MHDD Documentation

Very Low Level Hard Disk Diagnostic Tool

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About the MHDD Project

MHDD is the small and powerful freeware tool to work with hard drives at the lowest possible level. The first version was released in 2000 by Dmitry Postrigan whose main objective was to develop well-known and trusted HDD diagnostic tool. It was able to make surface scan of an IDE drive in CHS (Cylindar, Head,Sector) mode.

MHDD now includes features to access raw sectors, view S.M.A.R.T. (SMART) and other drive parameters such as acoustic management, security, Host Protected Area. You can issue a sequence of commands using simple scripting.

How it Works

When DOS needs to read a sector from a drive , it asks the BIOS to do it. The BIOS looks into its tables to find where that drive is attached, checks ranges and then starts sending commands to the drive. After everything is done BIOS returns result to DOS.

This diagram shows how a DOS program talks to the drive:

```
program  <--->  MSDOS  <--->  BIOS  <--->  IDE/SATA controller  <---> Hard disk
```

This is how MHDD works:

```
MHDD  <------------------------------>  IDE/SATA controller  <---> Hard disk
```

The main difference: MHDD does not use DOS or BIOS functions or interrupts and works even if the BIOS does not detect the drive. You can turn on your drive after DOS boots (A small risk of drive damage exists if you are not careful).

MHDD works directly with IDE or Serial ATA controller so it does not know about partitions, file systems, BIOS (motherboard) limitations, etc.

For SCSI drives MHDD uses DOS ASPI driver (incuded).

If the drive under test is on the Primary IDE interface use /ENABLEPRIMARY switch. (this is included in the CD image).

Platform and Supported Hardware

Platform:
DR-DOS , MSDOS version 6.22 included on CD image

Hardware:
Intel Pentium or higher CPU
boot device (USB, CDROM, FDD, HDD)

IDE/SATA Controllers:
Any integrated into motherboard north bridge (addresses: 0x1Fx for primary channel, 0x17x for secondary channel)

PCI UDMA boards (detected automatically): HPT, Silicon Image, Promise, ITE, ATI and so on. Some RAID boards are supported. In this case MHDD works with each physical drive separately.

UDMA/RAID controllers integrated into motherboard as additional chip

Hard Disk Drives:
IDE or Serial-ATA drive with size bigger than 600Mbytes, i.e. LBA mode is supported in full. removed CHS code since version 2.9

IDE or Serial-ATA drive with size smaller than 8,388,607 TBytes, i.e. LBA48 mode is supported.

SCSI drive with sector size 512—528 bytes

Other Devices:
Any SCSI removable media such as tape, CDROM. Maximum sector size for such devices is 4096 bytes

Getting MHDD
Please use HDDguru.com website.
MHDD is available as CD image, as self-extracting floppy image or as an archive.
MHDD is included in the sysresccd free download at SysRescCD.org

Preparing the Package
Write a bootable CD from the ISO image with any CD burning software.
Floppy image can be written under Windows 2000/XP.
Take the executables and build your own system.

MHDD Package Contents
mhdd.exe Main executable
mhdd.hlp used by MAN to describe commands
batch/sample.mba Sample batch script to run tests without intervention
scripts/test Sample script for sending commands
cfg/mhdd.cfg configuration

AUTOEXEC.BAT
```
@ECHO OFF
set EXPAND=YES
SET DIRCMD=/O:N
set LglDrv=27 * 26 Z 25 Y 24 X 23 W 22 V 21 U 20 T 19 S 18 R 17 Q 16 P 15
set LglDrv=%LglDrv% O 14 N 13 M 12 L 11 K 10 J 9 I 8 H 7 G 6 F 5 E 4 D 3 C
call setramd.bat %LglDrv%
path=%RAMD%:\
copy command.com %RAMD%:\ > NUL
set comspec=%RAMD%:\command.com

echo.
%RAMD%:
MD MHDD
cd \MHDD
copy A:\mhdd\mhdd.zip . > nul
copy a:\pkunzip.exe . > nul
pkunzip -d mhdd.zip > nul
del mhdd.zip
del pkunzip.exe
echo.
```

```
echo The MHDD was successfully unpacked to  %RAMD%:\MHDD
echo.

set CDROM=
set LglDrv=

mhdd /enableprimary
```

CONFIG.SYS

```
[menu]
menuitem=SCSI, Start computer with ADAPTEC SCSI adapter support
menuitem=NOSCSI, Start computer without SCSI support.
menudefault=NOSCSI,30
menucolor=7,0

[SCSI]
device=himem.sys /testmem:off
device=aspi2dos.sys
device=aspi8dos.sys
device=aspi4dos.sys
device=aspi8u2.sys

[NOSCSI]
device=himem.sys /testmem:off

[COMMON]
files=10
buffers=10
dos=high,umb
stacks=9,256
devicehigh=ramdrive.sys /E 2048
lastdrive=z
```

SETRAMD.BAT

```
@echo off
set RAMD=
set CDROM=

@rem  sweeps all possible drive letters to find ramdrive
@rem  returns i errorlevel for drive (C:=3)

findramd

if errorlevel 255 goto no_ramdrive
if not errorlevel 3 goto no_ramdrive

goto do_shift

:loop
if errorlevel %1 goto no_shift

:do_shift
set cdrom=%2
shift
shift
if not %1*==* goto loop
```

```
goto no_ramdrive

:no_shift
set ramd=%2

goto success

:no_ramdrive
echo MHDD startup disk could not create a temporary drive for itself.
echo This happen because this computer has less than 4 Mbytes of memory.
echo.

:success
```

The bootable CD image creates a:
RAM drive (2MB) as D:,
the CD becomes A: and the
floppy is B:.

