
Chapter 3

Tests and Diagnostics

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3.15 Wireless LAN Test (Atheros)

This section describes how to perform the wireless LAN transmitting-receiving test with the test program. (Atheros 11b/g)

NOTE: Use another computer (with Atheros 11b/g) that can communicate by the wireless LAN as a responder machine to perform this test.

When conducting this test, make sure that any wireless network device using 2.4GHz band other than IEEE 802.11b, such as Bluetooth, is not used nearby.

In this test, the following items are tested:

- * Test PC side
 - (1) SKU (destination code) check
 - (2) Mac Address check
 - (3) Communication test (11a mode) (only for 11a/b/g card)
 - (4) Communication test (11g mode)
 - (5) Communication test (11b mode)

This program conducts the above test items continuously and displays results for each item during the test. However, only the last result for the whole test shall be checked. (The message "OK" or "NG" is displayed.)

When an "NG" item is detected during the test, the message "NG" is displayed on the screen and the test stops.

To start the Wireless LAN test program, follow the steps below:

NOTE: Before starting the wireless LAN test, make sure the Wireless Communication Switch on the left side of the computer is turned on. (The Wireless Communication LED lights orange.)

Setting the responder machine

NOTE: Release the write-protection of the floppy disk for the test.

Insert a floppy disk containing the test program into the floppy disk drive of the responder machine and turn on the responder machine. The Wireless LAN test menu will appear.

```
#####
###      Atheros WLAN sub system repair test  VX.XX      ###
#####
*
*      1 .....Test PC [Initiator]                        *
*
*      0 .....[Responder]                                *
*
*****
....Press test number [1,0] ?
```

Press **0** and **Enter** in the responder machine. After a while, the following messages will appear. The latter message is updated every 3 seconds.

```
Waiting for transmitter to ring the bell in 11a mode.
Input or output error (EIO) : rxDatBegin : nothing receive within
3000millisecs (waitTime)
```

The responder machine is ready for the test.

Setting the tester machine

NOTE: Release the write-protection of the floppy disk for the test.

Insert a floppy disk containing the test program into the floppy disk drive of the tester machine and turn on the tester machine. The Wireless LAN test menu will appear.

```
#####
###      Atheros WLAN sub system repair test  VX.XX      ###
#####
*
*      1 .....Test PC [Initiator]                        *
*
*      0 .....[Responder]                                *
*
*****
....Press test number [1,0] ?
```

Press **1** and **Enter** in the tester machine. After a while, the following message will appear:

```
-----
-
-      mac address check OK !!
-
-      ...Press any key !!
-
-----
```

To proceed the test, press any key.

When the tester machine has passed the test, "OK" message will appear in the tester machine.



Press **Enter** to return to the main menu.

When the tester machine has not passed the test, "NG" message will appear in the tester machine. Pressing **Enter** on the screen shows the following message.

```
*****  
*  
*           11g Throughput test : NG !!  
*  
*****
```

Then the test returns to the main menu automatically.

- (c) When the machine has passed the test, it displays **BD_ADDR**. If **BD_ADDR** is normal, the following message is shown.

```

-----
Bluetooth Subsystem T&D for PCSE(BD_ADDR) VerX.XX Copyright (C) by TOSHIBA Co.
-----

My BD_ADDR = 00037A003196 [h]

PPPPPP  A    SSSSS  SSSSS
P  P  A A  S    S  S  S
P  P  A  A  S      S
PPPPPP  A    A  SSSSS  SSSSS
P        AAAAAAA  S    S
P        A    A  S    S  S  S
P        A    A  SSSSS  SSSSS

```

Figure 3-2 Test pass

- (d) If the target machine has any problem, it displays **Error code**. And the following message is shown.

```

-----
Bluetooth Subsystem T&D for PCSE(BD_ADDR) VerX.XX Copyright (C) by TOSHIBA Co.
-----

My BD_ADDR = 00037A003196 [h]

FFFFFF  A    III  L
F        A A    I  L
F        A  A    I  L
FFFFFF  A    A    I  L
F        AAAAAAA  I  L
F        A    A    I  L
F        A    A    III  LLLLLL

```

Figure 3-3 Test fail

2. Messages when BD_ADDR is invalid are as follows:

Message	Meaning
Invalid BD_ADDR (all 00)	0x000000000000
Invalid BD_ADDR (all FF)	0xFFFFFFFFFFFF
Invalid BD_ADDR (bit0=1)	bit40=1b
Invalid BD_ADDR (bit1=1)	bit41=1b
Invalid BD_ADDR (define in the file)	BD_ADDR is the one already defined in the file.

If the machine detects a malfunction, it indicates the error code as shown below.

The error code begins with the least significant digit.

Error code

Table 3-2 Error code for NICSPC73.EXE (1/2)

Error code	Meaning
0x01	Unknown HCI Command.
0x02	No Connection.
0x03	Hardware Failure.
0x04	Page Timeout.
0x05	Authentication Failure.
0x06	Key Missing.
0x07	Memory Full.
0x08	Connection Timeout.
0x09	Max Number Of Connections.
0x0a	Max Number Of SCO Connections To A Device.
0x0b	ACL Connection already exists.
0x0c	Command Disallowed.
0x0d	Host Rejected due to limited resources.
0x0e	Host Rejected due to security reasons.
0x0f	Host Rejected due to remote device is only a personal device.
0x10	Host Timeout.
0x11	Unsupported Feature or Parameter Value.
0x12	Invalid HCI Command Parameters.
0x13	Other End Terminated Connection: Used Ended Connection.
0x14	Other End Terminated Connection: Low Resources.
0x15	Other End Terminated Connection: About to Power Off.
0x16	Connection Terminated by Local Host.
0x17	Repeated Attempts.
0x18	Paring Not Allowed.
0x19	Unknown LMP PDU.
0x1a	Unsupported Remote Feature.
0x1b	SCO Offset Rejected.
0x1c	SCO Interval Rejected.
0x1d	SCO Air Mode Rejected.
0x1e	Invalid LMP Parameters.
0x1f	Unspecified Error.

** See the Specification of the Bluetooth System for details.

Table 3-2 Error code for NICSPC73.EXE (2/2)

Error code	Meaning
0x20	Unsupported LMP Parameter Value.
0x21	Role Change Not Allowed.
0x22	LMP Response Timeout.
0x23	LMP Error Transaction Collision.
0x24	LMP PDU Not Allowed.
0x25	Not Exist
0x26	Not Exist
0x27	Not Exist
0x28	Not Exist
0x29	Not Exist
0x2a	Not Exist
0x2b	Not Exist
0x2c	Not Exist
0x2d	Not Exist
0x2e	Not Exist
0x2f	Not Exist

** See the Specification of the Bluetooth System in detail.

- (g) If the target machine has any problem, the following message shown in the following figure "INCOMPLETE" is displayed with the **Error CODE**.

```

-----
Bluetooth Subsystem T&D for PCSE(CS-Air) VerX.XX Copyright (C) by TOSHIBA Co.
-----

+-----+
|          DUT          |  BD_ADDR of the DUT = XXXXXXXXXXXXX [h]
+-----+

III  N      N  CCCC   OOO  M      M  PPPPPP  L      EEEEEE  TTTTTT  EEEEEEE
I   NN    N  C   C  O   O  MM   MM  P      P  L      E          T      E
I   N  N   N  C     O   O  M  M  M  P      P  L      E          T      E
I   N  N   N  C     O   O  M  M  M  PPPPPP  L      EEEEEE   T  EEEEEEE
I   N    N  N  C     O   O  M      M  P      L      E          T      E
I   N      NN  C   C  O   O  M      M  P      L      E          T      E
III  N      N  CCCC   OOO  M      M  P      LLLLLL  EEEEEE   T  EEEEEEE

                                Testing is finished

A>_
    
```

Figure 3-7 Test incomplete (failure)

If the machine detects a malfunction, it indicates the error code as shown below.
The error code begins with the least significant digit.

Error code

Table 3-3 Error code for NICSPC53.EXE (1/2)

Error code	Meaning
0x01	Unknown HCI Command.
0x02	No Connection.
0x03	Hardware Failure.
0x04	Page Timeout.
0x05	Authentication Failure.
0x06	Key Missing.
0x07	Memory Full.
0x08	Connection Timeout.
0x09	Max Number Of Connections.
0x0a	Max Number Of SCO Connections To A Device.
0x0b	ACL Connection already exists.
0x0c	Command Disallowed.
0x0d	Host Rejected due to limited resources.
0x0e	Host Rejected due to security reasons.
0x0f	Host Rejected due to remote device is only a personal device.
0x10	Host Timeout.
0x11	Unsupported Feature or Parameter Value.
0x12	Invalid HCI Command Parameters.
0x13	Other End Terminated Connection: User Ended Connection.
0x14	Other End Terminated Connection: Low Resources.
0x15	Other End Terminated Connection: About to Power Off.
0x16	Connection Terminated by Local Host.
0x17	Repeated Attempts.
0x18	Pairing Not Allowed.
0x19	Unknown LMP PDU.
0x1a	Unsupported Remote Feature.
0x1b	SCO Offset Rejected.
0x1c	SCO Interval Rejected.
0x1d	SCO Air Mode Rejected.
0x1e	Invalid LMP Parameters.
0x1f	Unspecified Error.

** See the Specification of the Bluetooth System for details.

Table 3-3 Error code for NICSPC53.EXE (2/2)

Error code	Meaning
0x20	Unsupported LMP Parameter Value.
0x21	Role Change Not Allowed.
0x22	LMP Response Timeout.
0x23	LMP Error Transaction Collision.
0x24	LMP PDU Not Allowed.
0x25	Not Exist
0x26	Not Exist
0x27	Not Exist
0x28	Not Exist
0x29	Not Exist
0x2a	Not Exist
0x2b	Not Exist
0x2c	Not Exist
0x2d	Not Exist
0x2e	Not Exist
0x2f	Not Exist

** See the Specification of the Bluetooth System in detail.

3.17 Sound/LAN/Modem Test

To execute the Sound/LAN/Modem Test, use the Test Diagnostics disk (Sound/LAN/Modem). Finish the tests of the Diagnostics disk (T&D) by selecting 99 - EXIT TO DIAGNOSTICS MENU in the DIAGNOSTIC TEST MENU. Then in the DIAGNOSTICS MENU, select 9 - EXIT TO MS-DOS.

