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

FCC ID	:	APYDMR0121
Name of Product	:	Household Microwave Oven
Model Number	:	R-410C
Input Power Rating	:	120 V ac, 60 Hz
Output Power Rating	:	1100 W
Nominal Frequency	:	2450 MHz
Magnetron Type No.	:	2M246, mfd by LG Electronics
Test Date	:	November 10 - 12, 1998

Tested by _____

Y. Honkawa, Engineer
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 attachment Data Sheet.

Measurement Test Site : Sharp Corporation
Kitchen Appliance Systems Division
Yao factory, EMI Anechoic Chamber

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

Total power input to oven	:	1685 Watts
Power developed in dummy load	:	956 Watts (Thermal method with 1500 ml water load, well heated microwave oven)
Supply Voltage	:	120 V ac, 60 Hz
PERMISSIBLE	:	34.56 uV/m at 300 m

1. FREQUENCY MEASUREMENTS

FCC ID	:	APYDMR0121
Tested Unit	:	Microwave Oven, Model R-410C
Magnetron Type No.	:	2M246, mfd by LG Electronics
Tested	:	November 12, 1998

(1) Frequency VS Line Voltage Variation Test

Test Result (Room Temperature: 20 degC)
Load: 1500 cc water in the glass beaker
(Note: Since the RF output power is rated 1100 watts (more than 1000 watts), the load was increased 50 %)

Line Voltage Variation (V)	Frequency against the tolerance for center frequency 2450 MHz	Allowed Tolerance for the ISM Band (2450 MHz)
96 (80%)	+21 MHz - 14 MHz	+/- 50 MHz
108 (90%)	+ 22 MHz - 10 MHz	
120 (Nominal)	+ 21 MHz - 27 MHz	
132 (110%)	+ 22 MHz - 10 MHz	
150 (125%)	+ 24 MHz - 7 MHz	

(2) Frequency VS Load Variation Test

Test Results (room temperature: 20 degC)
Initial Load: 1500 cc water in the glass beaker
(Note: Since the RF output power is rated 1100 watts (more than 1000 watts), the load was increased 50 %)

Volume of Water (cc)	Frequency against the tolerance for center frequency 2450 MHz	Allowed Tolerance for the ISM Band (2450 MHz)
1500	+ 21 MHz - 27 MHz	+/- 50 MHz
1200	+ 21 MHz - 9 MHz	
900	+ 26 MHz - 6 MHz	
600	+ 16 MHz - 2 MHz	
300	+ 12 MHz - 8 MHz	

2. RADIATED FIELD STRENGTH

DATA SHEET (FCC Measurement Procedure MP-5) **FCC ID: APYDMR0121**

Model R-410C **Magnetron: 2M246, mfd by LG Electronics** **Date: November 10-12, 1998**

	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	2466	1500	Center	20.70	1.03	82	85	978.80	1382.59
2nd Harmonic	4906	1050	Center	20.50	1.58	43	38	17.95	10.09
	4924	1050	R.F.Corner	20.50	1.58	41	36	14.26	8.02
	4922	450	Center	20.50	1.58	47	44	28.45	20.14
	4916	450	R.F.Corner	20.50	1.58	46	42	25.35	16.00
3rd Harmonic	7373	1050	Center	19.20	2.10	26	27	2.32	2.60
	7368	1050	R.F.Corner	19.20	2.10	28	29	2.92	3.27
	7388	450	Center	19.20	2.10	28	30	2.92	3.67
	7383	450	R.F.Corner	19.20	2.10	25	27	2.07	2.60
4th Harmonic	9813	1050	Center	20.00	2.62	25	25	2.40	2.40
Sprious F<1000, 4575<F	-	1050	Center	-	-	-	-	-	-
	-	1050	Center	-	-	-	-	-	-
Spurious 1000<F<4575	2553	1050	Center	20.80	1.04	24	24	1.29	1.29
	-	1050	Center	-	-	-	-	-	-
Emission Sideband	2400	1500	Center	20.70	1.01	29	32	2.13	3.01
	2415	1500	Center	20.70	1.02	35	37	4.28	5.39
	2485	1500	Center	20.70	1.03	21	22	0.88	0.99
	2500	1500	Center	20.80	1.04	21	22	0.89	1.00

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 : 0.06 mW/cm2

Since the RF output power rating is more than 1000 W, the load for measurment was increased 50%.