The CD is removable and you can insert a different CD having an editor or other programs.

First Run

Some important information
MHDD is very easy to use.
Knowing what to have MHDD do is not easy!

If you don't have in depth knowledge of how disk drives work, read the ATA/ATAPI standard: ATA8-ACS PDF.

If you already have in depth knowledge of how disk drives work, read the ATA/ATAPI standard: ATA8-ACS PDF.

It is very important to understand that you have to spend several hours (minimum) before you will start using MHDD.

I strongly recommend trying a couple of good SPARE drives, with MHDD before you start working with bad drives.

Before you Start

IDE drive to be tested MUST be configured as master (i.e. set the jumpers on the drive), no other devices should be attached.
MHDD uses **cfg/mhdd.cfg** for program configuration information.

Primary IDE channel is disabled. To enable it, first read read this warning message:

```
WARNING: Do not run MHDD from the hard drive that is on the same physical
IDE channel (cable) you are going to use to diagnose drives! DOS
(SMARTDRV.EXE, for example) may access any drive at the same moment as
MHDD. This will cause data loss on both devices on that channel! There is
no way to block or trace MSDOS or BIOS read/write attempts. That is why, by
```

default, MHDD does not work with Primary IDE as it usually used to boot DOS and run MHDD.

then edit **MHDD.CFG** and include:

#PRIMARY=TRUE

If you booted from the CD, MHDD runs from a RAM drive, so this is not problem and **UTOEXEC.BAT** starts **MHDD** with the **/enableprimary** command line option.

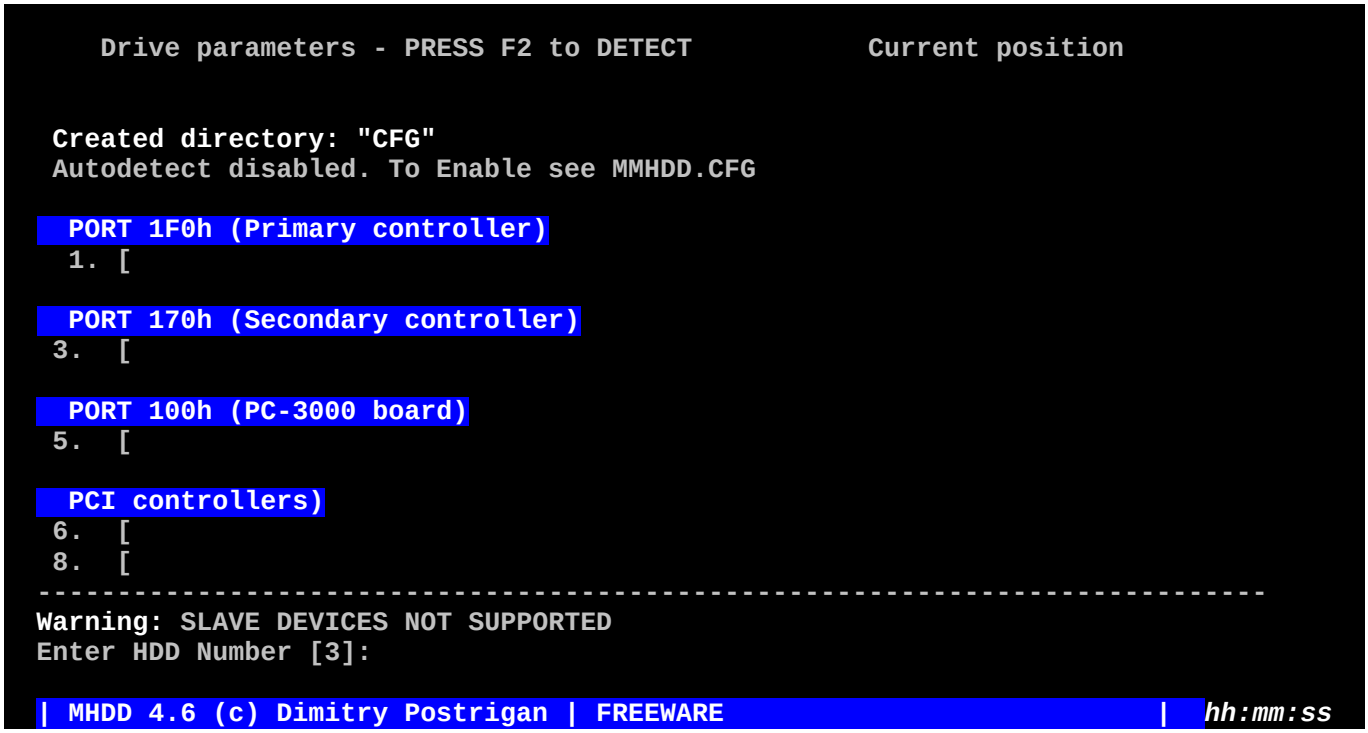
Have a DOS formatted floppy ready for saving logs, screenshots and config files. Adding a tiny editor like vi.exe and pkzip would also be a good idea. Remember floppy is B: if you booted from the CD.

