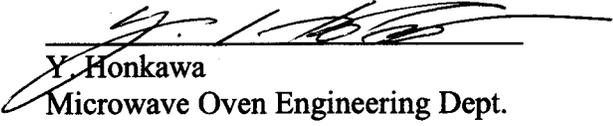


ENGINEERING TEST RECORD
REPORT OF MEASUREMENTS (MICROWAVE OVEN TEST DATA SHEET)

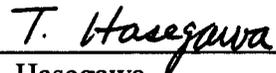
FCC ID : APYDMR0139
Tested Product : Household Microwave Oven, Model R-90GC
Input Power Rating : 240 V ac, 60 Hz
Output Power Rating : 1000 W (IEC method)
Nominal Frequency : 2450 MHz
Magnetron Type No. : 2M253H(L), Toshiba
Test Date : April 23 – May 8, 2002

Tested by;

Reviewed by;


Y. Honkawa

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


T. Hasegawa

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 : 1770 W
Power Developed in Dummy Load : 749 W
(by calorimetric method with 1000 ml water load,
well heated microwave oven.)
Supply Voltage : 240 V ac, 60 Hz
PERMISSIBLE : 30.59 uV/m at 300 m

1. FREQUENCY MEASUREMENTS

FCC ID : APYDMR0139
 TESTED UNIT : Household Microwave Oven, Model R-90GC
 Magnetron Type No. : 2M253H(L), mfd by Toshiba
 Tested : May 8, 2002

(1) Frequency VS Line Voltage Variation Test

Test Result (Room Temperature: 20 degC)
 Load: 1000 cc water in the glass beaker

Line Voltage Variation (V)	Frequency	Allowed Tolerance for the ISM Band (2450 MHz)
180 (75%)	Upper: 2470 MHz Lower: 2414 MHz	Upper: 2500 MHz Lower: 2400 MHz
216 (90%)	Upper: 2472 MHz Lower: 2414 MHz	
240 (Nominal)	Upper: 2470 MHz Lower: 2414 MHz	
264 (110%)	Upper: 2471 MHz Lower: 2413 MHz	
300 (125%)	Upper: 2471 MHz Lower: 2413 MHz	

(2) Frequency VS Load Variation Test

Test Results (Room Temperature: 20 degC)
 Test Voltage: 240 V, 60Hz
 Initial Load: 1000 cc water in the glass beaker.

Volume of Water (cc)	Frequency	Allowed Tolerance for the ISM Band (2450 MHz)
1000	Upper: 2470 MHz Lower: 2414 MHz	Upper: 2500 MHz Lower: 2400 MHz
800	Upper: 2469 MHz Lower: 2408 MHz	
600	Upper: 2471 MHz Lower: 2407 MHz	
400	Upper: 2469 MHz Lower: 2406 MHz	
200	Upper: 2455 MHz Lower: 2412 MHz	

2. RADIATED FIELD STRENGTH

DATA SHEET (FCC Measurement Procedure MP-5)

FCC ID: APYDMR0139

Model R-90GC

Magnetron: 2M253H(L), mfd by Toshiba

Date: April 23 - May 08, 2002

	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	2454	1000	Center	20.70	1.03	84	84	1226.62	1226.62
2nd Harmonic	4884	700	Center	20.50	1.58	37	20	9.00	1.27
	4881	700	R.F.Corner	20.50	1.58	35	21	7.15	1.43
	4877	300	Center	20.50	1.58	39	27	11.32	2.84
	4881	300	R.F.Corner	20.50	1.58	37	21	9.00	1.43
3rd Harmonic	7328	700	Center	19.20	2.10	30	17	3.67	0.82
	7352	700	R.F.Corner	19.20	2.10	25	13	2.07	0.52
	7320	300	Center	19.20	2.10	29	16	3.27	0.73
	7321	300	R.F.Corner	19.20	2.10	24	13	1.84	0.52
4th Harmonic	9782	700	Center	20.00	2.62	35	21	7.60	1.52
Sprious	2395	700	Center	20.70	1.00	36	35	4.76	4.24
	2509	700	Center	20.80	1.05	23	25	1.13	1.42
	14628	700	Center	19.20	3.68	17	26	0.99	2.78
	17078	700	Center	18.70	4.20	21	16	1.57	0.88
		700	Center						
Emission Sideband	2400	1000	Center	20.70	1.01	33	31	3.38	2.68
	2415	1000	Center	20.70	1.02	44	41	12.07	8.54
	2485	1000	Center	20.70	1.03	17	17	0.55	0.55
	2500	1000	Center	20.80	1.04	22	20	1.00	0.80

