User's Guide

OS Selector 8.0

Acronis

Compute with confidence

www.acronis.com

END-USER LICENSE AGREEMENT

BY ACCEPTING, YOU (ORIGINAL PURCHASER) INDICATE YOUR ACCEPTANCE OF THESE TERMS. IF YOU DO NOT WISH TO ACCEPT THE PRODUCT UNDER THESE TERMS YOU MAY CHOOSE NOT TO ACCEPT BY SELECTING "I decline..." AND NOT INSTALLING THE SOFTWARE.

The OS Selector (the Software) is copyright © 2000-2002 by SWsoft. All rights are reserved. The ORIGINAL PURCHASER is granted a LICENSE to use the software only, subject to the following restrictions and limitations.

1. The license is to the original purchaser only, and is not transferable without prior written Permission from SWsoft.
2. The Original Purchaser may use the Software on a single computer owned or leased by the Original Purchaser. You may not use the Software on more than a single machine even if you own or lease all of them without the written consent of SWsoft.
3. The Original Purchaser may not engage in, nor permit third parties to engage in, any of the following:

A. Providing or permitting use of or disclosing the Software to third parties.

B. Providing use of the Software in a computer service business, network, timesharing or multiple user arrangement to users who are not individually licensed by SWsoft.

C. Making alterations or copies of any kind in the Software (except as specifically permitted above).

D. Attempting to un-assemble, de-compile or reverse engineer the Software in any way.

E. Granting sublicenses, leases, or other rights in the Software to others.

F. Making copies, or verbal or media translations, of the users guide.

G. Making telecommunication data transmission of the software.

SWsoft has the right to terminate this license if there is a violation of its terms or default by the Original Purchaser. Upon termination for any reason, all copies of the Software must be immediately returned to SWsoft, and the Original Purchaser shall be liable to SWsoft for any and all damages suffered as a result of the violation or default.

ENTIRE RISK

THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE SOFTWARE IS WITH YOU THE PURCHASER. SWSOFT DOES NOT WARRANT THAT THE SOFTWARE OR ITS FUNCTIONS WILL MEET YOUR REQUIREMENTS OR THAT THE OPERATION OF THE SOFTWARE WILL BE UNINTERRUPTED OR ERROR FREE OR THAT ANY DEFECTS WILL BE CORRECTED. NO LIABILITY FOR CONSEQUENTIAL DAMAGES - IN NO EVENT SHALL SWSOFT OR ITS VENDORS BE LIABLE FOR ANY DAMAGES WHATSOEVER (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR THE LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, OR ANY OTHER PECUNIARY LOSS) ARISING OUT OF THE USE OR INABILITY TO USE THE SOFTWARE, EVEN IF SWSOFT HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Table of Contents

About This Guide

The purpose of this Guide is to help in using Acronis OS Selector and solving problems that might arise while working with it.

User Guide consists of the following chapters and appendices:

Chapter 1 «Introduction» provides an overview of Acronis OS Selector and its main features.

Chapter 2 «Basic Information» makes the user acquainted with the basic concepts, terms and principles that are necessary when working with Acronis OS Selector.

Chapter 3 «Installing and Uninstalling Acronis OS Selector» tells how to install and uninstall Acronis OS Selector and what other actions the Installation program performs.

Chapter 4 «Boot Menu» describes the appearance and functioning of Acronis OS Selector Boot Menu.

Chapter 5 «Acronis OS Selector Setup» gives detailed description of Acronis OS Selector Setup and all the configuring options that are provided by its interface.

Chapter 6 «Disk Administrator» provides a description of Disk Administrator's interface and basic working principles.

Chapter 7 «Main Operations with Disk Administrator» provides detailed information and instructions for performing the most common operations with partitions in the Disk Administrator, such as creating, formatting, moving and resizing.

Chapter 8 «Advanced Operations with Disk Administrator» explains how and what for one can use advanced features of Disk Administrator, such as resizing clusters, changing partition type, etc.

Chapter 9 «Particularities of Operating System Functioning» describes the particularities of functioning of different operating systems in the context of their operation together with Acronis OS Selector.

Chapter 10 «Windows 95/98/ME Installation Wizard» gives detailed information about how the Installation Wizard can be used to install or upgrade Windows 95/98/ME operating systems.

Appendix A. «Text Editor» contains the description of the text editor that is provided with Acronis OS Selector.

Appendix B. «Disk Editor» acquaints the user with the additional feature – direct sector-by-sector hard disk editing.

Appendix C. «Acronis OS Selector On-Line Help» covers the functioning of the Acronis OS Selector built-in hypertext On-Line Help.

Appendix D. «Compatibility with Other Software» describes how different programs react on partition structure and actions performed by Disk Administrator.

Appendix E. «FAQ (Frequently Asked Questions)» answers some frequently asked questions about Acronis OS Selector.

Appendix F. «Glossary» contains the main terms that are used in this Guide, and the Acronis OS Selector interface, together with brief explanations.

Chapter 1. Introduction

This chapter contains the following general information about Acronis OS Selector:

1.1 Acronis OS Selector as a Boot Manager

The main function of a boot manager is to allow the user to install multiple operating systems on one computer and to choose the necessary one when the computer is booted.

All boot managers can be divided into several complexity levels:

1. Boot managers that are able to boot an operating system by reading the boot sector from the first sector of a partition. These boot managers do not recognize file systems and hence cannot support multiple operating systems that are installed on one partition. They have the simplest user interface and occupy minimum disk space. The examples are OS/2 BootManager and Linux's LILO.
2. Boot managers that can load the boot sector from a file with a specified name. These usually are parts of an operating system (built-in boot managers) that are supposed to somehow help the operating system to co-exist with other operating systems. Built-in boot managers have the simplest user interface. Examples are: NT OS Loader.
3. Full-scale boot managers that can detect file systems (FAT), recognize different operating systems, and are able to automatically detect them. These boot managers are aware of system and configuration files of operating systems and are able to create backup copies of them, to allow the user to have multiple operating systems with same system file names or multiple copies of configurations of one operating system on one partition. Examples are: BootWizard 3.x, System Commander, BootIt.
4. Only Acronis OS Selector 8.0 can be put on the last, highest level of complexity. Unlike all other boot managers, it allows users to have multiple operating systems with same named system folders on one

partition and allows hiding any specified partitions from any given operating system.

Aside from performing its main function, Acronis OS Selector has many additional features.

1.2 Acronis OS Selector as a Partition Manager

When new operating systems are installed, hard disks are replaced or added and in some other cases the necessity arises in relocating the information on hard disks. That is why the Acronis OS Selector distribution package now includes Disk Administrator – a program that allows users to easily perform a variety of operations with partitions such as creating and deleting, formatting and resizing on the fly without data loss, moving and copying.

Because of the limitations in the FAT16 file system that is used in many popular operating systems such as MS-DOS and Windows 95/98/ME, up to 40% of disk space might be wasted. With help from our Disk Administrator you will be able to easily analyze the waste and reduce it by choosing appropriate partition or cluster sizes or converting the partitions to the FAT32 file system. Reverse conversion is also possible.

With the same ease the Disk Administrator can perform various actions with NTFS, Linux Ext2/Ext3, Linux Swap, and even Linux Ext3 and ReiserFS partitions.

You can also get detailed information about the hard disk drive geometry and partitions, as well as view and edit their content sector-by-sector.

1.3 Acronis OS Selector Key Features

Here the key features of Acronis OS Selector as a boot manager are listed:

- Supports more than 100 operating systems on one computer.
- Supports operating systems both on primary and logical partitions of any hard disk.
- Can boot both from A: and B: floppy drives.
- Supports multiple operating systems on one FAT partition.
- Automated backing up and restoring the critical system and configuration files, such as IO.SYS, MSDOS.SYS, COMMAND.COM, CONFIG.SYS etc.
- Detects possible boot virus infection.
- Ability to establish password protection on Boot Menu and any operating system configuration.

The following features are unique to Acronis OS Selector:

- Standardized intuitive user interface.
- Power-off from Boot Menu.
- Flexible Boot Menu appearance adjustment.
- Fast creating and adjustment of different configurations of an operating system.
- Actions that can be performed from the installation media (usually a bootable diskette or a CD-ROM), such as activating and deactivating Acronis OS Selector, uninstalling it, running Disk Administrator etc.
- Supports operating systems with same system folder names (like Program Files) on one partition.
- Very flexible adjustment of boot context for each operating system including the possibility to hide any partition. A special mode is provided to hide partitions for Windows NT, 2000, and XP operating systems.
- Can be installed on any FAT16 or FAT32 partition of any hard disk or on a separate partition that will be hidden from all operating systems.
- Increased stability in case of partition structure and hard disk configuration changes.

1.4 Main Disk Administrator features

Disk Administrator has the following main features:

- Create and format FAT16, FAT32, NTFS, Linux Ext2/Ext3, Linux ReiserFS and Linux Swap partitions;
- Convert FAT16<=>FAT32 partitions without data loss;
- Copy and move any partitions;
- Resize FAT16, FAT32, NTFS, Linux Ext2/Ext3, Linux ReiserFS and Linux Swap partitions on the fly without data loss;
- Select cluster/block size and any other file system parameters manually;
- Delete partitions of any type;
- Edit partition label;
- Adjust logical partition chain parameters automatically;
- View partition and file system parameters;
- Optional usage of 64-kilobyte clusters.

The following features are unique to Disk Administrator:

- Choose the precise position of a partition on the disk and in the partition structure (primary/logical), its size, file system type, label, and cluster size (when the partition is created, moved or resized). All these actions can be performed in one pass.
- As a result, you can copy a partition to free space of smaller size.
- Built-in sector-by-sector hard disk and partition editor.
- Different sorting modes of the partition list.
- View partition letters and numbers and their changes for different operating systems.
- Support of hard disks of any type (IDE, SCSI) and of any size that are visible through BIOS in any mode (Normal, Large, LBA), including the extended BIOS functions.
- View detailed hard disk information.

1.5 Acronis OS Selector System Requirements

Acronis OS Selector requires the following hardware:

- **CPU –** at least i386.
- **RAM –** at least 16MB (we recommend having more memory when working with large hard disks and partitions).
- **Disk space –** 2MB plus extra space on any FAT16 or FAT32 partition to store backups of system files of detected operating systems. If there are no FAT partitions on the computer, the installation program helps to create a special partition to install Acronis OS Selector.
- **3.5-inch floppy drive –** to install from an installation diskette.
- **CD-ROM –** to install from CD-ROM.
- **Video-card and monitor –** VGA-compatible (VBE 2.0 compatible video-card is recommended).
- **Mouse –** handy, but not mandatory.

Acronis OS Selector may conflict with boot virus checkers that are built into many existing BIOSes because Acronis OS Selector frequently modifies the contents of MBR and boot sectors. This function should be disabled for proper Acronis OS Selector installation and functioning. Some anti-virus software may also alert you for possible virus presence for example in the REINSTAL.COM file. If you have grounds to suspect that the computer is really infected, perform the necessary diagnostics and cures and then restore Acronis OS Selector from clean installation media.

1.6 How does Acronis OS Selector Function?

During the installation on your computer, Acronis OS Selector writes its own code into the MBR of the first hard disk, and thus gains control before any other operation system. The old MBR content is stored in the \BOOTWIZ\ MBRBACKS.DAT file to enable a restore of the configuration as it was before Acronis OS Selector installation. Acronis OS Selector MBR contains the information about what hard disk and partition holds the main part of the boot manager. With help from this information, the MBR code loads the Acronis OS Selector boot sector (it is located in the \BOOTWIZ\BOOTSECT.SYS file) and passes control to it. In turn, this boot sector code looks for the BOOTWIZ.SYS (Acronis OS Selector Loader) file in the root folder and loads it. The loader checks if any changes were done to the partition structure and boot sectors since the last execution. If there are any changes then \BOOTWIZ\ BOOTCFG.EXE (Acronis OS Selector Setup) is automatically executed. It then tracks the changes and tries to find any new operating systems with their help. The configurations of the newly found operating systems are automatically added to the Boot Menu configurations. The \BOOTWIZ\ BOOTMENU.EXE program is then executed. This is the Acronis OS Selector Boot Menu itself.

The Boot Menu allows you to choose which operating system to boot. The boot manager itself performs all the actions that are necessary for the preparation of boot context for the selected operating system and passes control to its boot sector. Then the operating system is booted normally without any help from Acronis OS Selector.

1.7 What is a Boot Context?

Every operating system configuration that was detected by Acronis OS Selector has its own boot context that includes the following elements:

- **Operating system partition** (**operating system boot partition, partition of system files**). Such partitions are marked with a «Boot» flag in Acronis OS Selector Setup interface.
- **Boot sector** of an operating system (for operating systems installed on FAT partitions). Operating system is booted by loading it to memory address 0000h:7C00h and executing it.
- **Boot sector modifiers**. Some modification of the boot sector data is needed to allow certain operating systems to be booted from a logical partition and/or from non-first hard disk. Acronis OS Selector allows modification of the following parameters: BIOS extension usage for MS-DOS 7.1/8.0 (Windows 95OSR2/98/ME), hard disk number, absolute boot sector number, or boot partition letter for OS/2.

- **System files** of an operating system that are backed up by Acronis OS Selector in its own folder and are copied by it to their place (usually the root folder of the operating system partition) before booting the operating system. Backing up the system files allows the installation of multiple operating systems with same system file names, like IO.SYS, MSDOS.SYS, COMMAND.COM, NTLDR etc. on one partition.
- **System folders** of an operating system that are copied by Acronis OS Selector from its folder where they are stored to their proper place before the operating system is booted. It allows multiple operating systems with same system folder names to share one partition while preventing possible conflicts. System folder names usually include Windows or WinNT, Program Files, etc. A partition where folders with these names are stored is called a **system folder partition of an operating system**. Such a partition is marked with a «Win» flag in Acronis OS Selector Setup interface.
- **Hidden partition list** for an operating system. Hiding any specified partitions from an operating system allows very flexible changes in letter assignment to partitions by the operating system and some more exotic things like booting operating systems, that cannot execute without Acronis OS Selector, from different hard disks and logical partitions.
- **Active partition list** for an operating system. For some operating systems the order of letter assignment depends on which primary partitions are active. For each operating system, Acronis OS Selector allows separate selection of active partitions on all hard disks.
- **LBA partition support flag** that defines if there is any need to set LBA type for partitions that can only be accessed via BIOS extension.
- **Configuration files** of an operating system configuration. These are files that Acronis OS Selector backups in its folder and copies back to their place (usually the root folder of the operating system partition) before the operating system is booted. Backing up configuration files allows users to have multiple configurations of an operating system on one partition that differ only by the contents of their configuration files (the latter being usually CONFIG.SYS, AUTOEXEC.BAT, BOOT.INI etc.).

Chapter 2. Basic Information

This chapter elaborates on basic concepts that are related to hard disk partitioning. This will help you to better understand and use Acronis OS Selector.

2.1 What is a Hard Disk?

A **hard disk** is a part of a computer that is used for long-term information storage. Unlike Random Access Memory (RAM) that loses all the data when the power is switched off, a hard disk continually stores data, thus allowing the saving of programs, documents and other information. Hard disks also have much higher capacity than RAM; modern hard disk capacity can exceed hundreds of gigabytes.

2.1.1 Hard Disk Architecture

A hard disk consists of the following basic parts: magnetic platters, axis, read/write heads and integrated electronics.

- **Magnetic platters** actually are the hard disks that are made of metal or plastic that gives the name to the entire device. Both sides of each platter are covered with iron oxide or some other magnetic material.
- Magnetic platters are installed on one **spindle** and rotate on it as one body.
- For each side of each platter there is a separate **read/write head**. The heads are also joined together and move radially with respect to the magnetic platters, thus allowing access to any point of any platter.
- **Integrated electronics** are used to process computer commands, magnetic platter rotation control, read/write head movements and for data buffering and transfer of it between the hard disk and the computer.

2.1.2 How does Hard Disk Work?

In a computer, all data is stored as bit sequences. On hard disks each bit is stored as a magnetic charge (positive or negative) on the magnetized platter surface. When a computer saves the data, it sends it to the hard disk as a sequence of bits, the hard disk receives the data, positions the magnetic heads and records the information received with their help by magnetizing the platter surface. Reading the data from a hard disk is done in a similar way.

Read/write heads can access any point of any platter at any time, so the data may be stored and read with high speed in a random sequence (unlike sequential access to data on magnetic tapes).

2.2 Hard Disk Formatting

A computer needs to have access to the necessary information at any time, but even the smallest of hard disks can hold millions and millions of bits. So how does a computer know where to look for the data required or where to store the new data? Dividing the disks into small easily identifiable parts solves this problem. This allows the computer to easily find the needed data. The process of creation of such parts is called formatting. There are two levels of formatting:

- physical formatting (or low-level formatting),
- logical formatting.

2.2.1 Physical Formatting

Physical formatting of a hard disk must be performed first. Usually users do not have to worry about this, since the manufacturer usually provides low-level formatting. Physical formatting divides the surface of the magnetic platters into tracks and sectors.

