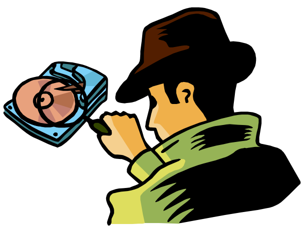
Miray Stand-Alone-Tool-Series



DiskSpy

Version 2.0

User's Manual

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1. INTRODUCTION

1.1. Preface

DiskSpy does not need an installation in the usual sense. However, these contain an installation program to create a bootable floppy disk in the first instance. Chapter → *2. Installation* shows in a few simple steps how you create a bootable disk by means of the installation package that you have downloaded or been sent. Once having created this disk you can start (→ *1.5. Program Start*) and use (→ *3. User Interface,* → *4. Functions*) DiskSpy on every PC without any further installation.

This manual explains to you in chapter → *3. User Interface* step by step and detailed the user interface of DiskSpy and how to operate it. Chapter → *4. Functions* focuses on the various functions available in the program. Functioning and effects of the different modes are described there in detail. For users of the **Professional SCSI Edition** there are some remarks in chapter → *5. SCSI*.

Nevertheless, in case of encountering any problems using the program, you find useful information in chapter → *6. Trouble-Shooting*. If this also does not help solving the problem you are welcome to contact out support (support@miray.de). We also appreciate obtaining your suggestions of improvement under feedback@miray.de.

1.2. Fields of Use

DiskSpy is a sector-based hard disk drive viewer and editor. You can access and edit every single sector of your hard disk, even those sectors which are usually invisible or inaccessible in normal operating systems. Furthermore it is possible to search the entire hard disk drive for values or character sequences. DiskSpy also shows detailed information about the capabilities of an installed hard disk drive.

1.3. Edition Overview

Edition Differences	PIO	SCSI	Search	Editing	Commercial Use
Free Edition	✓	✗	limited	✗	✗
Professional Edition	✓	✗	full	✓	✓
Professional SCSI Edition	✓	✓	full	✓	✓

Depending on the Edition you are using some of the features described in this manual may not be available to you. In most cases this will be also specially indicated in the concerning chapters.

1.4. Compatibility

DiskSpy runs on 486 or higher PCs with at least 4 MB RAM, keyboard and VGA. Additionally an internal 3.5"/1.44 MB floppy disk drive or a bootable CD-ROM drive is needed. Furthermore, for a useful deployment the used system should contain a PCI-IDE or standard IDE controller and one or more harddisks.
DiskSpy currently supports ATA/IDE harddisks with a capacity of up to 2048 GB (= 2 Terabytes), i.e. also harddisks above the “magical” limit of 128 GB. The **Professional SCSI Edition** additionally supports SCSI harddisks (→ *5. SCSI*).

1.4.1. Hardware Requirements

- PC 486 or higher, 4 MB RAM, VGA, keyboard
- bootable internal floppy disk or CD-ROM drive
- PCI-IDE- or standard IDE controller

optionally:

- *SCSI controller (Professional SCSI Edition only)*

1.4.2. IDE Controller

DiskSpy supports standard IDE controller (ISA) and PCI-IDE controller. These can be internal (onboard) controllers as well as external controllers (PCI or ISA adapter card). In case of an ISA/standard IDE controller, the first two channels are searched for harddisks. DiskSpy automatically recognizes all available PCI-IDE controllers and searches them for connected harddisks

> **Remark:** If there are one or more PCI-IDE controllers present in the system, possibly existing ISA controllers are not taken into account.

Regarding the "PCI-IDE controllers" supported by DiskSpy, this refers to a standardized programming interface that is supported by the majority of IDE controllers. But there are also some, especially along the external PCI controllers, that incorporate a different, usually proprietary interface. These mostly also call themselves "IDE controllers", as they allow IDE harddisks to be connected. Since "IDE" stands for a programming interface (program↔controller) as well as for a hardware interface (controller↔harddisk), this double meaning arises. If your PCI controller is complying the PCI-IDE standard can be determined, if necessary, by means of the program **PCISniffer**, that can be downloaded for free under www.miray.de/de/download/sat.pcisniffer.html. For the PCI controller in question, the field "Classcode" displayed by **PCISniffer** has to show the value "0101xx" (xx = arbitrary).

1.5. Program Start

Insert the bootable floppy disk or CD-ROM into the appropriate drive. Switch on or restart the PC. If necessary, ensure in the BIOS setup that the particular floppy or CD drive will be booted. DiskSpy then will be started from floppy disk or CD-ROM automatically. You will be displayed program screen directly. For further steps in operating the program continue in chapter → *3. User Interface*.