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

FCC ID	:	APYDMR0121
Name of Product	:	Household Microwave Oven
Model Number	:	R-410C
Input Power Rating	:	120 V ac, 60 Hz
Output Power Rating	:	1100 W
Nominal Frequency	:	2450 MHz
Magnetron Type No.	:	2M253J(L), mfd by Toshiba
Test Date	:	November 12 - 16, 1998

Tested by _____

Y. Honkawa, Engineer
Microwave Oven Engineering Dept.
Kitchen Appliance Systems Div.
Sharp Corp. (Yao factory)

DATA SUMMARY (FCC Measurement Procedure MP-5)

Radiated Field Strength	:	See attachment Data Sheet.
Frequency variation	:	See attached Data Sheet
Measurement Test Site	:	Sharp Corporation Kitchen Appliance Systems Division Yao factory, EMI Anechoic Chamber

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

Total power input to oven	:	1678 Watts
Power developed in dummy load	:	963 Watts (Thermal method with 1500 ml water load, well heated microwave oven)
Supply Voltage	:	120 V ac, 60 Hz
PERMISSIBLE	:	34.69 uV/m at 300 m

1. FREQUENCY MEASUREMENTS

FCC ID	:	APYDMR0121
Tested Unit	:	Microwave Oven, Model R-410C
Magnetron Type No.	:	2M253J(L), mfd by Toshiba
Tested	:	November 16, 1998

(1) Frequency VS Line Voltage Variation Test

Test Result (Room Temperature: 20 degC)
Load: 1500 cc water in the glass beaker
(Note: Since the RF output power is rated 1100 watts (more than 1000 watts), the load was increased 50 %)

Line Voltage Variation (V)	Frequency against the tolerance for center frequency 2450 MHz	Allowed Tolerance for the ISM Band (2450 MHz)
96 (80%)	+ 13 MHz - 14 MHz	+/- 50 MHz
108 (90%)	+ 14 MHz - 10 MHz	
120 (Nominal)	+ 15 MHz - 14 MHz	
132 (110%)	+ 14 MHz - 7 MHz	
150 (125%)	+ 15 MHz - 8 MHz	

(2) Frequency VS Load Variation Test

Test Results (room temperature: 20 degC)
Initial Load: 1500 cc water in the glass beaker
(Note: Since the RF output power is rated 1100 watts (more than 1000 watts), the load was increased 50 %)

Volume of Water (cc)	Frequency against the tolerance for center frequency 2450 MHz	Allowed Tolerance for the ISM Band (2450 MHz)
1500	+ 15 MHz - 14 MHz	+/- 50 MHz
1200	+ 14 MHz - 24 MHz	
900	+ 17 MHz - 15 MHz	
600	+ 9 MHz - 6 MHz	
300	+ 8 MHz - 15 MHz	

2. RADIATED FIELD STRENGTH

DATA SHEET (FCC Measurement Procedure MP-5) **FCC ID: APYDMR0121**

Model R-410C **Magnetron: 2M253J(L), mfd by Toshiba** **Date: November 12-16, 1998**

	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	2457	1500	Center	20.70	1.03	82	83	975.46	1094.48
2nd Harmonic	4905	1050	Center	20.50	1.58	37	34	9.00	6.37
	4925	1050	R.F.Corner	20.50	1.58	33	28	5.68	3.19
	4905	450	Center	20.50	1.58	34	34	6.37	6.37
	4897	450	R.F.Corner	20.50	1.58	35	28	7.15	3.19
3rd Harmonic	7363	1050	Center	19.20	2.10	33	32	5.19	4.62
	7325	1050	R.F.Corner	19.20	2.10	32	34	4.62	5.82
	7369	450	Center	19.20	2.10	32	32	4.62	4.62
	7342	450	R.F.Corner	19.20	2.10	34	35	5.82	6.53
4th Harmonic	9816	1050	Center	20.00	2.62	44	45	21.43	24.04
Sprious F<1000, 4575<F	14717	1050	Center	19.20	3.56	36	38	8.67	10.91
	17169	1050	Center	18.60	4.20	31	38	4.90	10.97
Spurious 1000<F<4575	2378	1050	Center	20.70	1.00	25	24	1.33	1.19
	1348	1050	Center	21.80	0.80	29	27	1.06	0.84
Emission Sideband	2400	1500	Center	20.70	1.01	34	36	3.79	4.77
	2415	1500	Center	20.70	1.02	38	40	6.05	7.61
	2485	1500	Center	20.70	1.03	23	24	1.11	1.24
	2500	1500	Center	20.80	1.04	28	26	2.00	1.59

