
The HDAT2 Cookbook

"How can I do...?"

Version 1.1

08.09.2010

Lubomir Cabla / CBL

<http://www.hdat2.com/>

Contents

CONTENTS.....	2
PREFACE.....	3
RUN THE PROGRAM.....	4
OVERVIEW.....	4
CHANGE THE NATIVE SIZE (HPA, DCO).....	5
OVERVIEW.....	5
CREATE HIDDEN AREA HPA WITH SET MAX ADDRESS.....	5
CREATE HIDDEN AREA DCO.....	9
REMOVE HIDDEN AREA HPA.....	15
REMOVE HIDDEN AREA HPA WITH SET MAX ADDRESS.....	15
REMOVE HIDDEN AREA DCO.....	20
AUTO REMOVE HIDDEN AREAS.....	20
LOCK THE DEVICE.....	24
OVERVIEW.....	24
UNLOCK THE DEVICE.....	26
OVERVIEW.....	26
ERASE THE DEVICE.....	30
OVERVIEW.....	30
SECURITY ERASE THE DEVICE.....	30
SCT WRITE SAME.....	33
SEARCH THE DEVICE.....	39
SEARCH FOR STRING.....	39
SEARCH FOR EMPTY SECTOR.....	43
SEARCH FOR NON-EMPTY SECTOR.....	44
FREQUENTLY ASKED QUESTIONS.....	46

Preface

This is the cookbook of program HDAT2 in pictures for beginners.

There should be the answers for questions "How can I do...?".

For a more detailed information see "User's Manual HDAT2".

I am sorry for my English.

Run the program

Overview

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Device List [WDC WD200EB-00CPF0]
Type      Nr.  Device name                BIOS  LBA  Capacity
-----
FDD       1   3 1.44 MB                   00h
PATA      2!  WDC WD200EB-00CPF0         82h  28   20.02 GB

Controller=Primary/Master Base/CTRL=01F0h/03F6h IRQ=14 Mode=UDMA5/ATA100
CTRL/Device=ATA/PATA [Direct Access]
!SMART: WARNING !POWER: ACTIVE
-

↑↓ Move D Detect P Params ENTER Menu ESC Exit

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Main Menu [WDC WD200EB-00CPF0]

▶Device Tests Menu           Check and Repair bad sectors
▶File System Menu           Check bad sectors only
▶Device Information Menu     Read and Repair bad sectors
▶SMART Menu                 Read bad sectors
▶SET MAX (HPA) Menu         Wipe device
▶Device Configuration Overlay (DCO) Menu Seek device
▶Hidden Areas Menu         Most powerful test
▶Security Menu              User defined test
▼▶Commands Menu

↑↓ Move ENTER Select ESC Return

```

Change the native size (HPA, DCO)

Overview

The hidden area like Host Protected Area (HPA) or DCO area, is an area of a hard drive that is not normally visible to BIOS, an operating system, or user.

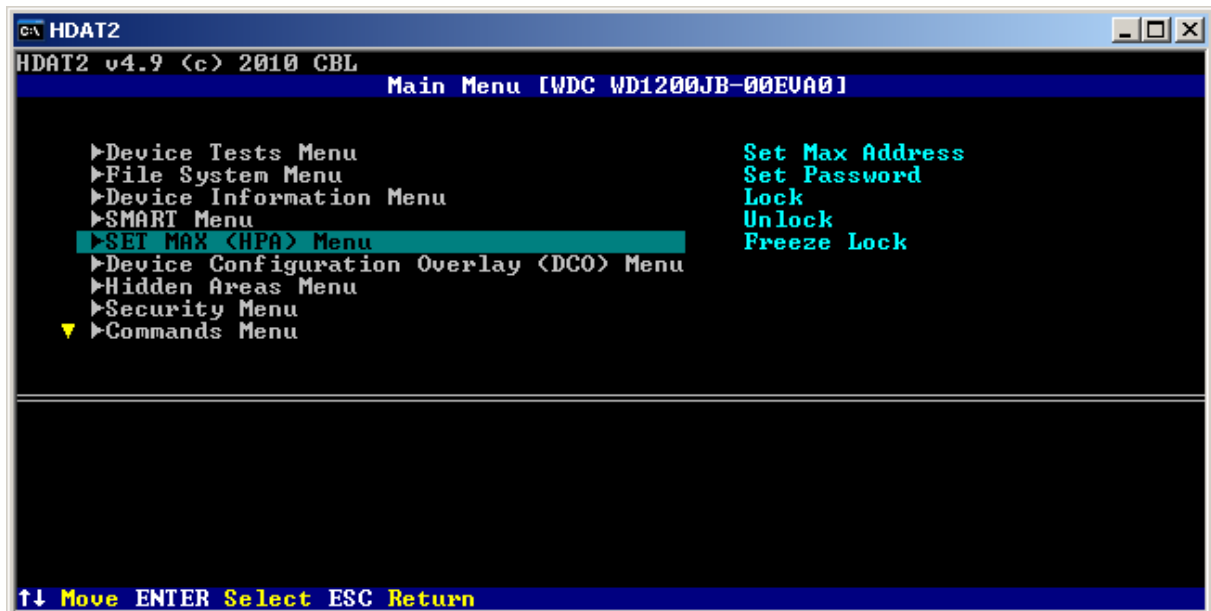
To create or remove Host Protected Area (HPA) is used the command SET MAX ADDRESS.

To create or remove DCO hidden area is used the command DCO MODIFY.

Note: To create or remove DCO area you must first remove an active HPA area. If you want to create both HPA and DCO area first you have to create DCO area without any HPA area. After power off/on you can create HPA area.

Create hidden area HPA with SET MAX ADDRESS

Example: We create HPA with a size of 100 sectors (50 KB).



```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
SET MAX (HPA) Menu [WDC WD1200JB-00EVA0]

Set Max Address
Set Password
Lock
Unlock
Freeze Lock

Host Protected Area: disabled
SET MAX status      : unlocked

Allows to redefine the maximum address of the user accessible address space,
to create or remove unlocked Host Protected Area (HPA).
This command will be aborted in SET MAX locked or frozen mode.

↑↓ Move ENTER Run ESC Return

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Max Address [WDC WD1200JB-00EVA0]

Area                LBA Sectors      Size
-----
Current native      234441648         120.03 GB
Current user         234441648         120.03 GB
Current hidden       0                  0.00 KB ← O.K. nothing to restore

New user             234441648         120.03 GB ← full native size
New hidden           0                  0.00 KB ← O.K.

Use command : SET MAX EXT (48-bit) (if you get an error try 28-bit command)
Volatile mode: YES -> hard settings
SAVE PERMANENTLY: Changes shall preserve over power-up or hardware reset.

↑↓← Change INS Edit B BIOS limit C Command U Volatile ESC Abort

```

In this example we select 28-bit SET MAX command.

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Max Address [WDC WD1200JB-00EVA0]

Area                LBA Sectors      Size
-----
Current native      234441648         120.03 GB
Current user         234441648         120.03 GB
Current hidden       0                  0.00 KB ← O.K. nothing to restore

New user             234441648         120.03 GB ← full native size
New hidden           0                  0.00 KB ← O.K.

Use command : SET MAX (28-bit)
Volatile mode: YES -> hard settings
SAVE PERMANENTLY: Changes shall preserve over power-up or hardware reset.

↑↓← Change INS Edit B BIOS limit C Command U Volatile ESC Abort

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Max Address [WDC WD1200JB-00EVA0]
Area                LBA Sectors          Size
Current native      234441648             120.03 GB
Current user        234441648             120.03 GB
Current hidden      0                     0.00 KB <- O.K. nothing to restore
New user            234441548             120.03 GB <- less than native size
New hidden          100                   50.00 KB <- HPA

Use command : SET MAX <28-bit>
Volatile mode: YES -> hard settings
SAVE PERMANENTLY: Changes shall preserve over power-up or hardware reset.

Are you sure to run 'Set Max Address' <Y/N> ?

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Max Address [WDC WD1200JB-00EVA0]
Area                LBA Sectors          Size
Current native      234441648             120.03 GB
Current user        234441648             120.03 GB
Current hidden      0                     0.00 KB <- O.K. nothing to restore
New user            234441548             120.03 GB <- less than native size
New hidden          100                   50.00 KB <- HPA

Use command : SET MAX <28-bit>
Volatile mode: YES -> hard settings
SAVE PERMANENTLY: Changes shall preserve over power-up or hardware reset.

ATAreg FEA1  CNT2  LBA3  LBA4  LBA5  DEV6  CMD7  ASTA
Before 0000h 0001h 004Bh 004Bh 00F9h 004Dh 00F9h 0050h
After  0000h 0001h 004Bh 004Bh 00F9h 004Dh 0050h 0050h
Status ERR  INDX  CORR  DREQ  DSC  DF   DRDY  BUSY
Error  AMNF  T0NF  ABRT  MCR  IDNF  MC   UNC  ICRC

Command completed successfully. Press any key...

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
SET MAX <HPA> Menu [WDC WD1200JB-00EVA0]

Set Max Address
Set Password
Lock
Unlock
Freeze Lock
Auto Remove HPA Area

Host Protected Area: enabled (to disable use command SET MAX ADDRESS)
SET MAX status      : unlocked

Allows to redefine the maximum address of the user accessible address space,
to create or remove unlocked Host Protected Area (HPA).
This command will be aborted in SET MAX locked or frozen mode.

↑↓ Move ENTER Run ESC Return

```

Now is HPA enabled.

```
ca\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Device List [WDC WD1200JB-00EVA0]
Type      Nr.  Device name          BIOS  LBA  Capacity
PATA      1?  WDC WD1200JB-00EVA0  82h   48   120.03 GB
PATAPI    2    HL-DT-STDVD-RAM GH22NP20 32

Controller=Primary/Master Base/CTRL=01F0h/03F6h IRQ=14 Mode=UDMA5/ATA100
CTRL/Device=ATA/PATA [Direct Access]
!SET_MAX: HPA_IS_ACTIVE !SMART: WARNING !POWER: ACTIVE

↑↓ Move D Detect P Params ENTER Menu ESC Exit
```

Now we take a look at hidden areas.

```
ca\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Main Menu [WDC WD1200JB-00EVA0]
Overview of Hidden Areas
▶Device Tests Menu
▶File System Menu
▶Device Information Menu
▶SMART Menu
▶SET MAX (HPA) Menu
▶Device Configuration Overlay (DCO) Menu
▶Hidden Areas Menu
▶Security Menu
▼▶Commands Menu

↑↓ Move ENTER Select ESC Return
```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Hidden Areas Menu [WDC WD1200JB-00EVA01]

Overview of Hidden Areas
Auto Remove Hidden Areas
Dump of HPA area

Active areas: HPA

Summary of hidden areas (HPA,DCO,Address Offset).

↑↓ Move ENTER Run ESC Return

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Overview of Hidden Areas [WDC WD1200JB-00EVA01]

```

Area	Size	LBA Sectors	LBA Start	LBA End
USER	120.03 GB	234441548	0	234441547
HPA	50.00 KB	100	234441548	234441647
DCO	-	-	-	-
OFFS	disabled	-	-	-
	120.03 GB	234441648	0	234441647

```

↑↓←→ Move P▶ Print S▶ Save ESC Return

```

Create hidden area DCO

Example: We will try to create DCO area with a size of 50 sectors (25 KB) when device has a HPA area already.

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Device List [WDC WD200EB-00CPF0]
Type      Nr.  Device name                BIOS  LBA  Capacity
-----
PATA      1!  WDC WD200EB-00CPF0         82h   28   20.02 GB
PATAPI    2   HL-DT-ST DUDRAM GSA-4163B  32

```

```

Controller=Primary/Master Base/CTRL=01F0h/03F6h IRQ=14 Mode=UDMA5/ATA100
CTRL/Device=ATA/PATA [Direct Access]
!SET_MAX: HPA_IS_ACTIVE !SMART: WARNING !POWER: ACTIVE

```

↑↓ Move D Detect P Params ENTER Menu ESC Exit

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Main Menu [WDC WD200EB-00CPF0]

```

- ▶ Device Tests Menu
- ▶ File System Menu
- ▶ Device Information Menu
- ▶ SMART Menu
- ▶ SET MAX (HPA) Menu
- ▶ Device Configuration Overlay (DCO) Menu
- ▶ Hidden Areas Menu
- ▶ Security Menu
- ▼ ▶ Commands Menu

- Show Identify
- Modify
- Restore
- Freeze Lock
- Check DCO structure
- Dump DCO Data

↑↓ Move ENTER Select ESC Return

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Device Configuration Overlay (DCO) Menu [WDC WD200EB-00CPF0]

```

- Show Identify
- Modify
- Restore
- Freeze Lock
- Check DCO structure
- Dump DCO Data

```

DCO area : disabled
DCO frozen: disabled

```

Modify the set of optional commands, modes or feature sets supported by device.
Create or remove the DCO area.
To create or remove DCO area you must first remove an active HPA area.

