

**EMC** EMISSION - TEST REPORT

JQA APPLICATION No. : KL8080616

Model/Type No. : VRA671AT21

Name of Product : Video Cassette Recorder (TV Interface Device)

FCC ID : ADTVRA671

Applicant : Funai Electric Co., Ltd.

Address : 7-1, 7-chome, Nakagaito, Daito-shi, Osaka, Japan

Manufacturer : Funai Electric Co., Ltd.

Address : 7-1, 7-chome, Nakagaito, Daito-shi, Osaka, Japan

*Final Judgement* : **Passed**

**TEST RESULTS IN THIS REPORT** are obtained in use of equipment that is traceable to Electro-technical Lab. of MITI Japan and Communications Research Lab. of PTT Japan.

**THE TEST RESULTS** only responds to the test sample. This test report shall not be reproduced except in full.

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### TEST REGULATION

FCC Rules and Regulations Part 15 Subpart A and B (April 17, 1997)

- Class A Digital Device
- Class B Digital Device
- TV Broadcast Receiver
- TV Interface Device

#### Test procedure:

Conducted and radiated emission test were performed according to the procedures in ANSI C63.4-1992.

### GENERAL INFORMATION

#### Test facility:

- 1) Test Facility located at Kita-Kansai : 1st and 2nd Open Sites (3 m Site)  
Test Facility located at Kameoka Open Site (3, 10 and 30 m, on common plane)  
FCC filing No. : 31040/SIT 1300F2
- 2) KITA-KANSAI TESTING CENTER is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance established in Title 15, Part 285 Code of Federal Regulations.  
NAVLAP Lab Code: 200191-0

#### Description of the Equipment Under Test (EUT):

- 1) Name : Video Cassette Recorder
- 2) Model/Type No. : VRA671AT21
- 3) Brand Name : PHILIPS
- 4) Product Type : Pre Production (S/N 00003)
- 5) Category : TV Interface Device
- 6) EUT Authorization :  - Verification  - Certification  - D.o.C
- 7) Highest frequency used/generated : 71.75 MHz
- 8) Power Rating : 120V 60Hz

#### Definitions for symbols used in this test report:

- Black box indicates that the listed condition, standard or equipment is applicable for this Report.
- Blank box indicates that the listed condition, standard or equipment is not applicable for this Report.

### TEST CONDITIONS

**The measurement of the Conducted Emission (Disturbance Voltage)**  
was performed in the following test site.

#### Test location:

KITA-KANSAI Testing Center

7-7, Ishimaru, 1-Chome, Minoh-Shi, Osaka, 562-0027, Japan

● - Shielded room

KAMEOKA EMC Branch

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

○ - Shielded room

○ - On metal plane of open site

#### Used test instruments and sites:

| Model No.    | Device I.D No. | Last Cal. Date | Cal. Interval |
|--------------|----------------|----------------|---------------|
| ○ - ESH 3    | A - 1          |                |               |
| ● - ESH 2    | A - 2          | December, 1998 | 1 Year        |
| ○ - ESH 2    | A - 3          |                |               |
| ○ - 8568B    | A - 10         |                |               |
| ○ - 8566B    | A - 13         |                |               |
| ○ - 8593A    | A - 15         |                |               |
| ● - KNW-407  | D - 6          | February, 1998 | 1 Year        |
| ○ - KNW-242  | D - 7          |                |               |
| ○ - KNW-341C | D - 13         |                |               |
| ○ - KNW-408  | D - 14         |                |               |
| ○ - ESH2-Z5  | D - 10         |                |               |
| ○ - ESH3-Z5  | D - 12         |                |               |
| ○ - ESH2-Z3  | D - 17         |                |               |
| ○ - VG-40A   | B - 13         |                |               |
| ● - MG318A   | B - 14         | May, 1998      | 1 Year        |
| ● - 216/1    | B - 16         | May, 1998      | 1 Year        |
| ● - Cable    | H - 8          | February, 1998 | 1 Year        |

#### Environmental conditions:

Temperature: 23 °C Humidity: 34 %



**The measurement of the Radiated Emission (Electric Field)**

was performed in horizontal and vertical polarization, in the frequency range of 30 MHz - 1000 MHz, in the following test site.

