

# RDR-HX680/HX780/HX785/ HX980/HX1080 RMT-D246A/D249P/D250P

## SERVICE MANUAL

**Self Diagnosis**  
Supported model

Ver. 1.0 2008.04



Photo: RDR-HX780  
RMT-D246A



DVD+ReWritable



VIDEO/R/RW



™



(AEP)



(AEP, UK, Russian)

**AEP Model**  
RDR-HX680/HX780/HX785/HX980/  
HX1080

**Canadian Model**  
**UK Model**

**E Model**  
RDR-HX780

**Australian Model**  
**Russian Model**  
**Singapore Model**

**Thai Model**  
RDR-HX780/HX980

### SPECIFICATIONS

#### System

**Laser:** Semiconductor laser

#### Channel coverage:

AEP, UK, Russian model

PAL (B/G, D/K, I)/SECAM (L)

VHF: E2 to E12, R1 to R12, F2 to

F10, Italian A to H, Ireland A to J,

South Africa 4 to 11, 13

UHF: E21 to E69, R21 to R69, B21 to

B69, F21 to F69

CATV: S01 to S05, S1 to S20, France

B to Q

HYPER: S21 to S41

The above channel coverage merely ensures the channel reception within these ranges. It does not guarantee the ability to receive signals in all circumstances. The channels that can be received differ depending on the country/region.

#### Channel coverage:

Canadian, E model

NTSC

VHF: 2 to 13

UHF: 14 to 69

CATV: A8 to A1, A to W, W+1 to W+84

**Video reception:** Frequency synthesizer system

**Audio reception:** Split carrier system

**Aerial out:** AEP, UK, Russian model

**Antenna out:** Canadian, E model

75-ohm asymmetrical aerial socket

**Timer:** Clock: Quartz locked/Timer indication: 24-hour cycle (digital)

**Video recording format:** MPEG-2, MPEG-1

**Audio recording format/applicable**

**bit rate:** Dolby Digital 2 ch

256 kbps/128 kbps (in EP, SLP, and

SEP mode), PCM

#### Inputs and outputs

**LINE 2 OUT:** AEP, UK, Russian model

**LINE OUT:** Canadian, E model

**(AUDIO):** Phono jack/2 Vrms/10 kilohms

**(VIDEO):** Phono jack/1.0 Vp-p

**(S VIDEO):** 4-pin mini DIN/Y: 1.0 Vp-p,

C: 0.3 Vp-p (PAL)

C: 0.286 Vp-p (NTSC)

**LINE 2 IN:** AEP, UK, Russian model

**LINE IN 1/2/3:** Canadian, E model

**(AUDIO):** Phono jack/2 Vrms/more than 22 kilohms

**(VIDEO):** Phono jack/1.0 Vp-p

**(S VIDEO):** 4-pin mini DIN/Y: 1.0 Vp-p,

C: 0.3 Vp-p (PAL)

C: 0.286 Vp-p (NTSC)

**LINE 3 – TV:** 21-pin

AEP, UK, Russian model

CVBS OUT

S-Video/RGB OUT (upstream)

**LINE 1/DECODER:** 21-pin

AEP, UK, Russian model

CVBS IN/OUT

S-Video/RGB IN

Decoder

**DV IN:** 4-pin/i.LINK S100

**DIGITAL OUT (COAXIAL):** Phono jack/0.5 Vp-p/75 ohms

#### COMPONENT VIDEO OUT

**(Y, P<sub>B</sub>/C<sub>B</sub>, P<sub>R</sub>/C<sub>R</sub>):**

AEP, UK, Russian model

**(Y, P<sub>B</sub>, P<sub>R</sub>):** Canadian, E model

Phono jack/Y: 1.0 Vp-p,

P<sub>B</sub>/C<sub>B</sub>: 0.7 Vp-p, P<sub>R</sub>/C<sub>R</sub>: 0.7 Vp-p

**G-LINK\*:** mini jack

**HDMI OUT:** HDMI™ Connector

#### USB:

USB jack Type A (For connecting digital still camera, Memory card reader, USB memory and HDD camcorder)

USB jack Type B (For connecting PictBridge-compatible printers)

#### General

**Power requirements:** 220-240 V AC, 50/60 Hz

#### Power consumption:

43 W AEP, UK, Russian model

42 W Canadian, E model

#### Dimensions (approx.):

430 · 66.5 · 286.5 mm (width/height/depth) incl. projecting parts

#### Hard disk drive capacity:

RDR-HX680/HX780/HX785:

160 GB

RDR-HX980: 250 GB

RDR-HX1080: 500 GB

#### Mass (approx.): 4.4 kg

**Operating temperature:** 5°C to 35°C

**Operating humidity:** 25% to 80%

#### Supplied accessories:

Mains lead (1)

Aerial cable (1)

Audio/video card (1) Canadian, E model

Remote commander (remote) (1)

Set top box controller (1)\*

R6 (size AA) batteries (2)

\* RDR-HX780/HX785/HX980/HX1080 AEP model only

Specifications and design are subject to change without notice.

## DVD RECORDER

# SONY®

Sony Corporation

Home Electronics Network Company

2008D1600-1

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Published by Quality Assurance Dept.

## WARNING!!

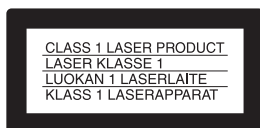
WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 25 cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

### CAUTION:

The use of optical instrument with this product will increase eye hazard.

### CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.



### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  $\triangle$  OR DOTTED LINE WITH MARK  $\triangle$  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

### Unleaded solder

Boards requiring use of unleaded solder are printed with the lead-free mark (LF) indicating the solder contains no lead. (Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size.)



### : LEAD FREE MARK

Unleaded solder has the following characteristics.

- Unleaded solder melts at a temperature about 40°C higher than ordinary solder.  
Ordinary soldering irons can be used but the iron tip has to be applied to the solder joint for a slightly longer time.  
Soldering irons using a temperature regulator should be set to about 350°C.  
Caution: The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful!
- Strong viscosity  
Unleaded solder is more viscous (sticky, less prone to flow) than ordinary solder so use caution not to let solder bridges occur such as on IC pins, etc.
- Usable with ordinary solder  
It is best to use only unleaded solder but unleaded solder may also be added to ordinary solder.

### Special Component Notice

The components identified by mark  $\square$  contain confidential information.

Strictly follow the instructions whenever the components are repaired and/or replaced.

## SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.
6. Flexible Circuit Board Repairing
  - Keep the temperature of the soldering iron around 270°C during repairing.
  - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
  - Be careful not to apply force on the conductor when soldering or unsoldering.

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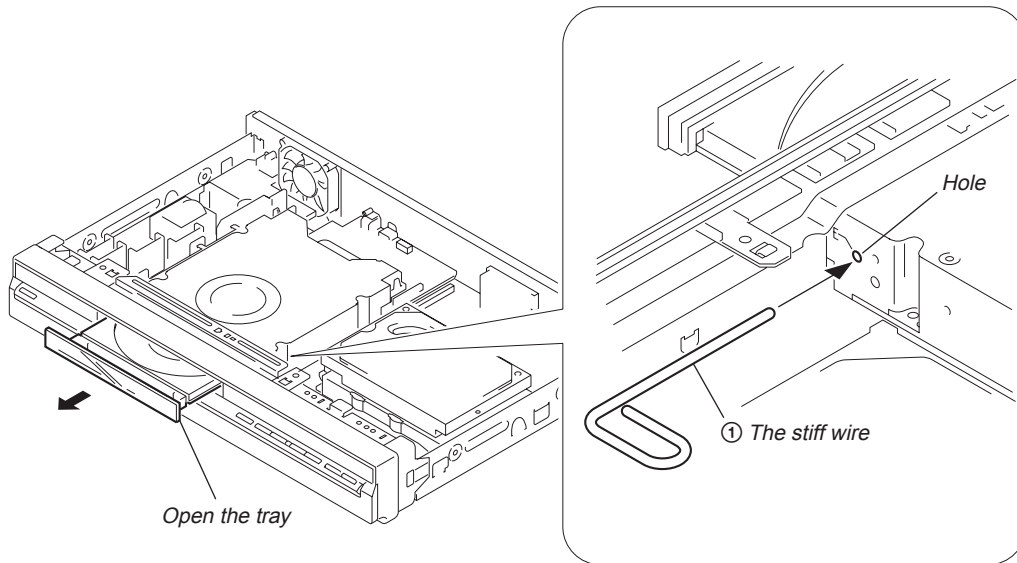
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## SECTION 1

### SERVICE NOTE

#### 1. DISK REMOVAL PROCEDURE IF THE TRAY CANNOT BE EJECTED (FORCED EJECTION)

1. Remove the upper case.
2. Insert the stiff wire in the hole and eject the tray.



#### NOTES DURING THE FORCED EJECTION

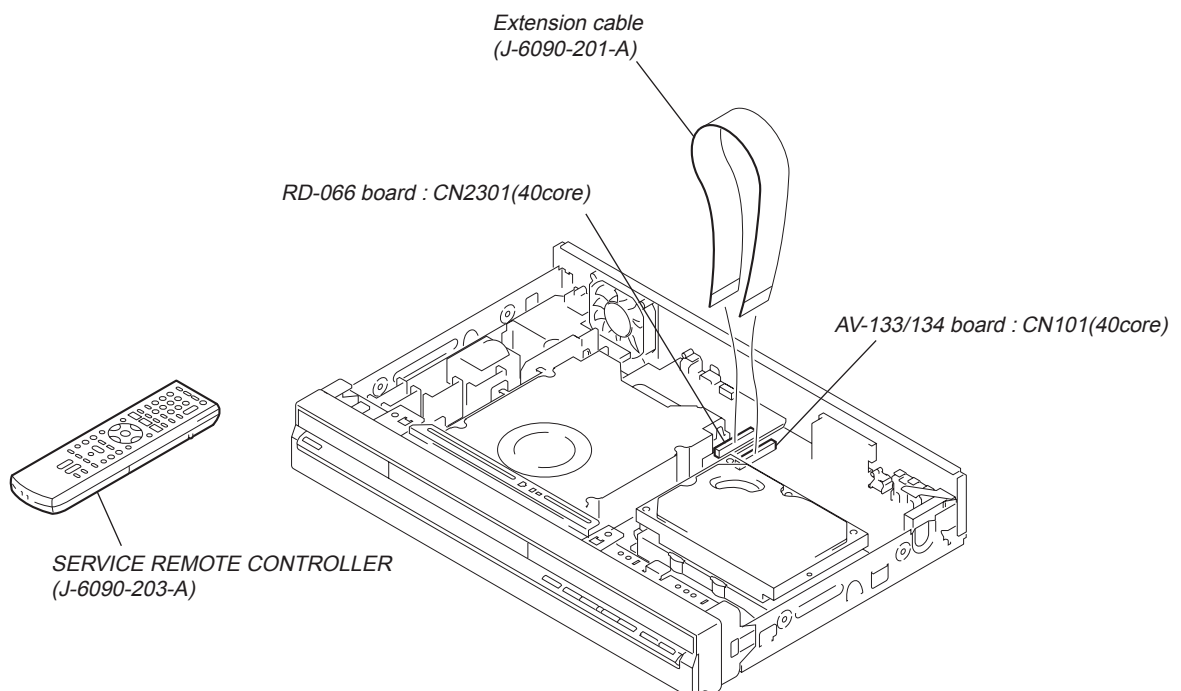
1. If the forced ejection is executed while a blank disc media (DVD±RW, ±R) exists on the tray
  - Insert a DVD-ROM (DVD test disc, DVD software available on the market, or the like) in the tray and then close the tray.

**Note1:** If you close the tray while it is empty, ejection of the tray becomes impossible.

**Note2:** If you close the tray with a CD disc inserted in it, the CD can be ejected. However, if you close the tray while it is empty, there can be a case that ejection of the tray becomes impossible.

**Note3:** Even if you replace the DVD drive unit while the tray remains under the state as described above, the situation cannot be improved.
2. If the tray cannot be ejected while the disc is not inserted
  - Execute the forced ejection.
  - Insert a DVD-ROM (DVD test disc, DVD software available on the market, or the like) on the tray and try to close the tray. (There are cases that it recovers the trouble.)
3. Contents of forcibly ejected blank disc media (DVD±RW, ±R) can be damaged. (There can be a case that initialization is also impossible.)

