

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.
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Sharp Corp. (Yao Factory)


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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 Upper: 2475 MHz	Lower: 2400 MHz Upper: 2500 MHz
108 (90%)	Lower: 2434 MHz Upper: 2476 MHz	
120 (Nominal)	Lower: 2421 MHz Upper: 2476 MHz	
132 (110%)	Lower: 2428 MHz Upper: 2475 MHz	
150 (125%)	Lower: 2447 MHz 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 Upper: 2476 MHz	Lower: 2400 MHz Upper: 2500 MHz
1200	Lower: 2444 MHz Upper: 2477 MHz	
900	Lower: 2441 MHz Upper: 2477 MHz	
600	Lower: 2443 MHz Upper: 2478 MHz	
300	Lower: 2427 MHz 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 (MHz)	Load (ml)	Place of the load	Antenna Factor (dB)	Cable Loss (dB)	Reading Data (dBuV @:3m)		Radiated Field Strength (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/cm²

DESCRIPTION OF THE MEASUREMENT FACILITIES

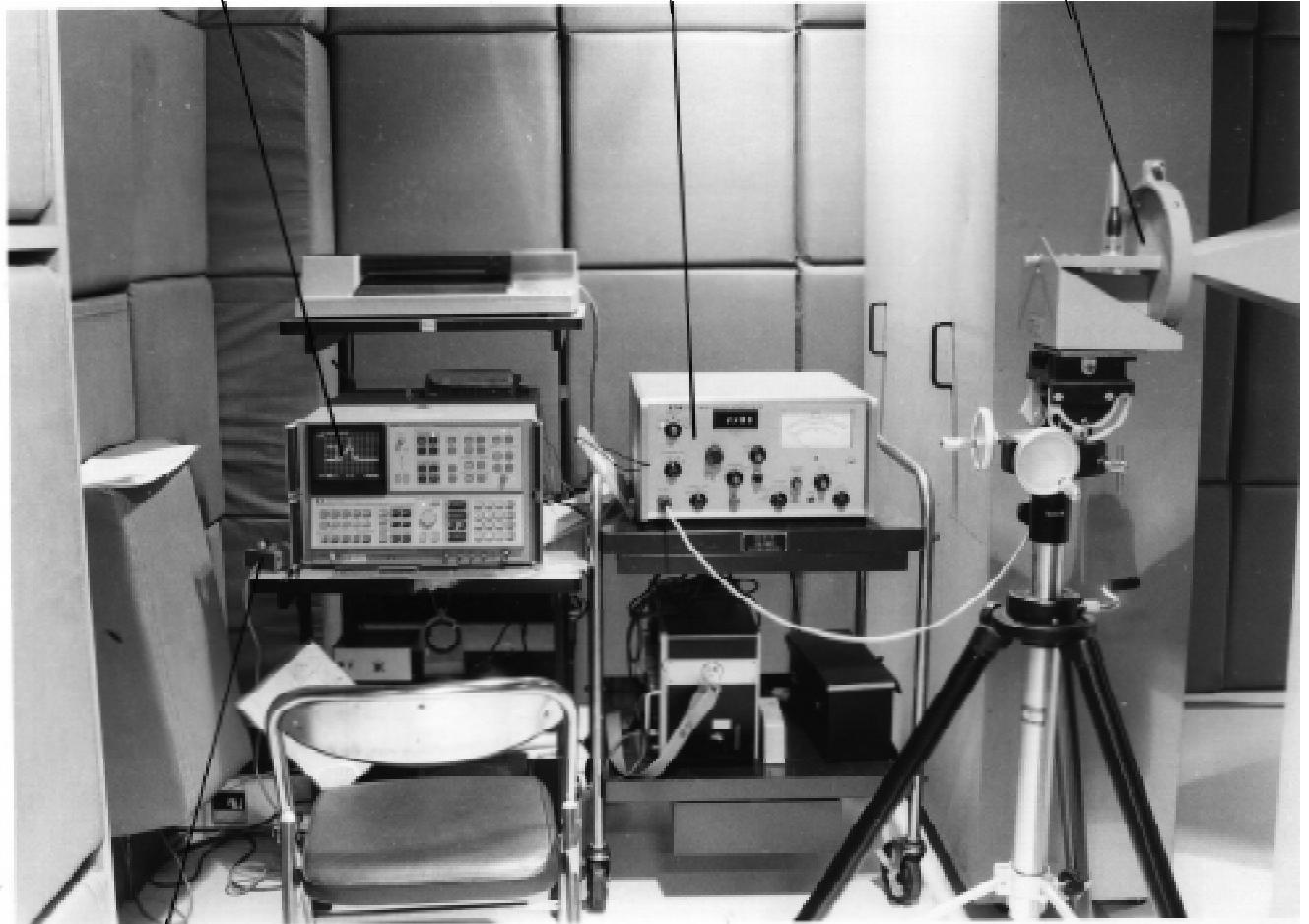
SHARP CORPORATION, KITCHEN APPLIANCE SYSTEMS DIVISION
EMI ANECHOIC CHAMBER

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

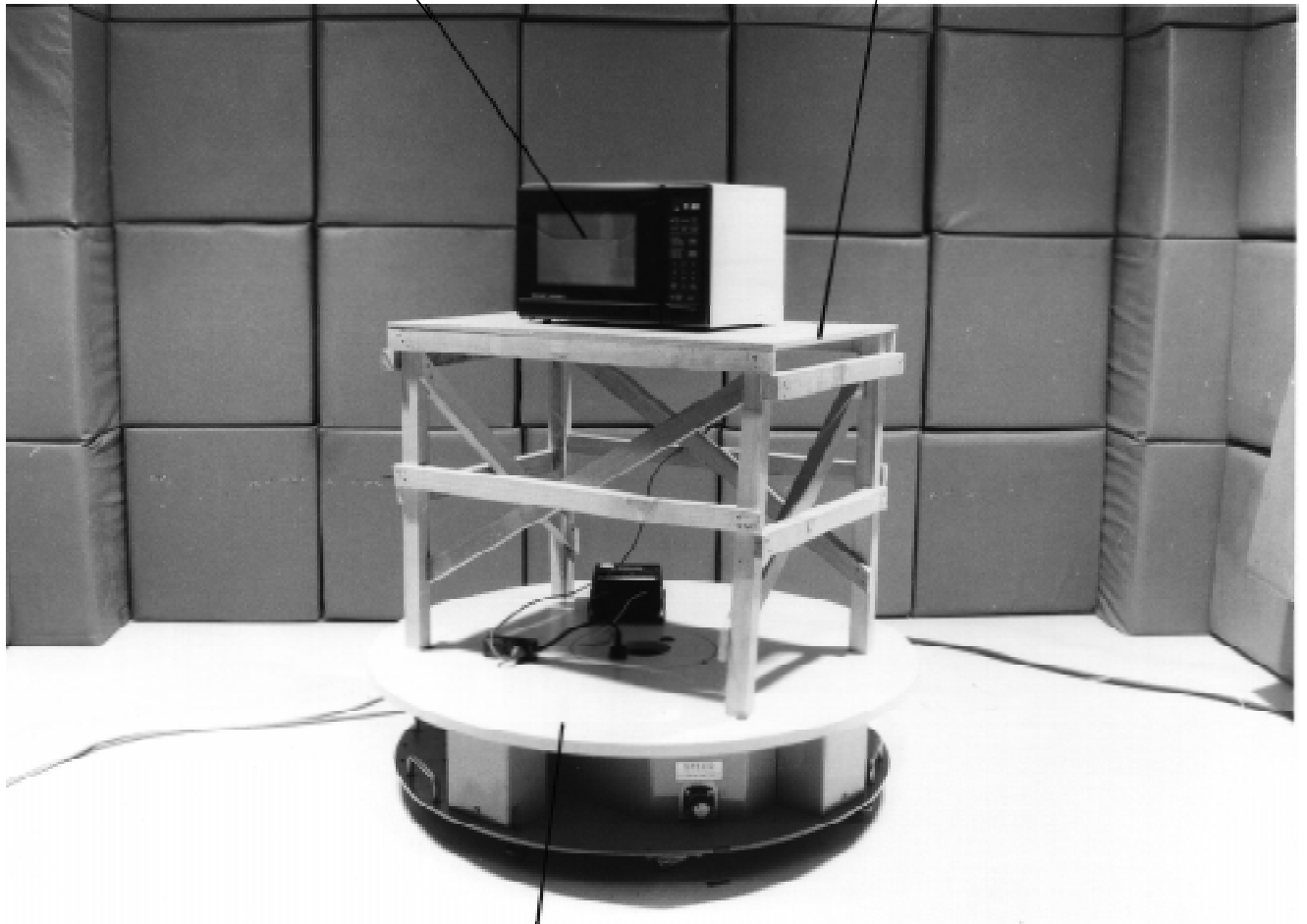


