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KANSAI ELECTRONIC INDUSTRY DEVELOPMENT CENTER

HEAD OFFICE 6-8-7 NISHITENMA KITA-KU OSAKA 530-0047 JAPAN



IKOMA TESTING LABORATORY 12128 TAKAYAMA-CHO IKOMA-CITY NARA 630-0101 JAPAN

TEST REPORT

Report No.A-046-99-C

Date: 7 February 2000

This test report is to certify that the tested device properly complies with the requirements of:

FCC Rules and Regulations Part 15 Subpart B Unintentional Radiators.

All the tests necessary to show compliance to the requirements were performed and these results met the specifications of requirement. The results of this report should not be construed to imply compliance of equipment other than that, which was tested. Unless the laboratory permission, this report should not be copied in part.

1. Applicant

Company Name	:	ORION ELECTRIC CO., LTD.
Mailing Address	:	41-1 IEHISA-CHO, TAKEFU-SHI FUKUI 915-8555 JAPAN

2. Identification of Tested Device

Type of Device	:	TV Interface Device
Kind of Equipment Author	rizat	ion : : DoC : Certification : Verification
FCC ID	:	A7RM4C9F
Device Name	:	VIDEO CASSETTE RECORDER (Test for RF Modulator)
Trade Name	:	MEMOREX
Model Number	:	MVR4040A
Serial Number	:	ID-112-1269 □: Prototype ⊠: Pre-production □: Production
Date of Manufacture	:	December 1999

3. Test Items and Procedure

- X: AC Power Line Conducted Emission Measurement
- ⊠: Radiated Emission Measurement
- ⊠: Output Signal Level Measurement
- 🛛: Output Terminal Conducted Spurious Emission Measurement
- : Transfer Switch Measurement
- Above all tests were performed under: ANSI C63.4 1992
 - \boxtimes : without deviation, \square : with deviation(details are found inside of this report)

4. Date of Test

Receipt of Test Sample : 17 January 2000 Test Completed on : 1 February 2000

Fumitoshi Nagaoka Associate Director/ Ikoma Testing Laboratory

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0. NVLAP ACCREDITATION AND MEASUREMENT UNCERTAINTY

0.1. NVLAP Accreditation

KEC is accredited by the National Voluntary Accreditation Program for the specific scope of accreditation under Lab Code: 200207-0.

When a test report concerns with the NVLAP Accreditation test, the first page of the test report is sighed by NVLAP Approved Signatory together with the expression.

The report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

0.2. Measurement Uncertainty

The result of a measurement is only an approximation or estimate of the value of a specific quantity. And thus the measurand is complete only when a statement of uncertainty is given. KEC quotes Measurement Uncertainty (U)

of +/- 4.9 dB for Radiated Emissions of +/- 2.2 dB for Conducted Emissions of +/- 1.5 dB for Output Signal Level of +/- 2.6 dB for Output Terminal Conducted Spurious Emission and of +/- 2.2 dB for Transfer Switch Measurement.

1. CERTIFICATION OF THE COMPLIANCE

This test report is to certify that the tested device properly complies with the requirements of FCC Rules and Regulations Part 15 Subpart B Unintentional Radiators.

KEC evaluation criteria for compliance:The Product complies, ifthe measured results are below the specification limit by a margin more than or equal to1/2 U (2.5 dB) for Radiated Emissions

U (2.2 dB) for Conducted Emissions

U (1.5 dB) for Output Signal Level

- U (2.6 dB) for Output Terminal Conducted Spurious Emission and
- U (2.2 dB) for Transfer Switch Measurement.

2. GENERAL INFORMATION

2.1. Product Description

The MEMOREX Model No.MVR4040A (referred to as the EUT in this report) is a VIDEO CASSETTE RECORDER containing RF modulator and Tuner.