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 : 0.23 mW/cm^2

DESCRIPTION OF THE MEASUREMENT FACILITIES

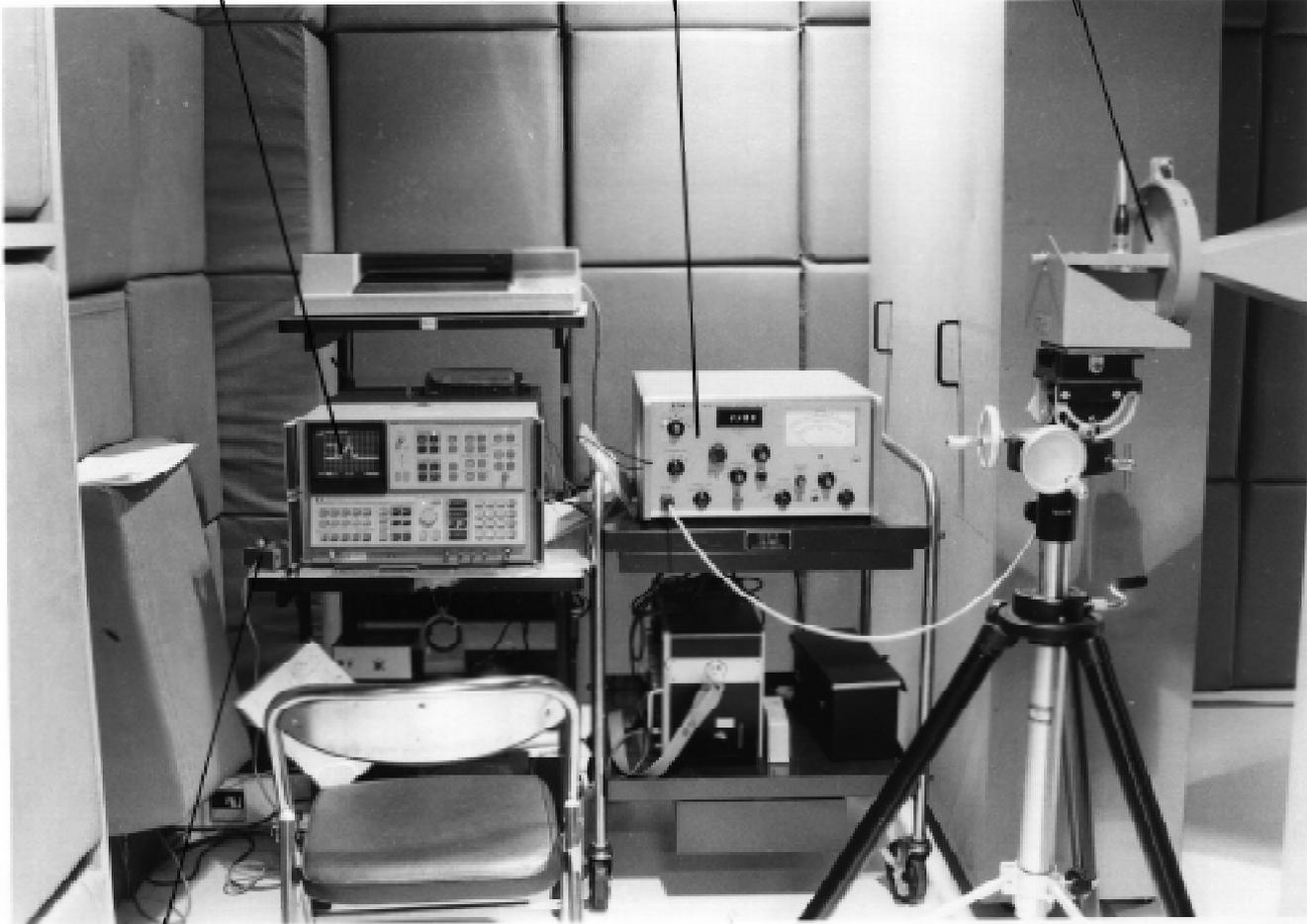