Field Strength Meter
NM-67

PHOTOGRAPH OF TEST EQUIPMENT #3

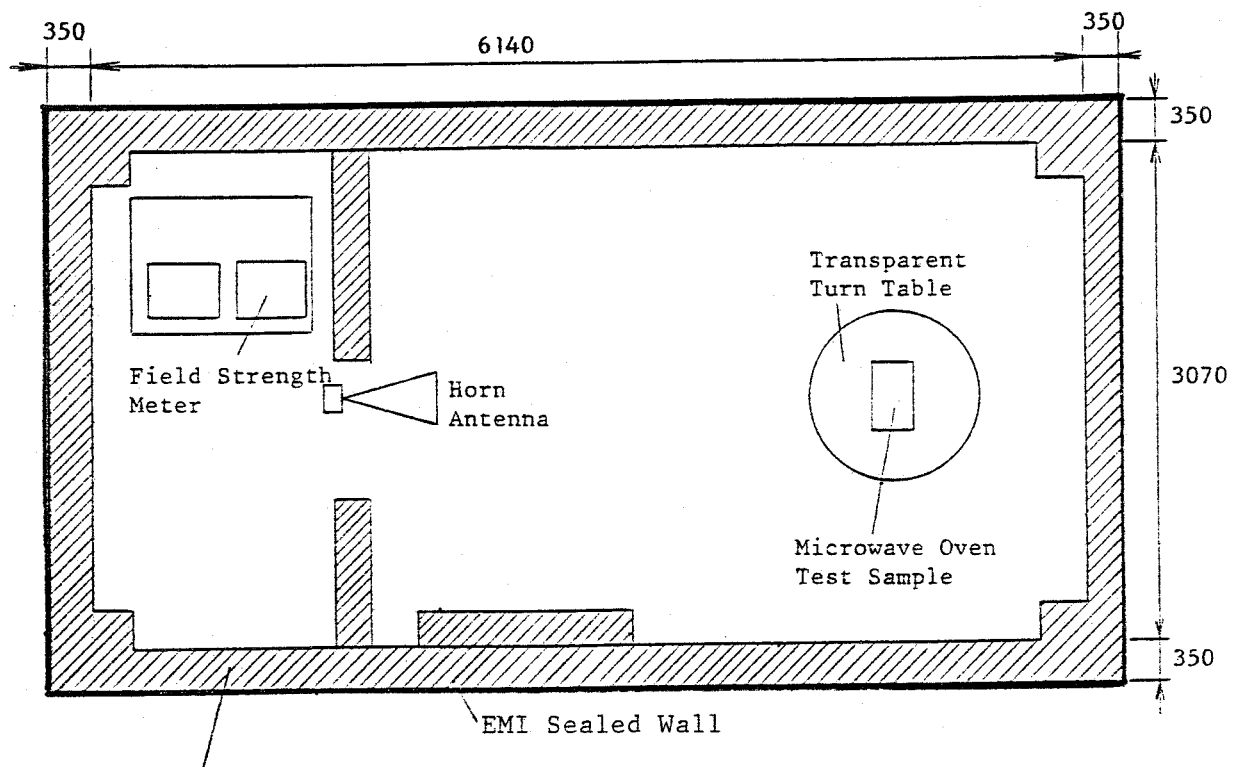
Microwave Oven
Test Sample

Wooden Table

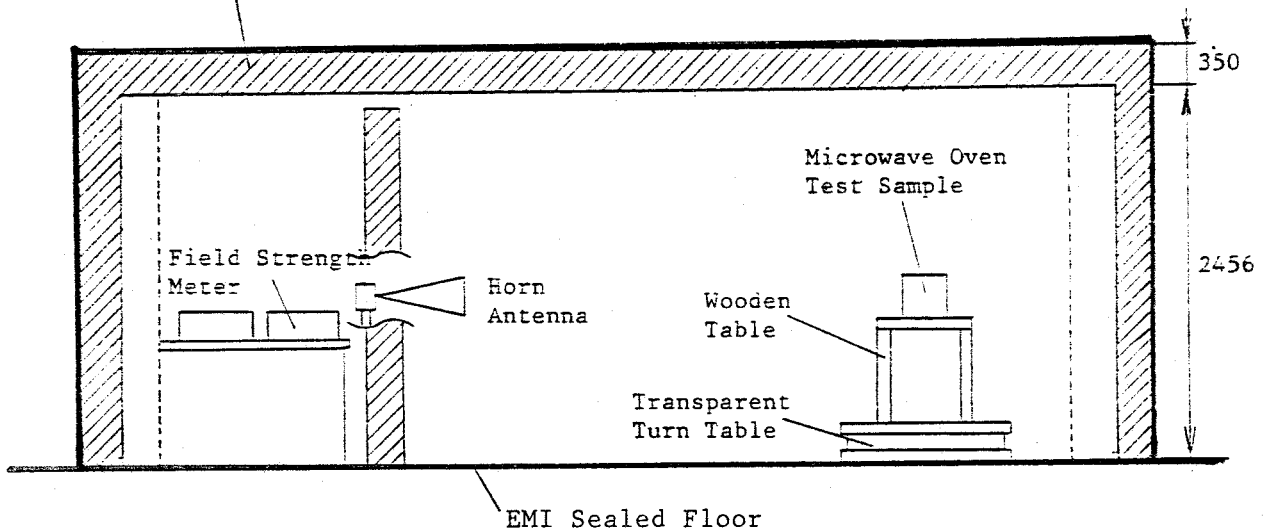


Transparent Turn Table

4. DIMENSIONS OF TEST SITE



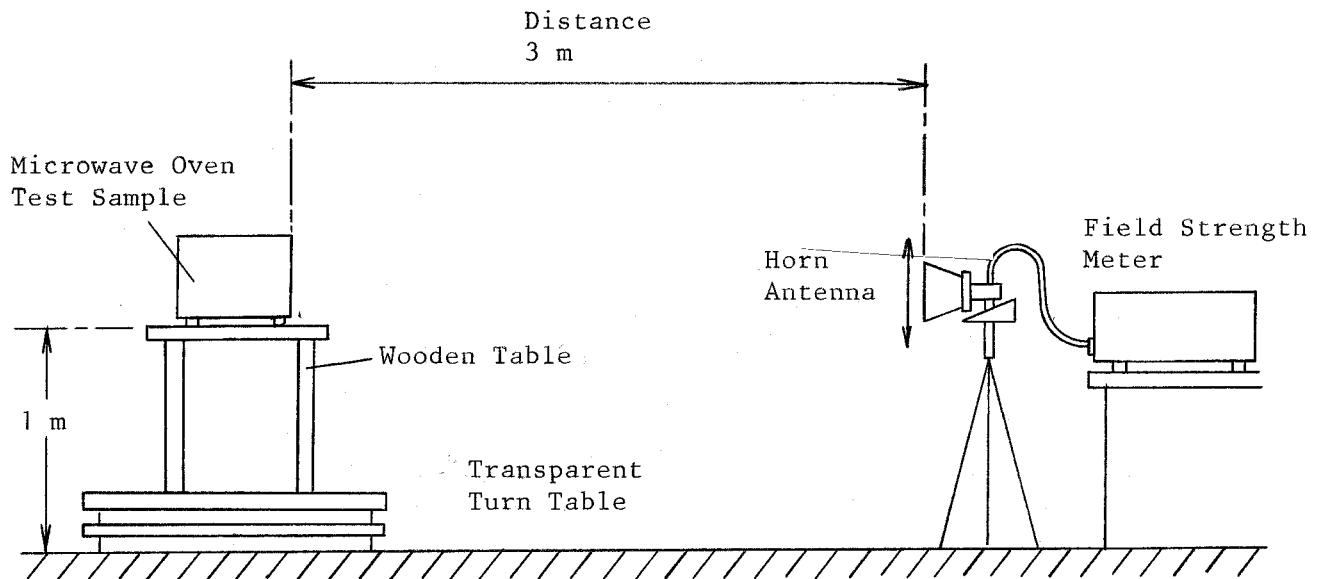
Electric Magnetic Wave Absorber: Cat. No. AEP-12EM WP
Mfd by Advanced ElectroMagnetic, Inc.