(1) Specification		
RF Modulator Frequency	: US CH. #3	Visual Carrier 61.25 MHz,
		Aural Carrier 65.75 MHz
	: US CH. #4	Visual Carrier 67.25 MHz,
		Aural Carrier 71.75 MHz
Type of RF Output Connector	: Type "F" Connec	tor 75 Ω (Unbalanced)
(2) Provided terminal		
ANT Input Terminal		
ANT Output Terminal		
A/V Input Terminals (front side	e)	
A/V Output Terminals	,	
(3) Used Oscillating Frequencies		
10 MHz	: SYSTEM CONTI	ROL / SERVO CONTROL
	MICROCOMPUT	TER CLOCK
3.579545 MHz	: CHROMINANCE	E SUBCARRIER OSCILLATOR
120 ~ 290 kHz	: SWITCHING FR	EQUENCY OF POWER SUPPLY
(4) Rated Power Supply	: AC 120 V, 60Hz	

2.2. Description for Equipment Authorization

(1) Type of device	: 🛛 TV Interface Device		
(2) Reference Rule and Specification	 FCC Rule Part 15 Section 15.107 (a) Section 15.109 (a)(c) and Section 15.115 (a) Section 15.115 (b)(1)(ii),(b)(2)(ii) and(c)(1)(ii) 		
(3) Kind of Equipment Authorization	: DoC Certification Verification		
(4) Procedure of Application	: 🛛 Original Equipment 🗌 Modification		
(5) Highest Frequency used in the Device	: 71.75 MHz		
(6) Upper Frequency of Radiated Emission Measu	rement Range : 🛛 1000 MHz 🗌 2000 MHz 🗌 5000 MHz		

2.3. Test Facility

All tests described in this report were performed by:					
Name:	KANSAI ELECTRONIC INDUSTRY DEVELOPMENT CENTER (KEC) IKOMA TESTING LABORATORY				
	Open Area Test Site No.1 No.2 No.3 No.4 EMC M.C. Anechoic Chamber No.1 No.1 Shielded Room No.2 No.4				
Address:	12128, Takayama-cho Ikoma-city, Nara, 630-0101 Japan				
These test facilitie Area Test Site No Shielded Room hav 25. Also the laboratory Product Service (O (EN45001).	s have been filed with the FCC under the criteria of ANSI C63.4-1992. The Open 0.4, EMC MC. Anechoic Chamber No.1, Shielded Room No.4 and EMC MC. e been accredited by the NVLAP (Lab. Code: 200207-0) based on ISO/IEC Guide y has been authorized by ITI (Interference Technology International, (UK), TUV GER) and TUV Rheinland (GER) based on their criteria for testing laboratory				

3. TESTED SYSTEM

3.1. Test Mode

In each measurement (excluding antenna transfer switch measurement), the compliance tests were performed under following five EUT operation modes. In transfer switch measurement, it was done under three modes ($a \sim c$).

- a. Playback mode Playback the video tape that is recorded 1V peak-to-peak VITS signal.
- b. Record mode (1V VITS Signal Input)
 1V peak-to-peak VITS signal is supplied through the VIDEO IN 1(front side) terminal.
- c. Record mode (5V VITS Signal Input)
 5V peak-to-peak VITS signal is supplied through the VIDEO IN 1(front side) terminal.
- d. Record mode (0 dBmV NTSC TV Signal Input) NTSC TV U.S. channel 13 (consist of visual carrier and aural carrier) is supplied through the ANTENNA IN terminal.

[Note]

- 1) Visual Carrier (0 dBmV at 211.25 MHz) is modulated by 1V peak-to-peak VITS signal.
- 2) Aural Carrier (-10 dBmV at 215.75 MHz) is not modulated.
- e. Record mode (25 dBmV NTSC TV Signal Input) NTSC TV U.S. channel 13 (consist of visual carrier and aural carrier) is supplied through the ANTENNA IN terminal.

[Note]

- 1) Visual Carrier (25 dBmV at 211.25 MHz) is modulated by 1V peak-to-peak VITS signal.
- 2) Aural Carrier (15 dBmV at 215.75 MHz) is not modulated.

