Pioneer

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Training Guide

DVR-65H-S / DVR-520H-S
DVR-320-S / DVR-225-S
DVR-220-S

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Pioneer

SERVICE

Contents

Overview

All five models covered in this guide have the same basic construction, board layout and electronic circuit design. Block diagrams shown will be of the DVR-520H-S and DVR-65H-S. The adjustment and test mode sections will be the same for all models with the exception of additional test modes for the hard drive models.

Basic differences in models from the DVR-520H-S & DVR-65H-S are as follows:

- **DVR-320-S……..No hard drive.**

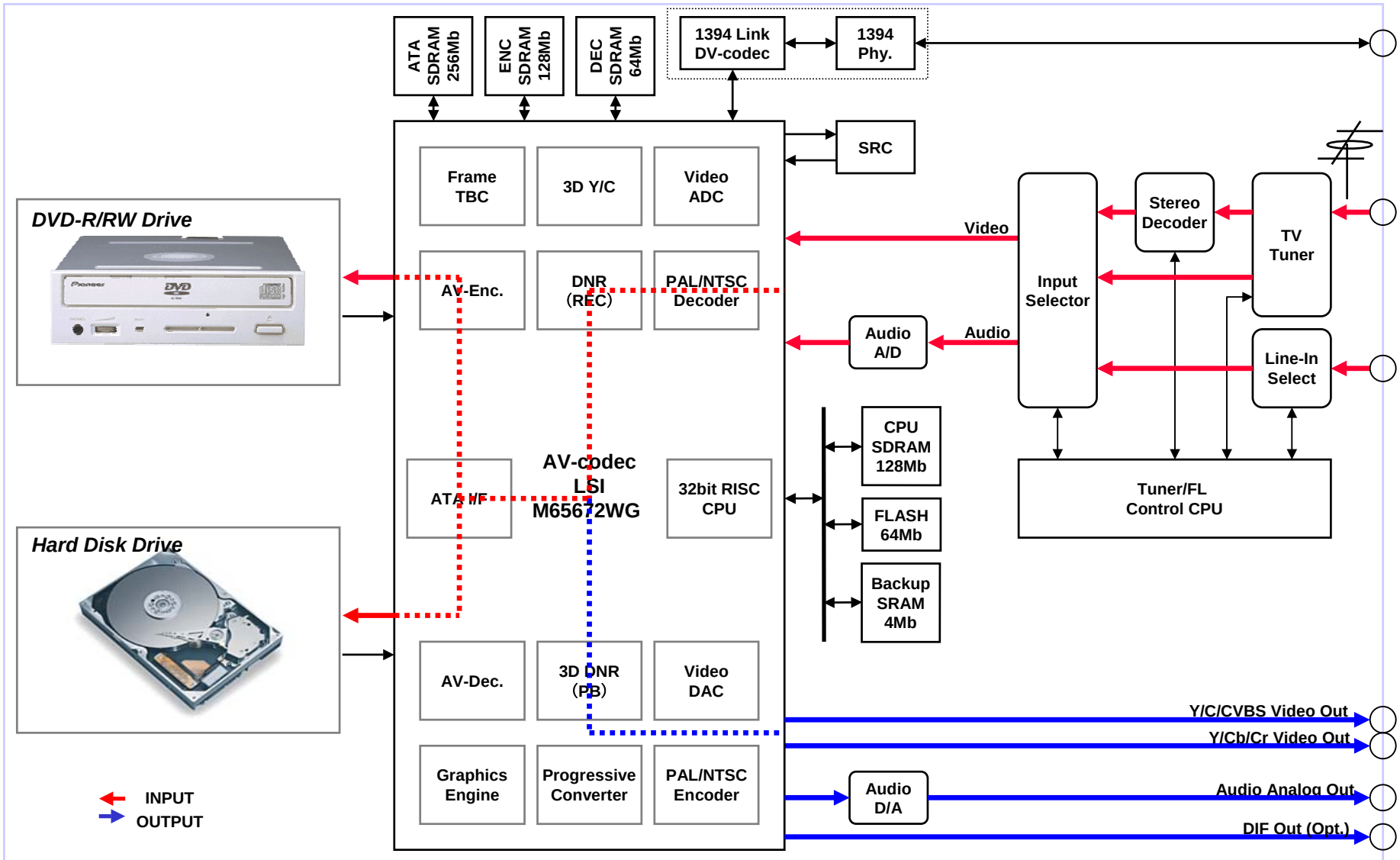
- **DVR-225-S & DVR-220-S……..No hard drive or DV in/out terminal.**

All models listed use the (R-7) DVDR/RW writer drive

Block Diagrams

SIGNAL FLOW

Tuner & Line Input Recording



Signal flow Record Mode

All video and audio record signals from tuner assembly, composite or S inputs pass through the jack panel assembly with the exception of the DV input/output.

The Tuner/FL Control CPU instructs an input selector based on user settings and sends the audio and video analog signals to the AV-codec IC .

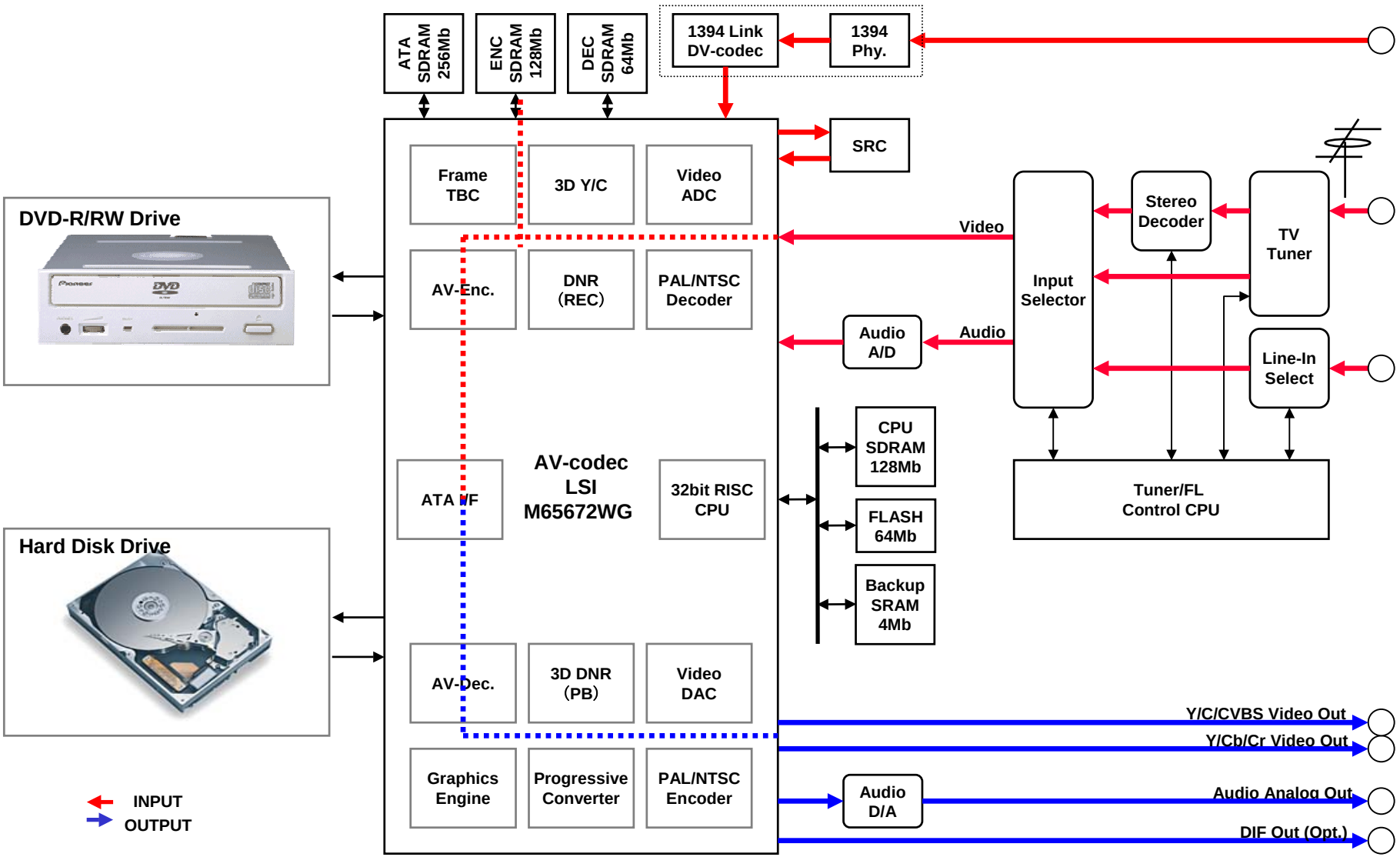
This AV-codec IC will take the analog audio and video input signals convert them to a digital DVD format and interface with the DVD-R/RW drive or the Hard Disk for recording.

In normal recording mode the video output signal from the AV-codec IC is basically a direct loop through the processing IC.

DV input/output record and playback line enter the AV-codec IC from the DV jack assembly. An audio sampling rate converter (SRC) is used to convert all incoming DV audio to 48khz.

SIGNAL FLOW

Recording Preview Mode



Signal flow Record Preview Mode

In the normal viewing mode (non record) or recording modes the video signal passes through the AV-codec IC on the main board with very little processing visible at the monitor output.

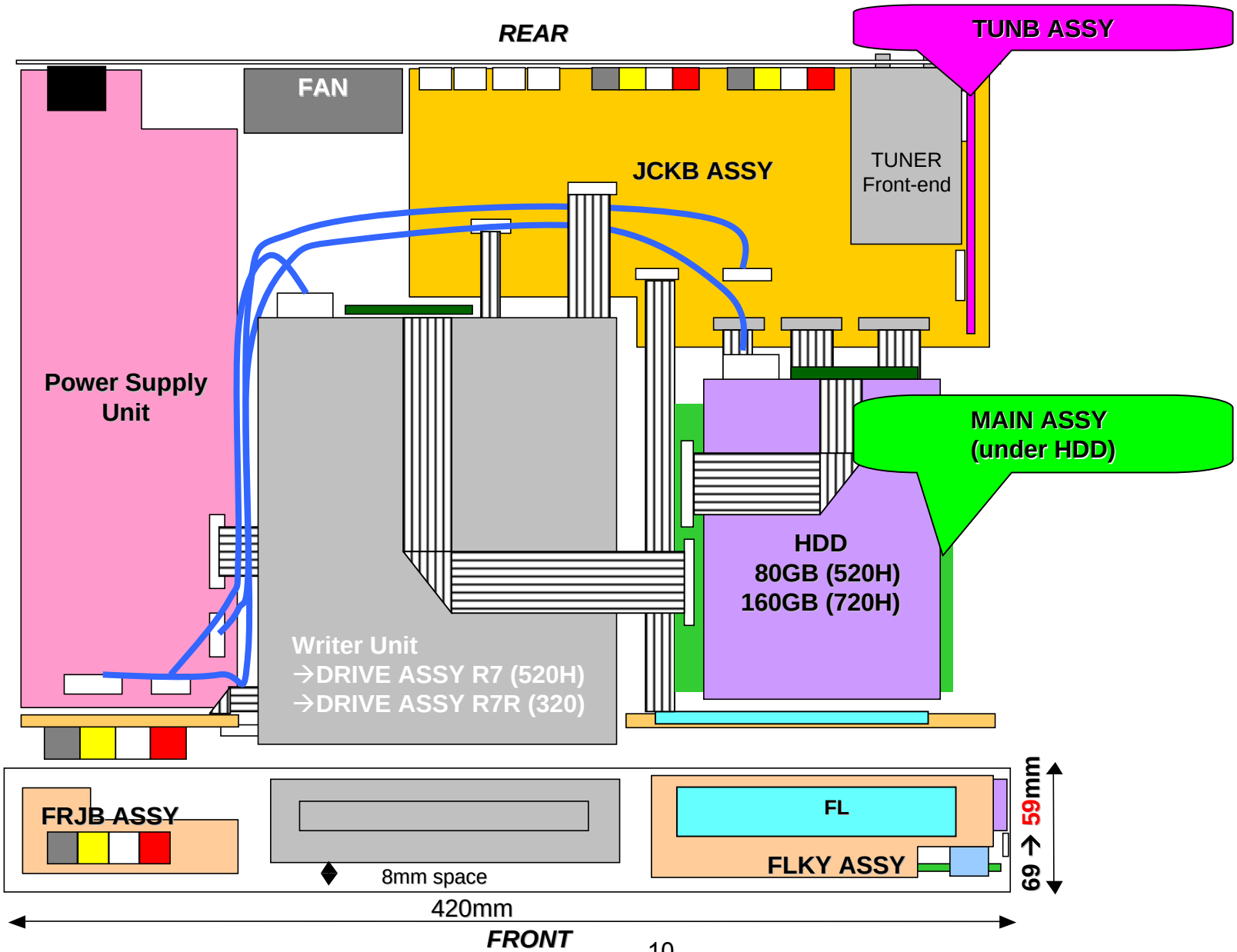
If the user selects Preview Mode the video output at the monitor will show the effects of all encoding, 3D Y/C separation, decoding and record mode settings.

This preview mode was designed to provide the user a way of viewing the record quality prior to making a disc.

All models have the capability to select different recording quality based on time from one to six hours.

BOARD LAYOUT

LAYOUT



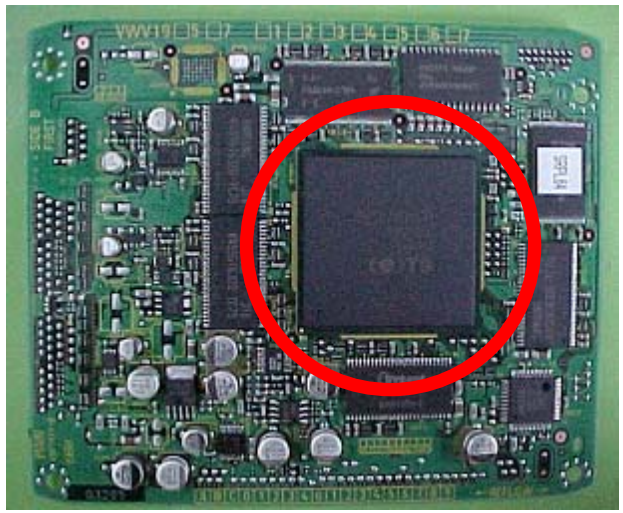
MAIN BOARD

1 Chip CODEC LSI (M65672WG)

MAIN FUNCTIONS

- 10bit*27MHz(1ch),8bit*27MHz(3ch) Video ADC
- PAL/NTSC Decoder
- 3-Dimensional YC Separation
- Frame TBC
- 3-Dimensional DNR
- MPEG Video Encoder
- Dolby Digital Consumer Encoder
- Graphics Engine （OSD, Scaling, Mixing）
- MPEG Video Decoder
- Audio Decoder （AC-3, MPEG)
- PAL/NTSC Encoder
- 10bit*54MHz(5ch) Video DAC
- Progressive Conversion
- Audio I/F
- Drive I/F（ATA/ATAPI, 2ch）
- Main CPU （32bit RISC, 54MHz）

Process
→ 0.13μm、CMOS 6 Layers (6Cu)
Gate Scale
→ about 4 million gate (Except memory)
Supply voltage
→ Internal 1.2V, External 3.3V (Voltage-proof 5V)
Package
→ 576pin　PBGA



MAIN BOARD

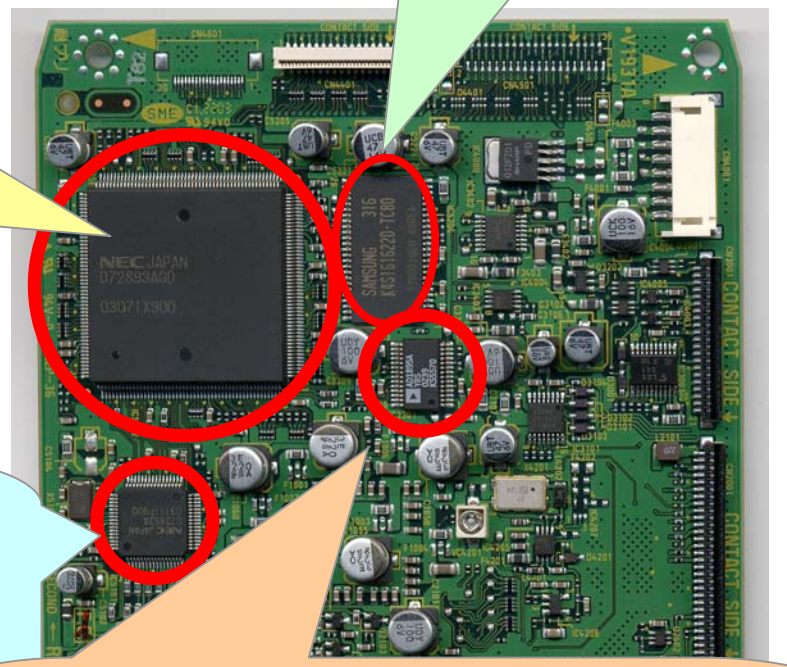
DV Device

1. DV CODEC / IEEE1394 Link LSI (IC5202)

Voltage **I/O: 3.3V**
Internal: 2.5V

Function **DV Decode**
DV Encode
IEEE1394 Link Layer Control
IEC61883 AV/C Command Control
(The control command sending function to a DV camcorder etc.)
CPU (For IEEE1394 processing)

IC5204
DV SDRAM
Function: Working area for DV link and the codec



2. IEEE1394 PHY LSI (IC5101)

Voltage **3.3V**

Function **IEEE1394 conformity physical layer control LSI**
24.576MHz (PLL for IEEE1394)
built-in Crystal oscillation circuit
(Crystal oscillator is external)

3. Audio Sampling Rate Converter (IC3301)

Voltage **3.3V**

Function **the following sampling rates are converted in order to absorb frequency deflection.**
48kHz (DV Clock) → 48kHz (Recorder Clock)
32kHz (DV Clock) → 48kHz (Recorder Clock)

HDD UNIT

Factory Installed Built-In HDD's could be one of three models. Replacement will be limited to one type.

1. TYPE

< DVR-520H-S >		< DVR-65H-S >	
VXF1010	80GB	VXF1028	160GB
VXF1043	80GB (NSP)	VXF1055	160GB (NSP)
VXF1036	80GB (NSP)	VXF1040	160GB (NSP)

2. Other Info

MODEL	PART#	ROTATIONAL SPEED [rpm]	REMARKS	
DVR-520H-S	VXF1010	5,400	Maxtor	Replacement
	VXF1043	7,200	Western Digital	Factory
	VXF1036	7,200	Seagate	Factory
DVR-65H-S	VXF1028	7,200	Maxtor	Replacement
	VXF1055	7,200	Western Digital	Factory
	VXF1040	7,200	Seagate	Factory

Overall Block Diagrams

System configuration

In each signal-processing LSI of the main function blocks, various processes have been integrated into one chip, which enables simpler system configuration. With the AV-signal-processing LSI at the center, video inputs/outputs, audio inputs/outputs, DV inputs/outputs, writer and various memory cells are connected to it.