↑↓ Move ENTER Run ESC Return

Here you get a warning message about active HPA area. See an error message later.

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
DCO Modify [WDC WD200EB-00CPF0]
Multiword DMA modes: N/A
Ultra DMA modes: Ultra DMA 5/ATA100
Maximum LBA sectors: 39102336 [20.02 GB] full capacity

1. Command/Feature set to <dis>allow      Status from drive      Action
Security Mode feature                    disabled               NONE
Automatic Acoustic Management (AAM)     disabled               NONE
Host Protected Area (HPA)                enabled                NONE

↑↓ Move →← Change INS Edit F7 Restore PgDn/Up Next/Prev S Set ESC Return

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
DCO Modify [WDC WD200EB-00CPF0]
Multiword DMA modes: N/A
Ultra DMA modes: Ultra DMA 5/ATA100
Maximum LBA sectors: 39102286 [20.02 GB]
DCO hidden sectors : 50 [25.00 KB]
1. Command/Feature set to <dis>allow      Status from drive      Action
Security Mode feature                    disabled               NONE
Automatic Acoustic Management (AAM)     disabled               NONE
Host Protected Area (HPA)                enabled                NONE

↑↓ Move →← Change INS Edit F7 Restore PgDn/Up Next/Prev S Set ESC Return

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
DCO Modify [WDC WD200EB-00CPF0]
Multiword DMA modes: N/A
Ultra DMA modes: Ultra DMA 5/ATA100
Maximum LBA sectors: 39102286 [20.02 GB]
DCO hidden sectors : 50 [25.00 KB]
1. Command/Feature set to <dis>allow      Status from drive      Action
Security Mode feature                    disabled               NONE
Automatic Acoustic Management (AAM)     disabled               NONE
Host Protected Area (HPA)                enabled                NONE

Are you sure to run 'DCO Modify' <Y/N> ?

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
DCO Modify [WDC WD200EB-00CPF0]
Multiword DMA modes: N/A
Ultra DMA modes: Ultra DMA 5/ATA100
Maximum LBA sectors: 39102286 [20.02 GB]
DCO hidden sectors : 50 [25.00 KB]
1. Command/Feature set to (dis)allow
Security Mode feature           disabled  NONE
Automatic Acoustic Management (AAM) disabled  NONE
Host Protected Area (HPA)      enabled   NONE

ATAreg  FEA1  CNT2  LBA3  LBA4  LBA5  DEU6  CMD7  ASTA
Before  00C3h 0000h 0000h 0000h 0000h 0000h 0000h 00B1h 0050h
After   0004h 0000h 0000h 0000h 0000h 0000h 0000h 0051h 0051h
Status  ERR   INDX  CORR  DREQ  DSC   DF    DRDY  BUSY
Error   AMNF  T0NF  ABRT  MCR   IDNF  MC    UNC   ICRC
Aborted command
Vendor specific = 0000h
Word location = 00h Invalid Data Structure revision
Bit location = 0000000000000000h

Press any key to continue...

```

We got an error message, because we was trying to create DCO area but there was HPA area already. We must first remove an active HPA area before creating DCO area.

Example: Now we create DCO area with a size 10,000,000 sectors (about 5 GB) without HPA area.

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Device Configuration Overlay (DCO) Menu [WDC WD200EB-00CPF0]

Show Identify
Modify
Restore
Freeze Lock
Check DCO structure
Dump DCO Data

DCO area : disabled
DCO frozen: disabled

Modify the set of optional commands, modes or feature sets supported by device.
Create or remove the DCO area.

↑↓ Move ENTER Run ESC Return

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
DCO Modify [WDC WD200EB-00CPF0]
Multiword DMA modes: N/A
Ultra DMA modes: Ultra DMA 5/ATA100
Maximum LBA sectors: 29102336 [14.90 GB]
DCO hidden sectors : 10000000 [5.12 GB]
1. Command/Feature set to <dis>allow
Security Mode feature           Status from drive   Action
Automatic Acoustic Management <AAM> disabled            NONE
Host Protected Area <HPA>      enabled             NONE

```

↑↓ Move →← Change INS Edit F7 Restore PgDn/Up Next/Prev S Set ESC Return

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
DCO Modify [WDC WD200EB-00CPF0]
Multiword DMA modes: N/A
Ultra DMA modes: Ultra DMA 5/ATA100
Maximum LBA sectors: 29102336 [14.90 GB]
DCO hidden sectors : 10000000 [5.12 GB]
1. Command/Feature set to <dis>allow
Security Mode feature           Status from drive   Action
Automatic Acoustic Management <AAM> disabled            NONE
Host Protected Area <HPA>      enabled             NONE

```

Are you sure to run 'DCO Modify' <Y/N> ?

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
DCO Modify [WDC WD200EB-00CPF0]
Multiword DMA modes: N/A
Ultra DMA modes: Ultra DMA 5/ATA100
Maximum LBA sectors: 29102336 [14.90 GB]
DCO hidden sectors : 10000000 [5.12 GB]
1. Command/Feature set to <dis>allow
Security Mode feature           Status from drive   Action
Automatic Acoustic Management <AAM> disabled            NONE
Host Protected Area <HPA>      enabled             NONE

```

```

ATAreg  FEA1  CNT2  LBA3  LBA4  LBA5  DEV6  CMD7  ASTA
Before  00C3h 0000h 0000h 0000h 0000h 0000h 00B1h 0050h
After   0000h 0000h 0000h 0000h 0000h 0000h 0050h 0050h
Status  ERR  INDX  CORR  DREQ  DSC  DF  DRDY  BUSY
Error   AMNF  I0NF  ABRT  MCR  IDNF  MC  UNC  ICRC

```

Command completed successfully. Press any key...

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Device Configuration Overlay (DCO) Menu [WDC WD200EB-00CPF0]

Show Identify
Modify
Restore
Freeze Lock
Check DCO structure
Dump DCO Data
Auto Remove DCO Area

DCO area : enabled (to disable use command Modify or Restore)
DCO frozen: disabled

Modify the set of optional commands, modes or feature sets supported by device.
Create or remove the DCO area.

↑↓ Move ENTER Run ESC Return

```

DCO area is enabled now.

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Device List [WDC WD200EB-00CPF0]

```

Type	Nr.	Device name	BIOS	LBA	Capacity
PATA	1	WDC WD200EB-00CPF0	82h	28	14.90 GB
PATAPI	2	HL-DT-ST DUDRAM GSA-4163B		32	

```

Controller=Primary/Master Base/CTRL=01F0h/03F6h IRQ=14 Mode=UDMA5/ATA100
CTRL/Device=ATA/PATA [Direct Access]
!DCO: DCO_IS_ACTIVE !SMART: WARNING !POWER: ACTIVE

↑↓ Move D Detect P Params ENTER Menu ESC Exit

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Hidden Areas Menu [WDC WD200EB-00CPF0]

Overview of Hidden Areas
Auto Remove Hidden Areas
Dump of DCO area

Active areas: DCO

Summary of hidden areas (HPA,DCO,Address Offset).

↑↓ Move ENTER Run ESC Return

```

```

CA\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Overview of Hidden Areas [WDC WD200EB-00CPF0]

```

Area	Size	LBA Sectors	LBA Start	LBA End
USER	14.90 GB	29102336	0	29102335
HPA	-	-	-	-
DCO	5.12 GB	10000000	29102336	39102335
OFFS	disabled	-	-	-
	20.02 GB	39102336	0	39102335

```

↑↓← Move P Print S Save ESC Return

```

Remove hidden area HPA

To remove HPA area you can use SET MAX ADDRESS command or menu option [Auto Remove Hidden Areas](#).

Remove hidden area HPA with SET MAX ADDRESS

Example: We try to remove created HPA of 100 sectors. We use 28-bit SET MAX ADDRESS command.

```

CA\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
SET MAX (HPA) Menu [WDC WD1200JB-00EVA0]

```

- Set Max Address
- Set Password
- Lock
- Unlock
- Freeze Lock
- Auto Remove HPA Area

```

Host Protected Area: enabled (to disable use command SET MAX ADDRESS)
SET MAX status      : unlocked

```

Allows to redefine the maximum address of the user accessible address space, to create or remove unlocked Host Protected Area (HPA). This command will be aborted in SET MAX locked or frozen mode.

```

↑↓ Move ENTER Run ESC Return

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Max Address [WDC WD1200JB-00EVA0]
Area          LBA Sectors      Size
-----
Current native      234441648      120.03 GB
Current user        234441548      120.03 GB
Current hidden          100        50.00 KB <- HPA
-----
New user            234441648      120.03 GB <- full native size
New hidden          0            0.00 KB <- O.K.
-----
Use command : SET MAX <28-bit>
Volatile mode: YES -> hard settings
SAVE PERMANENTLY: Changes shall preserve over power-up or hardware reset.

↑↓← Change INS Edit B BIOS limit C Command U Volatile S Set ESC Abort

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Max Address [WDC WD1200JB-00EVA0]
Area          LBA Sectors      Size
-----
Current native      234441648      120.03 GB
Current user        234441548      120.03 GB
Current hidden          100        50.00 KB <- HPA
-----
New user            234441648      120.03 GB <- full native size
New hidden          0            0.00 KB <- O.K.
-----
Use command : SET MAX <28-bit>
Volatile mode: YES -> hard settings
SAVE PERMANENTLY: Changes shall preserve over power-up or hardware reset.

Are you sure to run 'Set Max Address' <Y/N> ?

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Max Address [WDC WD1200JB-00EVA0]
Area          LBA Sectors      Size
-----
Current native      234441648      120.03 GB
Current user        234441548      120.03 GB
Current hidden          100        50.00 KB <- HPA
-----
New user            234441648      120.03 GB <- full native size
New hidden          0            0.00 KB <- O.K.
-----
Use command : SET MAX <28-bit>
Volatile mode: YES -> hard settings
SAVE PERMANENTLY: Changes shall preserve over power-up or hardware reset.

ATAreg  FE01  CNT2  LBA3  LBA4  LBA5  DEU6  CMD7  ASTA
Before  0000h 0001h 00AFh 004Bh 00F9h 004Dh 00F9h 0050h
After   0010h 0001h 00AFh 004Bh 00F9h 004Dh 0051h 0051h
Status  ERR  INDX  CORR  DREQ  DSC  DF  DRDY  BUSY
Error   AMNF  I0NF  ABRT  MCR  IDNF  MC  UNC  ICRC

Second non-volatile command: need power-off/on or HW reset!. Press any key...

```

This error message you will see if you try to call the second non-volatile command without power off (e.g. immediately after creating). So we turn power off and on and try it again, but with 48-bit SET MAX command.

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Max Address [WDC WD1200JB-00EVA01]
Area                LBA Sectors          Size
-----
Current native      234441648             120.03 GB
Current user        234441548             120.03 GB
Current hidden      100                   50.00 KB <- HPA
New user            234441648             120.03 GB <- full native size
New hidden          0                      0.00 KB <- O.K.

Use command : SET MAX EXT <48-bit> <if you get an error try 28-bit command>
Volatile mode: YES -> hard settings
SAVE PERMANENTLY: Changes shall preserve over power-up or hardware reset.

↑↓← Change INS Edit B BIOS limit C Command U Volatile S Set ESC Abort
  
```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Max Address [WDC WD1200JB-00EVA01]
Area                LBA Sectors          Size
-----
Current native      234441648             120.03 GB
Current user        234441548             120.03 GB
Current hidden      100                   50.00 KB <- HPA
New user            234441648             120.03 GB <- full native size
New hidden          0                      0.00 KB <- O.K.

Use command : SET MAX EXT <48-bit> <if you get an error try 28-bit command>
Volatile mode: YES -> hard settings
SAVE PERMANENTLY: Changes shall preserve over power-up or hardware reset.

Are you sure to run 'Set Max Address' <Y/N> ?
  