2. INSTALLATION

2.1. Introduction

2.1.1. Bootable Disk

If you received the program already on a **bootable floppy disk** or on a **bootable CD**, no further disk creation is needed. In this case, please proceed with step → *1.5. Program Start*.

2.1.2. Software Package

If you received the program as an installation package (= software package), you will need a 3.5" floppy disk. Proceed with step → *2.2. Installation Package* in the associated subsection, depending on whether you received the installation package as `.zip`, `.exe` or unpacked file.

2.1.3. Short Guide

The following short guide is sufficient in most cases. If you encounter any problems or prefer a more detailed installation guide, please continue with reading in the following chapters.

> Insert a formatted 3.5"/1.44 MB floppy disk into floppy drive A:. Any data on this floppy disk will be deleted, so please make sure not to use a floppy disk with data you might need later on. Please start the installation program that comes with the installation package. Initiate the creation of the floppy disk within the installation program. After completion of this process you have a **bootable floppy disk**. You can boot the installed program from this floppy disk on any PC (from 386/486, consult the hardware specifications) you want to – see also → *1.5. Program Start*.

2.2. Installation Package

2.2.1. Compressed Installation Package (.zip)

If you received the installation package in form of a packed file (**`.zip`**), you have to unpack it into a directory of your choice. Then you can start the associated installation program contained in this package. Proceed in chapter → *2.3. Installation Program*.

2.2.2. Self-Extracting Installation Package (.exe)

If you received a self-extracting installation package (**`.exe`**), you only have to execute the file. The installation process will be extracted and started automatically. Please proceed in chapter → *2.3. Installation Program*.

2.2.3. Plain Installation Package

If you have an installation package that is not compressed, you can usually start the installation process directly from the directory the installation files are located in. If this does not work, copy all files into a directory of your choice. Execute the installation program right from this directory and proceed in chapter → *2.3. Installation Program*.

2.2.4. Disk-/ISO-Image & other Operating Systems

If you have a disk image of the program or if you are unable to use the installation program for Windows, please create the bootable disk as described in → *2.3.2. Building from a Floppy* Disk Image, → *2.3.3. Building a Bootable CD* or → *2.3.4. Building a CD from* an ISO-Image.

2.3. Installation Program

2.3.1. Using the Installation Program

2.3.1.1. Main Window

When starting the installation program the main window appears (→ *fig. 1*). It contains 4 elements to control and display the current installation state:

- The **progress bar** (**1**) indicates the current completion state of the bootable floppy disk.
- The **status bar** (**2**) displays the current installation state and possibly occurring errors.
- The **start button** (**3**) starts building a bootable floppy disk.
- To **Exit** the installation program press the finishing button (**4**).

Fig. 1: main window of the installation program

For starting the installation of the program, insert an empty floppy disk into drive A:. Then click on *"Start Installation"*.

2.3.1.2. Security Check

Before starting the installation, a security prompt (→ *fig. 2*) will appear. Please ensure that there is a floppy disk in drive A: and that it does not contain any important data you possibly need later on. All data on the floppy disk will be deleted during the installation. If you are ready to proceed with the installation, click *"OK"*. The installation process will start immediately. By clicking *"Cancel"* you return to the main window without installing.

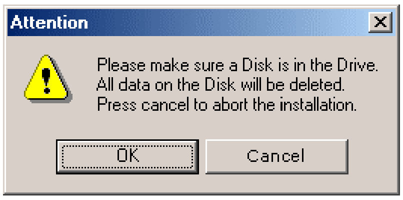


Fig. 2: security check

2.3.1.3. Error Message

In case of getting an error message (→ *fig. 3*), one of the following reasons may be responsible:

- there is no floppy disk in the disk drive,
- the floppy disk is write protected or
- the floppy disk used is defective.

Fig. 3: error message

Therefore replace the floppy disk if necessary respectively remove the write protection and confirm the error message with *"OK"*. Thereafter you will get back to the main window again and have to start over with the installation process as described in → *2.3.1.1. Main Window*.

2.3.1.4. Finishing the Installation

After successfully having built a floppy disk, you get a notification in form of a dialog window (→ *fig. 4*). Confirm this window with *"OK"*. Afterwards click on *"Exit"* in the main window (→ *fig. 1*) to close the installation program. Continue reading in chapter → *1.5. Program Start*.

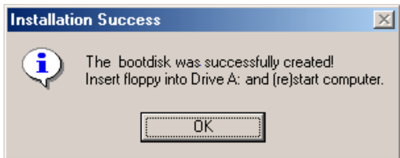


Fig. 4: installation complete

2.3.2. Building from a Floppy Disk Image

You can also use a floppy disk image for simply building a bootable medium. Since the installation program of miray Software currently runs on Windows only, this is especially recommended if you are using a different operating system. You can use the floppy disk image with a disk-imaging program of your choice. It is stored as a 1.44 MB image for 3.5'' floppy disks (`.img`).