**Test location:**

**KITA-KANSAI Testing Center**

7-7, Ishimaru, 1-Chome, Minoh-Shi, Osaka, 562-0027, Japan

- - 1st site (3 meters)
- - 2nd site (3 meters)

**KAMEOKA EMC Branch**

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

- - 3 meters
- - 10 meters

**Validation of Site Attenuation:**

- 1) Last Confirmed Date: November 27, 1998
- 2) Interval : 1 Year

**Used test instruments:**

| Model No.      | Device I.D No. | Last Cal. Date | Cal. Interval |
|----------------|----------------|----------------|---------------|
| ● - ESV/ESV-Z3 | A - 7 / A - 17 | December, 1998 | 1 Year        |
| ○ - ESV/ESV-Z3 | A - 6 / A - 18 |                |               |
| ○ - ESV/ESV-Z3 | A - 5 / A - 16 |                |               |
| ○ - ESV/ESV-Z3 | A - 4 / A - 20 |                |               |
| ○ - ESV/ESV-Z3 | A - 8 / A - 19 |                |               |
| ● - KBA-511A   | C - 12         | November, 1998 | 1 Year        |
| ● - KBA-611    | C - 22         | November, 1998 | 1 Year        |
| ● - MG318A     | B - 14         | May, 1998      | 1 Year        |
| ● - 216/1      | B - 16         | May, 1998      | 1 Year        |
| ● - Cable      | H - 5          | November, 1998 | 1 Year        |

**Environmental conditions:**

Temperature: 14 °C Humidity: 44 %

**The measurement of the Radiated Emission (Electric Field)**

was performed in horizontal and vertical polarization, in the frequency range of 1 GHz - 2 GHz, in the following test site.

**Test location:**

**KITA-KANSAI Testing Center**

7-7, Ishimaru, 1-Chome, Minoh-Shi, Osaka, 562-0027, Japan

○ - 1st site (3 meters)

○ - 2nd site (3 meters)

**KAMEOKA EMC Branch**

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

○ - 3 meters

○ - 10 meters

**Used test instruments:**

| Model No.       | Device I.D No. | Last Cal. Date | Cal. Interval |
|-----------------|----------------|----------------|---------------|
| ○ - 8566B       | A - 13         |                |               |
| ○ - 8593A       | A - 15         |                |               |
| ○ - ESV         | A - 5          |                |               |
| ○ - 4T-10       | D - 73         |                |               |
| ○ - 4T-10       | D - 74         |                |               |
| ○ - WJ-6611-513 | A - 23         |                |               |
| ○ - WJ-6882-824 | A - 21         |                |               |
| ○ - 91888-2     | C - 41 - 1     |                |               |
| ○ - 91889-2     | C - 41 - 2     |                |               |
| ○ - 94613-1     | C - 41 - 3     |                |               |
| ○ - 8494H/8595H | D - 76         |                |               |
| ○ - Cable       | C - 40 - 11    |                |               |
| ○ - Cable       | C - 40 - 12    |                |               |

**Setting of the spectrum analyzer:**

RES B.W :                      Video B.W :  
SCALE :                         Sweep Time:

**Environmental conditions:**

Temperature: \_\_\_\_\_ °C      Humidity: \_\_\_\_\_ %

**The measurement of the Output Signal Level**  
was performed in the following test site.

**Test location:**

KITA-KANSAI Testing Center

7-7, Ishimaru, 1-Chome, Minoh-Shi, Osaka, 562-0027, Japan

● - Shielded Room

○ - Anechoic Chamber

KAMEOKA EMC Branch

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

○ - Shielded Room

**Used test instruments:**

| Model No.     | Device I.D No. | Last Cal. Date | Cal. Interval |
|---------------|----------------|----------------|---------------|
| ● - 8568B     | A - 10         | May, 1998      | 1 Year        |
| ○ - 8566B     | A - 13         |                |               |
| ○ - 8593A     | A - 15         |                |               |
| ○ - 8447D     | A - 25         |                |               |
| ● - MG318A    | B - 14         | May, 1998      | 1 Year        |
| ● - 216/1     | B - 16         | May, 1998      | 1 Year        |
| ○ - MP614A    | D - 56         |                |               |
| ○ - 12B50/75  | D - 55         |                |               |
| ● - 12N50/75B | D - 72         | June, 1998     | 1 Year        |
| ○ - 1-6       | D - 32         |                |               |
| ○ - 1-3       | D - 34         |                |               |
| ○ - 2-10      | D - 40         |                |               |
| ○ - 8201-3    | D - 63         |                |               |
| ○ - 8201-6    | D - 64         |                |               |
| ● - Cable     | C - 40 - 9     | June, 1998     | 1 Year        |

**Environmental conditions:**

Temperature: 22 °C Humidity: 40 %

**The measurement of the Output Terminal Conducted Spurious Emission**  
was performed in the following test site.

**Test location:**

KITA-KANSAI Testing Center

7-7, Ishimaru, 1-Chome, Minoh-Shi, Osaka, 562-0027, Japan

● - Shielded Room

○ - Anechoic Chamber

KAMEOKA EMC Branch

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

○ - Shielded Room

**Used test instruments:**

| Model No.     | Device I.D No. | Last Cal. Date | Cal. Interval |
|---------------|----------------|----------------|---------------|
| ● - 8568B     | A - 10         | May, 1998      | 1 Year        |
| ○ - 8566B     | A - 13         |                |               |
| ○ - 8593A     | A - 15         |                |               |
| ● - 8447D     | A - 25         | June, 1998     | 1 Year        |
| ● - MG318A    | B - 14         | May, 1998      | 1 Year        |
| ● - 216/1     | B - 16         | May, 1998      | 1 Year        |
| ○ - MP614A    | D - 56         |                |               |
| ○ - 12B50/75  | D - 55         |                |               |
| ● - 12N50/75B | D - 72         | June, 1998     | 1 Year        |
| ○ - 1-6       | D - 32         |                |               |
| ○ - 1-3       | D - 34         |                |               |
| ○ - 2-10      | D - 40         |                |               |
| ○ - 8201-3    | D - 63         |                |               |
| ● - 8201-6    | D - 64         | June, 1998     | 1 Year        |
| ● - Cable     | C - 40 - 9     | June, 1998     | 1 Year        |

**Environmental conditions:**

Temperature: 22 °C Humidity: 40 %



**The measurement of the Transfer Switch Isolation**  
was performed in the following test site.

**Test location:**

KITA-KANSAI Testing Center

7-7, Ishimaru, 1-Chome, Minoh-Shi, Osaka, 562-0027, Japan

- - Shielded Room
- - Anechoic Chamber

KAMEOKA EMC Branch

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

- - Shielded Room

**Used test instruments:**

| Model No.     | Device I.D No. | Last Cal. Date | Cal. Interval |
|---------------|----------------|----------------|---------------|
| ● - 8568B     | A - 10         | May, 1998      | 1 Year        |
| ○ - 8566B     | A - 13         |                |               |
| ○ - 8593A     | A - 15         |                |               |
| ● - 8447D     | A - 25         | June, 1998     | 1 Year        |
| ● - MG318A    | B - 14         | May, 1998      | 1 Year        |
| ● - 216/1     | B - 16         | May, 1998      | 1 Year        |
| ○ - MP614A    | D - 56         |                |               |
| ○ - 12B50/75  | D - 55         |                |               |
| ● - 12N50/75B | D - 72         | June, 1998     | 1 Year        |
| ○ - 1-6       | D - 32         |                |               |
| ○ - 1-3       | D - 34         |                |               |
| ○ - 2-10      | D - 40         |                |               |
| ● - 8201-3    | D - 63         | June, 1998     | 1 Year        |
| ○ - 8201-6    | D - 64         |                |               |
| ● - Cable     | C - 40 - 9     | June, 1998     | 1 Year        |