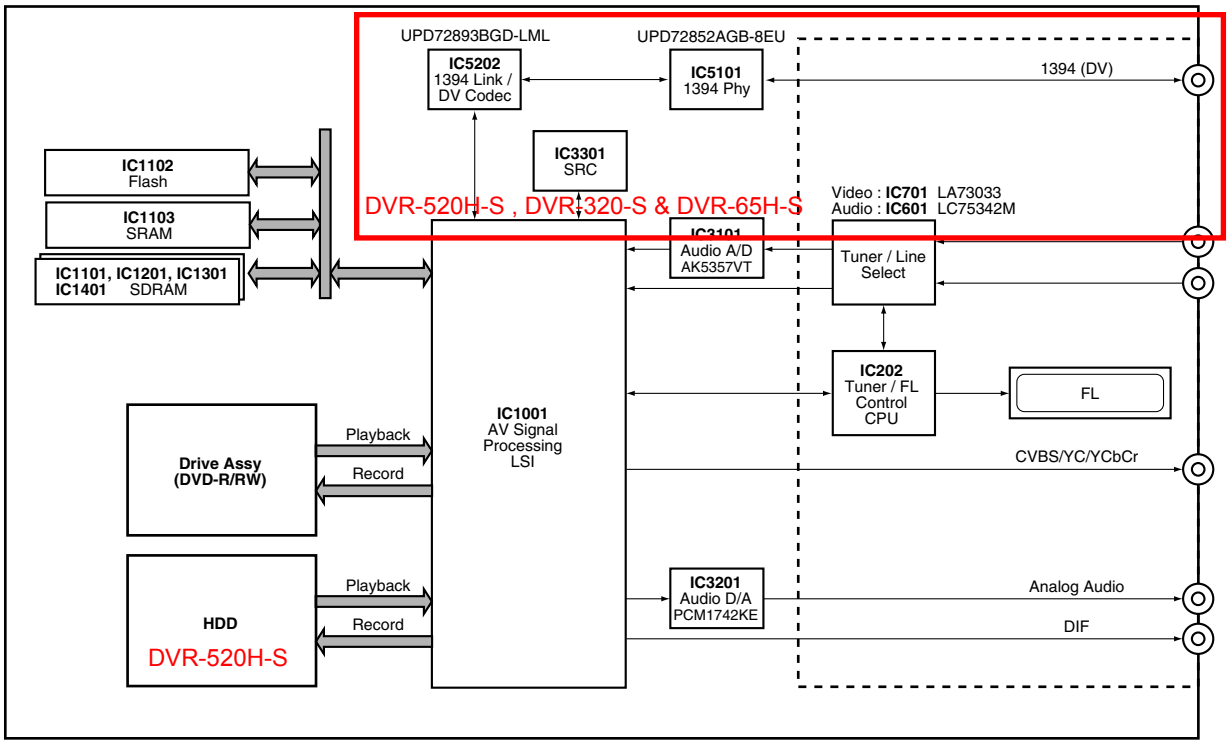


Fig2. System configuration

[Memorized Data]

- EEPROM (IC204 JCKB ASSY)
  The information about Tuner is backed up.
  (Pre-set CH, AFT ON/OFF, Skip CH, etc)
  Information about timed recording
  Other information
  (The state of Volume, remote control mode and last positions (Line/Tuner, etc)

- CPU SDRAM (IC1101 MAIN ASSY)
  The execution area and working area of a program

- FLASH ROM (IC1102 MAIN ASSY)
  The storing area of a program code and setting information

- SRAM (IC1103 MAIN ASSY)
  The working area for record and the storing area of setting information (backup RAM)

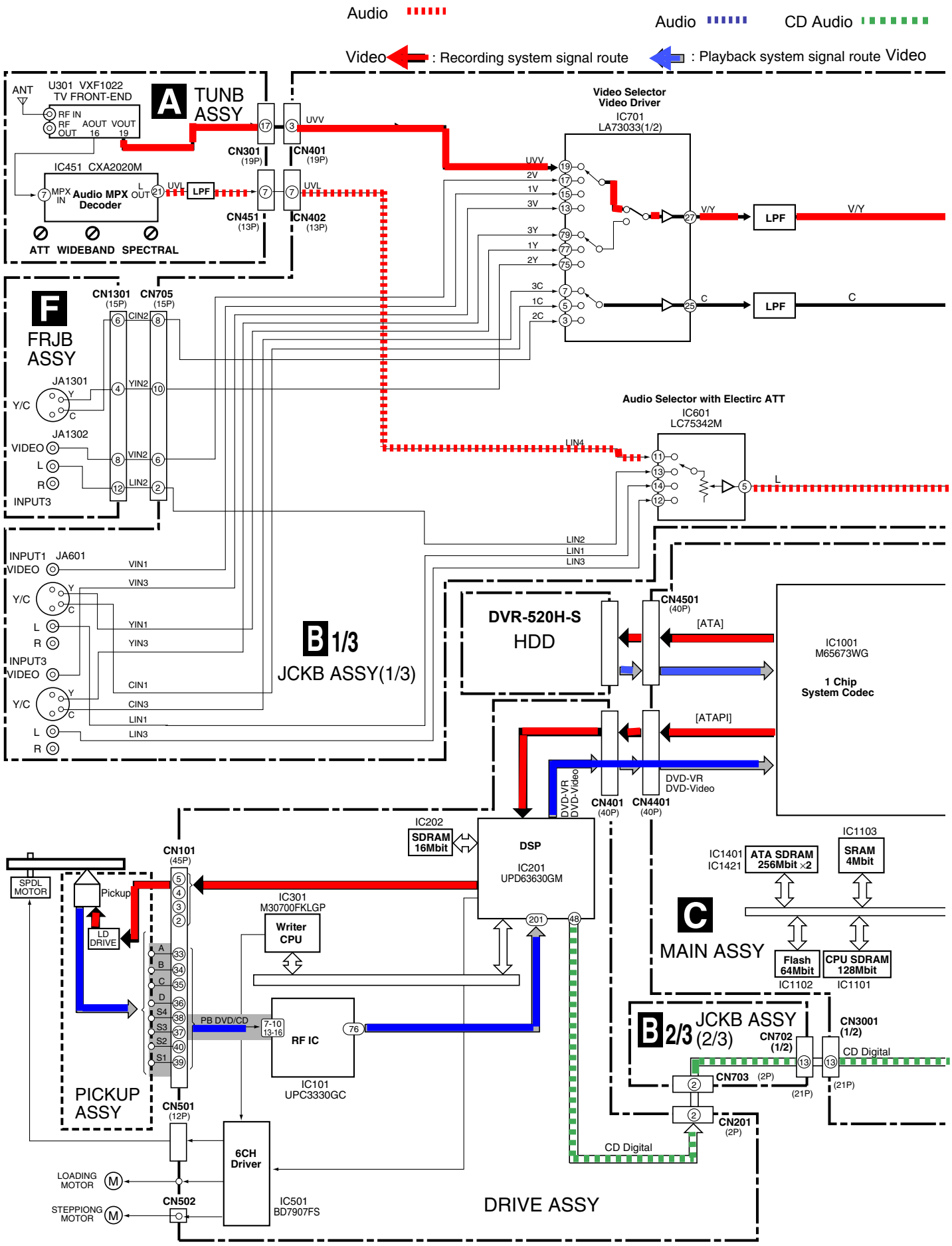
- DEC SDRAM (IC1201 MAIN ASSY)
  The working area of MPEG playback and OSD/Thumbnail
  (OSD is mainly for Disc Menu creation in Video mode)

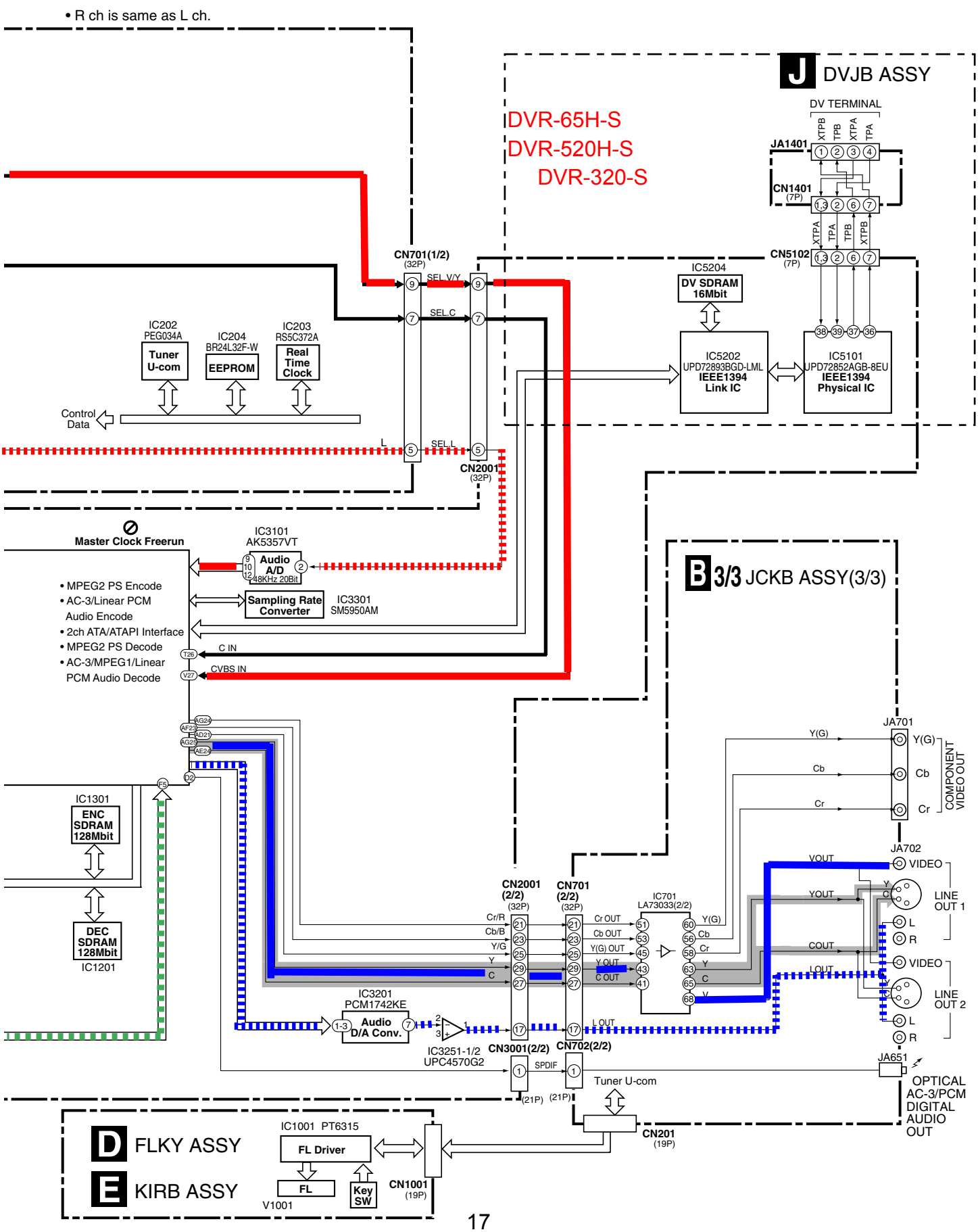
- ENC SDRAM (IC1301 MAIN ASSY)
  The working area of MPEG recording and analog input and output (AVIO)

- ATA SDRAM (IC1401 MAIN ASSY)
  The working area of ATA/OSD2/Audio TBC (OSD2 is for all GUI.)

- ATA SDRAM (IC1421 MAIN ASSY)
  This is only for HDD model.
  The working area about HDD operation.

- DV SDRAM (IC5204 MAIN ASSY)
  The working area of Link and DV Codec


Audio
Audio
CD Audio
Video : Recording system signal route
: Playback system signal route Video
ANT
U301 VXF1022
TV FRONT-END
RF IN
RF OUT
AOUT 16
VOUT 19
A TUNB ASSY
CN301 (19P)
CN401 (19P)
UVV
IC451 CXA2020M
MPX IN
Audio MPX Decoder
L OUT
UVL
LPF
CN451 (13P)
CN402 (13P)
ATT
WIDEBAND
SPECTRAL
Video Selector
Video Driver
IC701
LA73033(1/2)
UVV
2V
1V
3V
3Y
1Y
2Y
3C
1C
2C
V/Y
C
LPF
F FRJB ASSY
CN1301 (15P)
CN705 (15P)
JA1301
Y/C
JA1302
VIDEO
L
R
INPUT3
CIN2
YIN2
VIN2
LIN2
Audio Selector with Electirc ATT
IC601
LC75342M
LIN4
INPUT1 JA601
VIDEO
Y/C
L
R
INPUT3
VIDEO
Y/C
L
R
VIN1
VIN3
YIN1
YIN3
CIN1
CIN3
LIN1
LIN3
B 1/3 JCKB ASSY(1/3)
LIN2
LIN1
LIN3
DVR-520H-S
HDD
CN4501 (40P)
[ATA]
IC1001
M65673WG
1 Chip
System Codec
[ATAPI]
DVD-VR
DVD-Video
CN401 (40P)
CN4401 (40P)
IC202
SDRAM 16Mbit
DSP
IC201
UPD63630GM
IC1103
IC1401
IC1421
ATA SDRAM 256Mbit ×2
SRAM 4Mbit
C MAIN ASSY
Flash 64Mbit
IC1102
CPU SDRAM 128Mbit
IC1101
CN101 (45P)
SPDL MOTOR
Pickup
LD DRIVE
IC301
M30700FKLGP
Writer CPU
A
B
C
D
S4
S3
S2
S1
PB DVD/CD
7-10
13-16
RF IC
IC101
UPC3330GC
PICKUP ASSY
CN501 (12P)
B 2/3 JCKB ASSY (2/3)
CN702 (1/2)
CN3001 (1/2)
CD Digital
CN703 (2P)
(21P)
(21P)
CN201 (2P)
CD Digital
6CH Driver
LOADING MOTOR
STEPPIONG MOTOR
CN502
IC501
BD7907FS
DRIVE ASSY


• R ch is same as L ch.
J DVJB ASSY
DVR-65H-S
DVR-520H-S
DVR-320-S
DV TERMINAL
XTPB
TPB
XTPA
TPA
JA1401
CN1401
(7P)
CN5102
(7P)
CN701(1/2)
(32P)
SEL V/Y
SEL C
SEL L
L
CN2001
(32P)
IC202
PEG034A
Tuner
U-com
IC204
BR24L32F-W
EEPROM
IC203
RS5C372A
Real
Time
Clock
Control
Data
IC5204
DV SDRAM
16Mbit
IC5202
UPD72893BGD-LML
IEEE1394
Link IC
IC5101
UPD72852AGB-8EU
IEEE1394
Physical IC
Master Clock Freerun
IC3101
AK5357VT
Audio
A/D
48KHz 20Bit
Sampling Rate
Converter
IC3301
SM5950AM
• MPEG2 PS Encode
• AC-3/Linear PCM
Audio Encode
• 2ch ATA/ATAPI Interface
• MPEG2 PS Decode
• AC-3/MPEG1/Linear
PCM Audio Decode
C IN
CVBS IN
B 3/3 JCKB ASSY(3/3)
IC1301
ENC
SDRAM
128Mbit
DEC
SDRAM
128Mbit
IC1201
JA701
Y(G)
Cb
Cr
COMPONENT
VIDEO OUT
JA702
VOUT
COUT
LOUT
VIDEO
LINE
OUT 1
LINE
OUT 2
L
R
CN2001
(2/2)
(32P)
CN701
(2/2)
(32P)
IC701
LA73033(2/2)
Cr/R
Cb/B
Y/G
Y
C
Cr OUT
Cb OUT
Y(G) OUT
Y OUT
C OUT
IC3201
PCM1742KE
Audio
D/A Conv.
IC3251-1/2
UPC4570G2
CN3001(2/2)
CN702(2/2)
(21P)
SPDIF
Tuner U-com
JA651
OPTICAL
AC-3/PCM
DIGITAL
AUDIO
OUT
CN201
(19P)
D FLKY ASSY
E KIRB ASSY
IC1001 PT6315
FL Driver
FL
V1001
Key
SW
CN1001
(19P)

Adjustments

Test Modes

&

Service Modes

* It is not necessary to adjust the ASSY normaly when exchanging the ASSY. But the adjustment is necessary when exchanging the Tuner Module and IC451 stereo decoder IC.

No.	Adjustment Name	Adj. Point	Measurement Point	Adjustment Value	Adjustment State
1	Stereo Decoder ATT adjustment (Input system adjustment)	VR453	Audio ouput (L) (Rear panel)	370mVrms ± 18.5mV	Input a signal of Mono 1kHz/100% modulation to terrestrial tuner input. /through output.
2	Stereo Decoder Wideband adjustment (Input system adjustment)	VR451	Audio ouputs (L/R) (Rear panel)	Best point of separation ≥30dB Note 1	Input a signal of Stereo 300Hz/30% modulation (NR-ON/L ch only) to terrestrial tuner input. Note 2
3	Stereo Decoder Spectral adjustment (Input system adjustment).	VR452	Audio ouputs (L/R) (Rear panel)	Best point of separation ≥25dB Note 1	Input a signal of Stereo 3kHz/30% modulation (NR-ON) to terrestrial wave input. /through output Note 2

Note 1 : The values for channel separation is defined as those having passed through the following filters :
100Hz – 10kHz : +0/–0.5dB
15.75kHz – 100kHz : -40dB or more

Note 2 : The adjustment No.2 and No.3 should be repeated 2 times for good adjustment.
(Steps : No.1 → No.2 →No.3 →No.2 →No.3)

TUNB ASSY

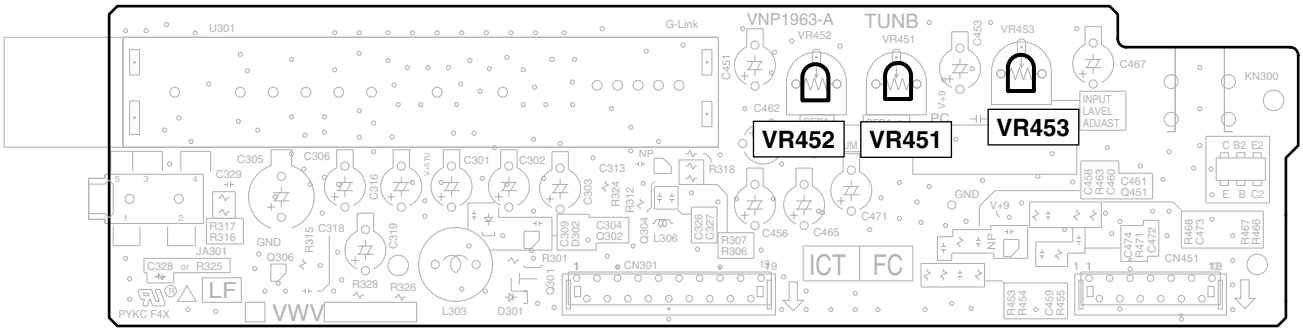


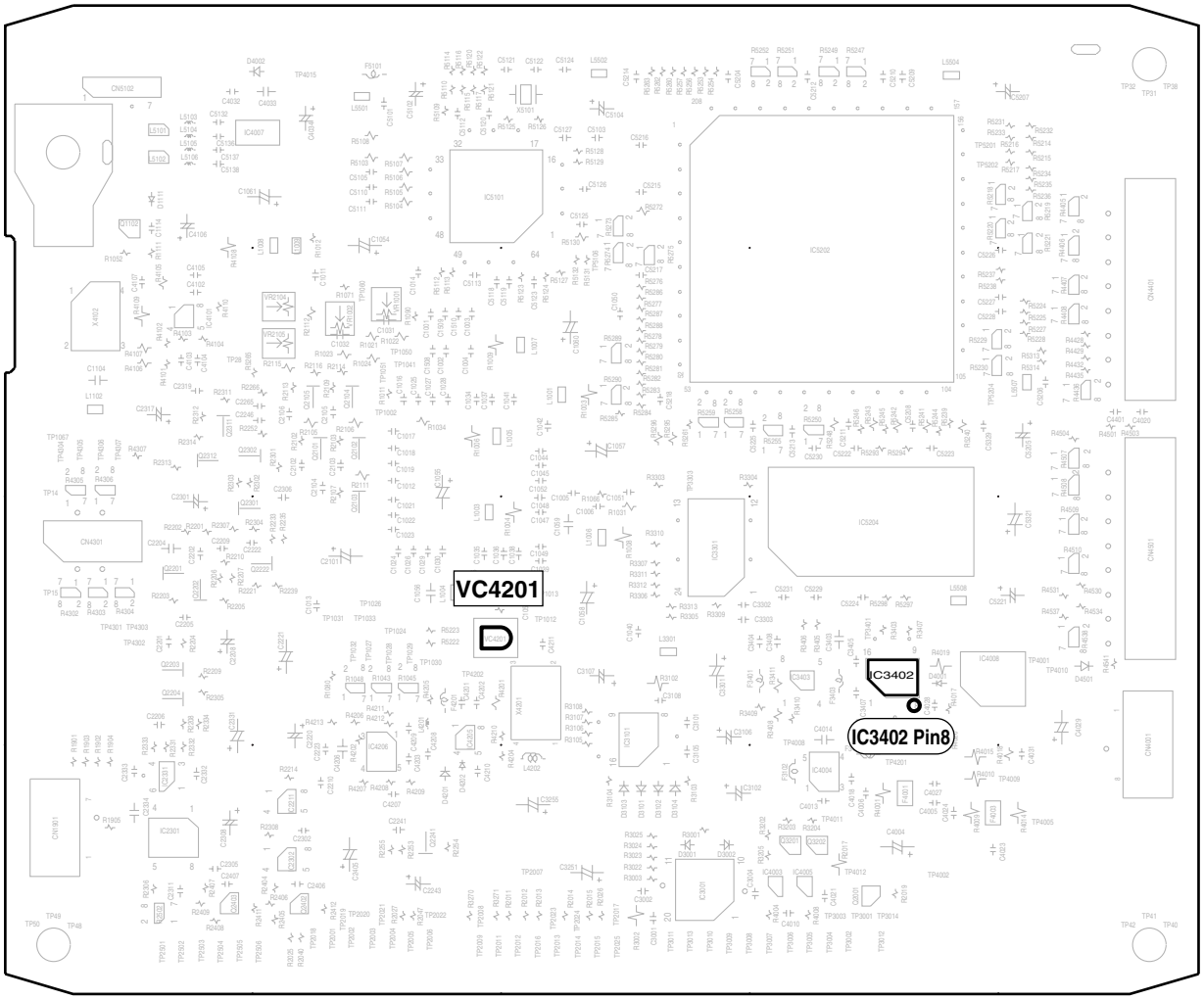
Fig.1 Adjustment Points (TUNB ASSY)

* It is not necessary to adjust the ASSY normaly when exchanging the ASSY, but confirm the data.