```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Max Address [WDC WD1200JB-00EVA0]
Area                LBA Sectors          Size
Current native      234441648             120.03 GB
Current user        234441548             120.03 GB
Current hidden      100                   50.00 KB <- HPA
New user            234441648             120.03 GB <- full native size
New hidden          0                      0.00 KB <- O.K.

Use command : SET MAX EXT (48-bit) (if you get an error try 28-bit command)
Volatile mode: YES -> hard settings
SAVE PERMANENTLY: Changes shall preserve over power-up or hardware reset.

ATAreg FEA1 CNT2 LBA3 LBA4 LBA5 DEU6 CMD7 ASTA
Before 0000h 0001h 00AFh 004Bh 00F9h 0040h 0037h 0050h
After  0004h 0001h 00AFh 004Bh 00F9h 0040h 0051h 0051h
Status ERR  INDX CORR DREQ DSC  DF  DRDY  BUSY
Error  AMNF T0NF ABRT MCR  IDNF MC  UNC  ICRC

Command aborted. Press any key...

```

This error message you will see if you try to remove HPA area with 48-bit SET MAX command, but HPA area was created with 28-bit SET MAX command. So we need to select 28-bit SET MAX command.

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Max Address [WDC WD1200JB-00EVA0]
Area                LBA Sectors          Size
Current native      234441648             120.03 GB
Current user        234441548             120.03 GB
Current hidden      100                   50.00 KB <- HPA
New user            234441648             120.03 GB <- full native size
New hidden          0                      0.00 KB <- O.K.

Use command : SET MAX (28-bit)
Volatile mode: YES -> hard settings
SAVE PERMANENTLY: Changes shall preserve over power-up or hardware reset.

↑↓←→ Change INS Edit B BIOS limit C Command U Volatile S Set ESC Abort

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Max Address [WDC WD1200JB-00EVA0]
Area          LBA Sectors          Size
Current native      234441648          120.03 GB
Current user        234441548          120.03 GB
Current hidden           100           50.00 KB <- HPA
New user            234441648          120.03 GB <- full native size
New hidden          0              0.00 KB <- O.K.

Use command : SET MAX <28-bit>
Volatile mode: YES -> hard settings
SAVE PERMANENTLY: Changes shall preserve over power-up or hardware reset.

Are you sure to run 'Set Max Address' <Y/N> ?

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Max Address [WDC WD1200JB-00EVA0]
Area          LBA Sectors          Size
Current native      234441648          120.03 GB
Current user        234441548          120.03 GB
Current hidden           100           50.00 KB <- HPA
New user            234441648          120.03 GB <- full native size
New hidden          0              0.00 KB <- O.K.

Use command : SET MAX <28-bit>
Volatile mode: YES -> hard settings
SAVE PERMANENTLY: Changes shall preserve over power-up or hardware reset.

ATAreg FEA1 CNT2 LBA3 LBA4 LBA5 DEV6 CMD7 ASTA
Before 0000h 0001h 00AFh 004Bh 00F9h 004Dh 00F9h 0050h
After  0000h 0001h 00AFh 004Bh 00F9h 004Dh 0050h 0050h
Status ERR  INDX CORR DREQ DSC  DF  DRDY  BUSY
Error  AMNF T0NF ABRT MCR  IDNF MC  UNC  ICRC

Command completed successfully. Press any key...

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
SET MAX <HPA> Menu [WDC WD1200JB-00EVA0]

Set Max Address
Set Password
Lock
Unlock
Freeze Lock

Host Protected Area: disabled
SET MAX status      : unlocked

Allows to redefine the maximum address of the user accessible address space,
to create or remove unlocked Host Protected Area (HPA).
This command will be aborted in SET MAX locked or frozen mode.

↑↓ Move ENTER Run ESC Return

```

Now is the HPA area removed.

Remove hidden area DCO

To remove DCO area you can use DCO MODIFY command or menu option [Auto Remove Hidden Areas](#).

Auto Remove hidden areas

Example: We try to remove any created HPA and DCO areas. We use auto remove option.

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Device List [WDC WD200EB-00CPF0]
Type      Nr.  Device name                BIOS  LBA  Capacity
-----
PATA      1!  WDC WD200EB-00CPF0        82h   28   14.90 GB
PATAPI    2   HL-DT-ST DVD-RAM GSA-4163B 32

Controller=Primary/Master Base/CTRL=01F0h/03F6h IRQ=14 Mode=UDMA5/ATA100
CTRL/Device=ATA/PATA [Direct Access]
!SET_MAX: HPA_IS_ACTIVE !DCO: DCO_IS_ACTIVE !SMART: WARNING !POWER: ACTIVE

↑↓ Move D Detect P Params ENTER Menu ESC Exit
```

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Hidden Areas Menu [WDC WD200EB-00CPF0]

  Overview of Hidden Areas
  Auto Remove Hidden Areas
  Dump of HPA area
  Dump of DCO area

Active areas: HPA DCO

Summary of hidden areas <HPA,DCO,Address Offset>.

↑↓ Move ENTER Run ESC Return
```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Overview of Hidden Areas [WDC WD200EB-00CPF0]

```

Area	Size	LBA Sectors	LBA Start	LBA End
USER	14.90 GB	29097336	0	29097335
HPA	2.56 MB	5000	29097336	29102335
DCO	5.12 GB	10000000	29102336	39102335
OFFS	disabled	-	-	-
	20.02 GB	39102336	0	39102335

```

↑↓← Move P→ Print S→ Save ESC Return

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Hidden Areas Menu [WDC WD200EB-00CPF0]

```

- Overview of Hidden Areas
- Auto Remove Hidden Areas
- Dump of HPA area
- Dump of DCO area

```

Active areas: HPA DCO
Auto remove hidden areas.
↑↓ Move ENTER Run ESC Return

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Auto Remove Hidden Areas [WDC WD200EB-00CPF0]

```

- Overview of Hidden Areas
- Auto Remove Hidden Areas
- Dump of HPA area
- Dump of DCO area

```

Active areas: HPA DCO
Auto remove hidden areas.
Are you sure to run 'Auto Remove Hidden Areas' <Y/N> ?

```

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Auto Remove Hidden Areas [WDC WD200EB-00CPF0]

Removing hidden areas...

HPA area: detected

Remove HPA temporarily only? <Y/N> NO
Using LBA address mode 28-bits: ERROR
SET MAX full capacity is not restored

DCO area: detected

DCO IDENTIFY: O.K.
DCO SET      : ERROR
DCO RESTORE  : ERROR
DCO full capacity is not restored

Press any key to continue...
```

This error message you will see if you try to call the second non-volatile command without power off. So we turned PC off and then turned on and try again.

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Auto Remove Hidden Areas [WDC WD200EB-00CPF0]

Removing hidden areas...

HPA area: detected

Remove HPA temporarily only? <Y/N> NO
Using LBA address mode 28-bits: O.K.
SET MAX full capacity is restored

DCO area: detected

DCO IDENTIFY: O.K.
DCO SET      : O.K.
DCO full capacity is restored

Press any key to continue...
```

c:\ HDAT2				
HDAT2 v4.9 (c) 2010 CBL				
Overview of Hidden Areas [WDC WD200EB-00CPF0]				
Area	Size	LBA Sectors	LBA Start	LBA End
USER	20.02 GB	39102336	0	39102335
HPA	-	-	-	-
DCO	-	-	-	-
OFFS	disabled	-	-	-
	20.02 GB	39102336	0	39102335

↑↓← Move P▶ Print S▶ Save ESC Return

Now are both hidden areas (HPA and DCO) disabled.

Lock the device

Overview

The security system is enabled (the device in a locked state) by sending a user password to the device with the SECURITY SET PASSWORD command. Setting the master password does not enable security system.

When a user password is set, the drive automatically enters lock mode by the next powered-on. In locked mode, device rejects media access commands until a SECURITY UNLOCK command is successfully completed.

Example: We set the high security mode with the user password "1234".

```
CA\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Security Menu [WDC WD200EB-00CPF0]

Set Password
Freeze Lock

Security status: disabled
Master Password Revision Code: 0000h - feature is not supported

Sets USER or MASTER password in HIGH or MAXIMUM security level.
Master password may be used to unlock the device if User password is lost.
Setting the Master password does not enable the password system.
The locked mode will be active after reset.

↑↓ Move ENTER Run ESC Return
```

```
CA\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Password [WDC WD200EB-00CPF0]

Set Password
Freeze Lock

Security status: disabled
Master Password Revision Code: 0000h - feature is not supported

Identifier: User          Password level: High
Password : ''            Fill password: none

L Identifier L Level P Password F Fill S Set ESC Abort
```

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Password [WDC WD200EB-00CPF0]

Set Password
Freeze Lock

Security status: disabled
Master Password Revision Code: 0000h - feature is not supported

Identifier: User Password level: High
Password : 1234 Fill password: none

INPUT: ←HOME/END Move INS Insert F8 Clear ALT-H HEX ENTER Set ESC Abort
```

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Password [WDC WD200EB-00CPF0]

Set Password
Freeze Lock

Security status: disabled
Master Password Revision Code: 0000h - feature is not supported

Identifier: User Password level: High
Password : '1234' Fill password: none

HEX: 31 32 33 34

L Identifier L Level P Password F Fill S Set ESC Abort
```

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Password [WDC WD200EB-00CPF0]

Set Password
Freeze Lock

Security status: disabled
Master Password Revision Code: 0000h - feature is not supported

Identifier: User Password level: High
Password : '1234' Fill password: none

HEX: 31 32 33 34

Command completed successfully. Press any key...
```

```
ca\ HDATE
HDATE v4.9 (c) 2010 CBL
Security Menu [WDC WD200EB-00CPF0]

Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device

Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported

Sets USER or MASTER password in HIGH or MAXIMUM security level.
Master password may be used to unlock the device if User password is lost.
Setting the Master password does not enable the password system.
The locked mode will be active after reset.

↑↓ Move ENTER Run ESC Return
```

Unlock the device

Overview

In **High security mode**, the disk can be unlocked with either the User or Master password, using the SECURITY UNLOCK command.

In **Maximum security mode**, the disk can be unlocked with the User password only. Without the User password the device requires a SECURITY ERASE PREPARE command and a SECURITY ERASE UNIT command with the Master password to unlock. Execution of the SECURITY ERASE UNIT command erases all user data on the device. See [Security erase the device](#).

Password lost

If the user password is lost and High level security is set, the drive does not allow the user to access any data. However, the drive can be unlocked using the master password. If the user password is lost and Maximum security level is set, it is impossible to access data. However, the drive can be unlocked using the ERASE UNIT command with the master password. The drive will erase all user data and unlock the drive.

Example: To disable the high security mode of the device we have to unlock and disable password with the our user password "1234".

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Unlock [WDC WD200EB-00CPF0]

Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device

Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported

Identifier: User
Password : '1234'                               Fill password: none
HEX: 31 32 33 34

I Identifier P Password F Fill S Set ESC Abort

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Unlock [WDC WD200EB-00CPF0]

Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device

Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported

Identifier: User
Password : '1234'                               Fill password: none
HEX: 31 32 33 34

Command completed successfully. Press any key...

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Security Menu [WDC WD200EB-00CPF0]

Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device

Security status: enabled/High [UNLOCKED mode]
Master Password Revision Code: 0000h - feature is not supported

SECURITY UNLOCK <unlock counter shall be initially set to 5>
With the correct password the device shall disable the Lock mode.
The Master password shall not unlock the device in Security Level Maximum.
If the password compare fails then the device decrements the unlock counter.

↑↓ Move ENTER Run ESC Return

```

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Disable Password [WDC WD200EB-00CPF0]

Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device

Security status: enabled/High [UNLOCKED mode]
Master Password Revision Code: 0000h - feature is not supported

Identifier: User
Password : '1234'          Fill password: none
HEX: 31 32 33 34

I Identifier P Password F Fill S Set ESC Abort
```

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Disable Password [WDC WD200EB-00CPF0]

Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device

Security status: enabled/High [UNLOCKED mode]
Master Password Revision Code: 0000h - feature is not supported

Identifier: User
Password : '1234'          Fill password: none
HEX: 31 32 33 34

Command completed successfully. Press any key...
```

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Security Menu [WDC WD200EB-00CPF0]

Set Password
Freeze Lock

Security status: disabled
Master Password Revision Code: 0000h - feature is not supported

Sets USER or MASTER password in HIGH or MAXIMUM security level.
Master password may be used to unlock the device if User password is lost.
Setting the Master password does not enable the password system.
The locked mode will be active after reset.

↑↓ Move ENTER Run ESC Return
```

You can also use a special function "Unlock device".

