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FCC TEST REPORT FOR

APPLICANT : DUAL TECHNOLOGY CORPORATION.
ADDRESS : 9F, 48, NAN-KANG ROAD, SEC. 3,
TAIPEI, TAIWAN, R. O. C.
EUT : NOTEBOOK PC
MODEL NO. : MRA-2000
FCC ID : G3LMRA-2000

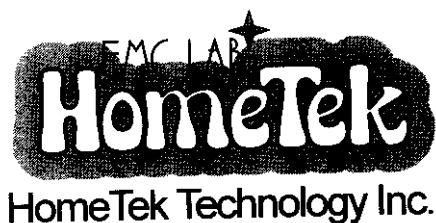
Under Part 15, SUBPART B. CLASS B Certification

PREPARED BY :

HomeTek Technology Inc.

No. 85-5, Shir Men Road, Tu Cheng City,
Taipei Hsien. TAIWAN, R. O. C.

Report # : FB7J012



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TEST REPORT CERTIFICATION

EUT : NOTEBOOK PC
MODEL NO. : MRA-2000
FCC ID : G3LMRA-2000
Final Test Date : 10/20/98
APPLICANT : DUAL TECHNOLOGY CORPORATION.
ADDRESS : 9F, 48, NAN-KANG ROAD, SEC. 3,
TAIPEI, TAIWAN, R. O. C.

MEASUREMENT PROCEDURE USED :

PART 15 SUBPART B OF FCC RULES AND REGULATIONS
(47 CFR PART 15) FCC / ANSI C63.4-1992

WE HEREBY SHOW THAT :

THE MEASUREMENT SHOWN IN THE ATTACHMENT WERE MADE IN ACCORDANCE
WITH THE PROCEDURES INDICATED, AND THE MAXIMUM ENERGY EMITTED BY THE
EQUIPMENT WAS FOUND TO BE WITHIN THE FCC LIMITS APPLICABLE.

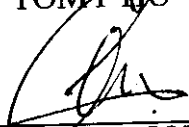
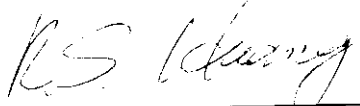
TEST ENGINEER :  DATE : 11/11/98
TOMY HU
CHECK BY :  DATE : 11/11/98
JOSEPH CHOU
APPROVED BY :  DATE : 11/11/98
R.S. HUANG/Manager



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APPENDIX A

CIRCUIT (BLOCK) DIAGRAM

APPENDIX B

USER'S MANUAL

GENERAL INFORMATION

1 APPLICANT : DUAL TECHNOLOGY CORPORATION.
2 ADDRESS : 9F, 48, NAN-KANG ROAD, SEC. 3,
TAIPEI, TAIWAN, R. O. C.

3 MANUFACTURER : DUAL TECHNOLOGY CORPORATION.
4 ADDRESS : NO. 8, LANE 97, WU-KUNG RD.,
WU-KU INDUSTRIAL PARK,
TAIPEI HSIEN, TAIWAN, R.O.C.

5 DESCRIPTION OF EUT :

EUT : NOTEBOOK PC
FCC ID : G3LMRA-2000
Model Number : MRA-2000
Serial # : N/A
Data Cable : SHIELDED
Power Cord : UN-SHIELDED
Power Supply Type : ADAPTOR



6 FEATURES OF EUT :

Processor

- Mobile Module Pentium II 266/300MHz
- Intel 440BX PCI chipset and 443BX Host Bridge Controller

System Memory

- 2-Slot 144-Pin / 64-bit Access SO-DIMM Memory Module
- 3.3 Voltage FPM / EDO RAM and SDRAM Module Support
- 8, 16, 32, 64, 128 up to 256MB user expandable

Cache Memory

- Internal L1/L2 cache
- External 512KB Pipeline Burst Mode

Indicators

- Power-on, suspend to RAM
- Battery Charging, Caps Lock, Scroll Lock, Num Lock
- Battery Gauge, Battery Low Warning, FDD/LS-120, CD-ROM/DVD-ROM, HDD and PCMCIA

Power Management

- APM 1.2 Standard Compliant
- Full On, Sleep, Suspend to DRAM and Suspend to Disk
- Auto Suspend on Low-Low Battery
- Accurate Status LED Fuel Gauge
- ACPI Platform Solution for PC 98 Standard

Disk Storage

- 1.44MB 3.5" FDD module
- 5.25" 24 x CD-ROM module
- 12.7mm height 2.5" HDD module
- 2-speed DVD-ROM & LS-120 (optional)

Display

- 15.0" TFT XGA
- 1024 X 768 X 16.7M True Color
- Built-in CCD Image Sensor Camera 704 X 480 at 30 fps
- 128/256-bit GUI Engine



- One Zoomed video port
- 2.5MB or 4.5MB NMG6 SGRAM (optional)
- Embedded Software MPEGII

Audio

- ESS Maestro-2M PCI Audio Accelerator Chipset
- Built-in 3D audio sound effects with integrated 3-D spatializer
- 64-Voice, 4MB Pipelined Wavetable Synthesizer
- 16-bit Stereo Sound and an AC '97 CODEC interface
- Built-in microphone
- Sound Blaster Pro compatible and Software Wavetable support
- 2 Encased Internal Rare Earth Speakers
- Three Audio Power Amplifiers
- AudioDrive Digital Mixer
- Built-in Jacks for Line-out, Line-in, and Mic-in

Security

- System/Setup Password
- Power on Password
- Kensington Security Lock

Keyboard/Pointing Device

- 86 keys, Microsoft Windows 95 compatible, multiple language
- All keyboards come with hot-key functions and Win95 keys
- Touchpad pointing device

PCMCIA Interface

- PCMCIA 2.1 Standard Compliant
- Has one Type III or two Type II PCMCIA slots
- Supports one ZV port
- Supports CardBus

I/O Ports

- IrDA compatible FIR port
- Two USB ports
- One RS-232 serial port
- External VGA port
- EPP/ECP/SPP 25-pin parallel port
- One PS/2 port / One PS/2 keyboard port



- TV-out (S-video)
- Line-out, Line-in, and Mic-in jacks
- RCA Jack for Composite Video
- AC-in
- RJ-11 Jack

Battery

- Fuel gauge on battery pack
- Smart battery compliant
- Built-in safety mechanisms
- Battery Life: Li-Ion 4-5hrs.