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

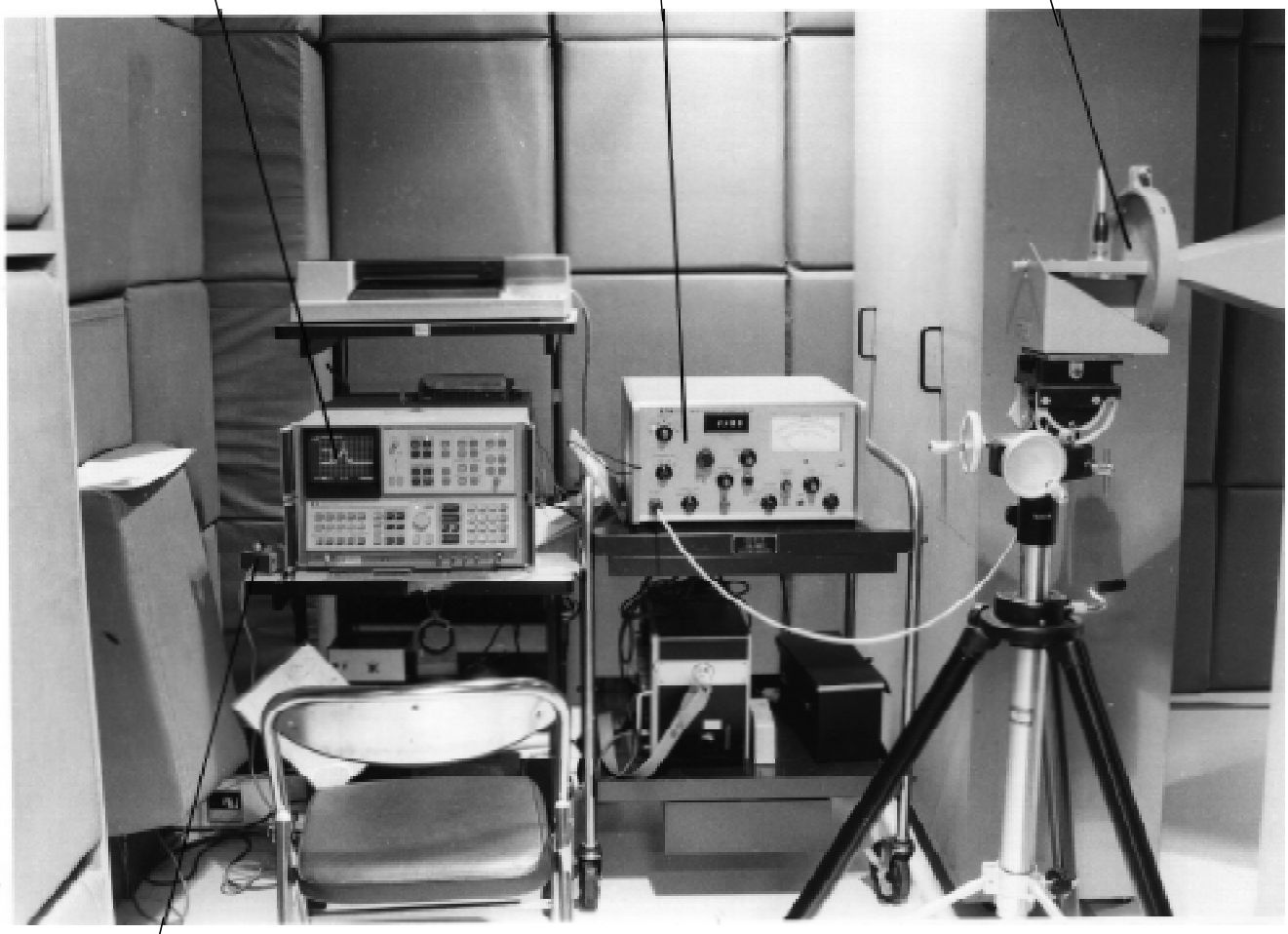
Microwave Leakage at 5 cm on fundamental : 0.07 mW/cm2

Since the RF output power rating is more than 1000 W, the load for measurment was increased 50%.