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Security Menu [WDC WD200EB-00CPF0]

Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device

Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported

Unlock a locked device if you know a password.
(calling command UNLOCK and then DISABLE PASSWORD)

↑↓ Move ENTER Run ESC Return
```

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Unlock device [WDC WD200EB-00CPF0]

Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device

Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported

Identifier: User
Password : '1234'
Fill password: none

HEX: 31 32 33 34

I Identifier P Password F Fill S Set ESC Abort
```

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Unlock device [WDC WD200EB-00CPF0]

Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device

Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported

Identifier: User
Password : '1234'
Fill password: none

HEX: 31 32 33 34

Command completed successfully. Press any key...
```

```
CA HDAT2
HDAT2 v4.9 (c) 2010 CBL
Security Menu [WDC WD200EB-00CPF0]

Set Password
Freeze Lock

Security status: disabled
Master Password Revision Code: 0000h - feature is not supported

Sets USER or MASTER password in HIGH or MAXIMUM security level.
Master password may be used to unlock the device if User password is lost.
Setting the Master password does not enable the password system.
The locked mode will be active after reset.

↑↓ Move ENTER Run ESC Return
```

Erase the device

Overview

Erase (wipe) does not mean delete or format. Data erasure is a method of software based overwriting. It uses an application to write patterns of data (like 00h or FFh) onto each of a hard drive's sectors on all areas of a hard drive.

To erase device you can use SECURITY ERASE UNIT command in Security Menu or, when supported, SCT Write Same command in SMART Menu.

Disk overwriting programs that cannot access the entire hard drive, including hidden areas like the Host Protected Area (HPA), Device Configuration Overlay (DCO), and remapped sectors, perform **an incomplete erasure**, leaving some of the data intact.

To use security erase command you should first set any password – we use password "1234".

Security erase the device

In Enhanced Erase mode, all previously written user data shall be overwritten, including sectors that are no longer in use due to reallocation.

SECURITY ERASE UNIT allow erase HPA (Host Protected Area) or DCO (Device Configuration Overlay) areas, if any, as well. But don't remove these areas.

Also in High security mode the SECURITY ERASE UNIT command can be used with either the User or Master password.

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Security Menu [WDC WD200EB-00CPF0]

Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device

Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported

SECURITY ERASE UNIT - all user data shall be overwritten!
This command shall disable the device Lock mode, however, the Master password
shall still be stored internally within the device and may be reactivated later
when a new User password is set.

↑↓ Move ENTER Run ESC Return

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Erase Unit [WDC WD200EB-00CPF0]

Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device

Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported

Identifier: User
Password : '1234'
HEX: 31 32 33 34

Erase level : Normal
Erase time : not specified
Fill password: none

I Identifier P Password F Fill S Set ESC Abort

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Erase Unit [WDC WD200EB-00CPF0]

Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device

Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported

Identifier: User
Password : '1234'
HEX: 31 32 33 34

Erase level : Normal
Erase time : not specified
Fill password: none

Are you sure to run 'Erase Unit' <Y/N> ?

```

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Erase Unit [WDC WD200EB-00CPF0]

Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device

Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported

Identifier: User           Erase level : Normal
Password : '1234'         Erase time  : not specified
HEX: 31 32 33 34        Fill password: none

Checking erase status, please wait...
```

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Erase Unit [WDC WD200EB-00CPF0]

Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device

Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported

Identifier: User           Erase level : Normal
Password : '1234'         Erase time  : not specified
HEX: 31 32 33 34        Fill password: none

ERASING IN PROGRESS: DON'T TURN OFF POWER OR RESET SYSTEM!
```

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Erase Unit [WDC WD200EB-00CPF0]

Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device

Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported

Identifier: User           Erase level : Normal
Password : '1234'         Erase time  : not specified
HEX: 31 32 33 34        Fill password: none

Command completed successfully. Press any key...
```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Security Menu [WDC WD200EB-00CPF01]

Set Password
Freeze Lock

Security status: disabled
Master Password Revision Code: 0000h - feature is not supported

Sets USER or MASTER password in HIGH or MAXIMUM security level.
Master password may be used to unlock the device if User password is lost.
Setting the Master password does not enable the password system.
The locked mode will be active after reset.

↑↓ Move ENTER Run ESC Return

```

SCT Write Same

When device supports SMART Command Transport (SCT) you can use the SCT function Write Same – LBA Repeat Write Pattern or LBA Repeat Write Sector.

Example: We will overwrite sectors from LBA 600000000 to LBA 625142447 with hexadecimal pattern "00001234".

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
SMART Menu [FUJITSU MHZ2320BJ G2]

▶SMART Command Transport (SCT) Menu
▶Read Log Menu
▶Routine Menu
▶Command Menu
Read Capability
Read Attribute Data

▶Error Recovery Control (ERC)
▶Feature Control Menu
▶Data Table Menu
▶Write Same Menu
SCT Status page (E0h)

SMART: enabled, status: ERROR, GPL: supported

↑↓ Move ENTER Select ESC Return

```

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
SMART Command Transport (SCT) Menu [FUJITSU MHZ2320BJ G2]

▶Error Recovery Control (ERC) Menu      Read Command Timer
▶Feature Control Menu                  Write Command Timer
▶Data Table Menu
▶Write Same Menu
SCT Status page (E0h)

Last command status: Command complete without error

Command Completion Time Limit (CCTL, Samsung, Hitachi)
Time Limited Error Recovery (TLER, Western Digital)

↑↓ Move ENTER Select ESC Return
```

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
SMART Command Transport (SCT) Menu [FUJITSU MHZ2320BJ G2]

▶Error Recovery Control (ERC) Menu      LBA Repeat Write Pattern
▶Feature Control Menu                  LBA Repeat Write Sector
▶Data Table Menu
▶Write Same Menu
SCT Status page (E0h)

Last command status: Command complete without error

↑↓ Move ENTER Select ESC Return
```

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
Write Same Menu [FUJITSU MHZ2320BJ G2]

LBA Repeat Write Pattern
LBA Repeat Write Sector

Last command status: Command complete without error

This action writes a pattern or sector of data repeatedly to the media.
It will not write over a HPA. Automatic sector reassignment is permitted.
All user data shall be overwritten!

↑↓ Move ENTER Run ESC Return
```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
LBA Repeat Write Pattern [FUJITSU MHZ2320BJ G2]

LBA Repeat Write Pattern
LBA Repeat Write Sector

Last command status: Command complete without error

READ/WRITE commands: LOG_EXT/LOG_EXT
Command mode: Background
Start LBA : 600000000
Last LBA : 625142447 [25142448 sector(s) = 11.99 GB]
Fill pattern: 00001234h

-> Change R/W Commands S Set ESC Abort

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
LBA Repeat Write Pattern [FUJITSU MHZ2320BJ G2]

LBA Repeat Write Pattern
LBA Repeat Write Sector

Last command status: Command complete without error

READ/WRITE commands: LOG_EXT/LOG_EXT
Command mode: Background
Start LBA : 600000000
Last LBA : 625142447 [25142448 sector(s) = 11.99 GB]
Fill pattern: 00001234h

Are you sure to run 'LBA Repeat Write Pattern' <Y/N> ?

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
LBA Repeat Write Pattern [FUJITSU MHZ2320BJ G2]

LBA Repeat Write Pattern
LBA Repeat Write Sector

Last command status: Command complete without error

READ/WRITE commands: LOG_EXT/LOG_EXT
Command mode: Background
Start LBA : 600000000
Last LBA : 625142447 [25142448 sector(s) = 11.99 GB]
Fill pattern: 00001234h

CAUTION: This test will OVERWRITE your disk drive! ARE YOU SURE <Y/N> ?

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
LBA Repeat Write Pattern [FUJITSU MHZ2320BJ G2]

LBA Repeat Write Pattern
LBA Repeat Write Sector

Last command status: Command complete without error

ATAreg  FEA1  CNT2  LBA3  LBA4  LBA5  DEU6  CMD7  ASTA
Before  0000h 0001h 00E0h 0000h 0000h 0040h 003Fh 0050h
After   0000h 00FFh 00FFh 0000h 0000h 0040h 0050h 0050h
Status  ERR   INDX  CORR  DREQ  DSC   DF    DRDY  BUSY
Error   AMNF  I0NF  ABRT  SFRR  SFRW  MC    UNC   ICRC

Command completed successfully. Press any key...

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
LBA Repeat Write Pattern [FUJITSU MHZ2320BJ G2]

LBA Repeat Write Pattern
LBA Repeat Write Sector

Last command status: Command complete without error

SCT command executing in background
Action      : Write Same
Function    : Repeat write pattern
Current LBA: 600209598
Wait 3 sec. or press any key to break.

```

You can also check command status in SCT status page.

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
SMART Command Transport (SCT) Menu [FUJITSU MHZ2320BJ G2]

▶Error Recovery Control (ERC) Menu
▶Feature Control Menu
▶Data Table Menu
▶Write Same Menu
SCT Status page (E0h)

Last command status: Command complete without error

Read the SCT Command/Status log with HDA temperature.

↑↓ Move ENTER Run ESC Return

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
SCT Status page (E0h) [FUJITSU MHZ2320BJ G2]

Format version                0002h
SCT version (vendor specific) 0000h
SCT level                     0001h

Status flags                  00000000h = 0000000000000000
Segment Initialized Flag:
-> Any user LBA is written, even if write cache is enabled or
    the capacity of the drive is changed via SET MAX or DCO.
Drive state                   05h
-> SCT command executing in background
Extended status code         FFFFh
-> SCT command executing in background
Action code of last SCT command 0002h
-> Write Same
-> Command is currently executing.
Function code of last SCT command 0001h
-> Repeat write pattern
-> Command is currently executing.
Current LBA of background SCT command 601201234

Head/disk assembly (HDA) temperature
f1-> Move P Print S Save ESC Return

```

In "View/Search Device" you can check the content of overwritten sectors.

```

c:\ HDAT2
HDAT2 v4.9b1 (c) 2010 CBL BETA 29.08.2010 21:49:54.048
View/Search [FUJITSU MHZ2320BJ G2]

Sector: 600000000, 96% [307.20 GB]

1/2  00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F  0123456789ABCDEF
000  34 12 00 00 34 12 00 00 34 12 00 00 34 12 00 00  4t..4t..4t..4t..
010  34 12 00 00 34 12 00 00 34 12 00 00 34 12 00 00  4t..4t..4t..4t..
020  34 12 00 00 34 12 00 00 34 12 00 00 34 12 00 00  4t..4t..4t..4t..
030  34 12 00 00 34 12 00 00 34 12 00 00 34 12 00 00  4t..4t..4t..4t..
040  34 12 00 00 34 12 00 00 34 12 00 00 34 12 00 00  4t..4t..4t..4t..
050  34 12 00 00 34 12 00 00 34 12 00 00 34 12 00 00  4t..4t..4t..4t..
060  34 12 00 00 34 12 00 00 34 12 00 00 34 12 00 00  4t..4t..4t..4t..
070  34 12 00 00 34 12 00 00 34 12 00 00 34 12 00 00  4t..4t..4t..4t..
080  34 12 00 00 34 12 00 00 34 12 00 00 34 12 00 00  4t..4t..4t..4t..
090  34 12 00 00 34 12 00 00 34 12 00 00 34 12 00 00  4t..4t..4t..4t..
0A0  34 12 00 00 34 12 00 00 34 12 00 00 34 12 00 00  4t..4t..4t..4t..
0B0  34 12 00 00 34 12 00 00 34 12 00 00 34 12 00 00  4t..4t..4t..4t..
0C0  34 12 00 00 34 12 00 00 34 12 00 00 34 12 00 00  4t..4t..4t..4t..
0D0  34 12 00 00 34 12 00 00 34 12 00 00 34 12 00 00  4t..4t..4t..4t..
0E0  34 12 00 00 34 12 00 00 34 12 00 00 34 12 00 00  4t..4t..4t..4t..
0F0  34 12 00 00 34 12 00 00 34 12 00 00 34 12 00 00  4t..4t..4t..4t..

VIEW: PgDn/PgUp Move P Params F BYTE S String J Jump ESC Return