- **Tracks** are concentric circles that are drawn on magnetic surfaces by the magnetic heads. The tracks are assigned numbers from zero and up center wards.
- Tracks in their turn are divided into small areas that are called **sectors** and contain a fixed amount of data. Usual sector size is 512 bytes (1 byte is equal to 8 bits).
- All tracks that can be accessed without moving the read/write heads form a **cylinder**. Track number and cylinder number are all the same. Access to data inside one cylinder is much faster than re-positioning of heads from one cylinder to another.

Over time the magnetic surface gradually loses its properties and there appear areas where data storage becomes impossible. Sectors that fall into these areas are called **bad**. Fortunately the quality of modern hard disks is such that they usually become outdated before failing. Most modern hard disks are also able to substitute bad sectors with good ones from a special reserve. But if bad sectors appear, they should be software treated, for example by marking them so that they are not used.

2.2.2 Logical Formatting

A physically formatted disk also must be logically formatted. Logical formatting means that a **file system** is created on the disk so that files can be written to it or read from it. Different operating systems (OS) use different file systems, so the way the disk should be formatted depends on the OS you want to install.

For more detailed information about file systems see paragraph 2.3 «File Systems».

Formatting of a whole hard disk for one file system heavily limits the number of operating systems that can be installed on this hard disk. Fortunately this problem can be solved. Prior to logical formatting a hard disk it must be **partitioned**. Each partition can then be formatted with its own file system. This will allow installing different OSes. Partitioning also allows more efficient use of disk space.

For more detailed information about partitions see paragraph 2.4 «Partitions».

2.3 File Systems

All file systems consist of structures that are necessary for data storage and management. These structures usually include the operating system boot record, folders and files. File systems perform the following basic actions:

1. Allocated and free space (and bad sector) tracking.
2. File names and folders support.
3. Tracking of physical file positions on the disk.

Different file systems are used by different operating systems. Some operating systems can use only one file system, while others are able to use multiple ones. Let us now go into more details about some of the most widely used file systems.

2.3.1 FAT16

FAT16 file system is used widely in DOS-compatible operating systems (DR-DOS, MS-DOS, PC-DOS etc.), Windows 95/98/ME, Windows NT/2000/XP, and is supported by most of the other operating systems.

Main FAT16 features are the file allocation table (FAT) and clusters. FAT is the core of the file system. For better security several copies of FAT exist (usually 2). A cluster is the minimum data storage unit in the FAT16 file system. One cluster contains a fixed number of sectors that equals to a power of 2. FAT stores the information about which clusters are free, allocated or bad, and also tells which files are stored in which clusters.

Maximum FAT16 file system size is 4 GB, maximum number of clusters is 65525 and maximum cluster size is 128 sectors. Usually the minimum cluster size that results in not more than 65525 clusters is chosen. The more the partition size the more the cluster size has to be. Many operating systems work with 128-sector clusters incorrectly, thus reducing the maximum size of a FAT16 partition to 2 GB.

Usually the larger the cluster size the greater disk space losses (waste) become. For more detailed information about cluster size management see paragraph 2.6 «Managing Partitions».

The FAT16 file system, like many others, has a root folder. But unlike all others its root folder is stored in a special place and is limited in size (standard formatting creates a root folder with 512 entries). Acronis OS Selector Disk Administrator allows you to change the size of the root folder for an existing partition.

Initially FAT16 had file name limitations of 8 characters in name and 3 characters in extension, but long file name support in Windows 95 and Windows NT eliminated this limitation. OS/2 also supports long names, but in another way. Yet another is used in UMSDOS file system that allows the Linux operating system to work on FAT disks.

2.3.2 FAT32

FAT32 operating system first appeared in Windows 95 OSR2 and is also supported in Windows 98/ME and Windows 2000/XP. FAT32 is an extension of FAT16. FAT32 mainly differs from FAT16 by 28-bit cluster numbers and more flexible root folder that is no longer limited in size. The reason for creating FAT32 was the need to support large (more than 8 gigabytes) hard disks and the impossibility of building more complicated file system into MS-DOS that remains the base for Windows 95/98/ME.

Maximum FAT32 file system size is 2 terabytes.

2.3.3 NTFS

NTFS is the basic Windows NT/2000/XP file system. Its organization is kept secret, so no other operating system fully supports it. Basic NTFS structure is an MFT (Master File Table). NTFS stores a backup copy of the MFT's critical part to decrease the probability of data damage and loss. All other NTFS data structures are special files (metafiles).

NTFS, like FAT, uses clusters to store files, but cluster size is independent from partition size. NTFS is a 64-bit file system; it uses Unicode to store file names, with a journaling (or so-called failure-proof) file system, that supports compression and encryption.

Files in folders are indexed to speed up search routines.

2.3.4 Linux Ext2

Ext2 is the basic file system for the Linux operating system. Ext2 is a 32-bit file system, its maximum size is 16 terabytes. The basic data structure, which describes a file, is an I-node. Area to store the table of all I-nodes should be allocated in advance (during formatting). Acronis OS Selector Disk

Administrator allows you to change the size of i-nodes table for an existing partition.

2.3.5 Linux Ext3

Officially introduced with their version 7.2 of the Linux operating system, Ext3 is the Red Hat Linux journaling file system. It is forward and backward compatible with Linux Ext2. It has multiple journaling modes and broad cross-platform compatibility in both 32- and 64-bit architectures.

2.3.6 Linux ReiserFS

The ReiserFS file system was officially added to Linux in 2001. ReiserFS is free of most of Ext2 disadvantages; and it is a 64-bit journaling file system with dynamic allocation of memory for data structures.

2.4 Partitions

As previously mentioned, a physically formatted disk has to be partitioned. Each partition may be viewed as an independent unit that can be formatted with any desirable file system.

2.4.1 When is it Useful to Have Multiple Partitions?

Formatting the whole hard disk with one file system is not always the best way to use your disk space and resources. On the contrary, several partitions allow you to:

- Install more than one operating system;
- Use disk space more effectively and efficiently;
- Physically separate programs and data according to functions or some other feature.

2.4.2 Partition Structure on a Hard Disk

A special place – a **partition table** – is left in the very first sector of the hard disk (this sector is called MBR, or Master Boot Record) to store information about the hard disk partitioning. This table consists of four entries and contains the following information about the partition:

- Status (a flag that shows if a partition is active);
- Type (0 – the entry is empty);
- First sector number;
- Size in sectors.

Status flag of a partition on the first hard disk usually tells the default MBR code that boot should be performed from this partition. Partition type identifies it with a certain operating system. An operating system usually recognizes only partitions with the numbers it knows and ignores the rest.

Such table structure has the following limitations:

- Maximum amount of partitions is four;
- Maximum number of types – 255;
- Maximum supported hard disk size is 4 terabytes.

The first limitation proved to be the most serious, so partition type 5 is now used not for partition description but as a reference to the sector where another partition table is located (let us call such partition table the extended partition table). Thus it became possible to have an unlimited number of partitions on a hard disk.

Partitions whose information is stored in MBR are called primary, while all others are known logical partition. The point of such division is that many operating systems can only be booted from a primary partition and only on the first hard disk.

Most operating systems impose the following limitations on partition structure of a hard disk:

- There can be only one primary partition for this operating system and it is booted from it. All other primary partitions should be of types that are not recognized by this OS;
- In the MBR partition table there can be only one reference to a partition table and such extended partitions must include all the logical partitions of this hard disk;
- Primary partitions should not overlap with the logical partition;
- Each extended partition table may hold only one usual partition and only one reference to a partition table;
- Each partition table must be located in the first sector of a cylinder;
- Each subsequent table must be located further from the beginning of the hard disk then the previous one;
- A partition that is described in an extended partition table must be located right after it, usually at the beginning of the next track.

The limitation of only one reference to a usual partition and only one reference to a partition table results in all logical partitions of a hard disk forming a linear chain.

2.5 Boot Sequence

2.5.1 Very Beginning

Whenever a computer is turned on or rebooted, control is given to BIOS (Base Input/Output System) that is stored in the computer ROM. BIOS initializes and tests the hardware and then loads the first sector from the boot disk device (usually it is the first hard disk, and the sector is the MBR) and passes control to it. All the actions that follow depend on the contents of this sector.

Some words should be said about how the hard disks are counted. BIOS assigns hard disks sequential numbers starting from 080h, the sequence is defined by the order in which the disks are plugged into IDE controllers (Primary Master, Primary Slave, Secondary Master, Secondary Slave), next follow the SCSI hard disks. This sequence would be broken if you change the boot sequence in the BIOS setup. Thus if you have set that booting should be done from hard disk E (do not confuse letters that are assigned to the hard disks by BIOS with partition letters!), then the sequence would start with the disk that would have otherwise been the third (usually its Secondary Master). In Acronis OS Selector BIOS hard disk sequence is used, but the initial number is 1.

2.5.2 Booting without the Boot Manager

Usually the MBR of the hard disk contains the code that is written there by a standard partitioning program (FDISK) and performs the following actions:

- Searches the partition table for the first partition that is marked as active;
- Attempts to load into memory the first sector of the partition found. Such sector of a partition is called the boot sector;
- Passes control to the loaded sector.

The boot sector usually contains the code that attempts to boot an operating system from the partition. Each operating system has its own boot code.

2.5.3 What does the Boot Manager do?

Installing a boot manager on your computer slightly changes the boot sequence. Usually the boot manager writes its own code into the MBR that loads into memory, not the boot sector of an operating system, but the boot manager's code. A boot manager usually offers you a choice of operating systems to boot, and the booting of the chosen operating system happens only after your selection.

2.6 Managing Partitions

2.6.1 Setting an Active Partition

If you do not have a boot manager but you have created several primary partitions, then you must select a partition from which the operating system will be booted. There is a status flag for that in the partition table. This flag should be on only for one partition, and it should be a partition and not an unused entry or a reference to the partition table.

Some modern BIOSes check the partition table to see if there is any active partition in it before passing control to MBR.

Make sure that the partition is formatted and contains an operating system before setting it as active.

2.6.2 Accessing the Same Files from Multiple Operating Systems

There are several basic differences between primary and logical partitions (it refers mainly to the FAT partitions):

- Most operating systems can boot only from a primary partition (excluding OS/2, Linux, and with some limitations and with help of Acronis OS Selector, Windows 95 OSR2, 98, and ME).
- Some operating systems recognize only one primary partition and ignore all others (OS/2).
- All boot managers, except the Acronis OS Selector, must be installed only on the primary partition of the first hard disk.

Considering these limitations one can decide which partitions to use for what purposes. Primary partitions are best used to boot operating systems and store system folders and files only. On the other hand, logical partitions can be used to store all data, because they will be accessible by the operating systems. If you are planning to install many different operating systems on your computer, then those that can be booted from logical partitions are better installed there to save primary partition space.

2.6.3 Efficiency of Disk Space Usage

If you have a large hard disk, but must use the FAT file system, then you should know some of its peculiarities to use the disk space more efficiently. As previously discussed, the main FAT feature is breaking the partition into clusters of fixed size ranging from 512 bytes to 64 kilobytes.

In FAT16, 16-bits are reserved to store numbers of clusters, so the maximum number of clusters is 65525. The result is that the bigger the partition size the bigger the cluster is needed, and the maximum partition size is about 4 gigabytes. However bigger cluster size results in higher hard disk space

losses (waste) due to the adjustment of allocated space to cluster boundaries.

The following table gives the approximate dependence of these losses (hard disk waste) versus the cluster size:

Partition size	Cluster size	Wastes
<127M	2K	2%
128÷255M	4K	4%
256÷511M	8K	10%
512÷1023M	16K	25%
1024÷2047M	32K	40%
2048÷4096M	64K	50%

One of the ways to reduce losses is to break the disk space into smaller partitions. The other is to use the FAT32 file system where 32 bits are assigned to the cluster number (28 bits actually), raising the maximum partition size to 4 terabytes. But FAT32 has its own drawback:

- If clusters size is small and partition size is big then the file allocation table size increases, and may lead to slowing down the booting of the operating system and file access.

2.7 Hidden Partitions

Disk Administrator allows you to hide partitions. Hiding is done to prevent an operating system from detecting a partition, assigning a letter to it and accessing its files, i.e. the partition becomes invisible to the operating system and the applications that run under it.

Hiding partitions is useful when important data should be protected from unauthorized or occasional access. Unlike other software Acronis OS Selector can hide any partition regardless of their type, or whether they exist as primary or not. A special mode is provided to hide partitions for Windows NT, 2000, and XP operating systems.

Be careful when creating several primary partitions, and leaving all of them visible since some operating systems (Windows 95/98/ME being first on the list) may experience trouble in handling them.

2.8 Drive Letters

Most operating systems when booting assign letters (C, D,...) to all partitions on all hard disks. You, your applications and the operating system itself identify file placement in a partition using these letters.

An operating system may change letter assignment if you plug or unplug hard disks or perform different actions with partitions. Some changes in letter assignment may lead to troubles in parts or in the entire configuration of an operating system. This usually happens when letters are changed for the partitions where the system files and folders of an operating system are stored.

To avoid such changes in configuration and/or to solve the problems associated with drive letters, you should know the following:

- How the operating systems assign letters to disks.
- What problems arise if the letter order is changed?
- What actions should be performed during partition management to avoid changing the letter order?
- How to solve the problems that arise with unavoidable changes.

2.9 Assignment of Letters in Different Operating Systems

2.9.1 MS-DOS 5.0-6.22, MS-DOS 7.0, Windows 95 (original)

These operating systems assign letters in a fixed order. This order has settled with the evolution of MS-DOS and abides by the following rules:

- Letter assignment begins with letter C: and goes on to letter Z:. Letters A: and B: are reserved for floppy disk drives.
- A partition to which the letter C: was assigned is treated as the boot partition, i.e. the partition from which the operating system was booted. So if the partition from which the operating system will boot is assigned a letter that is different from C:, most probably the booting will not execute properly.
- Only partitions of types 1 (FAT12), 4, 6 (FAT16) are recognized. The real type of file system is determined by the contents of the partition and not by its type. Partitions of all other types are skipped.
- Only the first suitable partition is looked for in any extended partition table, the rest are ignored.
- Records of type 5 (Extended) are treated as a reference to the next partition table, and only the first reference in any partition table is followed, all other records are ignored. Thus all the logical partitions form a linear chain.

- The first suitable active primary partition from the first hard disk is looked for. If there is none then the first suitable primary partition is looked for.
- Then the first suitable primary partitions of the rest hard disks are looked for in a similar way.
- Then all the suitable logical partitions are looked for following the chain on the first, then on the second, the third etc. hard disk.
- Then all the remaining primary partitions of the first, second etc. hard disks are looked for.

Letter sequence in Windows 95 may differ slightly from that of the MS-DOS 7.0, if drives are connected to the computer that are partially visible or completely invisible to BIOS. Letters to partitions on such devices will be assigned after all the letters from MS-DOS 7.0.

2.9.2 MS-DOS 7.1/8.0, Windows 95 OSR2/98/ME

The order of letter assignment in these operating systems is similar to previous ones with the following exceptions:

- Additional partition types are recognized: 11 (FAT32), 12 (FAT32 LBA) and 13 (FAT16 LBA), resulting from FAT32 and large hard disk support.
- Additional partition type 15 (EXTENDED LBA) is recognized as a reference to the next partition table.

FAT16 LBA, FAT32 LBA and Extended LBA partition types mean the same as FAT16, FAT32 and Extended respectively, but additionally inform MS-DOS 7.1/8.0 that these partitions should be accessed through BIOS extension.

2.9.3 OS/2

Letter assignment for this operating system is similar to that for MS-DOS 5.0 with the following exceptions:

- Partition status is ignored, i.e. on the first step the first suitable primary partition is looked for.
- Partitions with type 7 (HPFS) are also looked for.
- All the primary partitions except the first ones are completely ignored.

2.9.4 Windows NT/2000/XP

These systems differ from all the rest that use letters for disks, because it is possible to change the letter that is assigned to a partition. Initial assignment though is similar to that for MS-DOS 5.0–7.0 (for Windows NT 3.x) and for MS-DOS 7.1/8.0 (for Windows NT 4.0, Windows 2000/XP). Windows NT 4.0 does not support the FAT32 file system but does assign letters to FAT32 partitions. One should also keep in mind that letter assignment for these systems may differ heavily from that for other operating systems since it

does not matter if hard disks and other disk drives that are connected to the computer are visible to BIOS or not.

When changing the structure of partitions it is necessary to make sure that the letters for the partitions where the swap file (\PAGEFILE.SYS) do not change, otherwise the system may become unbootable.

2.10 Troubles Arising from Changing Letter Assignment

Changing letters may damage your application setup. For example, let us suppose that you have installed several applications on a certain partition that at that moment had letter D: assigned to it. You have decided to create shortcuts to these applications so that it would be easy to run them under Windows 95. Every time you run an application via a shortcut, Windows addresses to the partition D: in order to find and run corresponding software. If the letter for this partition is changed, the shortcut will point to an incorrect partition, and Windows will be unable to find the software to run the application since now the letter D: is assigned to another partition.

Changing partition letters usually affects all system configurations that are based on original partition letters. Those are usually the settings from AUTOEXEC.BAT, CONFIG.SYS, WIN.INI, SYSTEM.INI, and several other configuration files, and also in Windows 95/98/ME and Windows NT/2000/XP system registry.