No.	Adjustment Name	Adj. Point	Measurement Point	Adjustment Value	Adjustment State
1	Master clock free-running adjustment (Clock system adjustment)	VC4201	MAIN ASSY IC3402 Pin8 (XTO) (SM8707KV)	27.000000MHZ ± 130Hz	No signal input

C MAIN ASSY

SIDE A



Service Diagnosis List

CPRM ID NUMBER AND DATA SETTING

The Setting is necessary

- " CPRM ERR" is displayed on the FL display immediately after the power is turned on or in Stop mode.
- When the MAIN ASSY , DRIVE ASSY or the FLASH ROM is exchanged.

MODEL SETTING
DOWNLOAD METHOD

The Setting is necessary

- When the MAIN ASSY is replaced.
- When the JCKB ASSY is replaced.
- When the MAIN ASSY and JCKB ASSY is replaced.

SERVICE MODE

[First Screeen] (Version information, etc)
[Sub Screen 1] (Result of error-rate measurement : Video mode/VR mode)
[Sub Screen 2] (HDD information)

[Second Screen] (ATA/ATAPI debug screen)
[Sub Screen 3] (writer maintenance information of ATA/ATAPI DEBUG OSD)
[Sub Screen 4] (ATA/ATAPI DEBUG OSD_LD degradation judgement)

[Fourth Screen] (VR-recording error log)
[Sub Screen 4] (Error log for VR recording)

[Fifth Screen] (Error log for VR playback)
[Sub Screen 2] (Error log for VR playback)

DV DEBUG MODE

[Third Screeen] (DV debug information)

ERROR RATE MEASUREMENT

Only Video mode measurement

VIDEO ADJUSTMENT FOR SPECIFIC AREA

Purposes:

Depending on the area, jitter may appear in a picture received by the tuner, as conditions of signals received by the tuner are different from area to area. To correct this kind of problem, the function of the System Codec AVIO control section for adjusting signals received by the tuner can be used.

AGING MODE

CPRM ID NUMBER AND DATA SETTING

Entering the ID Number and ID Data for DVD Recorder

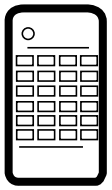
For the DVD recorder,it is necessary with the recoding/playback of DVD–RW disc to set an individual number (ID number) and ID data to each recorder. If the number and data are not set correctly with the following procedure, operations in the future may not be guaranteed. You will find the ID number to be set on the ID label on the rear panel.

Important: If no ID label is found on the rear panel, write down the specified ID number by checking it according to "How to confirm the ID number" shown below.

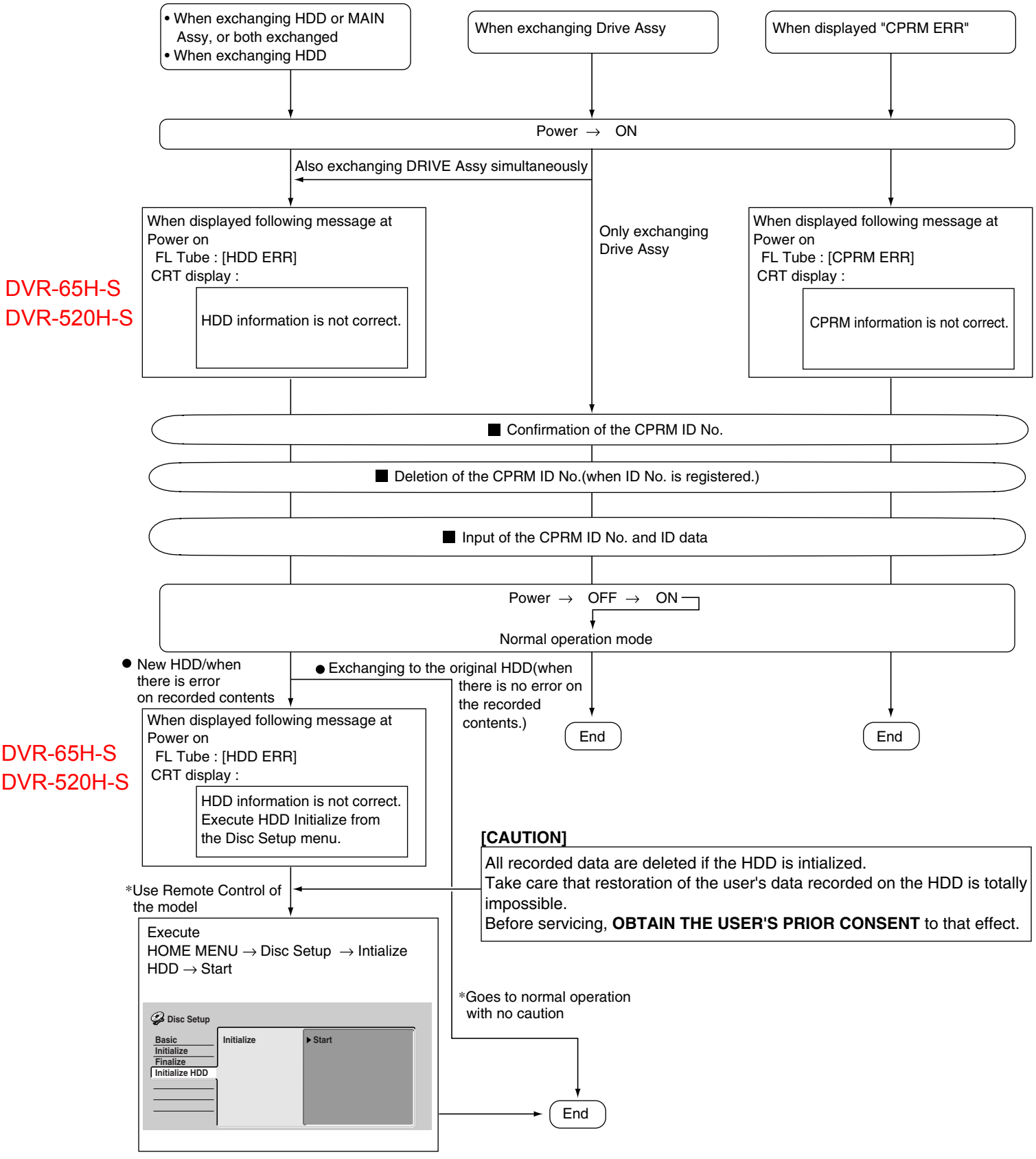
The Input is Necessary When:

- " CPRM ERR" is displayed on the FL display immediately after the power is turned on or in Stop mode.
- When the MAIN ASSY , DRIVE ASSY or the HDD is exchanged.

JIGS AND MEASURING INSTRUMENTS

 Service Remote Control Unit (GGF1381)	 DVD Recorder Data Disc (GGV1179) (*) Refer to P138.

Input Flow of the ID No. and ID data when exchanging HDD, MAIN Assy or Drive Assy

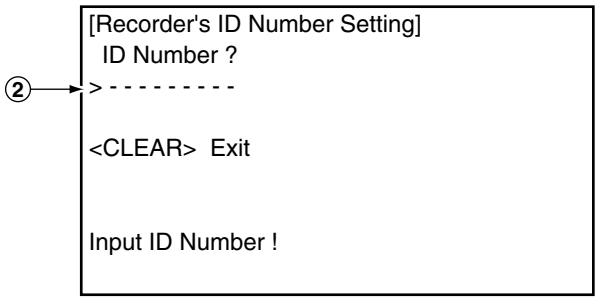


How to Input the ID Number and ID Data

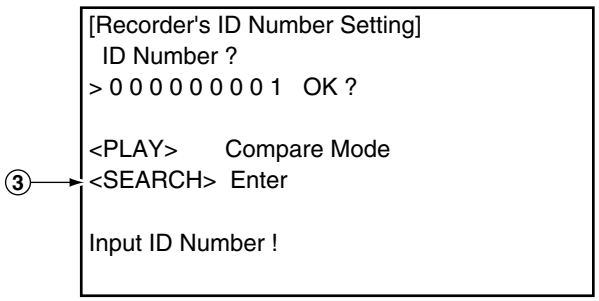
Note:
Be sure to enter the ID number in Stop mode.
Use the service remote control (GGF1381) for operations. Only opening/closing of the tray are performed from the player.
The ID data disc is swept out automatically after the recorder has read the data from it.

① To enter the input mode, press ESC + STEREO sequentially in a status with no ID number set, such as after FLASH-ROM downloading.

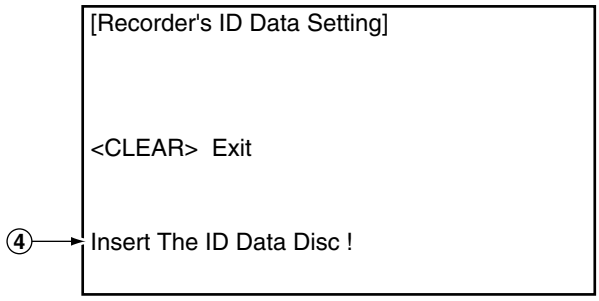
② As number input is enabled when the unit enters the input mode, input the 9-digit ID number.
(The entered number is also displayed on the FL display.)



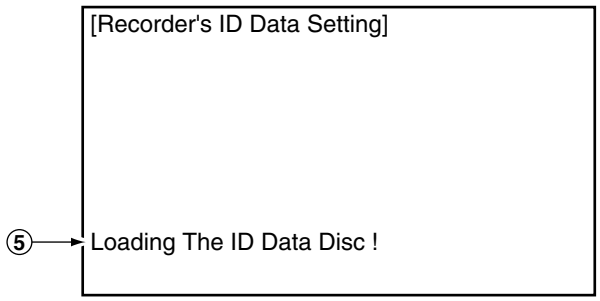
③ After inputting the number, press SEARCH to register the ID number.



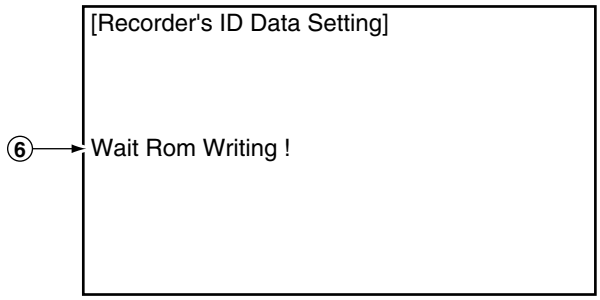
④ When the ID number has been registered, the unit enters the ID data input mode. (The FL display indicates "INSERT ID.")
In this condition, place the ID data disc on the tray and close the tray using the CLOSE key "■/⏏" on the player.



⑤ While the data are being read, the message shown in the figure at left is displayed on the screen.
(The FL display indicates "LOAD ID.")

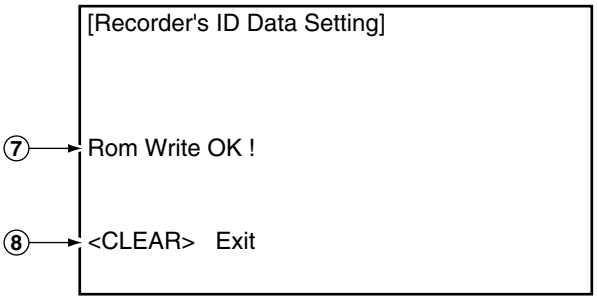


⑥ When the ID data have been read, the data are written to the FLASH-ROM.
(The FL display indicates "WRITE ID.")



⑦ When the ID data have been written to the FLASH-ROM, the message "Rom Write OK" is displayed on the screen.
(The FL display indicates "ID DATA OK.")

⑧ After confirming this message, press CLEAR to exit the input mode.

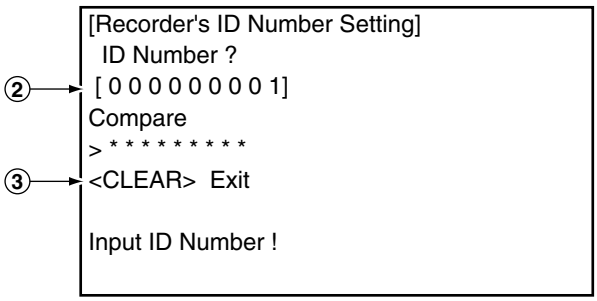


How to Confirm the ID Number

① Press ESC + STEREO sequentially with an ID number already set, and the unit enters the ID number confirmation mode.

② The set ID number is displayed on the screen (and on the FL display), permitting you to confirm it.

③ To exit this mode, press CLEAR.

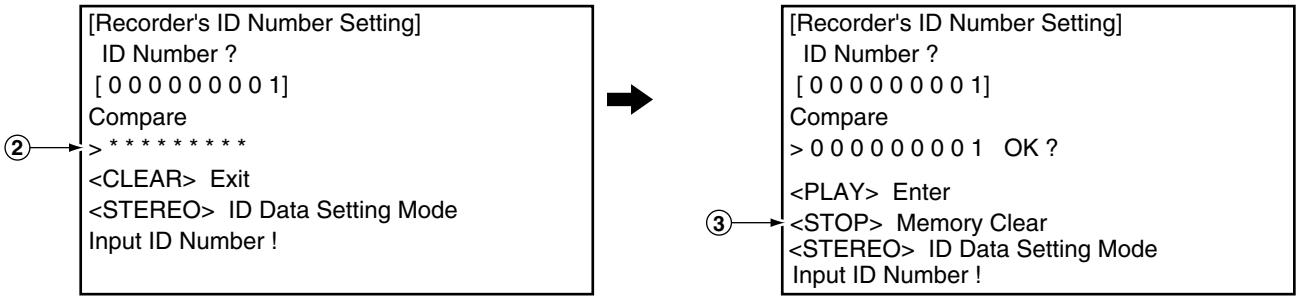


How to Clear the ID Number

① Press ESC + STEREO sequentially with an ID number already set, and the unit enters the ID number confirmation mode.

② Input the same number as the ID number you have set.

③ After inputting the number, press STOP.
Only when the entered number matches the set ID number, the ID number is cleared and the unit exits this mode.
If the numbers do not match, you must return to step 2.
(STOP is not accepted until 9 digits are entered.)



MODEL SETTING

• The Setup is Necessary When :

a) When the MAIN Assy is replaced
b) When the JCKB Assy is replaced
c) When the MAIN Assy and JCKB Assy are replaced

Note : Make sure of setting the correct number.

• How to Setup the Model

1) After power on, the following screen is displayed on TV monitor.
Press " 22 " by using the remote control unit for service(GGF1381).

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

  > --

  Input  No.          Model
  [     22        :   DVR-520H-S       ]
  [     23        :   DVR-65H-S        ]
```

Note: Press '29" for DVR-220-S

Press "26" for DVR-225-S

Press "21" for DVR-320-S

2) After 1), the following screen is displayed on TV monitor.
Press " 011 " by using the remote control unit for service.

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

  > ---                  (Type  --  ,   Region  No.  -)

  Input  No.          Type
  [     01        :    KU/CA    <US>                ]
```

The setting complete when OSD is disappeared.

3) Unplug the power cable.

4) Reset the recorder to all its factory settings.
   1. Make sure that the recorder is on.
   2. Press and hold [STOP] and press [STANDBY/ON] key on the front panel.
      The recorder turns off with all settings reset.

5) Enter the Service Mode and then confirm the Model Name " DVR-520H/KU/CA ".
   1. Make sure that the recorder is on.
   2. Press [ESC] then [DISP] keys by using the remote control unit for Service.

```
DVR-520H/KU/CA
  VERSION   : 0.60
  SYSCON    : RELEASE_45
              Rev     :1.3685  $
 TUFLCON    : 1.22     MASK                OK
    DRIVE   : DVD-RW DVR-107X              OK
              1.10K                        OK
              CKT0000353WL                 OK

      HDD   : ST380012ACE                  80
   DEVICE   : PRISM-PLUS
   REGION   : 1
          C : * * * * * * * * *
   FLASH    : 64M
```

Notes :

1) After the setting complete, you can NOT CLEAR the seting data.
Make sure the pressing number.

2) " NG " is appeared on TV when unsuitable number is pressed.
In such a case, please unplug the power cable and plug it again. Then restart the model setting.

DOWNLOAD METHOD

• The Download is Necessary When :

a) After model setting

b) When "NG" is displayed at First screen (version information, etc)

[Notes]

Be sure NOT to turn off the unit during downloading.

If the unit is turned off during downloading, the SYSCON, TUFLCON, and DRIVE programs may not be properly rewritten, in which case the unit may not be able to initialize itself normally when turned on again. If that happens, repair the unit, as described below, then perform downloading again:

- In a case where the power to the unit was shut off during rewriting of the SYSCON program:
  The SYSCON program will not function properly if the power to the unit is forcibly shut off while the message "DOWNLOAD-1" is displayed on the FL display during downloading. If downloading of the programs from the disc or through serial communication becomes impossible, replace the FLASH ROM.
- In a case where the power to the unit was shut off during rewriting of the DRIVE program:
  The DRIVE program will not function properly if the power to the unit is forcibly shut off while the message "DOWNLOAD-2" is displayed on the FL display during downloading. If downloading of the programs from the disc or through serial communication becomes impossible, replace the DRIVE ASSY.
- In a case where the power to the unit was shut off during rewriting of the TUFLCON program (only for the flash-type TUFLCON microcomputers):
  The TUFLCON program will not function properly if the power to the unit is forcibly shut off while the message "DOWNLOAD-3" is displayed on the FL display during downloading. If downloading of the programs from the disc or through serial communication becomes impossible, replace the TUFLCON microcomputer.

1. DISC DOWNLOAD METHOD

• How to Download

This is disc download method to save the initial setting data and user setting data.
However, the following data is deleted after downloading by this method.

* Disc history data
* REC mode
* Last channel (Before turn unit off)

1) Open a disc tray in the " DVD " function.
2) Put the download disc on the tray.
3) Press and hold a " STOP " button for playback,
   then press a " DISC NAVIGATOR " button on a front panel.
   - The disc tray closes automatically and the disc is loaded.
   - The disc tray opens automatically after loading.
4) Take out the Download Disc.
   - " DISC DWLD " is displayed on FL and download is started.
   - The display on FL changes to " DOWNLOAD-1 "
   - The display on FL changes to " DOWNLOAD-2 "
   - The display on FL changes to " DOWNLOAD-3 " (*)
   - After download is completed, the power turns off, and turns on and a disc tray closes automatically.
   * It takes for about 5 minutes until download is completed.
5) Press and hold a " ESC ", then press " DISP " on a test mode remote control unit for the release version confirmation.
6) Confirm a firmware release version.
7) Press " ESC " on a test mode remote control unit in order to exit the test mode.

(*) : " DOWNLOAD-3" is displayed only when the TuFL u-com is FLASH type.

2. Serial DOWNLOAD METHOD

[Notes]

This method is secondary way when the disc loading is impossible.

• JIGS

* PC with serial port
* RS232C straight cable
* RS232C I/F jig (GGF1348)
* 7P FFC (VDA1681)
* Download program (UFU.exe)
* Firmware

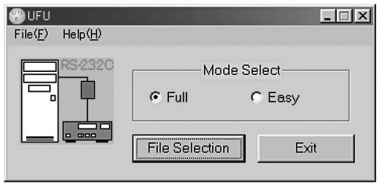
• Connection

PC ⇔ RS232C cable ⇔ RS232C I/F ⇔ 7P FFC ⇔ DVD Recorder

• How to Download

1) Connect the 232C I/F JIGS above way.

