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

FCC ID	:	APYDMR0138
Tested Product	:	Household Microwave Oven, Model R-220F
Input Power Rating	:	120 V ac, 60 Hz
Output Power Rating	:	800 W (IEC method)
Nominal Frequency	:	2450 MHz
Magnetron Type No.	:	2M231AH(L), Toshiba
Test Date	:	November 8 - 13, 2001

Tested by;

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

Reviewed by;

Y. Honkawa
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	:	1208 W
Power Developed in Dummy Load	:	576 W (by calorimetric method with 1000 ml water load, well heated microwave oven.)
Supply Voltage	:	120 V ac, 60 Hz
PERMISSIBLE	:	**26.83 uV/m at 300 m**

1. FREQUENCY MEASUREMENTS

FCC ID	:	APYDMR0138
TESTED UNIT	:	Household Microwave Oven, Model R-220F
Magnetron Type No.	:	2M231AH(L), mfd by Toshiba
Tested	:	November 8, 2001

(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)
96 (80%)	Upper: 2457 MHz Lower: 2410 MHz	Upper: 2500 MHz Lower: 2400 MHz
108 (90%)	Upper: 2462 MHz Lower: 2415 MHz	
120 (Nominal)	Upper: 2461 MHz Lower: 2427 MHz	
132 (110%)	Upper: 2460 MHz Lower: 2415 MHz	
150 (125%)	Upper: 2459 MHz Lower: 2422 MHz	

(2) Frequency VS Load Variation Test

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

Volume of Water (cc)	Frequency	Allowed Tolerance for the ISM Band (2450 MHz)
1000	Upper: 2461 MHz Lower: 2427 MHz	Upper: 2500 MHz Lower: 2400 MHz
800	Upper: 2468 MHz Lower: 2417 MHz	
600	Upper: 2468 MHz Lower: 2421 MHz	
400	Upper: 2465 MHz Lower: 2405 MHz	
200	Upper: 2461 MHz Lower: 2410 MHz	

2. RADIATED FIELD STRENGTH

DATA SHEET (FCC Measurement Procedure MP-5) **FCC ID: APYDMR0138**

Model R-220F **Magnetron: 2M231AH(L), mfd by Toshiba** **Date: November 9 - 13, 2001**

	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	2445	1000	Center	20.70	1.03	67	64	172.67	122.24
2nd Harmonic	4912	700	Center	20.50	1.58	10	10	0.40	0.40
	4907	700	R.F.Corner	20.50	1.58	10	10	0.40	0.40
	4905	300	Center	20.50	1.58	11	11	0.45	0.45
	4915	300	R.F.Corner	20.50	1.58	10	10	0.40	0.40
3rd Harmonic	7372	700	Center	19.20	2.10	16	17	0.73	0.82
	7351	700	R.F.Corner	19.20	2.10	18	13	0.92	0.52
	7364	300	Center	19.20	2.10	17	17	0.82	0.82
	7375	300	R.F.Corner	19.20	2.10	17	17	0.82	0.82
4th Harmonic	9846	700	Center	20.00	2.65	16	18	0.86	1.08
Sprious	2382	700	Center	20.70	1.01	28	28	1.89	1.89
	5332	700	Center	20.70	1.65	15	<10	0.74	<0.41
	6137	700	Center	21.20	1.82	11	18	0.50	1.12
	14726	700	Center	19.20	3.70	13	11	0.62	0.50
	17673	700	Center	18.50	4.32	15	11	0.78	0.49
Emission Sideband	2400	1000	Center	20.70	1.01	20	22	0.76	0.95
	2415	1000	Center	20.70	1.02	24	16	1.21	0.48
	2485	1000	Center	20.70	1.03	7	7	0.18	0.18
	2500	1000	Center	20.80	1.04	6	7	0.16	0.18

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 : 0.11 mW/cm^2

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

FCC ID	:	APYDMR0138
Tested Product	:	Household Microwave Oven, Model R-220F
Input Power Rating	:	120 V ac, 60 Hz
Output Power Rating	:	800 W (IEC method)
Nominal Frequency	:	2450 MHz
Magnetron Type No.	:	OM52S, mfd by Samsung
Test Date	:	November 14 - 16, 2001

Tested by;

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

Reviewed by;

Y. Honkawa
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	:	1230 W
Power Developed in Dummy Load	:	560.8W (by calorimetric method with 1000 ml water load, well heated microwave oven.)
Supply Voltage	:	120 V ac, 60 Hz
PERMISSIBLE	:	**26.45 uV/m at 300 m**

1. FREQUENCY MEASUREMENTS

FCC ID	:	APYDMR0138
TESTED UNIT	:	Household Microwave Oven, Model R-220F
Magnetron Type No.	:	OM52S, mfd by Samsung
Tested	:	November 14, 2001