#### 2. BOARD CONNECTION, SERVICE REMOTE CONTROLLER



### 3. MODEL NAME SETTING METHOD WHEN ENGINE IS REPLACED

#### Required equipment:

- Remote controller (RMT-D246A/D249P/D250P)
- Service remote controller (J-6090-203-A)
- Monitor

#### Model name delete method

1. Turn the main POWER ON.
2. Press the following buttons on the service remote controller in this order.:  
 “ESC” ⇨ “CHAP” ⇨ “1”  
 \* Confirm that the above operation is performed in the state that the screen has exited all settings such as “Home Menu” or “Simple Setting”.
3. Turn the main POWER OFF.
4. Turn the main POWER ON.
5. Find out the tentative model name from the Correspondence Table (Table 1) for the client machine. Then, enter the 4-digit “Input No.” on the screen using the service remote controller.
6. The model name setting method is complete. (Screen disappears.)  
 \* Upon completion of the model name setting, be sure to press both “ENTER” and “3” simultaneously on the service remote controller without fail. It sets the remote control code “3”.

**Table1 Correspondence table between tentative model name and final product name**

Model name	RDR-HX680	RDR-HX780	RDR-HX785	RDR-HX980	RDR-HX1080	
Tentative model name	AEP1	MRX-1730/CEK	MRX-1735/EC1	MRX-1735/EC1	MRX-1755/EC1	MRX-1799/EC1
	AEP2	MRX-1720/EC2	MRX-1730/EC2	—	MRX-1750/EC2	—
	AEP3	MRX-1730/CEK	—	—	—	—
	UK	—	MRX-1730/CEK	—	—	—
	CND	—	MRX-1790/CA2	—	—	—
	AUS	—	MRX-1730/AU2	—	MRX-1750/AU2	—
	RUS	—	MRX-1730/RU3	—	MRX-1750/RU3	—
	SP	—	MRX-1730/SP7	—	MRX-1750/SP7	—
	TH	—	MRX-1730/SP7	—	MRX-1750/SP7	—
	E32	—	MRX-1790/E32	—	—	—

#### [Symptom]

If the following operation is performed, set won't be able to be restored.

#### [Remedy]

Must not be performed the following operation using service remote.  
 If it is performed, set won't be able to be restored.  
 And if set is broken by the operation, we can't guarantee the set when pressing in order of the following button.

- \* [ESC]--> [STEREO]  
 ([ESC]--> [Any button which is not described in SM])

Service remote controller  
(Part code: J-6090-203-A)





## 4. HOW TO DIAGNOSE HDD FAILURE

### 4-1. Defective HDD

There are four symptoms of defects in the HDD.

1. “E01” is displayed on the FLD.  
(The HDD is unauthorized.)
2. “E02” is displayed on the FLD.
3. When playing a video, MP3, or JPG, contents freeze.
4. Irregular noises from the HDD

### 4-2. HDD Recognition status

How to enter Recognition status and sub screen mode.

- While the GUI screen is not displayed, use the service remote controller and press “ESC” key followed by “DISP” key.
- While the first screen is displayed, press “DIG/ANA” key repeatedly until the desired subscreen is displayed.  
The subscreens change.

Service remote controller  
(Part code: J-6090-203-A)



```

MRX-1635/EC1      VERSION : 1.01
SYSCON  : RELEASE 104
              Rev. 1. 5895
TUNERCON : 1.178      OK
DRIVE   : DVD-RW  DVR-L12X  OK
              1.00      OK
PIC SERIAL : 000800004940
HDD INT  : XXXXXXXXXXXXXXXX 250
HDD USE  :                250

DEVICE : E2R-FEx1.0  FLASH : 64M
REGION : 2          C : 0000400259
              HDCP : 0000400259
    
```

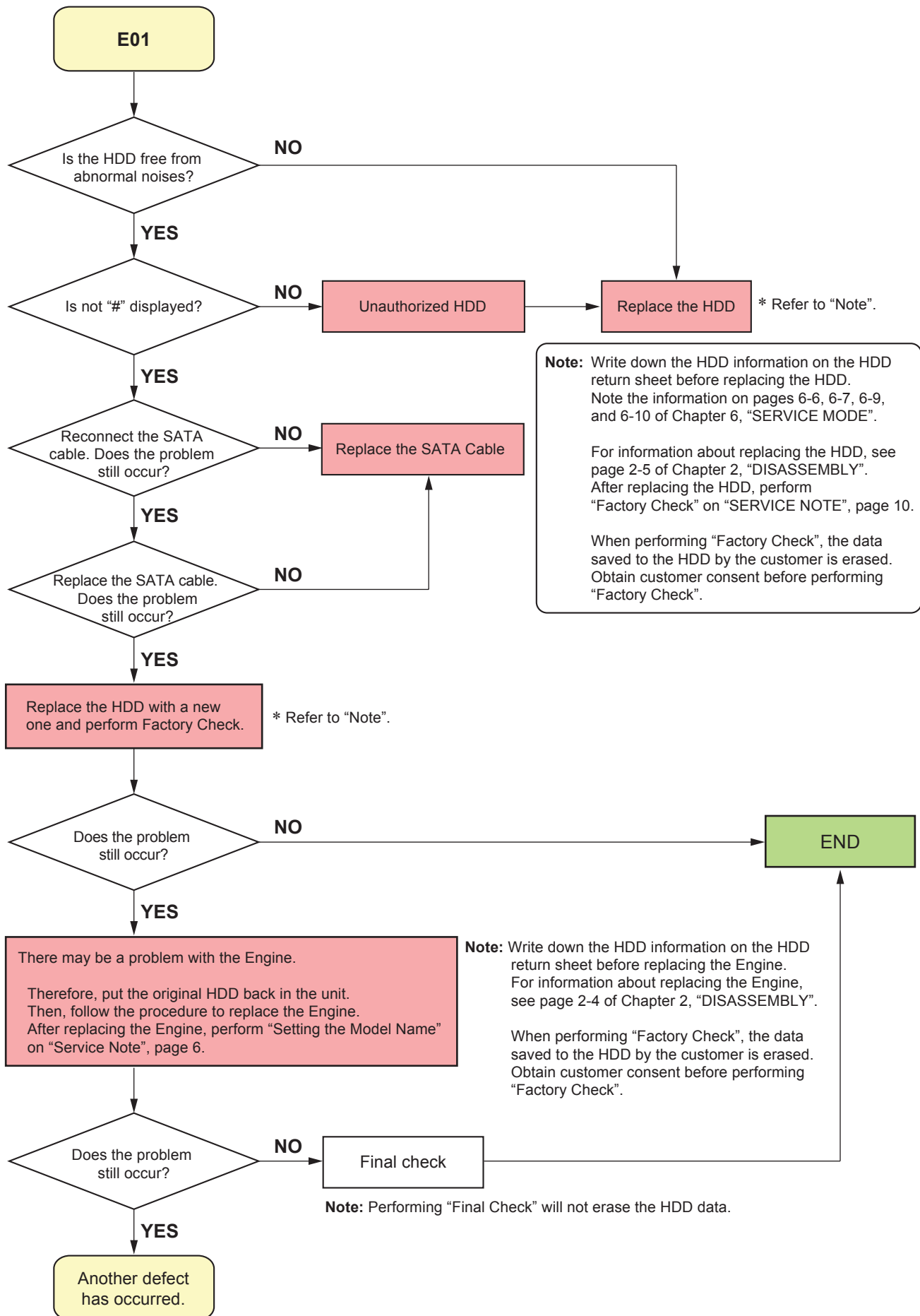
• Details on HDD data are described below:

- Sample 1: (For the DVD recorder of 120GB)  
HDD INT: XXXXXXXXXXXXXXXX 160  
HDD USE: 120
- Sample 2: (For the DVD recorder of 160GB)  
HDD INT: XXXXXXXXXXXXXXXX 160  
HDD USE: 160
- Sample 3: (For the DVD recorder of 250GB)  
HDD INT: XXXXXXXXXXXXXXXX 250  
HDD USE: 250
- Sample 4: (For the DVD recorder of 500GB)  
HDD INT: XXXXXXXXXXXXXXXX 500  
HDD USE: 500

The item [HDD USE] indicates the HDD capacity of the DVD recorder specifications.  
Check if the value matches with the specifications of the DVD recorder.

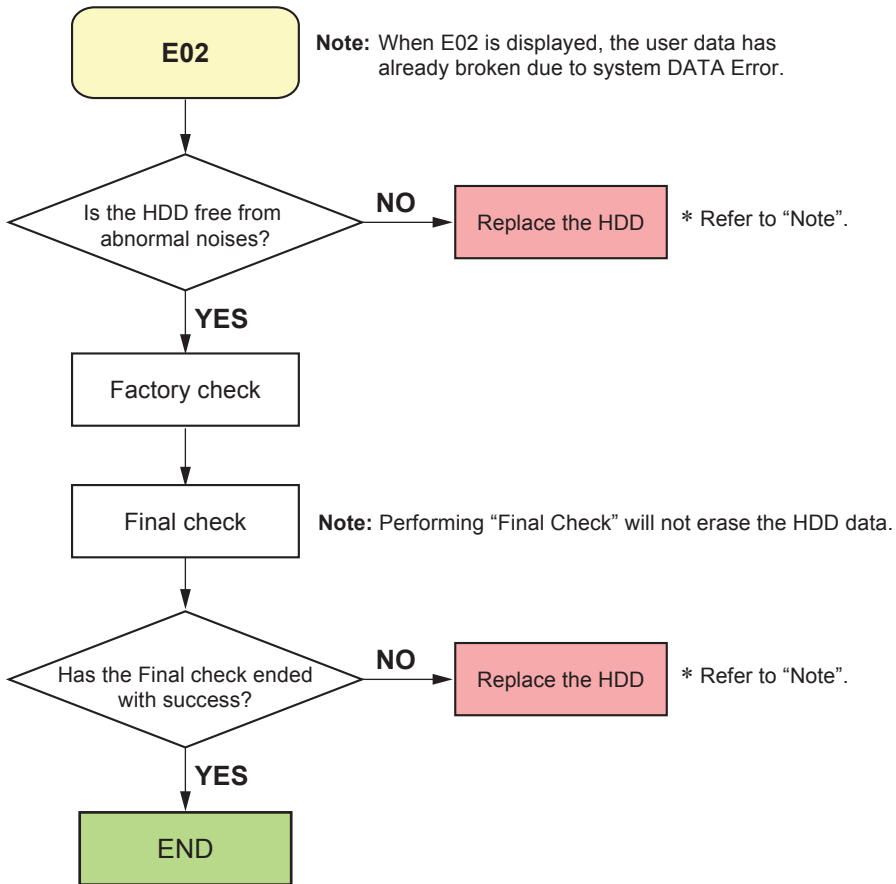
FL Display	OS Display	HDD identification conditions	Details on HDD data are described below.	Remarks
REPAIR	“Repairing the HDD”. ↓ “HDD repair is complete”.			
E01	An error occurred. Please consult your nearest Sony dealer. Note that contents on the HDD may be erased when servicing this unit.	Failure to physically identify the HDD (no connection, defective HDD, interface error).  Physical identification of HDD possible, but not identified	Blank space  WDC 10234564 # 160	Check the connection to the SATA cable and power cable. Replace the SATA cable or power cable. Replace the HDD. Replace the FE or part in the SATA/ATA communication.  “#” indicates that the HDD is unauthorized.
E02	The Hard Disk Drive info is incorrect. Use the Disk Setup menu to reformat.	Physical identification of HDD possible, HDD identified, but failure in logical formatting.	WDC 10234564 ! 160	“!” indicates an HDD authorization error. Initialize the HDD.
Normal		Physical identification of HDD possible, HDD identified, and correct logical formatting (HDD correctly identified).	WDC 10234564 160	