```

```

c:\ HDAT2
HDAT2 v4.9b1 (c) 2010 CBL BETA 29.08.2010 21:50:12.071
View/Search [FUJITSU MHZ2320BJ G2]

Sector: 600000000, 96% [307.20 GB]

1/2  00-08 01-09 02-0A 03-0B 04-0C 05-0D 06-0E 07-0F  0123456789ABCDEF
000  1234 0000 1234 0000 1234 0000 1234 0000  4t..4t..4t..4t..
010  1234 0000 1234 0000 1234 0000 1234 0000  4t..4t..4t..4t..
020  1234 0000 1234 0000 1234 0000 1234 0000  4t..4t..4t..4t..
030  1234 0000 1234 0000 1234 0000 1234 0000  4t..4t..4t..4t..
040  1234 0000 1234 0000 1234 0000 1234 0000  4t..4t..4t..4t..
050  1234 0000 1234 0000 1234 0000 1234 0000  4t..4t..4t..4t..
060  1234 0000 1234 0000 1234 0000 1234 0000  4t..4t..4t..4t..
070  1234 0000 1234 0000 1234 0000 1234 0000  4t..4t..4t..4t..
080  1234 0000 1234 0000 1234 0000 1234 0000  4t..4t..4t..4t..
090  1234 0000 1234 0000 1234 0000 1234 0000  4t..4t..4t..4t..
0A0  1234 0000 1234 0000 1234 0000 1234 0000  4t..4t..4t..4t..
0B0  1234 0000 1234 0000 1234 0000 1234 0000  4t..4t..4t..4t..
0C0  1234 0000 1234 0000 1234 0000 1234 0000  4t..4t..4t..4t..
0D0  1234 0000 1234 0000 1234 0000 1234 0000  4t..4t..4t..4t..
0E0  1234 0000 1234 0000 1234 0000 1234 0000  4t..4t..4t..4t..
0F0  1234 0000 1234 0000 1234 0000 1234 0000  4t..4t..4t..4t..

VIEW: PgDn/PgUp Move P Params F WORD S String J Jump ESC Return

```

```

ca HDAT2
HDAT2 v4.9b1 (c) 2010 CBL BETA 29.08.2010 21:50:15.073
View/Search [FUJITSU MH22320BJ G2]
Sector: 600000000, 96% [307.20 GB]
1/2 00-04-08-0C 01-05-09-0D 02-06-0A-0E 03-07-0B-0F 0123456789ABCDEF
000 00001234 00001234 00001234 00001234 4t..4t..4t..4t..
010 00001234 00001234 00001234 00001234 4t..4t..4t..4t..
020 00001234 00001234 00001234 00001234 4t..4t..4t..4t..
030 00001234 00001234 00001234 00001234 4t..4t..4t..4t..
040 00001234 00001234 00001234 00001234 4t..4t..4t..4t..
050 00001234 00001234 00001234 00001234 4t..4t..4t..4t..
060 00001234 00001234 00001234 00001234 4t..4t..4t..4t..
070 00001234 00001234 00001234 00001234 4t..4t..4t..4t..
080 00001234 00001234 00001234 00001234 4t..4t..4t..4t..
090 00001234 00001234 00001234 00001234 4t..4t..4t..4t..
0A0 00001234 00001234 00001234 00001234 4t..4t..4t..4t..
0B0 00001234 00001234 00001234 00001234 4t..4t..4t..4t..
0C0 00001234 00001234 00001234 00001234 4t..4t..4t..4t..
0D0 00001234 00001234 00001234 00001234 4t..4t..4t..4t..
0E0 00001234 00001234 00001234 00001234 4t..4t..4t..4t..
0F0 00001234 00001234 00001234 00001234 4t..4t..4t..4t..
VIEW: PgDn/PgUp Move P Params F DWORD S String J Jump ESC Return

```

Search the device

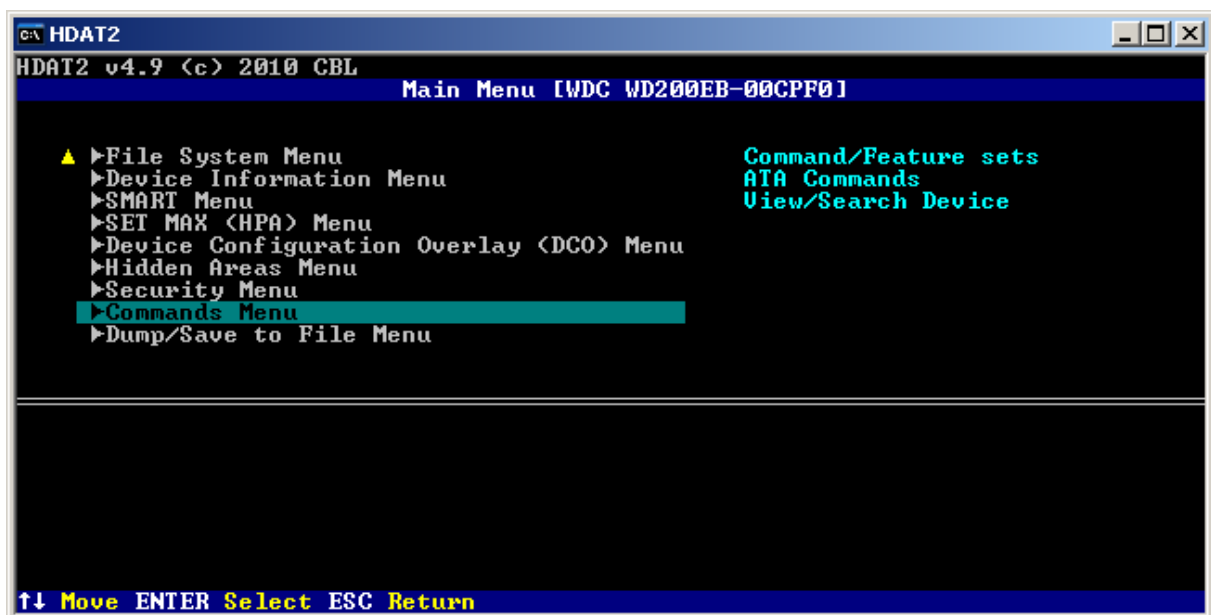
You can search a string, empty sector or non-empty sector.

Search for string

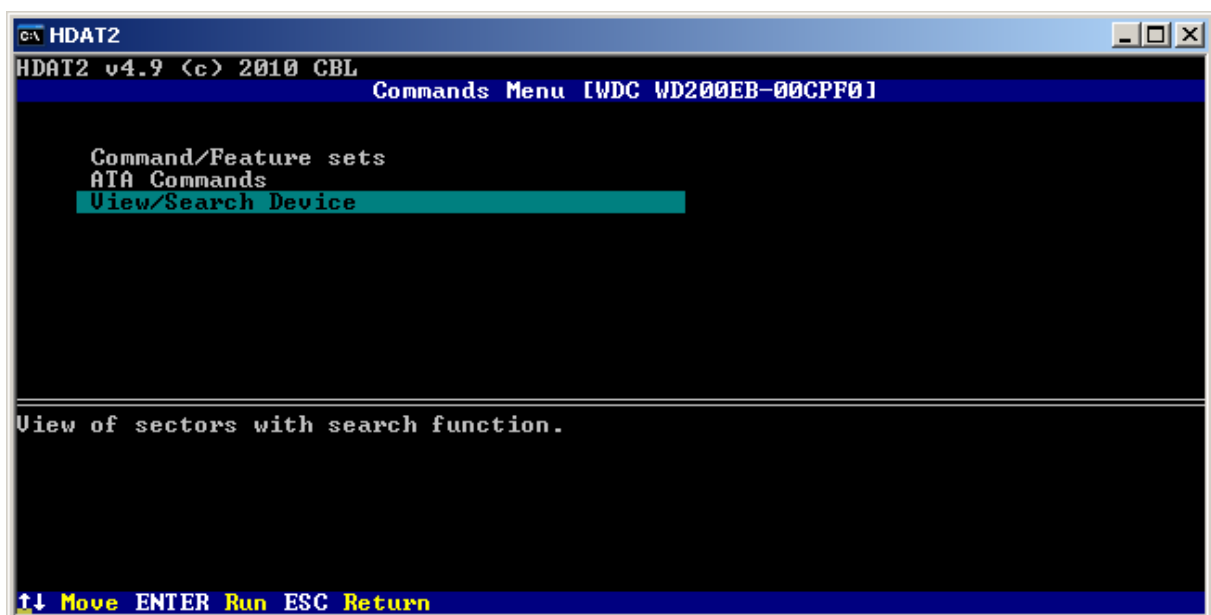
You can search a string with these parameters:

- case or non case sensitive
- string type (ASCII or UNICODE)
- position in sector

Example: We want to search string "U-" (hexadecimal 55h and AAh), in non case sensitive mode and only when this string is on fixed position 510 in sector. This could be e.g. master boot record (MBR) or boot sector.



The screenshot shows the HDAT2 software interface. The title bar reads 'C:\ HDAT2'. The main window displays 'HDAT2 v4.9 (c) 2010 CBL' and 'Main Menu [WDC WD200EB-00CPF0]'. A list of menu options is shown on the left, with 'Commands Menu' highlighted in green. On the right, the following options are listed: 'Command/Feature sets', 'ATA Commands', and 'View/Search Device'. At the bottom, a status bar indicates '↑↓ Move ENTER Select ESC Return'.



The screenshot shows the HDAT2 software interface with the 'Commands Menu' selected. The title bar reads 'C:\ HDAT2'. The main window displays 'HDAT2 v4.9 (c) 2010 CBL' and 'Commands Menu [WDC WD200EB-00CPF0]'. The menu options 'Command/Feature sets', 'ATA Commands', and 'View/Search Device' are listed, with 'View/Search Device' highlighted in green. Below the menu, the text 'View of sectors with search function.' is displayed. At the bottom, a status bar indicates '↑↓ Move ENTER Run ESC Return'.

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
View/Search [WDC WD200EB-00CPF0]
Sector: 00000000, 0% [0.50 KB]
1/2  00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F  0123456789ABCDEF
000  33 C0 8E D0 BC 00 7C FB 50 07 50 1F FC BE 1B 7C  3 4d! . i(P=PvRz+!
010  BF 1B 06 50 57 B9 E5 01 F3 A4 CB BD BE 07 B1 04  7+PW|n@~Azzz~
020  38 6E 00 7C 09 75 13 83 C5 10 E2 F4 CD 18 8B F5  8n. !ou!!a+0~=toS
030  83 C6 10 49 74 19 38 2C 74 F6 A0 B5 07 B4 07 8B  aN>I t18, t:an+}o
040  F0 AC 3C 00 74 FC BB 07 00 B4 0E CD 10 EB F2 88  -C<. tRn. . |P=>U. i
050  4E 10 E8 46 00 73 2A FE 46 10 80 7E 04 0B 74 0B  N>RF. s*P>C~dt
060  80 7E 04 0C 74 05 A0 B6 07 75 D2 80 46 02 06 83  C~*?t2an=ubCFa
070  46 08 06 83 56 0A 00 E8 21 00 73 05 A0 B6 07 EB  FaaU. R! . s2an'f
080  BC 81 3E FE 7D 55 AA 74 0B 80 7E 10 00 74 C8 A0  Ju>=>U-tC~>. tLa
090  B7 07 EB A9 8B FC 1E 57 8B F5 CB BF 05 00 8A 56  E=Ue6RAW6S71. U
0A0  00 B4 08 CD 13 72 23 8A C1 24 3F 98 8A DE 8A FC  . |Q=!!r#U!5?sU0UR
0B0  43 F7 E3 8B D1 86 D6 B1 06 D2 EE 42 F7 E2 39 56  C. N6D6i 7dtB. 09U
0C0  0A 77 23 72 05 39 46 08 73 1C B8 01 02 BB 00 7C  Qw#r29F@s-50E7. !
0D0  8B 4E 02 8B 56 00 CD 13 73 51 4F 74 4E 32 E4 8A  oN6U. =!!sQ0tN2nU
0E0  56 00 CD 13 EB E4 8A 56 00 60 BB AA 55 B4 41 CD  U. =!!anU. 'n-U|A=
0F0  13 72 36 81 FB 55 AA 75 30 F6 C1 01 74 2B 61 60  !!r6uuU-u0+!0t+a`
VIEW: PgDn/PgUp Move P Params F BYTE S String J Jump ESC Return

```

In parameters menu (with a key "P") you can select type of search object: string, empty sector or non-empty sector.

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
View/Search [WDC WD200EB-00CPF0]
Nr.  Parameter                               Value
-----
1.  Device access                            BIOS_EXT_INT13h
2.  First sector                              0, 0% [0.00 KB]
3.  Last sector                              39102335, 100% [20.02 GB]
4.  Show C/H/S                               disabled
5.  Sound <CTRL+S>                           enabled
6.  Set K-prefix value                        1000
7.  Search object                             string
8.  String: case sensitive                    NO
9.  String: type                              ASCII
10. String: position in sector                anywhere

Search for string

↑↓ Move ←→ Change F7 Defaults ENTER Accept ESC Cancel

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
View/Search [WDC WD200EB-00CPF0]
Forward, ASCII, non sensitive, position: anywhere, length/cursor: 0/1
CURSOR:
STRING:
1/2 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 0123456789ABCDEF
000 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
010 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
020 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
030 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
040 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
050 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
060 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
070 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
080 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
090 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0A0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0B0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0C0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0D0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0E0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0F0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
SEARCH: INS Insert ALT-H HEX ESC Abort

```

With "ALT-H" you can insert any hexadecimal value.