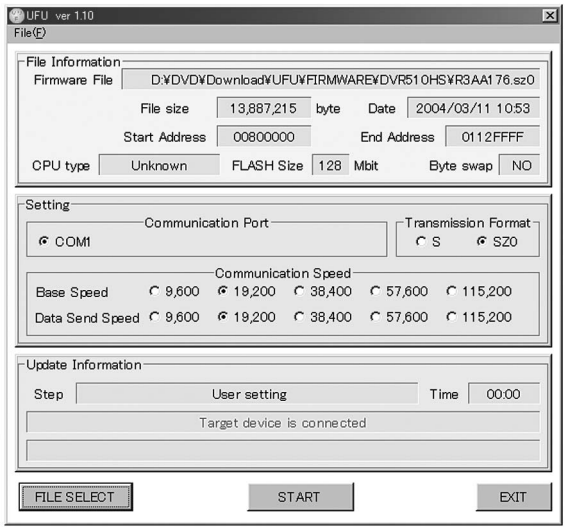
2) Turn on the PC and start the " UFU.exe ".



. 3) Select the Firmware file. ("sz0" file)

4) Turn the DVD recorder on and start the download program.

" Target Device is connected" is appeared on the screen.



. 5) Select the Communication Speed (Baud Rate)

a) Base Speed 38,400

b) Data Send Speed 115,200

6) START

* Even if you click "START" button,
sometimes "Communication Error" may come out one to twice, and download may fail.
In this case, please click "START" again.
* Other factors can be considerd if download fails 3 times or more.
* And it takes about an hour for updating the firmware.

SERVICE MODE

For service operations, use the GGF1381 remote control unit for service.
The Service-mode screens consist of nine mode screens, which are classified into such rough categories as recording system and VR playback system, and their subscreens.

- **How to enter Service mode** : Press the ESC then DISP keys in turn while no GUI is displayed. The first screen (version information, etc.) shown below is displayed.
- **How to exit Service mode** : Press the ESC key.
- **How to advance to the next Service-mode screen**
  : While the first screen is displayed, press directly one of the keys 1-9. For service, use the keys 2, 4 or 5, as shown below.
- **How to advance to a subscreen within the same Service-mode screen**
  : Press the DIG/ANA key. Pressing the DIG/ANA key repeatedly will change the subscreens within the same Service-mode screen cyclically.

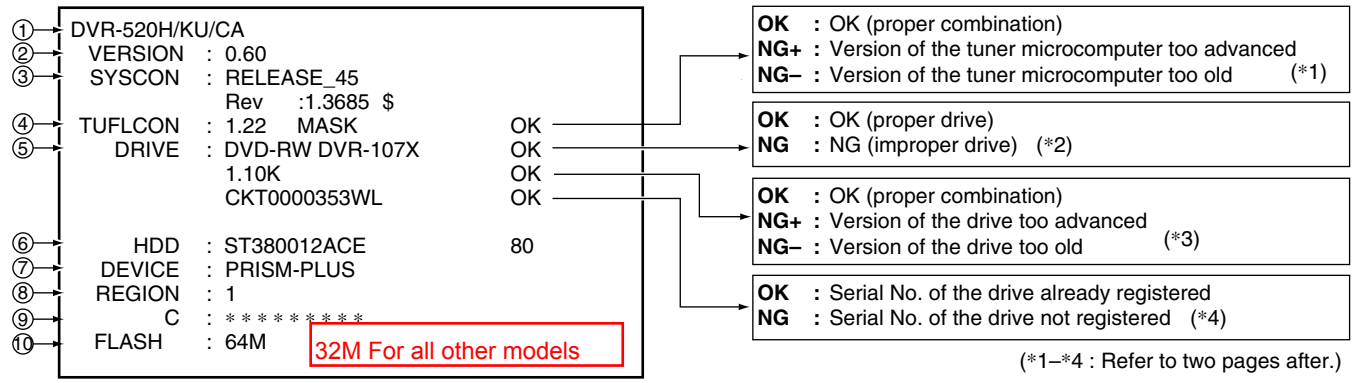
The Service-mode screens to be used for service are as follows:

1 = First screen: Version information, etc.
2 = Second screen: ATA/ATAPI debug screen (Writer data)
4 = Fourth screen: Error log for the VR recording system
5 = Fifth screen: Error log for the VR playback system

Note: After entering one of the Service-mode screens, if you wish to shift to another Service-mode screen, exit Service mode first, then reenter Service mode and select your desired Service-mode screen.

Description of Each Service-mode screen

1. First screen (version information, etc.)

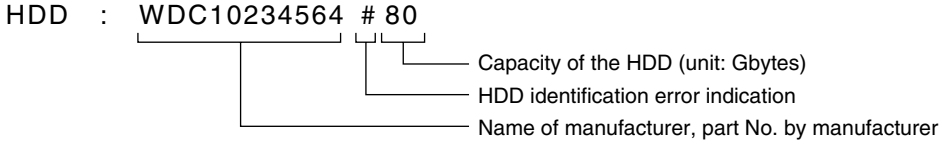


(*1–*4 : Refer to two pages after.)

① Model name/destination
② Version of the recorder software
③ Revision No. of the system-control computer software (Edition administration No. [from top to bottom, common software, firmware, application software])
④ Version No. of the tuner microcomputer, Mask or Flash
Result of the combination ckeck with system u-com
⑤ Information on the built-in drive (Model name, version No., model type, serial No.)
⑥ Data of the built-in HDD, capacity of the HDD
⑦ Version No. of PRISM
⑧ Region No.
⑨ CPRM data (CPRM key No.)
⑩ FLASH ROM information

While the first screen shown above is displayed, press the DIG/ANA key to enter the subscreen shown below.
Note: Each time the DIG/ANA key is pressed, the display changes between the first screen and its subscreen.

- **Details on HDD data are described below:**



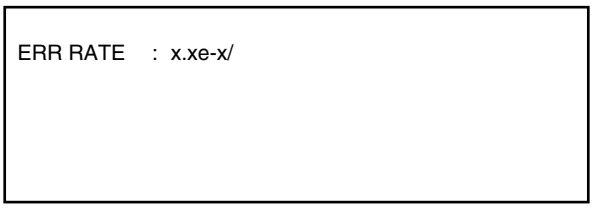
If any abnormality exists in HDD connection, the indications shown in Table 1 below are displayed.

Table 1: HDD data indications according to various HDD connection statuses DVR-65H-S & DVR-520H-S

HDD identification conditions	Example of HDD data to be displayed	Remarks
Failure in physical identification of HDD (no connection, defective HDD, interface error)	Blank space	
Physical identification of HDD possible, but not identified	WDC 10234564 # 80	"#" is displayed as HDD identification error
Physical identification of HDD possible, HDD identified, but failure in logical formatting	WDC 10234564 ! 80	"!" is displayed as HDD identification error
Physical identification of HDD possible, HDD identified, and correct logical formatting (HDD correctly identified)	WDC 10234564 80	

While the first screen shown above is displayed, press the DIG/ANA key to enter the subscreen shown below.
Note: Each time the DIG/ANA key is pressed, the display changes between the first screen and its subscreen.

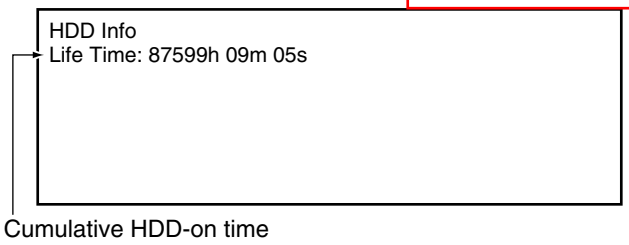
• Subscreen 1: Result of error-rate measurement



Note: Be sure to start playback after displaying this subscreen to calculate the error rate.

During playback in VR mode, the average error rate of the past 10 VOBUs is displayed, and during playback in DVD-Video or Video mode, the average error rate of the past 256 sectors is displayed. During playback in VR mode, the rotation rate of the drive (/: normal speed, no display = double speed) is also displayed.

• Subscreen 2: HDD information DVR-65H-S & DVR-520H-S



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

Storage place: Backup SRAM, Flash ROM

Timing of referring to the data on cumulative HDD-on time: When the power is turned on, the backup SRAM is referred to regarding the data on cumulative HDD-on time, and the data are stored in the RAM. If referring to the backup SRAM fails, the flash ROM is referred to.

Timing of updating the data on cumulative HDD-on time: While the HDD is on, the data on cumulative HDD-on time in the RAM is updated every 3 seconds, and every time updating is executed the data are stored in the backup SRAM. When the power is turned off, the data are stored in the flash ROM.

How to clear the data on cumulative HDD-on time

Backup SRAM: When the HDD Identification Setting is performed, the data on cumulative HDD-on time are automatically cleared. The HDD Identification Setting is automatically performed when the CPRM setting is performed on the CPRM setting screen (to display the CPRM setting screen, press the ESC then the STEREO keys).

Notes: The data on cumulative HDD-on time are not cleared when resetting to factory-preset values is performed.
The data on cumulative HDD-on time are not cleared when the system-control computer software is downloaded.

Flash ROM: The data on cumulative HDD-on time cannot be cleared (they are not cleared even if resetting to factory-preset values is performed or if the system-control computer software is downloaded).

Note: The data on cumulative HDD-on time in the flash ROM can be cleared if you clear the data in the backup SRAM following the above-mentioned procedures then turn off the power of the unit, because the data in the backup SRAM are stored in the flash ROM when the power is turned off.

• When "NG" is displayed at First screen (version information, etc)

(*1) NG+ : Version of the tuner microcomputer too advanced
NG- : Version of the tuner microcomputer too old

1. When TUFL μ-com is MASK type
NG+ : Download the firmware.
NG- : Replace the TUFL μ-com or JCKB ASSY.

2. When TuFL μ-com is FLASH type
NG+ : Download the firmware.
NG- : Download the firmware.

(*2) NG : NG (improper drive)

Replace the correct Drive Assy.

(*3) NG+ : Version of the drive too advanced
NG- : Version of the drive too old

NG+ : Download the firmware.
NG- : Download the firmware.

(*4) NG : Serial No. of the drive not registered

Check the part No. and replace the correct Drive Assy.

2. Second screen (ATA/ATAPI debug screen)

Subscreen 1 of the second screen is displayed when the ESC, DISP, then "2" keys are pressed, in that order.
Note: Each time the DIG/ANA key is pressed, the display changes cyclically among subscreens 1 to 4.

• Subscreen 1: Command log (ALL) of ATA/ATAPI DEBUG OSD

```
ATA/ATAPI  History - ALL
  32 010000000000A000          OK
  32 2A00000DEBB0000063000     OK
  32 2A00000DF1E0000063000     OK
  32 2A00000DF810000063000     OK
  32 2A00000DFE4000062000      OK
  32 2A00000E046000063000      OK
  32 2A00000E0A9000063000      OK
  32 2A00000E10C000063000      OK
>32 2A00000E16F00006200023A00
```

(Not for Service)

• Subscreen 2: Command log (ERROR) of ATA/ATAPI DEBUG OSD

(Not for Service)

• Subscreen 3: Writer mentenance information of ATA/ATAPI DEBUG OSD

The cumulative power-on time and error log that are administered by the writer are displayed. Such information is obtained when the power is turned on. Thereafter, each time the SEARCH key on the remote control unit for service is pressed while subscreen 3 is displayed, the updating command is sent, and the data on the subscreen are updated. Care must be taken when updating this subscreen, because an undesired command is inserted if it is executed while recording, etc.

```
ATA/ATAPI  Writer MaintenanceInfo
① 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  <-- Error log for the Writer
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
```

(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

(Reference)
MTTF time of each LD (as the guideline of life span of each LD)
R7R Drive Assy (Read + Write total time)
DVD : 4700h
CD : 11000h

• Subscreen 4: ATA/ATAPI DEBUG OSD_LD degradation judgment

The degrees of degradation of the LD (laser diode) for the writer (LDs for CD and DVD separately), temperature, and RF level are displayed. To update the data on the subscreen, press the SEARCH key on the remote control unit for service while subscreen 4 is displayed. See Table 1 below for a description of each item and the conditions for updating data.

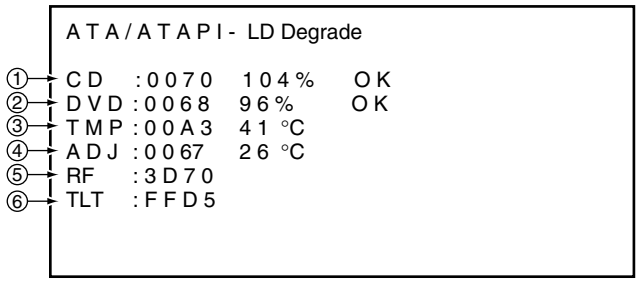


Table 1: Description of each item and conditions for updating data

No.	Item	Description	Conditions for updating by pressing the SEARCH key	Remarks
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	∗1
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	∗1
③	TMP	Current temperature inside the Writer	No disc inserted in the disc tray	∗1
④	ADJ	Temperature (approx. 25°C) inside the Writer during adjustment	No disc inserted in the disc tray	∗1
⑤	RF	RF level (16-bit data, proportional calculation performed using the actual RF level value with 2.5 V = 0xFFFF as the maximum value, displayed in 4-digit hexadecimal)	During playback of disc medium	∗2
⑥	TLT	Writer adjustment data for straight (non-HDD) model (FFFF is diplayed when the writer is not adjusted.)	No condition	

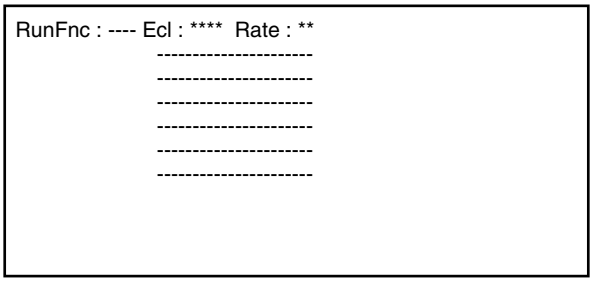
∗1 : For correct judgment, after leaving the unit at a normal temperature (25°C typ.) for some time, judgment must be performed immediately after the unit is turned on with no disc loaded.

∗2 : Use this item only for confirmation before and after lens cleaning, as the lens becomes dirty with dust.

3. Fouth screen (VR-recording-related error log)

Subscreen 1 of the fourth screen is displayed when the ESC, DISP, then "4" keys are pressed, in that order.
Note: Each time the DIG/ANA key is pressed, the display changes cyclically among subscreens 1 to 11.

• Subscreen 1:

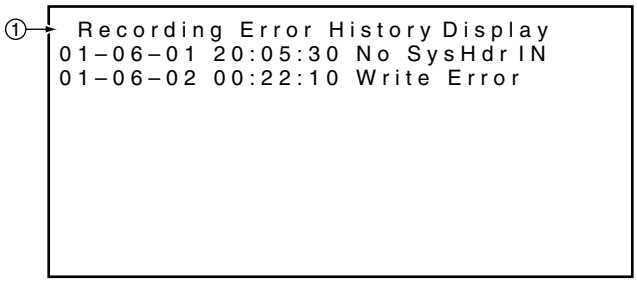


(Not for Service)

• Subscreens 2 and 3:

These subscreens are not for service use.

• Subscreen 4: Error log for VR recording



① Recording-related error log for the last 18 errors, divided into 2 screens
(generation time [year-month-day, hour:minute:second], error data in simplified description)

Notes:
• For details on error messages, see Table 2 "Description of VR-recording-related errors".
• The two error-log screens can be switched by pressing the SPEED+ or SPEED- key.

• Subscreens 5 to 11:

These subscreens are not for service use.

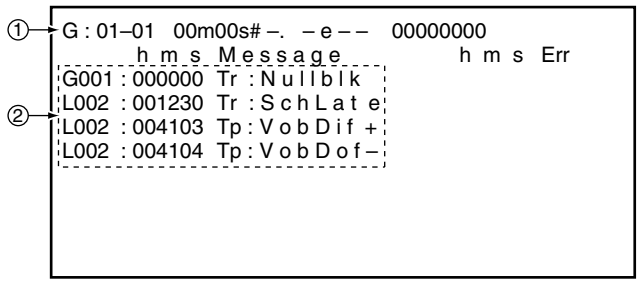
4. Fifth screen (Error log for VR playback)

Subscreen 1 of the fifth screen is displayed when the ESC, DISP, then "5" keys are pressed, in that order.
Note: Each time the DIG/ANA key is pressed, the display changes cyclically among subscreens 1 to 4.

• Subscreen 1:

```
G : 001–01   00h00m00s00# –.   – e – –  00 . 00M
Tgt : STOP  Now : STOP  Spd : 0
Man : STOP   Sub : 0  VBF : 000  ABF : 00
TrMd : STOP  TrSt : 0  TNo :     Ver : 00
RvMd : STOP  RvSt : 0  DNo :    Aer : 00
CcSt : STOP        Id : 00000000
Stc : 00000000   Tpp-Av1 : +-0  V-A : +-0
MPEG2  720x480 A0 AC-3 2ch 0256k
NT  ASP : 43  CGMS : 0  APS : 0  Src : 0
END : 00h00m00s00                 Cell : 000
```

• Subscreen 2: Error log for VR playback



① Data on location of the display
Original(G)/play list (L), title No., chapter No. (X:XX-XX), time of the display (min, sec, frame [XXmXXsXX]), busy mark of the virtual mechanical-control computer (#), error rate of the transfer data (X.XeXX), playback logical address (ID [XXXXXXXX])

② Error message log
Original(G)/play list (L), title No., time of generation (min, sec [XXX:XXXX]), playback-related error log for the last 13 errors (XX:XXXXXXX)

Notes:
- For details on error messages, see Table 1 "Description of VR-playback-related errors".
- If a VR-playback-related error is generated, a problem in data reading from the disc may be suspected. (The possibility of a problem on the drive side is high.)

• Subscreens 3 and 4:

These subscreens are not for service use.

Table 1: Description of VR-playback-related errors

Error Message	Description
Tr : NullBlk	Transfer task: NULL at the top block (Detecting NG stream made at the DVR-1000 series and starting protection process.)
Tr : ReadErr	Transfer task: ATA read error
Tr : SchLate	Transfer task: ATA search late
Tr : SemTOvr	Transfer task: Timeout for gaining semaphore (no synchronization with the display)
Tr : NaviErr	Transfer task: Inconsistency between NAVI (navigator) of management data and actual NAVI
Tr : OrderEr	Transfer task: Inconsistent order
Mn : Av1Hang	Main task: Detects hang-up of AV decoder and starts recovery
ERR_RCV!	TPP task: Detects hang-up of AV decoder and starts recovery
Tp : VobDif+	TPP task: The decoder STC advances by 1 VOBU hour.
Tp : VobDif-	TPP task: The STC of the management information advances
Tp : midNULL	TPP task: The management information pointer designated was NULL.
Tp : ScanNg	TPP task: Failure to set the TPP memory when scanning was canceled.
Tp : RStepEr	TPP task: Although the reverse step had failed, the operation was forcibly terminated because the top cell was located.
Tp : tppErr	TPP task: Inconsistency occurred.
Rv : 1stTOvr	Reverse playback task: Timeout for waiting for interruption to the top VOBU immediately after starting decoding
Rv : OpnTOvr	Reverse playback task: Timeout for waiting for B-picture of the open GOP immediately after starting decoding
Rv : OplTOvr	Reverse playback task: Timeout for waiting for I-picture of the open GOP immediately after starting decoding
Rv : LnkTOvr	Reverse playback task: Timeout for waiting for link
Rv : LnkFail	Reverse playback task: Starts compensation by detecting link failure
Rv : R2FTOvr	Reverse playback task: Starts retrial after detecting timeout from reverse pause to forward pause
Rv : TopVbEr	Reverse playback task: Forced termination because of a possible error of the top data during reverse normal playback
Rv : OrderEr	Reverse playback task: Inconsistent order
Av : B/CTOvr	AV1: Buffer-clear timeout
Av : StrmOvr	AV1: Timeout for waiting for stream ready
Av : TpmTOvr	AV1: Timeout for TP mode change
Av : SpmTOvr	AV1: Timeout for a step command
CC_OS_ERR	Closed caption task: OS error

Abbreviations:

STC = System Time Clock
VOBU = Video Object Unit
GOP = Group Of Picture
B-picture = Bidirectionally predictive-picture
I-picture = Intra-picture
P-picture = Predictive-picture
TP mode change = AV1 term (Trick Play mode change)

Table 2: Description of VR-recording-related errors

Error related to MPEG Encoder

Error Message	Description
Stream NG	Inappropriate input stream data
Stm Start NG	Failure to start encoding (reasons not clear)
AVEnc Hang	Inappropriate MPEG encoder
No SysHdr IN	System packet is not input periodically
Strm Start NG	Timeout waiting for system packet input at the beginning
IN Encode *	Changes cannot be made in the process of encoding
EncModul Hang	Encoder routine is hung up.