(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)
96 (80%)	Upper: 2459 MHz Lower: 2421 MHz	Upper: 2500 MHz Lower: 2400 MHz
108 (90%)	Upper: 2463 MHz Lower: 2421 MHz	
120 (Nominal)	Upper: 2462 MHz Lower: 2421 MHz	
132 (110%)	Upper: 2463 MHz Lower: 2420 MHz	
150 (125%)	Upper: 2470 MHz Lower: 2425 MHz	

(2) Frequency VS Load Variation Test

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

Volume of Water (cc)	Frequency	Allowed Tolerance for the ISM Band (2450 MHz)
1000	Upper: 2462 MHz Lower: 2421 MHz	Upper: 2500 MHz Lower: 2400 MHz
800	Upper: 2468 MHz Lower: 2406 MHz	
600	Upper: 2468 MHz Lower: 2420 MHz	
400	Upper: 2467 MHz Lower: 2410 MHz	
200	Upper: 2462 MHz Lower: 2448 MHz	

2. RADIATED FIELD STRENGTH

DATA SHEET (FCC Measurement Procedure MP-5) **FCC ID: APYDMR0138**

Model R-220F **Magnetron: OM52S, mfd by Samsung** **Date: November 14 - 16, 2001**

	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	2445	1000	Center	20.70	1.03	65	64	137.15	122.24
2nd Harmonic	4913	700	Center	20.50	1.58	21	25	1.43	2.26
	4940	700	R.F.Corner	20.50	1.58	18	23	1.01	1.79
	4908	300	Center	20.50	1.58	15	28	0.71	3.19
	4929	300	R.F.Corner	20.50	1.58	19	22	1.13	1.60
3rd Harmonic	7378	700	Center	19.20	2.10	17	24	0.82	1.84
	7381	700	R.F.Corner	19.20	2.10	13	17	0.52	0.82
	7360	300	Center	19.20	2.10	15	21	0.65	1.30
	7377	300	R.F.Corner	19.20	2.10	14	17	0.58	0.82
4th Harmonic	9835	700	Center	20.00	2.65	15	13	0.76	0.61
Sprious	2365	700	Center	20.70	1.01	21	19	0.84	0.66
	2509	700	Center	20.80	1.04	23	20	1.13	0.80
Emission Sideband	2400	1000	Center	20.70	1.01	15	11	0.43	0.27
	2415	1000	Center	20.70	1.02	42	29	9.59	2.15
	2485	1000	Center	20.70	1.03	11	10	0.28	0.25
	2500	1000	Center	20.80	1.04	12	15	0.32	0.45

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 : 0.09 mW/cm^2

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

FCC ID	:	APYDMR0138
Tested Product	:	Household Microwave Oven, Model R-220F
Input Power Rating	:	120 V ac, 60 Hz
Output Power Rating	:	800 W (IEC method)
Nominal Frequency	:	2450 MHz
Magnetron Type No.	:	2M213, LG Electronics
Test Date	:	November 19 - 21, 2001

Tested by;

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

Reviewed by;

Y. Honkawa
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	:	1212 W
Power Developed in Dummy Load	:	548 W (by calorimetric method with 1000 ml water load, well heated microwave oven.)
Supply Voltage	:	120 V ac, 60 Hz
PERMISSIBLE	:	**26.17 uV/m at 300 m**

1. FREQUENCY MEASUREMENTS

FCC ID	:	APYDMR0138
TESTED UNIT	:	Household Microwave Oven, Model R-220F
Magnetron Type No.	:	2M213, mfd by LG Electronics
Tested	:	November 19, 2001

(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)
96 (80%)	Upper: 2453 MHz Lower: 2420 MHz	Upper: 2500 MHz Lower: 2400 MHz
108 (90%)	Upper: 2456 MHz Lower: 2429 MHz	
120 (Nominal)	Upper: 2454 MHz Lower: 2423 MHz	
132 (110%)	Upper: 2457 MHz Lower: 2422 MHz	
150 (125%)	Upper: 2462 MHz Lower: 2435 MHz	

(2) Frequency VS Load Variation Test

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

Volume of Water (cc)	Frequency	Allowed Tolerance for the ISM Band (2450 MHz)
1000	Upper: 2454 MHz Lower: 2423 MHz	Upper: 2500 MHz Lower: 2400 MHz
800	Upper: 2462 MHz Lower: 2419 MHz	
600	Upper: 2463 MHz Lower: 2424 MHz	
400	Upper: 2462 MHz Lower: 2411 MHz	
200	Upper: 2459 MHz Lower: 2443 MHz	

2. RADIATED FIELD STRENGTH

DATA SHEET (FCC Measurement Procedure MP-5) **FCC ID: APYDMR0138**

Model R-220F **Magnetron: 2M213, mfd LG Electronics** **Date: November 19 - 21, 2001**