### 4-3. Display [E01] on FLD with unrecognized HDD

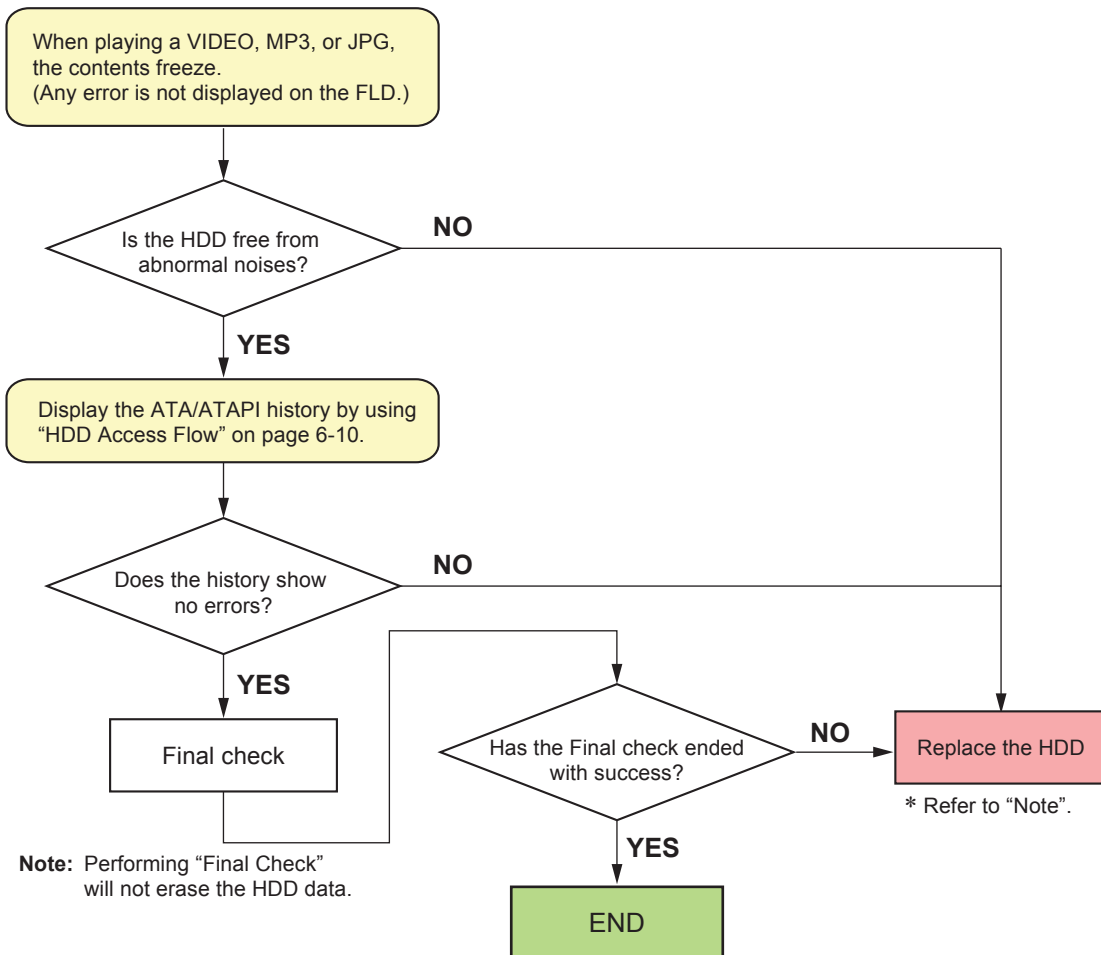




4-4. Display [E02] on FLD



4-5. When playing a VIDEO, MP3, or JPG, the contents freeze



#### 4-6. Factory Check

1. Pull out and then reconnect the AC cable.
2. Press “ESC” key followed by “P.RUN” key to start Formatting.
3. When “B COMPLETE” appears, the Factory Check is complete.
4. Press “Power” button. The unit starts normally.

When “Factory Check” has finished completely without error, reset “Recording Error History” and “ATA/ATAPI History Error” with the Clear key.

##### Recording Error History Display

```
07-03-19 12:36:06 ESFSYS INIT
07-03-19 12:36:06 HDD Zero MR
07-03-19 12:36:06 HDD Initialize
07-03-19 12:36:06 HDD Zero MR
07-03-19 12:27:27 Status NG
```

**Note:** Write down the HDD information on the HDD return sheet before replacing the HDD.  
Note the information on pages 6-6, 6-7, 6-9, and 6-10 of Chapter 6, “SERVICE MODE”.

When performing “Factory Check”, the data saved to the HDD by the customer is erased.  
Obtain customer consent before performing “Factory Check”.

“Recording Error History” and “ATA/ATAPI History Error”, see pages 6-9, 6-10 of Chapter 6, “SERVICE MODE”.

#### 4-7. Final Check

##### 4-7-1. SELF TEST (SMART TEST)

This is a simplified diagnosis for the HDD.  
A serious failure in the HDD can be detected with this test.  
Time required for testing: Approx. 60 sec.

##### How to start/terminate the diagnostic program

Use the remote control unit for servicing.

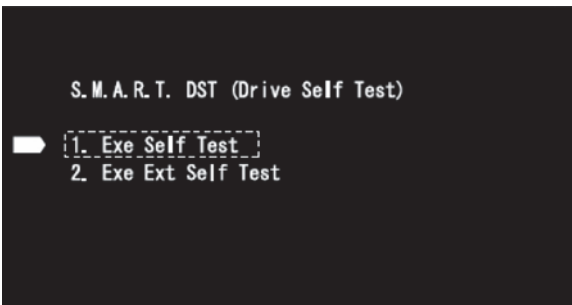
- How to start: Press the following keys in this order; “ESC”, “CX”, “0”, and “1” keys. (refer to 6-2-15)
- How to terminate: Press “ESC” key.

##### HDD CHECK MODE [1-4]

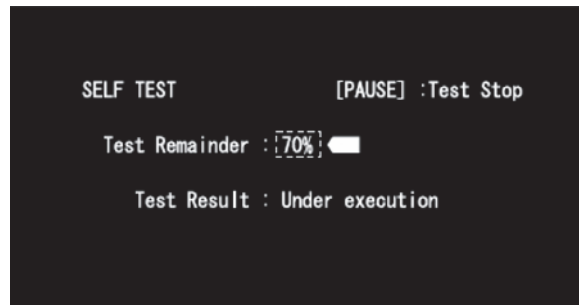
- 1 HDD Information
- 2 S.M.A.R.T Attribute Information
- 3 S.M.A.R.T DST
- 4 HDD R/W Check

Execute Self-Test.

- Press “3” key on the remote control unit for servicing while the menu screen is displayed.
- When the following screen is displayed, press “1” key to start the Self-Test.



**Note:** “2. Exe Ext Self Test” is not used.



**Note:** Performing “Self Test” will not erase the HDD data.

**Diagnosis results**

- Without an error: “. . . Completed” is displayed. Then, proceed to the Extended Self-Test.
- With an error: “. . . Error” is displayed. Look at the number in Test Result. If the place value for tens is 1 or 2, execute the Self-Test again. If it is from 3 to 7, the HDD must be replaced.

**Note:** If the result of the second test is the same, replacement of the HDD is required.



**4-7-2. Performance Check**

Press “ESC” key, then “A.MON” key.

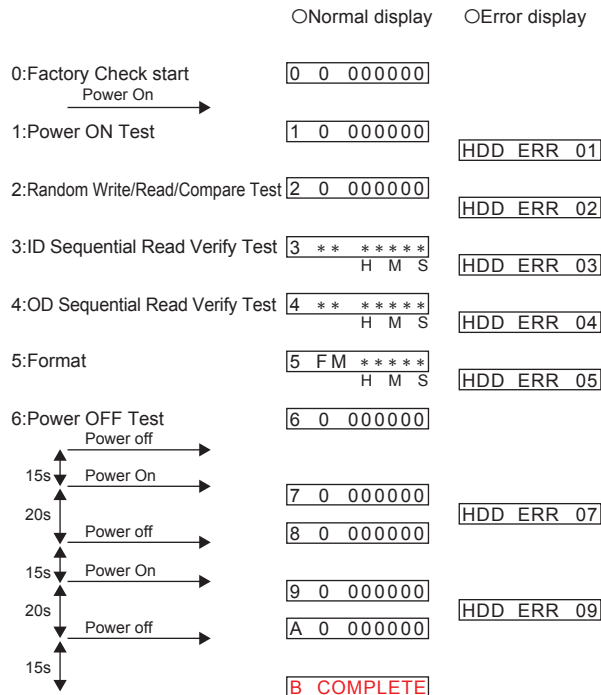
This is a reading test across all sectors of the HDD.

Data recorded on the HDD will not be erased, because no writing operation is performed.

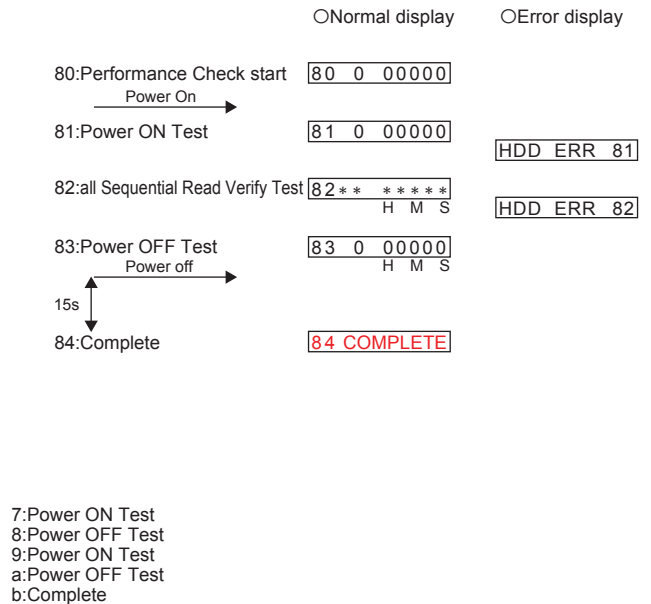
Time required for testing: Approx. 45 min/160 G  
 75 min/250 G  
 130 to 150 min/500 G

When “Performance Check” finishes completely without error, reset “ATA/ATAPI History Error” with the Clear key.

**FL display specification  
 HDD factory Check**



**HDD performance Check**



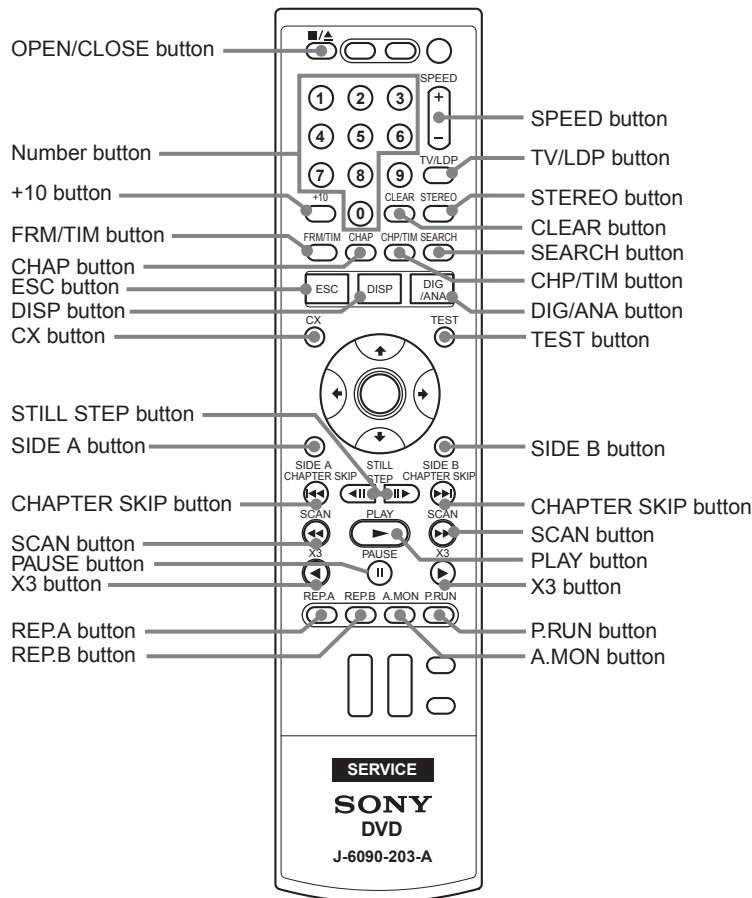
**Fig 1. FL Display Flow**

\* The logo for “Factory Check” and “Performance Check” is recorded in “ATA/ATAPI History Error”.

