

**FCC PART 15 SUBPART B**  
CERTIFICATION REPORT for E-File

KENWOOD CORPORATION COMMUNICATION EQUIPMENT DIVISION

SCANNING RECEIVER  
(As PC peripheral)

FCC ID : K4428451110

Report No. : Z02C-99247

Report Issue Date: September 16, 1999

ZACTA TECHNOLOGY CORPORATION  
YONEZAWA TESTING CENTER

4149-7 Hachimanpara 5-chome  
Yonezawa-shi Yamagata  
992-1128 Japan

**NVLAP**<sup>®</sup>  
Lab code : 200306-0

# TABLE OF CONTENTS

<b>CERTIFICATE COMPLIANCE</b> .....	3
<b>LABORATORY MEASUREMENTS</b> .....	5
JUSTIFICATION / ENGINEERING COMMENT .....	5
SUMMARY OF TEST DATA .....	6
CONFIGURATION INFORMATION .....	7
SYSTEM CONFIGURATION .....	8
<b>LABORATORY DESCRIPTION</b> .....	9
DESCRIPTION FOR TEST SITE .....	9
DESCRIPTION OF CONDUCTION TESTING .....	11
DESCRIPTION OF RADIATION TESTING .....	12
UNCERTAINTY .....	12
<b>TEST SITE CONDITION &amp; INSTRUMENTATION</b> .....	14
TEST SITE CONDITION .....	14
TEST EQUIPMENT FOR CONDUCTION .....	14
TEST EQUIPMENT FOR RADIATION .....	15
SAMPLE OF FIELD STRENGTH CALCULATION .....	16
<b>TEST DATA</b> .....	16

## CERTIFICATE COMPLIANCE

ZACTA TECHNOLOGY CORPORATION  
YONEZAWA TESTING CENTER  
4149-7 Hachimanpara 5-chome  
Yonezawa-shi Yamagata 992-1128  
Japan

This device was measured pursuant to ANSI C63.4-1992 by Zacta Technology Corporation. The data in this application complies with the applicable technical standards as indicated in the measurements report and FCC Part 15 Class B limits. The EUT complies with section 15.37 "Transition provision for compliance with the rules".

APPLICANT : KENWOOD CORPORATION COMMUNICATION EQUIPMENT  
DIVISION  
FCC ID : K4428451110  
FCC RULE PART : FCC Part 15 Subpart B, Docket 87-389  
EQUIPMENT CLASS : Class B  
EUT TYPE : PC Peripheral / Scanning Receiver  
FREQ. RANGE : 118MHz - 523.995MHz  
800MHz - 1299.995MHz  
MAX USED FREQ. : 1299.995MHz  
DATE OF TEST : September 14, 1998  
MEASUREMENT : ANSI C63.4-1992  
TEST RESULT : PASS  
REPORT NO. : Z02C-99247  
REMARKS : No modification was made during testing.  
EUT is powered from DC Power Supply.

Zacta Technology Corporation certifies that no party to the application is subject to a denial of federal benefits, that includes FCC benefits, pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21U.S.C. 853(a).

Authorized by : Shin-ichi Abe  
General Manager, Zacta Technology Corporation Yonezawa  
Testing Center

The results in this test report apply only to the samples tested.  
This report shall not be re-produced except in full without the

FCC ID: K4428451110

written approval of Zacta Technology Corporation.

## LABORATORY MEASUREMENTS

### PURSUANT TO PART 15, SUBPART B

COMPANY NAME : KENWOOD CORPORATION COMMUNICATION  
EQUIPMENT DIVISION  
EUT : PC PERIPHERAL / SCANNING RECEIVER  
MODEL NO. : TM-D700A  
FCC ID : K4428451110  
SERIAL NO. : N/A  
DATE OF TESTS : September 14, 1999  
MEASUREMENT : ANSI C63.4-1992  
FCC CLASS : B  
DISTANCE : 3m  
POWER SUPPLIED : DC 13.8V(From DC Power Supply)  
REPORT NO. : Z02C-99247

#### JUSTIFICATION / ENGINEERING COMMENT

The detector function in frequency range of 30MHz-1GHz was set to Quasi-peak mode.

