|                           | 7357               | 450          | Center               | 22.00                     | 2.10                  | 26                             | 32      | 3.20                                        | 6.38    |
|                           | 7329               | 450          | R.F.Corner           | 22.00                     | 2.10                  | 17                             | 24      | 1.14                                        | 2.54    |
| 4th Harmonic              | 9822               | 1050         | Center               | 20.00                     | 2.62                  | 16                             | 15      | 0.85                                        | 0.76    |
| Spurious : 1000<F<4575    | 2389               | 1050         | Center               | 20.70                     | 1.00                  | 24                             | 23      | 1.19                                        | 1.06    |
|                           | 2711               | 1050         | Center               | 20.80                     | 1.00                  | 14                             | 14      | 0.43                                        | 0.43    |
| Spurious : 1000>F, 4575<F | -                  | 1050         | Center               | -                         | -                     | -                              | -       | -                                           | -       |
|                           | -                  | 1050         | Center               | -                         | -                     | -                              | -       | -                                           | -       |
| Emission Sideband         | 2400               | 1500         | Center               | 20.70                     | 1.01                  | 26                             | 27      | 1.51                                        | 1.69    |
|                           | 2415               | 1500         | Center               | 20.70                     | 1.02                  | 26                             | 26      | 1.52                                        | 1.52    |
|                           | 2485               | 1500         | Center               | 20.70                     | 1.03                  | 9                              | 9       | 0.22                                        | 0.22    |
|                           | 2500               | 1500         | Center               | 20.80                     | 1.04                  | 9                              | 9       | 0.22                                        | 0.22    |

Emission observed from 100 MHz through 18 GHz by spectrum analyzer. No significant emission was detected except for above data.