DESCRIPTION OF THE MEASUREMENT FACILITIES

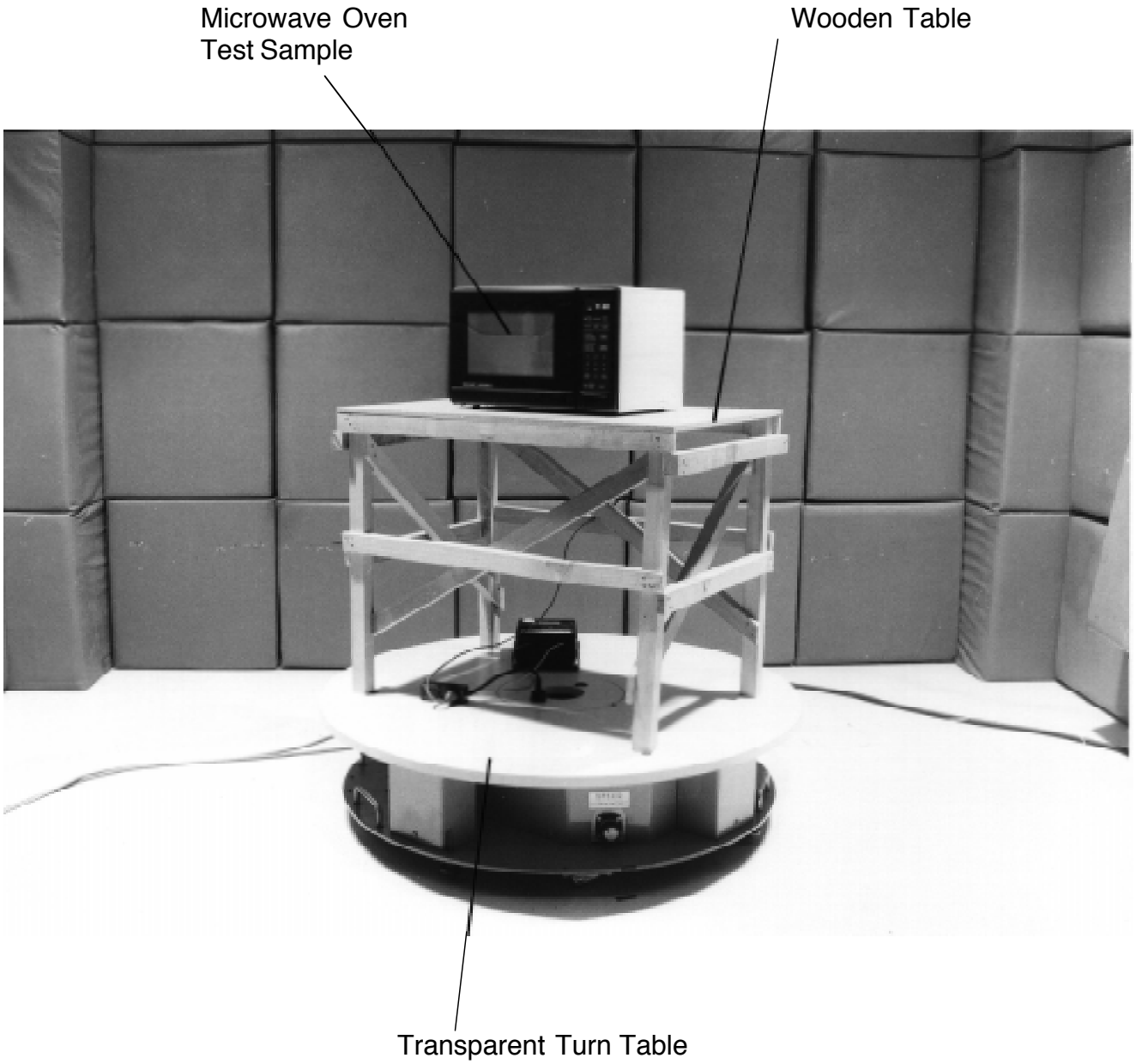
SHARP CORPORATION, KITCHEN APPLIANCE SYSTEMS DIVISION
EMI ANECHOIC CHAMBER

PHOTOGRAPH OF TEST EQUIPMENT #1

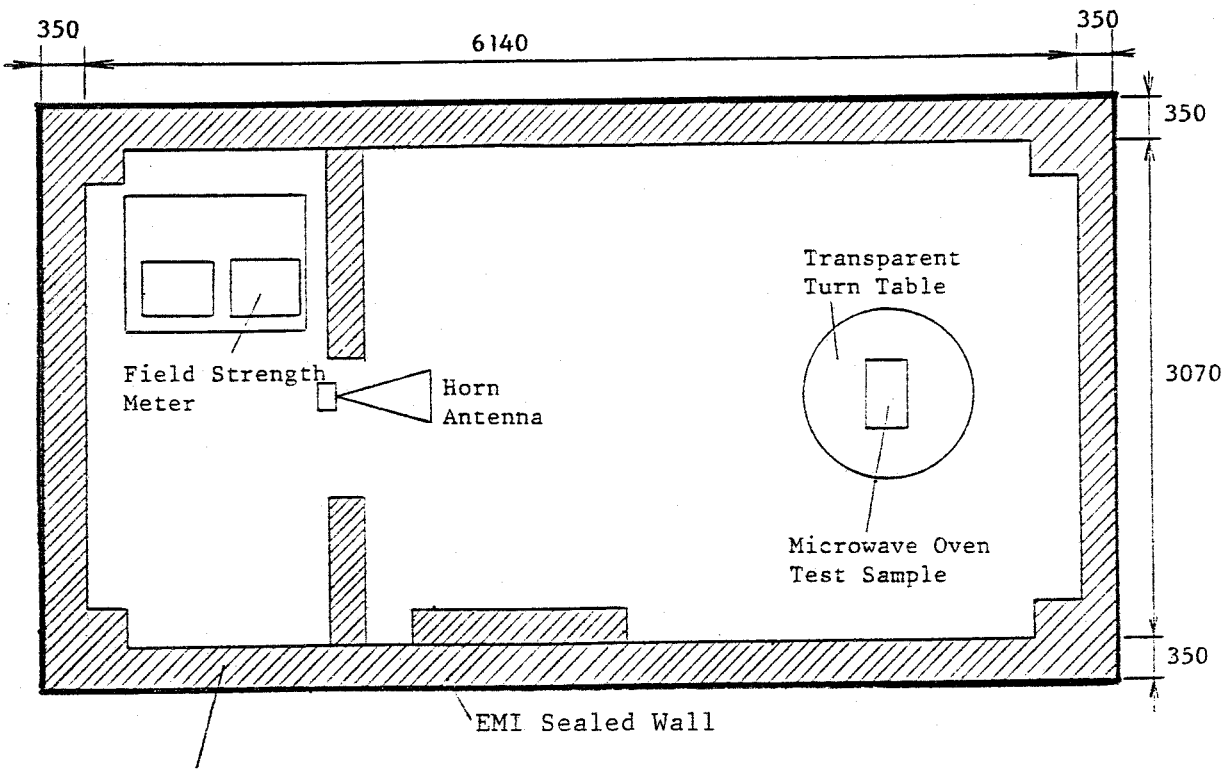


PHOTOGRAPH OF TEST EQUIPMENT #2