	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	2437	1000	Center	20.70	1.03	68	68	193.14	193.14
2nd Harmonic	4902	700	Center	20.50	1.58	33	33	5.68	5.68
	4904	700	R.F.Corner	20.50	1.58	18	27	1.01	2.84
	4898	300	Center	20.50	1.58	33	38	5.68	10.09
	4912	300	R.F.Corner	20.50	1.58	21	37	1.43	9.00
3rd Harmonic	7354	700	Center	19.20	2.10	21	28	1.30	2.92
	7355	700	R.F.Corner	19.20	2.10	18	23	0.92	1.64
	7348	300	Center	19.20	2.10	33	34	5.19	5.82
	7357	300	R.F.Corner	19.20	2.10	20	28	1.16	2.92
4th Harmonic	9800	700	Center	20.00	2.65	<10	<10	<0.43	<0.43
Sprious	2392	700	Center	20.70	1.01	20	22	0.75	0.95
	5332	700	Center	20.70	1.65	15	<10	0.74	<0.41
	-	700	Center	-	-	-	-	-	-
	-	700	Center	-	-	-	-	-	-
	-	700	Center	-	-	-	-	-	-
Emission Sideband	2400	1000	Center	20.70	1.01	22	20	0.95	0.76
	2415	1000	Center	20.70	1.02	24	23	1.21	1.08
	2485	1000	Center	20.70	1.03	6	7	0.16	0.18
	2500	1000	Center	20.80	1.04	6	6	0.16	0.16

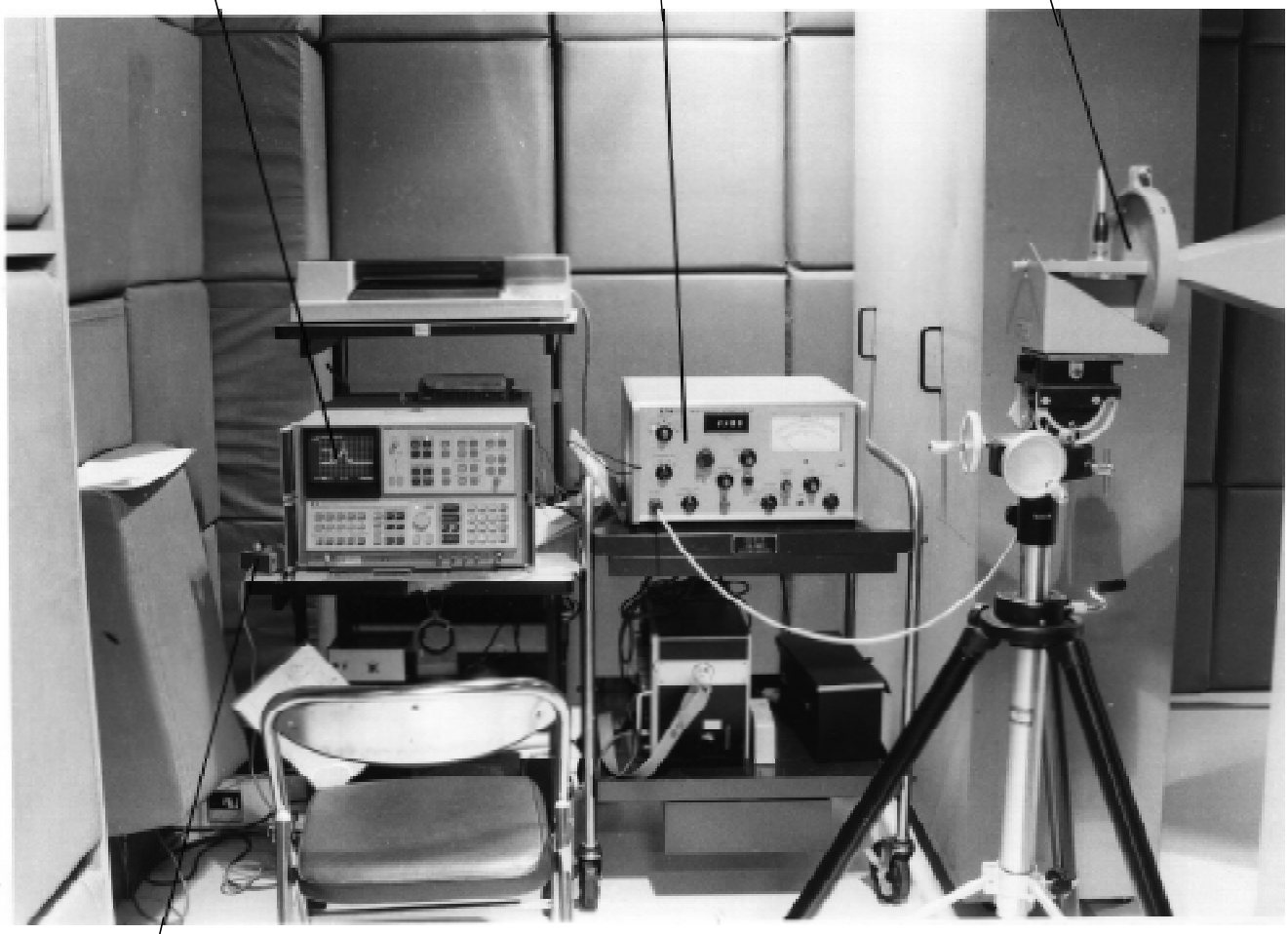
Emission observed from 100 MHz through 18 GHz by spectrum analyzer. No significant emission was detected except for above data.