Letter assignment usually changes when the following changes to the partition structure are performed:

- A partition is created.
- A partition is moved.
- A partition is deleted.
- An extra hard disk is plugged in.
- Some hard disk is unplugged.

Some letter changes may be avoided by using our partition hiding function. Acronis OS Selector allows the hiding of any partition from any operating system.

2.11 1024 or 4096 Cylinder Limit

For a long time the main way to access hard disks was through BIOS, i.e. interrupt 13h functions. In order to read or write to a disk three bytes had to be passed containing cylinder number (10 bits), head number (6 bits) and sector number (6 bits), so that the hard disk size was limited to 2016 megabytes. To overcome this limitation there was an attempt to use the leftover 2 bits, thus raising the maximum capacity to 8064 megabytes. But

since this was done in different ways, there appeared several BIOS functioning modes:

- **Normal**. In this mode cylinder number takes 12 bits, and head number takes 6 bits, allowing for 4096 cylinders and 64 heads.
- **Large** and **LBA**. In these modes cylinder number takes 10 bits and head number takes 8 bits, allowing for 1024 cylinders and 256 heads.

Few operating systems support the Normal mode. In the LBA mode errors in operating systems in calculating the hard disk parameters result in limitation of 255 heads, limiting the size to ~8032 megabytes.

BIOS extension that allowed addressing sectors via absolute numbers instead of cylinder, head, and sector numbers was a considerable advance. Absolute number takes 64 bits, thus allowing addressing hard disks of enormous capacity.

So the troubles with limitations arise in the following cases:

- If an application (or an operating system) does not support BIOS extension, it will be able to see not more than 1024 * number_of_heads * sectors_per_track sectors or 4096 * number_of_heads * sectors_per_track sectors if the application supports the Normal mode, usually these are 8064 megabytes.
- If the program has an error in calculating hard disk parameters (all MS-DOS version have this error), and BIOS reports 256 heads on the hard disk.
- If BIOS does not support extension (usually these are BIOSes that were released before 1994).

In some BIOSes even the extension does not allow to address more than 8064 megabytes.

BIOS problems can be solved by installing some program like EZ-Drive, DM6 DDO, MaxBlast, that uploads its own interrupt 13h code that is free of above-mentioned disadvantages. Acronis OS Selector whenever possible works through BIOS extension and is fully compatible with EZ-Drive type programs.

2.12 64K Boot Code Limit

Some operating systems, namely MS-DOS 6.x and earlier versions, and Windows NT 4.0 and earlier versions, have an error in the boot code in converting the absolute sector number into cylinder, head, and sector numbers. They suppose that the result of division of absolute sector number by the number of sectors per track will not exceed 16 bits, i.e. 64 K. Since most modern hard disks have 63 sectors per track, this results in 2016-megabyte limitation of boot code location.

Be careful when moving a partition containing an operating system with the above-mentioned limitation since the operating system may become unbootable.

Chapter 3. Installing and Uninstalling Acronis OS Selector

3.1 Getting Started

Before installing Acronis OS Selector you should undertake several additional steps to insure yourself from data losses:

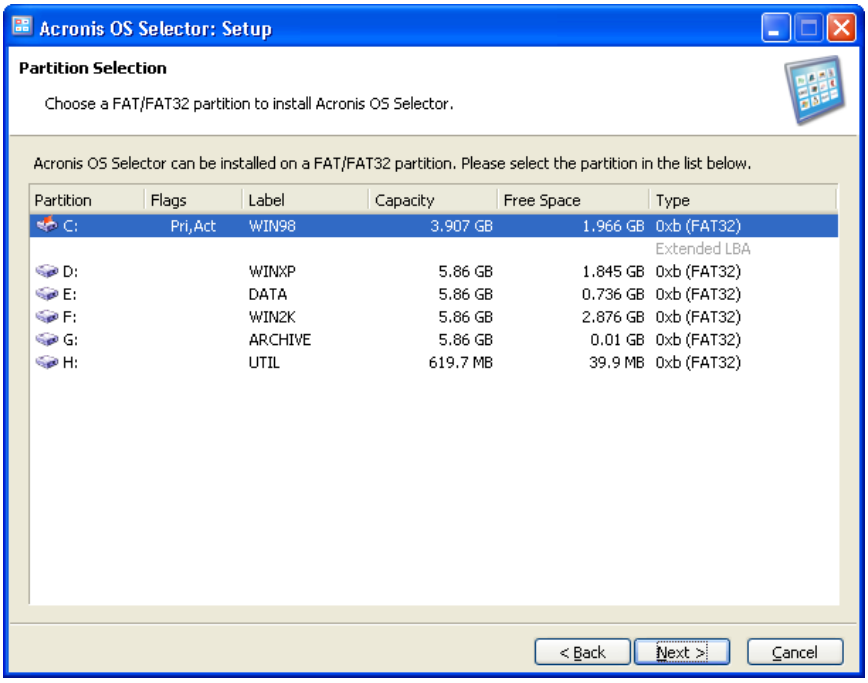
- BACK-UP ALL IMPORTANT DATA! You may even want to purchase a copy of Acronis TrueImage – it takes an exact image of your hard disk drive or separate partitions for complete back-up, and allows you to restore all of their contents, including operating systems, programs, personal data and settings. Please visit www.acronis.com for complete details.
- Create system diskettes for the operating systems that are installed on your computer.

All these actions are generally useful before any operations that include serious computer reconfiguring.

3.2 Installation

To install the Acronis OS Selector:

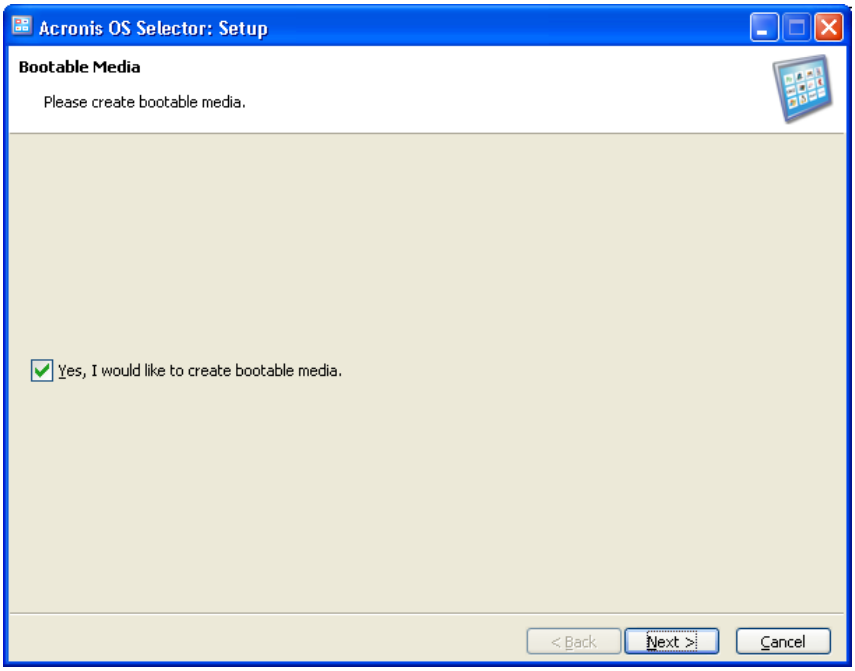
1. Insert the Acronis OS Selector installation CD into the CD-ROM drive and start the installation procedure.
2. Carefully follow the installation program instructions on the screen.
3. The Acronis OS Selector Installation Wizard will ask you to select the partition on which you wish the Acronis OS Selector to be installed.



Acronis OS Selector requires a FAT partition to work. However if there are no FAT partitions on the computer prior to its installation, then you can use the automatic partition creation mode.

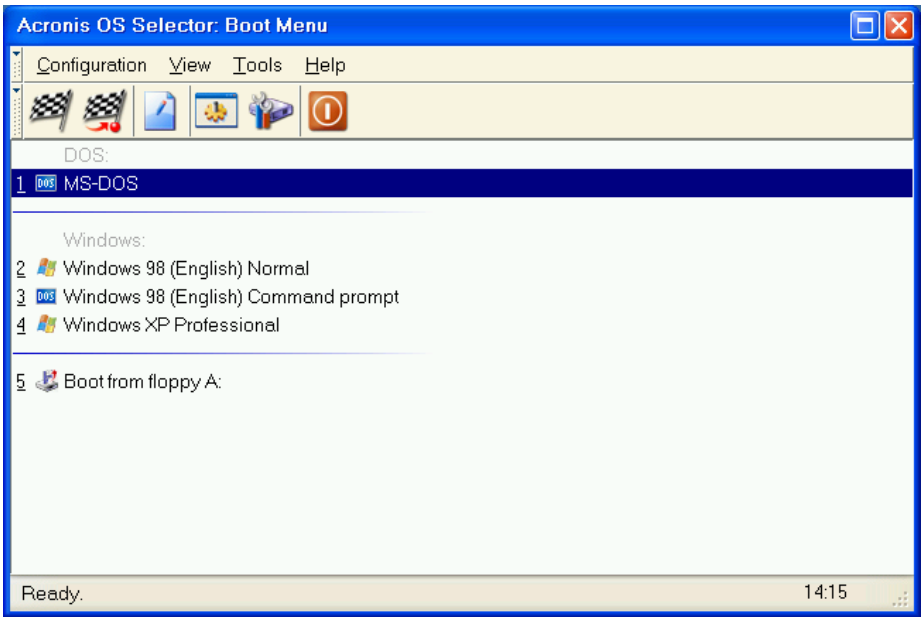
In this mode the Installation program checks if it is possible to create a partition in the free space that is not occupied by any existing partition. If it is impossible, the program checks to see if it is possible to free up some space at the expense of another partition. If this check is successful, a dialog appears prompting to automatically perform all the actions necessary to create the partition.

4. After making your installation choices and copying of Acronis OS Selector files onto your hard disk, you will be offered to create a **bootable rescue diskette or CD-R/W** (you may omit this step if you have purchased the boxed product that contains a bootable CD). It's very important to create the rescue media. Using it you will be able to repair/restore the software.



After the installation of Acronis OS Selector is completed, you should restart your computer.

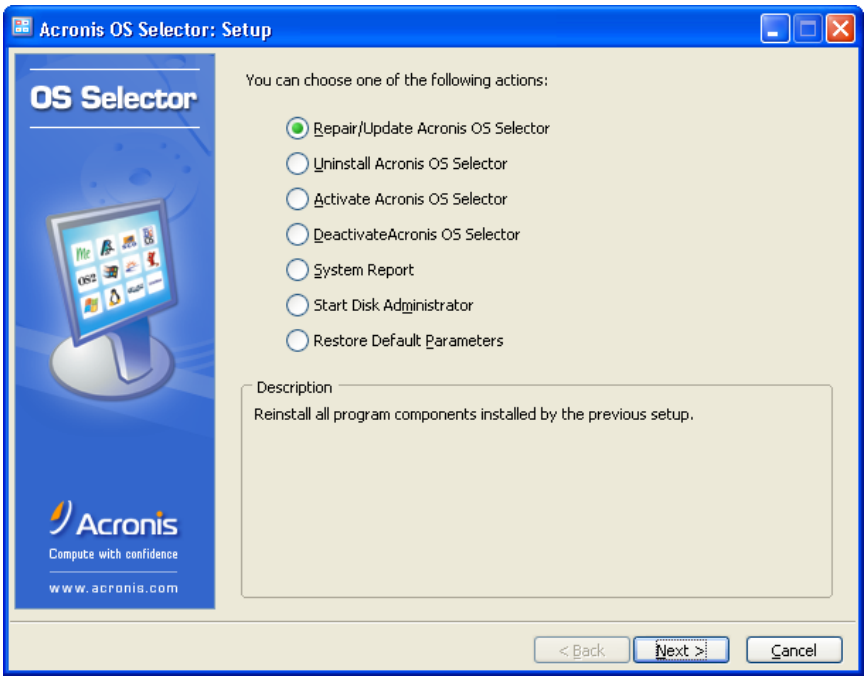
Acronis OS Selector will gain control immediately after the computer is rebooted and will search for operating systems.



3.3 Repairing/Upgrading Acronis OS Selector

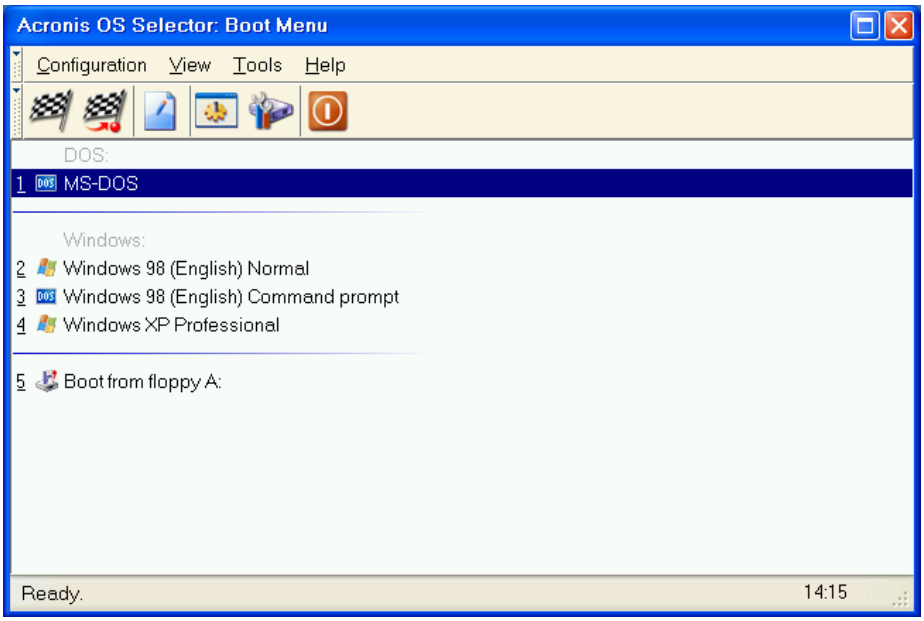
To upgrade or repair your software, start the OS Selector installation program. It will determine that OS Selector was already installed on your computer and will offer you several options:

- **Upgrade/repair** Acronis OS Selector (simple installation of Acronis OS Selector over the version that is already installed on your computer, preserving all the settings);
- **Activate** (activates Acronis OS Selector if it was previously deactivated);
- **Deactivate** (you will be prompted to choose a configuration for an operating system that will be booted, and thus bypassing Acronis OS Selector);
- **Uninstall** (Acronis OS Selector will be completely removed from your computer);
- **Remove passwords** (disable administration password and Boot menu access password; you have to enter the registration code of your copy of Acronis OS Selector to disable passwords);
- **Restore default display settings** (use this option if you have selected a mode that is not supported by your monitor in the Setup settings);
- **Create OS Selector rescue diskette.**



Chapter 4. Boot Menu

The Boot Menu is a program that opens a dialog box with the same name that contains a list of configurations of operating systems that you can see every time you reboot your computer.



The Boot Menu does not show up in two cases:

1. If you have deactivated Acronis OS Selector.
2. If you have indicated in the Setup options that default configuration should be booted at once.

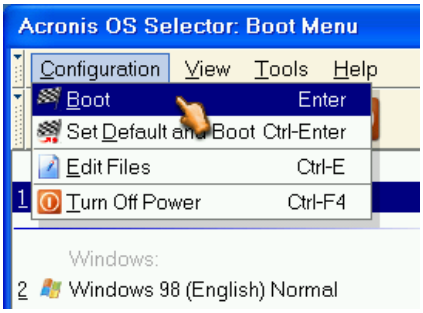
In the first case you should activate Acronis OS Selector by booting from the installation media. In the second, you can get into Boot Menu by managing to press the Esc key when Acronis OS Selector is booted.

On Boot menu an access password may be set. This password will be asked for on every Acronis OS Selector booting. Boot Menu access password may be set, disabled and changed through the Acronis OS Selector Setup Options dialog. To learn more about Passwords see 5.7.3 «Passwords».

If in the Setup Options **boot default configuration at once** option is chosen, the Boot Menu will not appear and a password will not be used.

4.1 Booting operating systems

From «Configuration» menu you can perform the following actions:



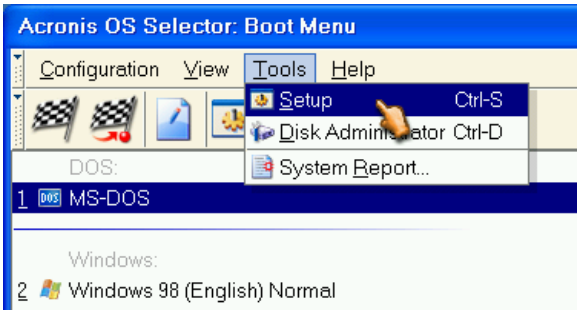
Boot begins booting the configuration that is selected in the configuration list. Double-clicking the item, clicking the OK button or pressing the Enter key also does it.

An access password can be set for any operating system configuration or Boot from floppy section. This password will be required for every booting of a protected configuration or Boot from floppy section. An access password can be set, disabled, or changed in configuration Properties dialog. To learn more about Passwords see 5.4.5 «Editing Configuration Properties» and 5.6.1 «Boot From Floppy Section».