)

- 3.2. Operation of EUT System
 - 1) Playback mode Playback the video tape that is recorded 1V peak-to-peak VITS signal.
 - 2) Record mode (1V / 5V VITS Signal Input) 1V/5V peak-to-peak VITS signal is supplied through the VIDEO IN terminal, if applicable.
 - 3) Record mode (0 dBmV / 25 dBmV NTSC TV Signal Input) NTSC TV U.S. channel 13 (consist of visual carrier and aural carrier) is supplied through the ANTENNA IN terminal, if applicable.
- 3.3. Characterization and condition of EUT System

 \boxtimes : normal , \square : not normal (that is

3.4. BlockDiagram of EUT System (for Conducted and Radiated Emission Measurements)

a. Playback mode



- Continued -

- b. Record mode (1V VITS Signal Input)
- c. Record mode (5V VITS Signal Input)



- Continued
 - d. Record mode (0 dBmV NTSC TV Signal Input)
 - e. Record mode (25 dBmV NTSC TV Signal Input)



4. AC POWER LINE CONDUCTED EMISSION MEASUREMENT

4.1. Test Procedure

(1)	Configure the EUT System in accordance with ANSI C63.4-1992 section 7.
	\boxtimes : without deviation, \square : with deviation(details are found below)
	See also the block diagram and the photographs of EUT System configuration in this
	report.
(2)	Connect the EUT's AC power cord to one Line Impedance Stabilization Network
	(LISN).
(3)	Any other power cord of other equipment is connected to a LISN different from the
	LISN used for the EUT.
(4)	Warm up the EUT System.
(5)	Activate the EUT System and run the software prepared for the test, if necessary.
(6)	Connect the spectrum analyzer (*1) to the measuring port of the LISN for the EUT,
()	using a calibrated coaxial cable.
(7)	To find out an EUT System condition, which produces the maximum emission, the
	configuration of EUT System, the position of the cables, and the operation mode, are
(-)	changed under normal usage of the EUT.
(8)	The spectrums are scanned from 450 kHz to 30 MHz and collect the six highest
	emissions minimum on the spectrum analyzer relative to the limits in the whole
	range.
(9)	The test receiver (*2) is connected to the LISN for the EUT, and the six highest
	emissions minimum recorded above are measured.
	[Note]
(*1)	Spectrum Analyzer Set Up Conditions
	Frequency range : 450 kHz - 30 MHz
	Resolution bandwidth : 10 kHz
	Video bandwidth : 1 MHz
	Detector function : Peak mode
(*2)	Test Receiver Set Up Conditions
	Detector function : Quasi-Peak/ Average (if necessary)
	IF bandwidth : 10 kHz

4.2. Test Results

Measured	LISN	Meter I	Reading	Maximum	Limits	Margin
Frequency	Factor	Va	Vb	RF Voltage		for Limits
(MHz)	(dB)	(dBmV)	(dBmV)	(dBmV)	(dBmV)	(dB)
0.960	0.3	34.8	34.6	35.1	48.0	12.9
1.189	0.3	35.9	35.8	36.2	48.0	11.8
1.493	0.3	36.5	36.5	36.8	48.0	11.2
1.658	0.3	36.3	36.1	36.6	48.0	11.4
1.829	0.3	35.1	35.4	35.7	48.0	12.3
20.274	1.0	36.6	36.9	37.9	48.0	10.1

[Calculation method]

Maximum RF Voltage (dBµV)

= Meter Reading (at maximum level of Va, Vb) + LISN Factor (dB)

[Note]

LISN Correction Factor includes the cable loss. (1)

(2) The emissions at channel #3 were nearly equal to channel #4. The spectrum was checked in each test mode and operation mode, and the data of the maximum EUT operation was reported.

[Environment]

Humidity 35%

[Tested Date / Tester] 31 January 2000

Temperature 23°C

Signature Yoshiko Kotani

- 4.3. Photographs of EUT System Configuration
 - a. Playback Mode

FRONT VIEW



SIDE VIEW



- Continued
 - b. Record mode (1V VITS Signal Input)
 - c. Record mode (5V VITS Signal Input)

FRONT VIEW





- Continued
 - d. Record mode (0 dBmV NTSC TV Signal Input)
 - e. Record mode (25 dBmV NTSC TV Signal Input)