NOTE: To execute the Tablet Dock CD Test, attach the computer to the Tablet Multi Dock before turning on the computer.

Insert the Test program disk (Sound/LAN/Modem) in the floppy disk drive and turn on the power. The following message will appear:

```
#####
#####   XXXX DIAGNOSTICS PROGRAM (SOUND/LAN/MODEM TEST)   #####
#####
*
*  1 ..... (Microphoned recording&play Mic 2&4)          *
*  2 ..... (Microphoned recording&play Mic 3&4)          *
*  3 ..... (Sin Wave)                                     *
*  4 ..... (LAN)                                          *
*  5 ..... (MODEM)                                       *
*  6 ..... (Tablet Dock CD TEST)                          *
*****
.... Press test number[1-6] ?
```

Press the number you want to test and press **Enter**.

NOTE: To record the sound from the specified microphone in Subtest 01, scratch each hole of the microphones lightly with a sharp-pointed thing to make sure the specified microphone catches the sound. The system is capable of producing high volume sound, so when you use the headphones be careful to set the volume low and adjust it as necessary. Using the headphones at full volume could damage your ears.

There are one microphone on the upper side of the LCD and two microphones on the lower side. Microphone numbers are assigned as following.

Right upper side of the LCD	-Mic 2
Left lower side of the LCD	-Mic 3
Right lower side of the LCD	-Mic 4

Subtest 01 Microphoned recording & play Mic 2&4

Executed by the load format of Playwave/recwave.

The sound is recorded automatically from microphone when the following message appears.

Press any key to continue ...

After a while, the recorded sound is replayed automatically.

Subtest 02 Microphoned recording & play Mic 3&4

This subtest is executed in the same way as Microphoned recording & play Mic 2&4.

Subtest 03 Sin wave

This subtest is executed by loading the COM file (ADSIN.COM.) The program expands sin wave data table from 16KB to 64KB, and creates the play data. Then it transfers the data between the DMA and the CODEC to play the sin wave. (It sounds like a continuous beep.) By using wave measuring devices such as an oscilloscope, the data can be measured as a sin wave.

When the subtest is executed, the following message appears.

Press any key to continue....

When you press any key, the sin wave is expanded from 16KB to 64KB data and is played.

The sound is heard and the test returns to the menu.

Subtest 04 LAN

This subtest checks the operation of mini-PCI I/F by the loopback in the chip.

The large "OK" is displayed if no error occurred.

Subtest 05 MODEM

For this subtest, connect the modem PCB and RJ11 connector with a harness. This subtest contains the following tests. They are tested with the dedicated "FAT-MODE inspection device(Product Code QE2000P01 made by Nittou Denki Seisakusyo)

- Scorpio Modem Initialize
- Digital Loopback Test

Subtest 06 Tablet Dock CD TEST

NOTE: This subtest needs the test media (CD-R) created by wiring the data, CDTEST.DAT, in the SOUND/LAN/MODEM disk (Test Diagnostics disc (No.2)). Also before selecting this subtest, set the test media in the drive of the Tablet Dock.

This subtest compares the data of the test program and the data in the test media to check whether the data from the drive can be read correctly.

When the test starts, the following message will appear.

```
TEST LOOP : Y=[Y], N=[N]..?
```

Select either (press **Y** or **N**) and press **Enter**.

When the message "OK" or "NO" appears, press **Enter** to return to the menu screen.

To finish the Sound/LAN/Modem test, the computer power should be off.

3.18 Thermal Radiation Control Test

This thermal radiation control test checks the temperature of the CPU and GPU. To execute this test, use the diagnostics disk (Thermal radiation control) and follow the procedures below.

1. Turn on the computer and start the Windows.
2. Insert the diagnostic disk for the thermal radiation control test to the USB FDD.
3. Open the [EXPLORE] window and double-click the [THERMAL.bat] file in the diagnostic disk.
4. The input field appears on the screen. Then, input the temperature around the computer and click [OK] button. The thermal radiation control test starts.
5. The display counting from 900 to 0 seconds (for 15 minutes) appears on the screen. When the test ends normally, the following message appears in the display.

```
[Status:pass]
```

When an error is found, the following message appears in the display.

```
[Status:CPU:FAIL GPU:FAIL]
```

When the error message appears in the display, there is a possibility of breakage of CPU, GPU or FAN.

NOTE: *The display on the screen changes while executing this test. This is not an error. Do not touch any key and keep executing the test, for this change applies some load to CPU and GPU for the test.*

Close the test menu to end the thermal radiation control test.

3.19 Error Status Code

Table 3-4 lists the error status codes for the Diagnostic Test.

Table 3-4 Error status codes names (1/2)

Device name	Error code	Error status name
(Common)	FF	Data Compare Error
System	01 02 03	ROM Checksum Error Location ID Error Serial ID Writer Error
Memory	01 02 14 DD DE DF	Parity error Protected mode not change Memory write/read error Cache memory error 2nd Cache error TAG-RAM error
Keyboard	01 02 03 04 05 06	Mouse interface error IPS interface error Interface error Retransmit error Mouse handler not support PS/2 mouse & IPS not
FDD	01 02 03 04 06 08 09 10 20 40 60 80 EE	Bad Command Error Address Mark Not Found Write Protected Record Not Found Media Removed DMA Overrun Error DMA Boundary Error CRC Error FDC Error Seek Error Not Drive Error Time Out Error Write Buffer Error

Table 3-4 Error status codes names (2/2)

Device name	Error code	Error status name
HDD	01	Bad Command Error
	02	Address Mark Not Found
	04	Record Not Found
	05	HDC Not Reset Error
	07	Drive Not Initialized
	08	HDC overrun (DRQ)
	09	DMA Boundary Error
	0A	Bad Sector
	0B	Bad Track Error
	10	ECC Error
	11	ECC recover error
	20	HDC Error
	40	Seek Error
	80	Time Out Error
	AA	Drive Not Ready
	BB	Undefined Error
	CC	Write Fault
E0	Status Error	
EE	Access Time Out Error	
DA	No HDD	
PCMCIA	C1	ADDRESS LINE ERROR
	C2	REG# LINE ERROR
	C3	CE#1 LINE ERROR
	C4	CE#2 LINE ERROR
	C5	DATA LINE ERROR
	C6	WAIT LINE ERROR
	C7	BSY# LINE ERROR
	C8	BVD1 LINE ERROR
	CB	ZV Port ERROR
	CD	NO PCMCIA
NDP	01	No Co-Processor
	02	Control Word Error
	03	Status Word Error
	04	Bus Error
	05	Addition Error
	06	Multiplay Error

3.20 HDC Status

When an error occurs in the hard disk test, the following message is displayed:

```
HDC status = XXXX
```

The hard disk test error status is displayed on the screen by a four-digit number.

The hard disk controller error status is composed of two bytes; the first byte displays the contents of the HDC error status register and the second byte displays the HDC error register. Each of them are indicated in hexadecimal form

The contents of the HDC error status register and error register are listed in Tables 3-5 and 3-6.

Table 3-5 Hard disk controller status register contents

Bit	Name	Description
7	BSY (Busy)	"0" ... HDC is ready. "1" ... HDC is busy.
6	DRDY (Drive ready)	"0" ... Hard disk drive is not ready to accept any command. "1" ... Hard disk drive is ready.
5	DWF (Drive write fault)	"0" ... DWF error is not detected. "1" ... Write fault condition occurred.
4	DSC (Drive seek complete)	"0" ... The hard disk drive heads are not settled over a track. "1" ... The hard disk drive heads are settled over a track.
3	DRQ (Data request)	"0" ... Drive is not ready for data transfer. "1" ... Drive is ready for data transfer.
2	CORR (Corrected data)	"0" ... Not used "1" ... Correctable data error is corrected.
1	IDX (Index)	"0" ... Not used "1" ... Index is sensed.
0	ERR (Error)	"0" ... Not used "1" ... The previous command was terminated with an error.

Table 3-6 Error register contents

Bit	Name	Description
7	BBK (Bad block mark)	"0" ... Not used "1" ... A bad block mark is detected.
6	UNC (Uncorrectable)	"0" ... There is no uncorrectable data error. "1" ... Uncorrectable data error has been detected.
5	—	Not used
4	IDN (Identification)	"0" ... Not used "1" ... There was no ID field.
3	—	Not used
2	ABT (Abort)	"0" ... Not used "1" ... Illegal command error or a command abort error.
1	TK0 (Track zero)	"0" ... The hard disk detected track 0. "1" ... The hard disk could not detect track 0.
0	—	Not used.

3.21 FDD Cleaning

3.21.1 Function Description

This function cleans the heads in the 3.5-inch FDD by executing a series of head load/seek and read operations. A cleaning disk is necessary to perform this program.

3.21.2 Operations

1. Selecting test **4-HEAD CLEANING** from the **DIAGNOSTIC MENU** and pressing **Enter** displays the following messages:

```
DIAGNOSTICS - FLOPPY DISK HEAD CLEANING : V6.00
```

```
Mount cleaning disk(s) on drive(s).
```

```
Press any key when ready.
```

2. Remove the Diagnostics Disk from the FDD, then insert the cleaning disk and press **Enter**.
3. When the following message appears, the FDD head cleaning has begun.

```
Cleaning start
```

4. The display automatically returns to the **DIAGNOSTIC MENU** when the program is completed.

3.22 Log Utilities

3.22.1 Function Description

This function logs error information generated while a test is in progress and stores the results in RAM. This function can also store data on a floppy disk or output the data to a display or a printer.