Peak and average detectors were used for measurements above 1GHz. Used maximum frequency of this device is 1299.995MHz, therefore, we were measured up to 7GHz when Radiated Emission Test. Cables were manipulated to produce the worst case emissions.

All operating configuration, combination of Accessory: Microphone were measured. Sufficient warm up time is proved for these testing.

ENGINEER : \_\_\_\_\_ Takuya Osato

SUMMURY OF TEST DATA

RADIATION DATA

OPERATING CONFIGURATION			RESULT
TEST MODE		FREQUENCY	MARGIN
A Band SCAN	B Band	1969.56MHz	-4.8dB
SCAN			

CONDUCTION DATA

OPERATING CONFIGURATION			RESULT
TEST MODE		FREQUENCY	MARGIN
A Band SCAN	B Band	1.359MHz	-13.7dB
SCAN			

**CONFIGURATION INFORMATION**  
**DEVICE INFORMATION**

COMMENT:

NO	EQUIPMENT	COMPANY	MODEL NO.	SERIAL NO.	FCC ID	COMMENT
1	Scanning Receiver	KENWOOD	TM-D700A	N/A	K4428451110	EUT
2	Panel	KENWOOD	N/A	N/A	K4428451110	EUT
3	Microphone	KENWOOD	N/A	N/A	N/A	Accessory
4	Communications Speaker	KENWOOD	SP-50B	N/A	N/A	
5	Communications Speaker	KENWOOD	SP-50B	N/A	N/A	
6	DC Power Supply	KENWOOD	PS-33	30200384	N/A	
7	Personal Computer	COMPAQ	Desk Pro 5150	7610HXG30479	CNT75MDCZ5	
8	Display	LG Electronics	StudioWorks 56i	15005G004960	BEJCS585	
9	Printer	HP	C4555A	SG69A1425N	B94C4555X	
10	Keyboard	COMPAQ	RT6674TJP	22861605	AQ6-MTN4C15	
11	Mouse	COMPAQ	M-S34-6MD	1D75BD3FOMA8	DZL210472	