- **Set default & boot** marks the current item in the configuration list as booted by default and boots it. Hotkey is Ctrl+Enter.
- **Edit files** opens the text editor and loads the configuration files of current configuration into it. Thus you can modify them, before booting any operating system, without entering Setup. This function is available on the toolbar and with Ctrl+E hotkey.
- **Turn off power** performs the programmable switching the power off if the computer provides such a possibility (ATX). This can also be done by clicking the Close button of Boot Menu dialog box or pressing the Alt+F4 hotkey.

4.2 Running Acronis OS Selector Tools

Choosing the «Tools» menu you can:



- **Setup** manually runs Setup thus allowing the performance of all the actions necessary for configuring Acronis OS Selector. Also available from the toolbar or with Ctrl+S hotkey.
- **Disk Administrator** runs Disk Administrator. Also available from the toolbar or with Ctrl+D hotkey.
- If administration password (see 5.7.3 «Passwords») is set, the Boot Menu will ask for this password on every Setup or Disk Administrator execution or the running of configuration file editing.

4.3 Tuning Acronis OS Selector

You can customize the Acronis OS Selector Boot menu. For example, by selecting View, you can show/hide the following:

- toolbar; uncheck the box to hide it;
- status bar,
- operating system icons;

  Uncheck the box to hide icons near listed configuration names.
- numeration of existing OS configurations;

  You can boot the first 10 configurations, using buttons from 1 to 9 and 0. Uncheck the **Show numbers** box to hide configuration numbers and disable fast boot.
- system clock in the bottom right corner of the Boot menu;
- setup the system clock style (12- or 24-hour format).

You may also select:

- whether to keep **the last configuration booted**;

  If this mode is enabled, the last used configuration becomes the default.

- boot menu item alignment (configurations; left, center, right);

  If the left or center alignment is enabled, icons are shown to the left of the configurations. In case of the right alignment, icons are shown to the right.

- display properties.

Selecting **View → Display** properties, you can change:

- resolution (800 x 600 pixels by default)
- color mode - 16-bit, 32768 colors by default; also available: 8-bit and 24-bit modes; refresh rate (horizontal; ranges from 60 to 150 Hz).

Chapter 5. Acronis OS Selector Setup

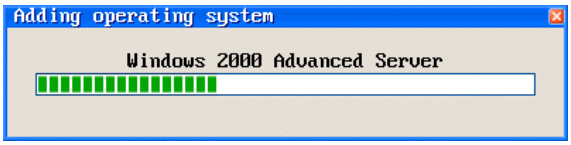
5.1 Automatic Setup Operation Mode

In 1.6 «How does Acronis OS Selector Function?» it was said that Acronis OS Selector Loader executes Setup in two cases:

- If the Loader detects any changes in the hard disk partition structure;
- On the first run after installation or update.

In these cases Setup scans the hard disks of your computer for operating systems, tries to identify them and adds their configurations to the Boot Menu.

If Setup has been able to identify the operating system it automatically backups its boot sector and system and configuration files, and creates a list of system folders if there are any.



Unidentified operating systems are added to the menu under «Unknown operating system» name and with empty system and configuration files and system folders lists. You can edit all these parameters if necessary by manually running Setup from Boot Menu.

Where possible, Setup also automatically detects operating system upgrades.

Sometimes Setup is unable to automatically finish the identification process. In these cases user intervention is required:

1. A system file of an operating system has been changed, and Acronis OS Selector does not know if a new operating system was installed, or the old one was upgraded, or the user or some program modified this file by mistake. In this case Setup will ask you what to do.
2. Acronis OS Selector has detected that you have started a Windows NT/2000/XP installation. Windows NT/2000/XP installation consists of several steps on which Setup might need additional information from you. See Chapter 11 «Installing/Updating Windows NT/2000/XP» for details.

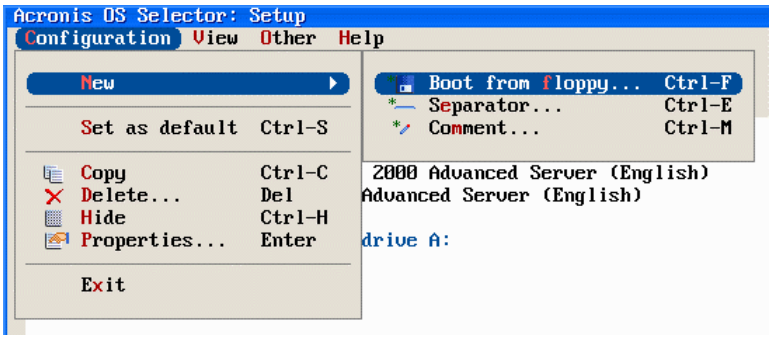
5.2 Acronis OS Selector Setup Main Window

Acronis OS Selector Setup Main Window is a dialog box with pull-down menu bar, toolbar, configuration list and OK and Help buttons.

You can get to the main window by manually running Setup from Boot Menu.

The following action can be performed from the Setup main window:

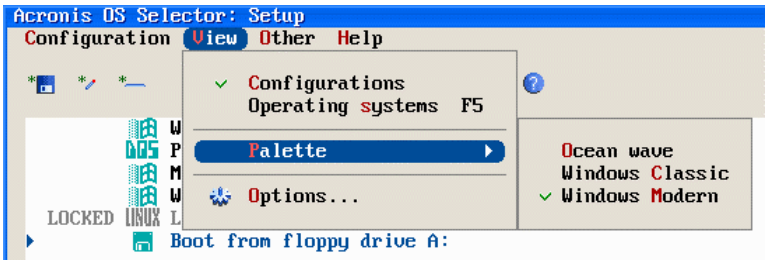
- **In the «Configuration» menu:**



  - **New/Boot from floppy** (in Configurations view). It adds a new Boot from floppy section to the configurations list of the Boot menu. Also available from the toolbar or with Ctrl+F hotkey. See 5.6.1 «Boot From Floppy Section».
  - **New/Separator** (in Configurations view). It adds a new separator to the configurations list of the Boot menu. Also available from the toolbar or with Ctrl+E hotkey. See 5.6.2 «Separator».
  - **New/Comment** (in Configurations view). It adds a new comment to the configurations list of the Boot menu. Also available from the toolbar or with Ctrl+M hotkey. See 5.6.3 «Comment».
  - **Set default**. It marks the selected item of the configurations list as bootable by default. Also available with Ctrl+S hotkey. See 5.4.1 «Setting a Default Configuration».
  - **Copy Configuration.** It creates a copy of the selected configuration. Also available from the toolbar or with Ctrl+C hotkey. See 5.4.2 «Copying».
  - **Copy Operating System** (in Operating systems view). It creates a copy of the selected operating system. Also available from the toolbar or with Ctrl+C hotkey. See 5.5.1 «Copying».
  - **Delete Configuration.** It deletes the selected configuration. Also can be done by pressing the Del key or from the toolbar. See 5.4.3 «Deleting».
  - **Delete Operating System** (in Operating systems view). It deletes the selected operating system. Also can be done by pressing the Del key or from the toolbar. See 5.5.2 «Deleting».

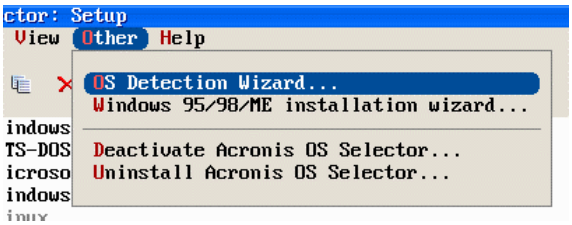
- **Delete Information about a removed hard disk** (in Operating systems view). It deletes the information about the selected removed hard disk and all the operating systems on it. Also can be done by pressing the Del key or from the toolbar. See 5.5.2 «Deleting».
- **Hide/Unhide Configuration**. It hides/unhides the selected configuration. Also available from the toolbar or with Ctrl+H hotkey. See 5.4.4 «Hiding».
- **Hide/Unhide Operating System** (in Operating systems view). It hides/unhides all the configurations of an operating system at once. Also available from the toolbar or with Ctrl+H hotkey. See 5.4.4 «Hiding».
- **Configuration Properties**. It opens the dialog where the properties of the selected configuration can be edited. It can also be accessed by pressing the Enter key, double-clicking or from the toolbar. See 5.4.5 «Editing Configuration Properties».
- **Operating System Properties** (in Operating systems view). It opens the dialog where the properties of the selected operating system can be edited. It can also be accessed by pressing the Enter key, double-clicking or from the toolbar. See 5.5.4 «Editing Operating System Properties».
- **Exit**. It closes the Acronis OS Selector Setup and returns to the Boot menu. This can also be done by pressing Alt+F4 keys.

- **In the «View» menu:**



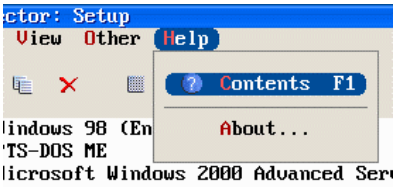
- **Configurations/Operating systems.** It allows selecting the way the configurations list is displayed. View mode can also be toggled from the toolbar or with the F5 key.
- **Palette**. Allows selecting the desired palette for the Acronis OS Selector interface.
- **Options**. It opens the dialog where the settings of Acronis OS Selector can be edited. It can also be accessed from the toolbar. See 5.7.

- **In the «Other» menu:**



  - **OS Detection Wizard**. It starts the wizard with the same name. See 5.8.
  - **Windows 95/98/ME Installation Wizard**. It starts the wizard with the same name. See Chapter 10.
  - **Deactivate Acronis OS Selector**. It allows temporary deactivation of Acronis OS Selector. See 5.9.
  - **Uninstall Acronis OS Selector**. Allows uninstalling of Acronis OS Selector from your computer. See 5.10.

- **In the «Help» menu:**

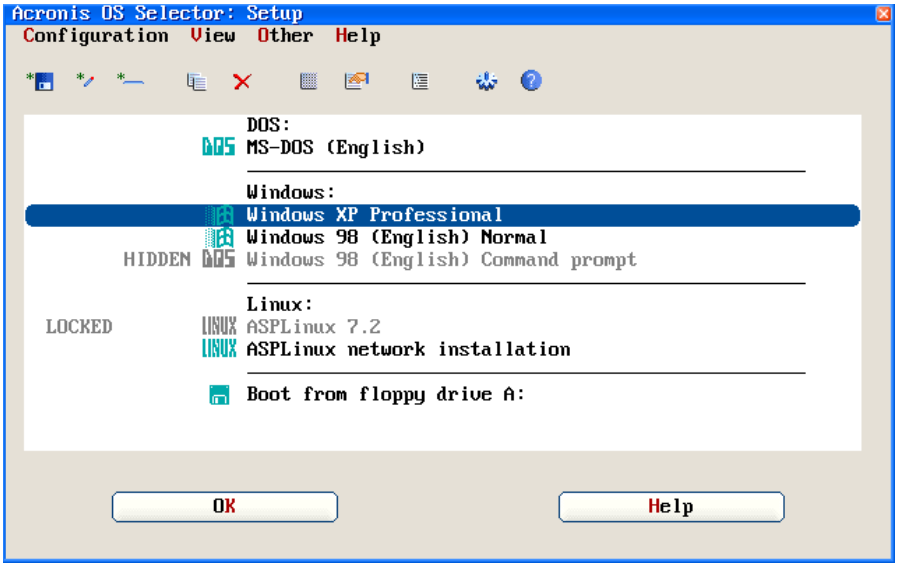


  - **Contents**. Opens the on-line help on the main window of Acronis OS Selector Setup. See. Appendix C. .
  - **About…** displays brief information about the name and the version of the software and about the copyrights.

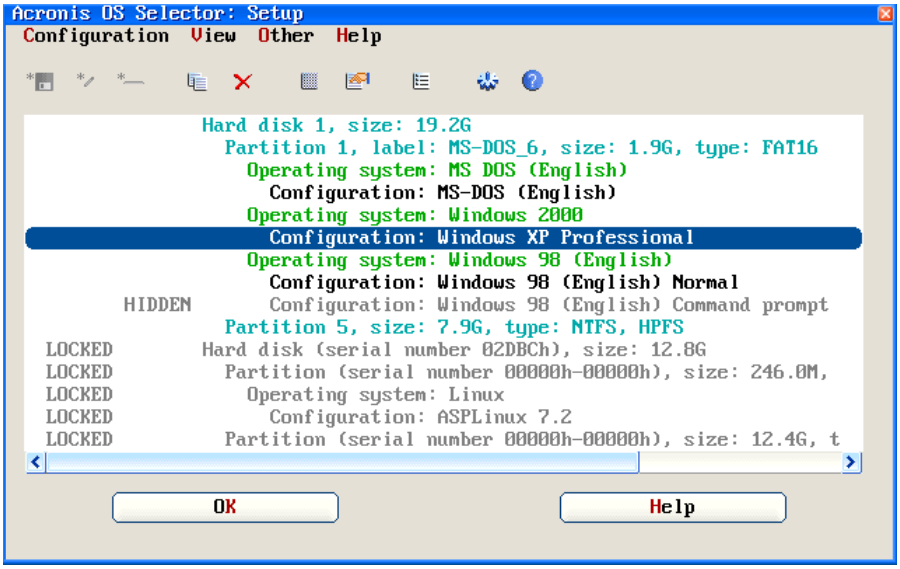
5.3 Two View Modes of Configuration List

Configuration info in the Setup main window can be presented in two modes:

- **Configurations**. In this mode all the configurations are shown in the same order as they appear in Boot Menu. Aside from configurations, Boot From Floppy section and separators and comments are also present. Icons are shown to the left of configuration names and Boot From Floppy section icons are shown. When created, a separator or comment can be associated with an operating system. In this case it will be hidden/unhidden/deleted together with this operating system. Only in this mode it is possible to change the order of components, add or delete Boot From Floppy sections, separators and comments and edit the Boot From Floppy section properties.



- **Operating systems**. In this mode you can see a 4–level tree: first level shows the hard disks (each hard disk is shown with its number and size); the second one shows partitions (each partition comes with its number, label, size and type); the third one shows operating systems; and the fourth one shows operating system configurations. Only in this mode is it possible to copy and delete operating systems, edit operating system properties, and delete information about removed hard disks.



Switching between view modes is done either by selecting the corresponding item from the «View» menu, or from the toolbar, or with F5 hotkey.

Both views also display the hidden («HIDDEN») and locked («LOCKED») items. It is possible to hide operating systems, configurations, boot from floppy or MBR sections, and comments and separators. Hiding is done manually. Locked items are displayed when a certain hard disk is removed either physically or from BIOS Setup. Acronis OS Selector treats this hard

disk as removed, along with all partitions, operating systems, and configurations on it.

Hidden and locked items are not displayed in the Boot menu and are grayed in the Setup lists.

5.4 Manipulating an Operating System Configuration

5.4.1 Setting a Default Configuration

A selected configuration can be made a default configuration. This means that every time you get into the Boot Menu selection bar it will point on this configuration. You can also choose automatic (bypassing Boot Menu) or timeout default booting in Setup options.

The default configuration can be set with the «Set as Default» item of the «Configuration» menu or with Ctrl+S hotkey.

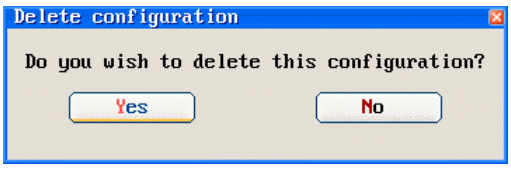
5.4.2 Copying

An operating system configuration can be copied. In this case another configuration is created that is totally identical to the original one including the configuration files. After copying the new configuration, it can be adjusted to your taste, with files and configuration name edited.

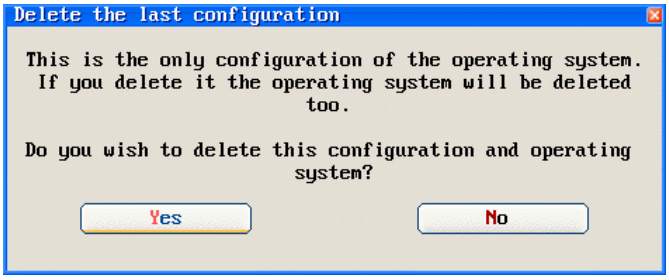
You can copy a configuration by selecting the «Copy» item of the «Configuration» menu or by pressing the Ctrl+C hotkey.

5.4.3 Deleting

Deleting a configuration leads to complete deleting all its configuration files. Setup requires a confirmation before performing deleting.



If the configuration deleted is the only configuration of an operating system then deleting it will also delete the information about this operating system, so Setup requests another confirmation.



See 5.5.2 «Deleting» on details about deleting the information about an operating system.