If the power switch is turned off, the error information will be lost. The error information is displayed in the following order:

1. Error count (CNT)
2. Test name, Subtest number (TS-No)
3. Pass count (PASS)
4. Error status code (STS)
5. FDD/HDD or memory address (ADDR)
6. Write data (WD)
7. Read data (RD)
8. HDC status code (HSTS)
9. Error status name (ERROR STATUS NAME)

3.22.2 Operations

Selecting 5-LOG UTILITIES and pressing **Enter** in the DIAGNOSTIC MENU logs error information into RAM or onto a floppy disk. The error information is displayed in the following format:

```

0003 ERRORS
CNT  TS-No PASS STS ADDR  WD RD HSTS [ERROR STATUS NAME]
001  FDD 01 0000 110 24015 00 00      FDD-CRC ERROR
002  FDD 01 0001 110 30108 00 00      FDD-CRC ERROR
003  FDD 03 0003 110 23106 00 00      FDD-CRC ERROR

```

FDD/HDD or
HDC status

Error status
memory address
Read data
Error status name

Pass count
Write data

Subtest number

Test name

Error count

[[1:Next,2:Prev,3:Exit,4:Clear,5:Print,6:FD Log Read,7:FD Log Write]]

2. The error information displayed on the screen can be manipulated by the following number keys:

The **1** key scrolls the display to the next page.

The **2** key scrolls the display to the previous page.

The **3** key returns to the Diagnostic Menu.

The **4** key erases all error log information in RAM.

The **5** key outputs the error log information to a printer.

The **6** key reads the log information from a floppy disk.

The **7** key writes the log information to a floppy disk.

3. In the case of “error retry OK”, a capital “R” will be placed at the beginning of the error status. However, it is not added to the error count.

3.23 Running Test

3.23.1 Function Description

This function automatically executes the following tests in sequence:

1. System test (subtest 01)
2. Memory test (subtests 01, 02, 04, 06)
3. Real timer test (subtest 02)
4. Display test (subtest 01)
5. FDD test (subtest 02)
6. HDD test (subtests 01, 05)

The system automatically detects the number of floppy disk drives connected to the computer for the FDD test.

3.23.2 Operations

Caution: Do not forget to remove the diagnostics disk and load a formatted work disk in the FDD. If a work disk is not loaded, an error will be generated during the FDD testing.

1. Remove the diagnostics disk from the floppy disk drive and insert the formatted work disk.
2. Select **6-RUNNING TEST** from the DIAGNOSTIC MENU and press **Enter**. The following message is displayed.

```
Printer wrap around test (Y/N) ?
```

Select **Y (yes)** to execute the Printer wraparound test or **N (NO)** not to execute, then press **Enter**. A printer wraparound connector must be connected to the parallel port of the computer to execute properly this test.

3. When the selecting of the Printer wraparound test is completed, the following message is displayed.

```
Serial #A wrap around test (Y/N) ?
```

Select **Y (yes)** to execute the Serial #A test or **N (NO)** not to execute, then press **Enter**. A RS-232C wraparound connector must be connected to the serial port of the computer to execute properly this test.

4. After specifying of the **Serial #A** test, the following message will appear:

```
Mount the work disk(s) on the drive(s),  
then press [Enter] key.  
[Warning : The contents of the disk(s),  
will be destroyed.]
```

5. This program is executed in the above mentioned ways. To exit the program, press **Ctrl + Break**.

3.24 Floppy Disk Drive Utilities

3.24.1 Function Description

This function formats the FDD, copies the floppy disk and displays the dump list for both the FDD and HDD.

1. FORMAT

Caution: *This program is only for testing a floppy disk drive. The option is different from the MS-DOS FORMAT command.*

This program formats the floppy disk in the following formats.

- (a) 2DD: Double-sided, double-density, double-track, 96/135 TPI, MFM mode, 512 bytes, 9 sectors/track.
- (b) 2HD: Double-sided, high-density, double-track, 96/135 TPI, MFM mode, 512 bytes, 18 sectors/track.

2. COPY

This program copies data from a source floppy disk to a target floppy disk.

3. DUMP

This program displays the contents of the floppy disk and the designated sectors of the hard disk.

4. HDD-ID

This program reads the hard disk ID and displays the hard disk ID, serial number and other hard disk information.

3.24.2 Operations

1. Selecting **7-FDD UTILITIES** from the **DIAGNOSTIC MENU** and pressing **Enter** displays the following message:

```
[ FDD UTILITIES ]  
  
1 - FORMAT  
2 - COPY  
3 - DUMP  
4 - HDD-ID  
9 - EXIT TO DIAGNOSTICS MENU
```

2. **FORMAT** program

- (a) When **FORMAT** program is loaded, the following message is displayed:

```
DIAGNOSTICS - FLOPPY DISK FORMAT : V6.00  
Drive number select (1:A, 2:B) ?
```

- (b) Select a drive number to display the following message:

```
Type select (0:2DD, 3:2HD) ?
```

- (c) Select a media/drive type number and press **Enter**. The following message will be displayed:

```
Warning : Disk data will be destroyed.  
Insert work disk into drive A:  
Press any key when ready.
```

- (d) Remove the Test program Disk from the FDD, insert the work disk and press any key. The following message will be displayed and the FDD format is executed:

```
[ FDD TYPE ] : TRACK   = XXX  
[ FDD TYPE ] : HEAD    = X  
[ FDD TYPE ] : SECTOR  = XX  
  
Format start  
[[track, head = XXX X]]
```

After the floppy disk is formatted, the following message will appear:

```
Format complete  
Another format (1:Yes/2:No) ?
```

- (e) Typing **1** displays the message from step (c) above. Typing **2** returns the test to the **DIAGNOSTIC MENU**.

3. COPY program

- (a) When FORMAT program is loaded, the following message is displayed:

```
FLOPPY DISK FORMAT & COPY : V6.00
Type select (0:2DD,3:2HD) ?
```

- (b) Selecting a media/drive type number will display a message below:

```
Insert source disk into drive A:
Press any key when ready.
```

- (c) Remove the Diagnostics Disk from the FDD, insert the source disk and press any key. The following message appears and copying of the disk starts.

```
[ FDD TYPE ] : TRACK = XXX
[ FDD TYPE ] : HEAD = X
[ FDD TYPE ] : SECTOR = XX

Copy start

[[ track,head = XXX X ]]
```

- (d) Remove the source disk from the FDD, insert a formatted work disk and press any key. The following message will appear and start copying to the target disk.

```
Insert target disk into drive A:
Press any key when ready.
```

```
[[ track,head = XXX X ]]
```

- (e) When the amount of data is too large to be copied in one operation, the message from step (b) is displayed again. After the floppy disk has been copied, the following message will appear:

```
Copy complete
Another copy (1:Yes/2:No) ?
```

- (f) To copy another disk, type **1** and the message from step (a) is displayed again. Entering **2** returns the test program to the DIAGNOSTIC MENU.

4. DUMP program

- (a) When DUMP program is loaded, the following message appears:

```
DIAGNOSTICS-HARD DISK & FLOPPY DISK DUMP : V7.00
Drive type select (1:FDD, 2:HDD) ?
```

- (b) Select a format type number. If 2:HDD is selected, the display will go to step (h).

If 1:FDD is selected, the following message appears:

```
Select drive number (1:A, 2:B) ?
```

- (c) Select a drive number and the following message will be displayed.

```
Format type select (1:2DD, 2:2HD) ?
```

- (d) Select a format type and the following message will appear:

```
2HD media mode (1:1.20MB, 2:1.44MB, 3:1.23MB) ?
```

- (e) Select a media mode and the following message will appear:

```
Insert source disk into drive A:
Press any key when ready.
```

- (f) Insert a source disk and press any key and the following message will appear:

```
— Max. address —
[Track ] = XXXX
[ Head ] = XX
[Sector] = XX
Track number ????
```

- (g) Select the track number, the head number and the sector number you want to dump. The system will access the disk and dump a list. Then the message shown in (k) will appear.

- (h) The following message will appear.

```
Select drive number (1:C, 2:D) ?
```

- (i) Select a drive number and the following message will be displayed.

```
— Max. address —
[LBA ] = XXXXXXXXXXX
LBA number ??
```

- (j) Set the LBA number you want to dump. The system will access the disk and dump a list.

- (k) The following message will appear. To finish the dump, select 3.

Press number key (1:up, 2:down, 3:end) ?

- (l) The following message will appear. Selecting 2 returns to the FDD UTILITIES MENU.

Another dump (1:Yes, 2:No) ?

5. HDD-ID READ program

Loading HDD ID READ program displays the following HDD ID configuration:

```
[HDD ID Read (VX.XX)] [Drive #X]
  ID code (h)           = XXXX
  No. of Cylinders      = XXXXXXXXX
  Removable Cylinders   = XXXXXXXXX
  No. of Heads          = XXXXXXXXX
  Unformat Bytes/Track  = XXXXXXXXX
  Unformat Bytes/Sector = XXXXXXXXX
  Sectors/Track         = XXXXXXXXX
  Gap Length            = XXXXXXXXX
  Sync. Bytes           = XXXXXXXXX
  Reserved (h)         = XXXX
  Serial No.            = YYY...
  Controller Type (h)   = XXXX
  Sector Buffers        = XXXXXXXXX
  ECC Bytes             = XXXXXXXXX
  Firmware Rev.         = YYYYYY..
  Model No.             = YYYY...
  Reserved (h)         = XXXX
  Double Word Capability = XXXXXXXXX

  Press [Enter] key
```

Press **Enter** to return to the FDD UTILITIES MENU.