**CABLES INFORMATION**

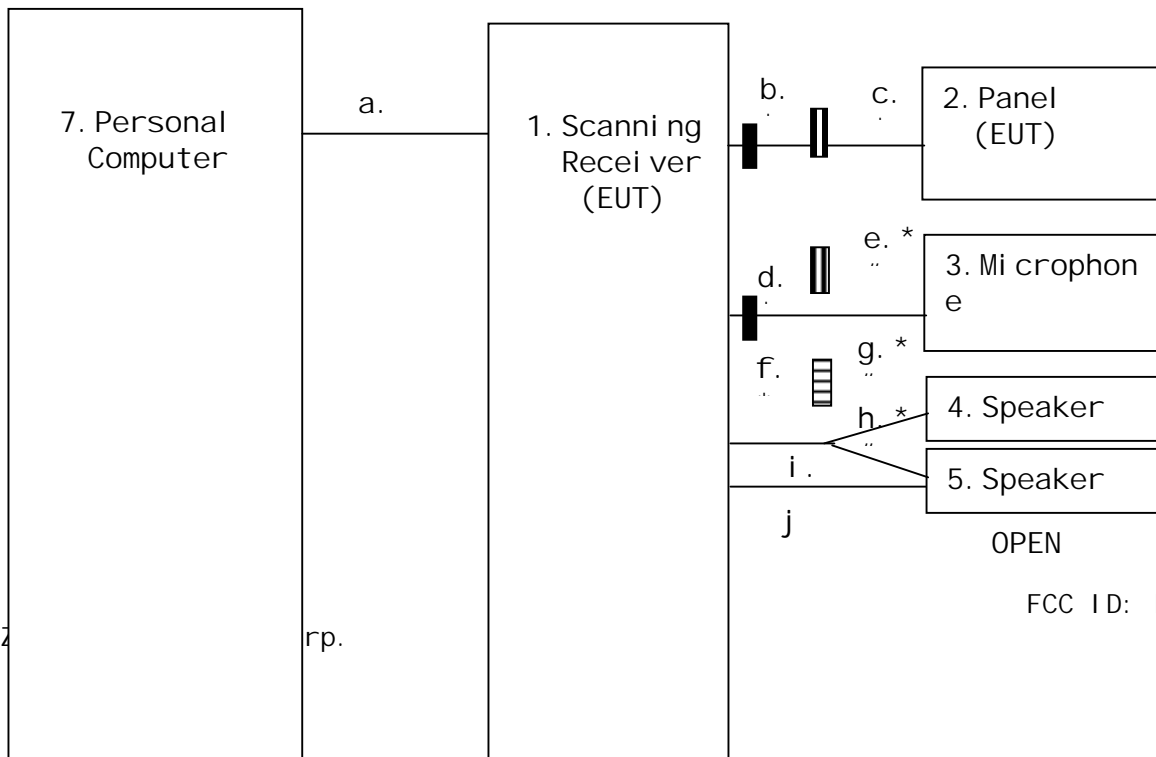
NO	CABLE	COMPANY	LENGTH [m]	SHIELDED		Connected Situation		COMMENT
				Cable	Connector	From	To	
a	Serial cable	N/A	2.0	Shielded	Metal	EUT	PC	
b	Panel cable	KENWOOD	4.0	Unshielded	Plastic	EUT	Modular ADP	*
c	Panel cable	KENWOOD	3.0	Unshielded	Plastic	Modular ADP	Panel	*
d	Microphone cable	KENWOOD	4.0	Shielded	Plastic	EUT	Modular ADP	*
e	Microphone cable	KENWOOD	3.0	Unshielded	Plastic	Modular ADP	Microphone	*
f	SP cable	KENWOOD	4.0	Unshielded	Metal	EUT	SP cable CN	*

g	SP cable	KENWOOD	2.5	Unshielded	Metal	SP CN	Speaker	*
h	SP cable	KENWOOD	2.5	Unshielded	Metal	SP CN	Speaker	*
i	DATA cable	KENWOOD	1.0	Shielded	Metal	EUT	(OPEN)	
j	GPS cable	KENWOOD	1.0	Unshielded	Metal	EUT	(OPEN)	
k	DC cable	KENWOOD	0.25	Unshielded	Plastic	EUT	Connector	
l	DC cable	KENWOOD	1.8	Unshielded	Plastic	Connector	Power supply	*
m	AC Power cord	KENWOOD	1.8	Unshielded	Plastic	Power Supply	AC Outlet	
n	RGB cable	N/A	1.4	Shielded	Metal	PC	Display	
o	AC Power cord	N/A	2.0	Unshielded	Plastic	Display	Ac Outlet	
p	Printer cable	N/A	2.0	Shielded	Metal	PC	Printer	*
q	AC Power cord	N/A	2.0	Unshielded	Plastic	Printer	AC Outlet	
r	Keyboard cable	COMPAQ	1.6	Shielded	Metal	PC	Keyboard	
s	Mouse cable	COMPAQ	1.6	Unshielded	Metal	PC	Mouse	
t	AC Power cord	N/A	2.0	Unshielded	Plastic	PC	AC Outlet	