Microwave Leakage at 5 cm on fundamental : 0.10 mW/cm<sup>2</sup>

DESCRIPTION OF THE MEASUREMENT FACILITIES

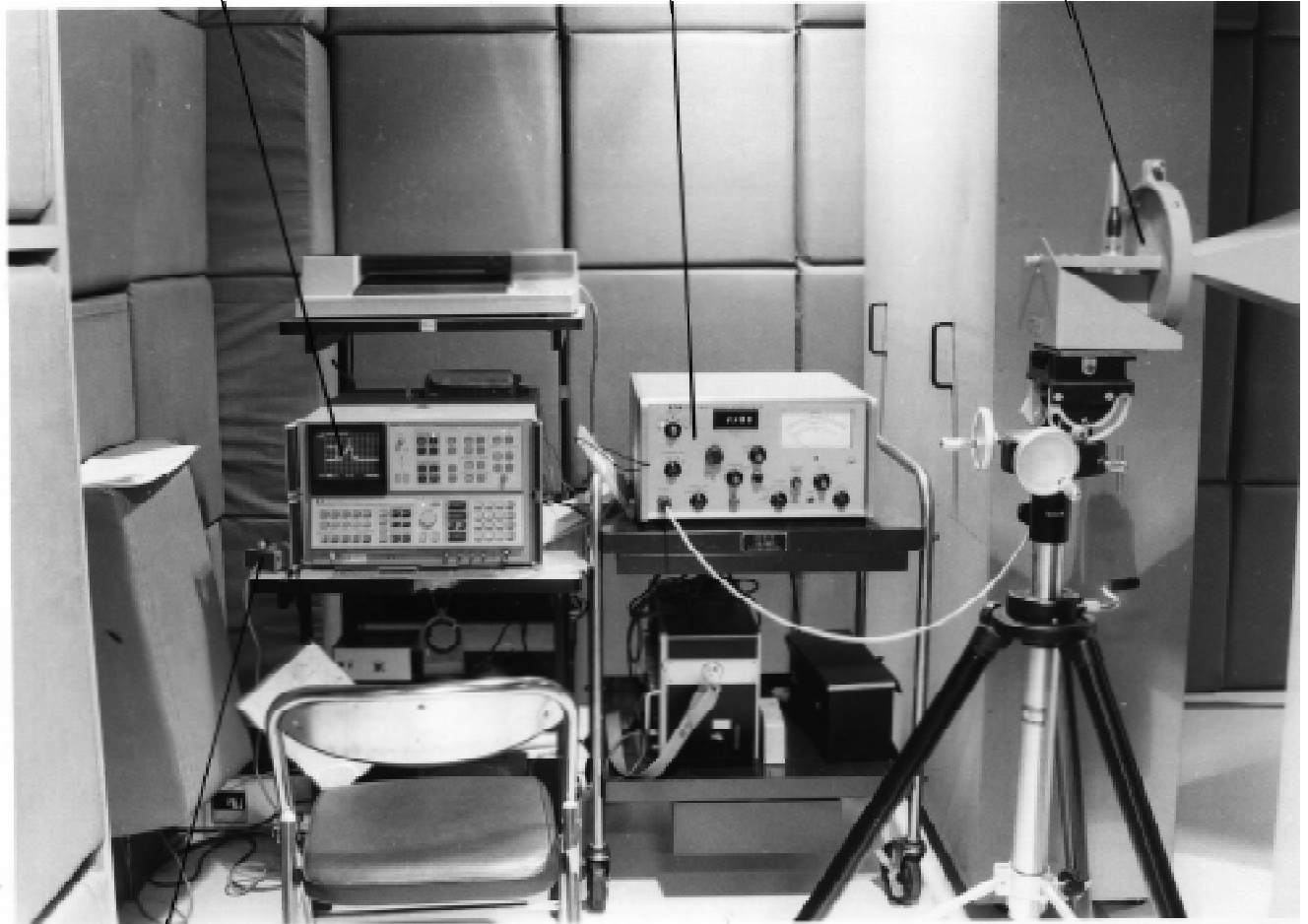
SHARP CORPORATION, KITCHEN APPLIANCE SYSTEMS DIVISION  
EMI ANECHOIC CHAMBER

# PHOTOGRAPH OF TEST EQUIPMENT #1

Spectrum Analyzer  
8566B

Field Strength Meter  
NM-67

Horn Antenna



Turn Table Controller

## PHOTOGRAPH OF TEST EQUIPMENT #2

Horn Antenna

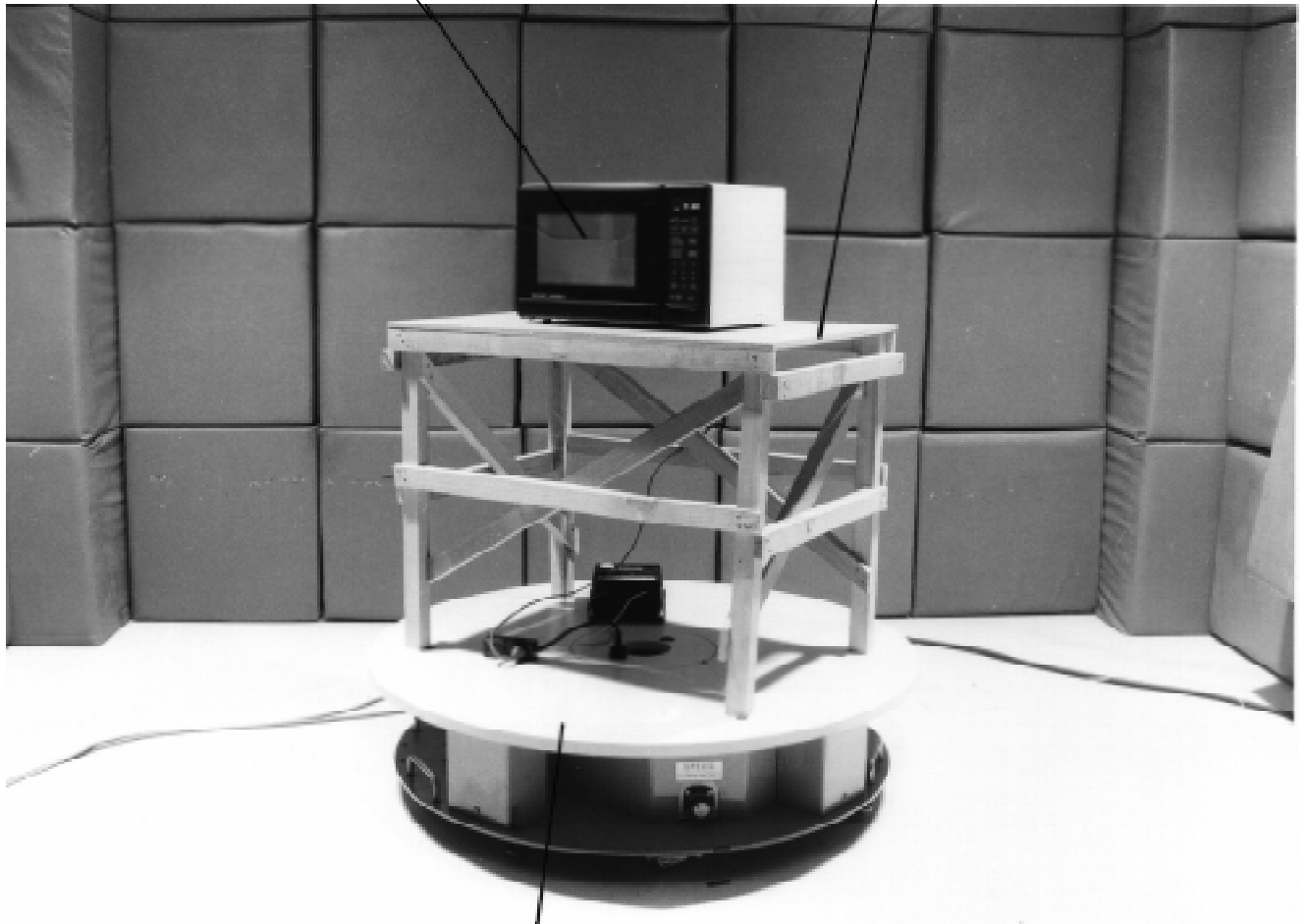


Field Strength Meter  
NM-67

### PHOTOGRAPH OF TEST EQUIPMENT #3

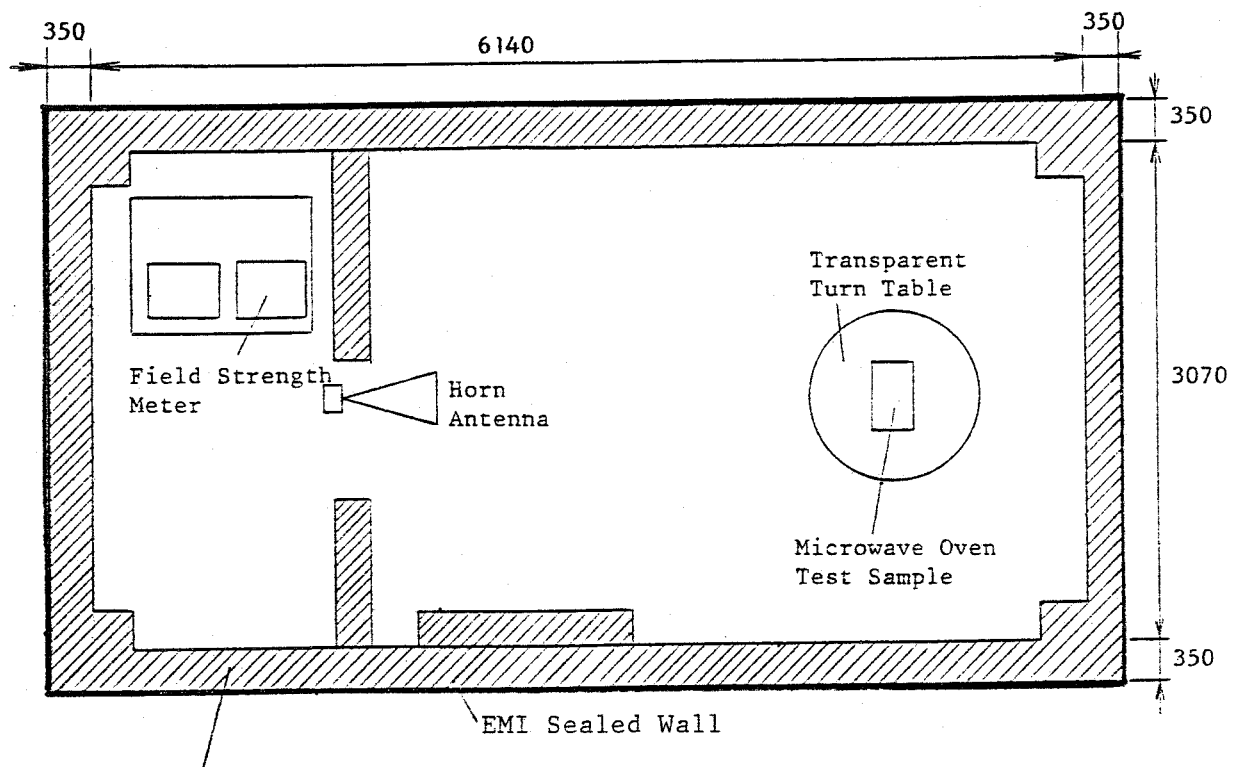
Microwave Oven  
Test Sample

Wooden Table

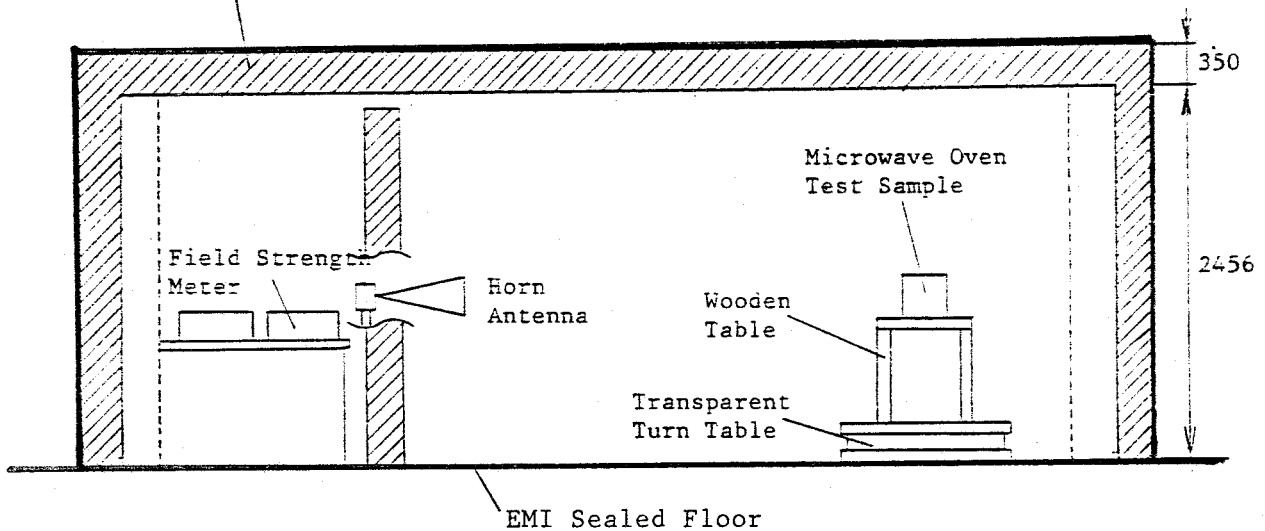


Transparent Turn Table

#### 4. DIMENSIONS OF TEST SITE



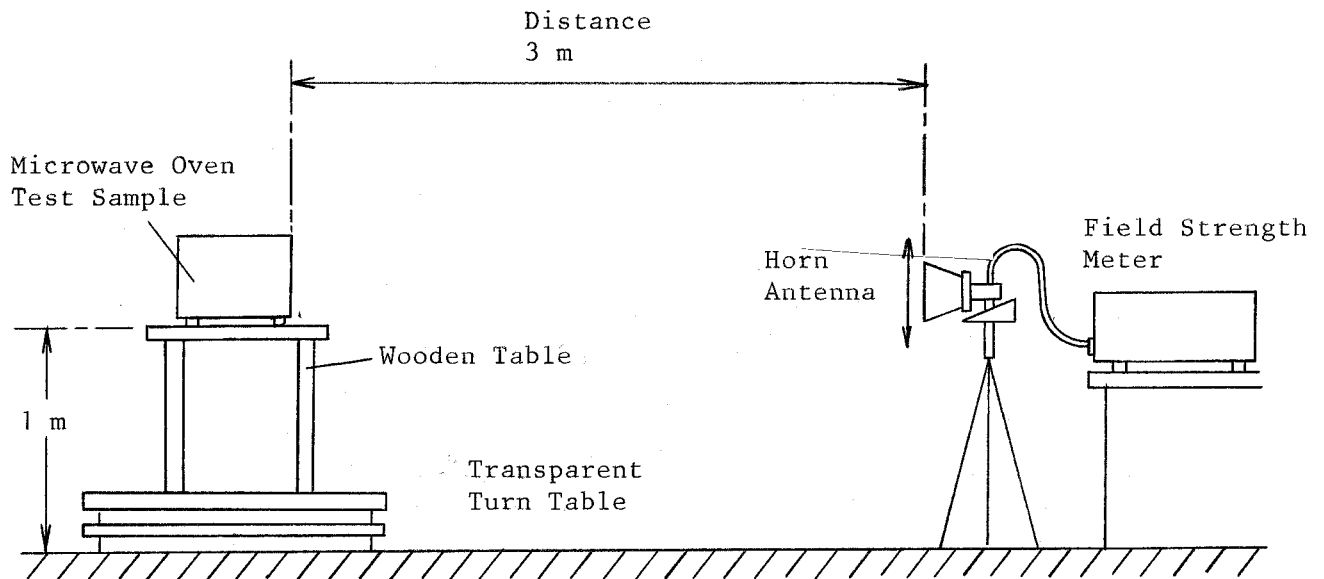
Electric Magnetic Wave Absorber: Cat. No. AEP-12EM WP  