**Environmental conditions:**

Temperature: 22 °C Humidity: 40 %

CONFIGURATION OF EUT

The Equipment Under Test (EUT) consists of:

| Description             | Applicant<br>(Manufacturer)                            | Model No.<br>(Serial No.) | FCC ID    |
|-------------------------|--|---------------------------|-----------|
| Video Cassette Recorder | Funai Electric Co., Ltd.<br>(Funai Electric Co., Ltd.) | VRA671AT21<br>(00003)     | ADTVRA671 |

The measurement was carried out with the following equipment connected:

| Description | Grantee/Distributor | Model No.<br>(Serial No.) | FCC ID |
|-------------|---------------------|---------------------------|--------|
| None        |                     |                           |        |

Type of Interference Cable(s) and the AC Power Cord used with the EUT:

| No. | Cable   | Shielded  | Ferrite Core | Length       |
|-----|---|-----------|--------------|--------------|
| 1   | EUT (VIDEO INPUT (Rear)) / 75Ω termination<br>or VITS Generator | --<br>YES | --<br>NO     | -- m<br>2.5m |
| 2   | EUT (VIDEO INPUT (Front)) / 75Ω termination                     | --        | --           | -- m         |
| 3   | EUT (VIDEO OUTPUT) / 75Ω termination                            | YES       | NO           | 1.0m         |
| 4   | EUT (AUDIO INPUT L/R (Rear)) / No termination                   | --        | --           | -- m         |
| 5   | EUT (AUDIO INPUT L/R (Front)) / No termination                  | --        | --           | -- m         |
| 6   | EUT (AUDIO OUTPUT L/R ) / No termination                        | YES       | NO           | 1.0m         |
| 7   | EUT (ANTENNA INPUT) / 75Ω termination<br>or Colorbar Generator  | --<br>YES | --<br>NO     | -- m<br>2.5m |
| 8   | EUT (RF OUTPUT) / 75Ω termination                               | YES       | NO           | 1.0m         |
| 9   | AC Power Cord (EUT) with 2-pin plug                             | NO        | NO           | 1.5m         |

### Operation - mode of the EUT:

The equipment under test was operated under 3 modes shown as follows:

- A) Playing the internal modulation sources (NTSC TV signal recording tape)
- B) Recording the video modulation sources (VITS: 1Vp\_p and 5Vp\_p)
- C) Recording the RF modulation sources (NTSC Colorbar: 70dB( $\mu$ V) at 193.25 MHz)

### Test system:

The EUT has ports shown as follows:

F-Type Plugs : ANTENNA IN, RF OUT  
Pin Plugs : VIDEO IN (Front/Rear), AUDIO IN L/R (Front/Rear), VIDEO OUT, AUDIO OUT L/R

### Special accessories:

None

### The used (generated) frequency in the EUT:

#### Carrier Frequency

3ch Visual : 61.25 MHz  
Aural : 56.75 MHz, 65.75 MHz  
4ch Visual : 67.25 MHz  
Aural : 62.75 MHz, 71.75 MHz

System Control : 14.3 MHz  
Color Carrier : 3.58 MHz  
Clock : 32 kHz

EUT Modification

- - No modifications were conducted by JQA to achieve compliance to the applied levels.
- - To achieve compliance to the applied levels, the following change(s) were made by JQA during the compliance test.

The modification(s) will be implemented in all production models of this equipment.