Under UNIX/Linux it is recommended that you use the available tool *dd* (syntax: *dd if=filename.img of=/dev/fd0*), just replacing *filename.img* with the name of the according image file.

Remark: Note that a floppy disk image always contains the program itself only. Even if you are not using Windows as an operating system, the complete installation package often contains other useful files like a manual for example.

After having built a bootable floppy disk you can start DiskSpy on any PC as described in chapter → *1.5. Program Start*.

2.3.3. Building a Bootable CD

The image file described in → *2.2.4. Disk-/ISO-Image & other Operating Systems* can also be used for building bootable CDs. Simply specify this image file as bootable image in your CD recording program. You will possibly have to select the type bootable CD for the recorded CD before. After having built a bootable CD you can start DiskSpy on any PC as described in chapter → *1.5. Program Start*.

2.3.4. Building a CD from an ISO-Image

If your installation package contains an ISO image (`.iso`), you can use it to create a CD with most CD recording programs. After having finished the recording you have a bootable CD with the corresponding program on it. From this bootable CD you can start DiskSpy on any PC as described in chapter → *1.5. Program Start*.

3. USER INTERFACE

3.1. Startup

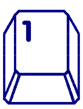
After starting, DiskSpy searches for installed hard disk drives. If only one hard disk drive is installed, DiskSpy immediately changes to the main window and displays the first sector of this hard disk.
If more hard disks are found by DiskSpy, a selection window will appear, where you can select the disk you want to work on. After selection the main window appears and the first sector of the selected hard disk will be shown.
The main window shows exactly one sector, i.e. exactly 512 bytes. Since the scrolling is not bound to sector boundaries, the end of one sector and the beginning of the following sector can be shown simultaneously. Nonetheless there are always 512 bytes shown at a time.

3.2. Address Display

The left row in the main window bears the address display. Prior to the colon it shows the number of the sector whose data is displayed in the main window. The sector number is counted continuously, starting from 0 (Zero). Sector numbers are shown in hexadecimal notation. After the colon the byte offset within a sector is shown. The sector number is only shown at the beginning of a new sector.

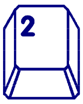
3.3. Hex-Display

The middle row of the main window bears the hex display. Here the data contained on the hard disk drive is shown in hexadecimal notation.

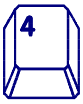


With the <1> key you change to **8-bit-display-mode** (1-byte). This is the default display you find when starting DiskSpy. Every byte is shown separately in hexadecimal no-

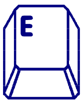
tation.
The current display mode is also visible in the status bar (see also *"2.6. Status Bar"*). At startup the 8-bit-display-mode is activated.



With the <2> key you can change to the **16-bit-display-mode** (2-byte). In this display mode 2 bytes are combined to a word and shown in hexadecimal notation. The display is also depending on the endianness, which can be set with the <E> key (see below). Please note that in the 16-bit-display-mode the cursor also moves byte-wise. So two cursor steps are needed to change from word to word.
The actual display mode is visible in the block `[124]` in the status bar (see also *"2.6. Status Bar"*). At startup the 8-bit-display-mode is activated.



With the <4> key you can change to the **32-bit-display-mode** (4-byte). In this display mode four bytes are combined to a doubleword and are shown in hexadecimal notation. The display is also depending on the endianness which can be set with the <E> key (see below). Please note that in the 32-bit display mode the cursor also moves byte-wise. So four cursor steps are needed to change from doubleword to doubleword.
The actual display mode is visible in the block `[124]` in the status bar (see also *"2.6. Status Bar"*). At startup the 8-bit-display-mode is activated.

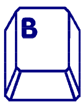


With the <E> key you can change the **endianness** of the display. You can change between big-endian (Intel-notation) and little-endian. This changes are only effective in the Hexadecimal display when the display mode is either 16-bit or 32-bit (see above). It always affects the values shown in the display window described in *"2.5. Value Display"*.

The actual display mode is visible in the block **[BL]** in the status bar (see also "2.*6. Status Bar*"). At startup the big-endian-display-mode is activated.

3.4. ASCII-Display

In the right row of the main window the ASCII display can be found. The data of the hard disk drive is displayed with ASCII characters.



Using the <B> key you can change the **bit width** of the ASCII display between 7-bit and 8-bit. In the 7-bit-mode only those bytes are displayed with their ASCII value, whose values are between 32 and 127 (inclusive). Every other values are represented by a dot. This eases the reading of character strings. In the 8-bit-mode every byte's value is represented with the corresponding ASCII character.
The actual display mode is visible in the status bar (see also *"2.6. Status Bar"*). The 7-bit display mode is active at program startup.