5.4.4 Hiding

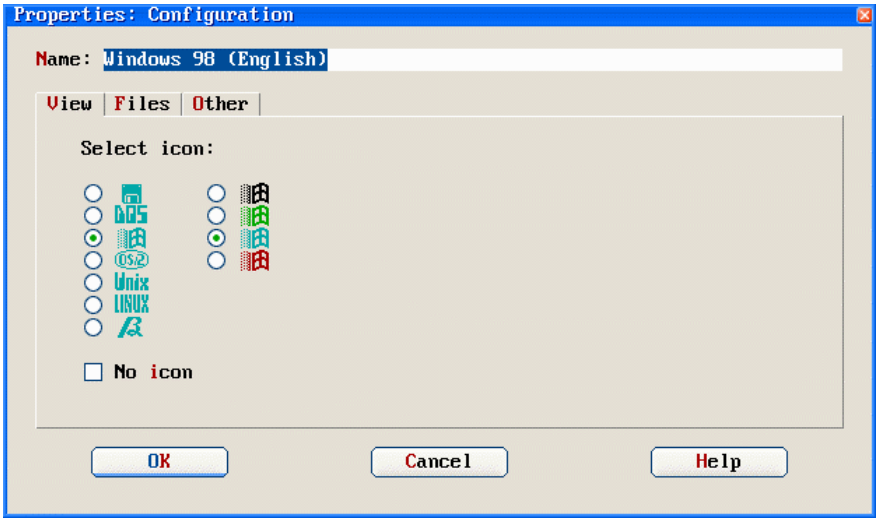
An operating system configuration can be temporarily removed from Boot Menu list by hiding it. Hidden configuration can be unhidden again. Hidden configurations are grayed in Setup list and marked with «HIDDEN» sign.

HIDDEN status can be toggled with corresponding item of the «Configuration» menu or with the `Ctrl+H` hotkey.

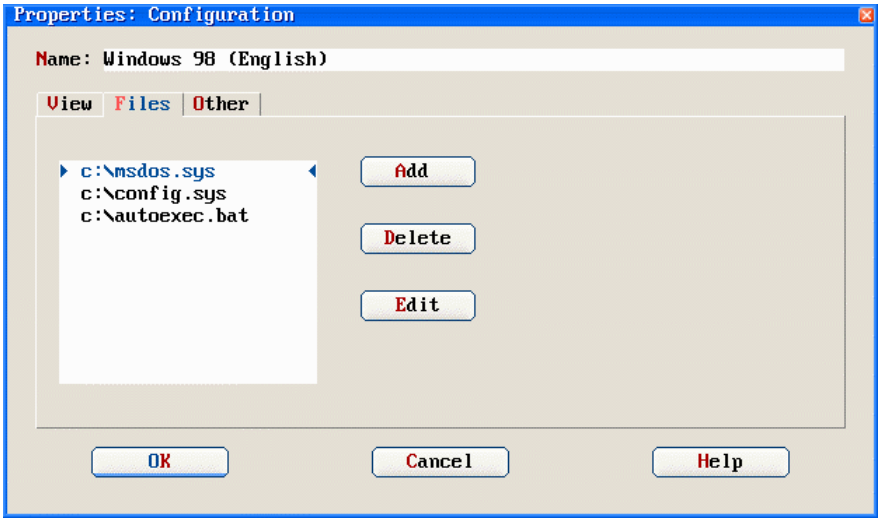
5.4.5 Editing Configuration Properties

Editing configuration properties is arranged in a dialog box with three property sheets:

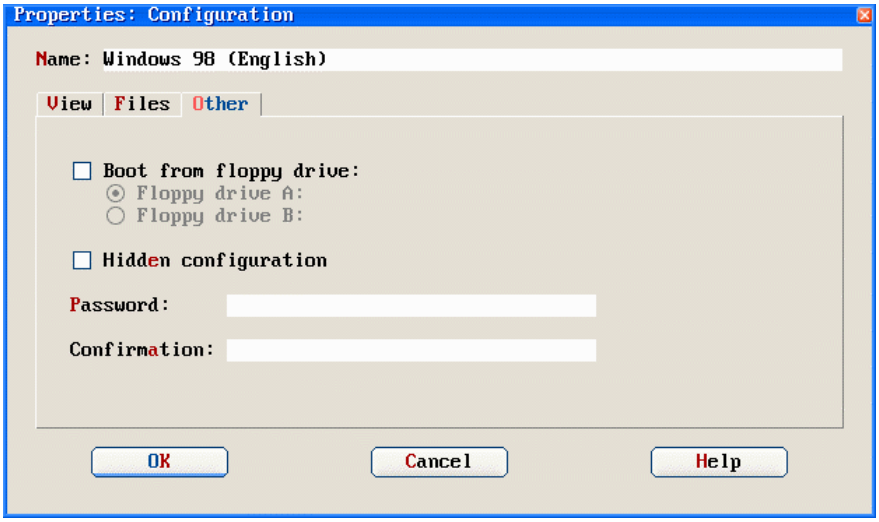
- **View**. On this sheet you can select the icon types and colors or completely turn it off.



- **Files**. On this sheet different actions can be performed with the configuration files list: Files can be added, deleted and edited with help of a built-in text editor.



- **Other**. On this sheet you can turn on booting from a diskette in the configuration context, hide/unhide the configuration and set, change or disable an access password (this password will then be required on booting the configuration).



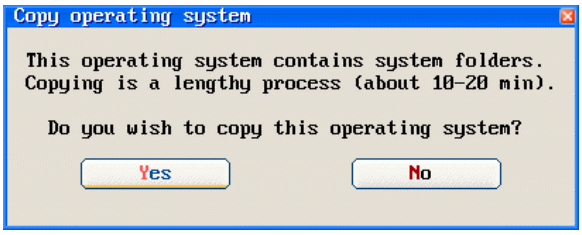
In the upper part of the box there is an edit box that allows editing configuration name. When an operating system is first detected this name is constructed automatically, but you may need to edit it if, for example, similar multiple operating systems or multiple configurations of one operating system, that resulted from copying, are installed on your computer. In the lower part of the dialog box there are OK, Cancel and Help buttons that perform standard actions.

5.5 Manipulating an Operating System

5.5.1 Copying

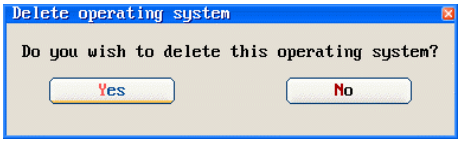
Acronis OS Selector allows not only copying a configuration of an operating system but can also copy a whole operating system. Copying an operating system includes copying all its system files, all system folders and all the configurations.

Copying the system folders may be a lengthy process so Setup requests a confirmation if any is present.

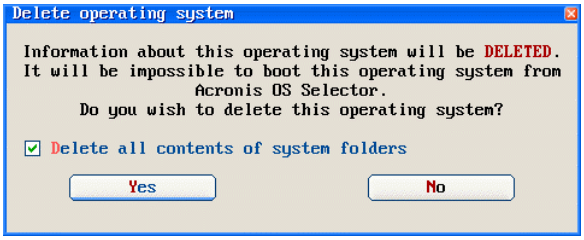


5.5.2 Deleting

You can delete an operating system (information about it), from Acronis OS Selector, that it had detected. Setup requires a confirmation before doing so.



If you are sure and have confirmed deletion, another confirmation dialog opens:



If there are system folders associated with this operating system, you can choose if they should also be deleted.

What really happens is that all backups of system and configuration files are deleted. Setup either deletes (if you chose deleting) or tries to move the system folders of the operating system to their proper place. If it cannot do so (their place is occupied by system folders of another operating system) it moves them to a special \LOSTFILE folder that is located on the same partition.

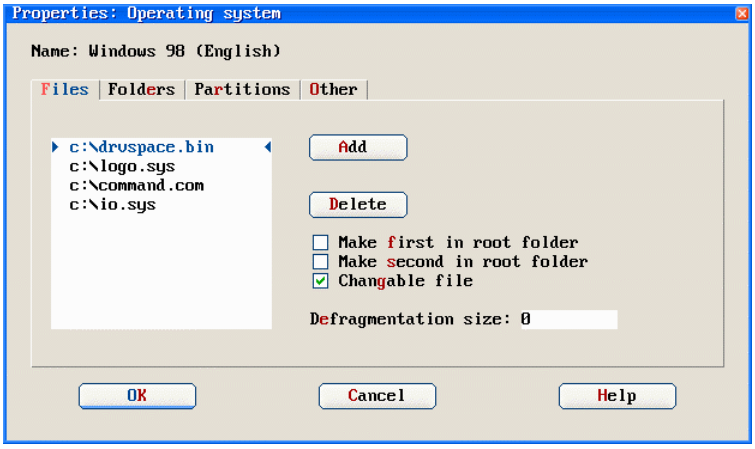
5.5.3 Hiding

Hiding an operating system results in hiding all its configurations, similarly the reverse operation («Unhide») makes all the configurations visible.

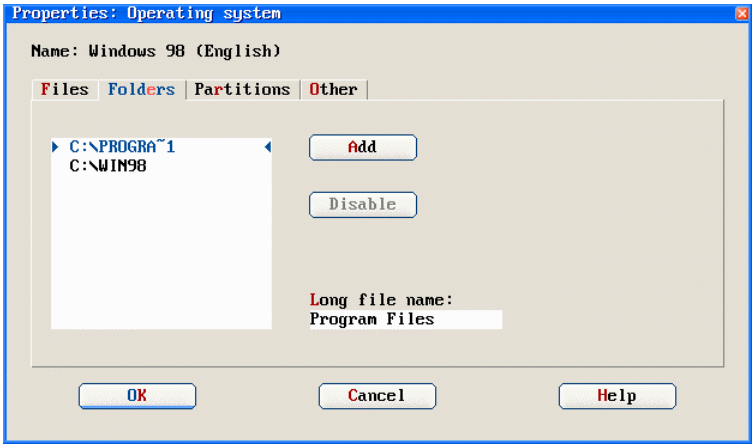
5.5.4 Editing Operating System Properties

Browsing and editing of operating system properties is done in a dialog box with four property sheets:

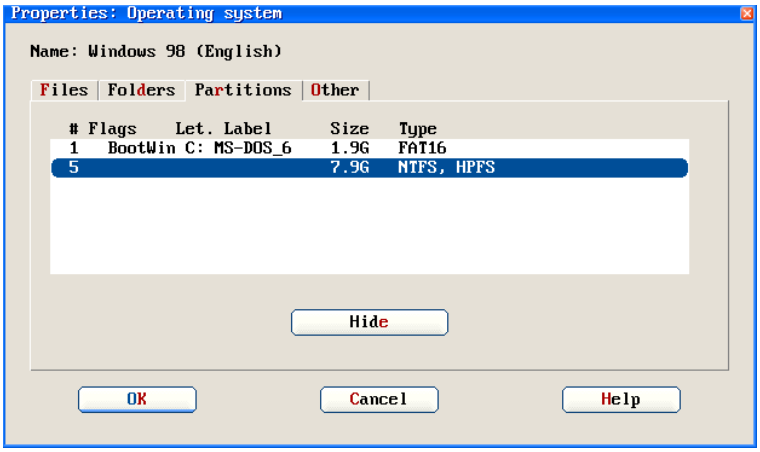
- **Files**. On this sheet you can perform various actions on the system files list: add files, delete them and change their parameters (should the file be the first or the second in the root folder, if the file be modified or not, and the size of the initial part of the file that must be contiguous on the disk).



- **Folders**. This sheet gives you access to the list of system folders. Here you can add a folder, delete/disable a folder (manually added system folders can be deleted, standard ones can be disabled), enable a disabled standard folder, assign a long file name.



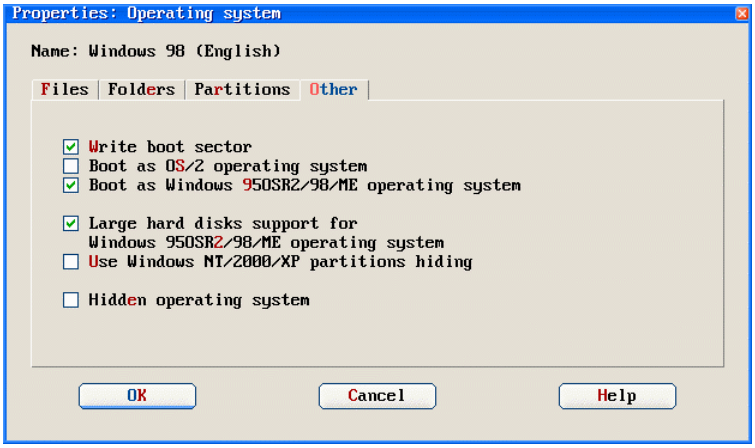
- **Partitions**. On this sheet you can see what partitions are visible to this operating system, hide some partitions or show some of the hidden ones, and change the active partitions settings. If the given operating system uses letters to access partitions, these letters are shown in the list and they change dynamically when partitions are hidden. For Windows NT/2000/XP type operating systems the letters are shown tentatively. Hidden partitions are grayed. Partitions with a type that cannot be recognized by the given operating system are also grayed they cannot be hidden nor unhidden. You cannot hide a partition from which the operating system itself is booted.



Special partitions are marked with the following flags:

- **Boot**: a boot partition of an operating system;
- **Act**: an active partition;
- **Win**: system folders (Windows, Program Files) partition of an operating system.

- **Other**. «Other» sheet allows you to choose some general parameters of an operating system.



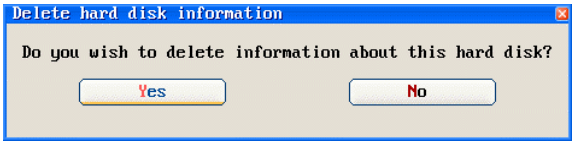
- **Write boot sector**: check it if the boot sector should be written to the beginning of the boot partition of the operating system before it is booted;

- **Boot as OS/2 operating system**: check it if the boot sector should be modified in memory when booting an OS/2 operating system from a logical partition;
- **Boot as Windows 95OSR2/98/ME operating system**: check it if the boot sector should be modified in memory when booting a Windows 95OSR2/98/ME operating system from a logical partition;
- **Large hard disks support for Windows 95OSR2/98/ME operating system**: If this checkbox is checked, LBA type is set for all FAT partitions spanning beyond the 1023rd cylinder, otherwise all LBA types are cleared;
- **Use Windows NT/2000/XP partitions hiding**: If this checkbox is checked, an alternative method to hide partitions is used. This method makes it is possible to hide partitions even from Windows NT/2000/XP operating systems, but it is incompatible with other partition managing software;
- **Hidden operating system**: Toggling this checkbox is equivalent to performing the hide/unhide operating system operation.

  The upper part of the dialog box contains the name of the operating system and the lower one contains the OK, Cancel and Help buttons.

5.5.5 Deleting the Information about Removed Hard disk

If you plug in an additional hard disk to a computer where Acronis OS Selector is installed, Acronis OS Selector will register it and will attempt to find operating systems on it. If you decide to remove this hard disk, the information about it will remain in Acronis OS Selector configuration files should you wish to plug in this hard disk again. If you are not going to plug in this hard disk to your computer again, you can completely delete the information about it from Acronis OS Selector. Setup requires a confirmation before doing so.



Be careful if you have operating systems that are partially installed on one hard disk and partially on the other. If you remove one of these disks you will be unable to boot such an operating system. Acronis OS Selector will of course allow this operation, but might be unable to properly delete information about it.

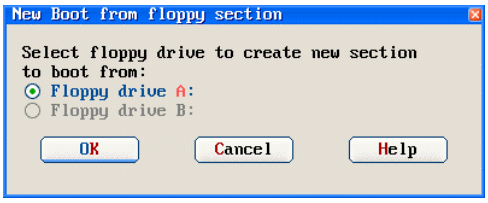
5.6 Special Configuration List Items

5.6.1 Boot From Floppy Section

Boot From Floppy section allows you to:

- Boot from a diskette directly from Acronis OS Selector Boot Menu;
- Boot from floppy drive B: (if, of course, the operating system on the bootable diskette allows you to do this);
- Flexibly adjust the Boot From Floppy context.

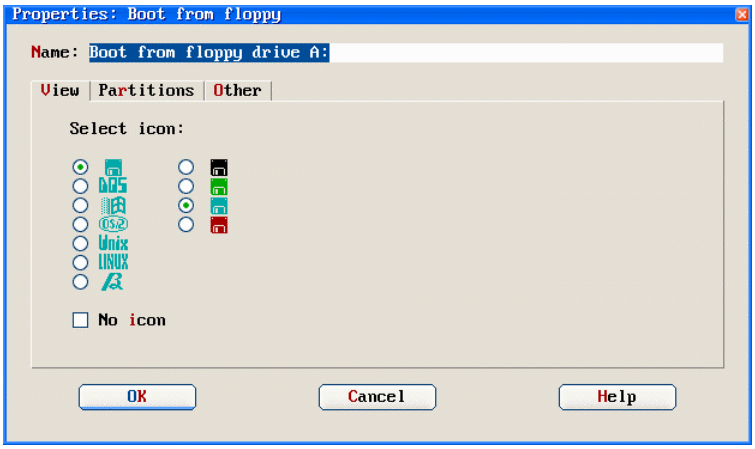
A Boot From Floppy section can be added to the configuration list either with the «Boot From Floppy» item of the submenu «New» of the «Configuration» menu, or from the toolbar, or with Ctrl+F hotkey.