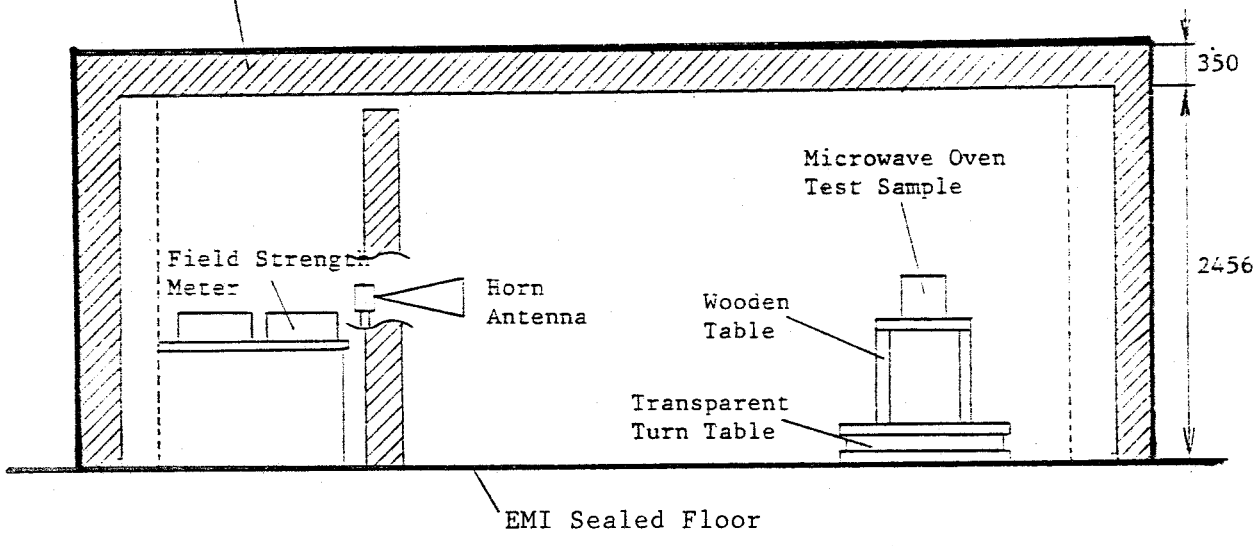
PHOTOGRAPH OF TEST EQUIPMENT #3



4. DIMENSIONS OF TEST SITE



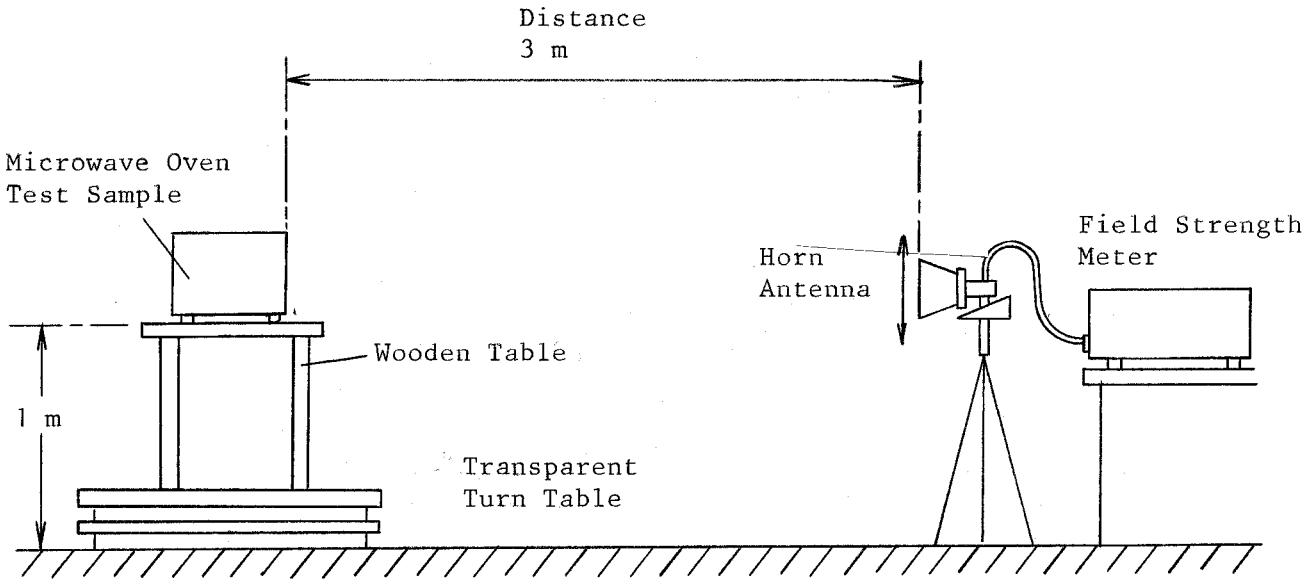
Electric Magnetic Wave Absover: Cat. No. AEP-12EM WP
Mfd by Advanced ElectroMagnetic, Inc.



(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 14, 1998

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

BANDWIDTH	10 MHz
DETECTOR FUNCTION	Linear average value; Field Intensity
CALIBRATION DATE	July 17, 1998

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)