(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; AVERAGE 1: 1 ms averaging 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
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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 Mfd by EATON
From 7.3 GHz to 12.0 GHz	#91891-2 with Reflector #91892-1 Mfd by EATON
From 12.0 GHz to 18.0 GHz	#94614-1 with Reflector #91892-1 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)

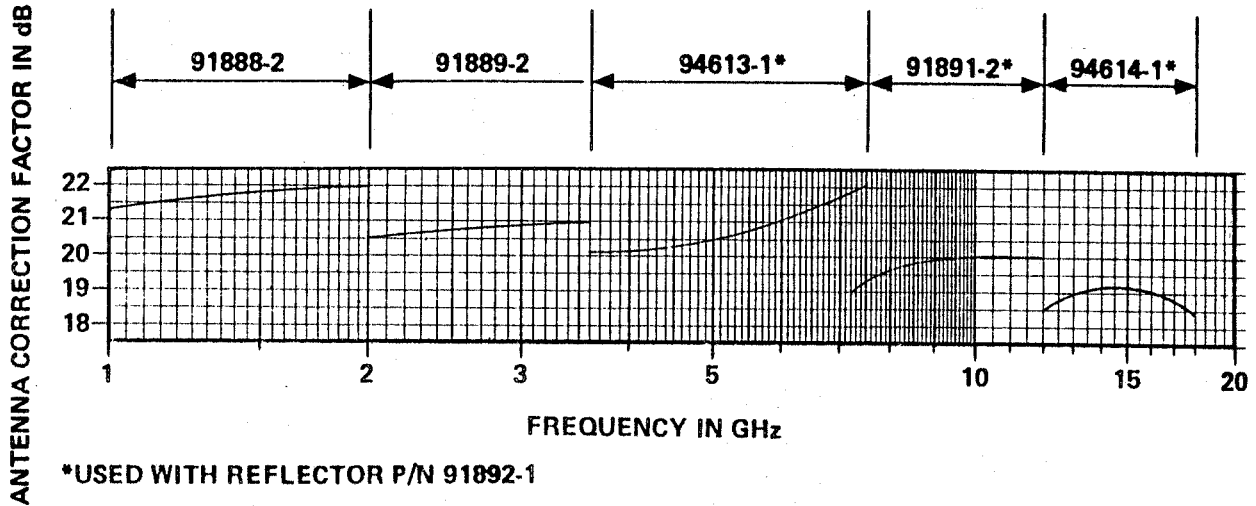


Figure 5-3. Antenna Correction Factors, 1-18 GHz Horn Antennas

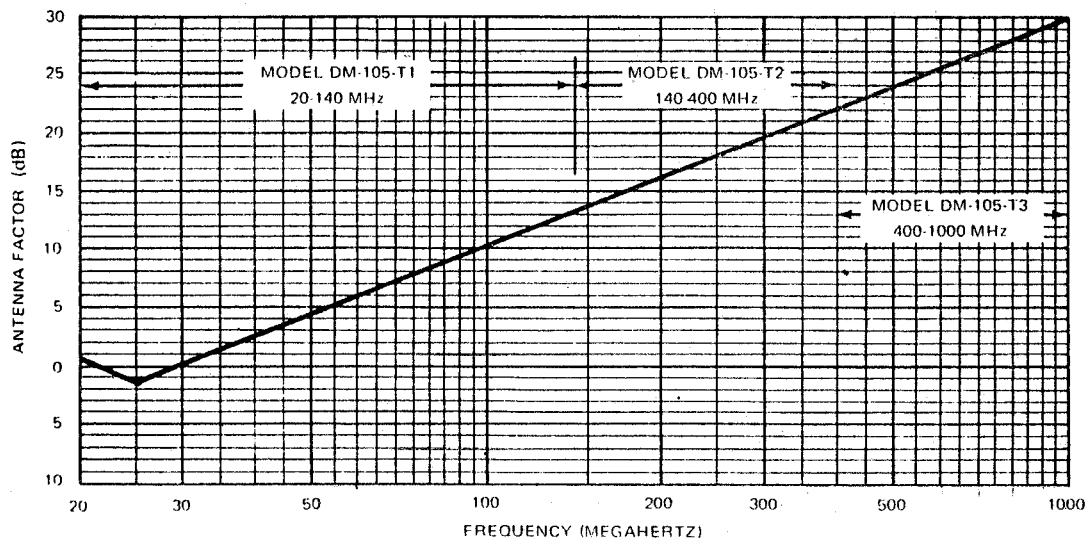


Figure 2-18. Antenna Factor Versus Frequency Characteristics, Models DM-105-T1, DM-105-T2 and DM-105-T3 Dipole Antennas