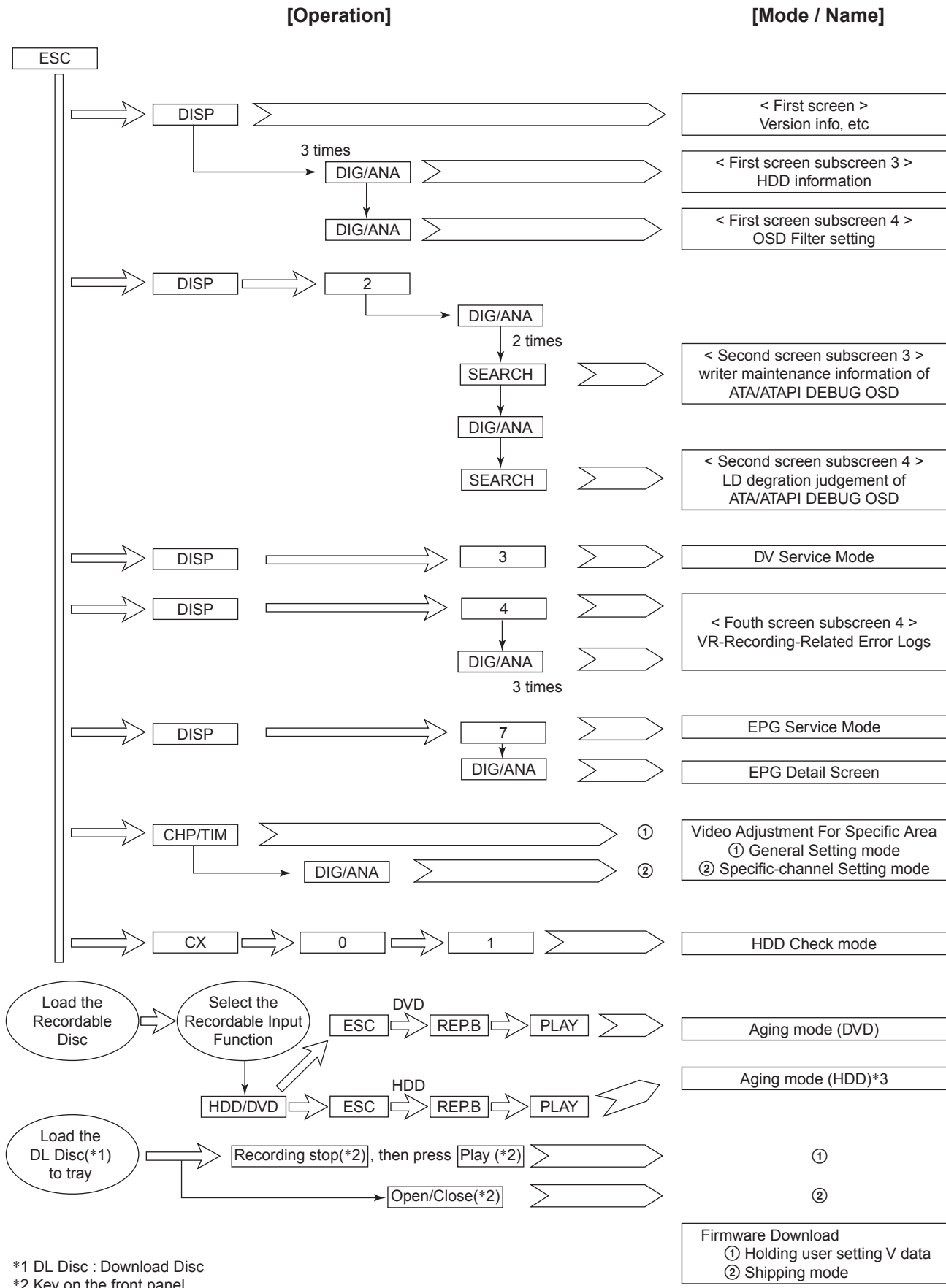
## SECTION 6 SERVICE MODE

### Preparing for Service tool

- Color monitor
- Service remote controller  
(Part code: J-6090-203-A)



# 6-1. SERVICE MODE MAP



\*1 DL Disc : Download Disc  
\*2 Key on the front panel

## 6-2. Diagnostic Mode

### 6-2-1. Model Setting

- 1) Turn of the main power ON.
- 2) On the screen after exiting all menu screen's, press the following buttons "ESC" ⇒ "CHAP" ⇒ "1" on the service remote controller.
- 3) Turn of the main power OFF.
- 4) Turn of the main power ON.
- 5) Press four digits properly (Refer to page 5 service remote controller.) by using the according to the screen information.
- 6) Press the following buttons "ESC" ⇒ "CHAP" ⇒ "1" on the service remote controller.

```
[Recorder's Model Setting]
Input the number using the remote for Service.

>---

Input No.      Manufacturer
[ 0101      :          ]
[ 0201      :          ]
[ 0102      :          ]
[ 0202      :          ]
[ 0103      :          ]
[ 0203      :          ]
```

- 7) Disconnect then reconnect the AC power cord of the unit. Be careful not to impart vibration to the unit immediately after the AC power cord is disconnected.
- 8) Reset the recorder to all its factory settings.  
(Make sure that the recorder is on. Press and hold "■" (STOP) key and press "⏻" (STANDBY/ON) key on the front panel.)  
The recorder turns off with all settings reset.
- 9) Turn of the main power ON.
- 10) Press "ESC" then "DISP" keys by using the service remote controller and then confirm each Model Name.

```
----          VERSION :----
SYSCON       :RELEASE_100
              Rev      :1.*****
TUNERCON     : 198.000          OK
DRIVE        : DVD-RW DVR-L11X  OK
              1.00            OK

PIC SERIAL   :-----
HDD INT     :-----

DEVICE      :-----          FLASH : 64M
REGION     : 2                C : *****
                                HDCP : -----
```

- 11) Press "ESC". (Returns to the original screen)



### 6-2-2. Service Mode

- 1) Turn of the main power ON.
- 2) On the screen after exiting all menu screen's, press "ESC" on the service remote controller.
- 3) Press "DISP".
- 4) Press "DIG/ANA".

#### Overview and purposes

To be used to check the status of the product and to collect the information for failure diagnosis.

The following information to be used for servicing is displayed:

- [1] First screen : Version, HDD information, etc.
- [2] Second screen : ATA/ATAPI debug screen (Writer information)
- [4] Fourth screen : VR-recording-related error logs

Each screen has sublevel screens.

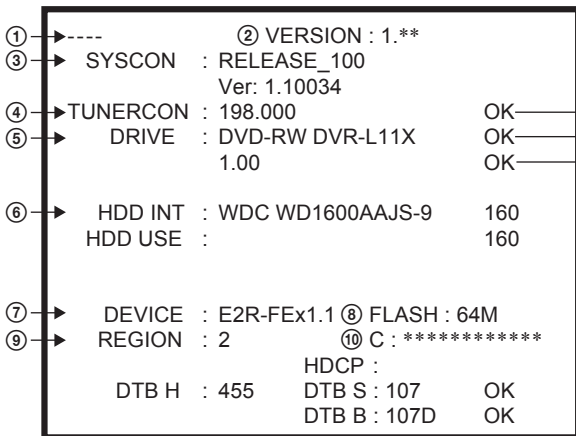
**Note:** After entering any Service mode screen, to shift to another Service mode screen, first quit that Service mode screen then enter another Service mode screen.

- 5) Press "ESC". (Returns to the original screen)

### 6-2-3. Version Information and Other Information (First screen)

- 1) Turn of the main power ON.
- 2) On the screen after exiting all menu screens, press "ESC" on the service remote controller.
- 3) Press "DISP".

\* Checking the respective software version numbers and other HDD information.



**OK** : Appropriate version compared with that of the firmware of the system control computer.  
**NG-** : The version of the TUNER microcomputer is older.  
 Measures to be taken:  
 • Download the firmware.

**OK** : The appropriate drive is mounted.  
**NG** : An inappropriate drive is mounted.  
 Measures to be taken: Download the firmware.

**OK** : Appropriate version compared with that of the firmware of the system control computer.  
**NG-** : The version of the drive microcomputer is older.  
 Measures to be taken: Download the firmware.

- ① Model name/destination
- ② Version of the recorder software
- ③ Revision No. of the system-control computer software
- ④ Version No. of the tuner microcomputer
- Result of the combination check with system microcomputer
- ⑤ Information on the built-in drive  
(Model name, version No., model type)
- ⑥ Data of the built-in HDD, capacity of the HDD
- ⑦ DEVICE information (EMMA type, ES No.)
- ⑧ FLASH ROM information
- ⑨ Region No.
- ⑩ CPRM information (CPRM key No.)

- 4) Press "ESC". (Returns to the original screen)

### 6-2-4. RF Level Simplified Diagnosis (Subscreen1)

- 1) Turn of the main power ON.
- 2) On the screen after exiting all menu screens, press “ESC” on the service remote controller.
- 3) Press “DISP”.
- 4) Press “DIG/ANA”.

```

----          VERSION : 1.**
SYSCON   : RELEASE_***
           Rev       :1.*****
TUNERCON : 198.000      OK
  DRIVE  : DVD-RW DVR-L11X  OK
           1.00          OK

HDD INT  : WDC WD1600AAJS-9  160
HDD USE  :                   160
DEVICE   : E2R-FE      FLASH : 64M
REGION  : 2           C : *****

Input CH : ** ch
Freq Diff : Low 1
AGC Volt  : **** mV
    
```

\* The RF signal status can be obtained from the input frequency deviation information and the AGC voltage.

Input CH : \*\* ch ← Input channel  
 Freq Diff : Low 1 ← Input frequency difference \*1)  
 AGC Volt : \*\*\*\* mV ← AGC voltage \*2)

#### \*1) Frequency Difference (Freg Diff)

How much tuning is off is monitored, as shown below:

Input Frequency	Display	
Faraway	High 7	
High (within 200kHz)	High 1-5	
Just Tune	Center	
Low	within 200kHz	Low 1-5
	over 200kHz	Low 7

#### \*2) AGC voltage (AGC Volt)

The gain controlled by the tuner is monitored to infer the input electric field intensity.  
 (The accuracy of inference differs depending on the product.)

	Field Intensity	AGC Volt
Intense field area (Clear image)	70 dBμ or more	3100 mV or less
Less intense field area (Noise may be generated.)	50 dBμ or more 70 dBμ or less	3100 – 4400mV
Weak field area (Much noise. EPG/VPS/PDC sometimes cannot be obtained.)	30 dBμ or more 50 dBμ of less	4400 mV or more (It is unable to discriminate under the weak field area.)
Very weak field area (Image damaged. EPG/VPS/PDC cannot be obtained.)	30 dBμ or less	4400 mV or more (It is unable to discriminate.)

#### [Tips]

For good reception, the field intensity must be 50 dBμ or more (AGC Volt 4400 mV or less).  
 For accurate measurement, use a field intensity meter.

- 5) Press “ESC”. (Returns to the original screen)

## 6-2-5. HDD Information for the HDD return sheet (Simplified measurement mode)

### HDD Information

#### • How to start/terminate the diagnostic program

Use the remote control unit for servicing.

How to start: Press the following keys in this order; “ESC”, “CX”, “0”, and “1” keys: (refer to 6-2-15).

How to terminate: Press “ESC” key.

Do not perform other operations on the unit while HDD diagnosis is in progress.

Although the diagnostic program is designed to function independently from the unit’s functions, operations on the unit during a diagnosis may cause a malfunction.

The following status is recommended during diagnosis: All stop, no timer recording (including auto-recording)

#### A) Display the menu on the screen.

The menu shown below is displayed when the diagnostic program is started.

To enter each mode, press the corresponding key “1” – “4” on the remote control unit for servicing.

```

HDD CHECK MODE [1-4]

1 HDD Information
2 S.M.A.R.T Attribute Information
3 S.M.A.R.T DST
4 HDD R/W Check
    
```

#### Tests to be executed

- ① **HDD Information:**  
Checks the HDD information.
- ② **S.M.A.R.T. DST:**  
Executes a simplified test or a reading test for all data.
- ③ **HDD R/W Check:**  
Executes a writing/reading test for all data.  
All data on the HDD will be erased if this test is executed.

**Note:** “2. S.M.A.R.T. Attribute...” is not used.

#### B) Check the HDD information.

Press “1” key on the remote control unit for servicing.

Check the following data:

Model: Is the correct model name of the HDD displayed ?

Recog. No: Is a positive value displayed ?

SMART threshold: Is “not exceeded” displayed ?

```

HDD Information<SND_MS>[clear]
Cylinders : 0x3FFF Heads: 0x0010
Sec/Track : 0x003F
A → Model : Maxtor 4R080L0
D → Firmware : RAMC1TU0
SN : R22RRL2SE
E → Major No : ATA/ATAPI-7
Life Time : 7h 18m 45s
B → Recog. No : 1
C → SMART threshold : not exceeded
    
```

#### Detailed description

- ① **Model:**  
For the correct model name, refer to the display of the unit.
- ② **Recog No:**  
Positive value : The HDD has been recognized.  
Negative value : The HDD has not been recognized.
- ③ **SMART threshold:**  
exceeded : The has come near the end of its service life.  
not exceeded : The HDD has not reached the end of its service life.
- ④ Check HDD SN.

To return to the menu screen, press “Clear” key.

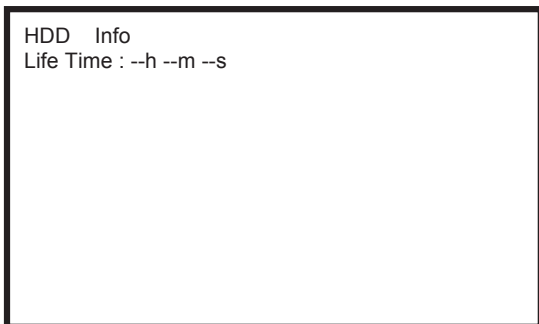
#### C) How to check the HDD return sheet.