Error related to Drive system

Error Message	Description
BUF Overflow	Overflow of the Stream Buffer
Drive Hang	The Drive is hung up.
Write Err	The Drive failed to write and could not be recovered.
Read Err	Reading failed, ECC failed, etc.
Drv Hard Err	Abnormality in the drive hardware or firmware
Mech No Res	No response from the mechanical-control computer
Drv Timeout	Timeout waiting for drive operation
NWA Exhaust	NWA surpassed and impossible to use
MKB Invalid	MKB reading error
Drv Err	General error of the drive
Fail Repair	Repair failed
ReadOnly DISC *	Because some data are invalid, data cannot be written
May Be V mode	AlthoughTMP_VMGI is not written, it may be Video Mode disc.
Rzn Rsv NG	Reserve RZone failed
Rzn Cls NG	Close RZone failed
Rzn Rpr NG	Repair RZone failed
Bdr Opn NG	Open Border failed
Bdr Cls NG	Close Border failed
Format NG	Format failed
OPC NG	OPC failed
PCA Full	PCA has been used up.
RMA Full	RMA has been used up.
VTSI_B Wr Err	Video Mode VTSI BUP Write Error
VTSI Wr Err	Video Mode VTSI Write Error
TMP-VMG WrErr	Video Mode TMP VMGI Write Error
CLS Rzon Fail	Video Mode Close Rzone failure

Error related to Dubbing DVR-65H-S DVR-520H-S

Error Message	Description
Mem get NG	Video Mode Copy Memory has not ensured.
V Rsv RzoneNG	Video Mode Copy Reserve Rzone failed
VCHDD Info NG	Obtaining Video Mode Copy HDD Cell information failed
VC Pck Anl NG	Analizing Video Mode Copy Pack failed
VC VOBU SizeE	Video Mode Copy VOBU Size NG
Tracon Trn NG	Video Mode Copy Tracon tranfer has not been completed.

Error related to Dubbing (continued)

Error Message	Description
Strm TransfNG	Video Mode Copy Stream Transfer NG
VC FlushC NG	Video Mode Copy Flush Cache NG
VC Transf Stp	Video Mode Copy Transfer Stop
VC CopyCancel	Video Mode Copy Copy Cancel
VC Idling NG	Video Mode Copy idling NG
VC TSO BLK NG	Video Mode Copy TSO Block transfer has not been completed.
VC Cell Max	Maximum number for Video Mode copy Cells exceeded
VC HDD Inf NG	No information on Video Mode Copy HDD
VC HDD C Err	Inappropriate Video Mode Copy HDD content
V2H SRC Prot	VR →HDD copy prohibitted material
V2H Aud Ch NG	VR →HDD Audio Channel NG
V2H Aud Stm N	VR →HDD Audio Stream number NG
V2H Aud Md NG	VR →HDD Audio Mode NG
V2H V Reso NG	VR →HDD Video resolution NG
V2H Unknown	VR →HDD other NG
H2D CP SomeNG	VR →HDD copy and other NG

Other Errors

Error Message	Description
DRAM NG	Abnormality in access to the Work DRAM
SRAM NG	Abnormality in access to the backup work SRAM
CPRM IC NG	Inappropriate CPRM IC
Drive Destroy	The drive has crashed.
MKB REVOKED	Error in gaining data
WM Cracked	WM Cracked
VBR-SRAM NG	Abnormality in VBR SRAM
BK BATT Down	Backup RAM data has been erased.
BK FSYS Dirty	Backup RAM data has not been wrtten on the File Sys.
VOBU Info NG	Inappropriate VOBU information
Ourob Strm NG	Inappropriate stream data to the Ouroboros input
WaterMark Det	Watermark detected
No Video	No video input (not locked)
Disc Full	No further data can be written because the disc is full.
No More Info *	No more space in the internal work-management area
No Permission *	No permission to write to the disc
Limit Over *	Standard maximum limit exceeded
Rec Pause *	No operation permitted during recording pause
Invalid Param *	Invalid parameter
Protect Src *	Source to be recorded is copy-protected.
Now Busy *	In the process of the emergency processing
Invalid Disc *	The disc cannot be recognized.
Invalid UDF *	Invalid UDF content
Invalid VMG *	Invalid VMG content
Invalid TMVMG	Invalid TMP_VMGI content
Unmatch Stamp *	Impossible to modify because of nonmatching time stamp
Virgin DISC	Virgin Disc

Other Errors (continued)

Error Message	Description
SW Vpb mode *	Switching to video playback routine is required.
SW Vrec mode *	Switching to video recording routine is required.
NV Pck MK Err	Error in creating NaviPack
NV Pck DMA Er	Inappropriate NaviPack DMA
Cell Close NG	Cell Close NG
Relocation Do	VR-recording data was relocated
Something *	undetermined error
Status NG *	Abnormality in change of statuses
Irr Action *	Incorrect action
Abort *	Cancellation
BusReset Done	Bus Reset has been excecuted.
Repair Excec	Repairing has been executed.
Format Excec	Formatting has been executed.
BUG	Some bugs
PARAM NO ACCP	Recording parameter is not matched.
DRAM CLR Err	Video Mode DRAM (Stream Buffer) Clear failure
V Categ ID NG	Inappropriate Category ID
V Cate Inf NG	Inappropriate Category information
V Ext TY NG	Type NG
V Ext MAX Ovr	Count Max exceeded
V ExtToo Big	The extension file is too large.
Over Heat	Abnormal temperatute

Error related to HDD

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Error Message	Description
HDD unauthor	Inconsistent HDD serial No.
HDD Destroy	HDD is not recognized on the bus.
TT Rec Over	Title recording time full
HDDReset Done	HDD Reset executed
Task No Activ	Task has not been activated.
HDD Buff High	High-level process executed for the HDD Buffer
HDD Trans Err	DMA error in HDD copy transfer
HDD Zero WR	MBR readout generated
HDD Initialize	HDD initialized
HDD MBR NG	Inconsistent MBR data
HDD SIG NG	Inconsistent HDD Management Data Magic
HDD INFO BAD	Incorrect HDD Management Data
HDD IRRG POFF	Abnormal power off
HDD SMART NG	Inappropriate HDD SMART

No Error

Error Message	Description
Non Err *	Normal

Notes;

- Any error message marked with * is displayed "RecErr : ---------" on the Subscreen 1 of the fourth screen.
- In a case of an error in the drive system, scratches or dirt on a disc, or a problem of the drive itself (dirty pickup) may be suspected.

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

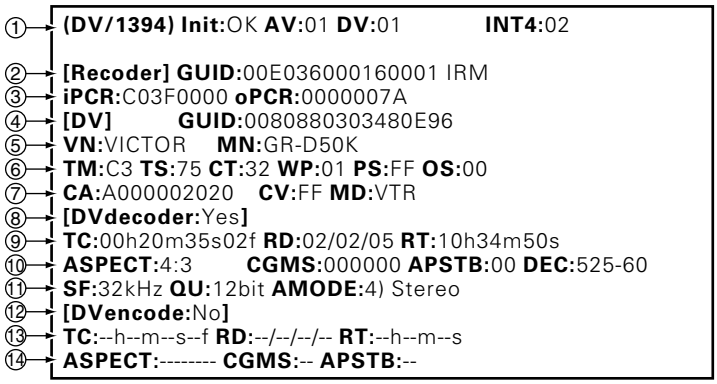
Table 3: List of Key Codes

How to enter each check mode
Test mode remote control unit : [A8**]
Remote control unit supplied with the DVR : [AB**]

No.	Check Item	Key Input	Operation / purpose	Remarks
1	EE system (same as preview)	[ESC] → [A.MON]	Turns on/off EE mode cyclically	Make sure that CGMS = 11 becomes when CGMS = 10 is input. EE mode: Simulation mode for recording status
		[PLAY]	Starts the EE system in EE mode (main-unit setting rate)	
		[STOP]	Stops the EE system in EE mode	
2	Error-rate measurement	[ESC] → [SIDEB]	**V-mode recording:** After recording for 10 seconds, the unit starts playback while displaying the error rate. **DVD-Video:** The error rate is automatically measured, then the result will be displayed.	For details, see " 7.1.4 ERROR RATE MEASUREMENT ".
3	Settings for specific areas	[ESC] → [CHP/TIM]	Enters Adjustment mode for AVIO settings	Settings are made for the selected input (TUNER, LINE). For details, see " 7.1.5 SETTINGS FOR SPECIFIC AREAS ".
		[ESC]	Determines the settings, then exits Adjustment mode	

How the ESC code is processed
• When the ESC code is received, ESCAPE mode is entered, but in combination with the code(s) that follow(s), a specific meaning is added.
• If ESC codes are received continuously, ESCAPE mode is retained.

Press the ESC, DISP, then "3" keys, in that order.



Boldface alphanumerics : Fixed indications
Nonboldface alphanumerics : Variable indications

No.	Item	Description	Remarks
①	Init	Whether the initialization of uPD72893B (1394LINK & DVcodec IC) has been completed (OK) or not (NG)	In a case of NG, communication with uPD72893B may have failed.
	AV	Number of AV devices on the local bus	
	DV	Number of DV devices on the local bus	If the number does not become 01 even if a DV device is connected, identification of that device fails.
	INT4	Number of executing INT4(PIO) interrupt processing routines until a POWER ON notification arrives from uPD72893B (normally, 02)	
②	GUID	GUID set in ConfigROM of the unit	In a case of ROOT (IRM), IRM is displayed at the rightmost of the GUID indication
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 rightmost of the GUID indication
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 vendor 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	Copy-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 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

No.	Item	Description	Remarks
⑨	TC	Time-code data of the DVdecode Stream, or response data of the Time Code command	Stream time-code data are obtained when playback in the forward direction is performed. 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 ch2, bits 3-2: Audio ch1, and bits 1-0: Video)	Recording of DV input cannot be performed unless the value of CGMS is 00.
	APSTB	APS trigger bit of DVdecode 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	
⑫	[DVencode:XXX]	Whether Yes (in the process of requesting DV output) or No is indicated in XXX	Normally, Yes is indicated only with HDD or DVD playback
⑬	TC	TIME CODE of DVencode stream	
	RD	REC DATE of DVencode stream	
	RT	REC TIME of DVencode stream	
⑭	ASPECT	Aspect Ratio of DVencode stream	
	CGMS	CGMS of DVencode stream (common to video, audio ch1 and audio ch2)	Normally, sources other than CGMS=00 are not output.
	APSTB	APS trigger bit of DVencode stream	

Simple Diagnosis For DV Input Problems

Symptoms	Location in the Debug Screen	Items to be Checked, and Conditions	Possible causes
No operation for either DV input or output	①	Check the init indication: OK: Initialization of DV-related LSIs (IC5101, IC5202) appropriately completed NG: Communication failure between DV-related LSIs (IC5101, IC5202) and HOST microcomputer (IC1001). Initialization of DV-related LSIs (IC5101, IC5202) has not been completed properly.	Defective IC, defective soldering, defective power supply, etc.
		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 IC, defective cables, an IEEE 1394 device other than the DV device connected
No picture nor sound for DV input	⑦	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 IC, defective soldering, defective power supply, etc.
	⑨	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 IC, defective source device **Note:** 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	⑨	Check CGMS: 00: A copy-permitted source is being input. Other than 00: A copy-protected source is being input.	Recording cannot be performed for a copy-protected source.
No sound for DV input	⑩	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.
No picture nor sound for DV output	⑪	Check DVencode during DVD/HDD playback: Yes: The recorder is in the process of a DV output operation No: The recorder is not executing a DV output operation (No is also displayed during playback of copy-prohibited sources or simultaneous-recording/playback.)	Defective IC, defective soldering, defective power supply, etc.

How to enter Error-Rate Measurement mode

Press the ESC key then the SIDE-B key of the remote control unit for service to enter Error-Rate Measurement mode. During playback of DVD-VIDEO, Error-Rate Measurement mode can also be entered by pressing the ESC key then the PLAY key.

How to exit Error-Rate Measurement mode

Press the ESC key. The error-rate display disappears, and Error-Rate Measurement mode is exited.

Note: The error rate cannot be measured in VR mode or during CD playback.

Functions

① Video-mode recording (recording medium)

In this mode, DVD recording is automatically performed for 10 seconds, the recorded DVD title is played back while the error rate is being measured, then as soon as playback of the recorded DVD title is finished, playback stops.*1 After error-rate measurement is finished, the average error rate will be displayed on the FL display and OSD. Only in a case in which the calculation of the average error rate fails, the tray will open.

② DVD-VIDEO (playback medium)

Only during playback, when the ESC key then the SIDE-B key (or the ESC key then the PLAY key) are pressed, the error rate is calculated and displayed on the FL display and OSD.(∗2) Only in a case in which the calculation of the average error rate fails, the tray will open.

Changes of display

Table 1: Video mode (recording medium)

Operation	Display	
	FL Display	OSD (On Screen Display)
"ERROR RATE" is displayed on the FL display for an instant.	ERROR RATE	
DVD recording starts.	ERROR RATE	
DVD recording is performed for 10 seconds.	xxxxx	
The recorded DVD title is played back while the error rate is being measured, then as soon as playback is finished it stops.	ER x.xE-x	ERR RATE : x.xE-x -
After error-rate measurement is finished (∗1), the average error rate, the measurement-finish mark (∗), and the OK/NG-judgment result (∗3) will be displayed on the FL display and OSD. (If the tray opens as a result of NG judgment, the display on the FL display and OSD will be retained.)	ER x.xE-x	ERR RATE : x.xE-x ∗ OK

Table 2: DVD-Video (playback medium)

Operation	Display	
	FL Display	OSD (On Screen Display)
Only during playback, when the corresponding keys are pressed, the error rate is calculated and displayed on the FL display and OSD. (∗2)	ER x.xE-x	ERR RATE : x.xE-x -
After error-rate measurement is finished (∗1), the average error rate, the measurement-finish mark (∗), and the OK/NG-judgment result (∗3) will be displayed on the FL display and OSD. (If the tray opens as a result of NG judgment, the display on the FL display and OSD will be retained.)	ER x.xE-x	ERR RATE : x.xE-x - OK

∗1 : Whether error-rate measurement is finished or not is judged, as shown in Table 3 below.

Table 3: On judgment whether error-rate measurement is finished or not

Recording Mode	Judgment whether error-rate measurement is finished or not	Recording/playback duration required for error-rate measurement
Video mode	After playback of a certain amount (∗) of data Measurement of the 16 ECC blocks is performed 16 times, then the grand sum is used for calculation of the error rate. The capacity is as follows: 16 ECC blocks × 16 sectors × 2048 bytes × 16 times = 8388608 bytes = 67108864 bits	The time required for completion of error-rate measurement varies, depending on the input video signal to be recorded. (The more the motion in the input video signal to be recorded is animated, the shorter the playback time required for completion of error-rate measurement becomes.)

∗2 : During DVD-VIDEO error-rate measurement, even after error-rate measurement is finished, playback continues, and the display of the error rate results is retained. In this playback mode, if Error-Rate Measurement mode is exited by pressing the ESC key, then it is reentered by pressing the ESC and SIDE-B keys (or ESC and PLAY keys), the error rate will not be updated, and the previous value is displayed. To reset the previous error rate, stop disc playback.

∗3 : OK/NG judgment
In DVD/VIDEO and Video Mode recording, OK/NG judgment is displayed under the following conditions:

Table 4: List of OK/NG threshold values

Disc Type	Recording Mode	Finalized or not finalized	Reference Value	Display
DVD-VIDEO			8.0×10^{-4}	OK / NG
DVD-R	Video mode	Finalized	1.0×10^{-3}	OK / NG
		Not finalized	1.0×10^{-3}	OK / NG
DVD-RW	Video mode	Finalized	1.0×10^{-3}	OK / NG
		Not finalized	1.0×10^{-3}	OK / NG

Purposes: Depending on the area, jitter may appear in a picture received by the tuner, as conditions of signals received by the tuner are different from area to area. To correct this kind of problem, the function of the System Codec AVIO control section for adjusting signals received by the tuner can be used.

How to enter setting modes: To enter General Setting mode, press the ESC key then the CHP/TIM key of the remote control unit for service. To enter Specific Channel Setting mode, press the DIG/ANA key in General Setting mode.

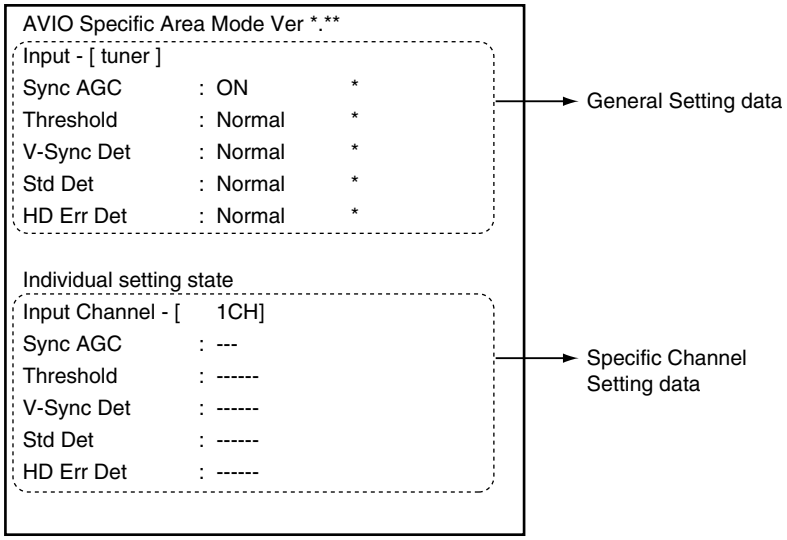
How to exit setting modes: Press the ESC key. The setting mode is exited, the OSD disappears.

1. Specific Channel Setting mode

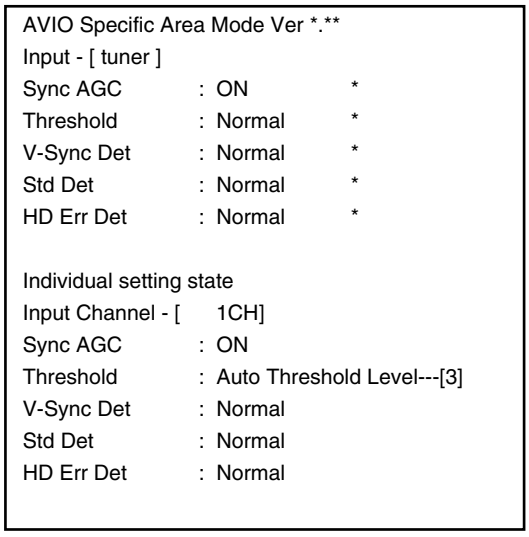
This mode is entered when the DIG/ANA key is pressed in General Setting mode. In this mode, specific settings can be made for up to 12 channels. For channels that do not have specific settings, the settings of General Setting mode are applied.
Display in Specific Channel Setting mode (A picture from the tuner can be viewed using the semitransparent OSD display.)

[Display in Specific Channel Setting mode]

[When specific channel settings have NOT been made]



[When specific channel settings have been made]



* : setting is the default.

- If a channel that does not have specific settings is displayed, the setting figures are displayed as hyphens (--). If the setting figures are not displayed as hyphens, those settings have been specifically set even if they are identical to the default settings or those of General Setting mode.
- The channels to be displayed in "Input Channel" are as follows:
  - In a case of line input: L1-L3, DV
  - In a case of tuner input: Received channel (a channel to be set in specific channel settings)

Table 1: Key operations in Specific Channel Setting mode
(effective only during recording/playback stop)

Key	Operation	Setting (∗: Default)	Remarks
DIG/ANA	Switches cyclically between General Setting mode and Specific Channel Setting mode.	–	–
INPUT SELECT, CHANNEL +/– (∗R)	Switches inputs or channels.	–	–
[SIDE A], [SIDE B]	Sets Sync AGC.	ON (∗) / OFF	–
[Rev ×3], [×3 Fwd]	Sets Threshold level.	(∗) Normal Auto Threshold Level Manual Threshold Level Pedestal Level	–
[Rev CHAPTER SKIP] [CHAPTER SKIP Fwd]	Sets Threshold level.	According to the setting of Threshold, the values can be changed within the range mentioned below.	–
		• Normal: The value is fixed, with no display of the value.	–
		• Auto Threshold Level: 0-8 (Default: 0)	–
		• Manual Threshold Level: 0-8 (Default: 0)	–
		• Pedestal Level: 0-8 (Default: 0)	–
[Rev SCAN], [SCAN Fwd]	Sets V-Sync Det.	Normal (∗) / Short / Long	–
[Rev STILL STEP], [STILL STEP Fwd]	Sets Std Det.	Normal (∗) / Non STD	–
[SPEED +], [SPEED -]	HD Err Det	Normal (∗) / Fast / Stop	–
PLAY	All channels assigned to have specific settings are canceled, and the specific settings are reset to their default values.	–	Settings of General Setting mode are not affected.
CLEAR	Initializes the setting of Specific Channel Setting mode.	–	Pressing the key resets the settings of Specific Channel Setting mode for that channel to the initial values. Settings of General Setting mode are not affected.
PAUSE	The specific-setting data for the currently selected channel are reset to their default values. (But the assignment of a channel having specific settings is not canceled.)	–	Settings of General Setting mode are not affected (retained).
ESC	Exits AVIO setting for specific areas, clearing the OSD.	–	–

∗R: Refers to keys on the remote control unit supplied with this unit. The keys without "R" refer to the remote control unit for service.