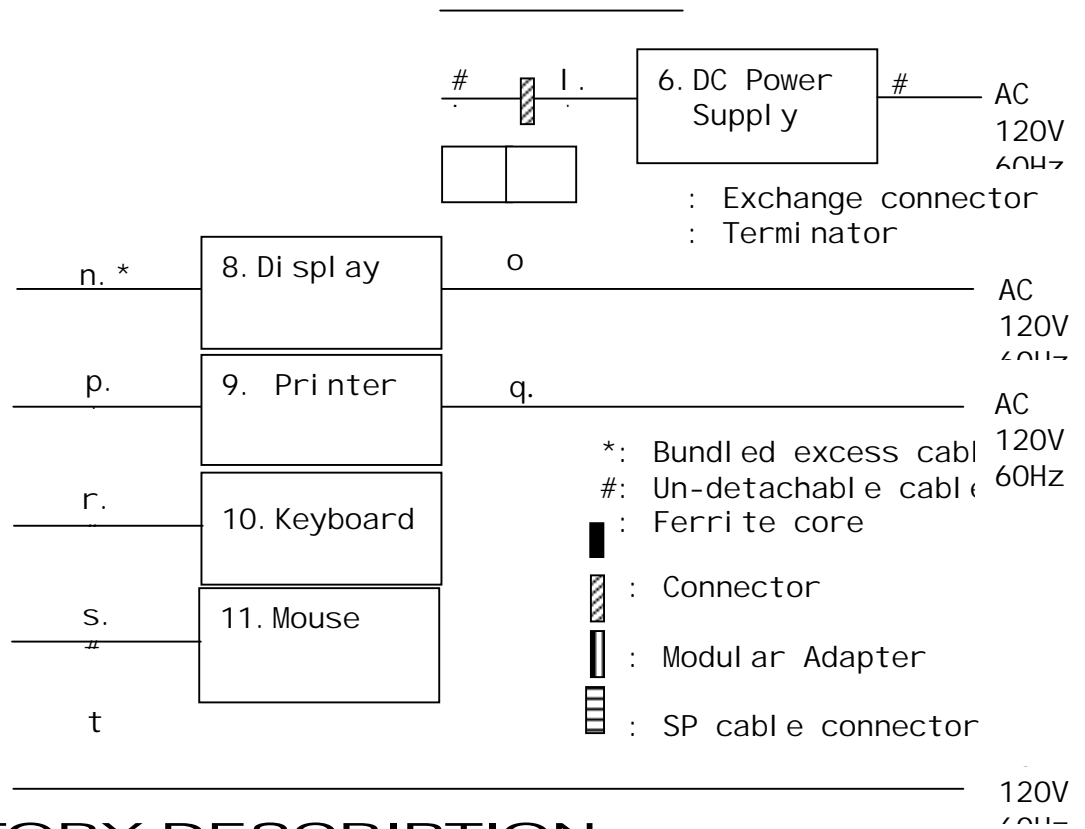
\* Bundled excess cable.

**SYSTEM CONFIGURATION**

COMMENT: \_\_\_\_\_







## LABORATORY DESCRIPTION

### DESCRIPTION FOR TEST SITE

1. LOCATION:

ZACTA TECHNOLOGY CORPORATION YONEAZAWA TESTING CENTER  
4149-7 Hachimanpara 5-chome, Yonezawa-shi Yamagata 992-1128  
Japan

Phone: +81-238-28-2880 Fax: +81-238-28-2888

2. THE NUMBER OF SITE:

Total: 4 sites - Site #1, Site #2, Site #3, Site #4

3. THE TYPE OF SITE:

Whether protected site

4. TEST TYPE:

All sites could perform as follows tests:

- 1) 3/10m Radiated disturbance test
- 2) Conducted disturbance test

5. FACILITY FILING INFORMATION

FCC FINAL SITE FILING: 2.948 Pursuant to ANSI C63.4-1992

Site #1, Site #2, Site #3 (Final date: January 29, 1997)

Site #4 (Final date: June 18, 1998)

\*3m/10m Radiated emission test & Conducted emission test could be performed on each site

VCCI FINAL SITE FILING: V-5/97.04 Pursuant to VCCI Regulations for Registration of measurement facilities

Site #1 R - 136 C - 132 (Final date: April 1, 1997)

Site #2 R - 137 C - 133 (Final date: April 1, 1997)

Site #3 R - 138 C - 134 (Final date: April 1, 1997)

Site #4 R - 752 C - 775 (Final date: June 23, 1998)

NVLAP ACCREDITATION:

NVLAP CODE: 200306-0

NVLAP INFORMATION: NVLAP accreditation does not constitute any product endorsement by NVLAP or any agent of the U.S. Government

## DESCRIPTION OF CONDUCTION TESTING

The line-conducted emissions testing facility is located inside of the site which used for radiated emissions testing.

