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## TEST REPORT

REPORT NUMBER : MKM98F-004  
APPLICANT : Matsushita-Kotobuki  
Electronics Industries, Ltd.  
MODEL NUMBER : CR-589-B  
FCC ID : IUO9TB072CRB  
Regulation : FCC Part15B Class B

Conducted Emission Test  
Radiated Emission Test

Matsushita-Kotobuki Electronics Ind., Ltd.  
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SECTION 1. TEST CERTIFICATION

## APPLICANT INFORMATION

Company : Matsushita-Kotobuki Electronics Industries, Ltd.  
Address : 8-1, Furujin-machi, Takamatsu-city, Kagawa-ken,  
760-0025 Japan

## GRANTEE INFORMATION

Company : Matsushita-Kotobuki Electronics Industries, Ltd.  
Division / Section : Matsuyama Division Legal Affairs Sec.  
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Telephone number : +81 89 966 2111  
Fax number : +81 89 966 3602  
Contact person : Kenji Matsugi

## DESCRIPTION OF TEST ITEM

Kind of equipment : CD-ROM Drive  
Trademark : Matsushita-Kotobuki  
FCC ID : IUO9TB072CRB  
Model number : CR-589-B  
Serial number : SA8710000012

TEST PERFORMED	
FCC File No.	: 31040/SIT
Test started	: August 5, 1998
Test completed	: August 5, 1998
Purpose of test	: FCC Docket 87-389
Regulation	: FCC Part 15B Class B Unintentional Radiators
Test setup	: ANSI C63.4 -1992

Report file number : MKM98F-004

Report issue date : August 6, 1998

Test engineer : Shinji Yamauchi S. Yamauchi

Report approved by : Shigeru Suzuki S. Suzuki  
[ Manager ]

This equipment complies with above standard or regulation under the test condition or test configuration shown on this test report.

## SECTION 2. EQUIPMENT UNDER TEST

The equipment under test (E.U.T.) consists of the following equipment.  
Indication in the following left side column corresponds to section 5.

Symbol	Item	Model No.	Serial No.	FCC ID	Manufacturer
A)	CD-ROM Drive	CR-589-B	SA8710000012	IUO9TB072CRB	Matsushita-Kotobuki Electronics Ind., Ltd.

Power ratings of E.U.T. : +5V DC, 1.2A / +12V DC, 0.8A

### 2.1 Port(s) / Connector(s) :

IDE Bus Connector(40pin), Head Phone Jack(Stereo Mini Plug),  
Audio Out Connector(4pin), Digital Audio Out Connector(2pin), DC IN Connector(4pin)

### 2.2 Oscillator(s) / Crystal(s) :

Oscillator	Operating Frequency	Board name	Remarks
33.86 MHz	33.86 MHz	Main PCB	ECC & ATAPI I/F IC, LC895199
20.0 MHz	20.0 MHz	Main PCB	CPU, MN101CF290

### SECTION 3. SUPPORT EQUIPMENT USED

The E.U.T. has been supported by the following equipment during these tests. Indication in the following left side column corresponds to section 5.

Symbol	Item	Model No.	Serial No.	FCC ID	Manufacturer
B)	Interface Card	LMEP0345A	None	IUO9TB035CRI	Matsushita-Kotobuki
C)	Host Computer	4865	4115HAM60075	CNT75M8403F1	COMPAQ
D)	Head Phone	RP-HT28	None	N.A.	Panasonic
E)	Stereo Radio Cassette Recorder	RX-F5	None	ACJ9TBRX-F5	Panasonic
F)	Keyboard	Enhanced II Keyboard	9101421CB515	CNT47K109232	COMPAQ
G)	Color Display	CM1483MU	Y0J005103	ABL9679001CD	HITACHI
H)	Printer	3630A	3040A00351	BSD8533630A	HEWLETT PACKARD
I)	Modem	C202A	010489	BKM552C202A	EPSON

SECTION 4. CABLE(S) USED

The following cable(s) was used for testing. Indication number in the following left side column corresponds to section 5.