Microwave Leakage at 5 cm on fundamental : 0.12 mW/cm^2

DESCRIPTION OF THE MEASUREMENT FACILITIES

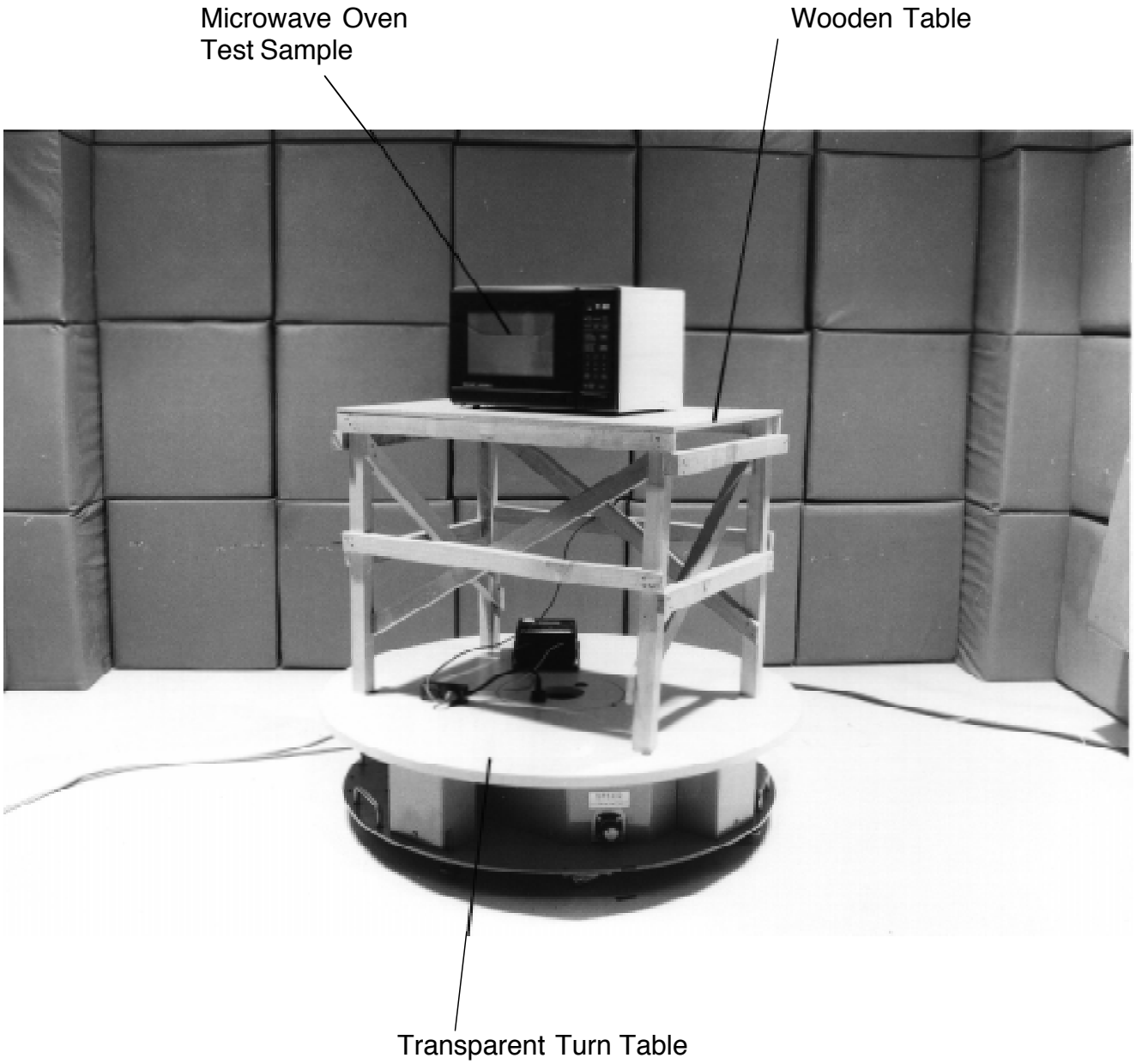
SHARP CORPORATION, KITCHEN APPLIANCE SYSTEMS DIVISION
EMI ANECHOIC CHAMBER

PHOTOGRAPH OF TEST EQUIPMENT #1

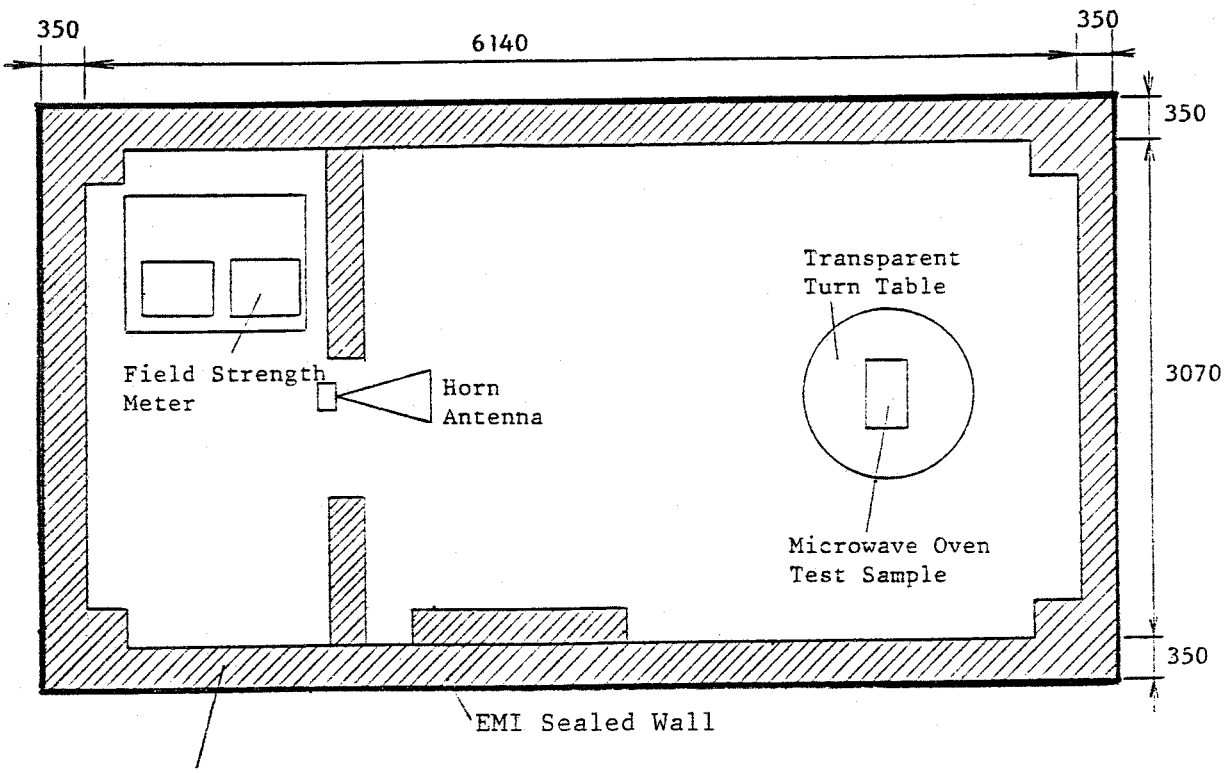


PHOTOGRAPH OF TEST EQUIPMENT #2

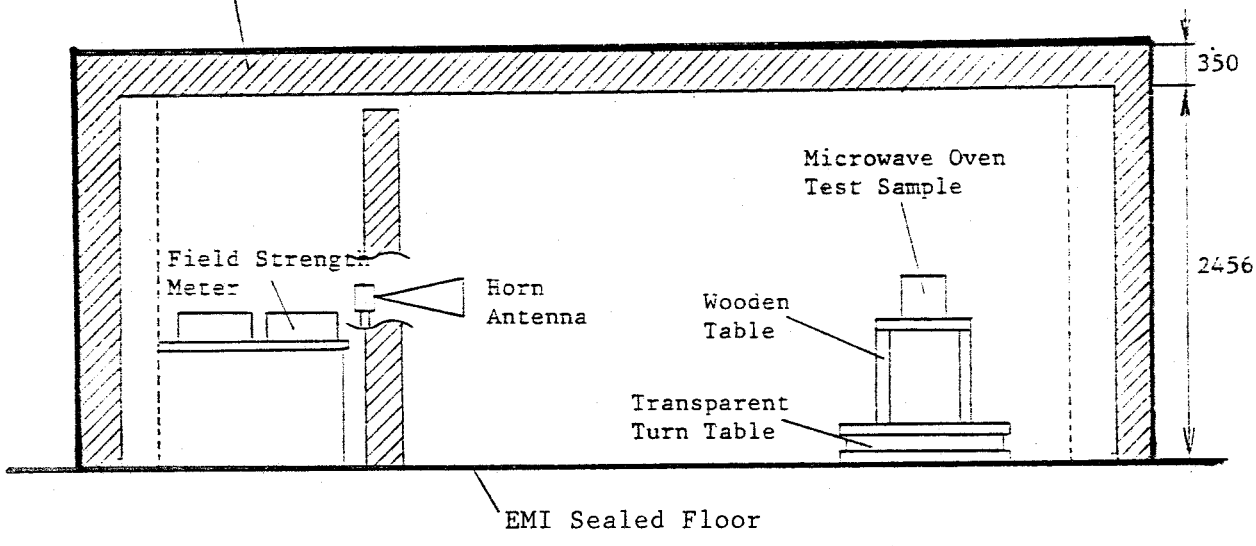