Mfd by Advanced ElectroMagnetic, Inc.



(mm)

EMI Anechoic Chamber equipped by Akzo Kashima Ltd.

## 5. ARRANGEMENT OF INSTRUMENTATION



## 6. DESCRIPTION OF MEASUREMENT EQUIPMENTS

### 6-1. FIELD STRENGTH METER

- a) #UHR4000, Mfd by CHASE (100 MHz through 1.0 GHz)

|                   |                                                                                   |
|-------------------|-----------------------------------------------------------------------------------|
| BANDWIDTH         | 120 kHz                                                                           |
| DETECTOR FUNCTION | Linear average value;<br>AVERAGE 1: 1 ms averaging<br>AVERAGE 2: 600 ms averaging |
| CALIBRATION DATE  | July 21, 1999                                                                     |

- b) #NM-67, Mfd by EATON (1.0 GHz through 18 GHz)

|                   |                                       |
|-------------------|---------------------------------------|
| BANDWIDTH         | 1 MHz                                 |
| DETECTOR FUNCTION | Linear average value; Field Intensity |
| CALIBRATION DATE  | October 20, 1999                      |

### 6-2. RADIATED FREQUENCY OBSERVATION SUB-EQUIPMENT

|                   |                                 |
|-------------------|---------------------------------|
| SPECTRUM ANALYZER | #8566B, Mfd by HEWLETT. PACKARD |
|-------------------|---------------------------------|

### 6-3. ANTENNA

| <u>RANGE FOR FREQUENCY</u> | <u>ANTENNA</u>                                   |
|----------------------------|--------------------------------------------------|
| From 100 MHz to 140 MHz    | #DM-105A-T1, Mfd by SINGER                       |
| From 140 MHz to 400 MHz    | #DM-105A-T2, Mfd by SINGER                       |
| From 400 MHz to 1.0 GHz    | #DM-105A-T3, Mfd by SINGER                       |
| From 1.0 GHz to 2.0 GHz    | #91888-2, Mfd by EATON                           |
| From 2.0 GHz to 3.6 GHz    | #91889-2, Mfd by EATON                           |
| From 3.6 GHz to 7.3 GHz    | #94613-1 with Reflector #91892-1<br>Mfd by EATON |
| From 7.3 GHz to 12.0 GHz   | #91891-2 with Reflector #91892-1<br>Mfd by EATON |
| From 12.0 GHz to 18.0 GHz  | #94614-1 with Reflector #91892-1<br>Mfd by EATON |

### 6-4. CABLE

| <u>RANGE FOR FREQUENCY</u> | <u>CABLE</u> |
|----------------------------|--------------|
| From 100 MHz to 1.0 GHz    | #RG-55/U     |
| From 1.0 GHz to 18.0 GHz   | #94615-1     |