MHHD logs all activity in **log/mhdd.log**.

Example:

```
31.07.2007  17:22:14
31.07.2007  17:22:14    | MHDD 4.6 (c) Dmitry Postrigan | FREEWARE
31.07.2007  17:22:14   Changing mode to: IDE
31.07.2007  17:22:30   Changing mode to: IDE
31.07.2007  17:22:30   Device selected: 3
31.07.2007  17:22:32
31.07.2007  17:22:32   MHDD<QUIT
31.07.2007  17:22:32   MHDD: Exit
```

After starting **MHDD** you will see drive selection menu. This can be displayed later by pressing **SHIFT+F3**.



Be extremely careful when running MHDD the first time.

[F1] displays the commands.
MAN EN command or **MAN RU** command describes what the command does.

Some have shortcuts, for example **F4** for **SCAN**.

SCREENSHOT or **[F10]** will do a print screen to file **LOG\SCRSHOT.LOG**.

Using MHDD

Device identify commands

Retrieve information from the drive.

ID and **EID** display detailed information about the drive.

ID or shift**[F2]**

```
Maxtor 5T030H3  LBA: 60,030,432 BIOS: 80H
SN: T3D3N8WC  FW: TAH71DP0 CACHE:512KN  Size = 8063MB
```

EID adds

```
Supports: HPA DLMC LBA MS16 DMA (UDMA2,MWDMA2) EID
SMART: Enabled EID
Size=8063MB
```

PORT or shift**[F3]** detects disks and presents the drive selection menu.

CX seek read test measures access times:

```
Init drive: Done
Seel&Read test
Press <>ESC> to finish...
Start: hh:mm:ss
Average Access Time:
16.87
```

This is continueously averaged and updated until you press [ESC].

```
Maximun: 35.03
 Done: hh:mm:ss
```

SMART Attributes

SMART ATT or **[F8]**.

Different manufactures and different models provide different information.

- #5 Reallocated Sectors Count attribute is the most important item. This reports the number of remaps on the drive. This should be ZERO . If it is more than 50 — you have a problem. That means you have bad power supply, vibration, or overheating.

- #194 Temperature best values are between 20 and 40 degrees centigrade.

- #199 CRC error rate attribute means how many errors have happened during transferring data through the IDE/SATA cable and should be zero . If not change the cable! Overclocking may result in increased error rate. For more information about SMART ATT display smart attributes to screen and smart.log

Each drive model may present different attributes

```
HDD: Maxtor 5T030H3; FW: TAH71DP0; SN: T3D3N8WC
            Name                        Val Worst Raw
Att #   1 : Read error rate           : 253  252  94
Att #   3 : Spin up time              : 210  208  16970
Att #   4 : Number of spin-up times   : 240  240  27451
Att #   5 : Reallocated sectors count : 253  253  0
Att #   6 : Read channel margin       : 253  253  0
Att #   7 : Seek error rate           : 253  252  0
Att #   8 : Seek time performance     : 252  245  53387
Att #   9 : Power-on time             : 216  216  64096
Att #  10 : Spin-up retries          : 253  252  0
Att #  11 : Calibration retries      : 253  252  0
Att #  12 : Start/stop count         : 252  252  432
Att # 187 : Unknown                  :  35   46  35
Att # 189 : Unknown                  :  35   46  35
Att # 190 : Unknown                  :  35   46  35
Att # 194 : HDA Temperature          :  35   46  35
Att # 196 : Reallocate event count   : 253  253  0
Att # 197 : Current pending sectors  : 253  253  0
Att # 198 : Offline scan UNC sectors : 253  253  0
Att # 199 : Ultra ATA CRC Error Rate : 199  199  0
Att # 200 : Write error rate         : 253  252  0
Att # 201 : Unknown                  : 253  172  794
Att # 202 : Unknown                  : 100  253  0
```

SMART Commands

SMART off | on
SMART AAS enable | disable attribute autosave
SMART DATA read data

If this does not display in about 50 seconds the drive may not be responding.