A 1 meter x 1.5 meter surface, 0.8 meter height from conducting ground plane wooden table is placed 40 cm away from the vertical conducting surface.

Two 50 /50 H Line Impedance Stabilization Network (LISN) are placed on the conducting ground plane.

The EUT was powered from the KYORITSU LISN and the support Equipment were another KYORITSU LISN.

50 BNC connector of the KYORITSU LISN (for peripheral) is terminated in 50 .

An isolation transformer has 50A which is large enough to not affect the peak consumption current by the EUT.

All interconnecting cables more than 1 meter were bundled to 1 meter length.

Sufficient time for the EUT, support equipment, and test equipment were allowed in order for them to warm up to their normal operating condition.

The frequency range was scanned from 450KHz to 30 MHz. The detector function of the test receiver was set to CISPR Quasi-peak mode and the bandwidth was set to 10KHz.

The EUT, support equipment and interconnecting cables were arranged and manipulated to maximize worst emissions for each emission in this test report.

## **DESCRIPTION OF RADIATION TESTING**

Measurements: were made at 3 meter using broadband antenna (Biconical Antenna and log-periodic antenna) & Test receiver. Frequency Range : 30MHz - 1GHz was scanned and investigated using receiver. Six highest emissions (Min.) was reported. The test results represents the worst case emissions for each emission with manipulating the EUT, support equipment and interconnecting cables maximize the worst emissions in this test report.

### **Condition:**

The detector function of the test receiver was set to CISPR Quasi-peak mode and the bandwidth was set to 120kHz. Sufficient time for the EUT, support equipment, and test equipment were allowed in order for them to warm up to their normal operating condition.

The EUT and support equipment were placed on a top of a 0.8 meter height wooden table.

For Floor-Standing devices, the EUT and all cables were installed on electrical insulating material.

The antenna height was varied 1 to 4 meters and stopped at height producing the maximum emission. The turntable was rotated by 360 degrees and stopped at azimuth of producing the maximum emission.

Interconnecting cables which are connected to a peripheral was bundled in center, and its length was not exceed 1 meter.

Each emissions were maximized by: varying the mode of operation, changing the polarity of the antenna, whichever determined the worst case emission.

The normalized site attenuation graph for the both horizontal and vertical polarization are shown in Description for site.

As specified in CFR section 15.33, in case of the highest frequency used in the device is maximum frequency 1.2GHz, the frequency range was investigated from 30MHz up to the frequency 7GHz.

For measurements above 1GHz, double-ridged guide antenna was used as specified in ANSI C63.4-1992 section 4.1.5.4.

Pursuant to CFR section 15.35(b) and ANSI C63.4-1992 section 4.2., Peak and Average detectors were used for measurements above 1GHz. The bandwidth of spectrum analyzer was set to 1MHz.

When measuring emissions above 1GHz, the frequencies of maximum emissions were determined by manually positioning the antenna close to the EUT and by moving the antenna over all sides of the EUT while observing a spectral display. The beam width of the antenna at that time was larger than EUT.