**Symptom \*\*\*\*\* ⇒ Enter a symptom.**

- ① MODEL :\*\*\*\*\* not recognize or recognize ⇒ Enter a model name. Refer to “A” of the above screen.  
When the model name is recognized, circle “recognize”.
- ② RECOG NO:Positive or Negative ⇒ Check whether “Recog No” is positive or negative.  
Refer to “B” of the above screen.
- ③ SMART threshold: exceeded or not exceeded ⇒ Check whether “SMART threshold” is “exceeded” or “not exceeded”.  
Refer to “C” of the above screen.  
**Note:** If the HDD model name and serial number cannot be read, check the HDD label.
- ④ Check HDD SN:\*\*\*\*\* not recognize or recognize ⇒ Enter the HDD SN. Refer to “D” of the above screen.  
Check whether the HDD SN is recognized.
- ⑤ HDD Life Time: \*\*\*h\*\* m \*\* s ⇒ Enter the Life Time. Refer to “E” of the above screen.  
**Note:** If the HDD life time is not found, check it on page 6-7 of Chapter 6, “SERVICE MODE”.
- ⑥ HDD Status: # / ! / Blank / No Model Name ⇒ Check “HDD Status”. Refer to “SERVICE NOTE”, page 7.
- ⑦ FL Display E01 / E02 / No Problem ⇒ Check “FL Display”.
- ⑧ Recording Error history :\*\*\*\*\* ⇒ Refer to “SERVICE MODE”, page 6-9.
- ⑨ ATA/ATAPI History ERR :\*\*\*\*\* ⇒ Refer to “SERVICE MODE”, page 6-10.

### HDD Information (Simplified measurement mode)

- 1) Turn on the main power.
- 2) Press "ESC".
- 3) Press "DISP".
- 4) Press "DIG/ANA" three times.



\* Checks the HDD power-on time.

#### [Tips]

##### • How the cumulative HDD-on time data is processed in memory

Storage place:  
FLASH ROM

Timing for referring to the cumulative HDD-on time data:

If the power attempts to turn on but fails, the unit refers to the FLASH ROM.

Timing for updating the cumulative HDD-on time data:

While the HDD is on, the cumulative HDD-on time data in the RAM is updated every 3 seconds, and the data is stored in the Backup SRAM every update. When the power is turned off, the data is stored in the FLASH ROM.

##### • How to clear the cumulative HDD-on time data

FLASH ROM:

When the HDD Identification Setting is configured, the cumulative HDD-on time data is automatically cleared.

The HDD Identification Setting is automatically configured when the CPRM setting is configured on the CPRM setting screen.

(To display the CPRM setting screen, press the "ESC" key, then the "STEREO" key.)

**Note:** The cumulative HDD-on time data is not cleared when resetting to default values.

The cumulative HDD-on time data is not cleared when the system-control computer software is downloaded.

- 5) Press "ESC". (Returns to the original screen)

## 6-2-6. Cautions for handling the HDD

### (1) Cautions for handling the HDD

- The HDD is very sensitive to shocks and vibrations. Care must be taken especially during operation (when the power is on).
- The HDD is very sensitive to electrostatic charges.
- Rapid change in temperature or humidity may cause deterioration of the HDD.

**Note:** After receiving damage caused by any above-mentioned factors, the HDD may operate normally for dozens or hundreds of hours, but then suddenly crash. If you are certain you have damaged a new repair part (HDD) while making repairs, do not use the part.

#### Reference: Main specifications for damage to the HDD

	During operation	During nonoperation
Shock G (acceleration)	Approx. 20 G or more	Approx. 200 G or more
Temperature change	15 °C/hour or more	
Moisture change	20%/hour or more	

← The HDD is about 10 times as sensitive to shock during operation compared to nonoperation.

#### Reference: Estimated value of falling distance vs. shock (G) when the HDD is dropped without protection

Falling distance \ Landing surface	Granite surface	Concrete floor	Synthetic-resin-coated table	Antistatic sponge
0.5 inch / 12.7 mm	387	217	200	26
1.0 inch / 25.4 mm	595	457	310	37
2.0 inch / 50.8 mm	1133	600	680	70
4.0 inch / 101.6 mm	1795	1040	1050	267

## (2) Cautions for handling and examples of dangerous handling for the product that the HDD is mounted on or the HDD repair part

### [Cautions for handling the product that the HDD is mounted on]

- The HDD is always in operation while the unit is turned on. Do NOT to apply shock to the unit.

#### Examples of dangerous handling: while the power is on

- Bumping the case
- Dropping an object, such as a small screwdriver or remote control unit, onto the case or bumping an object against the cabinet
- Physically dragging the unit
- Stacking another product on the unit

**Note:** Do NOT to apply shock, such as bumping or hitting a screwdriver against the HDD, during diagnosis with the case open.

#### Examples of dangerous handling: while the power is off

- Applying strong shock, although the HDD is more resistant to shock when the power is off
- Dropping the unit from a height of several centimeters, or lifting one side of the unit and letting it drop
- Do NOT move the unit immediately after the power is turned off. Wait at least 30 seconds after the indication on the FL display changes from POWER OFF to the clock indication before moving the unit.

If the AC power cable is accidentally disconnected before turning the unit off, wait at least for one minute before moving the unit.

In this case, damage to the HDD caused by sudden shutoff may be small because the emergency relief mechanism is activated.

However, if sudden shutoff occurs during recording or playback, recorded data may be damaged. Be sure to check the operations.

### [Caution for handling the HDD repair part]

#### 1. Handle the HDD in a safe environment:

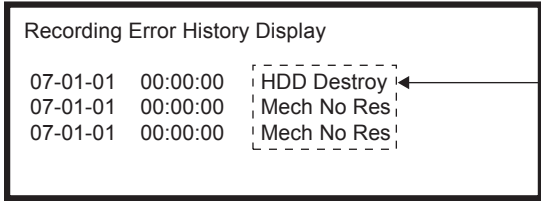
- Handle the HDD over an antistatic pad that can also absorb shock.
- Wear wrist bands to prevent electrostatic charges generated in your body from affecting the HDD.

#### 2. Observe the following rules when handling the HDD:

- Handle one HDD at a time. Do NOT hold several HDDs at the same time.
- Grip the HDD on both sides so that you do not touch its terminals or circuit boards.
- Do NOT stack one HDD onto another HDD (even if the HDDs are protected by antistatic bags).
- Do NOT bump the HDDs against one another.
- Do NOT bump any tool, such as a screwdriver, or other hard object against the HDD.
- When a repair part (HDD) is transported and there is a large temperature difference between the outside and inside temperature, leave the HDD in its package for about half a day after it is moved inside to gradually cool or warm it to room temperature before unpacking.

### 6-2-7. HDD Error Logging

Use the following operations to display “Recording Error History”.  
 Press “ESC”, “DSP”, and “4” keys, followed by “DIG/ANA” key three times.



\* The error display appears in the underlined location.

#### Recording Error History Display

Error related to HDD	
Error Message	Description
Buf over flow	Overflow of the Stream Buffer
ESFSYS CORUPT	easyfsys error
ESFSYS INIT	easyfsys initializing
HDD Aging NG	HDD Aging Command failed
HDD DEF DONE	HDD defrag finished
HDD DEF ERR	HDD defrag error
HDD DEL OC TT	Title imported to the HDD deleted
HDD DEL PL	Dubbing list deleted by HDD recovery
HDD DEL TT	Title deleted by HDD recovery
HDD Destroy	HDD is not recognized on the bus
HDD INFO BAD	Incorrect HDD Management Data
HDD Initialize	HDD initialized
HDD IRRG POFF	Abnormal power off
HDD MBR NG	Incorrect MBR data
HDD SIG NG	Incorrect HDD Management Data Magic
HDD SMART NG	Incorrect HDD SMART
HDD unauthor	Incorrect HDD serial No.
HDD Zero WR	Incorrect MBR data
HDD Reset Done	HDD Reset executed
irr astion	Incorrect action
Mech No Res	No response from the mechanical-control computer
STATUS NG	Abnormal status change
Task No Activ	Task has not been activated
TT Rec Over	Title recording time full

**Note:** Not only the HDD error history, but also the error recovery history are logged in “Recording Error History”.



## 6-2-8. ATA/ATAPI History - ERR

Use the following operations to display "ATA/ATAPI Error History".  
Press "ESC" key, followed by "DSP", "2", "DIG/ANA", and "FRM/TIM" key.

```
ATA/ATAPI History - ERR
0223 151843> C8 00013 09387FC4 40FC4051 2B 3C 01
0000 000000 00 00000 00000000 00000000 00 00 00
0000 000000 00 00000 00000000 00000000 00 00 00
0000 000000 00 00000 00000000 00000000 00 00 00
0000 000000 00 00000 00000000 00000000 00 00 00
0000 000000 00 00000 00000000 00000000 00 00 00
0000 000000 00 00000 00000000 00000000 00 00 00

HDD ERR is Selected.
```

### ATA/ATAPI ERR History display specification

The diagram illustrates the mapping of error history fields to their respective registers and command codes. It shows two tables: a 28-bit command table and a 48-bit command table. The 28-bit table lists error codes A1-A4 (error datecode), B1-B6 (error time), C1-C2 (command), D1-D5 (TBD), E1-E8 (LBA High, Mid, Low), F1-F2 (Error), F3-F4 (Sector Count), F5-F6 (Device), and G1-G2, H1-H2, I1-I2 (TBD). The 48-bit table lists error codes A1-A4 (error datecode), B1-B6 (error time), C1-C2 (command), D1-D5 (TBD), E1-E2 (LBA Low), E3-E4 (LBA High), E5-E6 (LBA Mid), E7-E8 (LBA Low), F1-F2 (Error), F3-F4 (Sector Count), F5-F6 (Device), and F7-F8 (Status). A legend on the right lists command codes: 90 (EXECUTE DEVICE DIAGNOSTIC), E7 (FLUSH CACHE), EC (IDENTIFY DEVICE), E3 (IDLE), C8 (READ DMA), 25 (READ DMA EXT), EF (SET FEATURES), B0 (SMART), E2 (STANDBY), E0 (STANDBY IMMEDIATE), CA (WRITE DMA), 35 (WRITE DMA EXT), E1 (IDLE IMMEDIATE), 42 (Read Verify EXT), and a note: "Only use performance and factory check Note: \*\*EXT: 48bit command".

## 6-2-9. How to confirm HDD Access Flow

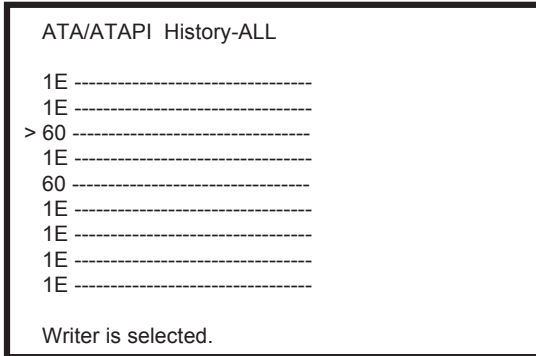
Use the following operations to display "ATA/ATAPI History - All".  
Press "ESC" key, followed by "DSP", "2", and "FRM/TIM" key.  
Confirm whether the result is OK or NG in the screen below. If it is NG, check the error in the command table to the lower right.

The left screenshot shows the ATA/ATAPI History - ALL screen with all commands marked as OK. A red arrow points to the text "No problem". The right screenshot shows the same screen with some commands marked as NG. A red arrow points to the text "READ DMA Error Occurred (NG)". A legend on the right lists command codes: 90 (EXECUTE DEVICE DIAGNOSTIC), E7 (FLUSH CACHE), EC (IDENTIFY DEVICE), E3 (IDLE), C8 (READ DMA), 25 (READ DMA EXT), EF (SET FEATURES), B0 (SMART), E2 (STANDBY), E0 (STANDBY IMMEDIATE), CA (WRITE DMA), 35 (WRITE DMA EXT), E1 (IDLE IMMEDIATE).

## 6-2-10. ATA/ATAPI Debugging Screen (Second Screen) and LD Deterioration Judgment (for writer)

### 1. Writer maintenance information of ATA/ATAPI DEBUG OSD (Subscreen3)

- 1) Turn of the main power ON.
- 2) On the screen after exiting all menu screens, press “ESC” on the service remote controller.
- 3) Press “DISP”.
- 4) Press “2”.



- \* Simplified judgment method of optical pickup quality
  1. Stains on pickup lens
  2. Deterioration of CD-R/DVD-RW laser diode

\* Screens are switched when “DIG/ANA” is pressed two times or three times to select the desired menu. Press “SEARCH” to start measurement.

Update the display by pressing the “SEARCH” key while subscreen 3 is displayed.

①	ATA / ATAPI	Writer MaintenanceInfo
	Power ON	00 00 00 0000 00000000
	0102 : 56	01 00 00 0000 00000000
	DVD	02 00 00 0000 00000000
②	R0053 : 48	03 00 00 0000 00000000
③	W0022 : 16	04 00 00 0000 00000000
	CD	05 00 00 0000 00000000
④	R0034 : 04	06 00 00 0000 00000000
⑤	W0000 : 00	07 00 00 0000 00000000
		00-00

Error log for the Writer  
(Not for Service)

- ① Power-on time/cumulative power-on time
- ② Duration of emission of the laser diode (LD) for DVD-R/DVD while reading
- ③ Duration of emission of the LD for DVD-W/DVD while writing
- ④ Duration of emission of the LD for CD-R/CD while reading
- ⑤ Duration of emission of the LD for CD-W/CD while writing  
(This function is not used for this model.)