AC Adapter

- 2-pin Power Cord
- 60W, 90V~264V full range and auto-sensing AC adapter
- Universal input, Auto switching

Options

- Additional battery pack
- DVD-ROM
- LS-120 Disk Drive

Dimensions

- 13.3"(W) x 11.46"(D) x 1.93"(H)
338(W) x 291(D) x 49(H)mm
- 3.5kg (7.7lbs) without battery

MODIFICATION LIST

THE FOLLOWING ACCESSORIES WERE ADDED TO THE EUT DURING TESTING :

1. The Enclosure Case
 - a. This is a nickel-electroplated housing case.
2. The Gaskets
 - a. A gasket are added on the case opposite the audio jacks.
 - b. A gasket are added on the USB Port.
3. The Shielding Cables
 - a. The LCD wire cable is shielded and screwed by two ground pads.
 - b. The INVERTER wire cable is shielded.
 - c. The internal microphone wire cable is shielded.
 - d. The CCD wire cable is shielded and screwed by one ground pads.
4. The Cores
 - a. A cores are added on the LCD wire cable at the motherboard end.
 - b. A cores are added on the INVERTER cable at the motherboard end.
 - c. A cores are added on the internal microphone wire cable at the motherboard end.
 - d. A cores are added on the CCD wire cable at the motherboard end.
5. The Metal Spring Fingers
 - a. A metal spring finger is added on the Audio jacks.
 - b. A metal spring finger is added on the TV-Out connector.
6. The Metal Covers
 - a. A metal cover is added on CPU board.
 - b. A metal cover is added on AUDIO board.
 - c. A metal cover is added on the PCMCIA slot.
 - d. A metal cover is added on the LCD.
7. Two jump wires is added on the motherboard that it is used for the layout error and not an EMI solution.

CONDUCTED POWER LINE TEST

1 TEST INSTRUMENTS & FACILITIES

The following test Instruments was used during the conducted test :

Item	Instruments/ Facilities	Specification	Manufacturer	Model # / S/N#	Date Of Cal.
1	EMI Receiver	9KHz ~ 30MHz	ROHDE & SCHWARZ	ESHS 30 844827/007	FEB/98
2	LISN	50 Ω /50uH/100A 9KHz ~ 30MHz	SCHWARZ BECK	NNLK 8121 8121370	FEB/98
3	LISN	9KHz ~ 30MHz	ROHDE & SCHWARZ	ESH3-Z5 846128/007	FEB/98
4	Signal Generator	9KHz ~ 2080MHz	ROHDE & SCHWARZ	SMY02 845096/018	FEB/98
5	Pulse Limiter	9KHz ~ 30MHz	ROHDE & SCHWARZ	ESH3Z2 357.8810.52	N/A

Note : All equipment upon which need to calibrated are with period of 1 year.