No error is displayed by MHHD if the command timesout.

```
off-line data collection statue: CODE:130

Self-test execution status: nn%*, and was aborted by the HOST
 -or-
```

```
Never started
  -or-
and the previous self-test completed having the read element of the
test failed.
  -or-
Completed, and previous test
  -or-
Completed without error or no test has ever been run.
  -or-
nn%, and IN PROGRESS  ( percent remaining)
 Total time in seconds to complete off-line
   data collection activity: 430
 Off-line data collection capability (bit-mapped): 91
 Error logging capability: supported
 Short self-test routine polling time (minutes): 1   (don't believe it)
 Extended self-test routine polling time (minutes): 54
 Conveyance self-test routine polling time (minutes): 2
 CheckSum: OK
  -or-
 CheckSum:  FAIL, 1    -or- 109
subsequent queries return increasing values up to 255
```

SMART ErLog dumps the error log to a file (this takes a minute or two)

The **ERR** and **ABRT** indicators will blink as MHDD queries log entries.

```
 * Smart ->  ERLOG
Filename to save the ErrorLog:

 Log #01 found.
 …
 Log #EE found.
 Log #EF found.
 Log #F0 found.
 …
 Log #FF found.

Log saved to file: "xxxxx"
Sucessful
```

Sample Error Log with failing LBAs:

```
ErrorLogs dump. Drive : Maxtor 6Y060L0
---------------------------------------------------------------

Log #01 found.
Log name : "Summary Error Log"
Errors Count       : 2152
```

```
Errors in summary log:
Error log data structure #1:
CMD # 1 :    00   FF   88   1C   57   E0   42, TIME: 147462080
CMD # 2 :    00   FF   87   1D   57   E0   42, TIME: 147463104
CMD # 3 :    00   FF   86   1E   57   E0   42, TIME: 147464176
CMD # 4 :    00   FF   85   1F   57   E0   42, TIME: 147465200
CMD # 5 :    00   FF   84   20   57   E0   42, TIME: 147466208 -> LBA:5709956
Registers contains after error :
             40   F7   84   32   87   E0   51, TIME: 26432 -> Err. REG: UNC

Error log data structure #2:
CMD # 1 :    00   FF   7C   28   57   E0   42, TIME: 147467088
CMD # 2 :    00   FF   7B   29   57   E0   42, TIME: 147467088
CMD # 3 :    00   FF   7A   2A   57   E0   42, TIME: 147467104
CMD # 4 :    00   FF   79   2B   57   E0   42, TIME: 147467104
CMD # 5 :    00   FF   78   2C   57   E0   42, TIME: 147467104 -> LBA:5713016
Registers contains after error :
             40   31   78   44   87   E0   51, TIME: 26432 -> Err. REG: UNC

Error log data structure #3:
CMD # 1 :    00   FF   7B   29   57   E0   42, TIME: 147467088
CMD # 2 :    00   FF   7A   2A   57   E0   42, TIME: 147467104
CMD # 3 :    00   FF   79   2B   57   E0   42, TIME: 147467104
CMD # 4 :    00   FF   78   2C   57   E0   42, TIME: 147467104
CMD # 5 :    00   FF   77   2D   57   E0   42, TIME: 147468144 -> LBA:5713271
Registers contains after error :
             40   FD   77   45   87   E0   51, TIME: 26432 -> Err. REG: UNC

Error log data structure #4:
CMD # 1 :    00   FF   7A   2A   57   E0   42, TIME: 147467104
CMD # 2 :    00   FF   79   2B   57   E0   42, TIME: 147467104
CMD # 3 :    00   FF   78   2C   57   E0   42, TIME: 147467104
CMD # 4 :    00   FF   77   2D   57   E0   42, TIME: 147468144
CMD # 5 :    00   FF   76   2E   57   E0   42, TIME: 147469200 -> LBA:5713526
Registers contains after error :
             40   FF   76   46   87   E0   51, TIME: 26432 -> Err. REG: UNC

Error log data structure #5:
CMD # 1 :    00   FF   79   2B   57   E0   42, TIME: 147467104
CMD # 2 :    00   FF   78   2C   57   E0   42, TIME: 147467104
CMD # 3 :    00   FF   77   2D   57   E0   42, TIME: 147468144
CMD # 4 :    00   FF   76   2E   57   E0   42, TIME: 147469200
CMD # 5 :    00   FF   75   2F   57   E0   42, TIME: 147470224 -> LBA:5713781
Registers contains after error :
             40   FB   75   47   87   E0   51, TIME: 26432 -> Err. REG: UNC

Log #06 found.
 ------------------------------------------------
 #   1x3    selftest    life      selftest    failing
     reg     status   timestamp  checkpoint     LBA
 ------------------------------------------------
  1  129       118     24787           3    72817737
  2  129       118     24787           3    72817737
  3  130        35     24787           0    72817737
  4    1       118      6875           3    72817737
  5    2       114      6878           5    72817737
```

```
 6    1       118      6894           3    72817737
 7    1       118      6897           3    72817737
 8    2       114      6901           5    72817737
 9    1       118      6914           3    72817737
10    1       118      6937           3    72817737
11    1       118      6941           3    72817737
12    1       118     12301           3    72817737
13    2        20     12301           0    72817737
14    1       118     12301           3    72817737
15    2       118     24786           0           0
16    2       118     24786           0           0
17    2       118     24786           0           0
18  129       118     24786           3    72817737
19  129       118     24786           3    72817737
20  130       114     24787           5    72817737
21    0         0         0           0           0
-------------------------------------------------
```

```
Log #09 found.
```