- ② If the total hours of duration of emission of the laser diode (LD) for DVDs while reading ② and that of emission of the LD for DVDs while writing ③ exceed 4,700 hours, the LDs may be degraded.  
Perform an LD degradation judgment, using subscreen 4.

#### [Tips]

MTTF hours for each LD

DVD : 4,700 hours

CD : 11,000 hours

The ATA/ATAPI Writer Maintenance Info is obtained each time the power is turned on. Thereafter, the data on the subscreen is updated each time the “SEARCH” key is pressed (the updating command is sent) while this subscreen is displayed. Care must be taken when updating this subscreen, because an undesired command is inserted if it is executed while recording, etc.

#### [Note on lighting time data for each LD]

Since data on lighting time of each laser diode (LD) are stored in the flash ROM on the MAIN Assy, after the MAIN Assy is replaced, the data will be cleared. However, after the LOADER Assy is replaced, data on lighting time of each LD will be retained in the MAIN Assy. Therefore, before either the MAIN Assy or LOADER Assy is to be replaced, it is recommended that you write down the lighting time data.

- 5) Press “ESC”. (Returns to the original screen)

## 2. LD degradation judgment of ATA/ATAPI DEBUG OSD (Subscreen 4)

- 1) While the User Operation screen is being displayed, press “ESC” on the service remote controller.
- 2) Press “DISP” on the service remote controller.
- 3) Press “2” on the service remote controller.
- 4) Press “DIG/ANA” three times.

**Note:** For correct measurement of items ① to ④ indicated in the display below, leave the unit at room temperature (25°C) for a while before turning it on, and do not load a disc.

To update the value for each item, press the “SEARCH” key while subscreen 4 is displayed.

For details on each item and the conditions of updating the values, see table below.

ATA / ATAPI - LD Degrade			
①	→ CD	: 0070 104%	OK
②	→ DVD	: 0068 96%	OK
③	→ TMP	: 00A3 41°C	
④	→ ADJ	: 0067 26°C	
⑤	→ TLT	: FFD5	

### Description of each item and conditions for updating data

No.	Item	Description	Conditions for updating by pressing the SEARCH key
①	CD	Degradation judgment of LD for CD. Regarded as NG when the value is 120% or higher (same standard as for the PC drive)	No disc inserted in the disc tray
②	DVD	Degradation judgment of LD for DVD. Regarded as NG when the value is 120% or higher (same standard as for the PC drive)	No disc inserted in the disc tray
③	TMP	Current temperature inside the Writer	No disc inserted in the disc tray
④	ADJ	Temperature (approx. 25°C) inside the Writer during adjustment	No disc inserted in the disc tray
⑤	TLT	Writer adjustment data for straight (non-HDD) model (FFFF is displayed when the writer is not adjusted.)	No condition

If the results of degradation of the LDs for CDs and DVDs are both NG, replace the drive.

- 5) Press “ESC”. (Returns to the original screen)

### 6-2-11. History of VR Recording-related Errors

- 1) Turn of the main power ON.
- 2) On the screen after exiting all menu screens, press “ESC” on the service remote controller.
- 3) Press “DISP”.
- 4) Press “4”.

```

RunFnc : ---- Ecl : STDBY Rate : 21   VID : 1000
enVobu : ---- Rem Sec : ---- ChgAtr : ----
WorkSt : ---- EmgTyp : ---- ProtF : ----
Rec Err : ---- TrmStp : Normal
                LastRecMsg : PARAMCHG

LyrOrem : ---- LyrBndLSN : SglLayer
Drv Err : ----- ErrAdr : --- Pause : ----
DscSt1 : ----- DscSt2 : ----- DscSt3 : -----
LastLSN : ----- NWA : ----- WrtSpd : -----
BrdNum : --- DV : --- RzNum : --- Format : --- tvSys : PAL
RemMemo : ---- RMDn : ---- LstErr : ----
    
```

\* Used for broadly dividing the poorly-reproducible trouble phenomena.

\* Press “DIG/ANA” three times to browse the error log.

- 5) Press “ESC”. (Returns to the original screen)

#### Error Message Check Method

- 1) Turn of the main power ON.
- 2) On the screen after exiting all menu screens, press “ESC” on the service remote controller.
- 3) Press “DISP”.
- 4) Press “4”.
- 5) Press “DIG/ANA” 12 times. (Select the desired screen.)

```

RunFnc : ---- Ecl : STDBY Rate : 21   VID : 1000
-----
-----
-----
-----
    
```

\* Used for localizing the cause of trouble to an approximate area from the error message information.

Recording-related errors are displayed.



Press “DIG/ANA” three times on the above screen to select the desired screen.

```

① Recording Error History Display
01-06-01  20:05  30  No SysHdr IN
01-06-02  00:22  10  Write Error
    
```

Error message display screen

① There are two error-log screens, and up to 9 logs are displayed per screen. (generation time [year-month-day, hour: minute: second], error data in simplified description.)

#### [Tips]

- The two error-log screens can be switched by pressing the “SPEED+” or “SPEED-” key.
- For details on error messages, see table “Description of VR-recording-related errors” (page 6-14 to 6-16).

- 6) Subscreen 5 to 11 (These subscreens are not for service use.)
- 7) Press “ESC”. (Returns to the original screen)

## Description of VR-recording-related errors

### Error Message Contents

#### Abbreviations

ECC : 4-byte Code for Error Correction  
 UDF : Universal Disc Format  
 PCA : Power Calibration Area  
 OPC : Optical Power Control  
 NWA : Next Writable Address  
 VMG : Video Manager  
 RMA : Recording Management Area  
 MKB : Media Key Block  
 TMP\_VMGI : Temporary Video Manager Information  
 Border : from Lead-in to Lead-out

### MPEG Encoder-Related Errors

ERROR MESSAGE	DESCRIPTION
AVEnc Hang	AVEncoder failed
IN Encode*	Changes cannot be made in process of encoding
No SysHdr IN	System packet is not input periodically
Stm Start NG	Failure to start encoding (reasons not clear)
Stream NG	Inappropriate input stream data
Strm Start NG	Timeout waiting for system packet input at the beginning

**Note:** Any error message with "\*" is displayed "RecErr: -----" on the Subscreen1 of the forth screen.

## Drive System-Related Errors

ERROR MESSAGE	DESCRIPTION
Bdr Cls NG	Close Border failed
Bdr Opn NG	Open Border failed
BUF Overflow	Overflow of the Stream Buffer
CLS Rzon Fail	Video mode Close Rzone failure
Drive Hang	The Drive is hang up
Drv Err	General error of the Drive
Drv Hard Err	Abnoemality in the drive hardware or firmware
Drv Timeout	Timeout waiting for drive operation
Fail Repair	Repair failed
Format NG	Format failed
Mey Be V mode	Although TMP_VMGI is not written, it may be Video mode disc
Mech No Res	No response from the mechanical-control computer
MKB invalid	Media Key Block reading error
NWA Exhaust	Next Writable Address surpassed and impossible to use
OPC NG	Optical Power Control failed
PCA Full	Power Calibration Area has been used up.
Read Err	Reading failed, ECC (4 byte Code for Error Correction) failed, etc
Read Only Disc*	Because some data are invalid , data cannot be written
RMA Full	Recording Management Area has been used up
Rzn Cls NG	Close Rzone failed
Rzn Rpr NG	Repair Rzone failed
Rzn Rsv NG	Reserve RZone failed
TMP-VMG WrErr	Video mode TMP VMGI Write Error
VTSI_B Wr Err	Video mode VTSI BUP Write Error
VTSI_B2 Wr Err	Video mode VTSI BUP Write Error (After Layer Change)
VTSI Wr Err	Video mod VTSI Write Error
VTSI2 Wr Err	Video mod VTSI Write Error (After Layer Change)
Write Err	The Drive failed to write and could not be recovered
May Be PVR	May be +VR disc, but no RSAT
V Final fail	Abnormal process occurred when finalizing Video mode
DLVR trace NG	Close Rzone failed at dual layer disc

## Dubbing-Related Errors

ERROR MESSAGE	DESCRIPTION
H2D CP SomeNG	Other NG HDD → DVD copy
Mem get NG	Video Mode Copy Memory has not been ensured
Strm TransfNG	Video Mode Copy Stream Transfer NG
Tracon Tm NG	Video Mode Copy Tracon transfer has not been completed
VC Cell Max	Maximum number for Video Mode Copy Cells exceeded
VC CopyCancel	Video Mode Copy Copy Cancel
VC FlushC NG	Video Mode Copy Flush Cache NG
VC HDD C Err	Obtaining Video Mode Copy HDD Cell information failed
VC HDD Inf NG	No information on Video Mode Copy HDD
VC HDD Info NG	Format failed
VC Idling NG	Video Mode Copy idling NG
VC Pck Anl NG	Analyzing Video Mode Copy Pack failed
VC Transf Stp	Video Mode Copy Transfer Stop
VC TSO BLK NG	Video Mode Copy TSOBlock transfer has not been completed
VC VOBUsizeE	Video Mode Copy VOBUsize NG
V Rsv RzoneNG	Video Mode Copy Reserve Rzone failed
V2H APP FL NG	VR→HDD APP FLG is OFF
V2H Aud Ch NG	VR→HDD Audio Channel NG
V2H Aud Md NG	VR→HDD Audio mode NG
V2H Aud Stm N	VR→HDD Audio Stream Number NG
V2H SRC Prot	VR→HDD Copy prohibited material
V2H Unknown	VR→HDD Other NG
V2H VOBUsizeE	VR→HDD Play back time of each VOBUsize is different
V2H V Reso NG	VR→HDD Video resolution NG
H2D CP NoSpec	HDD→DVD insufficient free space for copy
H2D TO HDDRD	HDD→DVD(VR) Timeout at HDD playing side
H2D TO SPRP	HDD→DVD(VR) Timeout at internal processing
H2D TO DVDWR	HDD→DVD(VR) Timeout at HDD recording side
C2H LOG (XXX)	HDD CAM→HDD operation log (XXX indicates process code.)
C2H NG (XXX)	HDD CAM→NG (XXX indicates process code.)

## HDD-Related Errors

ERROR MESSAGE	DESCRIPTION
Do nothing	Do nothing for demand
ESFSYS CORUPT	easyfsys error
ESFSYS INIT	easyfsys initializing
HDD Buff High	High-level process executed for the HDD Buffer
HDD DEF DONE	HDD deflag finished
HDD DEF ERR	HDD deflag error
HDD Destroy	HDD is not recognized on bus
HDD INFO BAD	Inconsistent HDD Management Data
HDD Initialize	HDD initialized
HDD IRRG POFF	Abnormal Power off
HDD MBR NG	Inconsistent MBR data
HDDReset Done	HDD Reset executed
HDD ROMSUM NG	Rom-code check sum NG
HDD SIG NG	Inconsistent HDD Management Data magic
HDD SMART NG	Inappropriate HDD SMART
HDD Trans Err	DMA error in HDD copy transfer
HDD unauthor	Inconsistent HDD serial No
HDD Zero WR	MBR was written
Task No Activ	Task has not been activated
TT Rec Over	Title recording time full
HDD WRONG TGT	Invalid HDD target No is directed
extHDD Ignore	External HDD is dismounted
HDD PFile NG	Program file installed in HDD is NG
HDD DEL TT	Delete the title by HDD recovery
HDD DEL PT	Delete the dubbing list by HDD recovery
HDD Del OC TT	Delete the title moving on the way inside HDD



## Other Errors

ERROR MESSAGE	DESCRIPTION
Abort	Cancellation
Already open	Extension file is already opened
BK BATT Down	Backup RAM Data has been erased
BK FSYS Dirty	Backup RAM Data has not been written on the File Sys
BUG	some Bugs
BusReset Done	Bus Reset has been executed
Cell Close NG	Cell Close NG
CPRM IC NG	Inappropriate CPRM IC
Dir Depth Err	Tree of Directory is too deep
Disc Full*	No further data can be written because the disc is full
DRAM CLR Err	Video Mode DRAM (Stream Buffer) Clear failure
DRAM NG	Abnormality in access to the Work DRAM
Drive Destroy	The Drive has crashed
EncModul Hang	Encoder routine is hung up
F Alrdy Exst	Extension file is already exist
File cancel	Extension file is canceled
FileNot Exist	Extension file is not exist
Format Excec	Formatting has been executed
Invalid Disc*	The disc cannot be recognized
Invalid Param*	Invalid parameter
Invalid TMVMG	Invalid TMP VMGI content
Invalid UDF*	Invalid UDF content
Invalid VMG*	Invalid VMG content
Invalid VTSI	VTSI information of +VR is unusual
Irr Action*	Incorrect action
MKB REVOKED	Error is gaining data
limit Over*	Standard maximum limit exceeded
No More Info*	No more space in the internal work-management area
No Permission*	No permission to write to the disc
No Video	No Video input (not locked)
Now busy*	In the process of the emergency processing
NV Pck DMA Er	Inappropriate NaviPack DMA
NV Pck MK Err	Error in creating NaviPack
Ourob Strm NG	Inappropriate Stream data to the Ouroboros input
Over Heat	Abnormal temperature
PARAM NO ACCP	Recording parameter is not matched
Process Over	Process is overfull
Protect Scr*	Source to be recorded is copy-protected
Rec Pause*	No operation permitted during recording pause
Relocation Do	VR-recording data was relocated
Repair Excec	Repairing has been executed
Something*	Undetermined error
SRAM NG	Abnormality in access to the backup Work SRAM
Status NG*	Abnormality in change of statuses