## **UNCERTAINTY**

### **Conducted Emission Test**

Total probabi l i ty	Uncertai nty @95%mi n. Confi dence	±1. 78dB
-------------------------	---------------------------------------	----------

Radi ated Emi ssi on Test

Total probabi l i ty	Uncertai nty @95%mi n. Confi dence	3m	10m
		±2. 66dB	±2. 01dB

## TEST SITE CONDITION & INSTRUMENTATION

### TEST SITE CONDITION

Test date	September 14, 1999
Site #	Site 1
Power supply	DC 13.8V
Weather	Weather: Sunny Temp.: 28 Humidity: 55%
Standard	ANSI C63.4-1992
Deviation from The standards	Not applicable

### TEST EQUIPMENT FOR CONDUCTION

Equipment	Manufacture	Model name / Serial No.	Calibration date	Period
Spectrum Analyzer	Hewlett Packard	8568B / 2634A02803	Jun. 1999	1 year
Test Receiver	Kyori tsu Electrical Works, Ltd.	KNM-2402 / 4N-192-1	Nov. 1998	1 year
Line Impedance Stabilization Network	Kyori tsu Electrical Works, Ltd.	KNW-242C / 8-1096-3 (For EUT)	Jan. 1999	1 year
Line Impedance Stabilization Network	Kyori tsu Electrical Works, Ltd.	KNW-242C / 8-875-19 (For peripheral)	Feb. 1999	1 year
Coaxial cable	FUJIKURA	8D-2W / H110601#1/15C	Jun. 1999	1 year

**TEST EQUIPMENT FOR RADIATION**

Equipment	Manufacture	Model name / Serial No.	Calibration date	Period
Spectrum Analyzer	Hewlett Packard	8568B / 2634A02803	Jun. 1999	1 year
RF Preamp l i fi er	Anri tsu	MH648A / M96057	Nov. 1998	1 year
Test Receiver	Kyori tsu Electrical Works, Ltd.	KNM-5002 / 4N-200-5 KCV-6002 / 4-288-2	Jun. 1999	1 year
Bi conical Antenna	Schwarzbeck	BBA9106/VHA9103LE / 13130919	Jun. 1999	1 year
Log Peri odi c Antenna	Electro-Mechani cs Co.	3146 / 8901-2336	Jun. 1999	1 year
Coaxi al cabl e	FUJI KURA	8D-2W / H110601#1/08R	Jun. 1999	1 year
Coaxi al cabl e	FUJI KURA	23D-HA/ H110601#1/23D-HA	Jun. 1999	1 year
Si te attenuati on	Zacta Technology Corp.	Si te 1	Dec. 1998	1 year

\*\*\* Measurement above 1GHz \*\*\*

Equipment	Manufacture	Model name / Serial No.	Calibration date	Period
Spectrum Analyzer	ADVANTEST	R3271A / 65050042	May. 1999	1 year
RF Preamp l i fi er	Hewlett Packard	8449B / 3008A00589	May. 1999	2 year
Double Ridged Guide Antenna	Electro-Mechani cs Co.	3115 / 4328	Jun. 1998	2 year
Coaxi al cabl e	SUHNER	SUCOFLEX 104 108014/4 & 108015/4	May. 1999	2 year

Calibration is traceable to NIST or an equivalent standards reference organization.

**SAMPLE OF FIELD STRENGTH CALCULATION**

$$dB \ V = 20 \log_{10} (V)$$

$$dB \ V/m = 20 \log_{10} (V/m)$$

[Sample Calculation]

\*For Conduction   Class B limit = 250 V = 48.0dB V

@ 3.332MHz

Reading = 41.6dB V  
Cable Loss = 0.2dB  
Total = 41.6 + 0.2 = 41.8dB V

Margin = 41.8 - 48.0 = -6.2dB

6.2 dB below the limit

\*For Radiation   Class B limit = 150 V/m = 43.5dB V/m

@ 181.0MHz

Reading = 35.7dB V  
Ant. Factor + Cable Loss - Amp. Gain = 15.8 + 1.4 - 15.0 = 2.2dB/m  
Total = 35.7 + 2.2 = 37.9dB V/m