Number	Name	Length	Shield	From	To
1)	40Pin Flat cable	0.4 m	None	CD-ROM Drive Plastic connector	Host Computer
2)	Audio cable	0.4 m	None	CD-ROM Drive Plastic connector	Interface Card
3)	Digital Audio cable	0.4 m	None	CD-ROM Drive Plastic connector	Interface Card
4)	DC Power cable	0.4 m	None	CD-ROM Drive	Host Computer
5)	Head Phone cable	1.5 m	None	CD-ROM Drive Plastic connector	Head Phone
6)	Audio cable	1.0 m	None	Interface Card	Stereo Radio Cassette Recorder
7)	Audio cable	1.0 m	None	Interface Card	Stereo Radio Cassette Recorder
8)	Keyboard I/F cable	1.4 m	Yes	Host Computer Metal connector	Keyboard
9)	Video Signal cable	1.5 m	Yes	Host Computer Metal connector	Color Display

None :

All cables are not attached ferrite core.

The following cable(s) was used for testing. Indication number in the following left side column corresponds to section 5.

Number	Name	Length	Shield	From	To
10)	Parallel I/F cable	1.5 m	Yes	Host Computer Metal connector	Printer
11)	RS-232C I/F cable	1.2 m	Yes	Host Computer Metal connector	Modem
12)	Power cord for Host Computer	2.0 m	Yes	Host Computer	Power Source
13)	Power cord for Stereo Radio Cassette Recorder	1.9 m	None	Stereo Radio Cassette Recorder	Power Source
14)	Power cord for Color Display	2.0 m	None	Color Display	Power Source
15)	Power cord for Printer	2.0 m	None	Printer	AC Adapter
16)	Power cord for Printer	2.0 m	None	AC Adapter	Power Source
17)	Power cord for Modem	1.9 m	None	Modem	Power Source

None :

All cables are not attached ferrite core.