SMART TEST executes internal tests

```
 -=- -=- SMART Execut OFF-Line immediate (tests) -=- -=-
 ---------------------------------------------------------
 0   Execute SMART off-line routine (off-line)
 1   Execute SMART Short self-test routine (off-line)
 2   Execute SMART Ext.  self-test routine (off-line)
 3   Execute SMART Conveyance s.t. routine (off-line)
 4   Execute SMART Selective s.t. routine (off-line)
 5-63 Reserved
 64-126 Vendor specific
 127 Abort off-line mode self-test routine
 128 Reserved
 129 Execute SMART Short self-test routine (captive)
 130 Execute SMART Ext.  self-test routine (captive)
 131 Execute SMART Conveyance s.t. routine (captive)
 132 Execute SMART Selective s.t. routine (captive)
 133-191 Reserved
 192-255 vendor specific
 -------------------------------------------------
 Select a test (0-255, blank or any symbol for cancel):
 Starting routine n, press "Y" to process:
```

captive tests wait until the test completes before MHDD regains control

off-line tests return control immediately and the drive continues the test. This would permit switching to another drive and starting an off-line test on multiple drives. Use **SMART DATA** to determine that status of the off-line test.

After pressing **Y**, the **BUSY** indicator will light up until the test completes . smart data will return the remaining % of the test

Scanning a Drive

Scanning is possible only if the drive was detected by **ID** or **EID** commands.

MAKELOG scans the surface of the drive and creates a detailed log file.

If you booted from the CD there will, most likely, be insufficient space for the log file on the RAM drive.

If the target drive is less than 10GB the log will fit on a floppy.

To create the log on a hard drive:
(this means there must be one with a FAT partition which you are willing and able to write to).
(Here's a use for those old < GB drives you have laying around.)

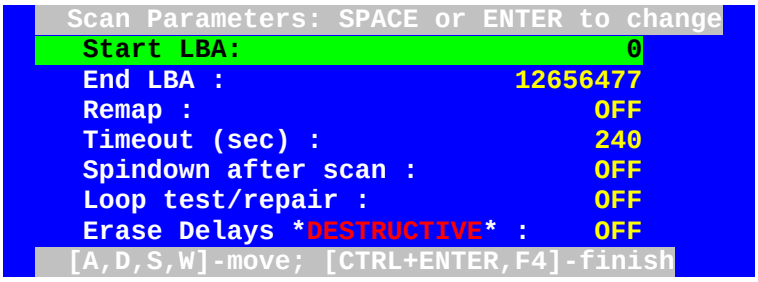
mkdir C:\MHDD or on another partition
COPY MHDD*.* C:\MHDD to copy files from the RAM drive (or CD) to the hard drive
C:
CD C:\MHDD to that directory and start MHDD

or use **SCAN** or **[F4]** and forget the logfile.

You will see menu where you can adjust **Start** and **End LBA**,

set to **Remap** bad spots (warning) Remapping with MHDD is safe to data if there are less then 100 bad blocks.