FRONT VIEW

SIDE VIEW



5. RADIATED EMISSION MEASUREMENT

5.1. Test Procedure

(1)	Configure the EUT System in ac	cordance with ANSI C63.4-1992 section 8.
	\boxtimes : without deviation, \square : with	deviation(details are found below)
	See also the block diagram and	the photographs of EUT System configuration in this
	report.	
(2)	If the EUT system is connected	to a public power network, all power cords for the
	EUT System are connected the re	eceptacle on the turntable.
(3)	Warm up the EUT System.	-
(4)	Activate the EUT System and run	the prepared software for the test, if necessary.
(5)	To find out the emissions of the	EUT System, preliminary radiated measurement are
. /	performed at a closer distance th	an that specified for final radiated measurement using
	the spectrum analyzer (*1) and the	e broad band antenna.
	In the frequency above 1 GHz, it	is performed using the spectrum analyzer (*2) and the
	horn antenna.	
(6)	To find out an EUT System co	ndition, which produces the maximum emission, the
	configuration of EUT System, th	e position of the cables, and the operation mode, are
	changed under normal usage of the	ne EUT.
(7)	The spectrums are scanned from	m 30 MHz to the upper frequency of measurement
	range, and collect the six highest	emissions minimum on the spectrum analyzer relative
	to the limits in the whole range.	
(8)	In final compliance test, the si	x highest emissions minimum, recorded above, are
	measured at the specified distan	ce using the broad band antenna or the tuned dipole
	antenna and the test receiver (*3)).
	In the frequency above 1 GHz,	the measurements are performed by the horn antenna
	and the test recei	ver (*4).
	the spectrum	analyzer(*2) with pre-amplifier.
	[Note]	
(*1)	Spectrum Analyzer Set Up Condi	itions 1000 NW
	Frequency range	: 30 - 1000 MHz
	Resolution bandwidth	: 100 kHz
(*** ••	Detector function	: Peak mode
(*2)	Spectrum Analyzer Set Up Condi	itions
	Frequency range	: 1 GHz - Upper frequency of measurement range
	Resolution bandwidth	: 1 MHZ
	video bandwidth	
	Attenuator	: 10 dB
(*2)	Detector function	: Peak mode
(*3)	Detector function	· Ower Deals
	Detector function	: Quasi-Peak
(*4)	IF DalluWIUII Test Deceiver Set Up Conditions	. 120 KIIZ
(*4)	Detector function	
	IE bandwidth	· Avelage
		. 1 IVIIIZ

5.2. Test Results

				Measurement E	Distance 🛛: 3	m 🗌: 10m		
Measured Frequency	Antenna Factor	Meter Reading		Maximum Field Strength	Limits	Margin for Limits		
-1		Horizontal	Vertical					
(MHz)	(dB/m)	(dBmV)	(dBmV)	(dBmV/m)	(dBmV/m)	(dB)		
Test Chan	nel #3							
61.25	10.0	0.5	8.1	18.1	40.0	21.9		
65.75	9.5	1.6	< 0.0	11.1	40.0	28.9		
122.50	16.0	4.7	0.9	20.7	43.5	22.8		
245.00	21.7	< 0.0	< 0.0	<21.7	46.0	>24.3		
Test Chann	Test Channel #4							
67.25	9.3	8.5	3.3	17.8	40.0	22.2		
71.75	8.9	12.8	7.1	21.7	40.0	18.3		
134.50	17.2	1.9	< 0.0	19.1	43.5	24.4		
201.75	20.7	< 0.0	< 0.0	<20.7	<43.5	>22.8		
Other emi	ssions							
33.13	17.9	< 0.0	11.5	29.4	40.0	10.6		
57.29	10.7	13.6	17.9	28.6	40.0	11.4		
59.03	10.4	4.8	18.8	29.2	40.0	10.8		
71.61	8.9	23.7	16.7	32.6	40.0	7.4		
85.91	10.1	18.8	26.0	36.1	40.0	3.9		
114.55	15.0	16.2	15.1	31.2	43.5	12.3		
200.46	20.7	10.2	0.3	30.9	43.5	12.6		

[Note]

(1) Antenna Factor includes the cable loss.

(2) * mark in Measured Frequency :

asured Frequency : Measured with the tuned dipole antenna.

no mark in Measured Frequency : Measured with the broadband antenna.(3) The spectrum was checked in each test mode and operation mode, and the

data of the maximum EUT operation was reported.