SHARP CORPORATION, KITCHEN APPLIANCE SYSTEMS DIVISION
EMI ANECHOIC CHAMBER

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

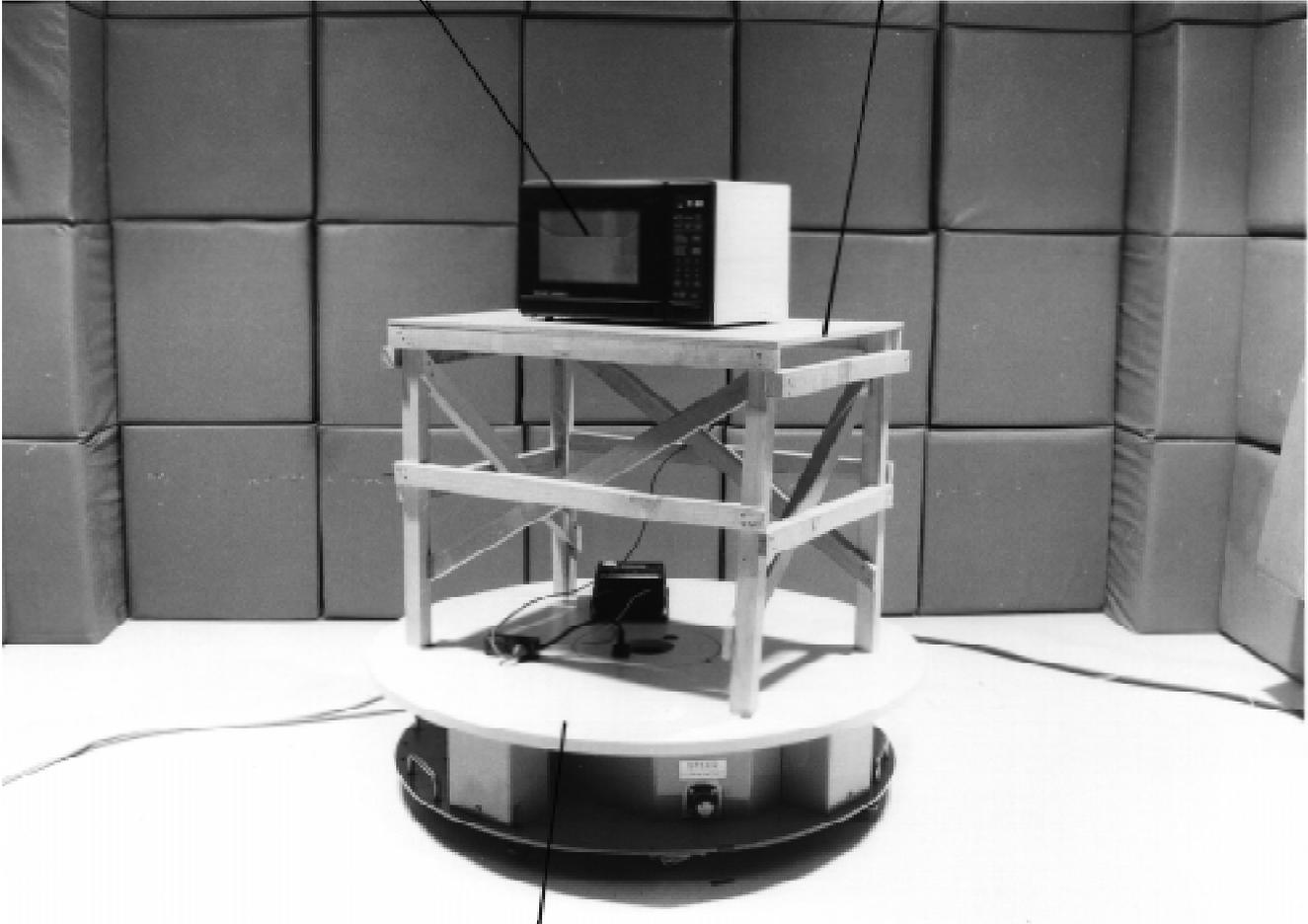


Field Strength Meter