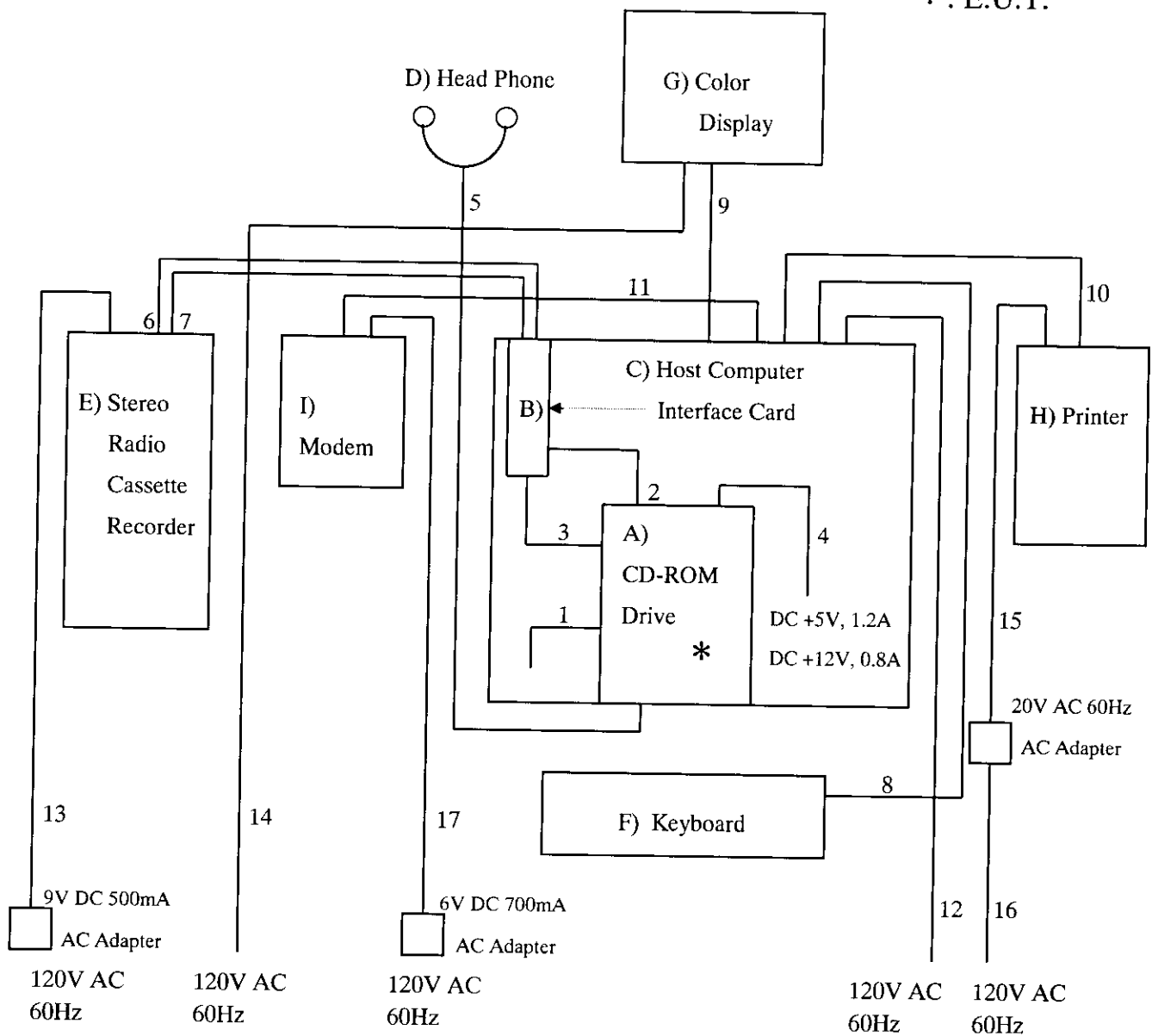


## SECTION 5. CONSTRUCTION OF EQUIPMENT

The construction of E.U.T. during testing is as follows.

### System configuration

\* : E.U.T.



Symbol or numbers assigned to equipment or cables on this diagram are corresponded to the symbols or numbers assigned to equipment or cables on tables in Sections 2 to 4.

## SECTION 6. OPERATING CONDITIONS

The E.U.T. has been operated under the following conditions during the tests.

### 6.1 Operating condition

The tests have been carried out under Read mode.

### 6.2 Operation flow

Performed following operations continuously.

1. The E.U.T. operates the normal speed.
2. The E.U.T. play-backs the audio data.
3. The E.U.T. reads the 'H' characters' data.
4. The Color Display displays 'H' characters.
5. The Printer prints 'H' characters' data.
6. The Modem sends 'H' characters' data.
7. The E.U.T. changes the disc rotating speed to the 32 times.
8. The E.U.T. play-backs the audio data.
9. The E.U.T. reads 'H' characters' data.
10. The Color Display displays 'H' characters.
11. The Printer prints 'H' characters.
12. The Modem sends 'H' characters' data.

**SECTION 7. TEST PROCEDURE(S)**

Tests have been carried out with the test procedure(s) drawn up by our laboratory which is in accordance with the following test procedure(s).

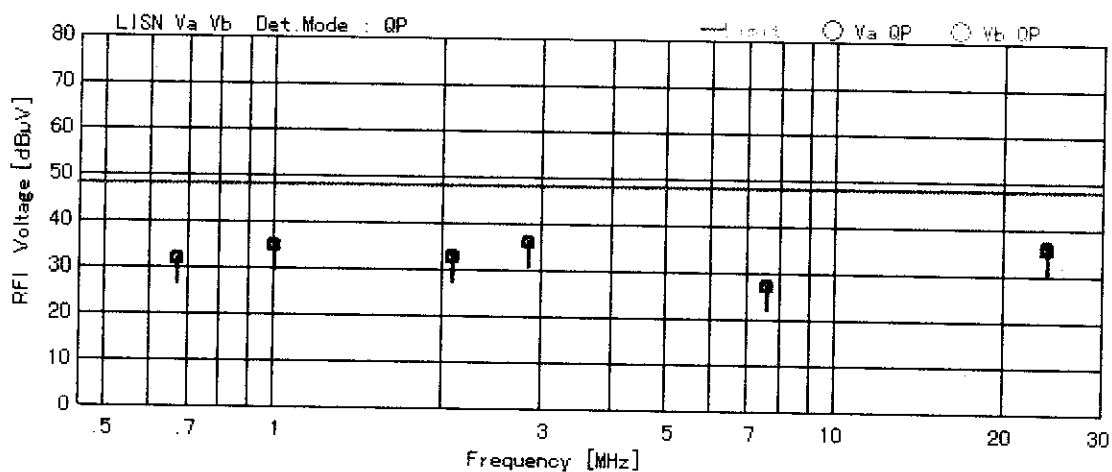
Test item	Test procedure used	Scanned Frequency Range
Conducted Emission	ANSI C63.4-1992	0.45 - 30 MHz
Radiated Emission	ANSI C63.4-1992	30 - 1000 MHz

## SECTION 8. EVALUATION OF TEST RESULTS

### 8.1 Conducted Emission Test

Model Name	CD-ROM Drive
Model No.	CR-589-B
Serial No.	SA8710000012
Power Supply	120V / 60Hz
Test Mode	Read Mode
Temp/Humi/Pres	21°C / 57% / 1012 hPa
Operator	S.Yamauchi