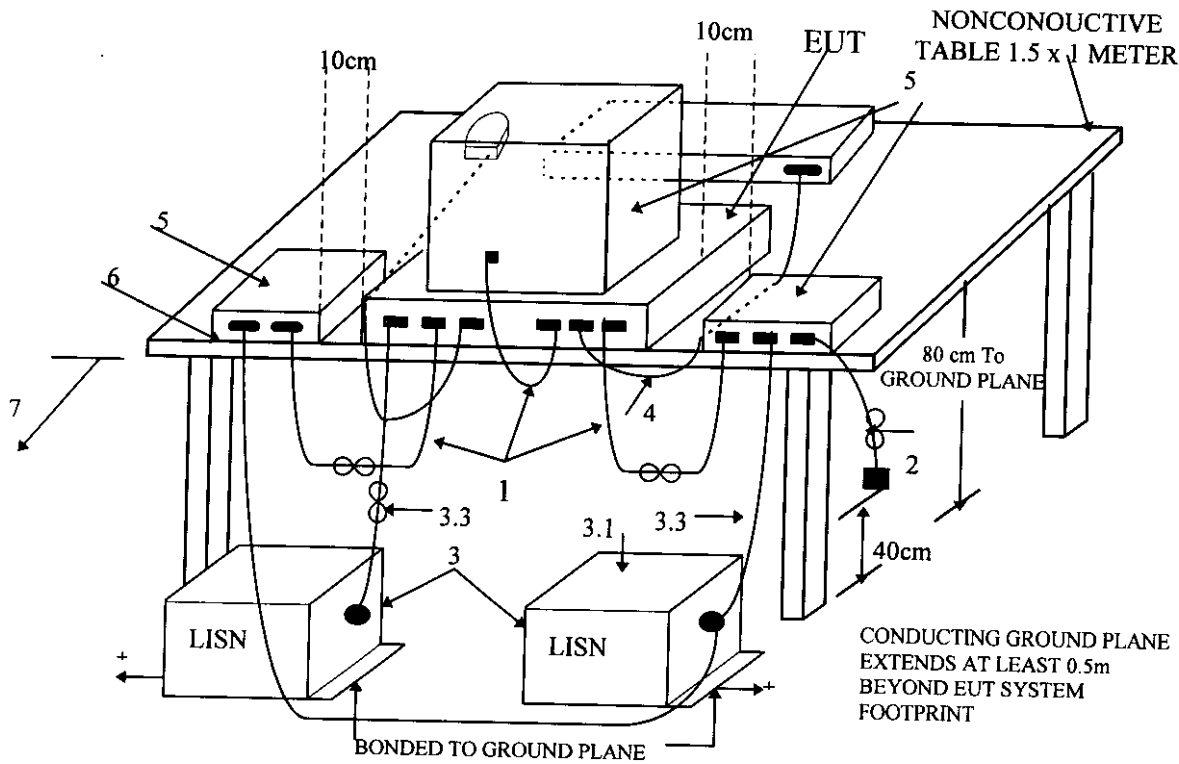
2 TEST PROCEDURE

- 2.1 The EUT was tested according to **ANSI C63.4 - 1992**.
- 2.2 The EUT was placed 0.4 meter from the conducting wall of shielding room and kept at least 0.8 meter from any other grounded conducting surface.
- 2.3 The frequency range form 0.45 MHz to 30 MHz was investigated.
- 2.4 The LISN used was 50 Ohm / 50 uHenry as specified by Section 5.1 of **ANSI C63.4 - 1992**.
- 2.5 All the support peripherals are connect to the other LISN.
- 2.6 Cables and peripherals were moved to find the maximum emission levels for each frequency.

3 TEST SETUP

3.1 Typical : Setup Of Conducted Test

ELECTRICAL AND ELECTRONIC EQUIPMENT IN THE RANGE OF 9kHz TO 40 GHz ANSI C63.4-1992



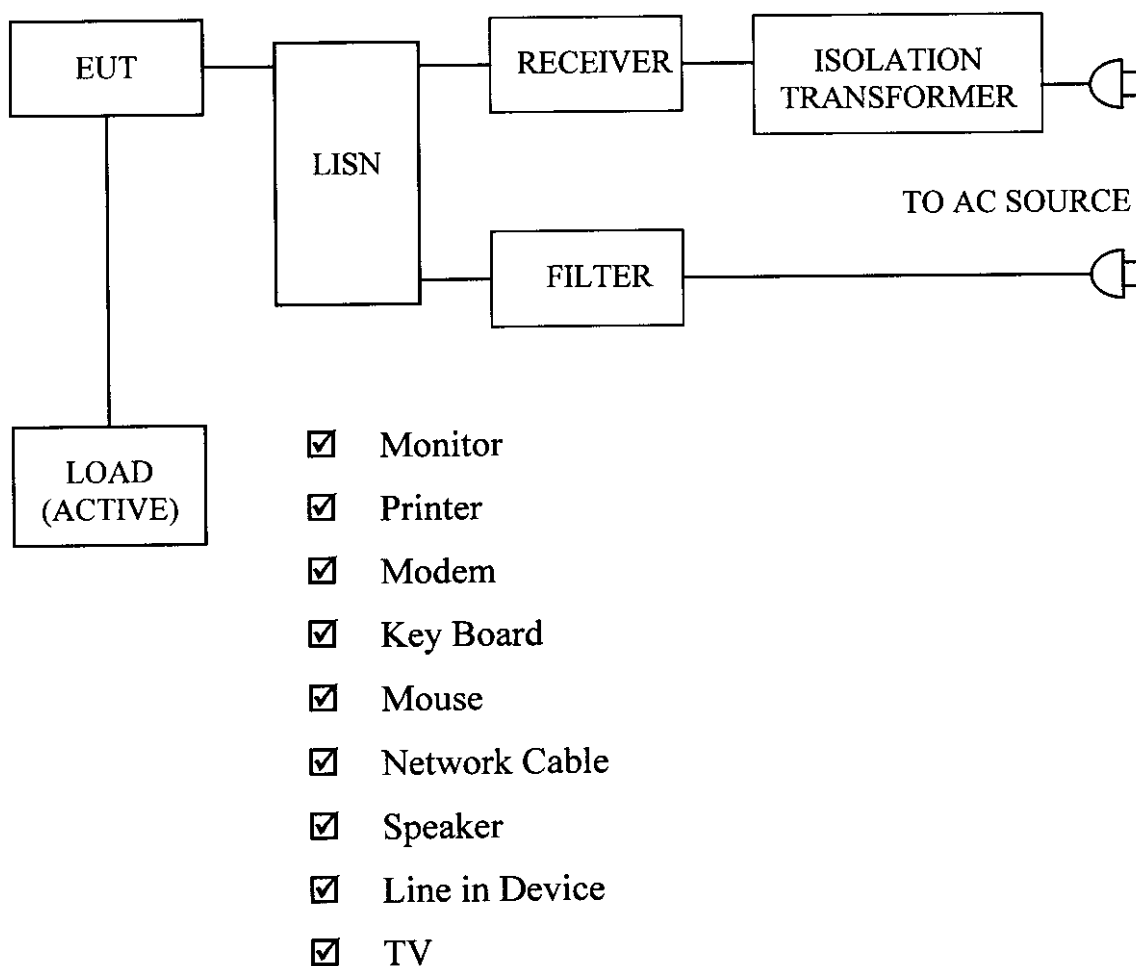
+LISNs may have to be moved to the side to meet 3.3 below.

LEGEND:

1. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 to 40 cm long, hanging approximately in the middle between ground plane and table.
2. I/O cables that are connected to a peripheral shall be bundled in center. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1m.
3. EUT connected to one LISN. Unused LISN connectors shall be terminated in 50 Ω . LISN can be placed on top of, or immediately beneath, ground plane.
 - 3.1 All other equipment powered from second LISN.
 - 3.2 Multiple outlet strip can be used for multiple power cords of non-EUT equipment.
 - 3.3 LISN at least 80 cm from nearest part of EUT chassis.
4. Cables of hand-operated devices, such as keyboards, mice, etc., have to be placed as close as possible to the host.
5. Non-EUT components being tested.
6. Rear of EUT, including peripherals, shall be all aligned and flush with rear of tabletop.
7. Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the floor ground plane (see 5.2).