3.25 System Configuration

3.25.1 Function Description

The System Configuration program contains the following configuration information for the computer:

1. Processor Type
2. VGA Controller
3. MS-DOS Version
4. BIOS ROM version (1st ID, 2nd ID)
5. BOOT ROM version
6. KBC version
7. PS Micon Version
8. Total Memory Size
9. Battery Code
10. Sound System
11. The number of printer adapters
12. The number of ASYNC adapters
13. The number of Co-processors
14. The number of PCMCIA Slots
15. Modem Type
16. LAN Type
17. The number of FDDs
18. The number of HDDs
19. Date/Time

3.25.2 Operations

1. Selecting 8-SYSTEM CONFIGURATION from the DIAGNOSTIC MENU and pressing **Enter** displays the following system configuration:

```

System Configuration Display : Ver X.XX [Machine Name : XXXX      ]

** - Processor Type           = XX - XXXXX
** - VGA Controller           = xxxx
*  - MS-DOS Version           = Vxxxx
*  - BIOS-ROM Version         = Vxxxx 1st ID = XXH, 2nd ID = XXH
*  - BOOT-ROM Version         = Vxxxx
*  - KBC Version              = Vxxxx
*  - PS Micom Version         = Vxxxx (EC Version = VX.XX)
*  - Total Memory Size=      xxxxxMB(Conventional Memory = 00639KB)
*  - Battery Code             =
** - Sound System             = XXXXX
*  - 0 Printer Adapter        LPT1=      LPT2=      LPT3=
*  - 0 ASYNC Adapter          COM1=      COM2=      COM3=
*  -
*  - 1 Math Co-Processor
*  - 1 PCMCIA Slot
*  - Modem                     = MDC (AS KEY)
*  - LAN                       = Kinnerth
*  - X Floppy Disk Drive(s)    Tracks=XX, Head=XX, Section=XX
*  - 1 Hard Disk Drive(s)     #1 Sectors = XXXXXXXXXXXX (XXXXXMB)
*                               #2 Sectors =                (      MB)
*  -
Press [Enter] Key             [Date = YYYY-MM-DD, HH:MM:SS]

```

2. Press **Enter** to return to the DIAGNOSTIC MENU.

3.26 SETUP

3.26.1 Function Description

This program displays the current system setup information as listed below:

1. Memory
 - (a) Total
2. System Date/Time
 - (a) System Date
 - (b) System Time
3. Battery
4. Password
5. HDD Password
 - (a) HDD
 - (b) HDD Password Mode
 - (c) User Password
 - (d) Master Password
6. Boot Priority
 - (a) Boot Priority
 - (b) HDD Priority
 - (c) Network Boot Protocol
7. Display
 - (a) Power On Display
 - (b) LCD Display Stretch
8. Others
 - (a) CPU Cache
 - (b) Level 2 Cache
 - (c) Dynamic CPU Frequency Mode
 - (d) Auto Power On
9. Configuration
10. Drives I/O
 - (a) Built-in HDD
 - (b) PC Card
11. PCI bus
12. PC Card
13. Peripheral
 - (a) Internal Pointing Device
 - (b) Hard Disk Mode
14. Legacy Emulation
 - (a) USB KB/Mouse Legacy Emulation

(b) USB-FDD Legacy Emulation

15. PCI LAN

16. SD

3.26.2 Accessing the SETUP Program

Selecting 0-SETUP from the DIAGNOSTICS MENU and pressing **Enter** displays the followings:

SYSTEM SETUP (1/2) ACPI BIOS version = x.xx

<p>MEMORY</p> <p>Total = XXXXX KB (*1)</p>	<p>BOOT PRIORITY</p> <p>Boot Priority =HDD→FDD→CD-ROM→LAN HDD Priority =Built-in HDD→PC card Network Boot Protocol = PXE</p>
<p>SYSTEM DATE/TIME</p> <p>System Date =XX-XX-XXXX System Time =XX:XX:XX</p>	<p>DISPLAY</p> <p>Power On Display = Auto-Selected LCD Display Stretch = Enabled</p>
<p>BATTERY</p> <p>Battery Save Mode = Full Power</p>	<p>Others</p> <p>CPU Cache = Enabled Level 2 Cache = Enabled Dynamic CPU Frequency Mode = Dynamically Switchable = Dynamically Auto Power On = Disabled</p>
<p>PASSWORD</p> <p>Not Registered</p>	
<p>HDD PASSWORD</p> <p>HDD = Built-in HDD HDD Password Mode = User Only User Password = Not Registered Master Password = Not Registered</p>	

↑↓→←: Select items Space, BkSp: Change values PgDn, PgUp: Change pages
Esc: Exit without saving Home : Set default values End: Save changes and Exit

<p>CONFIGURATION</p> <p>Device Config. = Setup by OS</p>	<p>PC CARD</p> <p>Controller Mode = Auto-Selected</p>
<p>DRIVERS I/O</p> <p>Built-in HDD = Primary IDE(1F0H/IRQ14) PC Card = Others (190H/IRQ3)</p>	<p>PERIPHERAL</p> <p>Internal Pointing Device = Enabled Hard Disk Mode = Enhanced IDE(Normal)</p>
<p>PCI BUS</p> <p>PCI BUS = IRQ10, IRQ11</p>	<p>LEGACY EMULATION</p> <p>USB KB/Mouse Legacy Emulation = Enabled USB-FDD Legacy Emulation = Enabled</p>
	<p>PCI LAN</p> <p>Built-in LAN = Enabled</p>
	<p>SD</p> <p>SD Controller = Enabled</p>

↑↓→←: Select items Space, BkSp: Change values PgDn, PgUp: Change pages
Esc: Exit without saving Home : Set default values End: Save changes and Exit

NOTE: (*1) This depends on model.

Moving Within the SETUP Menu and Changing Values

1. Press ← and → to move between the columns horizontally. Press ↑ and ↓ to move between items in a column. Press **Fn+↑ (PgUp)** and **Fn + ↓ (PgDn)** to move between the two pages.
2. Press either the **Space bar** or **Back Space** to change the value.

Accepting Changes and Exiting the SETUP Window

1. Press **End** to accept the changes you made.

If the changed item does not require the system to reboot, the following message is displayed:

```
Are you sure? (Y/N)
```

If the changed item requires the system to reboot, the following message is displayed:

```
Are you sure? (Y/N)  
The changes you made will cause the system to reboot.
```

2. To make other changes, press **N**. Repeat the steps above.
3. To accept the changes, press **Y**.

NOTE: You can press **Esc** to quit at any time without saving changes. *SETUP* asks you to confirm that you do not want to save your changes. When *SETUP* is displayed at the next time, the current configuration appears.

The Factory Preset Configuration

When you access *SETUP*, the current configuration is displayed.

1. To display the factory preset configuration, press **Home**.
2. To accept the default settings, press **End** and then press **Y**.

NOTE: When you execute the default setting, the following settings are not changed:

- (1) HDD mode
- (2) Password
- (3) Write Policy

SETUP Options

The SETUP screen is divided into 16 functionally related groups. This section describes each group and its option.

1. Memory

(1) Total

This field displays the total amount of memory installed and it is automatically calculated by the computer. You cannot change this value.

2. System Date/Time

(a) System Date/Time

Use this option to set the date (month-day-year).

(b) System Date/Time

Use this option to set the time (hour : minute).

3. Battery

This option is used to select Full Power, Low Power or User Setting of the battery save mode. When you select the battery save mode, the followings will appear.

Full Power

The following shows full power settings.

BATTERY SAVE OPTIONS

Processing Speed	= High
CPU Sleep Mode	= Enabled
Display Auto off	= 30Min.
HDD Auto off	= 30Min.
LCD Brightness	= Bright (*1) Super-Bright (*2)
Cooling Method	= Maximum Performance

Low Power

The following shows low power settings.

BATTERY SAVE OPTIONS

Processing Speed	= Low
CPU Sleep Mode	= Enabled
Display Auto off	= 03Min.
HDD Auto off	= 03Min.
LCD Brightness	= Semi-Bright (*1) Bright (*2)
Cooling Method	= Battery Optimized

NOTE: Display of the LCD Brightness will be changed in the condition below:

(*1) Operating the battery

(*2) Using the AC adapter

User Setting Use this option to set the battery save parameters on the sub-window, **BATTERY SAVE OPTIONS**. For details, see *Battery Save Options* below.

Battery Save Options

Processing Speed

This feature changes the CPU processing speed.

High CPU operates at 1.4/1.5/1.6/1.7GHz (Pentium-M)
(Default in Full Power Mode)

Low CPU operates at half processing speed.
(Default in Low Power Mode)

CPU Sleep Mode

Use this option to enable or disable the CPU sleep function.

Enabled Enables sleep mode. (Default)

Disabled Disables sleep mode.

Display Auto Off

Use this option to disable or set the duration of the display automatic power off function. This function causes the computer to turn the LCD panel's illumination off if you make no entry (including no operation of a tablet pen or touch pad) for the set period of time.

Disabled Disables display automatic power off.

xx Min. Automatically turns off the power to the LCD panel's illumination if the panel is not used for the duration set. The duration xx can be set to 1, 3, 5, 10, 15, 20 or 30 minutes.

HDD Auto Off

Use this option to set the duration of the HDD automatic power off function. This option stops the rotation of the HDD if you do not read or write to the HDD more than the duration set.

xx Min. Automatically turns off the power to the hard disk drive if it is not used for the duration set. The duration xx can be set to 1, 3, 5, 10, 15, 20, 30 minutes or Disabled.

LCD Brightness

Use this option to set the level of LCD brightness.

Super-Bright Full brightness for maximum visibility.

Bright Full brightness for high visibility.

Semi-Bright Less than full brightness for saving power.

Cooling Method

Maximum Performance If the CPU becomes too hot, the fan turns on automatically in a high speed to cool down the CPU.

Performance If the CPU becomes too hot, the fan turns on automatically. When the CPU temperature falls to a normal range, the fan turns off.

Battery optimized If the CPU becomes too hot, the processing speed is lowered. If the temperature is still too high, the fan turns on. When the CPU temperature falls to a normal range, the fan is turned off and the processing speed is increased.

***NOTE:** Too hot condition may cause defect on the CPU. When the hot condition continues, the power is automatically turned off in resume mode.*

4. Password

When the incorrect password is continuously entered three times, the cursor does not move to this option. In this case, reboot the computer and register the password again.

Registered The user password has been registered.

Not registered The user password has not been registered.

For details on setting the user password, refer to the User's Manual.

5. HDD Password

***NOTE:** The contents of this option cannot be changed when the setup is started from the test program.*

(1) HDD

This option specifies the HDD to which the password is set. The built-in HDD is specified and you cannot change it.

(2) HDD Password Mode

This option selects the type of HDD password you want to register. You can select the type when any HDD passwords (user HDD password or master HDD password) are not set. If any HDD password is set, cancel it and select the type.

User Only Only the user password is registered. (Default)

Master+User Both the master password and the user password are registered.

(3) User Password

Use this option to set the user password.