### 6.5. PERTINENT DETAILS

|                              |                    |
|------------------------------|--------------------|
| a) Calculation Formula       | (See Attachment 1) |
| b) Antenna Correction Factor | (See Attachment 2) |
| c) Cable Loss                | (See Attachment 3) |
| d) Calibration Curve         | (See Attachment 4) |

### 6-6. TEST CONDITION

|                                  |                                   |
|----------------------------------|-----------------------------------|
| a) Antenna height variation      | From <u>1.1 m</u> to <u>2.1 m</u> |
| b) Antenna to test unit distance | <u>3 m</u>                        |

CALCULATION OF RADIATED FIELD STRENGTH (uV/m)

$$E_f = 10^{\left(\frac{F_a + F_c + D}{20}\right)} * K$$

$E_f$  : Radiated Field Strength at 300 m (uV/m)  
 $F_a$  : Antenna Factor (dB)  
 $F_c$  : Cable Factor (dB)  
 $D$  : Reading Data of the Field Strength Meter (dBuV at 3 m)  
 $K$  : Conversion Factor

$K = 0.0137 * \log F - 0.0401$  (if  $F < 4575$  MHz)  
 $K = 0.01$  (if  $F \geq 4574$  MHz)  
 $F$  : Emission Frequency

| Emission Frequency (MHz) | K      |
|--------------------------|--------|
| 1830                     | 0.0046 |
| 2745                     | 0.0070 |
| 3660                     | 0.0090 |
| 4575 and above           | 0.0100 |

In case of emission frequency less than 1.0 GHz, conversion factor  $K=0.01$  is used for the measurement of 3 m distance.