Test Configuration Tabletop Equipment Conducted Emission

3.2 Block Diagram Of Conducted Test



4 CONFIGURATION OF THE EUT

The EUT was configured according to **ANSI C63.4 - 1992**. All I/O ports were connected to the appropriate peripherals. All peripherals and cables are listed below (including internal device) :

4.1 EUT

Device	:	NOTEBOOK PC
Manufacturer	:	DUAL
Model Number	:	MRA-2000
Serial Number	:	N/A
FCC ID	:	G3LMRA-2000
Data Cable	:	Shielded
Power Cord	:	Un-Shielded, 1.8 m

4.2 PERIPHERALS

☒ Monitor

Manufacturer	:	ATEC
Model Number	:	G450DU
Serial Number	:	714PD000Q0002
FCC ID	:	GKR450
Data Cable	:	Shielded, 1.5 m
Power Cord	:	Un-Shielded, 1.8 m



☒ Printer

Manufacturer : HP
Model Number : DJ400
Serial Number : MY77V1C0DD
FCC ID : B94C2642X
Data Cable : Shielded, 1.5 m
Power Cord & Adaptor : Un-Shielded, 1.8 m

☒ Modem

Manufacturer : DATATRONIC
Model Number : 1200CK
Serial Number : N/A
FCC ID : E2050V1200CK
Data Cable : Shielded, 1.5 m
Power Cord & Adaptor : Un-Shielded, 1.8 m

☒ Mouse

Manufacturer : LOGITECH
Model Number : M-UA34
Serial Number : LTC73700263
FCC ID : DZL211087
Data Cable : Shielded, 1.8 m



☒ KeyBoard I

Manufacturer : AST
Model Number : SK-2000REW
Serial Number : S950800011
FCC ID : GYUR26SK
Data Cable : Shielded, 1.5 m

☒ KeyBoard II

Manufacturer : SILITEK
Model Number : SK-2000U
Serial Number : N/A
FCC ID : GYUR50SK
Data Cable : Shielded, 1.5 m

☒ TV

Manufacturer : NEC
Model Number : C-19R25(T)
Serial Number : N/A
FCC ID : N/A
Data Cable : Shielded
Power Cord : Un-Shielded



☒ Speaker

Manufacturer : JASS HIPSTER

Model Number : J-008

Serial Number : N/A

FCC ID : N/A

Data Cable : Un-Shielded

Power Cord : N/A

☒ Micro Phone

Manufacturer : SR

Model Number : SR-M02

Serial Number : N/A

FCC ID : N/A

Data Cable : Un-Shielded

☒ Walk Man

Manufacturer : National

Model Number : RQ-310

Serial Number : N/A

FCC ID : N/A

Data Cable : Shielded

☒ Ear Phone

Manufacturer : SR
 Model Number : SR-E11
 Serial Number : N/A
 FCC ID : N/A
 Data Cable : Un-Shielded, 0.8 m
 Power Cord : N/A

☒ Adaptor

Manufacturer : DELTA
 Model Number : ADP-60CB
 Serial Number : N/A
 FCC ID : N/A
 Data Cable : N/A
 Power Cord : Un-Shielded, 1.8 m

4.3 Internal Devices

☒ PCMCIA (fresh card)

Manufacturer : Kingmax
 Model Number : N/A
 Serial Number : A606081
 FCC ID : N/A
 Data Cable : N/A
 Power Cord : N/A

4.4 REMARK :

5 EUT OPERATING CONDITION

- 5.1 Operating condition is according to **ANSI C63.4 - 1992**.
- 5.2 CPU : Pentium II MMX - 300 MHz
CPU Clock : 66 MHz
- 5.3 Turn on the power of all equipments.
- 5.4 Test program sent "H" pattern to peripherals as following :
 - 5.4.1 Printer
 - 5.4.2 Monitor
 - 5.4.3 Modem
 - 5.4.4 Keyboard

6 LIMIT OF CONDUCTED POWER LINE EMISSION CLASS B:

Frequency Range	dBuV	uV
0.45 ~ 1.705 MHz	48	250 uV
1.705 ~ 30 MHz	48	250 uV

- 6.1 In the above table, the tighter limit applies at the band edges.

7 RESULT OF CONDUCTED POWER LINE TEST (1)

7.1 The frequency range from 0.45 MHz to 30 MHz was investigated. All readings are quasi-peak values.

7.2 IF bandwidth : 9 kHz, Meas Time : 1 sec.

7.3 Temperature : 26 °C, Humidity : 72 % RH.

7.4 Quasi-Peak :

Frequency (MHz)	Line 1		Line 2		Limit	
	dBuV	uV	dBuV	uV	dBuV	uV
0.573	29.66	30.41	30.11	32.03	48	250
1.044	28.06	28.29	29.19	28.81	48	250
1.518	21.12	11.38	22.97	14.08	48	250
3.294	21.22	11.51	33.42	46.88	48	250
6.266	31.08	35.81	32.15	40.50	48	250
9.275	34.25	51.58	37.38	73.96	48	250
18.001	24.83	17.44	25.24	18.28	48	250
25.661	35.13	57.08	34.95	55.91	48	250

REMARK :

1. Model : MRA-2000
2. Measuring mode : 1024 x 768
3. Uncertainty in conduction emission measured : $< \pm 2.0\text{dB}$.