Applicant : \_\_\_\_\_ Date :

Typed Name : \_\_\_\_\_ Position :

Responsible Party

Responsible Party of Test Item(Product) \_\_\_\_\_

Responsible party :

Contact Person :

\_\_\_\_\_  
Signatory



TEST RESULTS

Conducted Emission 450 kHz - 30 MHz

The requirements are

● - KEPT      ○ - NOT KEPT

Min. limit margin

+ 6.6 dB at 7.16 MHz

Max. limit exceeding

\_\_\_\_\_ dB at \_\_\_\_\_ MHz

Uncertainty of measurement results

+ 2.1 dB(2σ)    - 2.1 dB(2σ)

Remarks: \_\_\_\_\_  
\_\_\_\_\_

Radiated Emission (Electric Field) 30 MHz - 1000 MHz

The requirements are

● - KEPT      ○ - NOT KEPT

Min. limit margin

+ 2.1 dB at 85.9 MHz

Max. limit exceeding

\_\_\_\_\_ dB at \_\_\_\_\_ MHz

Uncertainty of measurement results

+ 4.1 dB(2σ)    - 4.2 dB(2σ)

Remarks: \_\_\_\_\_  
\_\_\_\_\_

Radiated Emission (Electric Field) 1 GHz - 2 GHz

The requirements are

○ - KEPT      ○ - NOT KEPT

Min. limit margin

\_\_\_\_\_ dB at \_\_\_\_\_ MHz

Max. limit exceeding

\_\_\_\_\_ dB at \_\_\_\_\_ MHz

Uncertainty of measurement results

\_\_\_\_\_ dB(2σ)    \_\_\_\_\_ dB(2σ)

Remarks: Not Applicable  
\_\_\_\_\_

**Output Signal Level**

The requirements are

● - KEPT            ○ - NOT KEPT

Min. limit margin

+ 2.8 dB    at 61.25 MHz

Max. limit exceeding

\_\_\_\_\_ dB    at \_\_\_\_\_ MHz

Uncertainty of measurement results

+ 2.3 dB(2σ)    - 2.3 dB(2σ)

Remarks: \_\_\_\_\_  
\_\_\_\_\_

**Output Terminal Conducted Spurious Emission 30 MHz - 1000 MHz**

The requirements are

● - KEPT            ○ - NOT KEPT

Min. limit margin

+15.8 dB    at 122.25 MHz

Max. limit exceeding

\_\_\_\_\_ dB    at \_\_\_\_\_ MHz

Uncertainty of measurement results

+ 2.3 dB(2σ)    - 2.3 dB(2σ)

Remarks: \_\_\_\_\_  
\_\_\_\_\_

**Transfer Switch Isolation**

The requirements are

● - KEPT            ○ - NOT KEPT

Min. limit margin

+ 5.3 dB    at 67.25 MHz

Max. limit exceeding

\_\_\_\_\_ dB    at \_\_\_\_\_ MHz

Uncertainty of measurement results

+ 2.3 dB(2σ)    - 2.3 dB(2σ)

Remarks: \_\_\_\_\_  
\_\_\_\_\_

SUMMARY

GENERAL REMARKS :

The EUT was tested according to the requirements of FCC Rules and Regulations Part 15 Subpart A and B (April 17, 1997) under the test configuration, as shown in page 16.

The conclusion for the test items of which are required by the applied regulation is indicated under the final judgement.

FINAL JUDGEMENT :

The "as received" sample;

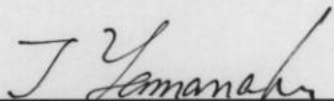
- - fulfill the test requirements of the regulation mentioned on page 3.
- - fulfill the test requirements of the regulation mentioned on page 3, but with certain qualifications.
- - doesn't fulfill the test regulation mentioned on page 3.

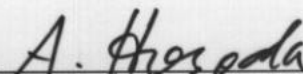
Begin of testing : December 18, 1998

End of testing : January 7, 1999

- JAPAN QUALITY ASSURANCE ORGANIZATION -

Approved Signatory :

  
\_\_\_\_\_  
Takashi Yamanaka  
Manager  
EMC Div.  
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