NM-67

PHOTOGRAPH OF TEST EQUIPMENT #3

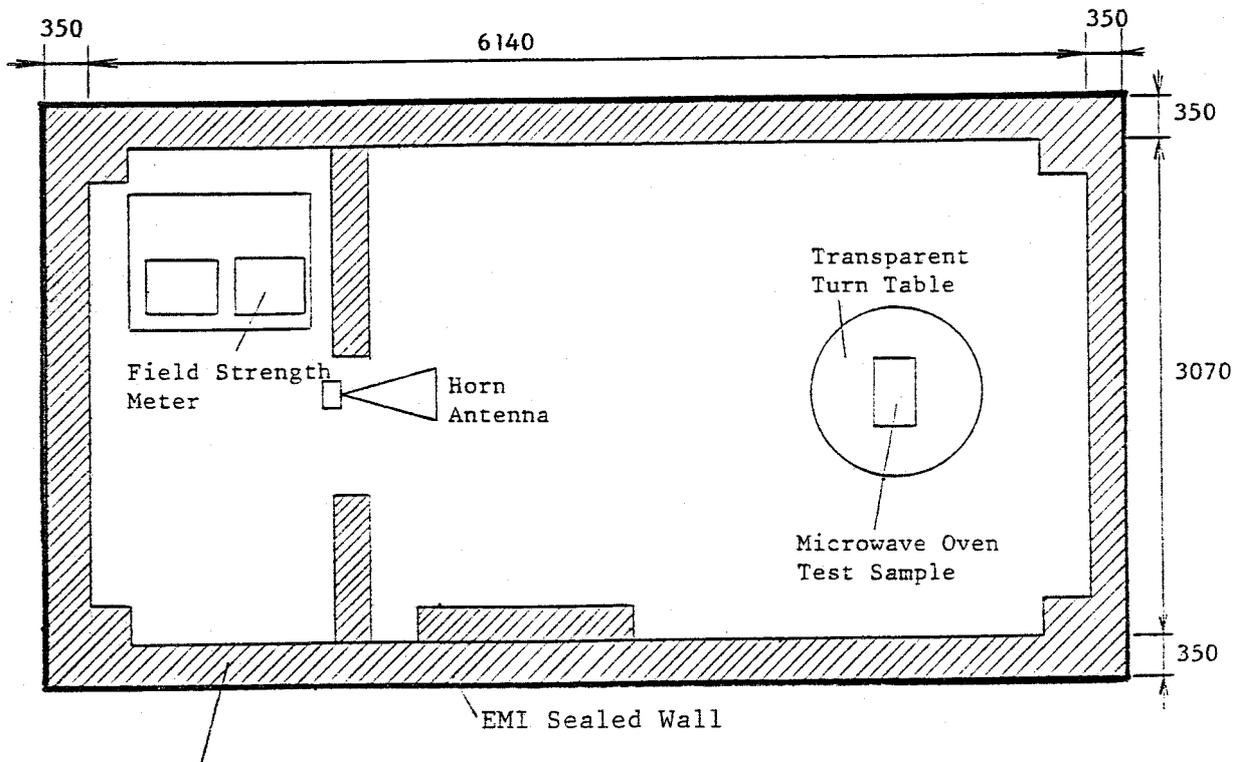
Microwave Oven
Test Sample

Wooden Table

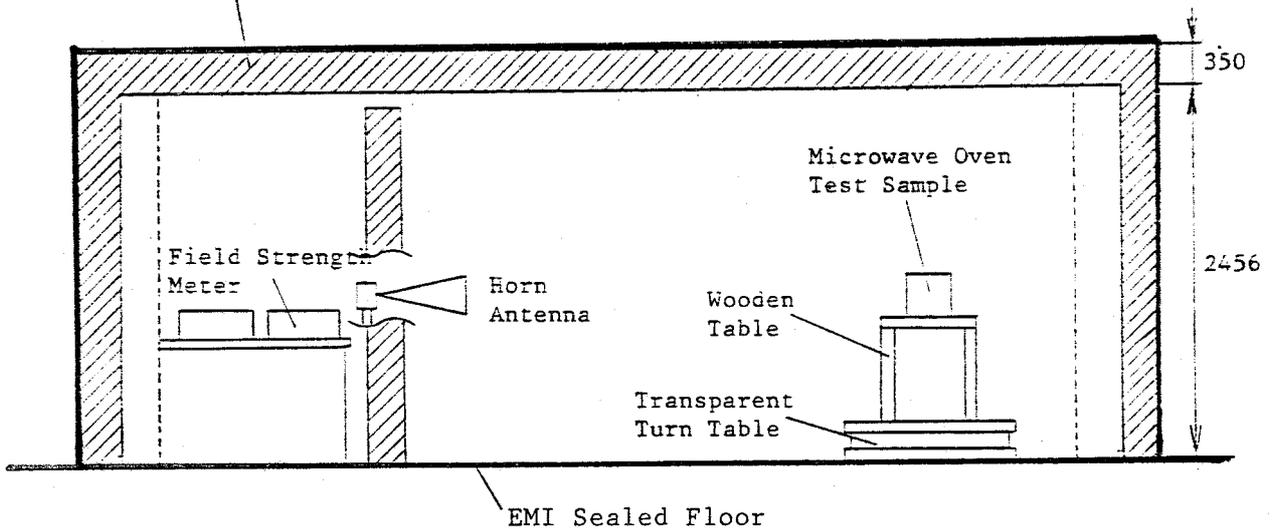


Transparent Turn Table