[Calculation method]

Maximum Field Strength (dBµV/m)

= Meter Reading (at maximum level of Horizontal or Vertical) $(dB\mu V)$ + Antenna Factor (dB/m)

[Environment]

Temperature: 23°C

Humidity: 45%

[Tested Date/ Tester] 28 January 2000

- 5.3. Photographs of EUT System Configuration
 - a. Playback Mode



FRONT VIEW

REAR VIEW



- Continued -

- b. Record mode (1V VITS Signal Input)
- c. Record mode (5V VITS Signal Input)



FRONT VIEW

REAR VIEW



- Continued -

- d. Record mode (0 dBmV NTSC TV Signal Input)
- e. Record mode (25 dBmV NTSC TV Signal Input)

FRONT VIEW



REAR VIEW



6. OUTPUT SIGNAL LEVEL MEASUREMENT

6.1. Test Procedure

(1)	Configurate the EUT System in accordance with ANSI C63.4-1992 section 12.2.						
	\boxtimes : without deviation, \square : with deviation(details are found below)						
	See also the block diagram and the photographs of EUT System configuration						
	In this report.						
(2)	Unused RF input/output terminals are terminated in the proper impedance.						
(3)	Activate the EUT system.						
(4)	Set the spectrum analyzer as follows.						
	Frequency Span : 1 MHz						
	Resolution bandwidth : 100 kHz						
	Video bandwidth : 3 MHz						
	Detector function : Peak mode						
(5)	The RF output terminal is connected to the spectrum analyzer through the matching						
	transformer with a calibrated 50 Ω coaxial cable.						
(6)	Then, the RF output signal level is measured under the EUT condition produced the						
	maximum signal level.						

6.2. Test Results

Emission Frequency	Correction Factor	Meter Reading	Maximum Signal Level	Limits
[MHz]	[dB]	$[dB\mu V/50\Omega]$	[dBμV/75Ω]	[dBμV/75Ω]
<u>Test Channel #3</u>				
61.25	6.1	58.9	65.0	69.5
65.75	6.1	43.7	49.8	56.5
<u>Test Channel #4</u>				
67.25	6.1	58.6	64.7	69.5
71.75	6.1	43.0	49.1	56.5

[Note]

- (1) The correction factor consist of the voltage loss of the impedance matching transformer and the coaxial cable used for the test.
- (2) The spectrum was checked in each test mode and operation mode, and the data of the maximum EUT operation was reported.
- (3) The spectrum was checked in each test mode and operation mode, and the data of the maximum EUT operation was reported.

[Calculation method] Maximum Signal Level ($dB\mu V/75\Omega$) = Meter Reading ($dB\mu V/50\Omega$) + Correction Factor (dB)

[Environment]

Temperature: 23°C

Humidity: 35%

[Summary of Test Results]

Minimum margin was 4.5 dB at 61.25 MHz, test channel #3

[Tested Date/ Tester] 31 January 2000

Signature <u>Ykołani</u> Yoshiko Kotani

6.3. Photographs of EUT System Configuration

REAR VIEW

a. Playback Mode



b. Record mode (1V VITS Signal Input)c. Record mode (5V VITS Signal Input)



- Continued -

REAR VIEW

d. Record mode (0 dBmV NTSC TV Signal Input) e. Record mode (25 dBmV NTSC TV Signal Input)



7. OUTPUT TERMINAL CONDUCTED SOURIOUS EMISSION MEASUREMENT

7.1. Test Procedure

(1)	Configurate the EUT System in accordance with ANSI C63.4-1992 section 12.2.				
	\boxtimes : without deviation, \square : with deviation(details are found below)				
	See also the block diagram and the photographs of EUT System configuration				
	in this report.				
(2)	Unused RF input/output terminals are term	inated in the proper impedance.			
(3)	Activate the EUT system.				
(4)	Set the spectrum analyzer as follow	/S.			
	Frequency Span	: 1 MHz			
	Resolution bandwidth	: 100 kHz			
	Video bandwidth	: 3 MHz			
	Detector function	: Peak mode			
(5)	The RF output terminal is connected to the	he spectrum analyzer through the matching			
	transformer with a calibrated 50 Ω coaxial cable.				
(6)	The spectrum was scanned from 30 MH	z to more than 4.6 MHz below the visual			
	carrier frequency, and from more than 7.4 MHz above the visual carrier frequency to				
	1000 MHz, and the three highest emissions are selected under the EUT condition				
	produced the maximum signal level at each frequency range.				
(7)	Then, the RF output terminal conducted sp	urious emission level is measured under the			
. ,	EUT condition produced the maximum signal level.				