3.5. Short-Info

In the lower left corner of the monitor the short info window with the title "Selected Disk" is located. In this window the key data of the selected hard disk drive are shown. Abundant information can be obtained by pressing the <I> key (see also *"3.4. Hard Disk Info"*).

3.6. Position-Info

In the lower right corner a window with the title “Current Position Info” is located. The data in this window is related to the current cursor position in the main window. The byte on the cursor position is shown binary, hexadecimal and decimal. It is also combined with the following bytes to a word and a doubleword, according to the current endianness settings (see also *“2.2. Hex Display”*). These word and doubleword values are displayed in both hexadecimal and decimal notation. The current cursor position, consisting of sector number and offset (see also *“2.1. Address Display”*) is shown in decimal form.

3.7. Status-Bar

The status bar is located at the left bottom line of the screen and shows the current status of certain settings. The display is divided into six blocks. Each of these blocks shows a certain program status. The yellow emphased character in each of these blocks shows the currently active setting. The following table lists the different blocks. The default setting after program startup is emphased here with the color orange (light gray when printed).

▼▲✷

This block refers to the search function (see also *“3.6. Search”*). The arrows show whether the **search direction** is forward or backward. The asterisk shows, if there is already data in the search mask. In this case the search can be continued by pressing the <C> key. If no data has been entered into the search mask, a dot appears instead of the asterisk.

78

This block shows the current **bit width** for the ASCII display (see also *“2.3. ASCII Display”*), accordingly whether the ASCII display occurs in **7-bit-** or **8-bit-display-mode**.

BL

This block shows the **endianness** referring to the hex display (see also *"2.2. Hex Display"*) and the position info (see also *"2.6. Position Info"*), accordingly whether the display occurs in **big-endian-** or **little-endian-notation**.

124

This block shows the display width referring to the hex display (see also *"2.2. Hex Display"*), accordingly whether the data is shown as 8-bit-values (**1**), 16-bit-values (**2**) or 32-bit-values (**4**).

RW

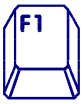
This block shows the current **working mode** of the DiskSpy (see also *"3.7. Edit"*), accordingly whether the **read-** or **write-mode** is activated.

HA

This block only refers to the write-mode. It shows which **edit window** is currently active and where data can be edited, these being the **hex**- or the **ASCII-display** (see also *"3.7. Edit"*). If the write-mode is inactive, the hex display is always shown as being active, because the current active display is only relevant in the write-mode.

4. FUNCTIONS

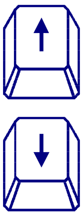
4.1. Quick-Help



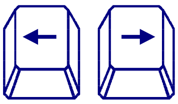
Using the <F1> key you can get a short overview about the different functions and key combinations of DiskSpy to remember them if they have been forgotten.

4.2. Navigation

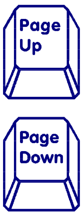
The cursor is moved with the arrow keys in the main window. It always moves in both the hexadecimal and the ASCII display.



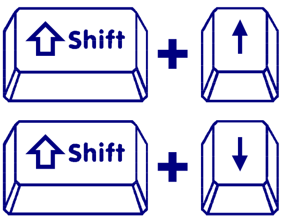
When a vertical motion occurs the cursor jumps to the preceding or succeeding line whilst retaining its horizontal position within the line. If the preceding or succeeding line is not visible, the entire view will scroll by one line up- or downward. If you try to jump from the first line of the first sector (number 0) in the preceding line (which does not exist), the cursor remains in the first line, but changes horizontally to the first position at the line's beginning. Analogous the cursor changes horizontally to the last position if you are located in the last line of the last sector of the hard disk drive and you try to jump beyond to the (also non-existing) next line.



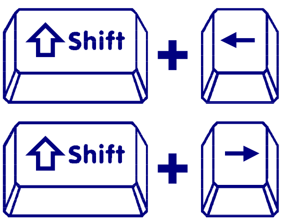
In a horizontal motion the cursor moves byte-wise to the left or right. This is also the case when the 16-bit- or 32-bit-display-mode is activated, i.e. in this case you have to press the corresponding arrow key twice or four times to change to the corresponding 16-bit or 32-bit value. Since the ASCII display is not affected by the selected bit width in the hex display, cursor movements occur always in byte steps. If the cursor is located at the beginning or the end of a line, it changes to the end or the beginning of the preceding or succeeding line. If the preceding or succeeding line is not visible, the entire view will scroll by one line up- or downward.



A vertical motion with the Page-Up or Page-Down keys scrolls the view in the main window exactly by one sector, i.e. 32 lines or 512 bytes up- or downward. The cursor retains his position on the screen. If you are located in the first or last sector and you try to scroll one sector up- or downward (to a non-existing sector), the view will scroll to the begin of the first or the end of the last sector and the cursor jumps to the first or last byte.