Test Engineer :

Jomy

11 RESULT OF RADIATED EMISSION TEST (3)

- 11.1 The frequency range from 30 MHz to 2 GHz was investigated. All readings are quasi-peak values with resolution bandwidth of 120 KHz.
- 11.2 The measurements above 2 GHz with a resolution bandwidth of 1 MHz are peak reading at 3 meters.
- 11.3 The measurements were made at 3 meters of HomeTek Lab's open site II.
- 11.4 Temperature : 27 °C, Humidity : 72 % RH.
- 11.5 Radiated Emission data : **Horizontal**

Frequency (MHz)	Reading Level (dBuV)	ANT factor (dBuV)	Cable Loss (dBuV)	Emission Level (dBuV)	Emission Level (uV/m)	Limit (dBuV)	Limit (uV/m)
54.35	17.60	12.68	0.42	30.70	34.28	40.0	100
65.23	25.23	8.71	0.46	34.40	52.48	40.0	100
132.72	17.73	11.55	0.74	30.02	31.70	43.5	150
152.19	23.85	9.85	0.76	34.46	52.84	43.5	150
173.95	19.03	11.72	0.76	31.51	37.63	43.5	150
215.78	16.19	13.21	0.81	30.21	32.40	43.5	150
261.67	18.68	14.17	0.96	33.81	49.03	46.0	200
521.81	18.97	18.89	1.30	39.16	90.78	46.0	200

- Emission Level = Reading Level + ANT Factor + Cable Loss.
- Sample Calculation for 521.81 MHz.
- Corrected Reading : (18.97) + (18.89) + (1.30) = 39.16 . (Emission Level)

Test Engineer :

Jerry

REMARK :

1. Model : MRA-2000
2. Measuring mode : TV OUT
3. Uncertainty in radiated emission measured : $< \pm 4.0\text{dB}$.

- Emission Level = Reading Level + ANT Factor + Cable Loss.
- Sample Calculation for 417.81 MHz.
- Corrected Reading : $(17.23) + (18.30) + (1.22) = 36.75$. (Emission Level)

Frequency (MHz)	Reading Level (dBuV)	ANT factor (dBuV)	Cable Loss (dBuV)	Emission Level (dBuV)	Emission Level (uV/m)	Limit (dBuV)	Limit (uV/m)
54.28	18.21	16.39	0.42	35.02	56.36	40.0	100
65.22	17.36	14.12	0.46	31.94	39.54	40.0	100
110.60	19.79	14.36	0.74	34.89	55.53	43.5	150
152.19	25.06	8.71	0.76	34.53	53.27	43.5	150
173.94	25.78	8.78	0.76	35.32	58.34	43.5	150
22.20	21.61	12.15	0.91	34.67	54.14	46.0	200
319.50	23.93	16.39	0.99	41.31	116.29	46.0	200
417.81	17.23	18.30	1.22	36.75	68.79	46.0	200

11.6 Radiated Emission data : Vertical

9 RESULT OF RADIATED EMISSION TEST (2)

- 9.1 The frequency range from 30 MHz to 2 GHz was investigated. All readings are quasi-peak values with resolution bandwidth of 120 KHz.
- 9.2 The measurements above 2 GHz with a resolution bandwidth of 1 MHz are peak reading at 3 meters.
- 9.3 The measurements were made at 3 meters of HomeTek Lab's open site II.
- 9.4 Temperature : 27 °C, Humidity : 72 % RH.
- 9.5 Radiated Emission data : **Horizontal**

Frequency (MHz)	Reading Level (dBuV)	ANT factor (dBuV)	Cable Loss (dBuV)	Emission Level (dBuV)	Emission Level (uV/m)	Limit (dBuV)	Limit (uV/m)
54.28	19.32	12.68	0.42	32.42	41.78	40.0	100
66.28	24.89	8.51	0.48	33.88	49.43	40.0	100
120.47	22.61	11.91	0.66	35.18	57.41	43.5	150
133.69	21.33	11.48	0.74	33.55	47.59	43.5	150
154.68	24.69	9.89	0.71	35.29	58.14	43.5	150
195.72	23.05	11.86	0.79	35.70	60.95	43.5	150
233.88	19.70	13.69	0.84	34.23	51.46	46.0	200
521.69	21.40	18.89	1.30	41.59	120.09	46.0	200

- Emission Level = Reading Level + ANT Factor + Cable Loss.
- Sample Calculation for 521.69 MHz.
- Corrected Reading : (21.40) + (18.89) + (1.30) = 41.59 . (Emission Level)

9.6 Radiated Emission data : Vertical

Frequency (MHz)	Reading Level (dBuV)	ANT factor (dBuV)	Cable Loss (dBuV)	Emission Level (dBuV)	Emission Level (uV/m)	Limit (dBuV)	Limit (uV/m)
52.32	18.18	17.15	0.46	35.79	61.59	40.0	100
65.25	16.09	14.12	0.46	30.67	34.16	40.0	100
132.42	23.22	12.10	0.67	35.99	63.02	43.5	150
152.67	24.81	8.71	0.76	34.28	51.76	43.5	150
173.56	24.63	8.78	0.76	34.17	51.11	43.5	150
227.87	20.79	12.69	0.81	34.29	51.82	46.0	200
320.17	24.85	16.42	1.07	42.34	130.92	46.0	200
417.25	18.55	18.27	1.17	37.99	79.34	46.0	200

● Emission Level = Reading Level + ANT Factor + Cable Loss.

● Sample Calculation for 417.25 MHz.