7.2. Test Results

Emission Frequency [MHz]	Correction Factor [dB]	Meter Reading [dBμV/50Ω]	Maximum Signal Level [dBμV/75Ω]	Limits [dBμV/75Ω]
<u>Test Channel #3</u>				
47.76 56.28 56.65 74.76 122.51 183.76 ** 56.65	6.1 6.1 6.1 6.1 6.1 6.1	5.8 10.1 33.5 7.3 12.7 7.1 7.7	11.9 16.2 39.6 13.4 18.8 13.2 13.8	39.5 39.5 39.5 39.5 39.5 39.5 39.5
<u>Test Channel #4</u>				
53.75 62.27 62.65 80.74 134.49 201.74 ** 62.65	6.1 6.1 6.1 6.1 6.1 6.1	8.0 10.7 35.8 6.7 5.8 6.0 10.2	14.1 16.8 41.9 12.8 11.9 12.1 16.3	39.5 39.5 39.5 39.5 39.5 39.5 39.5

[Note]

- (1) **: To except the effect of lower sideband of sound sub-carrier frequency component, if set the resolution bandwidth of spectrum analyzer to 30 kHz, these interference become to this value.
- (2) The correction factor consist of the voltage loss of the impedance matching transformer and the coaxial cable used for the test. And the meter readings descrived above are corrected by the gain of pre-amplifier.
- (3) The spectrum was checked in each test mode and operation mode, and the data of the maximum EUT operation was reported.
- (4) The spectrum was checked in each test mode and operation mode, and the Data of the maximum EUT operation was reported.

[Calculation method]

Maximum Signal Level ($dB\mu V/75\Omega$) = Meter Reading $(dBu V/50\Omega)$ + Correction Factor (dB)

[Environment]

Temperature: 23°C

Humidity: 35%

[Summary of Test Results]

Minimum margin was 18.8 dB at 122.51 MHz, test channel #3

[Tested Date/ Tester] 31 January 2000

Signature <u>Kolam</u> Yoshiko Kotani

7.3. Photographs of EUT System Configuration

The tested device configuration is the same as the output signal level measurement. (See 6.3 Photographs of EUT System Configuration.)

8. TRANSFER SWITCH MEASUREMENT

8.1. Test Procedure

(1)	Configurate the EUT System in accordance with ANSI C63.4-1992 section 12.2.					
	\boxtimes : without deviation, \square : with deviation(details are found below)					
	See also the block diagram and the photographs of EUT System configuration					
	In this report.					
(2)	Unused RF input/output terminals are terminated in the proper impedance.					
(3)	Activate the EUT system.					
(4)	Set the spectrum analyzer as follows.					
	Frequency Span : 1 MHz					
	Resolution bandwidth : 100 kHz					
	Video bandwidth : 3 MHz					
	Detector function : Peak mode					
(5)	The antenna input terminal is connected to the input of pre-amplifier through the					
. /	matching transformer with a calibrated 50 Ω coaxial cable. And the output of pre-					
	amplifier is connected to the spectrum analyzer.					
(6)	Then, the signal level on the antenna input terminal is measured under the EUT					
. /	condition produced the maximum signal level.					

8.2. Test Results

Emission Frequency	Correction Factor	Meter Reading	Maximum Signal Level	Limits
[MHz]	[dB]	[dBμV/50Ω]	[dBμV/75Ω]	[dBμV/75Ω]
<u>Test Channel #3</u> 61.25	2.0	1.0	3.0	9.5
<u>Test Channel #4</u> 67.25	2.1	1.3	3.4	9.5

[Note]

- (1) The correction factor consist of the voltage loss of the impedance matching transformer and the coaxial cable used for the test. And the meter readings descrived above are corrected by the gain of pre-amplifier.
- (2) The spectrum was checked in each test mode and operation mode, and the data of the maximum EUT operation was reported.