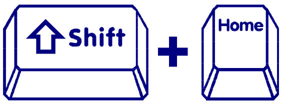


Using the <Shift> keys in combination with the vertical arrow keys you can scroll the entire view up- or downward by one line. The cursor retains its position on the screen, while the content of the main window is scrolled up- or downward according to the cursor keys.



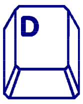
Using the <Shift> keys in combination with the horizontal arrow keys you can scroll the view in the main window to the left or to the right. The cursor remains at his former position within the window, only the content of scrolls to the left or to the right. This horizontal shift has the additional effect that the line start does not have to be 16-byte-aligned but can be shifted arbitrarily.

Using the <Home> key you can reposition the cursor at the upper left corner of the main view. The main window's view will not be shifted, only the cursor will be positioned at the beginning of the first visible line of the main window.



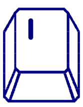
Combining the <Home> key with the <Shift> key you can reposition also the cursor in the upper left corner, but the main window's view will also shift so that the sector the cursor actually is positioned will start in the first line of the main view. So this displays a sector completely.

4.3. Drive Selection



By pressing the <D> key you can select another hard disk drive (**Drive Select**). If DiskSpy has found more than one hard disk drive installed, a window similar to the selection window at the program start pops up which lists all installed hard disk drives. You can choose the desired hard disk drive and change to it by pressing the <Enter> key.
If you change to a hard disk drive you have already selected before, DiskSpy remembers the cursor position for this hard disk drive and sets it to exactly the same view as when left. You can therefore change between hard disk drives and after changing back you will find yourself on exactly the same position you were when leaving this drive.

4.4. Harddisk Info



By pressing the <I> key you can activate the **hard disk info** window, which shows much more detailed information about the selected hard disk drive than the short info (see also *"2.4. Short Info"*). This information is divided into several groups. By using the following keys you can display the desired group of information.

[General] *General Information* about the harddisk – especially vendor, serial number, cache size, sector layout and size.

[Version] *Version Information* about the ATA/ATAPI version implemented by the harddisk.

[Modes] *Transfer Modes* that are supported by the harddisk, especially about multiple sector, DMA, UltraDMA and PIO modes and their respective timings.

[Hardware] *Hardware Test Results* as far as these are provided by the harddisk.

[Commands] *Supported Command Sets* of the harddisk. As there are two alternative indication possibilities for some of the command sets, both alternatives are displayed in two separate columns. A certain command set is available if it is displayed as supported in one of the two columns.
This information screen consists of two pages. You can display the second page by pressing any key.

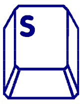
[Raw] *Raw Data* of the harddisk information block, that is displayed in clear text in the other information groups.

[eXtended] *Extended Information* about diverse harddisk features like streaming, acoustic management and security abilities.

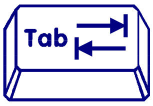
4.5. Goto

With the <G> key a dialog pops up which offers the possibility to jump to a desired sector of your hard disk drive (**Goto**). You can choose whether you want to jump to an absolute position or to a current-sector-relative position by pressing the <+> and <-> key. These keys can be pressed at any time during the input of the target address. The target address (absolute or relative) has to be entered in decimal notation. You can change between insert- and overwrite mode by pressing the <Ins> key. The resulting target address (absolute) will be shown below the input line in hexadecimal format.

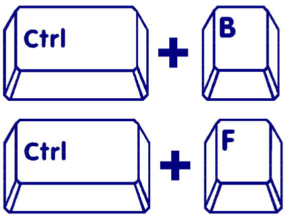
4.6. Standard Search (Hex-Search in Pro Edition only)



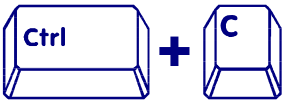
Pressing the <S> key a **search dialog** pops up. You can enter either an ASCII string or the pattern to search in hexadecimal form. Up to 512 characters can be entered into the search mask. You can start the search process by pressing the <Enter> key starting at the current cursor position.



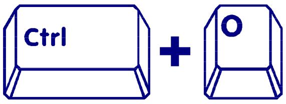
With the <Tab> key you can change between ASCII and hex input line. This can also be done during the input, so you can mix both ASCII and hexadecimal input.



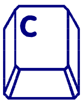
Pressing the key combinations <Ctrl>+<B> (**Backward**) or <Ctrl>+<F> (**Forward**) you can change the search direction. Forward search starts from the current cursor position upward, backward search starts from the same position downward toward lower addresses.



Pressing the key combination <Ctrl>+<C> within the search dialog you can load the complete **current** sector into the search mask.