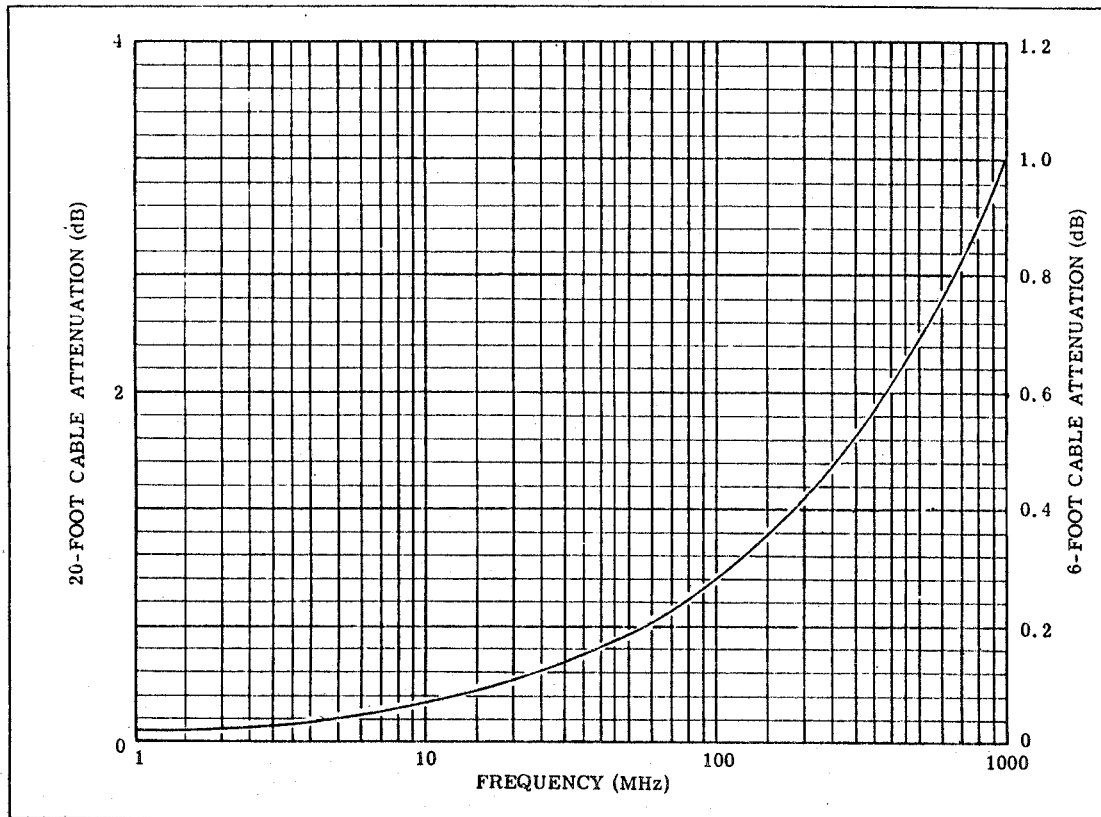


Figure 2-10. Attenuation Vs. Frequency for RG-55/U Coaxial Cable