[Calculation method]

Maximum Signal Level ($dB\mu V/75\Omega$)

= Meter Reading $(dB\mu V/50\Omega)$ + Correction Factor (dB)

[Environment]

Temperature: 23°C

Humidity: 35%

[Summary of Test Results]

Minimum margin was 6.1 dB at 67.25 MHz, test channel #4.

[Tested Date/ Tester] 31 January 2000

Signature <u>Ykołani</u> Yoshiko Kotani

8.3. Photographs of EUT System Configuration

REAR VIEW

a. Playback Mode



b. Record mode (1V VITS Signal Input)c. Record mode (5V VITS Signal Input)



Equipment	Manufacturer	Model No.	Speecifications	KEC Control	Test Item	Last Cal.	Next Cal.
Test Receiver	Rohde & Schwarz	ESH3	Frequency Range 9kHz-30MHz	FS-48-2	1	1999/12	2000/12
		ESVS10	Frequency Range 20MHz-1GHz	FS-60	2	1999/6	2000/6
Spectrum Analyzer	Rohde & Schwarz	FSA	Frequency Range 100 Hz-1.8 GHz	SA-35	2	1999/7	2000/7
	Hewlett Packard	8568B	Frequency Range 100 Hz-1.5 GHz	FS-46-3	1,3,4,5	1999/6	2000/6
Pre-amplifier	Anritsu	MH648A	Frequency Range 100 Hz-1.2 GHz	AM-28	4,5	1999/6	2000/6
Biconical Antenna	Schwarzbeck	BBA9106	Frequency Range 30MHz-300MHz	AN-219	2	1999/2	2000/2
Log- Periodic Antenna	Schwarzbeck	UHALP9108A	Frequency Range 300MHz-1GHz	AN-218	2	1999/2	2000/2
Tuned Dipole Antenna	Kyoritsu	KBA-511AS	Frequency Range 25MHz-500MHz	AN-132	N/A	1999/3	2000/3
/ uncenna		KBA-611S	Frequency Range 500MHz-1GHz	AN-115	N/A	1999/3	2000/3
LISN	Kyoritsu	KNW-407	Frequency Range 150kHz-30MHz	FL-106	1	1999/4	2000/4
Impeadance Transformer	NMC	MB-009	Frequency Range 10MHz-2GHz 50Ω: 75Ω	AX-61	3,4	1999/8	2000/8
Matching Transfomer	Anritsu	MG614A	Frequency Range 10MHz-1.2GHz 50Ω: 75Ω	AX-28-4	5	1999/11	2000/11

9. USED TEST EQUIPMENTS AND CALIBRATION STATUS

- Continued -

Instrument	Manufacturer	Model No.	Specifications	KEC Control No.	Test Item (*)	Last Cal.	Next Cal.
Video Part Signal Generator	Anritsu	MG3601A	Frequency Range 100kHz - 1.04GHz	SG-41	1,2,3,4	1999/9	2000/9
Audio Part Signal Generator	Anritsu	MG3601A	Frequency Range 100kHz - 1.04GHz	SG-48	1,2,3,4	1999/9	2000/9
Multiburst Signal Generator	Anritsu	MG318A	According to ANSI C63.4(1992) Section 12 Fig.15	MG-35	1,2,3,4,5	1999/12	2000/12
Matching Trans Former	Anritsu	MG614A	Frequency Range 10MHz - 1.2GHz	AX-28-2	1,2,3,4	1999/11	2000/11
Four-Port Junction Pad	Anritsu	MP659A	Frequency Range 40MHz - 1GHz	AX-16	1,2,3,4	1999/11	2000/11

[Note] Test Item (*): Conducted Emission Measurement 1: 2: Radiated Emission Measurement 3: Output Signal level Measurement 4: Output Terminal Conducted Spurious Measurement 5: Transfer Switch Measurement N/A: Not Applicable The overall program of calibration and verification of equipment is designed and operated so as to ensure that measurements made by KEC are traceable to national standards of measurement or equivalent abroad.