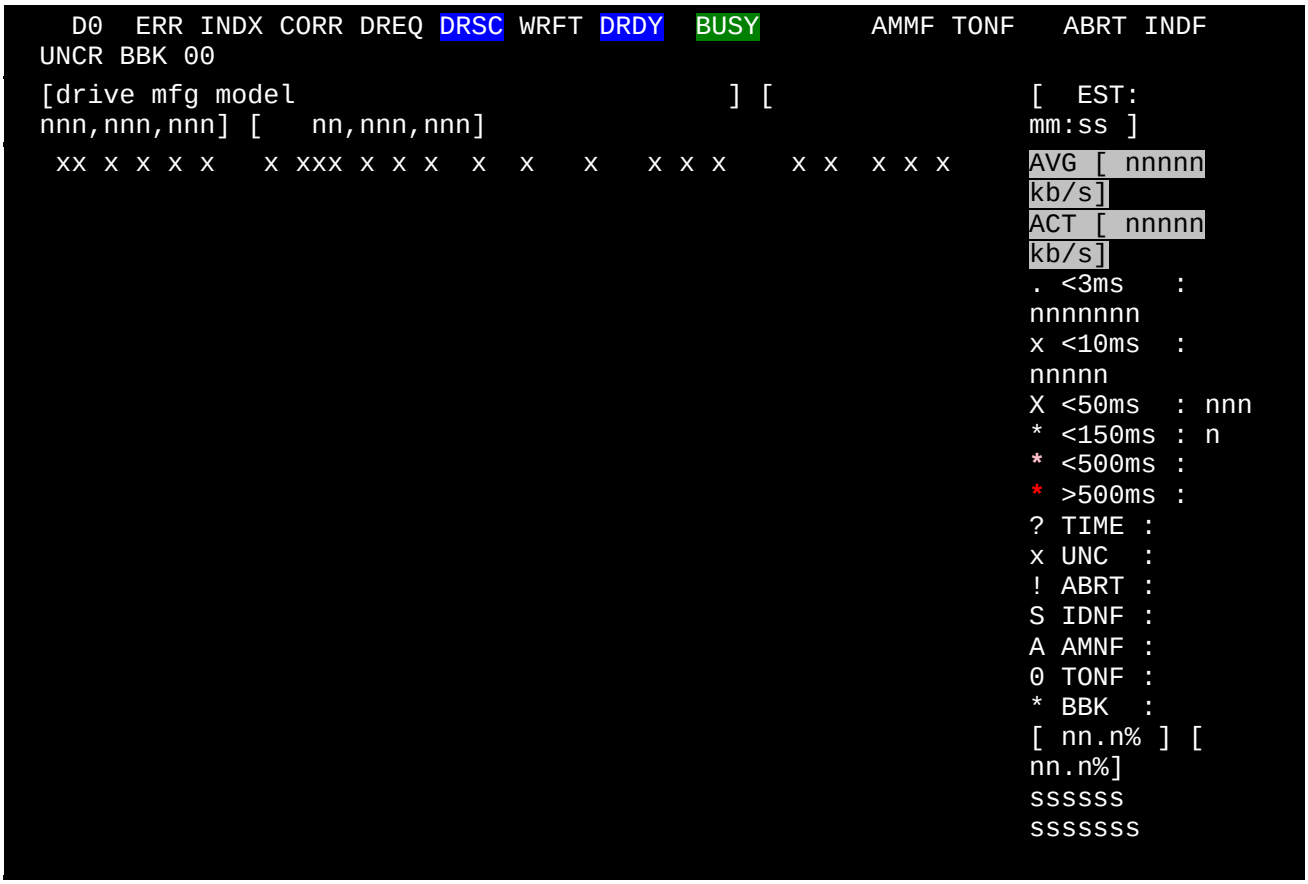
change the **Timeout** limit, **Spindown** after scan, **loop test/repair** and **Erase Delays** (danger data will be lost).



Defaults are shown. I suggest you change the **Timeout** to 5 DGG
Press **[F4]** again to start the scan .
One block is 255 sectors (130,560 bytes).

How Scan Works

1. **MHDD** issues a **VERIFY SECTORS** command with LBA number and number of sectors to verify
2. drive raises **BUSY** flag
3. **MHDD** starts timer
4. After drive executes **VERIFY**, it drops **BUSY**
5. **MHDD** measures the time and puts the corresponding block on the screen



6. Drive registers are displayed at the top of the screen.

7. Any IDE/SATA drive should report **DRIVE READY** and **DRIVE SEEK COMPLETE**, so you will see **DRDY** and **DRSC** flags colored in blue.

   BUSY appears when drive is executing (read or write command, for example).

   DATA REQUEST (DREQ) flag is on when drive wants to receive or send some data from/to the PC.

   Some flags such as **WRITE FAULT** and **TRACK 0 NOT FOUND** are obsolete, they never should appear.

   INDEX flag is obsolete too, but sometimes blinks.

8. When you see **ERROR** flag (ERR) you can look at the error register where you can see what kind of error happened. ATA/ATAPI standard has more information about registers and commands.

9. The brightness of the blocks reflect the length of time it to to read the sectors. This is most likely do to the firmware performing a retry. It is normal for a checker board like pattern to scroll across the screen.

10. A table on the right shows the number of blocks in each time range. If an error occurs a letter describing the type is shown

? TIME **VERIFY** command did NOT complete within the timeout	x UNC data is uncorrectable.	! ABRT command was aborted	* BBK Bad Block
S IDNF sector ID cannot be read or not as expected	A AMNF Data Address Mark Not Found	0 TONF Track 0 was not found during drive recalibration	

A blue block indicates remapping in progress.

The **AVG** (average) transfer rate in kilobytes per second is displayed, as well as the percentge complete.

During the scan pressing,

Left arrow backs up 10,000 sectors	up arrow backs up 250,000 sectors
down arrow advances 10,000 sectors	Right arrow advance 250,000 sectors

The log of scan is **log/mhdd.log** which is nice to save like to a floppy (or maybe **c:\driveSN.LOG**.

Now that the scan showed some **UNC** errors, what to do?
Save the scan log! Check
smart att

Of special interest are:

- **#5 Reallocated sectors count: 144 139 1109** this should be zero!
- **#194 HDA Temperature** perhaps there's an answer here!
- **#195 Hardware ECC recovered 253 252 731** Watch for astronomical number
- **#196 Reallocate event count 1 1 982** This looks bad!
- **#197 Current pending sectors 144 139 1109** Not good either!
- **#198 Offline scan UNC Sectors 1 1 11090** Looks like offline selftesting found errors too (same ones??)