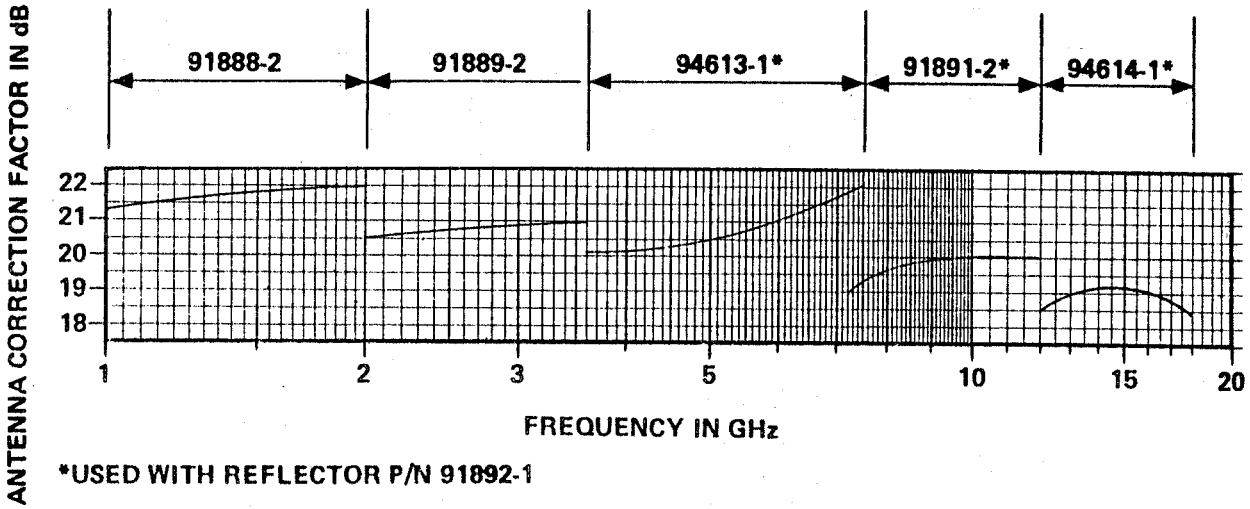


Figure 5-3. Antenna Correction Factors, 1-18 GHz Horn Antennas

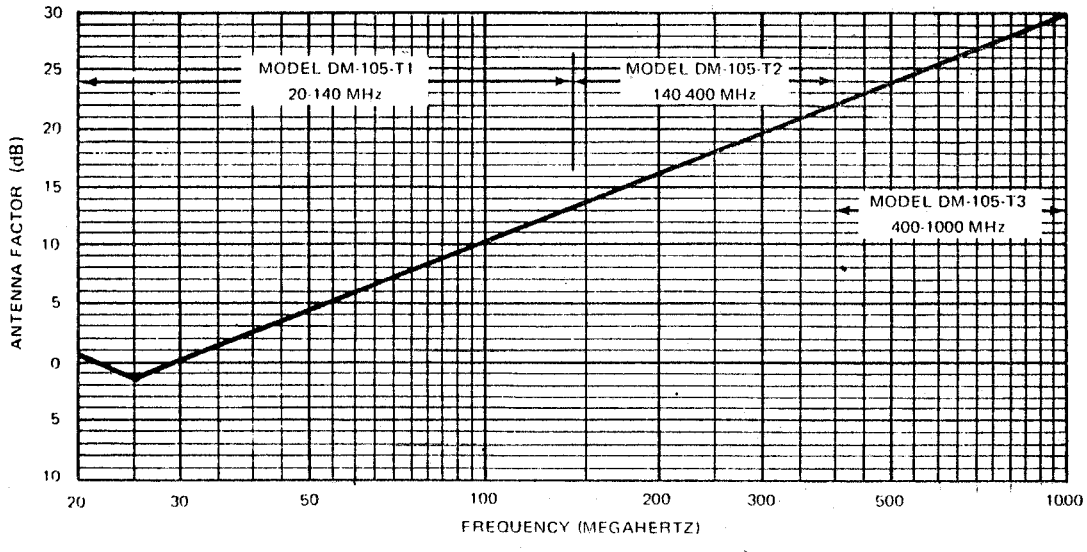


Figure 2-18. Antenna Factor Versus Frequency Characteristics, Models DM-105-T1, DM-105-T2 and DM-105-T3 Dipole Antennas