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
View/Search [WDC WD200EB-00CPF0]
Forward, ASCII, non sensitive, position: anywhere, length/cursor: 1/2
HEX input: 55h
STRING: J
1/2 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 0123456789ABCDEF
000 33 C0 8E D0 BC 00 7C FB 50 07 50 1F FC BE 1B 7C 3 4ãdJ. iúP~PvRz<+!
010 BF 1B 06 50 57 B9 E5 01 F3 A4 CB BD BE 07 B1 04 7<±PW|ñ@~A_IzZ~◆
020 38 6E 00 7C 09 75 13 83 C5 10 E2 F4 CD 18 8B F5 8n. !ou!!ã+|0~=1ó§
030 83 C6 10 49 74 19 38 2C 74 F6 A0 B5 07 B4 07 8B àã>I t 18, t:ãã~|~ó
040 F0 AC 3C 00 74 FC BB 07 00 B4 0E CD 10 EB F2 88 -C<. tRñ~. |ñ=>ú. z
050 4E 10 E8 46 00 73 2A FE 46 10 80 7E 04 0B 74 0B N>RF. s*~P|ç~♦ótd
060 80 7E 04 0C 74 05 A0 B6 07 75 D2 80 46 02 06 83 ç~♦ótdãã~uóçFóãã
070 46 08 06 83 56 0A 00 E8 21 00 73 05 A0 B6 07 EB FçããUç. R? .sããã~ó
080 BC 81 3E FE 7D 55 A0 74 0B 80 7E 10 00 74 C8 A0 uü>~>U~tóç~>. tLã
090 B7 07 EB A9 8B FC 1E 57 8B F5 CB BF 05 00 8A 56 È~óçããã~uóçFóãã
0A0 00 B4 08 CD 13 72 23 8A C1 24 3F 98 8A DE 8A FC . |ç=!!rãú~5?~óóóR
0B0 43 F7 E3 8B D1 86 D6 B1 06 D2 EE 42 F7 E2 39 56 ç. NóDóç iãããtB. ó9U
0C0 0A 77 23 72 05 39 46 08 73 1C B8 01 02 BB 00 7C çwãr~óçFçs~§óçñ. i
0D0 8B 4E 02 8B 56 00 CD 13 73 51 4F 74 4E 32 E4 8A óNóçU. =!!sQ0tN2ñó
0E0 56 00 CD 13 EB E4 8A 56 00 60 BB AA 55 B4 41 CD U. =!!óãóU. 'ñ-U|A=
0F0 13 72 36 81 FB 55 A0 75 30 F6 C1 01 74 2B 61 60 !!r6üüU~uó÷~|ótd+a`
Found: 2, last in sector: 63 at position: 3
INPUT: →←HOME/END Move INS Insert F8 Clear ENTER Set ESC Abort

```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
View/Search [WDC WD200EB-00CPF0]
Forward, ASCII, non sensitive, position: anywhere, length/cursor: 1/2
HEX input: 00h
STRING: J
1/2 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 0123456789ABCDEF
000 33 C0 8E D0 BC 00 7C FB 50 07 50 1F FC BE 1B 7C 3 4ãdJ. iúP~PvRz<+!
010 BF 1B 06 50 57 B9 E5 01 F3 A4 CB BD BE 07 B1 04 7<±PW|ñ@~A_IzZ~◆
020 38 6E 00 7C 09 75 13 83 C5 10 E2 F4 CD 18 8B F5 8n. !ou!!ã+|0~=1ó§
030 83 C6 10 49 74 19 38 2C 74 F6 A0 B5 07 B4 07 8B àã>I t 18, t:ãã~|~ó
040 F0 AC 3C 00 74 FC BB 07 00 B4 0E CD 10 EB F2 88 -C<. tRñ~. |ñ=>ú. z
050 4E 10 E8 46 00 73 2A FE 46 10 80 7E 04 0B 74 0B N>RF. s*~P|ç~♦ótd
060 80 7E 04 0C 74 05 A0 B6 07 75 D2 80 46 02 06 83 ç~♦ótdãã~uóçFóãã
070 46 08 06 83 56 0A 00 E8 21 00 73 05 A0 B6 07 EB FçããUç. R? .sããã~ó
080 BC 81 3E FE 7D 55 A0 74 0B 80 7E 10 00 74 C8 A0 uü>~>U~tóç~>. tLã
090 B7 07 EB A9 8B FC 1E 57 8B F5 CB BF 05 00 8A 56 È~óçããã~uóçFóãã
0A0 00 B4 08 CD 13 72 23 8A C1 24 3F 98 8A DE 8A FC . |ç=!!rãú~5?~óóóR
0B0 43 F7 E3 8B D1 86 D6 B1 06 D2 EE 42 F7 E2 39 56 ç. NóDóç iãããtB. ó9U
0C0 0A 77 23 72 05 39 46 08 73 1C B8 01 02 BB 00 7C çwãr~óçFçs~§óçñ. i
0D0 8B 4E 02 8B 56 00 CD 13 73 51 4F 74 4E 32 E4 8A óNóçU. =!!sQ0tN2ñó
0E0 56 00 CD 13 EB E4 8A 56 00 60 BB AA 55 B4 41 CD U. =!!óãóU. 'ñ-U|A=
0F0 13 72 36 81 FB 55 A0 75 30 F6 C1 01 74 2B 61 60 !!r6üüU~uó÷~|ótd+a`
Found: 2, last in sector: 63 at position: 3
INPUT: →←HOME/END Move INS Insert F8 Clear ENTER Set ESC Abort

```

```

CA\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
View/Search [WDC WD200EB-00CPF0]
Nr.  Parameter                               Value
-----
1.  Device access                             BIOS_EXT_INT13h
2.  First sector                               0, 0% [0.00 KB]
3.  Last sector                               39102335, 100% [20.02 GB]
4.  Show C/H/S                               disabled
5.  Sound <CTRL+S>                            enabled
6.  Set K-prefix value                        1000
7.  Search object                             string
8.  String: case sensitive                    NO
9.  String: type                              ASCII
10. String: position in sector                510

Position of string in sector

↑↓ Move →← Change F7 Defaults INS Edit ENTER Accept ESC Cancel

```

```

CA\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
View/Search [WDC WD200EB-00CPF0]
Sector: 00000000, 0% [0.50 KB]
2/2  00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F  0123456789ABCDEF
100  6A 00 6A 00 FF 76 0A FF 76 08 6A 00 68 00 7C 6A  j.j. v v j.h. !j
110  01 6A 10 B4 42 8B F4 CD 13 61 61 73 0E 4F 74 0B  @j>|Bó~=!aasf0tč
120  32 E4 8A 56 00 CD 13 EB D6 61 F9 C3 4E 65 70 6C  2n00.=!!0ía |Nep1
130  61 74 6E A0 20 74 61 62 75 6C 6B 61 20 6F 64 64  atná tabulka odd
140  A1 6C 85 00 43 68 79 62 61 20 70 FD 69 20 6E 61  ílů.Chyba při na
150  9F A1 74 A0 6E A1 20 6F 70 65 72 61 9F 6E A1 68  čítání operačníh
160  6F 20 73 79 73 74 82 6D 75 00 4F 70 65 72 61 9F  o systému.Operač
170  6E A1 20 73 79 73 74 82 6D 20 6E 65 6E 61 6C 65  ní systém nenale
180  7A 65 6E 00 00 00 00 00 00 00 00 00 00 00 00 00  zen.....
190  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
1A0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
1B0  00 00 00 00 00 2C 44 6A 1A 81 D9 F9 00 00 80 01  .....Dj>ü!...ç@
1C0  01 00 07 FE FF FF 3F 00 00 00 02 68 54 02 00 00  @.■ ?...@hI@..
1D0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
1E0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
1F0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....U-

Found: 1, last in sector: 0 at position: 510
VIEW: PgDn/PgUp Move P Params F BYTE S String F7 Find J Jump ESC Return

```

We get the first sector – master boot record (MBR).

Search for empty sector

This is usable if you are looking for empty (with 00h) sector on device. In parameters menu select "empty sector".

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
View/Search [WDC WD200EB-00CPF0]
Nr.  Parameter                               Value
1.  Device access                            BIOS_EXT_INT13h
2.  First sector                              0, 0% [0.00 KB]
3.  Last sector                             39102335, 100% [20.02 GB]
4.  Show C/H/S                               disabled
5.  Sound <CTRL+S>                          enabled
6.  Set K-prefix value                       1000
7.  Search object                            empty sector

Search for empty sector (contains a binary zeroes only)

↑↓ Move →← Change F7 Defaults ENTER Accept ESC Cancel
  
```

```

c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
View/Search [WDC WD200EB-00CPF0]
Sector: 00000001, 0% [1.00 KB]
1/2  00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F  0123456789ABCDEF
000  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
010  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
020  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
030  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
040  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
050  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
060  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
070  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
080  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
090  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0A0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0B0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0C0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0D0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0E0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0F0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
Found: 1, last in sector: 1 at position: 0
VIEW: PgDn/PgUp Move P Params F BYTE F7 Find J Jump ESC Return
  
```

Search for non-empty sector

This is usable if you are looking for any data on device. In parameters menu select "non-empty sector".

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
View/Search [WDC WD200EB-00CPF0]
Nr.  Parameter                                     Value
1.  Device access                                   BIOS_EXT_INT13h
2.  First sector                                    0, 0% [0.00 KB]
3.  Last sector                                     39102335, 100% [20.02 GB]
4.  Show C/H/S                                     disabled
5.  Sound <CTRL+S>                                  enabled
6.  Set K-prefix value                             1000
7.  Search object                                  non-empty sector

Search for non-empty sector (contains some data)

↑↓ Move →← Change F7 Defaults ENTER Accept ESC Cancel
```

```
c:\ HDAT2
HDAT2 v4.9 (c) 2010 CBL
View/Search [WDC WD200EB-00CPF0]
Sector: 00000000, 0% [0.50 KB]
1/2  00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F  0123456789ABCDEF
000  33 C0 8E D0 BC 00 7C FB 50 07 50 1F FC BE 1B 7C   3 4ãd! !úP•PvRž÷÷!
010  BF 1B 06 50 57 B9 E5 01 F3 A4 CB BD BE 07 B1 04   7←•PW|ñ@~A~Zž•◆
020  38 6E 00 7C 09 75 13 83 C5 10 E2 F4 CD 18 8B F5   8n. !Ou!!â†0~÷÷6$
030  83 C6 10 49 74 19 38 2C 74 F6 A0 B5 07 B4 07 8B   âñ>I t 48, t÷áÁ•†•ó
040  F0 AC 3C 00 74 FC BB 07 00 B4 0E CD 10 EB F2 88   -C<. tRñ•. ††→U. †
050  4E 10 E8 46 00 73 2A FE 46 10 80 7E 04 0B 74 0B   N>Rf. s•††††~††††
060  80 7E 04 0C 74 05 A0 B6 07 75 D2 80 46 02 06 83   C~††††ââ•u††††â
070  46 08 06 83 56 0A 00 E8 21 00 73 05 A0 B6 07 EB   F††âU†. R†. s†ââ•ó
080  BC 81 3E FE 7D 55 AA 74 0B 80 7E 10 00 74 C8 A0   †u>†>U-†††††. t†â
090  B7 07 EB A9 8B FC 1E 57 8B F5 CB BF 05 00 8A 56   È•óëóRAWóš†††. †U
0A0  00 B4 08 CD 13 72 23 8A C1 24 3F 98 8A DE 8A FC   .††=!!†††††?†††††
0B0  43 F7 E3 8B D1 86 D6 B1 06 D2 EE 42 F7 E2 39 56   C. N6Dc i†††††††††
0C0  0A 77 23 72 05 39 46 08 73 1C B8 01 02 BB 00 7C   †w†††††††††††††††
0D0  8B 4E 02 8B 56 00 CD 13 73 51 4F 74 4E 32 E4 8A   óNóóU. =!!sQ0†N2†††
0E0  56 00 CD 13 EB E4 8A 56 00 60 BB AA 55 B4 41 CD   U. =!!óóóU. ††-U††A=
0F0  13 72 36 81 FB 55 AA 75 30 F6 C1 01 74 2B 61 60   !!r6úúúU-u0÷÷††††††
```