4. DIMENSIONS OF TEST SITE



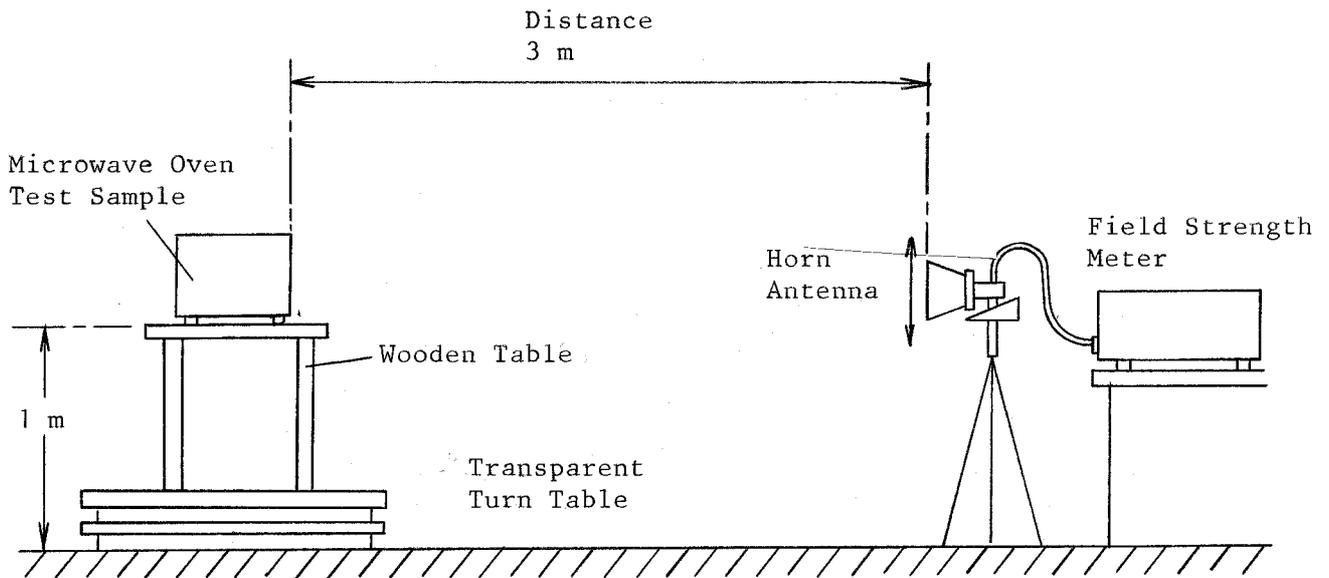
Electric Magnetic Wave Absorber: Cat. No. AEP-12EM WP
Mfd by Advanced ElectroMagnetic, Inc.