Margin = 37.9 - 43.5 = -5.6dB

5.6 dB below the

limit



FCC PART15B Class B 3m RADIATION DATA SHEET @

DATE OF TESTS: 99/09/14 SITE: 1 CHART NO - SHEET NO 1  
 COMPANY NAME: KENWOOD MODEL: TMD700A MODE  
 COMMENT: A Band SCAN  
 B Band SCAN

POL	ANT	TABLE	FREQ	READ	FACTOR	NET	LIMITS	MARGIN	COMMENT
H V	[m]	[deg]	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	[dBuV/m]	[dB]	
H	1.0	170	379.99	43.0	-12.2	30.8	46.0	-15.2	
V	1.7	40	379.99	35.9	-12.2	23.7	46.0	-22.3	
H	1.0	295	425.60	47.6	-11.1	36.5	46.0	-9.5	
V	1.3	305	425.60	47.7	-11.1	36.6	46.0	-9.4	
H	1.0	170	954.10	32.4	1.4	33.8	46.0	-12.2	
H	2.2	160	1641.37	51.5	-4.0	47.6	54.0	-6.5	PEAK
H	2.2	160	1641.37	51.0	-4.0	47.1	54.0	-7.0	AVERAGE
V	1.0	230	1641.37	49.2	-4.0	45.3	54.0	-8.8	PEAK
V	1.0	230	1641.37	49.1	-4.0	45.2	54.0	-8.9	AVERAGE
H	1.1	175	1949.36	46.8	-2.2	44.6	54.0	-9.4	PEAK
H	1.1	175	1949.36	40.3	-2.2	38.1	54.0	-15.9	AVERAGE
H	1.1	170	1949.41	45.9	-2.2	43.7	54.0	-10.3	PEAK
H	1.1	170	1949.41	40.3	-2.2	38.1	54.0	-15.9	AVERAGE
H	1.1	170	1969.56	51.4	-2.2	49.2	54.0	-4.8	PEAK
H	1.1	170	1969.56	49.0	-2.2	46.8	54.0	-7.2	AVERAGE
H	1.0	175	2163.62	49.2	-1.6	47.6	54.0	-6.4	PEAK
H	1.0	175	2163.62	47.5	-1.6	45.9	54.0	-8.1	AVERAGE
V	1.0	130	2163.62	47.2	-1.6	45.6	54.0	-8.4	PEAK
V	1.0	130	2163.62	44.1	-1.6	42.5	54.0	-11.5	AVERAGE
H	1.0	160	2288.71	49.1	-1.1	48.0	54.0	-6.0	PEAK
H	1.0	160	2288.71	46.0	-1.1	44.9	54.0	-9.1	AVERAGE
V	1.0	145	2288.71	46.0	-1.1	44.9	54.0	-9.1	PEAK
V	1.0	145	2288.71	40.7	-1.1	39.6	54.0	-14.4	AVERAGE

FCC PART15B Class B 3m CONDUCTION DATASHEET @

DATE OF TESTS : 99/09/14 SITE 1 CHART NO 1 SHEET NO 2  
 COMPANY NAME : KENWOOD MODEL: TMD700A MODE SCAN  
 COMMENT:

FREQ [MHz]	READ A [dBμV]	READ B [dBμV]	FACTOR [dB]	NET A [dBμV]	NET B [dBμV]	LIMITS [dBμV]	MARGIN [dB]	COMMENT
0.450	20.4	20.5	0.1	20.5	20.6	48.0	-27.4	
0.915	29.4	29.2	0.1	29.5	29.3	48.0	-18.5	Ambient Noise
1.359	34.0	33.5	0.3	34.3	33.8	48.0	-13.7	Ambient Noise
3.941	25.4	26.0	0.3	25.7	26.3	48.0	-21.7	Ambient Noise
6.036	13.5	14.2	0.3	13.8	14.5	48.0	-33.5	Ambient Noise
9.649	29.5	28.9	0.4	29.9	29.3	48.0	-18.1	Ambient Noise