● Corrected Reading : (18.55) + (18.27) + (1.17) = 37.99 . (Emission Level)

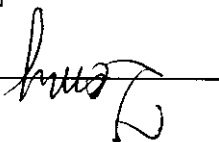
REMARK :

1. Model : MRA-2000

2. Measuring mode : 800 x 600, Camera

3. Uncertainty in radiated emission measured : < ± 4.0dB.

Test Engineer :



RADIATED EMISSION TEST

1 TEST INSTRUMENTS & FACILITIES

The following test Instruments was used during the radiated emission test :

Item	Instruments /facilities	Specification	Manufacturer	Model # / S/N#	Location	Date of Cal.
1	SPECTRUM ANALYZER	9KHz ~ 1.8GHz	HP	HP8591 3710A06158	Open Site I	APR/98
2	EMI TEST RECEIVER	20MHz ~ 1GHz	ROHDE & SCHWARZ	ESVS10 845165/017	Open Site I	FEB/98
3	PRE-AMPLIFIER	0.1MHz ~ 1.3 GHz	HP	8447D 1937A02095	Open Site I	MAY/98
4	EMI TEST RECEIVER	20Hz ~ 26.5GHz	ROHDE & SCHWARZ	ESMI 845442/006	Open Site II	FEB/98
5	PRE-AMPLIFIER	20MHz ~ 7GHz	ROHDE & SCHWARZ	ESMI-Z7 846363/001	Open Site II	FEB/98
6	SIGNAL GENERATOR	9KHz ~ 2080MHz	ROHDE & SCHWARZ	SMY02 845096/018		FEB/98
7	ANTENNA (BI-LOG)	25MHz ~ 2GHz	ARA	LPB2520 S/N:1096	Open Site II	MAR/98
8	ANTENNA (BI-LOG)	25MHz ~ 2GHz	ARA	LPB2520 S/N:1095	Open Site I	MAR/98
9	CABLES			No. 2, No. 4 No. 1, No. 3	OATS 1 OATS 2	JUL/98 JUL/98
10	OPEN AREA TEST SITE	☐ OATS 1 ☒ OATS 2				
11	ANTENNA (DIPOLE)	30 ~ 300MHz	ROHDE & SCHWARZ	HZ-12 842899/08		JAN/98
12	ANTENNA (DIPOLE)	300 ~ 1000MHz	ROHDE & SCHWARZ	HZ-13 842007/0004		JAN/98

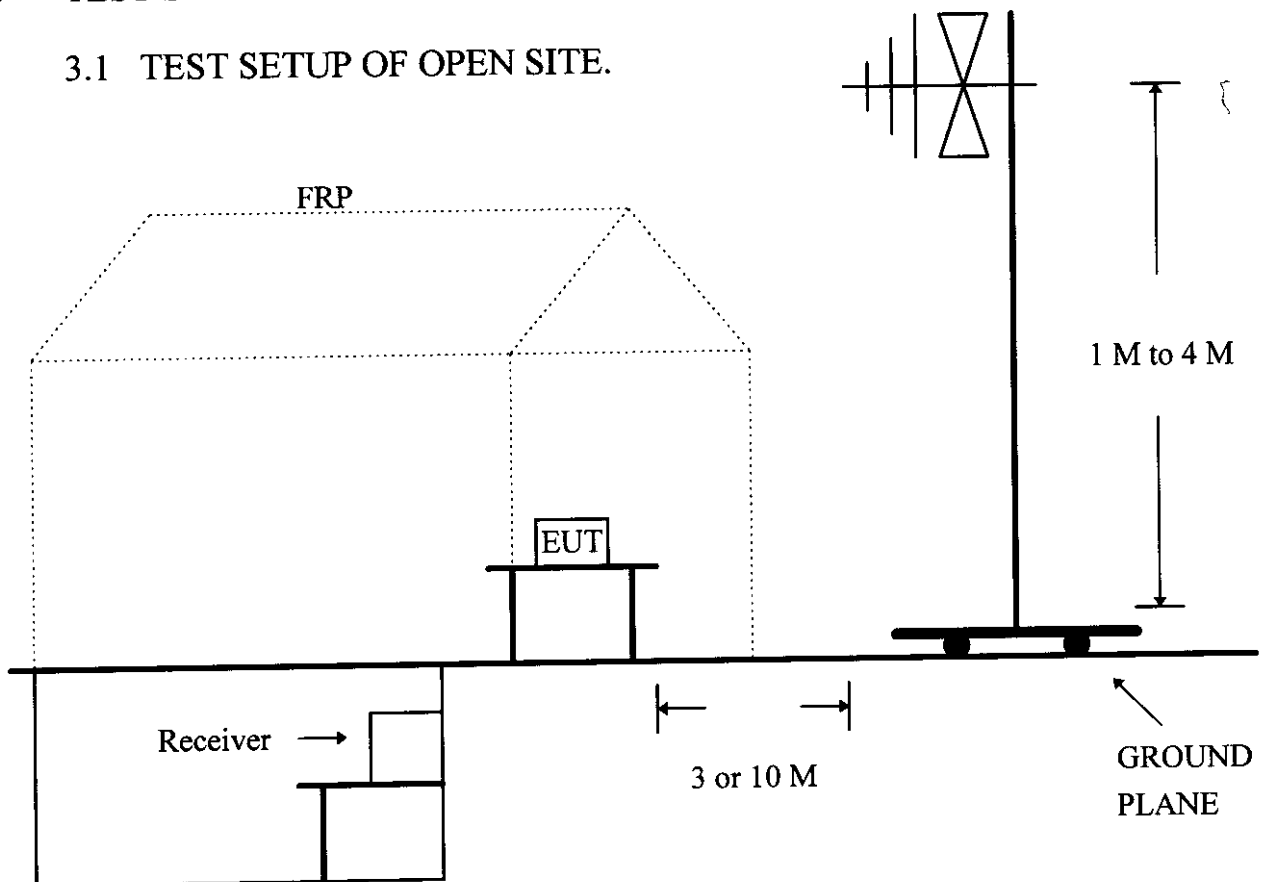
Note : 1. Items 1 ~ 10 upon which need to calibrated are with period of 1 year.
2. Items 11 ~ 12 upon which need to calibrated are with period of 3 year.