(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 2001

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

BANDWIDTH 1 MHz
DETECTOR FUNCTION Linear average value; Field Intensity
CALIBRATION DATE July 2001

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 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 1.1 m to 2.1 m
b) Antenna to test unit distance 3 m

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

$$K = 0.0137 * \log F - 0.0401 \quad (\text{if } F < 4575 \text{ MHz})$$

$$K = 0.01 \quad (\text{if } F \geq 4574 \text{ MHz})$$

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)

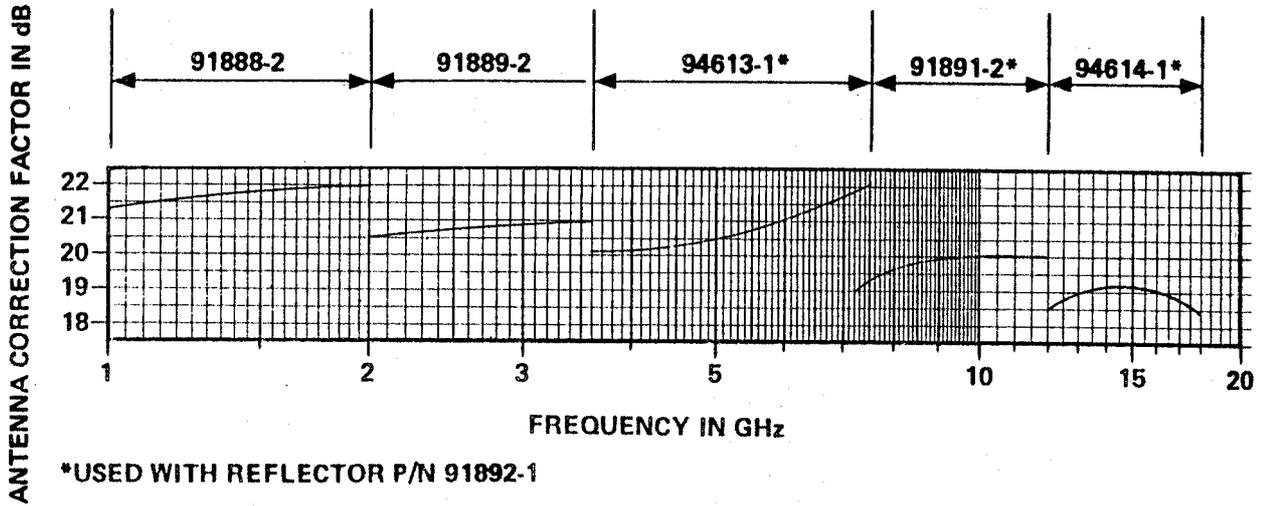


Figure 5-3. Antenna Correction Factors, 1-18 GHz Horn Antennas

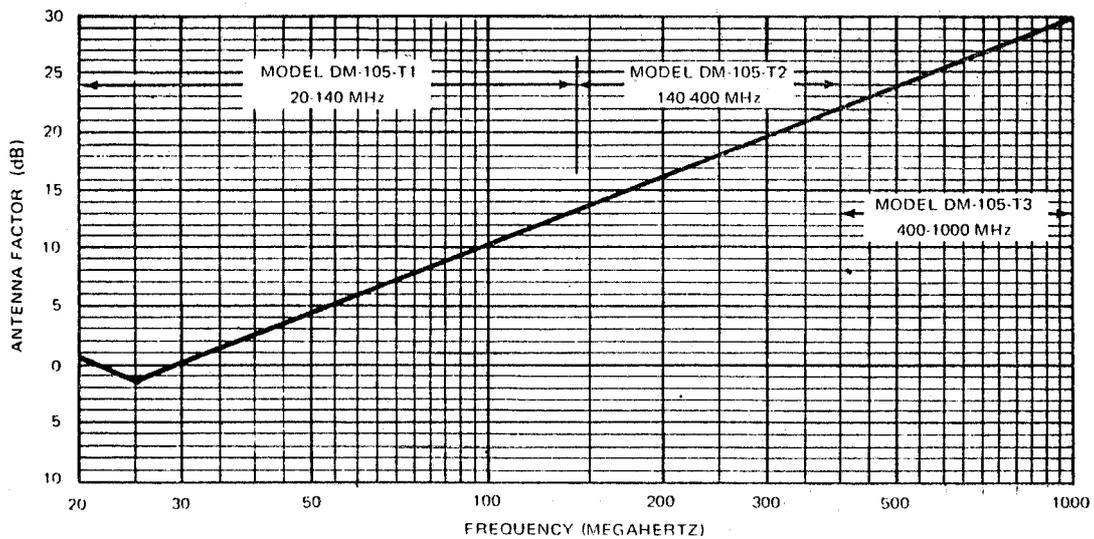


Figure 2-18. Antenna Factor Versus Frequency Characteristics, Models DM-105-T1, DM-105-T2 and DM-105-T3 Dipole Antennas