ERROR MESSAGE	DESCRIPTION
SW PVR	Switch to +VR playback process
SW Vpb mode*	Switching to video playback routine is required
SW Vrec mode*	Switching to video recording routine is required
Unmatch Stamp*	Impossible to modify because of nonmatching time stamp
VBR-SRAM NG	Abnormality in VBR SRAM
V Categ ID NG	Inappropriate category ID
V Cate Inf NG	Inappropriate category information
V Ext MAX Ovr	Count Max exceeded
V ExtToo Big	The extension file is too large
V Ext TY NG	Type NG
Virgin Disc	Virgin Disc
VOBU Info NG	Inappropriate VOB information
WaterMark Det	Watermark detected
WM Cracked	WM Cracked
Param Short	Editing Error (Clear A-B)
Invalid VRMI	Information of +VR is NG (VRMI)
Heap Mem NG	Failed acquire memory
Heap Mem RETY	Retry has occurred during acquisition of memory

## No Error

ERROR MESSAGE	DESCRIPTION
Non Err*	Normal

## 6-2-12. DV Service Mode

### 1. DV debug

- 1) Turn of the main power ON.
- 2) On the screen after exiting all menu screens, press “ESC” on the service remote controller.
- 3) Press “DISP”.
- 4) Press “3”.

```

① → (DV/1394) Init : NG AV : 02 DV : 01
② → [Recorder] GUID : 0000000000000000 IRM
③ → iPCR : C03F0000
④ → [DV] GUID : 0080880303480E96
⑤ → VN : VICTOR MN : GR-D50K
⑥ → TM : C3 TS : 75 CT : 32 WP : 01 PS : FF OS : 00
⑦ → CA : A000002020 MD : VTR
⑧ → [DVdecode : Yes] LineSys : 625-50
⑨ → TC : 00h20m35s RD : 02/02/05 RT : 10h34m50s
⑩ → ASPECT : 4 : 3 CGMS : 000000 APSTB : 00 DEC : 525-60
⑪ → SF : 32KHz QU : 12bit AMODE : 4) Stereo
    
```

\* Used when an error exists in connection with the DV equipment.

Boldface alphanumerics : Fixed indications  
 Nonboldface alphanumerics : Variable indications

No.	Item	Description	Remarks
①	InitDV	Whether the initialization of UPD72893B (1394 LINK and DV codec IC) has been completed (OK) or not (NG).	If NG is displayed, it is considered the communication failure to UPD72893B.
	InitVE	Whether the initialization of ADV7172 (Video Encoder for DV specific) has been completed (OK) or not (NG).	If NG is displayed, it is considered the communication failure to ADV7172.
	AV	Number of AV devices recognizing connection	Identification number of AV devices including D-VHS, Digital Tuner, etc other than DV devices.
	DV	Number of DV devices recognizing connection	If the number does not become 01 even if a DV device is connected, identification of that device fails.
②	GUID	GUID set in ConfigROM of the unit.	GUID : Global Unique ID (Specific ID for DV devices) If the unit is ROOT (IRM), IRM is displayed at the side position of GUID display.
③	iPCR	iPCR value of the unit	
	oPCR	oPCR value of the unit	
④	GUID	GUID set in ConfigROM of the connected DV device.	Data are displayed only if one DV device is identified. If the connected DV device is ROOT (IRM), IRM is displayed at the side position of GUID display.
⑤	VN	Vendor name set in ConfigROM of the connected DV device.	Data are displayed only if one DV device is identified. (Depending on the device, the vendor name may not be set in ConfigROM.)
	MN	Model name set in ConfigROM of the connected DV device.	Data are displayed only if one DV device is identified. (Depending on the device, the model name may not be set in ConfigROM.)
⑥	TM	Transport Mode data obtained from the DV device.	Data are displayed only if one DV device is identified.
	TS	Transport State data obtained from the DV device.	
	CT	Cassette Type data obtained from the DV device.	
	WP	Write-protection data obtained from the DV device.	
	PS	Power-state data obtained from the DV device.	
	OS	Output signal mode data obtained from the DV device.	
⑦	CA	Connect AV data obtained from the DV device.	Data are displayed only if one DV device is identified.
	CV	Camera/Vtr mode data obtained from the DV device.	
	MD	DV device mode	Camera or VTR is displayed only if one DV device is identified.
⑧	[DVdecode: XXX]	Whether Yes (in the process of requesting DV input) or No is indicated in XXX.	Normally, Yes is indicated only when CH is set to DV.
	LineSys	Input Line System setting	
⑨	TC	Time-code data of the DVdecode Stream, or response data of the Time Code command	Stream time-code data are obtained when the tape is played in forward direction. Otherwise, time-code data are obtained through an AV/C command.
	RD	Rec Date of DVdecode Stream	
	RT	Rec Time of DVdecode Stream	
⑩	ASPECT	Aspect Ratio of DVdecode Stream	
	CGMS	CGMS of DVdecode Stream (from left to right, CGMS data of bits 5-4: Audio ch 2, bits 3-2: Audio ch 1, and bits 1-0: Video)	*CGMS (Copy Generation Management System): The two-digit codes added to broadcast programs represent the following: 00: Copy freely, 10: Once copy, 11 : Never copy
	APSTB	APS trigger bit of DV decode stream	
	DEC	With/without DVdecode stream input	With input: Signal type (525-60, 625-50, 1125-60, 1250-50, or Invalid) is indicated, Without input: “No” is indicated.
⑪	SF	Sampling Frequency of DVdecode Stream	If SF is 44 kHz, it is considered that 44.1-kHz audio is input, and sound is muted on the unit.
	QU	QUANTIZATION of DVdecode Stream	
	AMODE	AUDIO MODE of DVdecode Stream	

- 5) Press “ESC”. (Returns to the original screen)

## 2. Simple Diagnosis of DV

Symptoms	Location in the Debug Screen	Items to be Checked, and Conditions	Possible causes
No operation for DV input	DV①	Check the initDV indication: OK: Initialization of DV related LSI (IC102, IC108) appropriately completed. NG: Initialization of DV related LSI (IC102, IC108) has not been completed properly. Defective communication with DV related LSI (IC102, IC108) and Host u-com. (IC1001)	Defective IC102 (1394Link & DVcodec)/ IC108 (1394PHY), improper connection between IC102 / IC108, defective soldering, defective power supply, etc.
	DV④	Check the number of DV devices when one DV device is connected to the recorder: 01 : The connected DV device is correctly identified. Other than 01 : The connected DV device is not correctly identified.	Defective DV terminals, improper connection of the DV-terminal board, defective IC108 (1394PHY), defective cables, an IEEE 1394 device other than the DV device connected.
No picture nor sound for DV input	DV⑥	Check of DV decoding when the recorder channel is set to DV: Yes : The recorder is in the process of a DV input operation. No : The recorder is not executing a DV input operation.	Defective IC102 (1394Link & DVcodec), defective soldering, defective power supply, etc.
	DV⑩	Check DEC: 525-60 : An NTSC DV signal is input from the DV device. 625-50 : A PAL DV signal is input from the DV device. No : No DV signal is input from the DV device.	Defective DV terminals, improper connection of the DV-terminal board, defective source device defective IC102 (1394Link & DVcodec), IC108 (1394PHY) <b>Note:</b> As to a model having the Input Line System setting, if the setting and the actual input signal system do not match, no picture appears.
DV input recording impossible	DV⑩	Check CGMS:	Recording cannot be performed for a copy-protected source.
No sound for DV input	DV⑪	Check SF: 32 kHz: An audio signal with 32-kHz sampling frequency is being input. 48 kHz: An audio signal with 48-kHz sampling frequency is being input. 44 kHz: An audio signal with 44.1-kHz sampling frequency is being input.	An audio signal with 44.1-kHz sampling frequency is muted.
	DV①	Check the initVE indication: OK: Initialization of DV specific VideoEncoder (IC101) appropriately completed. NG: Defective communication with DV specific VideoEncoder (IC101) and HOST u-com (IC1001). Initialization of DV specific VideoEncoder (IC101) has not been completed properly.	Defective IC101 (DV specific VideoEncoder), defective soldering, defective power supply, etc.

## 6-2-13. EPG Service Mode

### 1. Summary screen

- 1) Turn of the main power ON.
- 2) On the screen after exiting all menu screens, press “ESC” on the service remote controller.
- 3) Press “DISP”.
- 4) Press “7”.

0 1 2 3 4  
01234567890123456789012345678901234567

```

00 (EPG EURO)
01 Next Data Download Time : 14:00
02     Duration           : 01h30m
03 Gemstar Data Fail Count : 00
04
05
06
07 EPG Data Receive Err Summary
08 Data Start END MD CH RcvPkt TotalErr
09 03/31 13:00 13:30 DL 03 001853 000000
10 03/31 09:00 11:00 DL 03 001192 000000
11 03/31 08:00 08:05 HS -- 000654 000000
12 03/31 00:00 00:00      000000 000000
13 03/31 00:00 00:00      000000 000000
14 03/31 00:00 00:00      000000 000000
    
```

- \* Used when the EPG data cannot be acquired.
- \* The detailed screen appears every time when “DIG/ANA” is pressed.

Lines 01-02	The next download starting time for the EPG data is displayed. Next Data Download Time: Starting time Duration: Duration required for acquiring the EPG data														
Lines 03	The Gemstar EPG data cannot be found. Number times of Host Scan and Schedule Download, DT models only (Always 00 except DT model)														
Lines 09-14	The 6 latest error logs when EPG data were received are displayed, with the latest one at the top. <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">Data</td> <td>: Month/day when reception started</td> </tr> <tr> <td>Start</td> <td>: Time when reception started</td> </tr> <tr> <td>End</td> <td>: Time when reception ended</td> </tr> <tr> <td>MD</td> <td>: Method for acquiring the EPG data (HS: Host scanning process, DL:Downloading process of the EPG data)</td> </tr> <tr> <td>CH</td> <td>: Data-receiving channel</td> </tr> <tr> <td>RcvPkt</td> <td>: Total number of received packages. A number 999,999 or greater is displayed as “999999”.</td> </tr> <tr> <td>Total Err</td> <td>: Total errors during reception. The sum of Hamming Err, Trans Err InvLine Err numbers indicated on the Detail screen. A number 999,999 or greater is displayed as “999999”.</td> </tr> </table>	Data	: Month/day when reception started	Start	: Time when reception started	End	: Time when reception ended	MD	: Method for acquiring the EPG data (HS: Host scanning process, DL:Downloading process of the EPG data)	CH	: Data-receiving channel	RcvPkt	: Total number of received packages. A number 999,999 or greater is displayed as “999999”.	Total Err	: Total errors during reception. The sum of Hamming Err, Trans Err InvLine Err numbers indicated on the Detail screen. A number 999,999 or greater is displayed as “999999”.
Data	: Month/day when reception started														
Start	: Time when reception started														
End	: Time when reception ended														
MD	: Method for acquiring the EPG data (HS: Host scanning process, DL:Downloading process of the EPG data)														
CH	: Data-receiving channel														
RcvPkt	: Total number of received packages. A number 999,999 or greater is displayed as “999999”.														
Total Err	: Total errors during reception. The sum of Hamming Err, Trans Err InvLine Err numbers indicated on the Detail screen. A number 999,999 or greater is displayed as “999999”.														

#### [Tips]

In a case where only “HS” is displayed in the MD column of the logs, the host channel has not been found.  
It is necessary to check the country and postal-code settings in the user settings.

- 5) Press “ESC”. (Returns to the original screen)

## 2. Detail screens

- 1) Press the “DIG/ANA” key while the Summary screen is being displayed. (Refer to page 6-19)
- 2) Each time the “DIG/ANA” key is pressed, the Detail screen scrolls maximum six-Detail screens (1 to 6).  
Each Detail screen of 1 to 6 corresponds to the EPG reception error logs from the top of the Summary screen.