## ANTENNA FACTOR (dB)

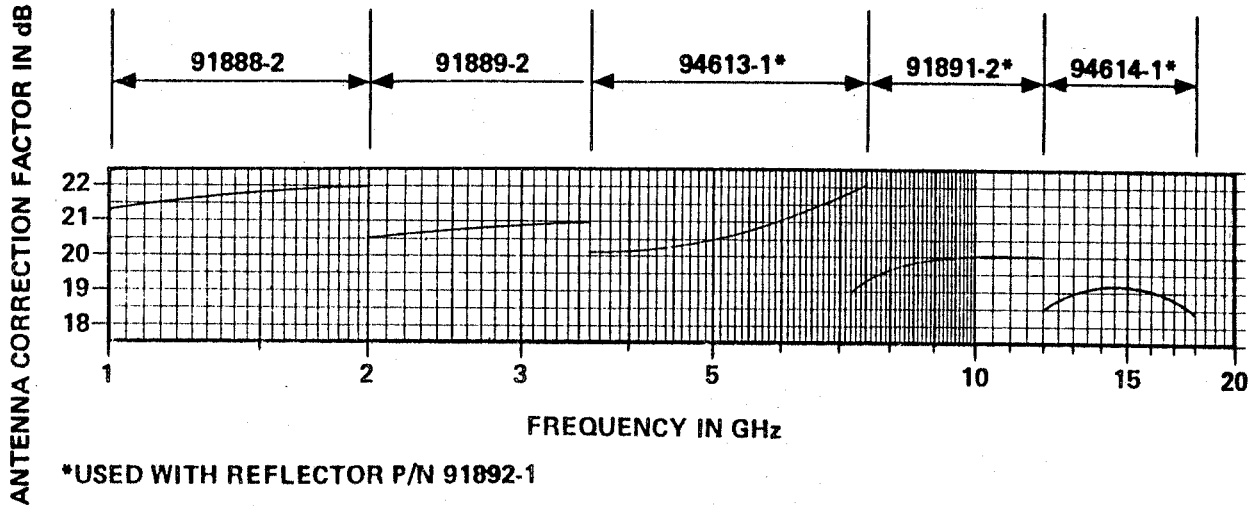


Figure 5-3. Antenna Correction Factors, 1-18 GHz Horn Antennas

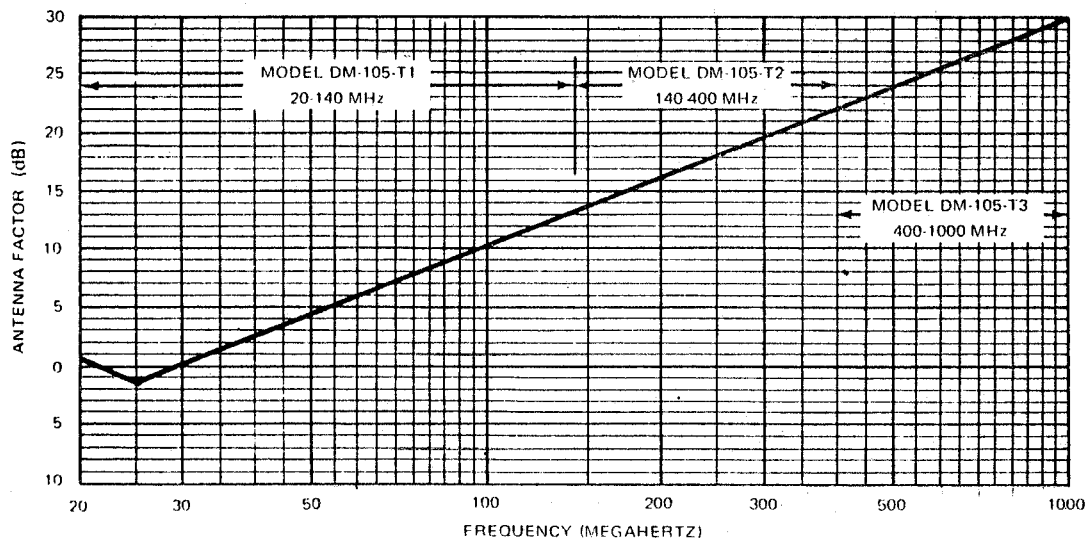


Figure 2-18. Antenna Factor Versus Frequency Characteristics, Models DM-105-T1, DM-105-T2 and DM-105-T3 Dipole Antennas