Found: 1, last in sector: 0 at position: 0
VIEW: PgDn/PgUp Move P Params F BYTE F7 Find J Jump ESC Return

```

HDAT2
HDAT2 v4.9 (c) 2010 CBL
View/Search [WDC WD200EB-00CPF0]
Sector: 00000061, 0% [31.00 KB]
1/2 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 0123456789ABCDEF
000 EB 52 90 4E 54 46 53 20 20 20 20 00 02 08 00 00 ÚRÉNTFS .00..
010 00 00 00 00 00 F8 00 00 3F 00 F0 00 3F 00 00 00 .....o...?..-?...
020 00 00 00 00 80 00 80 00 00 E0 C2 57 01 00 00 00 00 ...ç.ç.óTW@....
030 00 00 0C 00 00 00 00 00 10 00 00 00 00 00 00 00 ...♀.....▶.....
040 F6 00 00 00 01 00 00 00 06 AE D4 10 B7 D4 10 88 ÷...@...<<Ed>I
050 00 00 00 00 FA 33 C0 8E D0 BC 00 7C FB B8 C0 07 ... 3 4ã! .!ú$ L
060 8E D8 E8 16 00 B8 00 0D 8E C0 33 DB C6 06 0E 00 àèR_.$ .Fá 43 8ç.
070 10 E8 53 00 68 00 0D 68 6A 02 CB 8A 16 24 00 B4 ▶RS.h.Fh.j0_0_$.|
080 08 CD 13 73 05 B9 FF FF 8A F1 66 0F B6 C6 40 66 □=!!sç| ü'f*ããef
090 0F B6 D1 80 E2 3F F7 E2 86 CD C0 ED 06 41 66 0F *ãDç0? ôc=LçAf*
0A0 B7 C9 66 F7 E1 66 A3 20 00 C3 B4 41 BB AA 55 8A Èrf ,βfú .|Añ-Uü
0B0 16 24 00 CD 13 72 0F 81 FB 55 AA 75 09 F6 C1 01 _$.=!!h*úúU-u0÷!@
0C0 74 04 FE 06 14 00 C3 66 60 1E 06 66 A1 10 00 66 t♦ç. |f'▲ç í>.f
0D0 03 06 1C 00 66 3B 06 20 00 0F 82 3A 00 1E 66 6A ♥ç-.f;ç .çé:.▲fj
0E0 00 66 50 06 53 66 68 10 00 01 00 80 3E 14 00 00 .fPçSf h> .ç>ñ..
0F0 0F 85 0C 00 E8 B3 FF 80 3E 14 00 00 0F 84 61 00 *ãç.R | ç>ñ..*ãa.
Found: 2, last in sector: 61 at position: 0
VIEW: PgDn/PgUp Move P Params F BYTE F7 Find J Jump ESC Return

```

Frequently Asked Questions

1. **I received a 40 GB drive in replacement for a 20 GB model in PC. The drive is reported as 20 GB capacity. How can i get full capacity ?**
2. **How to bypass a Security and/or DCO frozen state ?**
3. **Can i remove non-existent bad sectors from the file table FAT ?**
4. **Connecting ATA/IDE Hard Drives**
5. **What are the differences between master/slave and cable select ?**
6. **Host Protected Area (HPA) vs. 28/48-bit LBA mode**
7. **Change of DCO Modify item is always aborted (abort command)**
8. **What is Spread Spectrum Clocking (SSC) ?**
9. **SATA NCQ / eSATA / xSATA**
10. **Can I cut down size of hard drive ?**
11. **How can I determine supported media format of CD/DVD drive ?**
12. **Portable computer with Windows Vista has problem with power consumption.**
13. **Host Protected Area (HPA) from BIOS.**
14. **The Hidden Protected Area (hidden partition).**
15. **I cannot remove Host Protected Area (HPA) on Dell notebook (Media Direct HPA).**
16. **I cannot read SMART for USB/Firewire hard drives.**
17. **Western Digital WD5000KS doesn't spin-up (firmware bug).**
18. **How to non-destructively convert dynamic disks to basic disks.**
19. **Hard disk doesn't spin up - PUIS (Power Up In Standby).**
20. **Windows support for logical units larger than 2 TB.**
21. **GUID partition table (GPT) disks.**

Q1: I received a 40 GB drive in replacement for a 20 GB model in PC. The drive is reported as 20 GB capacity. How can i get full capacity ?

A1: If you see in 'Device List' menu at your disk drive a notice '!SET MAX: HPA IS ACTIVE', use 1. method, otherwise use 2. method.

In program HDAT2 select your disk drive and press Enter to show 'Main Menu'.

1. method:

In 'Device List' menu at your disk drive you see notice '!SET MAX: HPA IS ACTIVE'. Select 'SET MAX (HPA) Menu', then select 'Set Max Address' and press Enter. By default is set so called native size of disk drive disku and you can just press a key 'S' to setup original capacity of hard drive and remove HPA area.

If the command is aborted, try change 'LBA mode' from 28 to 48 or vice versa (if disk supports 48-bit LBA mode).

2. method:

Select 'Device Configuration Menu', then select 'Restore' and press Enter. If you don't see any error message, in 'Device List' menu press a key 'D' to make new detection of devices or simple make restart of PC's and check capacity of your hard drive.

If you see any error message or in 'Device List' menu at your disk you see a notice '! DCO: FROZEN', then it is possible that BIOS was sent a command DCO Freeze and all subsequent DCO commands will be aborted now. How to try bypass this state see answer nr. 2.

Q2: How to bypass a Security and/or DCO frozen state ?

A2: Turn off PC, remove ribbon (data) cable from this hard drive (not the power cable), turn on PC and after boot from floppy you can connect ribbon (data) cable back to hard drive and start up HDAT2. Don't worry - program can detect this device.

Notice: this is valid only for PATA drivers, not for SATA drivers.

If you have SATA drive in Security and/or DCO frozen state, simple solution is connect this drive to PC with BIOS which doesn't set security mode.

Q3: Can i remove non-existent bad sectors from the file table FAT ?

A3: Yes, with file-system version program HDAT2FS or HDAT2 you can test FAT12/16/32.

select your drive and press Enter to run Menu
select 'File Level Tests Menu' and press Enter
select 'Read File System from MBR' and press Enter
for item 'All' press 'C' to check detected items
goto to 'Table' item and 2-times press Enter to run Utility menu
press 'T' to setup test for file table FAT
if you want to update file table press 'W' for update
press Enter to run

This procedure will first compare both FAT copies and second tests all FAT entries for bad sectors. If program will find 'bad sector' entry, then all sectors in this cluster will be tested. If all these sectors are not bad program will remove this record of bad sectors.

Q4: Connecting ATA/IDE Hard Drives

A4: ATA/IDE devices use a ribbon cable to connect to each other. Ribbon cables have all of the wires laid flat next to each other instead of bunched or wrapped together in a bundle. IDE ribbon cables have either 40 or 80 wires. There is a connector at each end of the cable and another one about two-thirds of the distance from the motherboard connector. This cable cannot exceed 18 inches in total length (12 inches from first to second connector, and six inches from second to third) to maintain signal integrity.
40-wire Cables

On the slower older 40-wire ATA cables, the Slave device, usually a CD-ROM or CD-ROM recorder/burner still goes on the END, but you need to set the jumpers as Slave. This is true even if you don't have a hard drive in the Master position. The Master for 40-wire cables goes on the the Middle connector.

If you want to use the cable select with the older drive on a 40-wire cable, you'll have to consult the maker of the drive for the instructions.

80-wire Cables

On the ATA66/100/133 standard 80-wire cable, the Master hard drive or your boot hard drive goes on the END of the cable. This is true whether or not you use the Master/Slave style or the Cable Select style.

The 40-pin 80-conductor cable is orientation specific. The cable connectors are color-coded: blue for the host connector, black and gray for the primary and secondary disk drives. The blue connector should be installed into the Primary IDE connector.

The blue connector attaches to the motherboard.

The black connector attaches to the primary, or master, drive.

The gray connector attaches to the secondary, or slave, drive.

Along one side of the cable is a stripe. This stripe tells you that the wire on that side is attached to Pin 1 of each connector. Wire 20 is not connected to anything. In fact, there is no pin at that position. This position is used to ensure that the cable is attached to the drive in the correct position. Another way that manufacturers use to make sure that the cable is not reversed is by using a cable key. The cable key is a small plastic square on top of the connector on the ribbon cable that fits into a notch on the connector of the device. This allows the cable to attach in only one position.

Q5: What are the differences between master/slave and cable select ?

A5: Two different protocols can be used for jumpering ATA devices, including hard disk drives. One is the master-slave relationship. With this protocol, one device is jumpered as master and the other is jumpered as slave. The second protocol is cable select. With this protocol, both devices are jumpered as cable select and their position on the cable dictates which is the master and which is the slave. The end device is master while the device on the middle of the cable is slave. You can use either of these protocols but you cannot mix them on the same data cable.

Computers that use cable-select determine the master and slave drives by selecting or deselecting pin 28, CSEL, on the interface bus. Master and slave drives are determined by their physical position on the cable.

Configuration Using Cable Select

Cable Select is defined in the ATA-2 and ATA-3 specifications and is part of the ATA PnP standard and Microsoft's PC97 standard.

The standard 40-wire ATA ribbon cable and the 80-wire cable give different drive behavior when using Cable Select. If using the standard 40-wire cable, the Master goes in the middle connector and the Slave goes in the end connector. If using the 80-wire cable, attach the blue end connector to the system board or host controller, the gray middle connector to the Slave, and the black end connector to the Master.

All newer ATA hard drives can be jumpered as Cable Select (CS or CSEL). This is an alternate way to indicate which drive is master and which drive is slave (instead of jumpering one drive as master and one drive as slave). Cable Select jumpering requires a special IDE cable with wire 28 not connected to one of the drive connectors, which would configure the drive attached to that connector as the slave drive.

In order to use Cable Select jumpering, several conditions must be met. Both drives on a channel must support CSEL, both drives must be jumpered as CSEL, a CSEL cable must be used, and the host interface connector must support CSEL. For the host interface to support Cable Select, wire 28 must be grounded.

Although the Cable Select specification may simplify things in the future, there will probably be lots of confusion, especially on legacy systems, as this starts to be introduced. One problem will be in selecting the correct cable. Supposedly, the cables used for Cable Select will be clearly marked, with each connector labeled as Device 0 (or Master) or Device 1 (or Slave). If not clearly marked, it may not be easy to identify a CSEL cable visually. wire 28 can be checked for continuity.

A Cable Select cable can be constructed in various ways. Pin 28 may be non connected to the connector at the end of the cable or to the connector in the middle of the cable. Another design would have the host interface connector in the middle and the two drives would plug into each end of the cable, with the connector at one of the ends not connected to pin 28.

If both drives are set for CSEL and the host interface supports CSEL, but a regular cable is used, both drives will be seen as master.

A Cable Select cable can be used with master/slave drive jumpering.

Another problem will be with host interfaces on legacy motherboards and controller cards. If pin 28 is not grounded on the host interface, drives connected to either connector on the CSEL cable will be seen as slave. It will be common to find that pin 28 is open or high on many older IDE interfaces. This can be checked with a voltmeter.