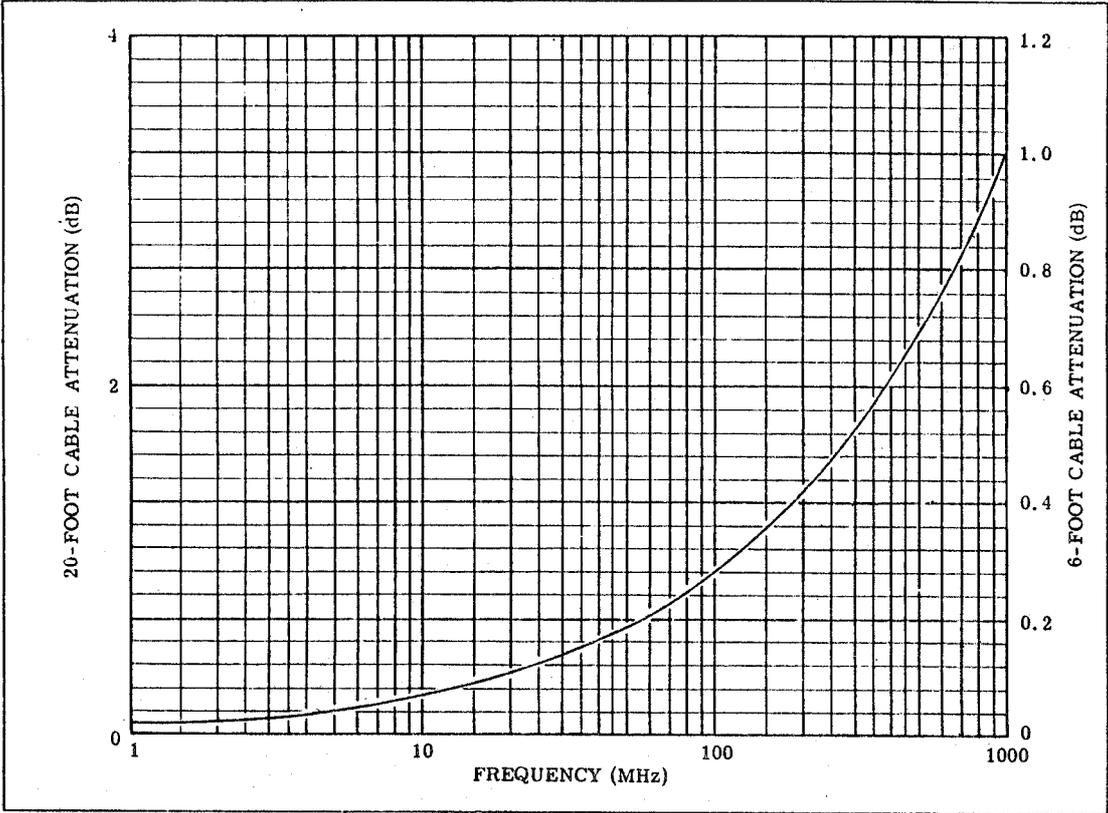


Figure 2-10. Attenuation Vs. Frequency for RG-55/U Coaxial Cable