- **#199 Ultra ATA CRC error rate 199.198 1** THis has to be BAD!

and

smart errlog

Maybe now is a good time to do a **file** based backup! (but you already did that I'm sure!)

Reruning the scan most likely will show the same errors since the hardware (firemware) has already done multiple attempts to read the data.

MAKELOG creates advlog.bin to a floppy as well, it will be rather large (example: 800KB for a 6GB drive), to be used by another program to further analyze the condition of the drive surface.

Example file:

```
9A 00 00 00 hex header
VER:2
MODE: IDE
DEVICE: Maxtor 90648D3
F/W: GAS54112
S/N: A30V0VFC
SECTORS: 12,656,448
SECTOR SIZE: 512 bytes
SCAN BLOCK SIZE: 255 sectors
              address    milli seconds
0000 0000 0000 0000 0000 0000 0000 302a
0000 0000 0000 ff00 0000 0000 0000 694c
0000 0000 0000 fe01 0000 0000 0000 5a1f
0000 0000 0000 fd02 0000 0000 0000 2b1f
0000 0000 0000 fc03 0000 0000 0000 6122
0000 0000 0000 fb04 0000 0000 0000 8c1c
...
0000 0000 0000 1f1f c100 0000  0000 c80b

0000 0000 0000 0a
```

49,633 blocks of 16 bytes for a 6GB drive

If your drive has errors, first thing to do is to make full back up. Then VERIFY that the backup you made is readable and complete!!

You can **WIPE OUT** all the DATA using the **ERASE** which erases every sector

Then **SCAN** with **REMAP** on.

If you see all blocks as errors STOP. You are dealing with service-area error which cannot be fixed by MHDD .

The best option contact the manufacturer for a Return Materials Authorztion, or discard the drive.

Writing Sectors to a File

TOF writes sectors To a File.
You can write several sectors or the whole drive to a file or to set of files.
ATOF (automatic file splitting) command will get more than 1 GB and to create several files.
MHDD skips bad sectors

Writing Sectors from file to the Drive

FF to write sectors From a File to the drive. input the LBA of the first sector to write and how many sectors to write.

Acoustic Management

AAM adjusts the Acoustic Management parameter. Note: decreasing the sound level is done by increasing the seek time!

Device Configuration

CONFIG views or set the maximum **UDMA** mode, Security , **SMART** , **LBA48** mode , **AAM** and **HPA** support, etc. You can also cut or uncut the drive by using this command. Some manufacturers are using Device Configuration to artifically reduce the size of a disk.

Display all PCI Devices

PCISCAN Scan PCI and save map to **MHDD_PCI.log** Example:

```
 MHDD PCI SCAN LOG

NAME----------------------CLASS--SUBCLASS--VENDOR--DEVICE--IO PORTS--------------------
Intel                      06     00        8086    7190    0008 0000 0000 0000 0000 0000
Intel                      06     04        8086    7191    0000 0000 0100 D0D0 FCA0 F480
Intel                      06     01        8086    7110    0000 0000 0000 0000 0000 0000
Intel PIIX4 EIDE Controller 01    01        8086    7111    0000 0000 0000 0000 FFA1 0000
Intel                      0C     03        8086    7112    0000 0000 0000 0000 EF81 0000
Intel                      06     80        8086    7113    0000 0000 0000 0000 0000 0000
                           04     01        12EB    0001    0000 EFA1 EF69 0000 0000 0000
VIA                        0C     00        1106    3044    F800 EC01 0000 0000 0000 0000
                           0C     03        1045    C861    E000 0000 0000 0000 0000 0000
PROMISE FastTrak100        01     80        105A    4D30    EFF1 EFE5 EFA9 EFE1 EE81 0000
                           02     00        10EC    8139    E801 F700 0000 0000 0000 0000
ATI                        03     00        1002    4C42    0000 D801 F000 0000 0000 0000
```

Erasing Sectors or Whole Drive

ERASE
If your drive is recognized by the BIOS, MHDD will use BIOS functions to erase the contents of the drive. Use **/DISABLEBIOS** command line switch to prohibit this.

First MHDD shows the disk ID, then invokes Fast Disk Eraser

```
Fast Disk Eraser v4.4 (LBA28/48/BIOS/ASPI)
Type start sector to write [0]:
Type end sector [16514063]:
tart : 1785
```

```
End  :1786
[] Continue? (y/N)

Start: 23:40:02

Sectors done: 2, 0Mbytes completed
End  :23:40:02
```

HDDerase from cmrr.ucsd.edu/people/Hughes/SecureErase.shtml or on the Ultimate Boot CD, will ERASE the contents of the entire drive at once using the internal SECURE ERASE command. This is the fastest erase and cannot be stopped.

If the drive is powered off after accepting the **SECURE ERASE** command, on power up it will be locked.