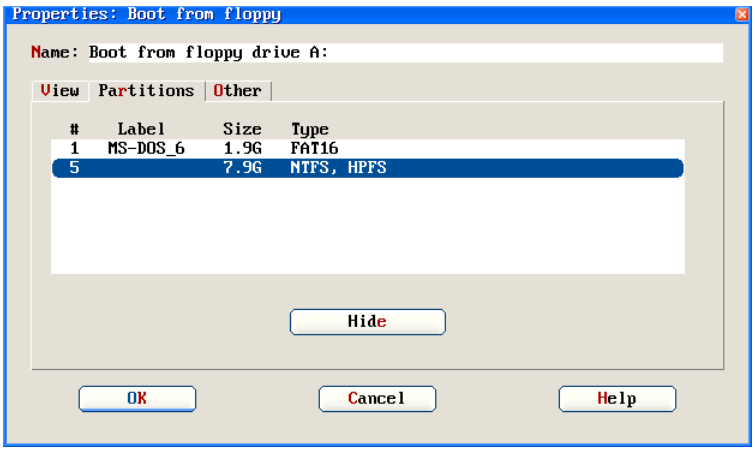
A Boot From Floppy section can be copied, deleted and hidden just like an operating system configuration.

Boot From Floppy section properties can be browsed and edited in a dialog box with the following sheets:

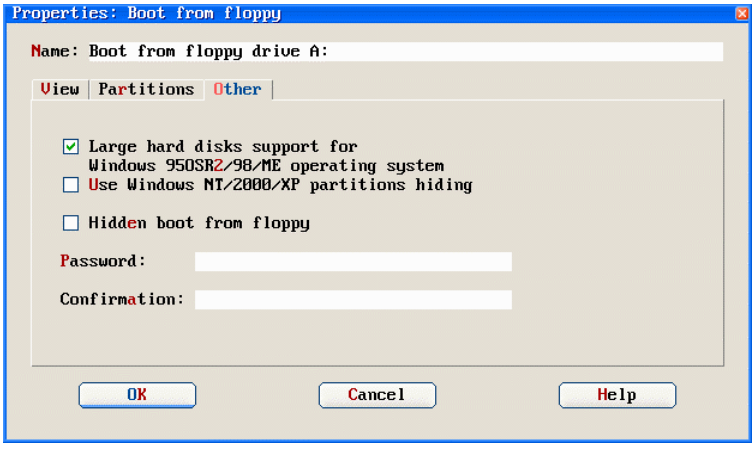
- **View**. Similar to an operating system configuration, here you can choose the type and color of an icon or turn it off completely.



- **Partitions.** Similar to an operating system, on this sheet you can choose which partitions will be visible and which will not be, when booting will be done from a diskette. Since it is not known in advance what operating system will be booted from the diskette, letters are not shown in the partition list but it is possible to hide partitions of any type.



- **Other.** On the last property sheet it is possible to select various general properties of the Boot from floppy section. These parameters correspond to the parameters with the same name of the Properties sheet described in 5.4.5 «Editing Configuration Properties» and 5.5.4 «Editing Operating System Properties».

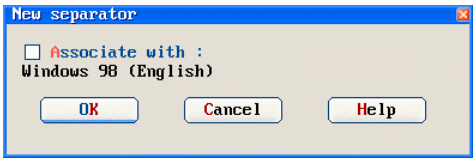


In the upper part of the dialog box you can edit the name of the Boot From Floppy section. The lower part, as usual, contains the OK, Cancel and Help buttons.

5.6.2 Separator

Separators are horizontal rulers that allow breaking the configuration list components into groups according to, for example, functionality or some other properties. Separators may help make the configuration list easy to browse or more understandable. Selection bar in Boot Menu does not stop on separators.

A separator can be added either with the «Separator» item of the «New» submenu of the «Configuration» menu, or from the toolbar, or with the Ctrl+E hotkey. If the selection bar in the list is on an operating system configuration, a dialog box appears where you can associate this separator with this operating system.



An associated separator will be hidden, disabled and deleted together with the operating system that it is associated to.

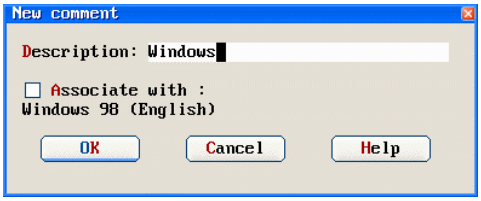
A separator is added before the current list item.

A separator can be copied, deleted and hidden just like an operating system configuration.

5.6.3 Comment

A comment is a configuration list item that can have an icon assigned to it and can contain any text. The selection bar in Boot Menu does not stop on comments. Comments together with separators may help make the configuration list easy to browse or more understandable.

A comment can be added with the «Comment» item of the «New» submenu of the «Configuration» menu, or from the toolbar, or with the Ctrl+M hotkey. A dialog box then appears where you can enter the text of the comment and, if the selection bar in the list is on an operating system configuration, associate the comment with this operating system.

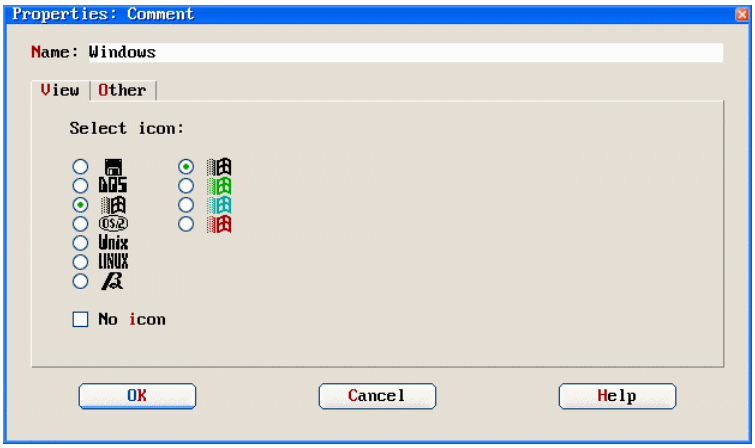


An associated comment will be hidden, disabled and deleted together with the operating system that it is associated to.

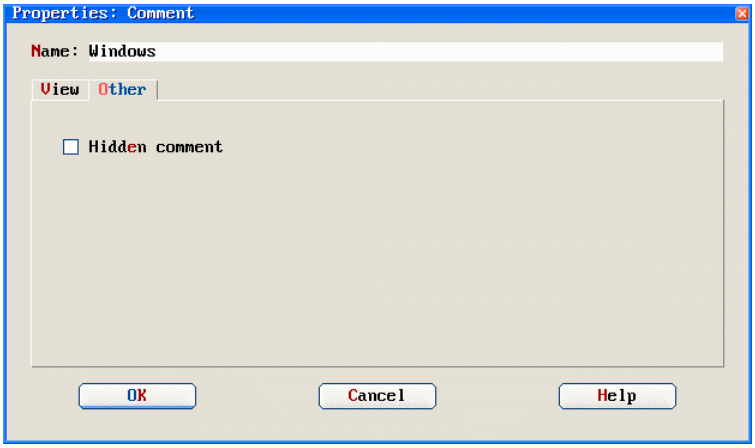
A comment is added before the current list item.

A comment can be copied, deleted and hidden just like an operating system configuration. Like an operating system configuration, a comment has some properties:

- **View.** On this page you can toggle icon display for the comment and choose its type and color.



- **Other.** Here you can chose if the comment should be hidden.



5.7 Acronis OS Selector Options

Acronis OS Selector Setup allows configuring not only its own options but also general parameters and appearance of Boot Menu and other programs included into the Acronis OS Selector package.

Acronis OS Selector Options are arranged in a dialog box with five property sheets.

5.7.1 Standard Options

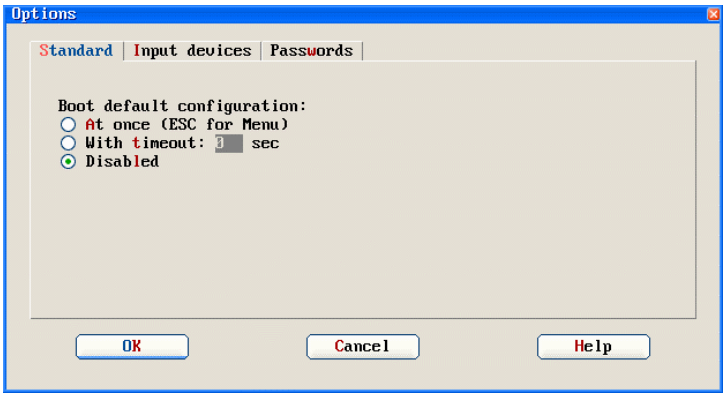
The following parameters can be edited on the Standard sheet:

- If a **default configuration** should be booted at once (in this case the Boot Menu is not displayed at all), or after the number of seconds that is entered in the edit box passes (selection bar in Boot Menu list blinks until the timeout expires, then the default section is booted automatically), or the default booting can be turned off.

  If the default configuration is set to be booted at once you still can enter the Boot Menu by pressing the Esc key when Acronis OS Selector is booted.

- Should **the last booted configuration be remembered**. If this mode is on, after each booting, the booted configuration becomes the default setting.

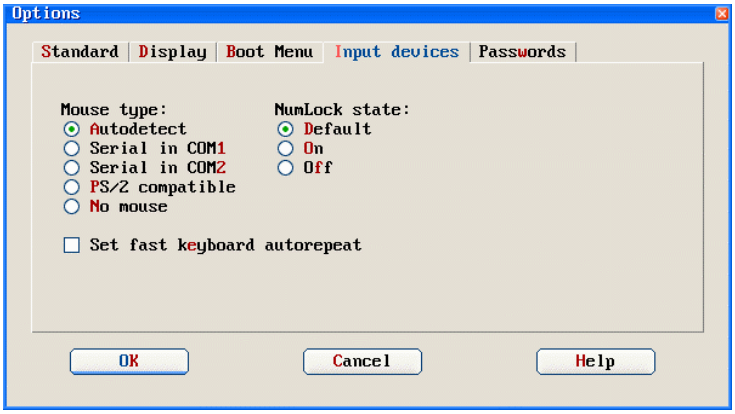
  - Should the **boot viruses be automatically checked for**? If this checkbox is on, then every time the computer is booted, Loader will try to check if a virus has booted before it and will give a corresponding warning. On some computers this warning will always appear, so boot virus checking is off by default.



5.7.2 Input Device Options

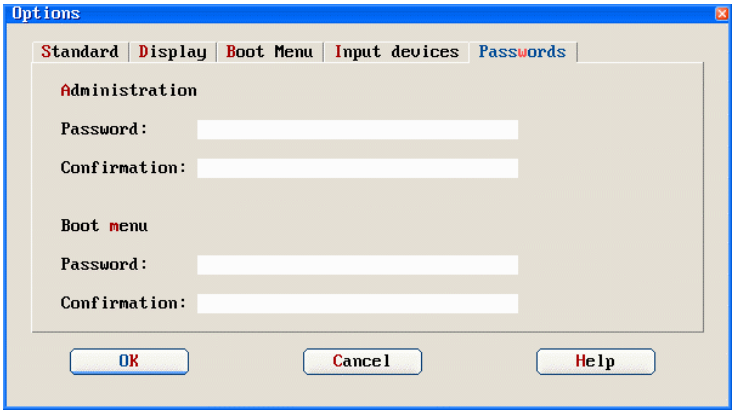
Various parameters of input devices that are used in Acronis OS Selector (keyboard and mouse) are shown on this sheet:

- **Mouse type** (auto-detect, COM1/2, PS/2 or no mouse at all).
- **NumLock state** (do not change, off, on).
- Should the fast keyboard autorepeat be set.



5.7.3 Passwords

On this sheet the global Acronis OS Selector passwords may be set, disabled or changed. Global passwords are the **Administration** password and the **Boot Menu** access password. Boot Menu access password is required on every Acronis OS Selector booting except when Boot Menu is not displayed, i.e. if you choose Boot default configuration at once. Administration password is required when running Setup and Disk Administrator, and when attempting to edit configuration files. The Administration password can be used instead of any another password.



In order to set or change password you should type it into the **Password** edit box and confirm it in the **Confirmation** edit box. In order to disable password, you must clear both edit boxes.

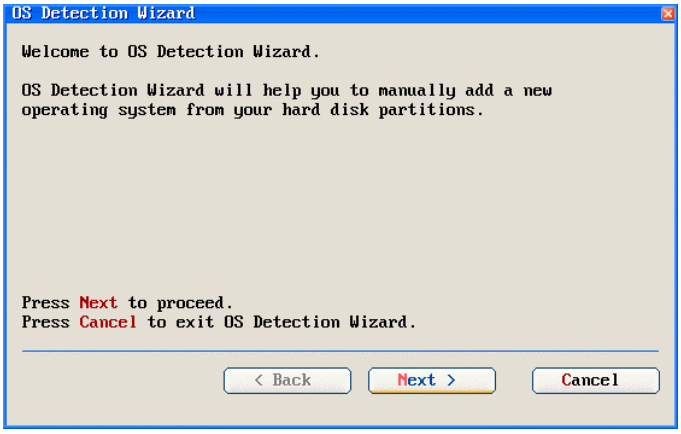
In extraordinary cases, booting from Acronis OS Selector installation media may disable global passwords.

5.8 OS Detection Wizard

OS Detection Wizard is used for manual addition of operating systems that Acronis OS Selector could not detect automatically, including the operating systems who's boot sectors are stored in files. With help of this Wizard you can select which partitions will be hidden from an operating system. It is useful for example for Windows 95/98/ME operating systems for which system folders reside in different partition than the system files do.

5.8.1 Intro Page

Intro page of Wizard describes what this Wizard does and asks you to press the Next > button to proceed to the following page.



You can interrupt the Wizard at any time by pressing the Esc key or the Cancel button. In this case the Wizard will request a confirmation.

5.8.2 Partition Page

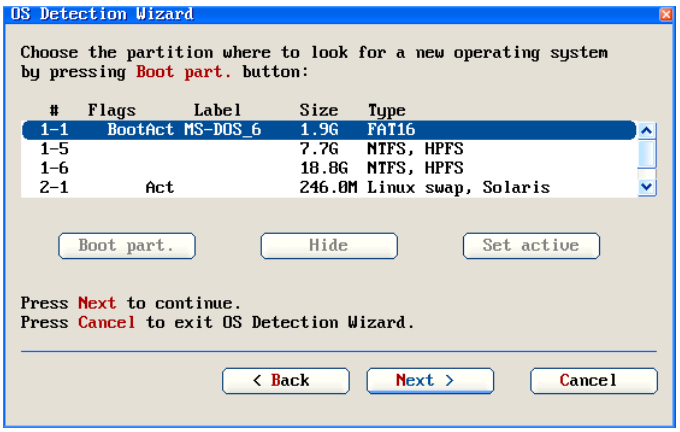
On this page of the Wizard you can select which partition should be scanned for an operating system, which partitions should be active, and which should be hidden from this operating system.

It is not enough to simply highlight a partition to select it as the boot partition of an operating system. You must use the Boot part. button for this purpose.

Partition page has the following controls:

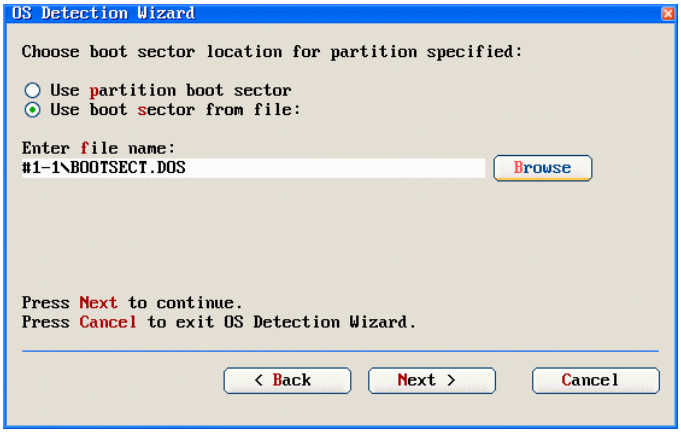
- Partition list (for each partition its number, flags, size and type is shown; hidden partitions are grayed);

- Boot part. button allows a partition to be scanned for an operating system (this partition will become a boot partition for the would-be found operating system);
- Hide/Unhide button hides a visible partition or makes a hidden partition visible.
- Set active button specifies the primary partitions that will be set active when the operation system is scanned for and booted;

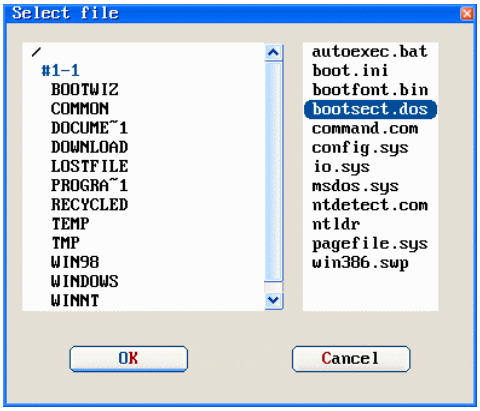


5.8.3 Boot Sector Selection Page

On this page you can choose where the boot sector for the operating system detection should be taken from: directly from boot partition (that has been selected on the previous page) or from the specified file. This page is displayed only when looking for operating systems on FAT16/FAT32 partitions.