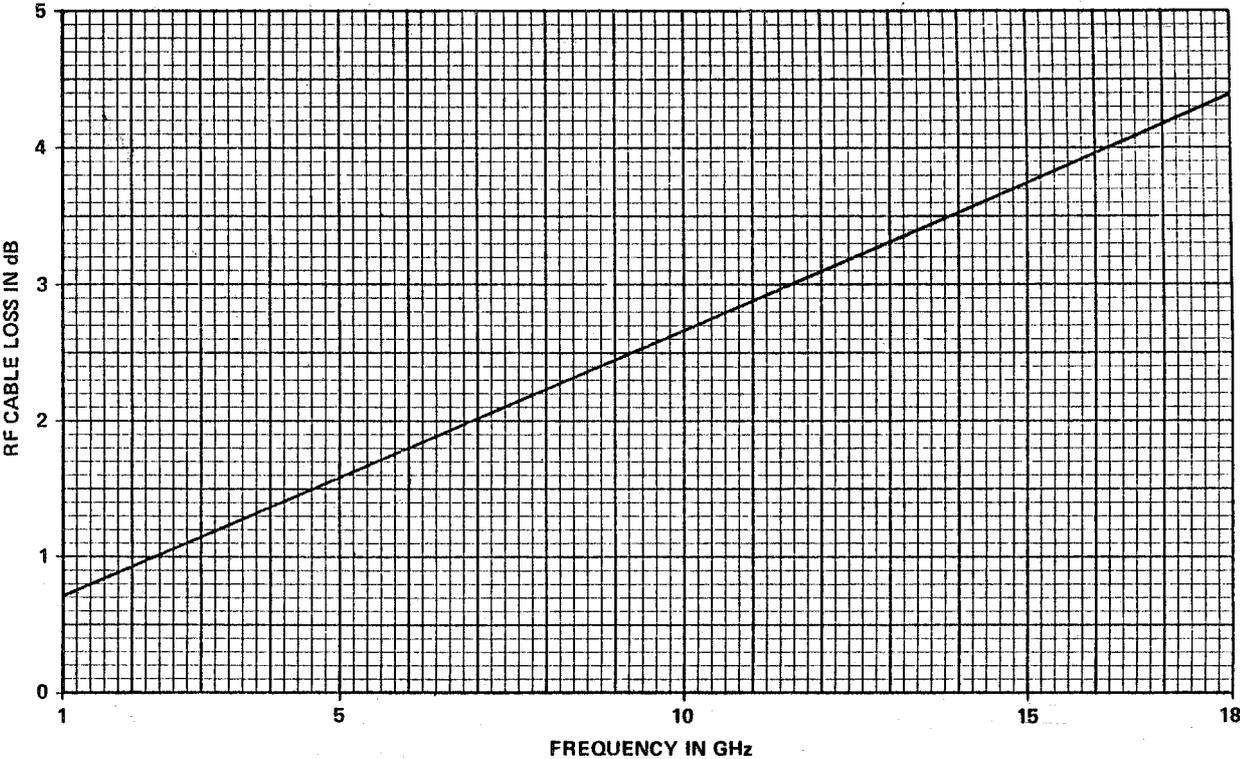


Figure 5-1. Model 94615-1 RF Cable Loss Chart

CALIBRATION CURVE

For Model NM-67