(4) Master Password

This option appears when "HDD Password mode" is set to "Master+User".

Set the master password first and then set the user password.

6. Boot Priority

(a) Boot Priority

Use this option to set the priority for booting of the computer and the priority for the HDD for booting.

FDD→HDD→CD-ROM→LAN: The computer looks for bootable files in the following order: FDD (*1), HDD (*2), CD-ROM (*3) and LAN

HDD→CD-ROM→LAN→FDD: The computer looks for bootable files in the following order: HDD, CD-ROM, LAN and FDD.

FDD→CD-ROM→LAN→HDD: The computer looks for bootable files in the following order: FDD, CD-ROM, LAN and HDD.

CD-ROM→LAN→HDD→FDD: The computer looks for bootable files in the following order: CD-ROM, LAN, HDD and FDD.

CD-ROM→LAN→FDD→HDD: The computer looks for bootable files in the following order: CD-ROM, LAN, FDD and HDD.

HDD→FDD→CD-ROM→LAN: The computer looks for bootable files in the following order: HDD, FDD, CD-ROM and LAN. (Default)

(*1) The FDD is looked for when the boot disk is contained in the external FDD. When an SD memory card is set as the boot disk, the external FDD is looked for first. Next, the SD memory card is looked for.

(*2) The HDDs are looked for in the order specified in "HDD Priority".

(*3) The CD-ROM is available only with the optional optical disk drive.

(b) HDD Priority

Use this option to set the priority for booting the computer from the HDD.

Built-in HDD -> PC Card The computer will look for the built-in HDD first, next the PC card. (Default)

PC Card -> Built-in HDD The computer will look for the PC card first, next the built-in HDD.

(c) Network Boot Protocol

Use this option to set the starting method via a network.

PXE Sets to PXE protocol. (Default)

RPL Sets to RPL protocol.

7. Display

This group of options configures the computer's display.

(a) Power On Display

This option is used to select the display when booting up.

Auto-Selected Selects an external monitor if one is connected. Otherwise it selects the internal LCD. (Default)

LCD+Analog RGB Selects both the internal LCD and the external CRT for simultaneous display.

System LCD only Selects the internal monitor even if the external LCD is connected.

NOTE: When LCD+Analog RGB is selected while connecting the external display not corresponding to SVGA mode, no image appears on the display.

(b) LCD Display Stretch

LCD Display Stretch enables or disables a larger display area of the screen.

Enabled Enables the LCD display stretch feature. (Default)

Disabled Disables the LCD display stretch feature.

8. Others

Whether or not you need to configure the computer with these options depends primarily on the kind of software or peripherals you use.

(a) CPU Cache

Use this option to enable or disable the CPU cache.

Enabled Enables the CPU cache. (Default)

Disabled Disables the CPU cache.

When "Enabled" is selected, the following subwindow is displayed to select the cache write policy. The options for this setting are **Write-back** (default) and **Write-through** for CPU cache.

OPTION	
Write policy	= Write-back

Write-back policy provides better system performance, because main memory is accessed only when necessary to update the cache contents with changes in main memory. Write-through policy accesses main memory every time data is handled by the processor.

(b) Level 2 Cache

Use this option to enable or disable the level 2 cache. When "CPU Cache" is set to "Disabled", this option cannot be changed.

Enabled Enables the level 2 cache. (Default)

Disabled Disables the level 2 cache.

(c) Dynamic CPU Frequency mode

Use this option to choose a setting from the followings.

Dynamically Switchable

Enables Intel SpeedStep technology. When the computer is in use, CPU power consumption and clock speed are automatically switched when necessary. (Default)

Always High Disables Intel SpeedStep technology and always runs the processor at its fastest speed.

Always Low Disables Intel SpeedStep technology and always runs the processor at low power consumption and low speed

(d) Auto Power On

This option displays setting for Wake-up on LAN.

Disabled Indicates auto power on and Wake-up on LAN is not set.

Enabled Indicates auto power on and Wake-up on LAN is set.

When “Enabled” is set, the following subwindow appears.

Auto power on and Wake-up on LAN is set in the options subwindow. To set alarm time, use **Space** and **BackSpace**. To switch between time and minute, month and date, use **↑** and **↓**.

OPTION	
Alarm Time	= 00:00:00
Alarm Date Option	= Disabled
Wake-up on LAN	= Disabled

Alarm Time sets a time and date for automatic power on. Second cannot be set. When this option is set to “Disabled”, the time for automatic power on is not set.

Alarm Date Option sets a month and date in order for automatic power on. When Alarm Time is set to “Disabled”, month and date for automatic power on is not set.

Wake-up on LAN automatically turn on the computer when accessed by the administrator of LAN. When Built-in LAN is “Enabled”, this option can be set to “Enabled”. AC adapter is required for this option.

- NOTE:**
1. Do not remove the AC adapter and battery pack at the same time when you use this feature. If you do so, data saved by the resume function will be lost. You must also reset this option.
 2. If you have set a password and the computer starts up by the Auto Power On function from the hibernation condition, the message “**password =**” is displayed. Enter the password to return to the Windows screen from the hibernation condition.
 3. This option is enabled only once, the setting is reset, after booting up

9. Configuration

This option lets you set the device configuration.

All Devices	BIOS sets all devices.
Setup by OS	Operating system sets devices that it can control. (Default)

NOTE: When using installed OS, selecting “Set by OS” is recommended. But, when setting “PC CARD-Controller Mode” to other than “Auto-Selected”, select “All Devices”.

10. Drives I/O

(a) Built-in HDD

This option displays setting for hard disk drive. It is for information only and cannot be changed.

(b) PC Card

This option displays the interruption level of the PC card HDD. The setting cannot be changed.

11. PCI Bus

This option displays the interrupt level for the Card Bus in the computer. It is for information only and cannot be changed.

12. PC Card

This option displays the PC Card Controller mode. When “Device Config.” is set to “All Devices”, it can be changed.

Auto-Selected	Use this setting when OS supports Plug&Play. (Default)
Card Bus/16-bit	Use this setting when PC card which supports Card Bus does not work properly in “Auto-Selected”.
PCIC Compatible	Use this setting when 16-bit PC card does not work properly in “Auto-Selected” or “CardBus/16-bit”.

13. Peripheral

This option set the HDD and other devices.

(1) Internal Pointing Device

Use this option to set whether the touch pad is available or not.

Enabled Enables touch pad. (Default)

Disabled Disables touch pad.

(2) Hard Disk Mode

Use this item to select the hard disk mode.

Enhanced IDE (Normal) Select this mode when the HDD is used for Windows XP Tablet PC Edition. (Default)

Standard IDE Select this mode when using an OS which does not support the Enhanced IDE. When this mode is selected, up to 528MB is logically available and the rest of the capacity is not usable.

***NOTE:** Formats for Enhanced IDE and Standard IDE are different, so if you change the setting, you will have to reformat the hard disk for the appropriate setting.*

14. Legacy Emulation

(a) USB KB/Mouse Legacy Emulation

This option sets the legacy support condition of the USB keyboard and the USB mouse.

Enabled Enables legacy support. (Default)
USB keyboard and USB mouse are available without the driver.

Disabled Disables legacy support

(b) USB-FDD Legacy Emulation

This option sets the Legacy support condition of the USB floppy disk drive.

Enabled Enables LEGACY support. (Default)
USB floppy disk is available without the driver.

To start the computer by FD, set this option to "Enabled".

Disabled Disables legacy support

15. PCI LAN

This option sets the Enable / Disable of the built-in LAN functions.

Enabled Enables built-in LAN functions. (Default)

Disabled Disables built-in LAN functions.

16. SD

This option sets the Enable / Disable of the SD controller functions.

Enabled Enables SD controller functions. (Default)

Disabled Disables SD controller functions.

3.1 The Diagnostic Test

This chapter explains how to use the Diagnostic Test program which tests the functions of the computer's hardware modules and the Hardware Initial information Setting Tool which sets the configurations needed after repairing.

The Diagnostic Test Program is grouped into the Service Program Modules and the Test Program Modules. The Diagnostic Test consists of 10 programs. Wireless LAN test, Sound/LAN/modem test and Bluetooth test are also supported.

The Hardware Initial information Setting Tool consists of some programs which writes the hardware information or displays the current information of the computer.

NOTE: To start the diagnostics, follow these steps:

1. Check all cables for loose connections.
2. Exit any application and close Windows.

3.1.1 Diagnostics menu

The DIAGNOSTICS MENU consists of the following 7 test programs.

- DIAGNOSTIC TEST
- HEAD CLEANING
- LOG UTILITIES
- RUNNING TEST
- FDD UTILITIES
- SYSTEM CONFIGURATION
- SETUP

The DIAGNOSTIC TEST MENU contains the following 10 functional tests:

- SYSTEM TEST
- MEMORY TEST
- KEYBOARD TEST
- DISPLAY TEST
- FLOPPY DISK TEST
- ASYNC TEST
- HARD DISK TEST
- REAL TIMER TEST
- NDP TEST
- EXPANSION TEST

Other tests are as follows.

- WIRELESS LAN TEST
- SOUND/LAN/MODEM TEST
- BLUETOOTH TEST

You will need the following equipment to perform some of the Diagnostic test programs.

- The Diagnostics Disk (all tests, 5 disks (T&D, Sound/LAN/modem, Wireless LAN, Bluetooth, Thermal radiation control))
- A USB floppy disk drive (all tests)
- A formatted working disk (Floppy disk test)
- A cleaning kit to clean the floppy disk drive heads (FDD Head Cleaning)
- A RS-232C wraparound connector (ASYNC test)
- A PC card wraparound connector (Expansion test)
- An external CRT monitor (Expansion test)
- A USB test module (Keyboard test)
- A USB cable (Keyboard test)
- Headphone (Sound/LAN/modem test)
- A microphone (Sound/LAN/modem test)
- FAT-MODE inspection device (Sound/Modem /LAN test)
- A test media (Sound/Modem /LAN test)
- A LAN wraparound connector (Expansion test)
- Bidirectional machine for wraparound test

3.1.2 H/W (Hardware) initial information setting tool

The H/W initial information setting tool consists of the following 3 programs.