0            1            2            3            4  
012345678901234567890123456789012345678901234567

```

00 (EPG EURO)
01 EPG Data Receive Err Details - 1
02
03 Data : 03/31
04 Start Time : 13:00   END Time   : 13:30
05 Host CH   : 03      P-ON Kind  : Download
06
07 Data Receive Info   Total Err : 000000
08 Pkt Rcv Num : 001853 Pkt Snd Num : 001853
09 Inv Line Err : 000000
10 Slice Cont : Auto   EQ : OFF   LV : -h
11
12 Temporary Buffer Information
13 Pool Num   : 000000   Max Store  : 000000
14 Discard Pkt : 000000
    
```

Line	Display item	Description	Remarks
Line 01	EPG Data Receive Err Details-X	The rightmost figure represents the number of the current detail screen. This number corresponds to the order of the EPG reception error log from the top.	
Lines 03-05, Reception conditions	Data Start Time END Time Host CH P-ON Kind	: Month/day when reception started : Time when reception started : Time when reception ended : Data-receiving channel : Methods for acquiring the EPG data (host scanning and downloading)	Only during initialization, host scanning is automatically executed to find the host broadcast.
Lines 07-10, details on errors during reception	Total Err	: Total numbers of errors during reception. The total number of Hamming Err, Trans Err and InvLine Err indicated on the Detail screen. A number 999,999 or greater is displayed as “999999”.	Total Errors: If the total number of errors reaches two digits or greater, it is likely that EPG data acquisition failed. Display subscreen 1 of the first screen and check the electric field intensity from the AGC level.
	Pkt Rcv Num Pkt Snd Num	: Total number of received packages. A number 999,999 or greater is displayed as “999999”. : Total number of packages that were sent to the application program among all the received packages. A number 999,999 or greater is displayed as “999999”.	If the total number of received packages is 0, it is likely that the country and postal-code settings are wrong.
	InvLine Err	: Total number of errors that were generated by receiving data from invalid lines. A number 999,999 or greater is displayed as “999999”.	
	Slice Cont	: Slice level control Auto-Tu Con, Manual - Syscon.	
	EQ	: Equalizer setting (ON, OFF)	
	LV	: Slice level (10-30 hex) (Only when the slice Cont is Manual.)	

**Note:** The data on lines 12-14 are for software development, not for service use.

- 5) Press “ESC”. (Returns to the original screen)

## 6-2-14. Aging Mode

### 1. Aging for the DVD-RW/DVD-R

- 1) Turn of the main power ON.
- 2) Press the “DVD” key to switch to DVD.
- 3) Load a recordable disc.
- 4) Select the input function of a recordable source.
- 5) After disc detection is confirmed, exit all menu screens.
- 6) Press “ESC” on the service remote controller.
- 7) Press “REP.B” on the service remote controller.
- 8) Press “PLAY” to enter the Aging mode.

If symptoms regarding recording/playback of discs and/or the HDD that your customer claimed are difficult to reproduce, they can be reproduced with a long-time test in Aging mode.

- Note:**
- When aging for the DVD-RW/+RW/-RAM and HDD is executed, a recorded data on them will be erased.
  - Commands from the remote control unit are accepted during Aging mode.
  - If Aging mode is quit using the “ESC” key, indications on the FL display will return to normal display.
  - Cancel timer settings before entering Aging mode.
  - Set the recording rate beforehand. It cannot be changed during Aging mode.

Aging for the DVD-RW/+RW/-RAM	Aging for the DVD-R/+R
<p>During Aging mode, the following operations are repeated in the order shown below.</p> <ol style="list-style-type: none"> <li>① The tray opens.</li> <li>② The tray closes.</li> <li>③ Initialization</li> <li>④ Recording for 60 minutes</li> <li>⑤ Playback for 45 minutes</li> </ol> <p>&lt;DVD-RW&gt; The initialization process in step 3 follows the setting specified in “Setting of the main unit--Recording--Auto initialization of a DVD-RW”.</p> <p>&lt;DVD+RW&gt; The initialization process in step 3 is the same as that described in “Disc setting--Initialization--Initialization of a DVD+RW”.</p> <p>&lt;DVD-RAM&gt; In the initialization process in step 3, physical formatting is performed, if required.</p> <p>During Aging, the number of loops is indicated on the FL display, as shown below. [AGING 0001]</p> <p>If an error is generated, the aging operation stops. <b>Note:</b> Indications on the FL display are retained, and this information is also retained as an OSD.</p>	<p>During Aging mode, the following operations are repeated in the order shown below.</p> <ol style="list-style-type: none"> <li>① The tray opens.</li> <li>② The tray closes.</li> <li>③ Recording for 1 minute</li> <li>④ Recording pause for 6 minutes</li> <li>⑤ Recording stops.</li> <li>⑥ Playback for 1 minute</li> <li>⑦ Playback pause for 6 minutes</li> <li>⑧ Playback stops.</li> </ol> <p><b>Note:</b> A continuous test of the above operations is possible for approximately 23 hours.</p> <p>After ② the tray closes, disc detection is performed, &lt;DVD-R&gt; In step 2, if the disc is judged to have recorded up to 99 titles, the operation stops at that point. &lt;DVD+R&gt; If the disc is judged to have recorded up to 49 titles, the operation stops at that point. On the FL display, the number of loops is retained. On the OSD display, the error indication is retained.</p> <p>During Aging, the number of loops is indicated on the FL display, as shown below. [AGING 0001]</p> <p>If an error is generated, the aging operation stops. <b>Note:</b> Indications on the FL display are retained, and this information is also retained as an OSD.</p> <p><b>Note:</b> Recording time depends on the recording rate set. For example, if the recording rate is MN32, only up to 60 titles can be registered. Check the setting for recording rate before performing aging.</p>

- 9) Press the “ESC” key on the service remote controller to quit Aging mode and return to Normal mode.

- Note:**
- If during recording: Recording is stopped. (aging for ±RW/-RAM only)
  - If during playback: Playback is paused.
  - If during initialization: The unit stops after initialization is finished. \_\_\_\_\_
  - If the tray is being opened/closed: The unit stops after the tray is opened/closed. \_\_\_\_\_



## 2. Aging for the HDD

**Caution:** Take caution as the all recorded data of HDD is deleted.

- 1) Turn of the main power ON.
- 2) Press the “HDD” key to switch to HDD.
- 3) Press “ESC” on the service remote controller.
- 4) Press “REP.B” on the service remote controller.
- 5) Press “PLAY” to the Aging mode.

During Aging mode, the following operations are repeated in the order shown below.

- ① Erasure of all the memory data from the HDD
- ② Recording for 60 minutes
- ③ Playback for 60 minutes

### [Tips]

During Aging, the number of loops is indicated on the FL display, as shown below.

[AGING 0001]

If an error is generated, the aging operation stops.

**Note:** Indications on the FL display are retained, and this information is also retained as an OSD.

- 6) Press the “ESC” key on the service remote controller to quit Aging mode and return to Normal mode.

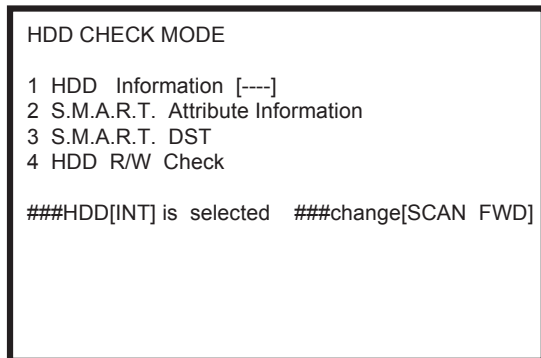
**Note:** • If during recording: Recording is stopped.

• If during playback: Playback is paused.

• If during erasure of all memory data from the HDD, the unit stops after all memory data have been erased.

## 6-2-15. HDD Check Mode

- 1) Turn of the main power ON.
- 2) On the screen after exiting all menu screens, press “ESC” on the service remote controller.
- 3) Press “CX”.
- 4) Press “0”.
- 5) Press “1”.



\* Used to check if the HDD has an error or not.

\* Press the number of the item you want to check.

- 6) Press “ESC”. (Returns to the original screen)

## 6-3. Setup Related Menu

### 6-3-1. Firmware Downloading

In case of any event as described below, be sure to download the software using the Version Upgrade CD Disc by following the Software Download Method shown below.

1. When engine (RD board or drive) is replaced, or when the AV board is replaced.
2. When HDD is replaced.
3. When the message “NG” is displayed on the Version Information in the Service Mode.

#### Software Download Method

- 1) Eject the tray.
- 2) Place the Version Upgrade disc on the tray.
- 3) Press “Rec Stop” and “EJECT” key at the same time to start version upgrade.

### 6-3-2. Area-Specific Channel Setting

When the following trouble symptom is displayed, set the broadcast reception channels as described below.

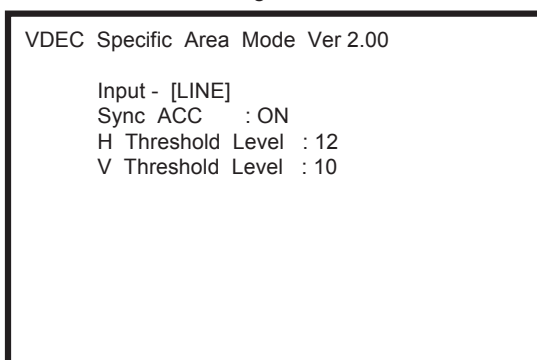
- When flickering is visible as if horizontal synchronization or vertical synchronization is lost on the broadcast reception screen.

#### [Entry]

Entry from the normal operating mode <Record/Play, Stop>

- 1) Turn of the main power ON.
- 2) Press “ESC” on the service remote controller.
- 3) Press “CHP/TIM”.

Setting screen

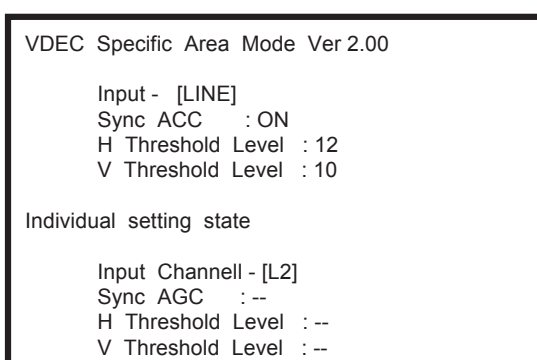


- 4) Press “ESC”. (Returns to the original screen)

#### [Entry from the individual setting mode]

- 1) Upon completion of the above operation, press “DIG/ANA”.

Setting screen



- 2) Press “ESC”. (Returns to the original screen)

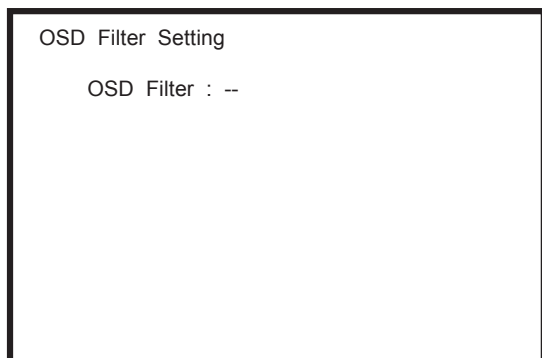
### 6-3-3. OSD Filter Setting (Subscreen 4)

When the following trouble symptom occurs, correct it by setting the OSD filter as described below.

- Characters on the OSD screen flicker depending on the monitor connected.

#### [Entry]

- 1) Turn of the main power ON.
- 2) Press “ESC” on the service remote controller.
- 3) Press “DISP”.
- 4) Press “DIG/ANA” four times.



- 5) Press “ESC”. (Returns to the original screen)

#### [Tips]

As the setting value becomes greater, jitter is reduced on a CRT display. However, as lines for characters appear thick, complex characters may become difficult to read. On the contrary, as the setting value becomes smaller, jitter increases on a CRT display. However, as lines for characters become sharper, complex characters become more legible.

**Note1:** A new setting becomes active as soon as it is made. As a new setting is stored in nonvolatile memory, it will be retrieved when the unit is turned on the next time.

**Note2:** After the factory-preset values are downloaded, the setting value for the OSD Filter will be the default Value (4).

#### [Key operation of OSD Filter setting]

Key	Operation	Setting value	Remarks
“Rev x 3”, “SPEED+” “ x 3 Fwd”, “SPEED-”	Changing the setting value for the OSD Filter	0 – 4 (Default value: 4)	“Rev x 3”, “SPEED+” : The setting value increases by1. “ x 3 Fwd”, “SPEED-” : The setting value decreases by1.
“CLEAR”	The setting value is reset to default.	—	
“ESC”	To exit the OSD Filter Setting and clear the screen (Appears the tuner screen.)	—	—