PHOTOGRAPH OF TEST EQUIPMENT #3



4. DIMENSIONS OF TEST SITE



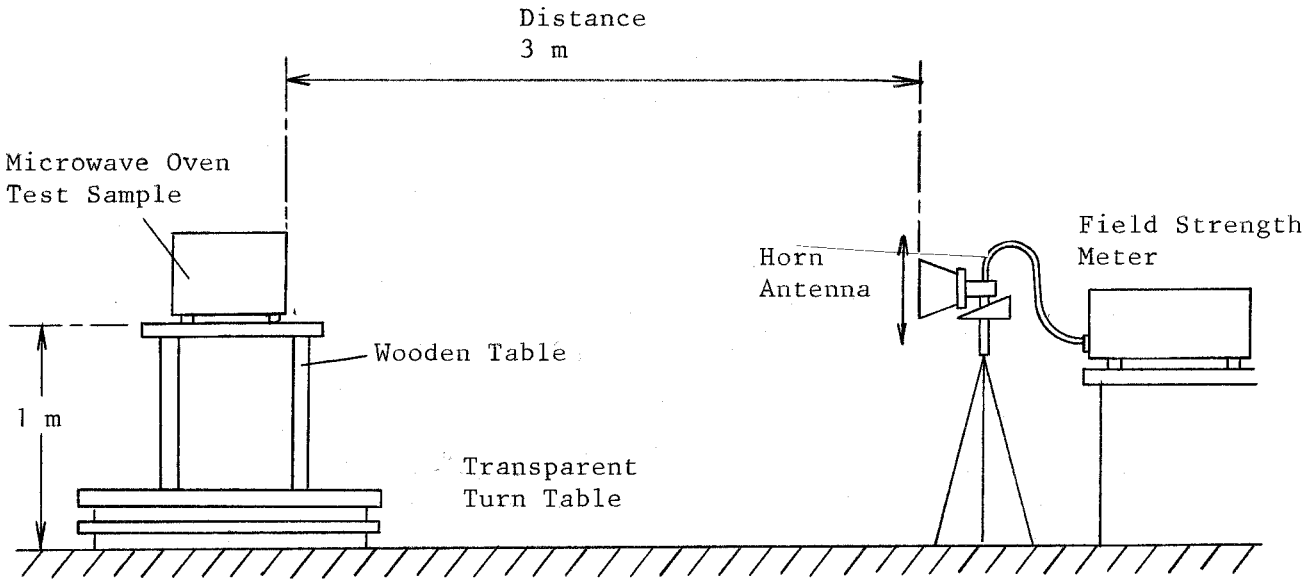
Electric Magnetic Wave Absover: Cat. No. AEP-12EM WP
Mfd by Advanced ElectroMagnetic, Inc.



(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

RANGE FOR FREQUENCY	ANTENNA
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

RANGE FOR FREQUENCY	CABLE
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 hight variation	From 1.1 m to 2.1 m
b) Antenna to test unit distance	3 m

CALCULATION OF RADIATED FIELD STRENGTH (uV/m)

$$Ef = 10^{\left(\frac{Fa + Fc + D}{20}\right)} * K$$

Ef : Radiated Field Strength at 300 m (uV/m)
Fa : Antenna Factor (dB)
Fc : 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)