Q6: Host Protected Area (HPA) vs. 28/48-bit LBA mode

A6: There is a problem of incompatibility on some hard drives (e.g. Seagate and/or in an external Maxtor One Touch) when you are using 48-bit command for removing Host Protected Area (HPA) created with 28-bit command. 48-bit command cannot remove HPA created with 28-bit command and vice-versa. Following solution is for disk supports 48-bit LBA mode only and if you have HPA greater than 127 GB.

Notice:

"Some vendor-specific external drive enclosures (Maxtor) are known to use HPA to limit the capacity of unknown replacement hard drives installed into the enclosure. When this occurs, the drive may appear to be limited in size (e.g. 128 GB). In this case, one must use software utilities that use READ NATIVE MAX ADDRESS and SET MAX ADDRESS to change the drive's reported size back to its native size."

Solution:

1. Power-on PC, boot and start HDAT2.
2. In 'SET MAX (HPA) Menu' select 'Set Max Address'. Change 'LBA mode' from 48 to 28-bit LBA mode and press 'S' key to set maximal address for 28-bit LBA mode (127 GB).
3. Power-off PC (Important !), power-on PC, boot and start HDAT2.
4. In 'SET MAX (HPA) Menu' select 'Set Max Address'. Leave the selected 48-bit 'LBA mode' (or change 'LBA mode' from 28 to 48-bit LBA mode) and then press 'S' key to set maximal address for 48-bit LBA mode.
5. After restart you should get the full (native) capacity of hard drive.

Q7: Change of DCO Modify item is always aborted (abort command)

A7: Some hard drives (Maxtor) allow to modify DCO always, the other hard drives (Seagate) allow to modify DCO one times only.

Example of the restrictions on changing of bits:

If a user attempts to change maximum LBA address (SET or RESTORE) after establishing a protected area with SET MAX address, the device will abort that command.

If the user attempts to disable Security feature when the device is enabled and the Security feature is set, the device will abort that command.

If you always got an error message (aborted command) when you want to change any item in DCO Modify menu, you should first run a 'Restore' item to restore default settings and then you can go to Modify menu.

Q8: What is Spread Spectrum Clocking (SSC) ?

A8: Spread Spectrum Clocking is a way to lower electromagnetic interference or EMI. This is important for storage solutions that are required to pass FCC and other agency certifications. Today, some Serial ATA disk drives implement SSC, some allow you to turn this feature on/off, and some do not implement SSC; it is anticipated that all will implement this feature in the near future.

The technique of modulating the operating frequency of a circuit slightly to spread its radiated emissions over a range of frequencies rather than just one tone. This reduction in the maximum emission for a given frequency helps meet FCC requirements.

Newer Serial ATA (3Gbps SATA) interface disc drives may employ a standard technology called Spread Spectrum Clocking (SSC) which helps to reduce electronic emissions (EMI) in large, multi-drive systems. Single drive environments do not need SSC to meet EMI requirements.

3Gbps means doubled interface speeds, which also means greater signal noise and electromagnetic emissions. As in the processor settings in many motherboards' BIOSes, spread spectrum clocking can reduce emissions to meet regulations.

In a single-drive environment, it's not necessary, but when you've got two or more drives, and they're all running at 3Gbps, that's when you've got a lot of electrical noise going on, and the spread spectrum feature is recommended. This is more for safety than reducing data errors, which most drives' ECC code will correct automatically.

A small number of SATA host products do not support this SSC standard feature. Similarly, RAID controllers may need to enable SSC on drive configurations with SSC disabled by default to reduce EMI.

Disable SSC: Host products that do not support SSC cannot detect the presence of the disc drive. Therefore, in order to disable SSC the drive must be attached to another host platform that does support SSC so that the feature can be disabled. Once SSC is turned off, the drive can be returned to the original host system.

Enable SSC: If the drive has SSC turned off by default and SSC is required for a large multi-drive environment, the target system is usually supported by the SSC software. RAID controllers, however, can pose a barrier to communicating with the SATA at the low hardware level required to make the SSC change. If your RAID controller is not supported then a more standard SATA system may be needed to toggle SSC on the drive. Once SSC is turned on, the drive can be returned to the original RAID controller.

There are many accounts on the Internet about problems arising from HBAs (Host Bus Adapter) not supporting SSC as required. Disk drive vendors that tried turning on SSC have had to provide consumers special programs or jumpers to turn SSC off so they will work in non-compliant systems.

Intel
Apple
Apple discussions
SeriTek controller/Hitachi hard disks
Seagate
Western Digital
Hitachi

Due to this problem, users believe that SATA 3Gb/s HDD's are not compatible with SATA 1.5Gb/s controllers. This is inaccurate as the technology is definitely backwards compatible.

Q9: SATA NCQ / eSATA / xSATA

A9: NCQ: NCQ (Native Command Queuing) debuted in many 1.5Gbps drives as a refinement of earlier CQ schemes used in SCSI drives. When a supporting controller sends NCQ-enabled commands to a drive, the drive will intelligently prioritize up to 32 of those commands before performing the reads/writes. Because the controller triggers CQ, the user can enable/disable it in the OS, as from Windows XP's Device Manager. That applications that take advantage of the multithreading features of dual-core and/or Hyper-Threaded processors should complement NCQ for faster throughput.

Explains Native Command Queing (NCQ) Seagate

eSATA: More of a cable and connector redesign than a fundamental change, eSATA means data cables with better shielding and connectors that are harder to accidentally dislodge or break. The external drive's power is still supplied separately. eSATA headers are rectangular instead of L-shaped, so eSATA cables won't work inside most PCs. The working group came up with eSATA to address the fact that users were already connecting SATA drives externally because the interface outpaces USB 2.0 and FireWire 800Mbps. Shielding that was adequate for use inside a computer case, wasn't good enough outside the box.

xSATA: This option allows the use of much longer external data cables of up to 8 meters in length.

Q10: Can I cut down size of hard drive ?

A10: Yes. In 'Device List' menu select your disk drive. Select 'SET MAX (HPA) Menu', then select 'Set Max Address' and press Enter. Now you can choose your required size of hard drive. It should be smaller as native (maximal) size of drive, of course. See also question nr. 1.

Q11: How can I determine supported media format of CD/DVD drive ?

A11: In 'Device List' menu select your CD/DVD drive. Select 'Device Information Menu', then select 'Get Configuration' and press Enter. Now you will see list of supported profiles of your drive.

Q12: Portable computer with Windows Vista has problem with power consumption.

A12: Power consumption may be slightly more than expected on a portable Windows Vista-based computer that uses a SATA hard disk that does not support Host-Initiated Link Power Management.

This problem may occur if the SATA hard disk does not support HIPM. In this case, Windows Vista may not use DIPM for power management. Therefore, the Windows Vista power management feature is less able to efficiently manage power consumption. See MS Article ID: 932079.

Q13: Host Protected Area (HPA) from BIOS.

A13: Some motherboards has incorporated the HPA feature in the BIOS. This feature allows information contained in the first partition of the Hard Drive to be copied to a hidden HPA partition on the same drive where it is immune from attack.

If the HPA is removed from the HD the area of use will be available at the end of the drive as 'Unallocated'.

E.g. Gigabyte's Xpress Recovery.

Q14: The Hidden Protected Area (hidden partition).

A14: The Hidden Protected Area is a special area (hidden partition) (usually a few gigabytes in size) located at the end of a hard disk. It is preinstalled on the harddisks of some PC's (e.g. IBM). It is normally hidden to the software running on this PC. It includes all the software and data needed to recover the preloaded state of the PC. This HPA also includes some diagnostic tools and a backup tool. Some vendors are using the HPA instead of providing rescue media.

It is referred to as the Predesktop Area in the BIOS Setup Utility. That hidden partition is not an HPA.

Q15: I cannot remove Host Protected Area (HPA) on Dell notebook (Media Direct HPA).

A15: With HDAT2 program you did the first half of the fix but missed the second part. The Dell MBR (Master Boot Record at sector 0) calls special code in LBA sector 3 to re-enable the HPA anytime you boot from the hard disk. After you unhide the HPA, in order for it to stay unhidden you need to either get rid of the Dell MBR (so LBA-3 doesn't get called) or you need to disable LBA-3 (wipe LBA sector 3). (search on Google for 'dell hpa mediadirect')

Q16: I cannot read SMART for USB/Firewire hard drives.

A16: It all depends on the chip your USB/Firewire enclosures with drive have. The protocol USB-IDE bridge between the USB and ATA protocols should support SMART data and correctly send SMART data over those interfaces. If you cannot see the SMART menu, your drive cannot send SMART data.

Supported bridge chips: Cypress, JMicron and Oxford.

E.g. Western Digital Passport is using Cypress AT2+ USB/ATA interface.

Q17: Western Digital WD500KS doesn't spin-up (firmware bug).

A17: Taken over from Google Notebook.

If any controller or software you have enables the "Power-up in Standby" feature on these drives, you can not disable it. In fact, once that mode is enabled, the drive reports conflicting information.

Western Digital said on the phone the KS line of drives are not a high-enough priority for them to fix the firmware.

Q18: How to non-destructively convert dynamic disks to basic disks.

A18: Read this instruction [disk_probe.pdf](#).

Q19: Hard disk doesn't spin up - PUIS (Power Up In Standby).

A19: The optional Power-Up In Standby (PUIS) feature set allows devices to be powered-up into the Standby power management state to minimize current at power-up and to allow the host to sequence the spin-up of devices.

This optional feature set may be enabled or disabled via the SET FEATURES command or may be enabled by use of a jumper, or both. When enabled by a jumper, this feature set shall not be disabled via the SET FEATURES command.

Once this feature is enabled in a device, the device shall not disable the feature as a result of processing a power-on reset, a hardware reset, or a software reset.

If the device implements this SET FEATURES subcommand and power-up into Standby is enabled, the device shall remain in Standby until the SET FEATURES subcommand is received.

If the device does not implement the SET FEATURES subcommand to spin-up the device after power-up and PUIS is enabled, the device shall spin-up upon receipt of the first command that requires the device to access the media, except the IDENTIFY DEVICE command or the IDENTIFY PACKET DEVICE command.

Solution for HDAT2 program: if you have a hard disk with enabled PUIS (cannot spin up and BIOS cannot recognize this drive) run program with parameter /W Wake/Spin-up the drive:

HDAT2 /W

List of parameters: HDAT2 /? or HDAT2 /h.

Q20: Windows support for logical units larger than 2 TB.

A20: Disk devices with more than 2 TB of disk space must be converted to GPT format for all of the disk space to be usable. If the device uses MBR format, the disk space beyond 2 TB will be unusable.

Q21: GUID partition table (GPT) disks.

A21: A GPT disk uses the GUID partition table (GPT) disk partitioning system. A GPT disk offers these benefits:

Allows up to 128 primary partitions. (MBR disks can support up to four primary partitions and an infinite number of partitions inside an extended partition.)

Allows a much larger volume size - greater than 2 TB, which is the limit for MBR disks.

Provides greater reliability due to replication and cyclical redundancy check (CRC) protection of the partition table.

Can be used as a storage volume on all x64-based platforms, including platforms running Microsoft Windows XP Professional x64 Edition. Windows Server 2003 SP1 also enables support for GPT in x86 versions of the Windows Server 2003 family.

Notes:

Unlike Windows support for the Intel Itanium platform, Windows x64 Edition and Windows Server 2003 SP1 operating systems support the use of GPT drives only as data volumes. Because the x64 and x86 architectures do not provide support for an EFI boot partition, you cannot use a GPT drive to boot an x64-based computer or an x86-based computer with a legacy BIOS. Therefore, computers running these operating systems must be equipped with more than one physical driver to allow the use of the GPT disk format.

On Intel Itanium platforms, Windows supports the use of GPT drives as boot drives or data volumes.

You can convert only empty, unpartitioned disks (raw drives or empty MBR drives) to the GPT format. To convert a volume that contains data, you must first manually delete the partition.

GPT is part of the EFI specification.

Extensible Firmware Interface (EFI) describes an interface between the operating system and the platform firmware.

Unified Extensible Firmware Interface (UEFI) <http://www.uefi.org/>
UEFI computers require at least three GPT partitions:

1. An EFI system partition (ESP) to store the boot applications and other related information (EFI drivers). Windows does not assign a driver letter to the ESP. This partition should not be used for any user or application data files.
2. A Microsoft reserved (MSR) partition, which must be located between the ESP and the Windows operating system partitions.
3. A Windows system partition.