- Initial configuration
- System configuration display
- Digitizer FW write
- E2PROM test (MAC/DMI)

You will need the following equipment to perform some of the programs.

- The Diagnostics Disk (all test (T&D))
- A USB floppy disk drive (all tests)
- A LAN wraparound connector (E2PROM test)

3.2 Executing the Diagnostic Test

To start the DIAGNOSTIC PROGRAM, follow these steps:

1. Insert the test program disk (No.1) in the floppy disk drive.
2. Release the lock of the power switch and turn on the computer by pressing the **F12**. Select the FDD in the display for selecting booting unit. Then press **Enter** and the following menu appears:

```

1. Repair Main (T&D)
2. Repair initial config set

Enter a choice: 1

```

To start the Diagnostics menu (T&D), press **1** and **Enter**.

To start the H/W initial information setting tool, press **2** and **Enter**.

3.2.1 Diagnostics menu (T&D)

The following menu appears.

```

TOSHIBA personal Computer XXXX DIAGNOSTICS
version XXX (c) Copyright TOSHIBA Corp. 20XX

```

```

DIAGNOSTICS MENU :

1 - DIAGNOSTIC TEST
2 -
3 -
4 - HEAD CLEANING
5 - LOG UTILITIES
6 - RUNNING TEST
7 - FDD UTILITIES
8 - SYSTEM CONFIGURATION
9 - EXIT TO MS-DOS
0 - SETUP

```

```

↑↓→← : Select items
Enter : Specify
Esc   : Exit

```

NOTE: To exit the DIAGNOSTIC TEST MENU, press the **Esc**. If a test program is in progress, press **Ctrl+Break** to exit the test program. If a test program is in progress, press **Ctrl+C** to stop the test program.

Set the highlight bar to **1**, and press **Enter**. The following TEST MENU will appear:

```
TOSHIBA Personal Computer XXXX DIAGNOSTICS
Version XXX (c) Copyright TOSHIBA Corp. 20XX
```

```
DIAGNOSTIC TEST MENU :
```

```
1 - SYSTEM TEST
2 - MEMORY TEST
3 - KEYBOARD TEST
4 - DISPLAY TEST
5 - FLOPPY DISK TEST
6 -
7 - ASYNC test
8 - HARD DISK TEST
9 - REAL TIMER TEST
10 - NDP TEST
11 - EXPANSION TEST
12 -
13 -
14 -
88 - ERROR RETRY COUNT SET [FDD & HDD]
99 - EXIT TO DIAGNOSTICS MENU
```

```
↑↓→← : Select items
Enter : Specify
Esc   : Exit
```

Functions 1 through 14 are the Diagnostic Tests. Function 88 sets the floppy disk drive and hard disk drive error retry count (0-255).

To return to the Diagnostics Menu, set the highlight bar to Function 99 and press **Enter**.

Select the option you want to execute on the test menu and press **Enter**. When you select 1- SYSTEM TEST, the following message will appear:

```
SYSTEM TEST      XXXXXXXX
```

```
XXXX DIAGNOSTIC TEST VXXX
[Ctrl]+[Break] : test end
[Ctrl]+[C]      : key stop
```

```
SUB-TEST   : XX
PASS COUNT: XXXXX      ERROR COUNT: XXXXX
WRITE DATA: XX        READ DATA  : XX
ADDRESS    : XXXXXXXX  STATUS     : XXX
```

SUB-TEST MENU :

```
01 - ROM checksum
02 - Dock/Undock
03 -
04 - Fan ON/OFF
05 - Geyserville
06 - Quick charge
07 - DMI read
08 - DMI write
09 -
10 - Calibration
11 -
12 - Second FAN ON/OFF
99 - Exit to DIAGNOSTIC TEST MENU
```

```
↑↓→← : Select items
Enter : Specify
Esc   : Exit
```

NOTE: The menu displayed on your computer may be slightly different from the one shown above.

Select the subtest number to execute from the subtest menu and press **Enter**. The following message will appear:

```
TEST LOOP : YES (or NO)
ERROR STOP : YES (or NO)
```

Use the right and left arrow keys to move the cursor to the desired option.

Selecting **YES** in TEST LOOP increases the pass counter by one each time the test cycle ends, and restarts the test cycle.

Selecting **NO** in TEST LOOP terminates the test and returns to the subtest menu after one test cycle is complete.

Use the up and down arrow keys to move the cursor to “**ERROR STOP**”.

Use the right and left arrow keys to move the cursor to the option to execute and press **Enter**.

Selecting **YES** in ERROR STOP stops the test program when an error is occurred and displays the error status. The operation guide will appear on the right side of the display as shown below:

```

ERROR STATUS NAME    [[ HALT OPERATION ]]

                                1: Test end
                                2: Continue
                                3: Retry

```

```

Press [1]  Terminates the test program and returns to the subtest menu.
Press [2]  Executes the next test.
Press [3]  Restarts the test from the error.

```

Selecting **NO** in ERROR STOP displays the error status and increases error counter by one if an error is occurred, and executes the next step.

The sections on and after 3.5 detail the tests of the DIAGNOSTIC TEST MENU. Refer to Sections 3.21 through 3.26 for detailed information on the remaining Service Program Module functions.

Table 3-1 in section 3.4 describes the function of each test on the subtest menu. Table 3-4 in section 3.19 describes the error codes and error status for each error.

3.2.2 H/W initial information setting tool

The following menu appears in the display.

```

#####
####      H/W initial information setting tool          VX.XX  ####
#####
*  1 ..... Initial configuration                      *
*  5 ..... Digitizer FM write                          *
*  8 ..... System configuration display                 *
*  9 ..... E2PROM test (MAC/DMI)                       *
*****
.... Press test number[1,5,8,9] ?

```

For more details on this test, refer to the section 3.3.

3.3 Setting of the hardware configuration

To execute this program, select 2-Repair initial config test from the startup menu, press **Enter** and follow the directions on the screen. The H/W initial information setting tool consists of three subtests. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 Initial configuration

This subtest executes the following items and shows their contents in the display. When an item ends normally, the program proceeds automatically to the next item. When an error is found, the program stops and waits for key input. (After solving the problem, it starts executing the item again.)

However, input the information when the DMI information appears. For details of inputting DMI information, refer to "Subtest 08, DMI write" in the System test.

- Setting of the CPU set table
- Setting of the micro code
- Inputting or writing of DMI information (RAM, text)
- Setting of the HWSC
- Setting of the UUID
- Display of the DMI information (including UUID)

After completion of the above settings, the DMI information and the H/W configuration & DMI information are appear in order. Check the contents and press **Enter**.

Subtest 05 Digitizer FM write

This subtest rewrites the digitizer's firmware. When the version of the firmware is under 45, this subtest rewrites the firmware. If the firmware's version is 45 or more, no rewrite is executed in this subtest.

When the test ends, the display returns to the H/W initial information setting tool menu automatically.

Subtest 08 System configuration display

This subtest displays the information of the system configuration.

When the following message appears, press **Enter**.

Press [Enter] key

For details of the system configuration information, refer to "3.25 System configuration".

Subtest 09 E2PROM test (MAC/DMI)

NOTE: To execute this subtest, the LAN wraparound connector is required.

This subtest checks whether the LAN function works correctly.

When the following message appears, press **Enter**.

COMPLETED_

After that, it checks automatically whether the MAC address and DMI information are written.

3.4 Subtest

Table 3-1 lists the subtest names for each test program in the DIAGNOSTIC TEST MENU.

Table 3-1 Subtest names (1/2)

No.	Test Name	Subtest No.	Subtest Name
1	SYSTEM	01	ROM checksum
		02	Dock/Undock
		04	Fan ON/OFF
		05	Geyserville
		06	Quick charge
		07	DMI read
		08	DMI write
		10	Calibration
		12	Second Fan ON/OFF
2	MEMORY	01	Conventional memory
		02	Protected mode
		04	Cache memory
		05	L2 Cache memory
		06	Stress
3	KEYBOARD	01	Pressed key display
		02	Pressed key code display
		04	Touch Pad
		05	USB (Port0, Port1) test
		07	Toshiba scroller test
		08	Windows security button test
4	DISPLAY	01	VRAM read/write for VGA
		02	Gradation for VGA
		03	Gradation for LCD
		04	Gradation & Mode test for VGA
		05	All dot on/off for LCD
		06	"H" pattern display
		07	LCD Brightness
		08	CRT shadow
5	FLOPPY DISK	01	Sequential read
		02	Sequential read/write
		03	Random address/data
		04	Write specified address
		05	Read specified address

Table 3-1 Subtest names (2/2)

No.	Test Name	Subtest No.	Subtest Name
7	ASYNCR	06 07	FIR/SIR point to point (send) FIR/SIR point to point (receive)
8	HARD DISK	01 02 03 04 06 07 09 10	Sequential read Address uniqueness Random address/data Cross talk & peak shift Write specified address Read specified address Sequential write W-R-C specified address
9	REAL TIMER	01 02 03	Real time Backup memory Real time carry
10	NDP	01	NDP test
11	EXPANSION	01 03	PC Card wraparound RGB monitor ID
-	Wireless LAN	1 2 3 0	Transmit & Receive test [Responder] MAC Address test [Mini-PCI Wireless LAN] Wireless LAN (WEP64/128) test Transmit & Receive test [Initiator]
-	BLUETOOTH	-	-
-	SOUND/ LAN/ MODEM	01 02 03 04 05 06	Microphone recording & play 2 & 3 Microphone recording & play 3 & 4 Sin Wave LAN MODEM Tablet Dock CD Test
-	THERMAL RADIATION CONTROL	-	-

3.5 System Test

To execute the System Test, select 1-SYSTEM TEST from the DIAGNOSTIC TEST menu, press **Enter** and follow the directions on the screen. The System test consists of nine subtests. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 ROM Checksum

This subtest executes a checksum test of the BIOS ROM (range: F0000h to FFFFFh, 64KB) on the System Board.

Subtest 02 Dock/Undock

***NOTE:** To execute this subtest, attach the computer to the Tablet Multi Dock before selecting the subtest number.*

The following message will appear. Then press the eject button of Tablet Multi Dock and **Enter**.