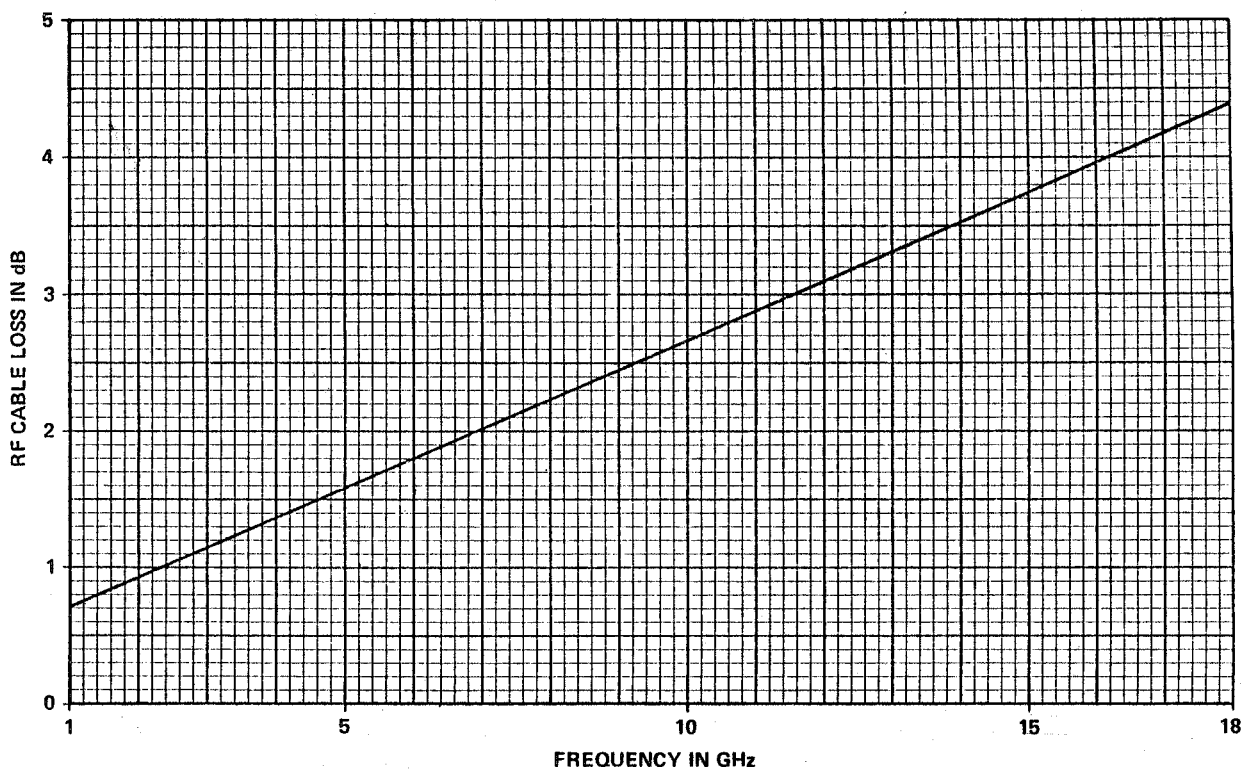


Figure 5-1. Model 94615-1 RF Cable Loss Chart

CALIBRATION CURVE

For Model NM-67