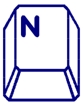


With the key combination <Ctrl>+<O> you can recall the prior used search pattern (**Old**) as new search pattern in the search mask.

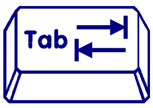


With the <C> key you can **continue** the search for the same pattern. It is necessary that a previous search has already been accomplished. This search will then start from the current cursor position with the same parameters. You can see whether a continuing search is possible by checking if the asterisk in the status bar is there (see also *"2.6. Status Bar"*).

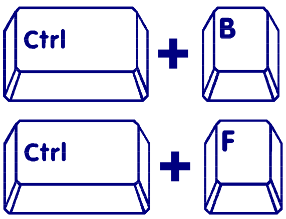
4.7. Not-Search



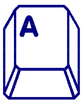
With the <N> key you open a **not-search dialog**. There you can enter a 8, 16 or 32 bit value in hexadecimal form. When opening the dialog, the value at the current cursor position is taken over by default. The not-search searches for the first occurrence of a value different from the one entered. This helps finding the end of blocks of repeating values. The not-search can be started by pressing <Enter>. It starts directly behind the current cursor position.



By pressing the <Tab> key you can change between the different input fields.

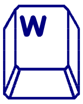


Pressing the key combinations <Ctrl>+<B> (**Backward**) or <Ctrl>+<F> (**Forward**) you can change the search direction. Forward search starts from the current cursor position upward, backward search starts from the same position downward toward lower addresses.



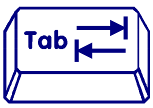
With the <A> key you can continue (**again**) the not-search for the same pattern. It is necessary that a previous search has already been accomplished. This not-search will then start from the current cursor position with the same parameters.

4.8. Edit (Pro Edition only)



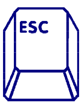
With the <W> key you activate the **write-mode**. The cursor in both hex- and ASCII-view changes its color to red. When in write mode, the cursor navigation is restricted to the currently visible data area. If you wish to change the current visible area, you have to leave the write-mode first.

You can determine whether you are in write or not mode by looking at the block **`[RW]`** in the status bar (see also *"2.6. Status Bar"*).

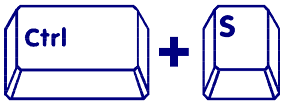


By pressing the <Tab> key within the write-mode you can change between the hex-view and the ASCII-view. When in hex-view, you can change the values in hexadecimal notation. If you are in ASCII-view, you can enter the characters directly with your keyboard.

To determine which view is currently active, you have to see either on the blinking cursor or you can see it in the block **`[HA]`** in the status bar (see also *"2.6. Status Bar"*).



By pressing the <Esc> key you leave the write-mode without saving any changes you made since entering the write-mode. These changes are displayed in red.



When pressing the key combination <Ctrl>+<S> you accept the changes you made and save these to the hard disk drive.

Attention: *The so made changes on your hard disk drive are final and can not be undone. Save changes only if you know exactly what you are doing!*

5. SCSI

This chapter exclusively refers to the **Professional SCSI Edition** as only this edition supports SCSI harddisks.

5.1. Usage

You can use DiskSpy with SCSI harddisks in the same way as with IDE harddisks without any significant differences in the user interface. DiskSpy recognizes supported SCSI controllers and connected SCSI harddisks – in addition to IDE harddisks – automatically at program start. Each SCSI harddisk detected is displayed with a continuous controller number, the identifier “SCSI” and its SCSI-ID. Type, vendor and size of a harddisk are itemized in the same way as with IDE harddisks.

5.2. Compatibility

DiskSpy generally supports all SCSI harddisk drives. Prerequisite is that this harddisk is connected to a SCSI controller that is supported by DiskSpy. Currently DiskSpy supports the popular Narrow, Wide, Ultra und Ultra-Wide SCSI controllers of Adaptec.

> **Remark:** Since DiskSpy contains the original drivers of the hardware manufacturer, miray Software does not have any influence on the actual grade of compatibility. All statements of miray Software about compatibility have only informational character, are based on specifications of the hardware manufacturer and therefore can not be legally binding (→ *7.1. Disclaimer*). To practically help determining the compatibility, miray Software offers the program **DiskCheck**, which can be downloaded for free at http://www.miray.de/de/download/sat.diskcheck.html. It is based on the same SCSI drivers and displays the SCSI harddisks detected by these.