In this state the drive will continue the erase unless it is unlocked (after being partially erased) if the internal password is known.

Cutting the Drive (size change)

RHPA display factory size
HPA limits the size of a drive. Enter the new MaxLBA number, in sectors.
NHPA returns to factory size

Power cycle the drive before using **NHPA**.

According to ATA/ATAPI standard, you can use HPA functions only once per drive's power cycle.

Security Commands

Before using Security passwords, look in the BIOS setup for options to provide the password. If there is no way to provide a password at boot time, the only way to access the drive once setting the password, is to use **MHDD** to disable the password.

PWD command locks a drive with defined user password. According to ATA/ATAPI standard , Power cycle the drive to make password setting active.

There are two commands to unlock drives: **UNLOCK** and **DISPWD**.

UNLOCK unlocks a drive until the next power cycle.
To disable password, **UNLOCK** the drive, then use **DISPWD** command.
You must know the password to use **UNLOCK** or disable password commands.

UNLOCK and **DISPWD** can change the master or user passwords. For example, **PWD** command sets **USER** password.

Master password is set by manufacturer and can be used to unlock a drive.

Batches

An example is in the **BATCH** directory.

Press **[F5]** to run a batch.

Comments begin with a ; but are not displayed as batch runs.

First (non comment) line must match program version number V1.1 **Commands:**

ASK_ON/ASK_OFF ask for permission to execute every command

default is **ASK_OFF**

SOUND frequency, **NOSOUND**, **BEEP** seconds**, ENDSND_ON / ENDSND_OFF**
HALT_ON / HALT_OFF on error
PAUSE seconds
REPEAT n next line n times.
[ESC] can be used to stop looping.
DEV_SELECT (from menu),
DRV-PORT p (use 1 for Primary Master... 3 for Secondary Master, 6 for first PCI channel (see output from **SHIFT+[F3]**),

DRV_SCAN {startLBA | MIN } { endLBA | MAX } {0 | 1 | 2 } (where 0 is for scan, 1 scan and remap, 2 scan + Erase Delays)

DRV_WAIT wiat for drive to be ready
DRV_ID, DRV_RESET, DRV_STOP, **DRV_NHPA** recover Native Drive size (Host Protected Area)
DRV_SEEK seconds of testing
DRV_ERASE {startLBA | MIN } {endLBA | MAX }

A comment can be added after some commands with a numeric argument, example **DRV_SEEK 10** ; expect 13.9 ms average

Use **MAN EN BATCH** to see the commands

Example:

```
;version - do not change
V1.1
;confirmations: on
ASK_ON
;terminate batch on error
HALT_ON
;make sound after each line
ENDSND_ON
beep 1 ;;;;; Please select drive with SN=Y2VSJQHE
;select a drive from the displayed list
DRV_SELECT
;ATA reset
DRV_RESET
;Seek Test for 10 seconds
```

```
DRV_SEEK 10
; scan a little
DRV_SCAN 0 200 0
ASK_OFF
;repeat NEXT command 2 times
REPEAT 2
;scan whole drive without repair
DRV_SCAN MIN MAX 0

;stop spindle
DRV_STOP
;announce completion
beep 10
```

Other MHDD Commands

EXIT
QUIT
HELP
CLS
WAIT until drive is no longer BUSY then beep

SCSIINFO
PORT shift+**F3**
INIT
RST or **[F3]**
STOP the spindle shift+**F4**
RX Receive data from buffer (internal porgram debuging use only)
RPM Calculate Rotation speed of disk
SETCDSPEED
SWITCHMBR i.e. toggle active | inactive

CLRMBR
save to LBA0.MBR and LBA 1 (backup)
erase LBA 0
set inactive

FDISK Write MBR with one partition containing the entire disk.
SCSIFORMAT
MAKEBAD
RANDOMBAD

Command Line Switches

If you booted from a CD with the **MHDD** command in the AUTOEXEC.BAT you will need to exit and issue the MHDD command to include switches.:

/NOPINGPONG Disable some sounds
/DISABLEBIOS Disable ERASE through BIOS
/DISABLESCSI Disable SCSI engine
/ENABLEPRIMARY Enable Pimary IDE/SATA channel

/RO (disable logging and temp files creation)

Environment Variables
CDROM
LglDrv
RAMD drive letter of RAM drive
CONFIG

CFG/mhhd.cfg File
as observed

N.B. # is NOT a comment but is included in every(?) line.

```
#AUTODETECT_ENABLED=FALSE
#DEVICE=3
#SCAN_ERASEWAITSDELAY=350
#SCAN_STARTLBA=0
#SCAN_ENDLBA=12656447
#SCAN_TIMEOUT=240
#SCAN_MENUX=20
#SCAN_MENUY=5
#SCAN_SLEEP=0
#PRIMARY_ENABLED=FALSE
```

Frequently Asked Questions
FAQ is available here: forum.hddguru.com/viewtopic.php?t=5
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revised by Dennis German

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