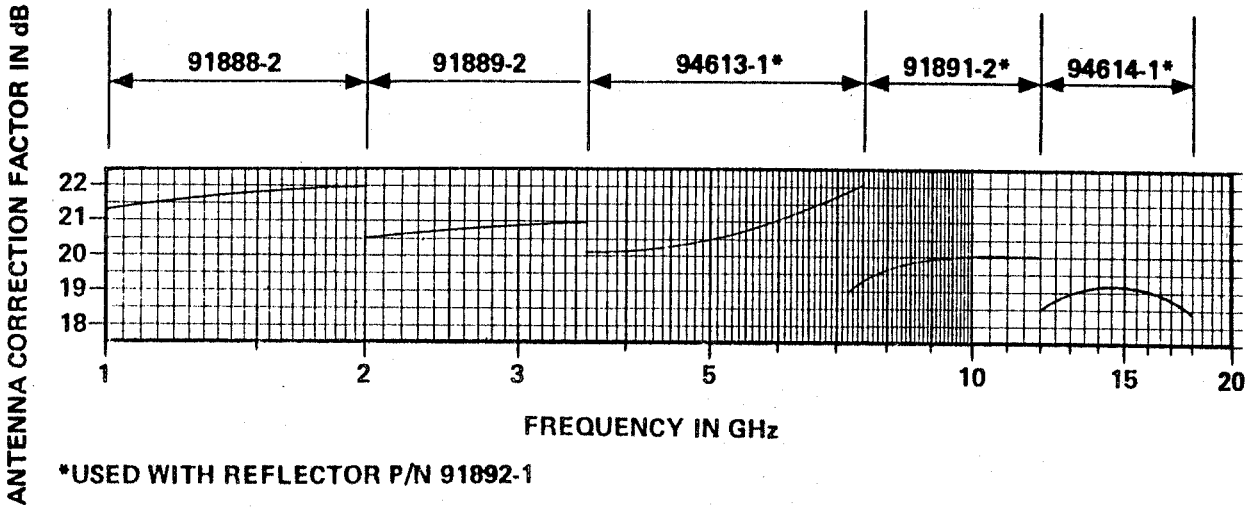


Figure 5-3. Antenna Correction Factors, 1-18 GHz Horn Antennas

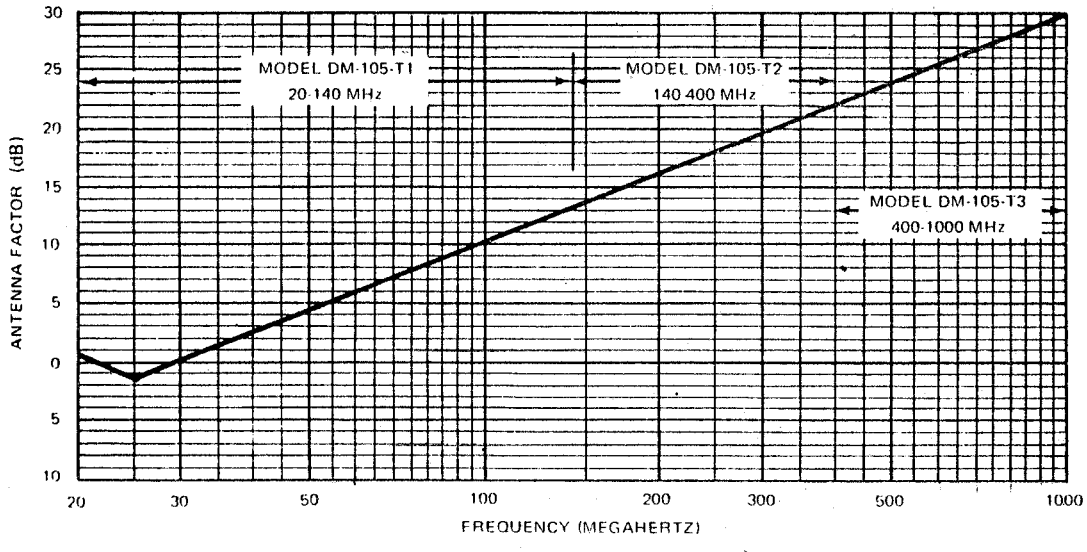


Figure 2-18. Antenna Factor Versus Frequency Characteristics, Models DM-105-T1, DM-105-T2 and DM-105-T3 Dipole Antennas