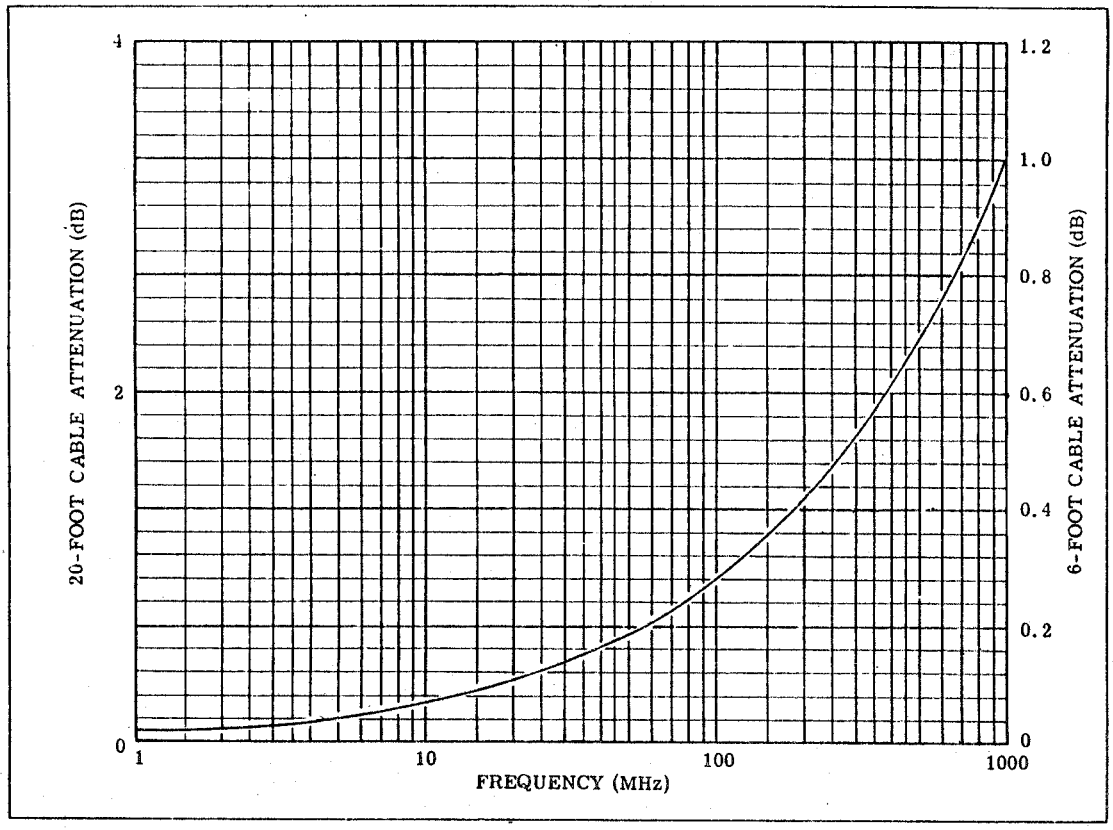


Figure 2-10. Attenuation Vs. Frequency for RG-55/U Coaxial Cable

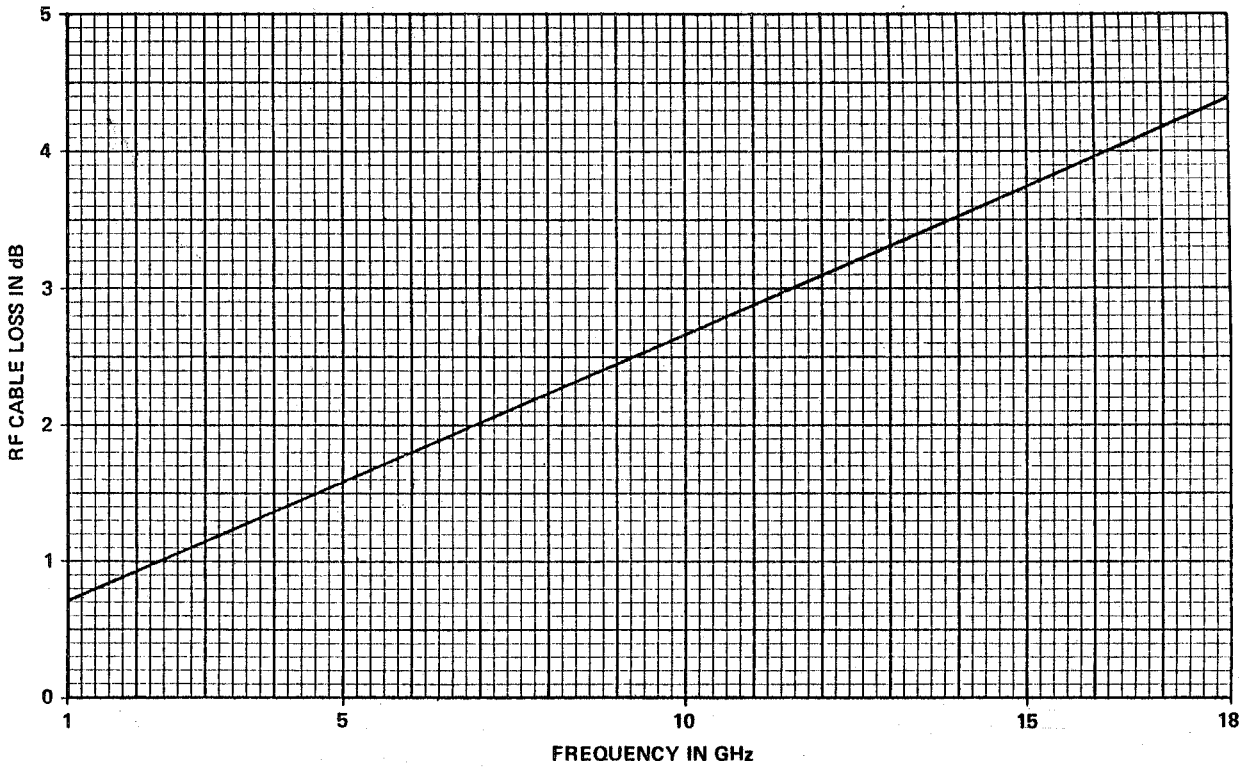


Figure 5-1. Model 94615-1 RF Cable Loss Chart

CALIBRATION CURVE

For Model NM-67