- Screen display when Specific Channel settings are made on 12 (maximum) channels: In such a case. If a channel which does not have specific settings is selected, the individual setting state for that channel is not displayed, as shown in the figure below, and the settings cannot be modified. In such a case, if you wish to make Specific Channel Settings for the currently selected channel, you must clear the Specific Channel Settings for one or more channels beforehand.

[With 12 channels having specific settings, when the currently selected channel does not have specific settings]

```
AVIO Specific Area Mode
Input - [ TUNER ]
Sync AGC        : ON        *
Threshold       : Normal    *
V-Sync Det      : Normal    *
Std Det         : Normal    *
HD Err Det      : Normal    *

Individual setting state
  Sorry !
You can store only 12 channels
for Specific Area mode.
```

2. General Setting mode

This mode can be entered only during recording/playback stop. In this mode, each item and its current settings are displayed on the OSD. The currently selected input mode (TUNER or LINE) is displayed. If L1, L2, L3 or DV is selected for input, general settings for the line input can be made, and if TUNER is selected, general settings for the tuner input can be made.

[General Setting mode] (*2)

```
AVIO Specific Area Mode
Input - [ tuner ]
Sync AGC        : ON        *
Threshold       : Normal    *
V-Sync Det      : Normal    *
Std Det         : Normal    *
HD Err Det      : Normal    *
```

* : setting is the default.

Table 2: Key operations in General Setting mode (effective only during recording/playback stop)

Key	Operation	Setting (∗: Default)	Remarks
INPUT SELECT, CHANNEL +/– (∗R)	Switches inputs or channels.	–	–
[SIDE A], [SIDE B]	Sets Sync AGC.	ON (∗) / OFF	–
[Rev ×3], [×3 Fwd]	Sets Threshold level.	(∗) Normal Auto Threshold Level Manual Threshold Level Pedestal Level	–
[Rev CHAPTER SKIP] [CHAPTER SKIP Fwd]	Sets Threshold level.	According to the setting of Threshold, the values can be changed within the range mentioned below.	–
		• Normal: The value is fixed, with no display of the value.	–
		• Auto Threshold Level: 0-8 (Default: 0)	–
		• Manual Threshold Level: 0-8 (Default: 0)	–
		• Pedestal Level: 0-8 (Default: 0)	–
[Rev SCAN], [SCAN Fwd]	Sets V-Sync Det.	Normal (∗) /Short/Long	–
[Rev STILL STEP], [STILL STEP Fwd]	Sets Std Det.	Normal (∗) /Non STD	–
[SPEED +], [SPEED -]	HD Err Det	Normal (∗) /Fast/Stop	
CLEAR	Initializes the setting of General Setting mode.	–	Pressing the key resets all settings of General Setting mode to the initial values. Settings of Specific Channel Setting mode are not affected (they are retained).
ESC	Exits AVIO setting for specific areas, clearing the OSD.	–	–

∗R: Refers to keys on the remote control unit supplied with this unit. The keys without "R" refer to the remote control unit for service.

∗1 : In General Setting mode, if the channel displayed has specific settings, the following will be displayed.

[Display in General Setting mode when the channel currently displayed has specific settings]

```
AVIO Specific Area Mode  Ver*.**
Input - [tuner ]
Sync AGC        : ON          *
Threshold       : Normal      *
V-Sync Det      : Normal      *
Std Det         : Normal      *
HD Err Det      : Normal      *

     This channel is set up
     individually.
```

Notes:
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.

*** Be aware that all recorded data are deleted when the aging for the DVD-RW and HDD is executed.**

Table 1: Aging for the DVD-RW and DVD-R

	Aging for the DVD-RW	Aging for the DVD-R
To enter Aging mode	Press the DVD key to switch to DVD. Install a recordable DVD-RW disc. After disc detection, press the ESC key then the REP.B key on the remote control unit for servicing to enter Aging mode.	Press the DVD key to switch to DVD. Install a recordable DVD-R disc. After disc detection, press the ESC key then the REP.B key on the remote control unit for servicing to enter Aging mode.
To quit Aging mode	Press the ESC key on the remote control unit for servicing to quit Aging mode and return to Normal mode. This also results in the following: • If during recording: Recording is stopped. • 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.	Press the ESC key on the remote control unit for servicing to quit Aging mode and return to Normal mode. This also results in the following: • If during recording: Recording is stopped. • If during playback: Playback is paused.
Function	During Aging mode, the following operations are repeated in the order shown below. ① The tray opens. ② The tray closes. ③ Initialization ④ Recording for 60 minutes ⑤ Playback for 45 minutes ③ Initialization is performed according to the setting specified in "DVD-RW automatic initialization" (accessed by selecting "Unit Setting" then "Option"). 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.	During Aging mode, the following operations are repeated in the order shown below. ① The tray opens. ② The tray closes. ③ Recording for 1 minute ④ Recording pause for 6 minutes ⑤ Recording stops. ⑥ Playback for 1 minute ⑦ Playback pause for 6 minutes ⑧ Playback stops. **Note:** A continuous test of the above operations is possible for approximately 23 hours. After ② the tray closes, disc detection is performed, and if 99 titles have already been registered, the unit stops there. The number of loops is retained and indicated on the FL display. An error indication is retained as an OSD. 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. **Note:** 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.

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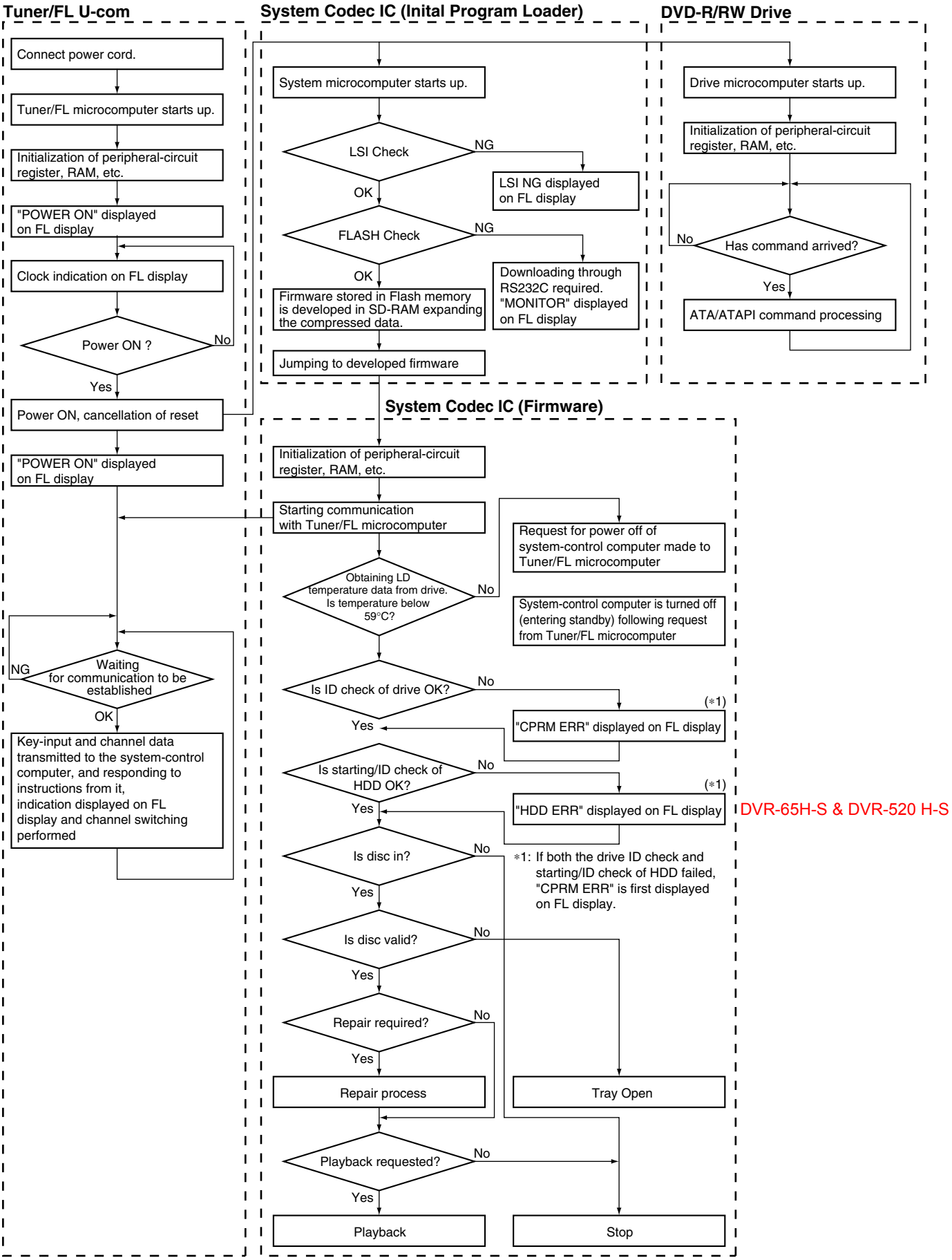
Table 2: Aging for the HDD

	Aging for the HDD
To enter Aging mode	Press the HDD key to switch to HDD. Press the ESC key then the REP.B key on the remote control unit for servicing to enter Aging mode.
To quit Aging mode	Press the ESC key on the remote control unit for servicing to quit Aging mode and return to Normal mode. This also results in the following: • 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.
Function	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 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.

Start-Up Sequence



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Disassembly Section

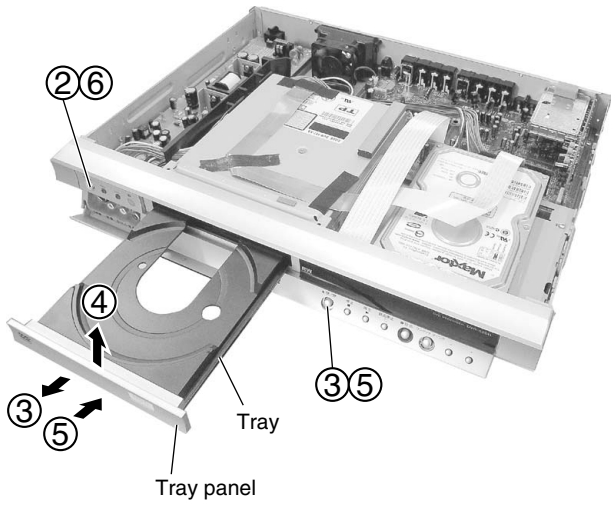
Note 1 : Even if the unit shown in the photos and illustrations in this manual may differ from your product, the procedures described here are common.

Note 2 : For performing the diagnosis shown below, the following jig cable for service is required:
- GGD1370 (Flexible cable)

Diagnosis of the MAIN Assy

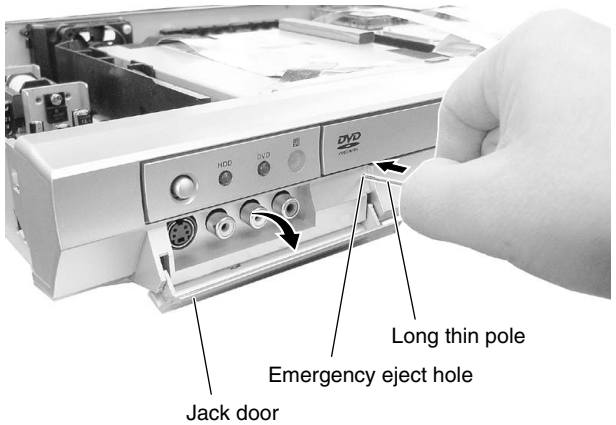
1 Bonnet Case S and Tray panel

① Remove the bonnet case S by removing the eight screws.
② Press the ⏻ STANDBY/ON button to turn on the power.
③ Press the ⏏ OPEN/CLOSE button to open the tray.
④ Remove the tray panel.
⑤ Press the ⏏ OPEN/CLOSE button to close the tray.
⑥ Press the ⏻ STANDBY/ON button to turn off the power.



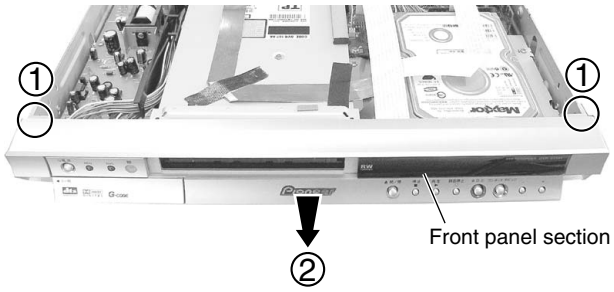
● How to open the tray when the power cannot be on

When the player cannot eject disc tray due to power failure or any other reasons, open the jack door, and use a long thin pole and push the emergency eject hole under the tray panel to eject.



2 Front panel section

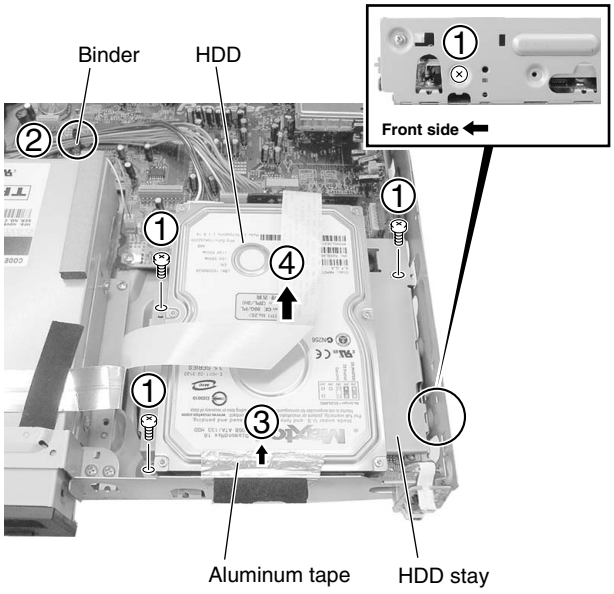
① Unhook the four hooks.
② Remove the front panel section.



• Bottom view

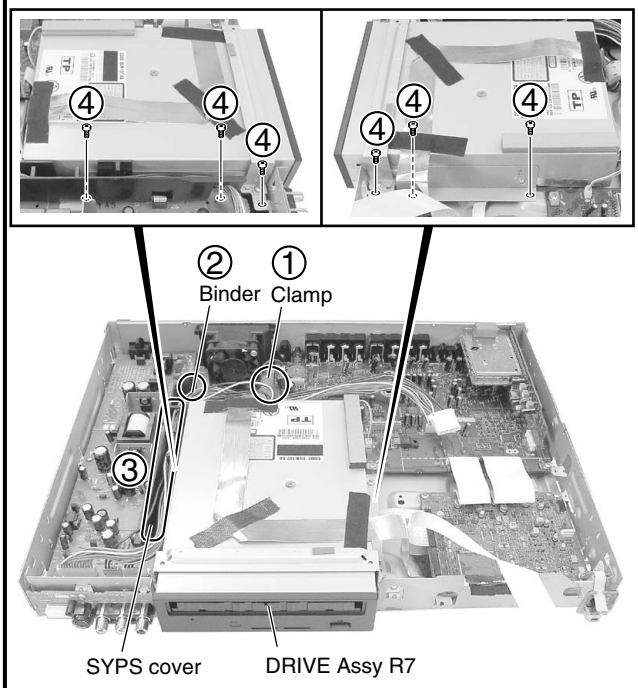
3 HDD Section

① Remove the four screws.
② Remove the binder.
③ Remove the aluminum tape.
④ Remove the HDD with HDD stay.

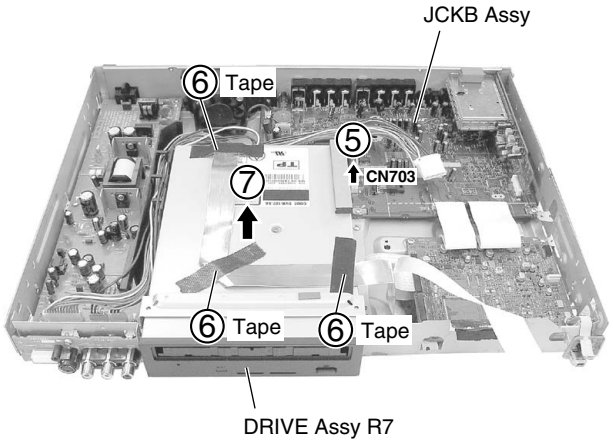


4 DRIVE Assy R7 (DVD-R/RW WRITER)

① Remove the some jumper wires from the clamp.
② Remove the binder.
③ Remove the some jumper wires from the SYPS cover.
④ Remove the six screws.

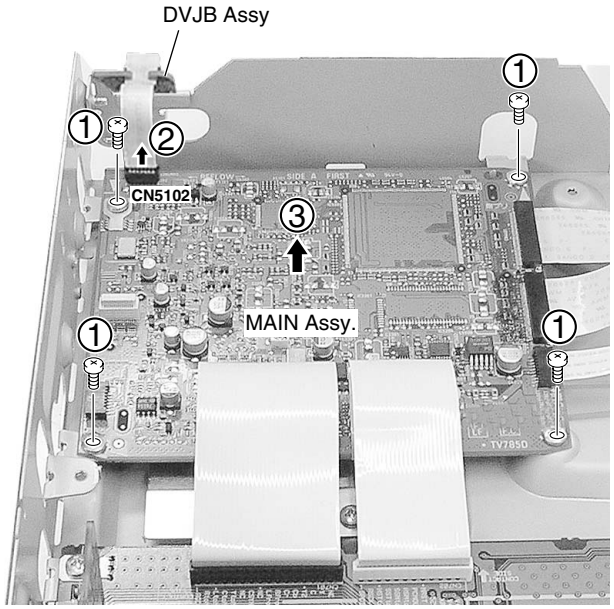


⑤ Disconnect the connector.
⑥ Remove the three tapes.
⑦ Remove the DRIVE Assy R7.



5 MAIN Assy

① Remove the four screws.
② Disconnect the flexible cable.
③ Stand the MAIN Assy.



Note : This photograph may show a different model.
However, the method for disassembly is the same.