Click the Browse button to open a standard file selection dialog box.

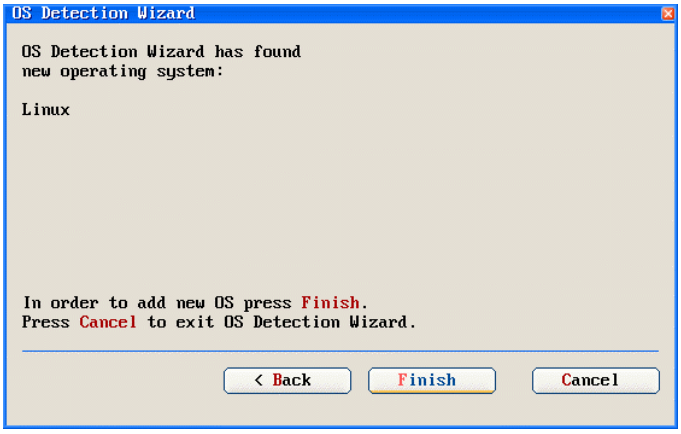


Please note that since the letter order for the detected operating system is not known in advance, default Acronis OS Selector partition enumeration is used instead of drive letters.

Choose an appropriate boot sector and click the Next > button, OS Detection Wizard will then attempt to find an operating system with the specified parameters.

5.8.4 Search Result Page

If OS Detection Wizard finds an operating system that is not yet present in Boot Menu, you get to the Search Result page.

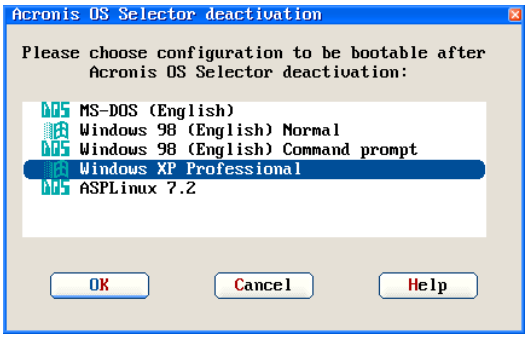


Click the Finish button, Wizard will quit and the configuration of the newly detected operating system will be added to Boot Menu. If for some reasons you do not want to add it, press the Esc key or click the Cancel button.

If OS Detection Wizard does not find a new operating system, it informs you, and you can return to the previous pages and search again with new parameters.

5.9 Deactivating Acronis OS Selector

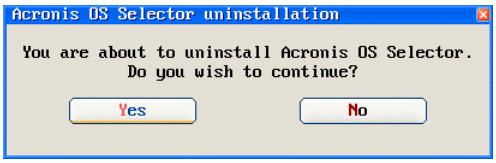
Acronis OS Selector can be temporarily deactivated (with the corresponding item of the «Other» Setup menu or by booting from the installation media and selecting the corresponding action in the Acronis OS Selector Installation Wizard). In this case you will be prompted to select the configuration that will be booted bypassing Acronis OS Selector.



When deactivated, Acronis OS Selector does not have control of your bootable operating systems or their parameters. To activate Acronis OS Selector, boot from the installation media and select the corresponding action in Acronis OS Selector Installation Wizard.

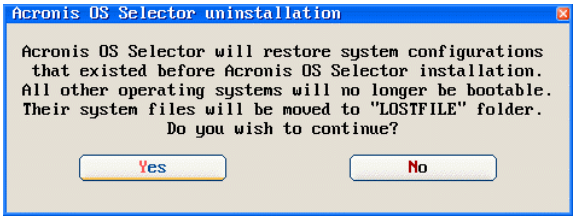
5.10 Uninstalling Acronis OS Selector

Acronis OS Selector can be completely removed from the computer (with the corresponding item of the «Other» Setup menu or by booting from the installation media and selecting the corresponding action in Acronis OS Selector Installation Wizard). You will have to confirm your desire to uninstall Acronis OS Selector by clicking the Yes button.

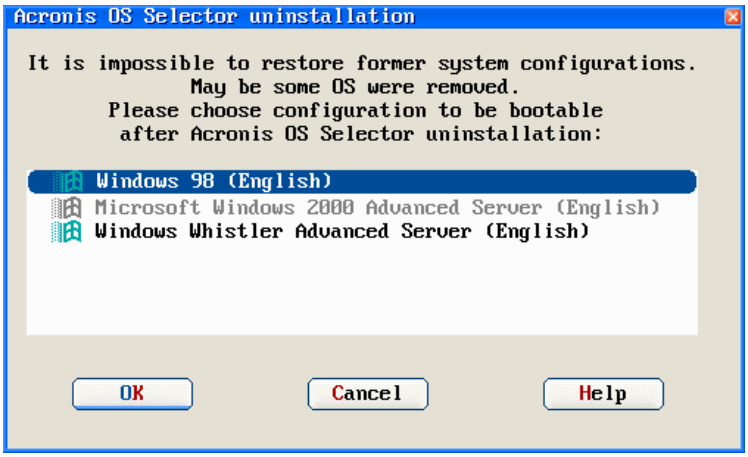


Two courses of events are the possible:

1. If no actions preventing the original configuration of the computer from restoration (such as uninstalling and deleting operating systems, moving, resizing or deleting partitions with operating systems) were performed since Acronis OS Selector had been installed, you will be prompted to re-confirm your desire.



2. If restoring your computer to the condition that existed before Acronis OS Selector installation proves to be impossible you are prompted to choose a configuration that will be booted after Acronis OS Selector is uninstalled.



Chapter 6. Disk Administrator

This chapter contains the following information:

6.1 Running Disk Administrator

In spite of Disk Administrator being very carefully debugged and tested software, different external factors, such as power failures and other hardware troubles may result in data loss. So before attempting any actions on changing the partitions structure with the Disk Administrator, some steps should be undertaken to reduce possible risk. Make sure that you have made backup copies of important information (again, you may wish to consider purchasing Acronis TrueImage at www.acronis.com), created boot floppies for the operating systems that are installed on your computer, and make sure that you still have the Acronis OS Selector installation media.

Because of possible conflicts that might occur due to hardware and software differences on different computers, it is undesirable to create hard disk partitions on one computer and then to use this hard disk on another PC. Doing so may lead to data loss.

There are two ways to run Disk Administrator:

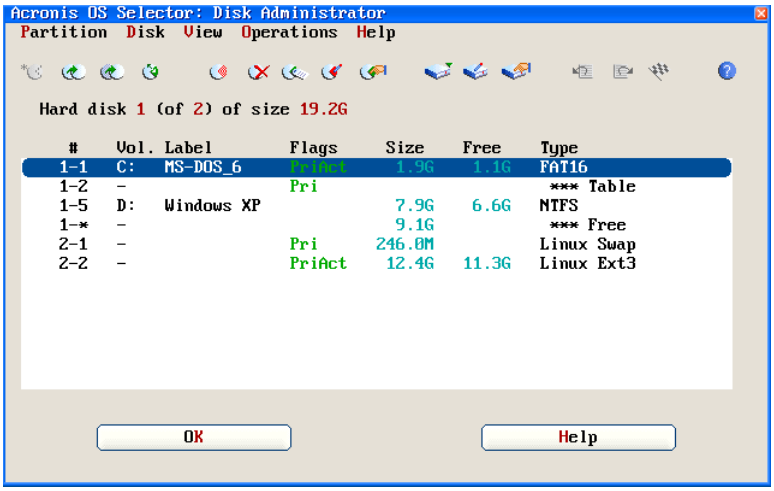
1. Booting from the installation diskette (or CD-ROM) allows you to prepare the hard disk for installing Acronis OS Selector, and also allows you to perform actions in case of unexpected situations.
2. From the installed Acronis OS Selector Boot Menu. This is the usual way you will run the Disk Administrator.

6.2 Disk Administrator Main Window Survey

Disk Administrator main window consists of several main parts:

- Title and frame.
- Menu bar.
- Toolbar.

- Current hard disk info line.
- Partition list.
- OK and Help buttons.



The title bar and the frame allow you to move the window around the screen and also exit Disk Administrator.

The pull-down menu bar allows you to perform all the actions on partitions and hard disks as well as adjust their appearance and get help.

All basic actions are grouped in the toolbar. Here they are available on one click. Please note: the toolbar is unavailable in the Acronis OS Selector text mode.

Hard disk info line shows the total number of hard disks on the computer, the current hard disk number and the total size of the hard disk.

The partition list is a table where the main information about hard disk partitions and free spaces are listed. Use keyboard or mouse to move along the list. All the actions in the menu refer to the selected partition or free space or the hard disk where it is located. Usually the following information about the partition or the free space is given in the list:

- Partition number in Acronis OS Selector format;
- Partition number or letter (for the selected operating system);
- Label.
- Flags (**Prim**ary, **Act**ive, **Hid**den).
- Size.
- Free space.
- Partition type.

Partitions with errors are listed in red.

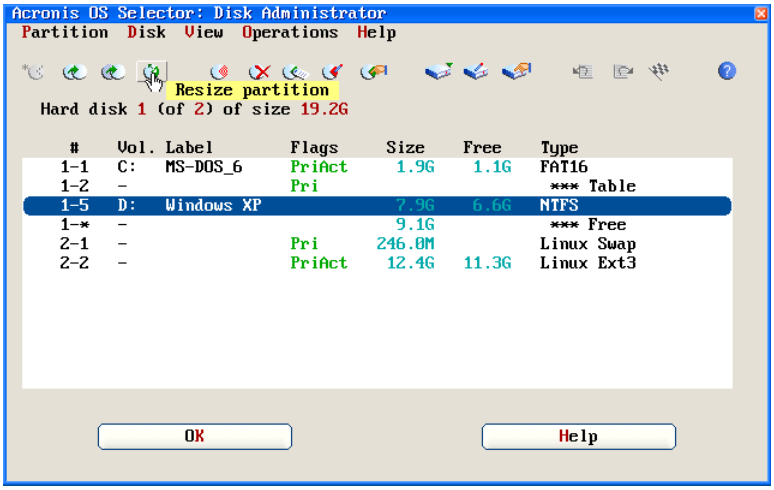
OK button exits the Disk Administrator. Help button opens the help on main window.

6.3 Disk Administrator Interface

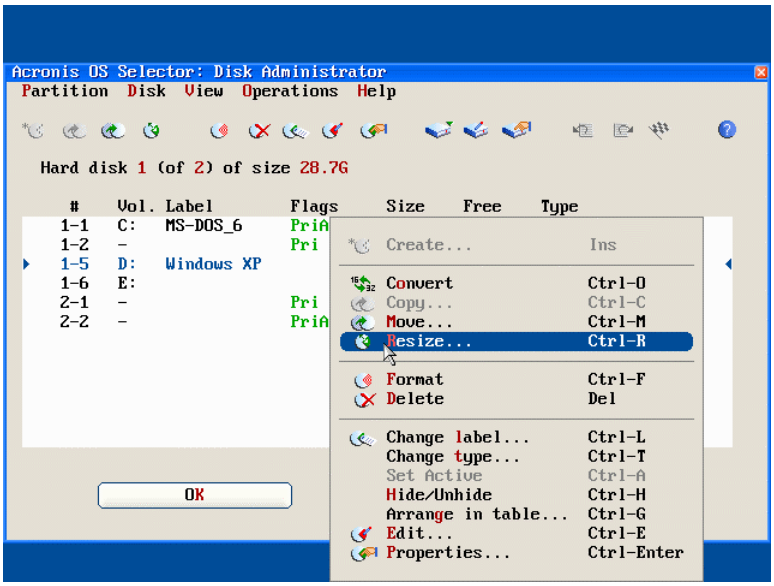
All the functions of Disk Administrator can be performed from the keyboard and most of them – with the mouse.

6.3.1 Using the Mouse

The Disk Administrator interface is very mouse-oriented. Left-clicking the necessary partition or free space, and then choosing the desired action from the toolbar, can perform most actions.

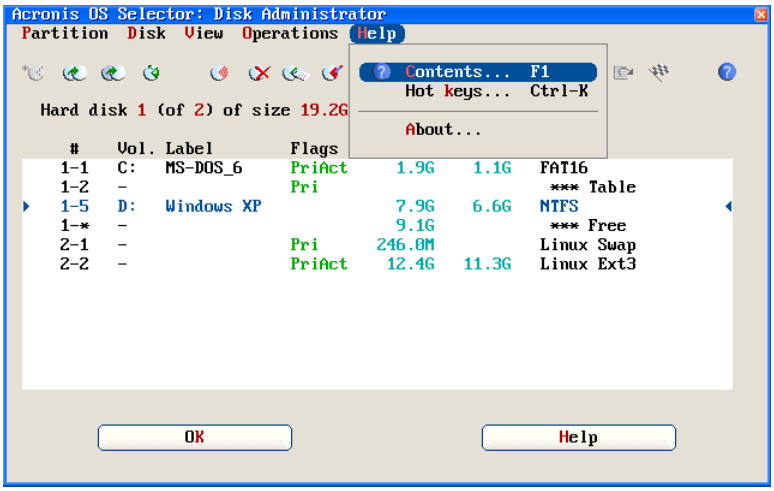


All the actions can be also performed on partitions from the context menu that opens via a right-click.



6.3.2 Using the Keyboard

Press Alt+<Bold Letter> to get into the menu. For example pressing Alt+H opens the Help menu.

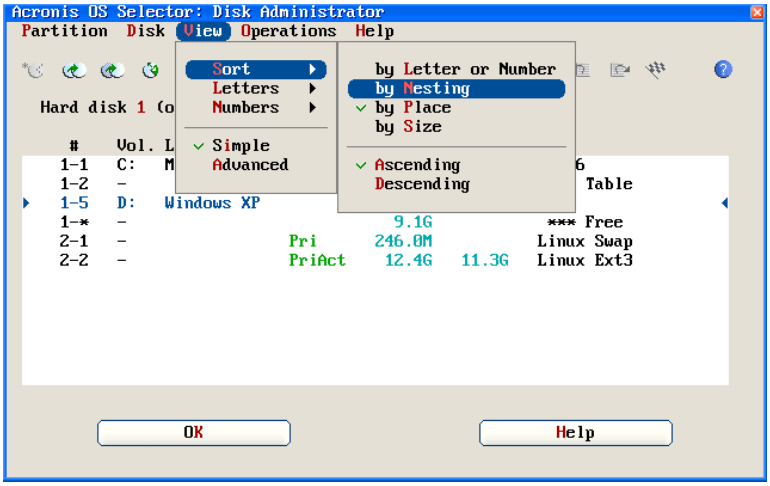


To choose an item from the menu either press the corresponding hot key or use the Up and Down keys to move the highlight bar to the chosen item and press Enter. Press Esc or Alt to leave the menu without performing any action.

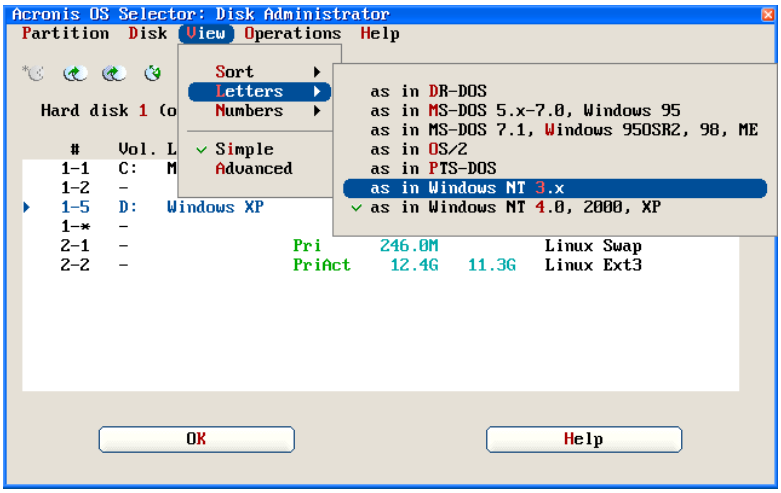
6.4 Disk Administrator Appearance Setup Menu («View» Menu)

Disk Administrator's great advantage over other similar programs is the flexible setup of the list of partitions that are shown in the main window. The following aspects of the main window view can be changed:

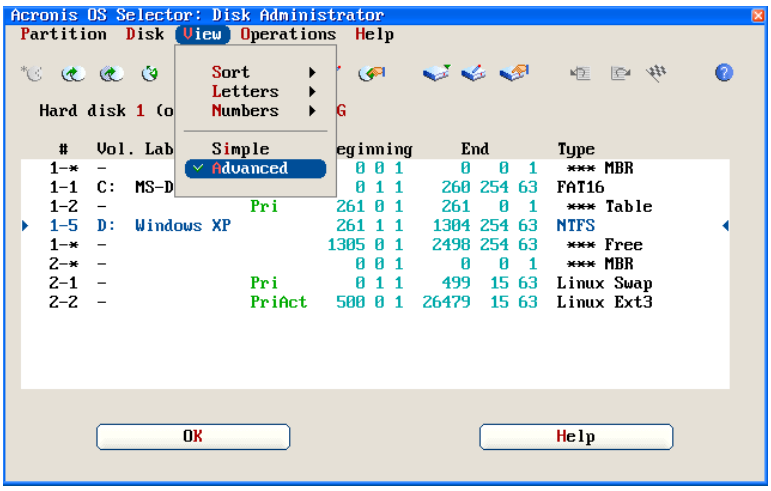
- **Sorting order of the partition list.**



- **Partition numbers or letters for the chosen operating system are shown.**



- **Simple or advanced view. Here is an example of an advanced main window view.**



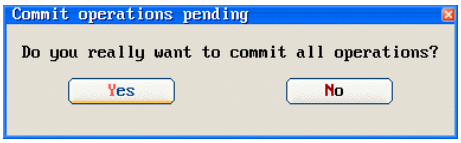
Advanced view differs from the simple one because along with partitions and free space it also shows the positions of all partition tables on the disk, and instead of sizes, it shows the cylinders, heads and sectors of the beginning and end of each disk area.