2 TEST PROCEDURE

- 2.1 The EUT was test according to ANSI C63.4 - 1992.
- 2.2 The radiated test was performed at HomeTek Lab's Open Site II.
- 2.3 This site is on file with the FCC laboratory division, reference 31040/site 1300F2, Date : August 22, 1997.
- 2.4 The frequency range from 30 MHz to 2 GHz, the measurement were made at 3 meters, with a BI-log antenna.

3 TEST SETUP

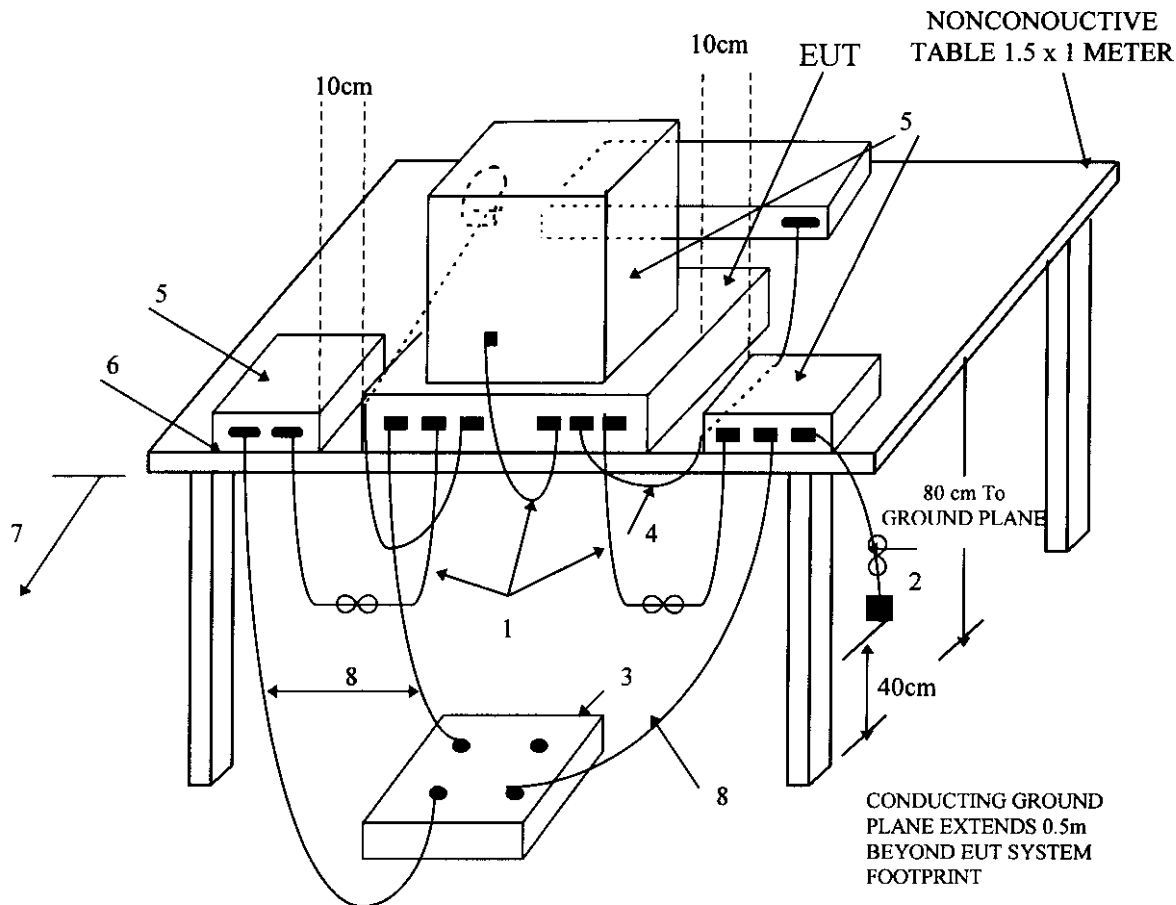
3.1 TEST SETUP OF OPEN SITE.



3.2 TEST SET OF EUT

ELECTRICAL AND ELECTRONIC EQUIPMENT IN THE RANGE OF 9kHz TO 40 GHz

ANSI
C63.4-1992



LEGEND:

1. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 to 40 cm long, hanging approximately in the middle between ground plane and table.
2. I/O cables that are connected to a peripheral shall be bundled in center. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1m.
3. If LISNs are kept in the test setup for radiated emissions, it is preferred that they be installed under the ground plane with the receptacle flush with the ground plane.
4. Cables of hand-operated devices, such as keyboards, mice, etc., have to be placed as close as possible to the controller.
5. Non-EUT components of EUT system being tested.
6. The rear of all components of the system under test shall be located flush with the rear of the table.
7. No vertical conducting wall used.
8. Power cords drape to the floor and are routed over to receptacle.

Test Configuration Tabletop Equipment Radiated Emission

4 CONFIGURATION OF THE EUT

Same as “Conducted Power Line test”, section 4

5 EUT OPERATING CONDITION

5.1 Same as “Conducted Power Line test”, section 5

5.2 The radiated emission in the frequency range from 30 MHz - 2000 MHz was test in a horizontal and vertical polarization at HomeTek Lab’s open site II.