No	Freq. [MHz]	Reading Level		Factor [dB]	Emission Level		Limit [dBuV]	Margin [dB]
		Va [dBuV]	Vb		Va [dBuV]	Vb		
1	0.673	---	31.5	0.1	---	31.6	48.0	16.4
2	1.008	34.3	---	0.1	---	34.4	48.0	13.6
3	2.099	32.3	---	0.2	---	32.5	48.0	15.5
4	2.856	---	35.8	0.2	---	36.0	48.0	12.0
5	7.647	26.7	---	0.4	---	27.1	48.0	20.9
6	24.005	34.4	---	1.2	---	35.6	48.0	12.4
7	24.004	---	34.5	1.2	---	35.7	48.0	12.3



### 8.3 Conclusion

This test report clearly shows that the EUT is in compliance with the FCC Part 15B, Class B specification.

The minimum margins to the limits are as follows:

-Conduction measurement	12.0 dB	at	2.856 MHz
-Radiation measurement	4.3 dB	at	733.335 MHz

## 8.4 Sample Calculations

### 8.4.1 Conducted Emission

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Example @ 2.856 MHz

$$\begin{array}{rcl}
 \text{Emission Level} & = & \text{Meter Reading} & 35.8 \text{ dBuV} \\
 & & + \text{A.M.N. Factor} & + 0.2 \text{ dB} \\
 & & & \hline
 & & = & 36.0 \text{ dBuV}
 \end{array}$$

$$\begin{array}{rcl}
 \text{Margin} & = & \text{Limit} & 48.0 \text{ dBuV} \\
 & & - \text{Emission Level} & - 36.0 \text{ dBuV} \\
 & & & \hline
 & & = & 12.0 \text{ dB}
 \end{array}$$


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A.M.N. : Artificial Mains Network = Line Impedance Stabilization Network (LISN)

### 8.4.2 Radiated Emission

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Example @ 733.335 MHz

$$\begin{array}{rcl}
 \text{Emission Level} & = & \text{Meter Reading} & 13.8 \text{ dBuV} \\
 & & + \text{Factor} & + 27.9 \text{ dB} \\
 \text{( Factor = Antenna Factor + Cable Loss )} & & & \hline
 & & = & 41.7 \text{ dBuV/m}
 \end{array}$$

$$\begin{array}{rcl}
 \text{Margin} & = & \text{Limit} & 46.0 \text{ dBuV/m} \\
 & & - \text{Emission Level} & - 41.7 \text{ dBuV/m} \\
 & & & \hline
 & & = & 4.3 \text{ dB}
 \end{array}$$


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SECTION 10. INSTRUMENTS USED FOR TEST

Instrument	Model No.	Serial No.	Manufacturer	Last cal.	Period
EMI Test Receiver	85462A	3520A00241	Hewlett Packard	8/97	1 Year
RF Filter Section	85460A	3448A00210	Hewlett Packard	8/97	1 Year
Biconical Antenna	BBA9106	None	Schwarzbeck	10/97	1 Year
Logperiodic Antenna	UHALP9107	1622	Schwarzbeck	10/97	1 Year
Double Ridged Antenna	3115	9702-5139	EMCO	7/98	1 Year
Artificial Mains Network(AMN)					
= Line Impedance Stabilization Network(LISN)					
	ESH3-Z5	840062/024	Schwarzbeck	6/98	1 Year
Artificial Mains Network(AMN)					
= Line Impedance Stabilization Network(LISN)					
	ESH3-Z5	840062/028	Schwarzbeck	7/98	1 Year

## SECTION 11. PRECISION

Tolerance of the measuring instruments are shown on below.

- |  |                      |
|--|----------------------|
| 1. Antenna factor  | $\pm 2.0$ dB         |
| 2. Cable loss  | $\pm 1.0$ dB         |
| 3. EMI test receiver   | $\pm 2.0$ dB         |
| 4. Artificial Mains Network(AMN)<br>= Line Impedance Stabilization Network(LISN) | impedance $\pm 20\%$ |
| 5. Site Attenuation  | $\pm 4.0$ dB         |

Repeatability and reproducibility about maximum emission setup are not specified herein.

## SECTION 12. VALIDITY TEST REPORT

- 12.1 The test result of this report is effective for equipment under test itself and under the test configuration described on the report.
- 12.2 This test report does not assure that whether the test result taken in other testing laboratory is compatible or reproducible to the test result on this report or not.
- 12.3 Copying of this report without permission is prohibited.