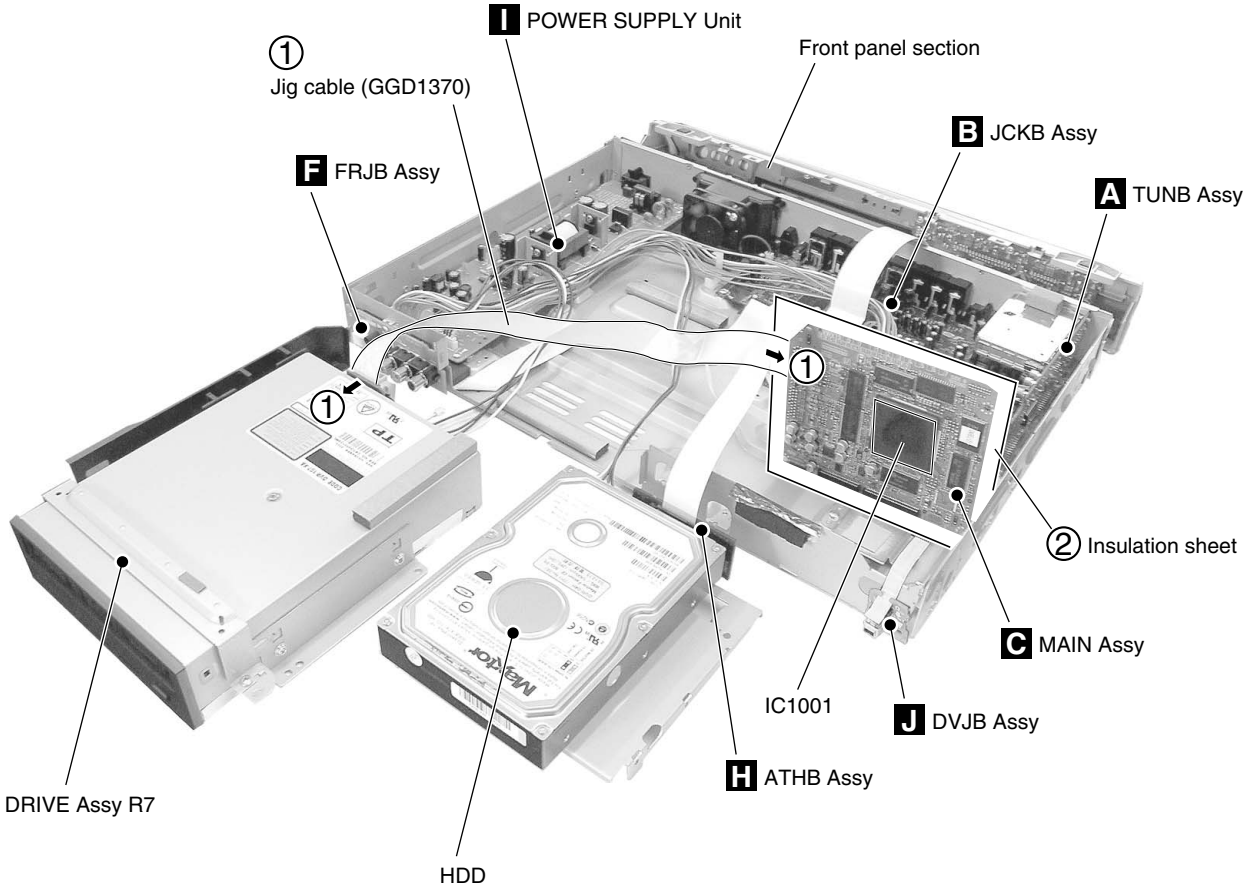
6 Diagnosis

① Connect the jig cable.

② Insert the insulation sheet between the MAIN Assy and base chassis.

③ Arrange the unit as shown in the photo below.

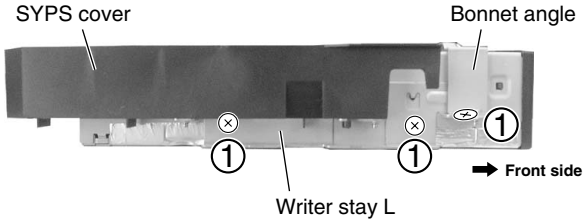
Caution :
Main IC (IC1001) on the MAIN Assy generate heat to arround 80 degrees.
Be careful when works.



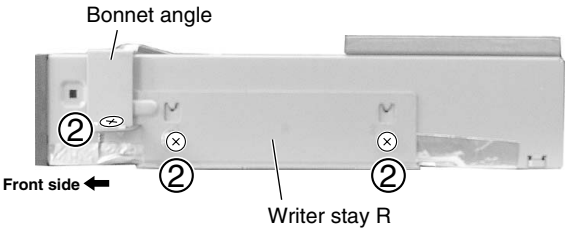
Diagnosis

Cleaning the pickup lens

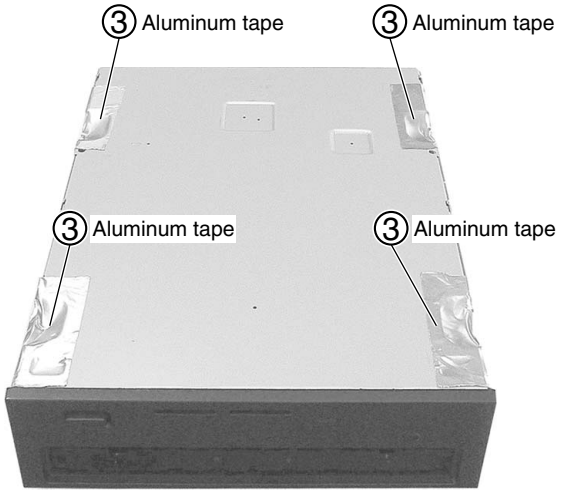
① Remove the writer stay L by removing the three screws with the bonnet angle and the SYPS cover.



② Remove the writer stay R by removing the three screws with the bonnet angle.

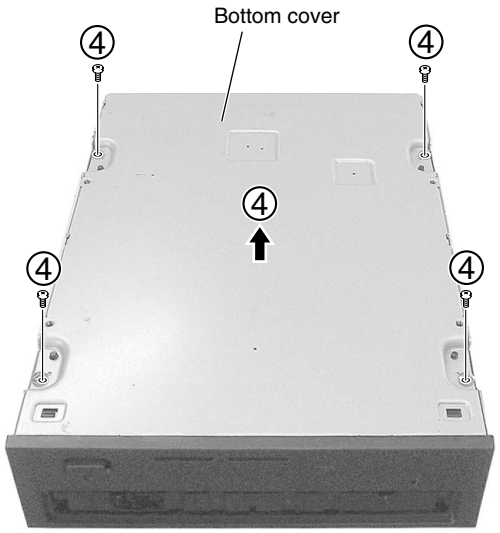


③ Remove the four aluminum tapes.



● **Bottom view**

④ Remove the bottom cover by removing the four screws.

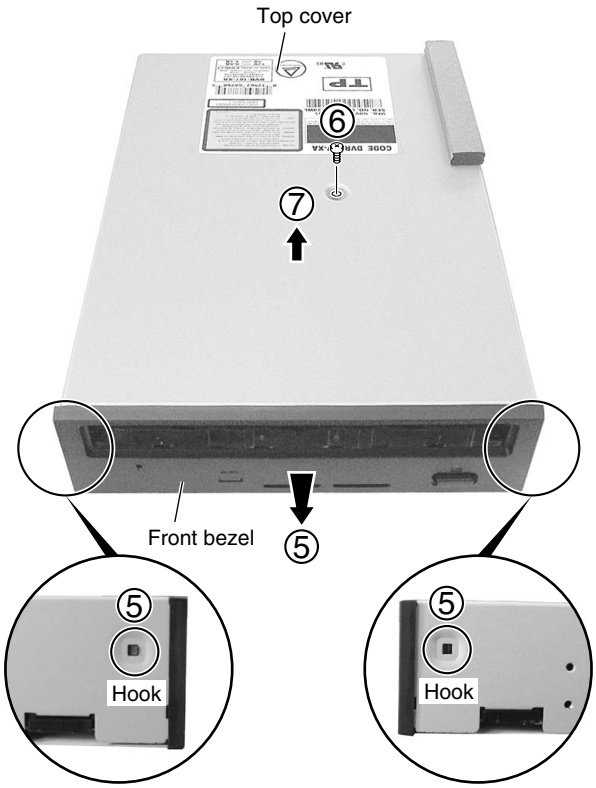


● **Bottom view**

⑤ Remove the front bezel by unhooking the two hooks.

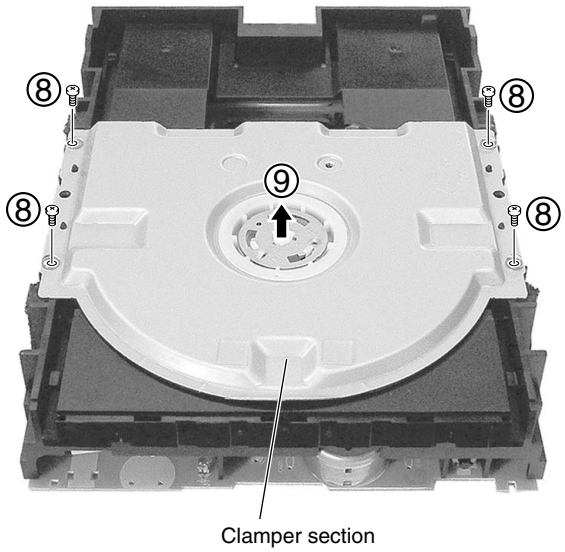
⑥ Remove the one screw.

⑦ Remove the top cover.



⑧ Remove the four screws.

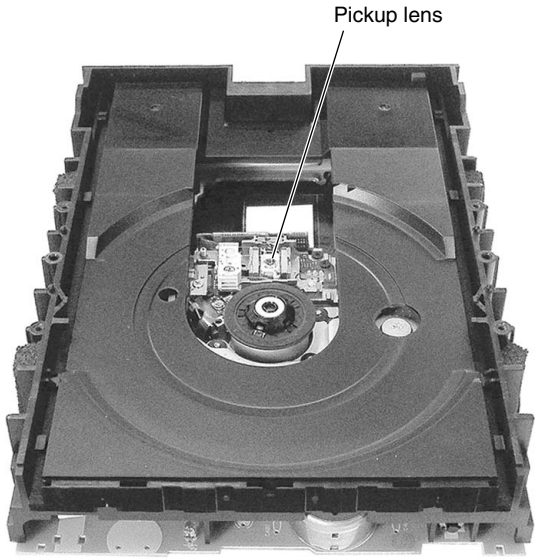
⑨ Remove the clamper section.



⑩ Clean the pickup lens.

Before shipping out the product, be sure to clean the following positions by using the prescribed cleaning tools :

Cleaning liquid : GEM1004
Cleaning paper : GED-008



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“LSI_NG” & “FLASH_NG” DIAGNOSIS METHOD

When “LSI_NG” has appeared on FL after a unit turns on, each IC on a main board might be faulty.
You can find the faulty blocks with this method.

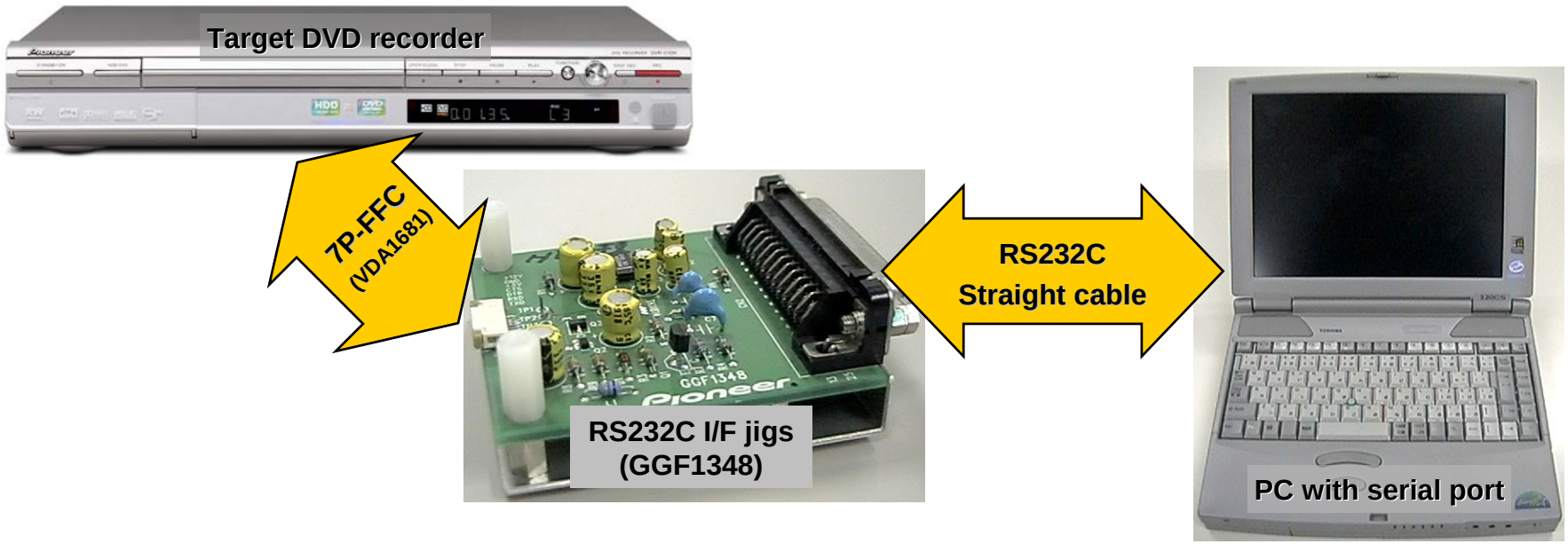
DVR-7000 / 310-S / 510H-S
320-S / 520H-S / 65H-S

1) PC SETUP (1/2)

a) Before communication setting

(1) Connect 7P-FFC and RS232C I/F jigs with serial port of the target recorder as shown below.

(2) Start “Hyper Terminal”, then setup the following communication settings.



NOTE

* Hyper Terminal is in an accessory for Windows OS.

1) PC SETUP (2/2)

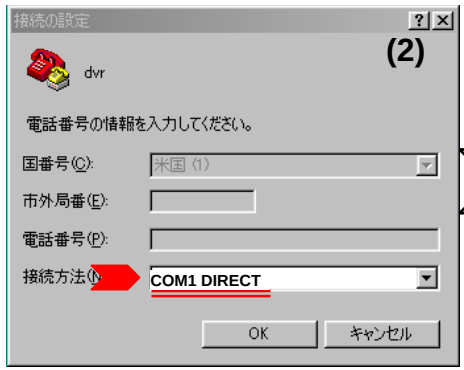
b) Communication settings

(1) Input any names after Hyper terminal starts up.

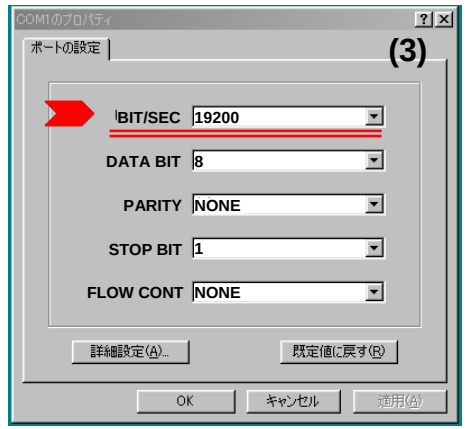
(2) Set up the connection settings.

(3) Set up the port settings.

Input any name



Select a connection port



Select each port settings as follows;

BIT/SEC : 19,200 or 38,400

DATA BIT : 8

PARITY : NONE

STOP BIT : 1

FLOW CONT : NONE

NOTE

Communication speeds to be set depend on the model number.

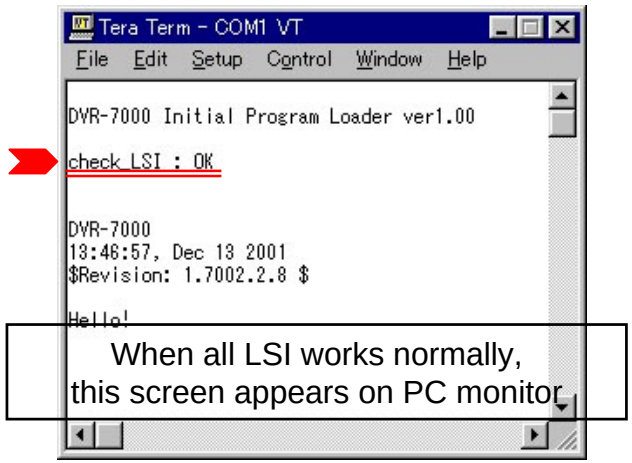
DVR-7000 : **19,200 bps**

DVR-310, 3100, 510H, 5100H : **38,400 bps**

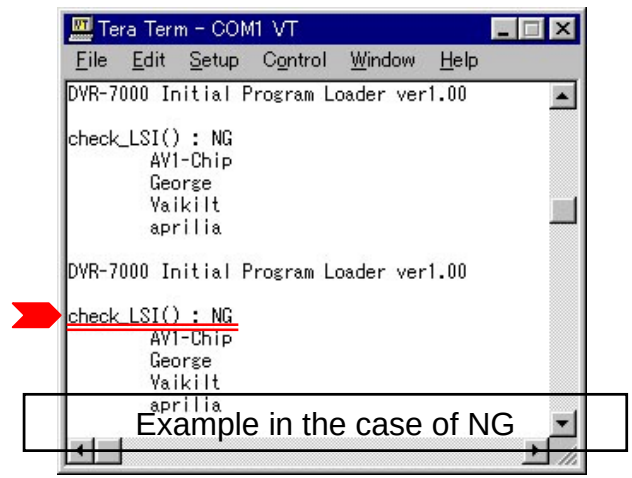
2) DIAGNOSIS for DVR-7000 (1/2)

a) Confirmation method for LSI_NG

After jigs connection and PC settings, LSI check starts automatically when DVR-7000 turns on.



When all LSI works normally, this screen appears on PC monitor



Example in the case of NG

ERROR MESSAGES

In LSI_NG, some of the following messages are displayed on PC, confirm the soldering condition, a power, and a clock signal of each LSI. And there is possibility of the memory IC connected to each LSI, also confirm the memory IC simultaneously.

MESSAGE	*IC#*
backup SRAM	**IC1011**
AV1-Chip	**IC4007, IC4001, 4002, 4003, 4004**
CPU SD-RAM	**IC1004**
By-Chip	**IC2004, IC2002**
George	**IC8008**
Slalom	**IC3003 (BGA)**
Slalom SD-RAM	**IC3008**
Vaikilt	**IC4006, IC4005**
aprilia	**IC6003**
ceLynx	**IC9001**

2) DIAGNOSIS for DVR-7000 (2/2)

b) Other check method

(1) When nothing is displayed on PC via RS232C;

SYSTEM-CPU does not work.

Confirm the IC connected to SYSTEM-CPU.

EX) IC1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1013

(2) When "FLASH_NG" appears on FL after DVR-7000 turns on;

The check of FLASH ROM(IC1008).

Confirm the soldering condition, power, and a clock signal of IC1008.

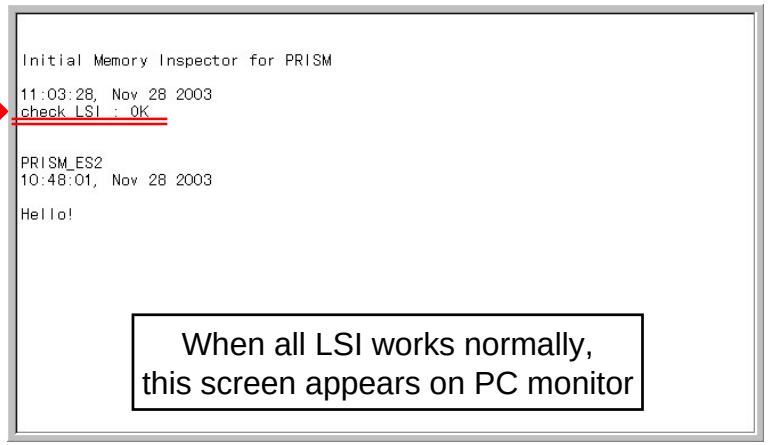
If it is normal, firmware download is required via RS232C.

If IC1008 is not downloadable via RS232C, FLASH ROM(IC1008) may be faulty.

3) DIAGNOSIS for DVR-310, 3100, 510H, 5100H-S, 320H, 520H, 65H (1/2)

a) Confirmation method for LSI_NG

After jigs connection and PC settings, LSI check starts automatically when a unit turns on.



ERROR MESSAGES

In LSI_NG, some of the following messages are displayed on PC, confirm the soldering condition, power, and a clock signal of each IC. If it is OK, replace each IC.

* However, there is possibility of IC1001 (PRISM) connected to each IC, when LSI_NG does not improve after each IC replace, PRISM may be faulty.

MESSAGE	IC#
CPU SDRAM	**IC1101**
Giant Slalom SDRAM	**IC1401, IC1421**
Backup SRAM	**IC1103**

b) Confirmation method for FLSH_NG

When "MONITOR" appears on FL after DVD recorder turns on;

Check FLASH ROM(IC1102).

Confirm the soldering condition, power, and a clock signal of IC1102.

If it is normal, firmware download is required via RS232C.

If IC1102 is not downloadable via RS232C, FLASH ROM(IC1102) may be faulty.

3) DIAGNOSIS for DVR-310, 3100, 510H, 5100H-S, 320H, 520H, 65H (2/2)

c) Other confirmation method

Each memory displayed in LSI_NG can be checked by the following Read and Write method to the arbitrary addresses individually.

1) Connect a target unit with PC like the LSI_NG check method, start Hyper Terminal, and set up a communication setting.