6 LIMIT OF RADIATED EMISSION CLASS B:

Frequency (MHz)	Measurement Distance	dBuV	uV/m
30 - 88	3 (M)	40	100
88 - 216	3 (M)	43.5	150
216 - 960	3 (M)	46	200
Above 1000	3 (M)	54	500

6.1 The tighter limit shall apply at the edge between two frequency bands.

6.2 Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

7 RESULT OF RADIATED EMISSION TEST (1)

- 7.1 The frequency range from 30 MHz to 2 GHz was investigated. All readings are quasi-peak values with resolution bandwidth of 120 kHz.
- 7.2 The measurements above 2 GHz with a resolution bandwidth of 1 MHz are peak reading at 3 meters.
- 7.3 The measurements were made at 3 meters of HomeTek Lab's open site II.
- 7.4 Temperature : 27 °C, Humidity : 72 % RH.
- 7.5 Radiated Emission data : **Horizontal**

Frequency (MHz)	Reading Level (dBuV)	ANT factor (dBuV)	Cable Loss (dBuV)	Emission Level (dBuV)	Emission Level (uV/m)	Limit (dBuV)	Limit (uV/m)
54.35	18.60	12.68	0.42	31.70	38.46	40.0	100
120.97	22.31	11.80	0.63	34.74	54.58	43.5	150
133.63	21.46	11.48	0.74	33.68	48.31	43.5	150
152.19	23.85	9.85	0.76	34.46	52.84	43.5	150
195.68	22.44	11.86	0.79	35.09	56.82	43.5	150
233.86	18.26	13.69	0.84	32.79	43.60	46.0	200
300.68	18.70	15.11	1.07	34.88	55.46	46.0	200
521.81	19.02	18.89	1.30	39.21	91.31	46.0	200
1200.00	14.80	23.50	2.10	40.40	104.71	54.0	500

- Emission Level = Reading Level + ANT Factor + Cable Loss.
- Sample Calculation for 521.81 MHz .
- Corrected Reading : (19.02) + (18.89) + (1.30) = 39.21 . (Emission Level)

7.6 Radiated Emission data : **Vertical**

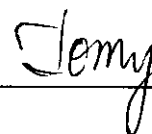
Frequency (MHz)	Reading Level (dBuV)	ANT factor (dBuV)	Cable Loss (dBuV)	Emission Level (dBuV)	Emission Level (uV/m)	Limit (dBuV)	Limit (uV/m)
54.28	18.67	16.39	0.42	35.48	59.43	40.0	100
65.22	16.99	14.12	0.46	31.57	37.89	40.0	100
132.71	22.81	11.81	0.74	35.36	58.61	43.5	150
152.19	25.18	8.71	0.76	34.65	54.01	43.5	150
173.94	25.81	8.78	0.76	35.35	58.55	43.5	150
228.22	19.42	12.69	0.81	32.92	44.26	46.0	200
319.50	23.96	16.39	0.99	41.34	116.68	46.0	200
417.81	17.18	18.30	1.22	36.70	68.39	46.0	200

- Emission Level = Reading Level + ANT Factor + Cable Loss.
- Sample Calculation for 417.81 MHz .
- Corrected Reading : (17.18) + (18.30) + (1.22) = 36.70 . (Emission Level)

REMARK :

1. Model : MRA-2000
2. Measuring mode : 1024 x 768
3. Uncertainty in radiated emission measured : $< \pm 4.0\text{dB}$.

Test Engineer :



11 RESULT OF CONDUCTED POWER LINE TEST (3)

11.1 The frequency range from 0.45 MHz to 30 MHz was investigated. All readings are quasi-peak values.

11.2 IF bandwidth : 2 kHz, Meas Time : 1 sec.

11.3 Temperature : 26 °C, Humidity : 72 % RH.

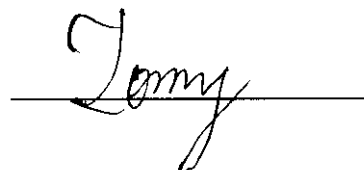
11.4 Quasi-Peak :

Frequency (MHz)	Line 1		Line 2		Limit	
	dBuV	uV	dBuV	uV	dBuV	uV
0.569	38.51	84.24	33.59	47.81	48	250
0.858	33.71	48.47	32.39	41.64	48	250
2.265	25.13	18.05	24.57	16.92	48	250
4.050	21.15	11.42	21.25	11.55	48	250
7.800	21.06	11.30	20.86	11.04	48	250
11.920	27.97	25.03	29.72	30.62	48	250
17.020	19.14	9.06	18.77	8.68	48	250
25.040	16.25	6.49	15.16	5.73	48	250

REMARK :

1. Model : MRA-2000
2. Measuring mode : TV OUT
3. Uncertainty in conduction emission measured : $< \pm 2.0\text{dB}$.

Test Engineer :



9 RESULT OF CONDUCTED POWER LINE TEST (2)

9.1 The frequency range from 0.45 MHz to 30 MHz was investigated. All readings are quasi-peak values.

9.2 IF bandwidth : 9 kHz, Meas Time : 1 sec.

9.3 Temperature : 26 °C, Humidity : 72 % RH.

9.4 Quasi-Peak :

Frequency (MHz)	Line 1		Line 2		Limit	
	dBuV	uV	dBuV	uV	dBuV	uV
0.475	35.07	56.69	35.26	57.94	48	250
1.045	32.50	41.17	31.84	39.08	48	250
1.810	24.46	16.71	25.44	18.71	48	250
3.210	22.56	13.43	24.08	16.00	48	250
6.200	23.32	14.66	24.02	15.89	48	250
8.250	16.39	6.60	16.45	6.65	48	250
14.740	24.06	15.96	26.07	20.11	48	250
20.210	17.55	7.54	24.02	15.89	48	250

REMARK :

1. Model : MRA-2000
2. Measuring mode : 800 x 600, Camera
3. Uncertainty in conduction emission measured : $< \pm 2.0\text{dB}$.

Test Engineer :