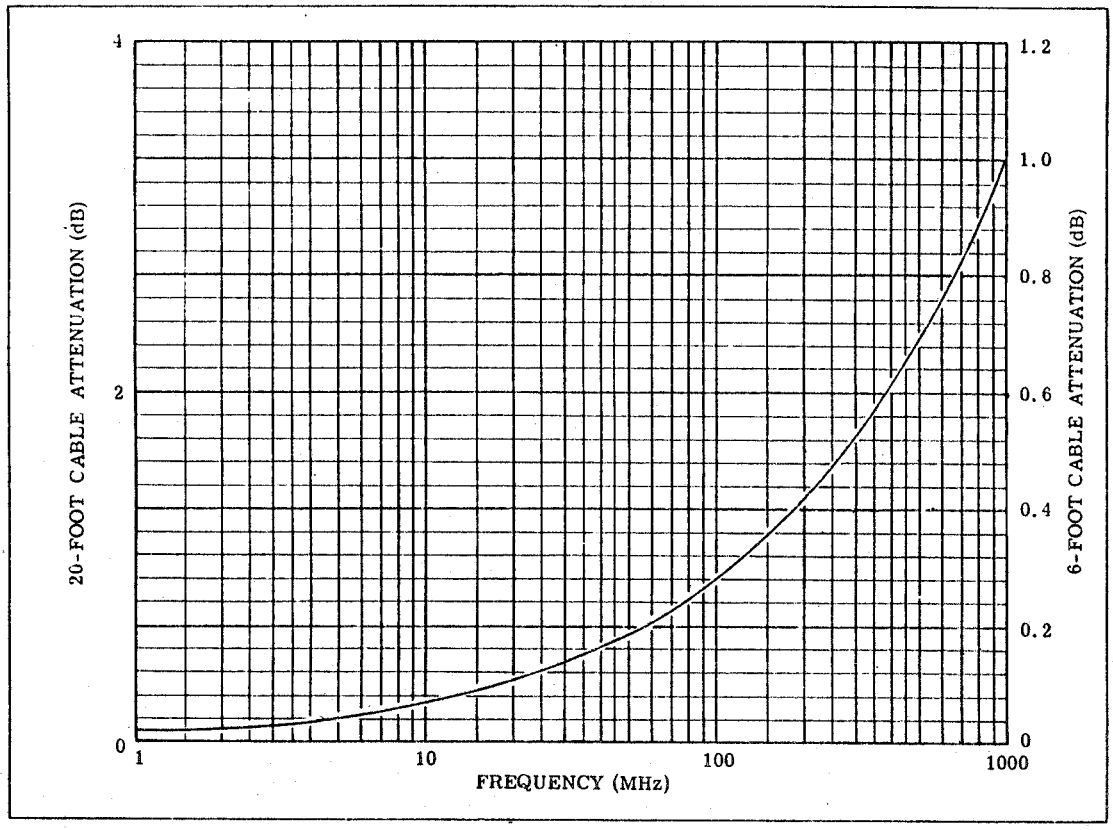


Figure 2-10. Attenuation Vs. Frequency for RG-55/U Coaxial Cable

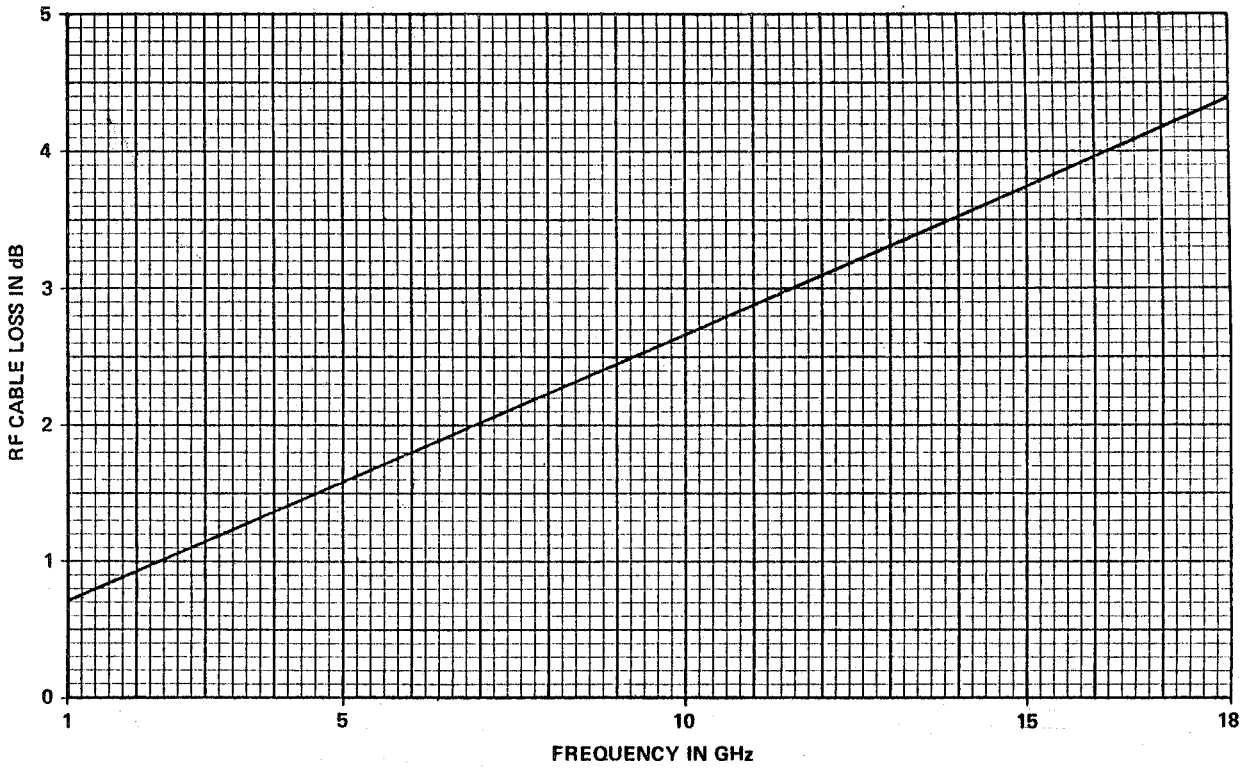


Figure 5-1. Model 94615-1 RF Cable Loss Chart

CALIBRATION CURVE

For Model NM-67