2) Only when the unit turns on, connect TP1065 (XCHK) on a MAIN ASSY B side to GND, and then turn on the unit, "MEMORYTEST" is displayed on FL and the following screen is outputted to PC monitor.

```
Initial Memory Inspector for PRISM

11:03:28, Nov 28 2003
check_LSI : OK
```

3) Input the following commands and check to Read and Write each memory.

[test command] Input as follows.

Write; **(memory test command _ IC# _ write _ address _ data)**

MTEST 1101 write 0000 FFFF

Read; **(memory test command _ IC# _ read _ address)**

MTEST 1101 read 0000

```
MTEST 1101 write 0000 FFFF
MTEST 1101 read 0000
FFFF
```

ex.

NOTE

The following four ICs can be checked.
IC# : 1101, 1103, 1401, 1421

Available addresses are the following numbers within the range.
Address# : 0000 ~ FFFF
*** Only even number address**

4) A result is good if the written-in data is displayed after a reading test command input.

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The HDD diagnostic method

- Hard disk drive (HDD) quality diagnosis -

<< Model for >>

DVR-520H-S, DVR-65H-S

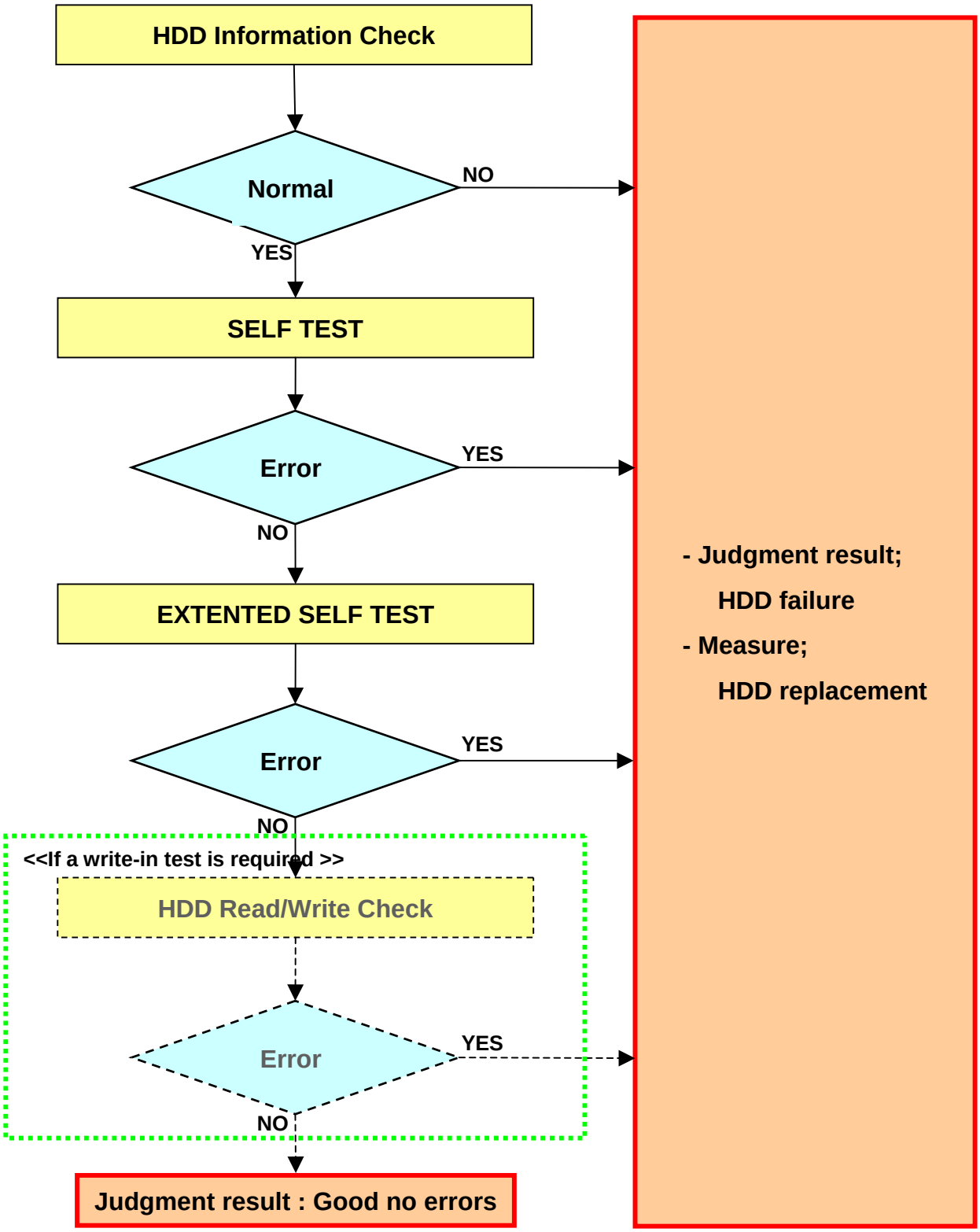
<<Purpose>>

This is the method for judging the physical error and the logical error on HDD by using the HDD diagnostic tool in the unit. When you face the following HDD condition, please use this method as a judgment tool of HDD.

<<fault case>>

1) **HDD error**
2) **HDD recording or playback fault**
3) **HDD recognition error.**

<< Index >>


HDD Information Check
Normal
NO
YES
SELF TEST
Error
YES
NO
EXTENTED SELF TEST
Error
YES
NO
<<If a write-in test is required >>
HDD Read/Write Check
Error
YES
NO
Judgment result : Good no errors
- Judgment result;
HDD failure
- Measure;
HDD replacement

<<Outline of each diagnostic item>>

HDD Information

It is a screen for checking the information on HDD. The part number of HDD, the resistance welding time, an attestation state, a life judging result, etc. can be checked.

→ Test time: About 30 seconds

SELF TEST

It is simple diagnosis of HDD. In the case of serious HDD fault, an error is detectable by this test.

→ Test time: About 90 seconds

EXTENTED SELF TEST

It is a reading test in all the areas (sector) of HDD.

Since write-in operation is not carried out, the data which recorded in HDD is not eliminated.

→ Test time: About 40 minutes per 80GB

HDD Read/Write Check

This is the writing, reading, and the collation test in all the areas (sector) of HDD. By this test, in order to overwrite all data, all data recorded on HDD are eliminated. Please obtain approval of a customer before this test.

→ Test time: About 7 hours per 80GB

The diagnostic method

<<How to use diagnostic tool>>

- How to enter : Press [ESC] + [CX] + [0] + [1]

- How to exit : Press [ESC]

<<Notes>>

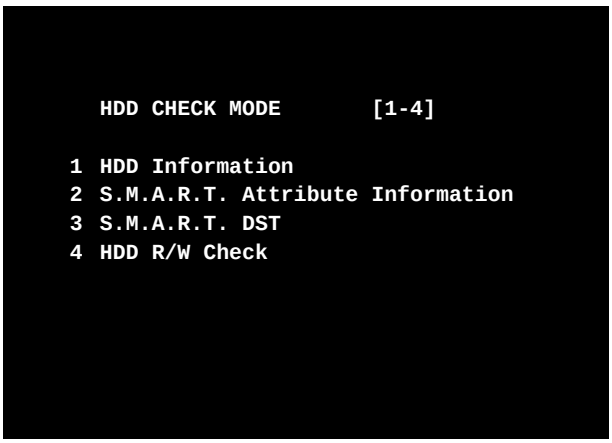
Although a diagnostic tool operates regardless of the unit function, since it may malfunction, please do not operate the unit during HDD diagnostic tool operation. And the recommendation states of the unit are all "stop", "No timer recording", and an input selection "L1~L3"

<<diagnostic method>>

1) Display a menu screen.

The following screens will be displayed if it goes into a diagnostic tool.

In order to go into each mode, press [1] ~ [4] of test remote control unit.



[The test to perform]
(1) HDD Information
The check of HDD information
(2) S.M.A.R.T.DST
A simple test and all reading test
(3) HDD R/W Check
Complete writing and reading test
If this test is performed,
all the data in HDD is eliminated.
* "2.SMART Attribute ..." does not use.

2) Check HDD information.

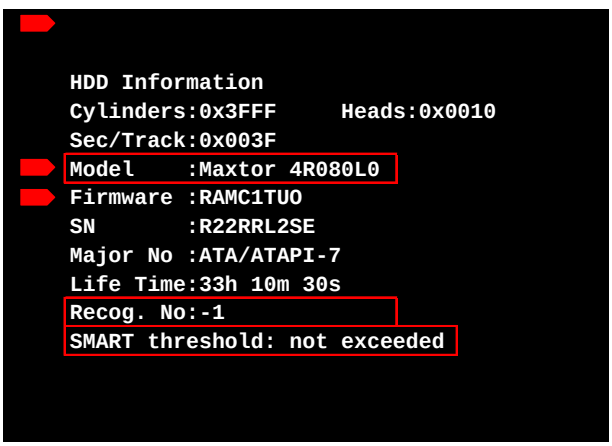
Press [1] and check the following information. A check item is as follows.

Model: Is the part number of HDD displayed correctly?

Recog.No: Is the positive value displayed?

SMART threshold: Is "not exceeded" displayed?

→ When "exceeded" is displayed, the HDD should be replaced.



[Check item]
(1) Model
Refer to S/M regarding the model number of HDD.
(2) Recog.No
Positive value : HDD is recognized.
Negative value : HDD is not recognized.
(3) SMART threshold
exceeded : HDD should be replaced
not exceeded : Normal (it is not a life yet)

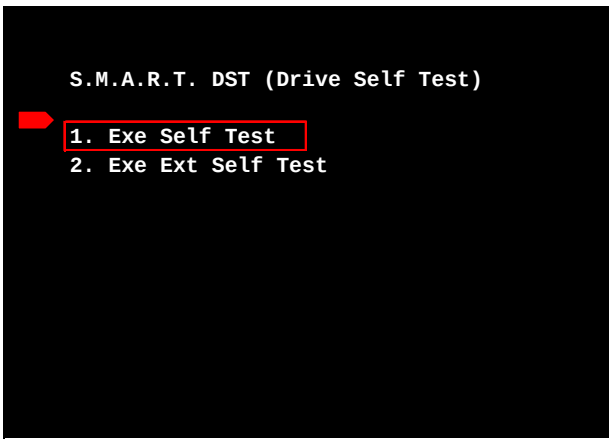
After the above checks, press [Clear] to return to a menu screen.

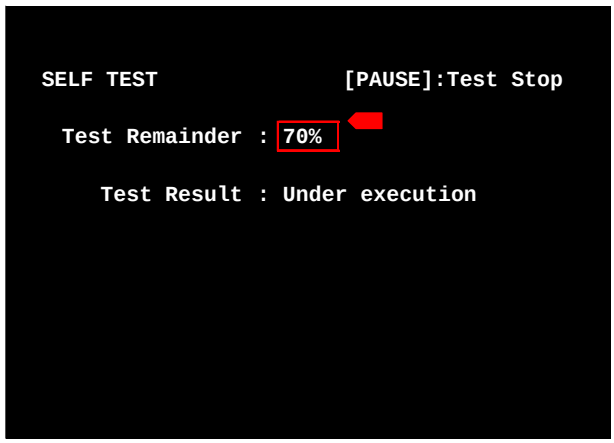
<<diagnostic method>>

3) Perform Self Test.

Press [3] on a menu to display the next screen.

Next, if [1] is pressed, Self Test will begin.





The situation of a test is shown as the above screen. The remain is displayed by %, and if it results to 00%, a test will end it. Check the existence of an error after a test end.

[Judgment criteria]

- "--Completed" is displayed when the HDD have no error

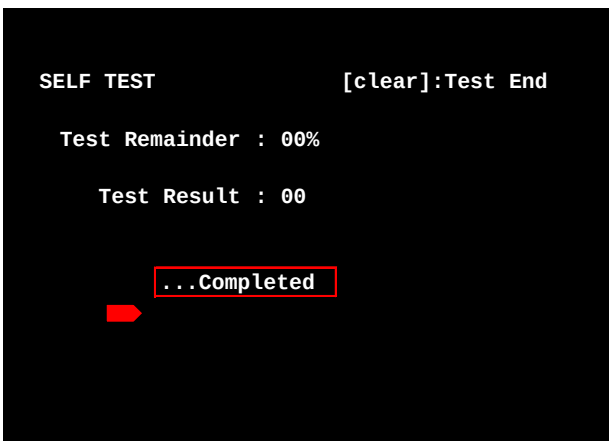
  Please execute the following Extended Self Test.

- "--Error" is displayed when the HDD with an error

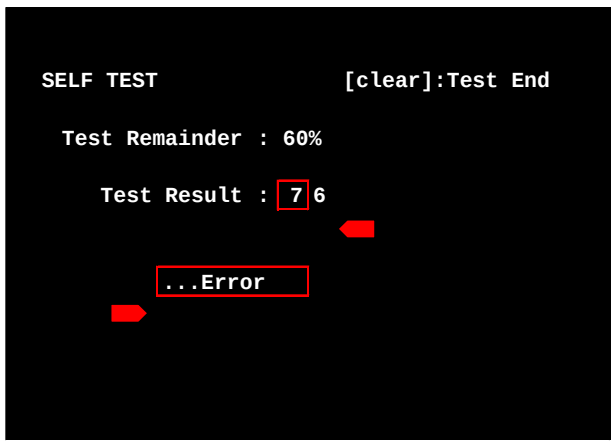
  Refer to Test Result. If the single figure is "1" or "2", perform this test again.

  If the result of a re-test is the same, or if it is "3" or “7”, HDD should be replaced.

[example of no Error]



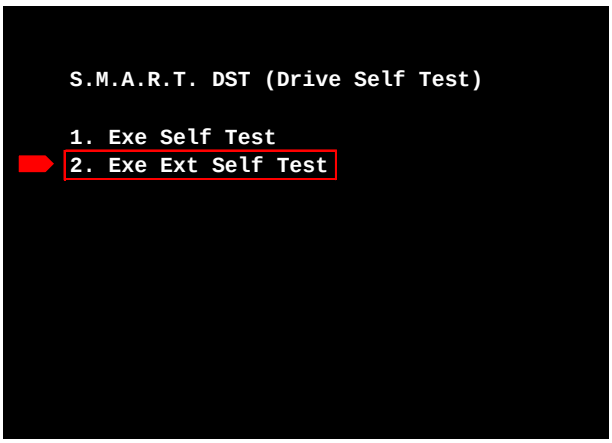
[example of Error]

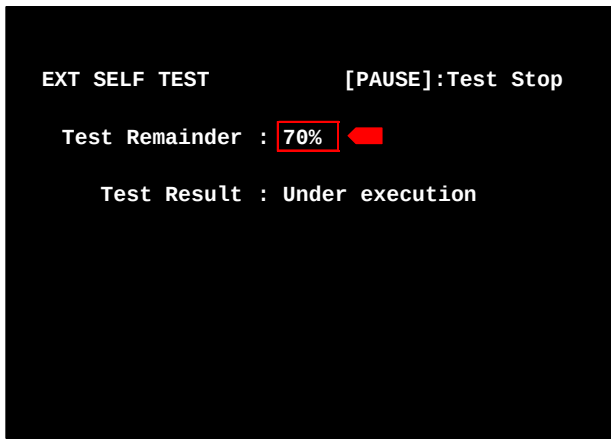


After a check, press [Clear] to return to a menu screen.

<<diagnostic method>>

4) Perform Extended Self Test.





Press [3] and then press [2], Extended Self Test will begin.

The remain of a test is displayed by %, and if it results to 00%, a test will end it.

Check the existence of an error after a test end.

[Judgment criteria]

- "--Completed" is displayed when the HDD have no error

When no error in the test so far, all operation except the writing of HDD is normal.

When there is fault of an HDD playback system, there is possibility of faults except HDD.

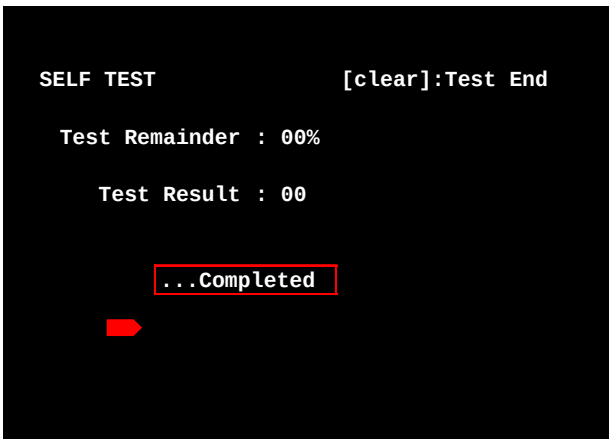
However, it is necessary to test by HDD Read/Write Check when there is fault of a record system in HDD operation.

- "--Error" is displayed when the HDD with an error

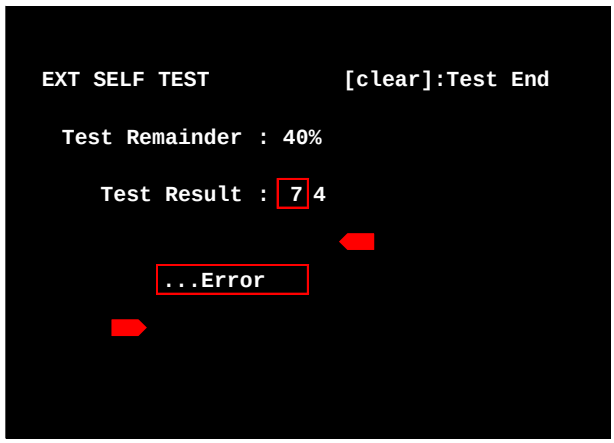
Refer to Test Result. If the single figure is "1" or "2", perform this test again.

If the result of a re-test is the same, or if it is "3" or “7”, HDD should be replaced.

[example of no Error]



[example of Error]



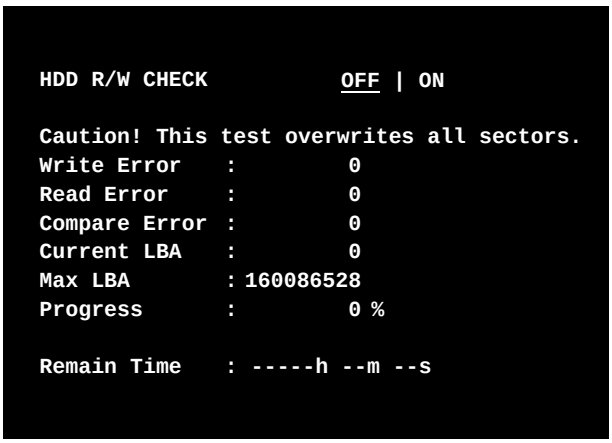
After a check, press [Clear] to return to a menu screen.

<<diagnostic method>>

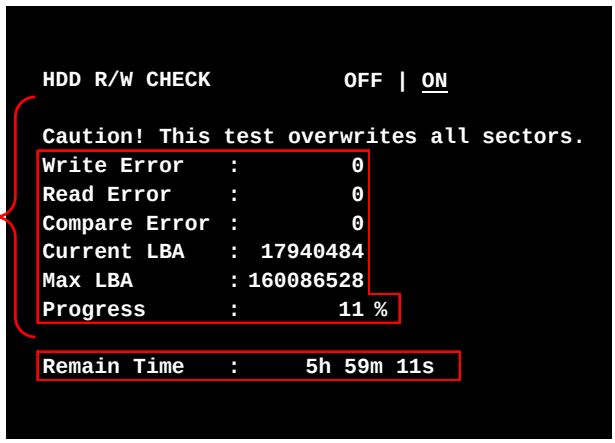
5) Perform HDD Read/Write Check.

Please be sure to obtain consent from a customer about elimination of HDD data before performing this test.

If [4] is pressed and [SKIP >>|] is pressed from a menu screen, HDD Read/Write Check will begin. And, it can be interrupted even if it is under test, when [SKIP |<<] is pressed.



The situation of a test is shown as the left screen. The progress of a test is displayed by % and if it results to 100%, the test is completed.



[Information on the screen]
- Write Error: The number of write errors
- Read Error: The number of reading errors
- Compare Error: The number of compare errors
- Current LBA: The address under test
- Max LBA: The total address of HDD
- Progress: Test progress situation [%]
- Remain Time : Estimate Remain time for test done
  Standard → 7 hours per 80GB

[Judgment criteria]

In all the items of Write/Read/Compare;

- With NO Error

→ HDD is normal, it is not necessary to replace the tested HDD. It is the fault by the block except HDD.

- With Error

→ HDD should be replaced.

After checking, press [Clear] to return to a menu screen then press [ESC] to escape from the diagnostic tool.