5.2.1. Manufacturer Information

According to information of the hardware manufacturer, the drivers utilized in DiskSpy currently support the following SCSI controllers:

- Adaptec **AHA-2930U**
- Adaptec **AHA-2940 Ultra**
- Adaptec **AHA-2940UW**
- Adaptec **AHA-2940AU**
- Adaptec **AHA-2944UW**
- Adaptec **ASC-19160**
- Adaptec **ASC-29160**
- Adaptec **ASC-29160LP**
- Adaptec **ASC-29160N**
- Adaptec **ASC-39160**

5.2.2. Driver Information

According to information from the drivers themselves, they also support a number of further SCSI controllers, partly designed as onboard chipset (AIC), partly as adapters (AHA, ASC). They can be identified clearly by PCI-Vendor-ID and PCI-Device-ID, listed in the following table.

Vendor	Model	Device
9004h	AHA-2930U	3860h
"	AHA-2930CVAR	3868h
"	"	3869h
"	AHA-4944(U)W	3B78h
"	AIC-755x	5x75h
"	AIC-785x	5x78h
"	AIC-7560	6075h
"	AIC-786x	6x78h
"	AIC-7870	7078h
"	AHA-2940(W)	7178h
"	AHA-3940(W)	7278h
"	AHA-2944	7478h
"	AHA-3944(W)	7578h
"	AHA-4944(U)W	7678h
"	AIC-7877	7778h

Vendor	Model	Device
9004h	AIC-7860	7860h
"	AIC-7895	7895h
"	AIC-7880	8078h
"	AHA-2940U(W)	8178h
"	AHA-3940U(W)(D)	8278h
"	AHA-2944UW	8478h
"	AHA-3944U(WD)	8578h
"	AHA-4944UW	8678h
"	AIC-7887	8778h
"	AIC-7888	8878h
"	AHA-4944(U)W	EC78h
9005h	AHA-2940/2950U2W	0010h
"	AIC-789x	001xh
"	"	002xh
"	"	003xh

Vendor	Model	Device
9005h	AHA-3940/3950U2x	0050h
"	AHA-3950 U2x	0051h
"	AIC-7896/7 U2	005Fh
"	AIC-789x	006xh
"	"	007xh
"	AIC-7892(A/B) U160	008xh
"	AIC-789x	009xh
"	"	00Axh
"	"	00Bxh
"	AIC-7899(A) U160	00Cxh
"	AIC-789x	00Dxh
"	"	00Exh
"	"	00Fxh
"	AHA-2930U2	0180h

If necessary, the IDs of your controller can be determined by means of the program **PCISniffer**. Under www.miray.de/download/sat.pcisniffer.html it is available for free download from the miray homepage. For the PCI SCSI controller in question the fields “Vendor ID” and “Device ID” in PCISniffer have to match the values given above for your SCSI controller.

6. TROUBLE-SHOOTING

6.1. Error #5002 while Loading

If Error #5002 appears when starting the program, start it over again. If this is not successful, build the floppy disk again. If the problem is still there, try another floppy disk or another floppy disk drive, if available. Users of the **Professional Edition** or **Professional SCSI Edition** please contact our support (support@miray.de).

6.2. DiskSpy Gets Stuck at Startup

If DiskSpy starts normally but freezes when scanning for harddisks, this is mostly result of an incorrect DMA configuration by the BIOS. Try to adjust the DMA and IDE settings in the BIOS step by step towards lower values in this case (→ *6.3.3. BIOS Adjustments*).
If you use the Professional SCSI Edition and the regarding system is equipped with a SCSI controller, this controller can also be the reason. To determine the source of error, deactivate all SCSI controllers. In case of the problem does not occur afterwards it is probable that a respectively the SCSI controller is the reason. In this case you find further hints in chapter → *6.4. Problems with SCSI*.

> **Remark:** The harddisk recognition of DiskSpy at program start can take up to a minute or longer under certain circumstances. After more than five minutes it can be assumed that the program has got stuck. The time required for the recognition of harddisks, beside other things, strongly depends on the number of IDE and SCSI controllers installed in the system.

6.3. Problems with IDE

6.3.1. Harddisk not Detected

If DiskSpy does not detect a specific harddisk this may have several reasons. It is possible that the controller it is connected to has not been detected (→ *6.3.2. IDE Controller not Found*). Another common reason for this problem is that the way your harddisk is connected does not comply with standard. This may be the case for example if a harddisk is configured as slave and the master drive on the same channel is a CD/DVD drive or is not present. But under normal circumstances DiskSpy even copes with that.

6.3.2. IDE Controller not Found

There are two conditions on that IDE controllers are not detected automatically by DiskSpy:

- Standard IDE controllers (ISA) are not taken into account if there are PCI IDE controllers existing. In this case connect the appropriate harddisks to a PCI IDE controller or deactivate the PCI IDE controller(s).
- The used controller does not comply with the PCI IDE standard. Although most controllers support this standardized programming interface, there are some controllers that feature only a proprietary programming interface. You also find particulars about this in → *1.4.2. IDE Controller*. Connect the according harddisk drives to another controller (PCI IDE controller).