Slide Eject-SW, and press [Enter] key

The following message will appear. Press **Enter** without pressing the eject button of Tablet Multi Dock.

Release Eject-SW, and press [Enter] key

If the test ends successfully, the display returns to the SYSTEM TEST menu.

After returning to the SYSTEM TEST menu, disconnect the computer from Tablet Multi Dock.

Subtest 04 Fan On/Off

This subtest turns on/off the fan motor with Fan ON/OFF commands.

The following message will appear. Make sure the revolution of the fan stops and press **Enter**.

*** Test Fan Revolution 0000RPM Start

Press [Enter] key

The following message will appear. Make sure the low-speed revolution of the fan starts and press **Enter**.

*** Test Fan Revolution Low Speed Start

Press [Enter] key

The following message will appear. Make sure the high-speed revolution of the fan starts and press **Enter**.

```
*** Test Fan Revolution High Speed Start
```

```
Press [Enter] key
```

Subtest 05 Geyserville

If the CPU supports Geyserville (SpeedStep), this Subtest checks that the CPU operating clock speed can be changed.

Subtest 06 Quick charge

This subtest checks the status for the quick charge.

Subtest 07 DMI read

This subtest displays the information in the Flash-ROM in the following format.

```
Model Name       : XXXXXXXXXXXX
Version Number   : XXXXXXXXXXXX
Serial Number    : XXXXXXXXX
Model Number     : XXXXXX-XXXXX
PCN/BND Number  : XXXXXXXXXXXX/XXXXXXXXXXXX
UUID Number      : XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

```
Press [Enter] to EXIT
```

To exit this subtest and return to the SYSTEM test menu, press **Enter**.

Subtest 08 DMI write

The following messages appear in order. Input each information. (If you do not replace the PCB, the DMI information should not be changed.)

1. “Enter Model Name ?” is displayed.

Input the computer’s model name and press **Enter**. (e.g. Portege)

2. “Enter Version Number ?” is displayed.

Input the computer’s version number and press **Enter**. (e.g. PC18070C313S)

3. “Enter Serial Number ?” is displayed.

Input the computer’s serial number and press **Enter**. (e.g. 12345678)

4. “Enter Model Number ?” is displayed.

Input the computer’s sales model number and press **Enter**. (e.g. PP200-AAAAA)
5. “Enter Bundle Number ?” is displayed.

Input the computer’s PCN/Bundle number and press **Enter**. (e.g. PMSREQ3Q34H/S0123456789)
6. “Write data OK (Y/N) ?” is displayed.
To write the DMI information to the Flash ROM, press **Y**, and then **Enter**. After that, the message "Create DMIInfo.TXT (Y/N)?" is displayed. Press **N** and **Enter** because the data is not needed for maintenance test.

Subtest 10 Calibration

This subtest sets the standard position for the automatic display layout change with tablet display.

Before starting this subtest, disconnect all the connector form the computer and set the display to the tablet style.

An arrow appears on the display. Then place the computer on the flat table with the arrow head to the bottom and press the Cross Function Button.

Continuously, the arrow points other directions. Then execute the test same way as the above.

NOTE: *When placing the computer, make sure the computer stands vertically.*

After executing the subtest for each of four directions, the result appears in the screen.

Press **Cross Function Button** to return to the select menu display.

Subtest 12 Second Fan ON/OFF

This subtest check that the computer controls the Second Fan by the command.

Following message appears in the display. Then confirm the fan stops completely and press **Enter**.

Test 2nd Fan Revolution 0000RPM Start

PRESS [Enter] KEY

The following message appears in the display. Then confirm the fan starts operating and press **Enter**.

Test 2nd Fan Revolution LEVEL 5 speed Start

PRESS [Enter] KEY

3.6 Memory Test

To execute the Memory Test, select 2-MOMORY TEST from the DIAGNOSTIC TEST menu, press **Enter** and follow the directions on the screen. The Memory test consists of five subtests. Set the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 Conventional Memory

This subtest writes test data to conventional memory (0 to 640 KB), and reads and compares the result with the original data. The test address is displayed per 4 KB.

Subtest 02 Protected Mode

NOTE: The CONFIG.SYS file must be configured without extended memory manager programs such as EMM386.EXE, EMM386.SYS or QEMM386.SYS. Also, the HIMEM.SYS must be deleted from the CONFIG.SYS file.

This subtest writes constant data and address data (from 1MB to maximum MB), and reads the new data and compares the result with the original data.

Subtest 04 Cache Memory

To test the cache memory, a pass-through write-read comparison of '5A' data is run repeatedly to the test area (from '7000': 'Program' size to '7000': '7EEE' (32 KB)) to check the hit-miss ratio (on/off status) for CPU cache memory.

Number of misses < Number of hits → OK

Number of misses ≥ Number of hits → NG

Subtest 05 L2 Cache Memory

To test the L2 cache memory, a pass-through write-read comparison of '5A' data is run repeatedly to the test area ('7000':'Program' size to '7000':'7FFF' (32 KB)) to check the hit-miss ratio (on/off status) for L2 cache memory.

Number of misses < Number of hits → OK

Number of misses ≥ Number of hits → NG

Subtest 06 Stress

This test prepares the write/read buffer (size:1b30h) and produce write date in the write buffer. The write data is written in the area larger than 1 MB and read into the read buffer then repeated to compare until maximum size.

Test data:

ffh, ffh, ffh, ffh, ffh
00h, 00h, 00h, 00h, 00h
ffh, ffh, ffh, 00h, ffh
00h, 00h, 00h, ffh, 00h
00h, ffh, ffh, ffh, ffh
00h, 00h, 00h, 00h, aah

These data are generated repeatedly by 1b30h size.

Subtest 04 Touch Pad

This subtest checks the functions of the pointing device as shown below.

- A) Direction of touch pad.
- B) Touch pad switch function check.

This test reports the response of touch pad, and touch pad switch. When you touch the touch pad and slide your finger towards the upper left, the <POINTING> display changes according to the following illustration. When a touch pad switch is pressed, the color of the <BUTTON> being pressed changes.

The parameters appear on the right side of the display. If the touch pad switches are pressed at the same time, the subtest menu displays.

```
***** IPS (PAD) TEST PROGRAM (Vx.xx) *****
```

```
<POINTING>
```



```
<PARAMETER>
```

```
STATUS:0000h  
X-RATE:0000h  
Y-RATE:0000h
```

```
<BUTTON>
```

```
(1) (2)
```



```
<<Press BUTTON1 + BUTTON2 THEN END>>
```

```
***** IPS (PAD) TEST PROGRAM (Vx.xx) *****
```

```
<POINTING>
```



```
< PARAMETER >
```

```
STATUS:0018  
X-RATE: OK  
Y-RATE: OK
```

```
<BUTTON>
```

```
(1) (2)
```



```
<<Press BUTTON1 + BUTTON2 THEN END>> >
```

Subtest 05 USB test

This subtest checks USB. The USB TEST Module (ZD0003P01) and USB Cable (ZD0003P02) must be connected to the computer.

The following message will appear. Select a port to be tested and press **Enter**.

```
Test port number select (1:Port0, 2:Port1, 0:Port0&1) ?
```

If the test ends successfully, OK is displayed. If nothing is displayed, there may be a problem with the USB port. Check the wraparound connection and repeat the test.

Subtest 07 Toshiba scroller test

This subtest checks functioning of the Toshiba scroller.

The following messages appear on the display in order. Move the 4D button (cross function button) to the indicated direction in the following order.

```
KB Test = Down -50
```

```
KB Test = Up -48
```

```
KB Test = Left -4B
```

```
KB Test = Right -4D
```

After the following message appears, press the 4D button.

```
KB Test = Enter -1C
```

After the following message appears, press the ESC (ESC/Rotation) button on the right side of the 4D button.

```
KB Test = ESC -01
```

If the test ends successfully, the display returns to the KEYBOARD TEST menu.

Subtest 08 Windows security button test

This subtest checks functioning of the Windows security button.

Press the Windows security button after the following message appears.

```
Press [ Windows Security ] button
```

If the test ends successfully, the display returns to the KEYBOARD TEST menu.

3.8 Display Test

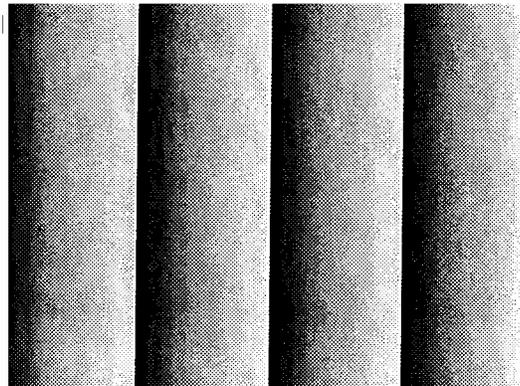
To execute the Display Test, select 4-DISPLAY TEST from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. The Display test contains seven subtests that test the display in various modes. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 VRAM Read/Write for VGA

This subtest writes the constant data (AAh and 55h) and the address data to the video RAM (16MB). The data is read and compared to the original data.

Subtest 02 Gradation for VGA

This subtest displays four colors: red, green, blue and white from left to right across the screen from black to maximum brightness. The display below appears on the screen when this subtest is executed.



To exit this subtest and return to the DISPLAY TEST menu, press **Enter**.

Subtest 03 Gradation for LCD

This subtest displays bands of gradations for mixed colors, then for red, green, and blue. Next, it displays eight solid colors full screen: red, semi-red, green, semi-green, blue, semi-blue, white, and semi-white. Each color displays for three seconds.

Subtest 04 Gradation & Mode test for VGA

This subtest displays gradations for following modes. To change the mode, press **Enter**.