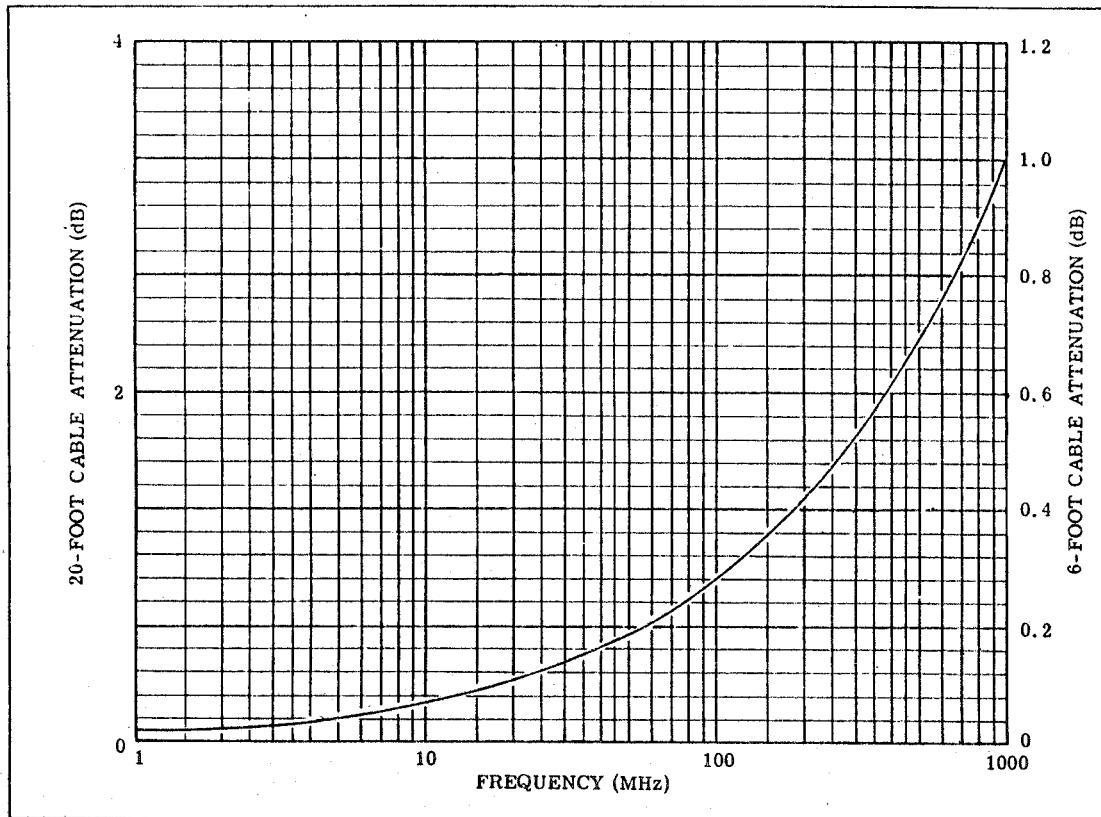


Figure 2-10. Attenuation Vs. Frequency for RG-55/U Coaxial Cable

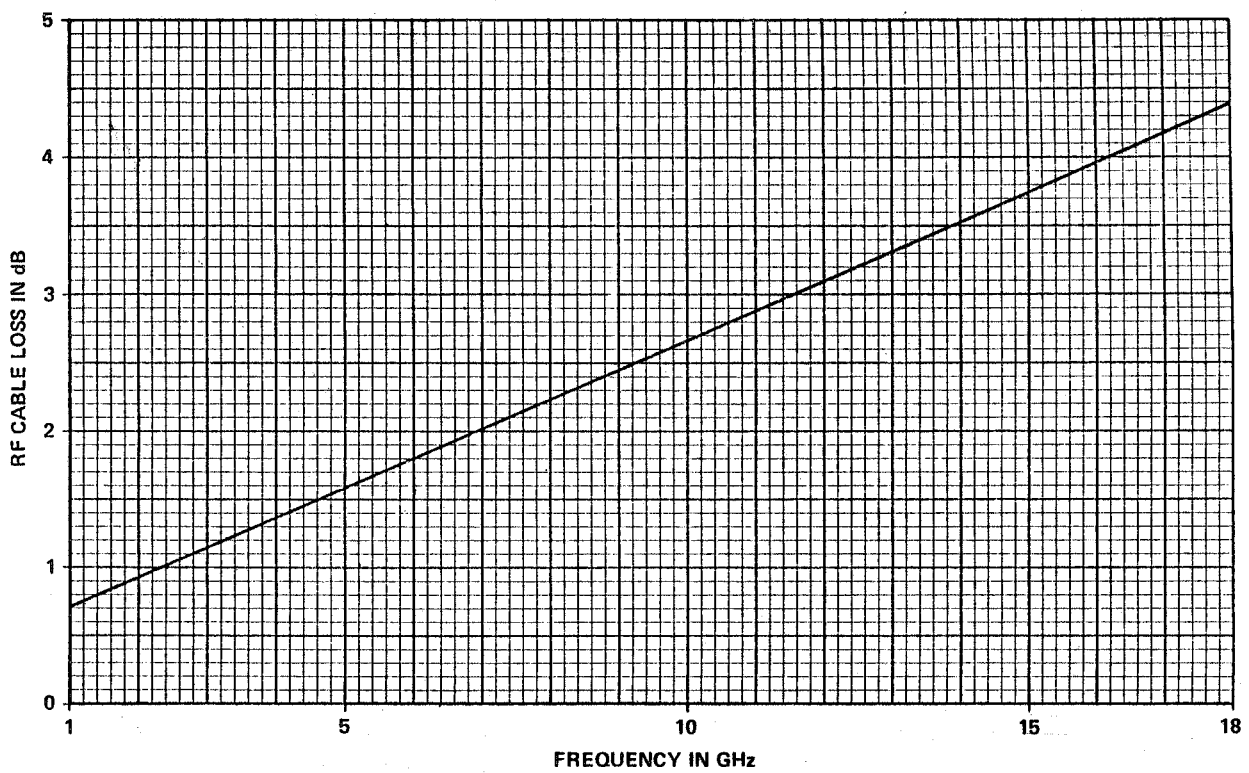


Figure 5-1. Model 94615-1 RF Cable Loss Chart

CALIBRATION CURVE

For Model NM-67