6.3.3. BIOS Adjustments

The following hints refer to Adjustments you probably can and should make in the BIOS setup of your PC in case of encountering problems when using DMA. However, since the adjustments provided by your BIOS are vendor and model specific, these hints can only be given in a generic form. For a detailed description how to change a particular adjustment and which adjustments are possible, consult your BIOS manual if necessary. The DMA adjustments are often to be found under *"Integrated Peripherals"* or *"Chipset Setup"*.

Remark: Execute the automatic harddisk detection in the BIOS after each alteration of the harddisk and DMA settings to ensure the changes made become effective for the according harddisks. Also remember to save the changes made with *“Save and Exit”* when leaving the BIOS setup.

6.3.3.1. Deactivating IO-Caching

If there are problems even in the PIO mode you should deactivate IO caches or buffers. Especially the option *“Dataport Postwrite”* should be set to *“Disable”* in case of problems, if it is available.

6.3.3.2. Setting the BIOS to Defaults

If DiskSpy does not work as desired, despite the hints mentioned above, you can try to set the default values by means of the *“Load BIOS/Setup Defaults”* option. This adjustment tries to avoid all other possible hardware conflicts.

6.4. Problems with SCSI

When using SCSI devices, please pay attention to them being configured and connected to the SCSI controller correctly. In particular SCSI controllers with SCSI BIOS must announce a harddisk at system startup to ensure this disk is available to DiskSpy subsequently. Furthermore, DiskSpy must support your controller. A list of supported SCSI controllers is to be found in chapter → *5.2. Compatibility*.

Remark: Even if a SCSI controller displays the desired harddisks at system startup, this is no warranty that these devices are configured and connected correctly. The BIOS of the SCSI controller naturally works on a lower level than the SCSI drivers utilized by DiskSpy and therefore possibly recognizes harddisks that are not detected by DiskSpy.

DiskSpy has been tested on numerous SCSI controllers. The software as far as possible bypasses problems that thereby have been encountered sporadically. For further random or sporadic problems the following chapters contain some useful hints for finding a remedy in most cases. These hints are described in the order they should be utilized in to minimize the necessary efforts as far as possible. The following problems have been encountered during the tests and could be bypassed by the hints described afterwards.

- DiskSpy gets stuck at startup (during initialization of the SCSI controllers)
- No SCSI harddisks are found
- Not all harddisks are found

6.4.1. Restart

If DiskSpy gets stuck at startup or does not display the desired SCSI harddisks, try to restart the computer. Try a simple reset at first (reset switch). Only if this does not produce relief you should try to switch off the computer and leave it switched off for about 30 seconds. Both kinds of restart can counteract signal and state problems of SCSI controllers.

6.4.2. Deactivating Unused Controllers

In case a restart does not result in the desired result you should deactivate unused SCSI controllers, as far as your system is equipped with more than one SCSI controller. This may be also advisable if a SCSI controller is generally used but the harddisks connected to it will not be used with DiskSpy.

6.4.3. Deactivating Unused Harddisks

In some cases it is possible that SCSI harddisks that are connected to the same SCSI controller interfere with each other or the controller itself. For this reason you should deactivate several harddisks temporarily or connect them to the controller one after another and step by step to determine from which harddisk the interference probably originates. Always keep in mind to ensure that the last SCSI device is must always be terminated during these attempts.

6.4.4. Minimal Configuration of the Controller

Remedy in case of problems can also be found by configuring the SCSI controller via its BIOS setup or, in case of an onboard controller, via the main BIOS setup of the PC.

Try to adjust the lowest and most secure values for the SCSI bus (e.g. Narrow transfer mode with a Wide controller).

6.4.5. Minimal Configuration of the System

Try also different ways to connect the SCSI harddisks used in the system, especially if using two or more SCSI controllers. As far as possible proceed the following way: De-activate all SCSI controllers except one, which should, if possible, incorporate only one SCSI channel and be one of the types listed in → *5.2.1. Manufacturer* Information. Then connect only the harddisk or harddisks required. Apart from defective harddisks this proceeding revealed a running configuration in most cases allowing execute the projected task.

7. MISCELLANEOUS

7.1. Disclaimer

Although DiskSpy was programmed with high diligence and was tested on a large scale of different systems, we hope you understand that we cannot give any warranty for the proper functioning of the program and that we are not liable for damages resulting from its usage, subject to gross negligence and intention.

7.2. Feedback

We are deeply interested in your feedback. If you encounter any program errors or if you have any suggestions for improvement, we always try to fix the former and to implement respectively to integrate the latter. If you simply want to tell us your opinion about this software, we are looking forward to it.

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Fax	++49 89 767291-68
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