```
[Mode 12]
[Mode 13]
[Mode 3]
[Mode 111 640*480 64K]
[Mode 112 640*480 16M]
[Mode 114 800*600 64K]
[Mode 115 800*600 16M]
[Mode 117 1024*768 64K]
[Mode 118 1024*768 16M]
```

The display below appears on the screen when this subtest is executed.



(Display example: Mode 12)

To exit this subtest and return to the DISPLAY TEST menu, press **Enter**.

Subtest 05 All Dot On /Off for LCD

This subtest displays an all-white screen then an all-black screen. The display changes automatically every three seconds.

3.9 USB Floppy Disk Test

Caution: Before running the floppy disk test, prepare a formatted work disk. Remove the Diagnostics Disk and insert the work disk into the FDD. Otherwise, the contents of the floppy disk will be erased.

To execute the Floppy Disk Test, select **5-FLOPPY DISK TEST** from the **DIAGNOSTIC TEST MENU**, press **Enter**.

1. The following message will appear. Select the kind of media and the start track of the floppy disk drive to be tested, then press **Enter**.

```
Media in drive #1 mode (0:2DD,1:2D,2:2D-2HD/2DD,3:2HD)?
Test start track (Enter:0/dd:00-79)
```

2. The Floppy Disk test contains five subtests that test the FDD. The floppy disk test menu will appear after you select FDD test parameters.

SUB-TEST MENU:

```
01-Sequential read
02-Sequential read/write
03-Random address/data
04-Write specified address
05-Read specified address
99-Exit to DIAGNOSTIC TEST MENU
```

Select the number of the subtest you want to execute and press **Enter**. The following message will appear during the floppy disk test.

```
Floppy Disk      XXXXXXXX
SUB-TEST
PASS COUNT:XXXXX  ERROR
COUNT:XXXXXX
WRITE DATA:XXXXX  READ DATA :XX
ADDRESS   :XXXXXX  STATUS      :XXX
```

```
xxx DIAGNOSTIC TEST VX.XX
[Ctrl]+[Break] ;test end
[Ctrl]+[C]    ;key stop
```

Subtest 01 Sequential read

This subtest performs a Cyclic Redundancy Check (CRC) that continuously reads all the tracks (track: 0 to 39/0 to 79) on a floppy disk.

The start track is specified at the start of the FDD test. Refer to 2. in this chapter.

Subtest 02 Sequential read/write

This subtest continuously writes data pattern B5ADADh to all the tracks (track: 0 to 39/0 to 79) on a floppy disk. The data is then read and compared to the original data.

Subtest 03 Random address/data

This subtest writes random data to random addresses on all tracks (track: 0 to 39/0 to 79) on a floppy disk. The data is then read and compared to the original data.

Subtest 04 Write specified address

This subtest writes the data specified by an operator to a specified track, head, and address.

Subtest 05 Read specified address

This subtest reads data from a track, head, and address specified by an operator.

3.10 ASYNC Test

To execute the ASYNC Test, select 7-ASYNC TEST from the DIAGNOSTIC TEST MENU, press **Enter**, and follow the directions on the screen. The ASYNC Test contains two subtests that test the ASYNC functions.

Move the highlight bar to the subtest you want to execute and press **Enter**.

The following shows the subtest 06 format.

SystemAsynchronous
Speed: 9600BPS
Data: Eight data bits and one parity bit (Even parity)
Data pattern From 20h to 7Eh

Subtest 06 FIR/SIR Point to Point (send)

CAUTION: *This test needs to access to the other computer infrared port from the computer.*

Send from 20h to 7Eh data to the other by using FIR/SIR port and compare original data with data received from the other computer.

Subtest 07 FIR/SIR Point to Point (receive)

This subtest is used with subtest 06 described above. This subtest receives the data from the send side, then sends the received data through the FIR/SIR port.

3.11 Hard Disk Test

To execute the Hard Disk Test, select **8-HARD DISK TEST** from the DIAGNOSTIC TEST MENU, press **Enter**, and follow the directions on the screen. The hard disk test contains eight subtests that test the hard disk drive functions.

CAUTION: *The contents of the hard disk will be erased when subtest 02, 03, 04, 06, 09 or 10 is executed. Before running the test, the customer should transfer the contents of the hard disk to another one by executing BACKUP.EXE or others.*

The following messages will appear after selecting the hard disk test from the DIAGNOSTIC TEST MENU.

1. Select the hard disk test drive number.

```
Test drive number select (1:HDD#1, 2:HDD#2, 0:HDD1&2)
HDC F/W error retry (1: yes, 2:no)
```

2. This message is used to select the error dump operation when a data compare error is detected. Select **yes** or **no**.

```
Data compare error dump 1:no
                        2:Yes
```

3. This message is used to select whether or not the HDC status is displayed on the screen. The HDC status is described in section 3.18. Select yes or no.

```
Detail status display 1:No
                      2:Yes
```

4. After setting is completed, select the number of the subtest and press Enter. The following message will appear.

```
HDD DISK TEST IN PROGRESS  XXXXXXXX
```

```
SUB-TEST:XX
```

```
PASS COUNT:XXXXX  ERROR COUNT:XXXXX
```

```
WRITE DATA:XXXXX  READ DATA  :XX
```

```
ADDRESS  :XXXXXX  STATUS      :XXX
```

```
xxx DIAGNOSTIC TEST VX.XX
[Ctrl]+[Break] ; test end
[Ctrl]+[C] ; key stop
```

The first three digits of the ADDRESS indicate which cylinder is being tested, the fourth digit indicates the head and the last two digits indicate the sector.

The first digit of the STATUS number indicates the drive number being tested and the last two digits indicate the error status code as explained in Table 3-5.

Subtest 01 Sequential read

This subtest is a sequential reading of all the tracks on the HDD starting at track 0 to maximum track. When all the tracks on the HDD have been read, the test starts at the maximum track and reads the tracks on the HDD sequentially back to track 0.

Subtest 02 Address uniqueness

This subtest writes unique address data to each sector of the HDD track-by-track. The data written to each sector is then read and compared with the original data. There are three ways the HDD can be read:

1. Forward sequential
2. Reverse sequential
3. Random

Subtest 03 Random address/data

This subtest writes random data in a random length to random addresses. This data is then read and compared to the original data.

Subtest 04 Cross talk & peak shift

This subtest writes eight types of worst pattern data (listed below) to a cylinder, then reads the data while moving from cylinder to cylinder (to check the data interference in the neighbor track) to compare. After the third pass, it tests the motor-off function (HDD motor is turned off, stops for 20 minutes and is turned on).

Worst pattern data	Cylinder
'B5ADAD'	0 cylinder
'4A5252'	1 cylinder
'EB6DB6'	2 cylinder
'149249'	3 cylinder
'63B63B'	4 cylinder
'9C49C4'	5 cylinder
'2DB6DB'	6 cylinder
'D24924'	7 cylinder

Subtest 06 Write Specified Address

This subtest writes specified data to a specified cylinder and head on the HDD.

Subtest 07 Read Specified Address

This subtest reads data which has been written to a specified cylinder and head on the HDD.

Subtest 09 Sequential Write

This subtest writes specified 2-byte data to all of the cylinders on the HDD.

Subtest 10 W-R-C Specified Address

This subtest writes data to a specified cylinder and head on the HDD, then reads the data and compares it to the original data.

3.12 Real Timer Test

To execute the Real Timer Test, select **9-REAL TIMER TEST** from the **DIAGNOSTIC TEST MENU**, press **Enter** and follow the directions on the screen. The real timer test contains three subtests. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 Real time

This subtest displays and changes the current date and time stored in the real time clock. To execute the real time subtest follow these steps:

Step 1: Select subtest 01 and the following message will appear:

```
Current date : XX-XX-XXXX
Current time : XX:XX:XX
Enter new date:

PRESS [ENTER] KEY TO EXIT TEST
```

Step 2: If the current date is not correct, input the correct date and press **Enter**. The date is updated and the following prompt will appear:

```
Enter new time :
```

Step 3: If the current time is not correct, input the correct time in 24-hour format. The time is updated and the following message appears.

The date and time switches by pressing **Enter**. To exit this subtest, press **Enter** during “Enter new time : ” display.

Subtest 02 Backup memory

This subtest checks the following backup memories:

Writes 1-bit of “on” data (01h through 80h) to address 0Eh through 7Fh

Writes 1-bit of “off” data (FEh through 7Fh) to address 0Eh through 7Fh

Writes the data pattern AAh and 55h to the address 0Eh to 7Fh

Then the subtest reads and compares this data with the original data.

Subtest 03 Real time carry

CAUTION: *When this subtest is executed, the current date and time are erased.*

This subtest checks the real time clock increments. Make sure the date and time are displayed in the following format and they move forward correctly.

Current date : 12-31-1999
Current time : 23:59:58

PRESS [Enter] KEY TO EXIT TEST

Press **Enter** to exit.

3.13 NDP Test

To execute the NDP test, select 10-NDP TEST from the DIAGNOSTICS TEST MENU, press **Enter** and follow the directions on the screen. The NDP test contains one subtest.

Subtest 01 NDP

This test checks the following functions of NDP. This test can be executed when NDP is installed. NDP is installed when the bit 1 of configuration byte is "1".

- Control word
- Status word
- Bus
- Addition
- Multiplication

3.14 Expansion Test

To execute the expansion test, select 11-EXPANSION TEST from the DIAGNOSTICS TEST MENU, press **Enter** and follow the directions on the screen. The expansion test contains two subtests.

NOTE: To execute this subtest, the PC card wraparound connector is required.

Subtest 01 PC Card Wraparound

This test checks the following signal line of the PC card slot:

- Address line
- REG#, CE#1, CE#2 line
- Data line
- Speaker line
- Wait line
- BSY#, BVD1 line

This subtest is executed in the following order:

Sub#	Address	Good	Bad	Contents
01	00001 00001	nn nn	xx xx	Address line REG#, CE#1, CE#2 nn=A0, 90, 80, 00
02	00002	ww	rr	Data line ww=write data, rr=read data
03	00003	—	—	Speaker line
04	00004	40,80	xx	Wait line (40<xx<80)
05	00005	nn	xx	Other lines (BSY#, BVD1) NN=21, 00

NOTE: When selecting the subtest number 01, the following message will appear. Specify the slot you want to use.

```
Test slot number select (1:slot0, 2:slot1, 0:slot0&1)?
```

Subtest 03 RGB monitor ID test

Connect a CRT monitor for this subtest. This subtest is conducted with VESA commands.