6.5 Pending Operations

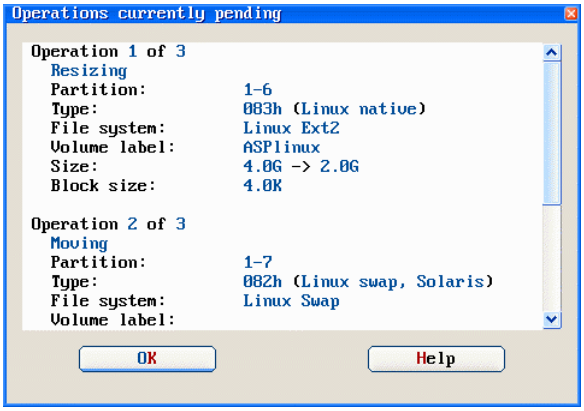
Acronis OS Selector Disk Administrator uses a pending operations technique. It means that when performing operations with partitions these operations are not actually executed, but are postponed until you are sure of ALL your changes. You can see all the changes in the list of partitions as if these operations were made.

All the actions with pending operations are available from the «Operations» menu.

- **Undo**: Undoes the last pending operation. Undone pending operations can be redone.
- **Redo**: Redoes the last undone pending operation.
- **Undo all**: Undoes all pending operations.
- **Redo all**: Redoes all undone pending operations.
- **Commit**: Actually performs all the pending operations. Committed operations cannot be undone, so an additional confirmation is required:



- **View**: Shows the list of all pending operations. The operations are listed not in the order they were invoked, but how they will actually be performed:



6.6 Getting Help

At any time the Disk Administrator can get you context help on the window that is currently on the screen. For more detailed information about Disk Administrator performance it is best to review this User Guide.

Aside from usual help features, the Acronis OS Selector package includes a README.TXT file that contains various useful information about system requirements, installation and the last changes that were not yet introduced to the User Guide. You may also visit our web-site for additional updated information – www.acronis.com

Chapter 7. Main Operations with Disk Administrator

This chapter covers the following operations with partitions:

Creating a Partition

Copying or Moving a Partition

Resizing a Partition

Formatting a Partition

Deleting a Partition

Changing the Partition Label

View Details about a Partition

Getting Detailed Information about a Hard Disk

7.1 Creating a Partition

The Create Partition function allows you to create primary or logical partitions. Up to four primary partitions, or three primary and an unlimited number of logical partitions can be on one hard disk.

Usually primary partitions are created to install operating systems on them, and logical ones are used for all other purposes like software installation and data storage. If you have several hard disks then you can increase productivity by installing operating systems and software on different disks. For more details about partitions see Chapter 2 «Basic Information».

You need free space on a hard disk to create a partition. If there is none, you can create some by reducing the size of one of the existing partitions. Desired position of free space on a disk may be obtained by moving the partitions. Moving and resizing partitions is covered in detail below.

Creating a new partition may lead to changes in letter sequence. You should avoid changes in letter assignment for partitions that may be referred to by different configuration files and system registries. Hiding the newly created partition(s) from the operating systems for which they change the letter sequence can do this. See paragraph 2.9 «Assignment of Letters in Different Operating Systems» for details about tracking the letter assignment for a given operating system.

7.1.1 Creating Bootable Partitions

Before creating a partition where you plan to install an operating system, you should know the limitations that different operating systems impose on their boot partition.

This table sums up such information about several operating systems.

Operating system	Bootable from		Supports				Maximum boot code length	Free space required for installation[1]
	Second hard disk	Logical partition	FAT16	FAT32	NTFS	Linux Ext2/Ext3		
MS-DOS 6.22	+[2]	–	+	–	–	–	2G	10M
Windows 95 (MS-DOS 7.0)	+[2]	–	+	–	–	–	8G	50M
Windows 95 OSR2 (MS-DOS 7.1)	+[2]	+[2]	+	+	–	–	no	150M
Windows 98 (MS-DOS 7.1)	+[2]	+[2]	+	+	–	–	no	300M
Windows ME (MS-DOS 8.0)	+[2]	+[2]	+	+	–	–	no	600M
Windows NT 3.x	–	–	+	–	+	–	2G	100M
Windows NT 4.0	–	–	+	–	+	–	2G[3]	150M
Windows 2000	–	–	+	+	+	–	no	700M
ASPLinux	+	+	+	+	+[4]	+	No	600M

[1] – Approximate value.

[2] – With help of Acronis OS Selector and if the partitions are hidden so that the boot partition is labeled with letter C:.

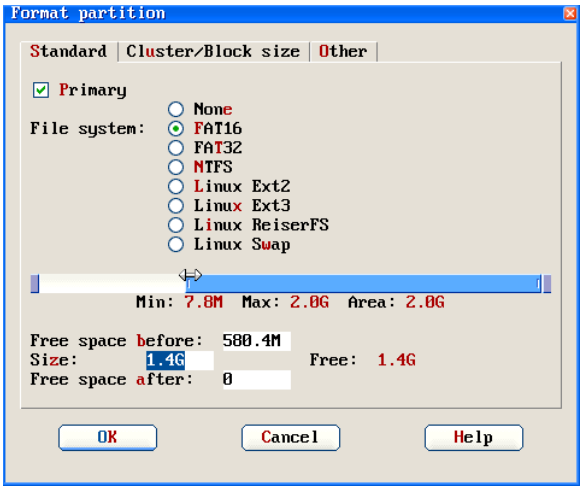
[3] – Fixed in Service Pack 4.

[4] – Experimental support.

7.1.2 Creating a Partition with Disk Administrator

Creation of a partition requires the following steps:

1. Choose the desired free space in the partition list.
2. Choose the «Create partition» operation (from the menu, toolbar or by pressing Insert key).
3. Enter the parameters of the new partition in the dialog box.



4. Confirm partition creation by pressing Enter key or the OK button in the lower part of the box.

In the «Create partition» dialog box you can set the following:

- **On the «Standard» sheet:**
  - Will the partition be primary or logical. Disk Administrator does not allow the creation of primary partitions if there are no more empty entries in the MBR partition table. You should also keep in mind that other partition manipulation software might misinterpret a primary partition as a logical one.
  - The file system that will be created on the partition: FAT16, FAT32, NTFS, Linux Ext2/Ext3, Linux ReiserFS, or Linux Swap. It is also possible to create a partition without a file system (if, for example, you further plan to format it for a file system that is not supported by Disk Administrator). Partition type is chosen automatically, based on partition format and size, but can be changed manually later via the change partition type operation.
  - Size of the partition and its position within the selected free space. These parameters can be changed both from the keyboard by entering the partition size and the amount of free space before and after the partition or with the mouse (there is a special control in the dialog box, partition can be resized by dragging its ends and moved by dragging its middle).

- **On the «Cluster/Block size» sheet:**
  - Cluster size (for FAT16, FAT32, and NTFS) or block size (for Linux Ext2/Ext3). This parameter is usually set automatically, but sometimes it is necessary to define it manually.
  - Allows the creation of a partition that is larger than the file system (only for FAT16). When this mode is on, Disk Administrator can create partitions that exceed the size of the file system by a cluster or more. This mode allows for more economic use of the disk space, but some software (such as MS-DOS installation program, Norton Utilities, etc) can corrupt such partitions.
  - Allows the creation of partitions with 64-kilobyte clusters (only for FAT16). Not all the operating systems understand such partitions, for example Windows 95/98/ME cannot boot from them.
- **On the «Other» sheet:**
  - **Number of FAT copies** (only for FAT16 and FAT32). The majority of operating systems incorrectly work with partitions for which the number of FAT copies is other than 2.
  - **Size of root folder** (only for FAT16). The usual size of the root folder is 512 items. This number may be increased if necessary.
  - **Size of disk space corresponding to one i-node** (only for Linux Ext2/Ext3). This parameter is approximately the lower estimation of the average assumed file size for the partition, and in fact defines the number of i-nodes on the partition. The lower these parameters the more i-nodes there will be on the partition.
  - **Sparse superblock (kernels 2.0.39+)** (only for Linux Ext2/Ext3). When this checkbox is checked, Ext2/Ext3 superblock is stored in a more optimal way.
  - **Filetypes in folders (kernels 2.0.39+)** (only for Linux Ext2/Ext3). When this checkbox is checked, the information about the types of files, which is usually stored in i-nodes, is also mirrored in folders (directories), thus significantly reducing the numbed of accesses to disk during certain operations. It should be noted that setting this flag for a partition that previously worked without one will make fsck report errors, since for the earlier-stored files will not be mirrored in the folders. This is a non-fatal error.
  - **Files larger than 4G (kernels 2.4.0+)** (only for Linux Ext2/Ext3). When this checkbox is checked, it is permitted to use files with sizes that do not fit into a 32-bit integer, thus avoiding the 4 GB per file size limitation. Naturally, this flag makes no sense for a partition less than 4 GB in size.

7.2 Copying or Moving a Partition

The Copy partition function allows you to create a partition with the same information as in the original. You may need to copy a partition in the following cases:

- To duplicate an operating system before upgrading it without losing the older version.
- To make a fast copy of one hard disk to another.
- To create a backup copy of the whole partition.

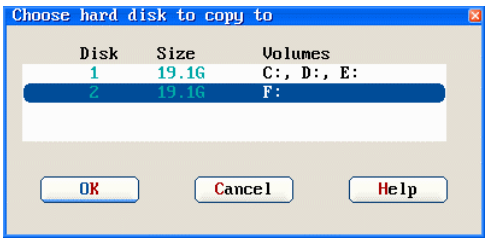
One should not copy partitions that have active system folders of operating systems, nor the partition where Acronis OS Selector resides.

Moving a partition is different from copying one in that the original partition is deleted. You may need to move a partition for example to forcefully change the letter sequence that is assigned to the partitions by an operating system.

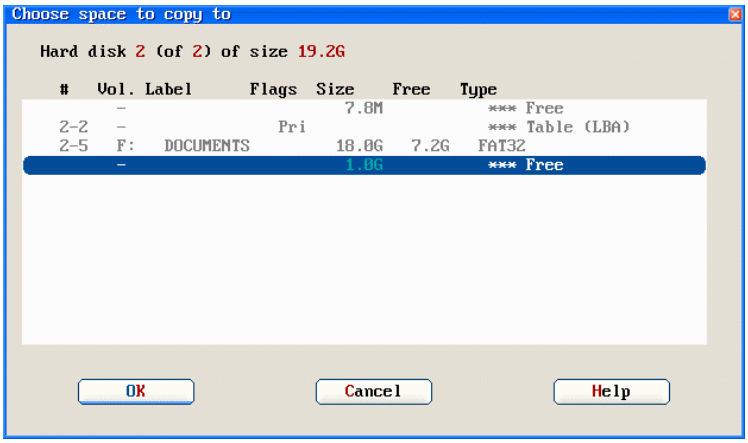
One should not move the partitions that have active system folders of operating systems, nor the partition where Acronis OS Selector resides to another hard disk.

The following steps should be made to copy a partition:

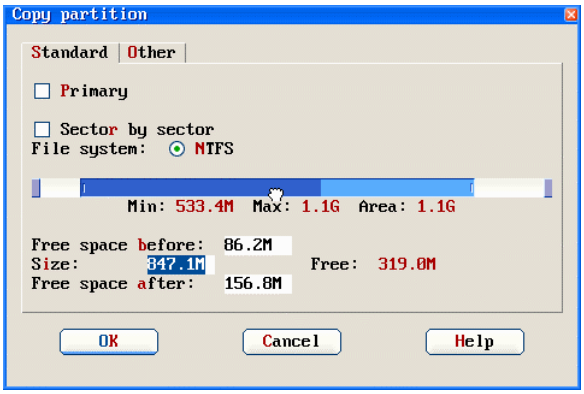
1. Choose the source partition from the list.
2. Select the Copy partition or Move partition function (from the menu, toolbar or by pressing the Ctrl+C or Ctrl+M hotkeys).
3. Choose the target hard disk (skip this step if there is only one hard disk installed on your computer).



4. Choose the target free space.



5. Choose the parameters of the new partition in the dialog box.



The dialog box for choosing the partition parameters has the same look and functionality as the one that appears during partition creation. Please note that it is impossible to change the file system (only the FAT16⇔FAT32 conversion is possible), and that cluster size can be changed only for FAT16/FAT32.

When moving a partition on the «Other» sheet, it is possible to set the mode when file system adjustment is not performed («Disable fitting» checkbox). Parameters are adjusted when the data areas of the source and destination partitions overlap. In this case no unnecessary data copying is done, but the parameters of the resulting partition may become non-standard.

6. Confirm the operation by pressing the Enter key or clicking the OK button in the lower part of the dialog box.

The creation, copying, moving and resizing partition functions of the Disk Administrator are fully universalized. It is possible to move a partition, resize it, and change the cluster size, label and file system type all in one pass. For example it is possible to copy a partition to a free space of smaller size, a task impossible for any other similar software!

7.3 Resizing a Partition

Resizing a partition allows you to both resize it and to move it inside the hard disk area where it was initially located, without data loss. Decreasing partition size requires free space inside it, while increasing takes some free space next to the partition.

If you need to increase the size of a partition, and there is no free space next to it, you can get some by moving and resizing other partitions.

You have to be careful when decreasing the size of a partition where an operating system or Acronis OS Selector is installed, since some free space should be left for normal system functioning (for the swap-file, temporary files, drivers etc.). Acronis OS Selector itself occupies about 2M, and some extra space is required for the backup copies of the system files of the detected operating systems.

Reducing a FAT partition size decreases waste – thus leading to more effective disk space usage.

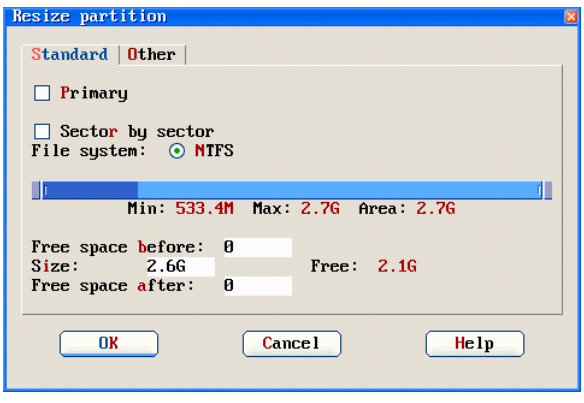
When moving a partition to higher number cylinders (to the right) you should check if it remains visible to the operating systems that use it. See the table in paragraph 7.1 «Creating a Partition».

When converting a partition file system to FAT32 remember that not all operating systems recognize this file system. See the table in paragraph 7.1 «Creating a Partition».

Copying, moving and resizing will not be performed on a partition where there are errors in the file system. Partitions with errors are listed in red in the Disk Administrator list. You should correct these errors with such software as CHKDSK or SCANDISK, and start the Disk Administrator afterwards.

Resizing a partition is done in the following steps:

1. Choose the necessary partition from the list.
2. Choose the Resize partition function (from the menu, toolbar or by pressing Ctrl+R hotkey).
3. Use the dialog box to change the partition parameters.



The Choose partition parameters dialog box looks and functions just like the Move partition dialog box.

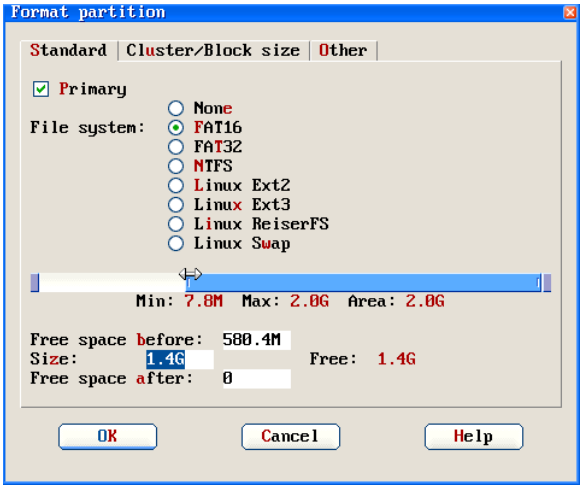
4. Confirm the operation by pressing Enter or clicking the OK button in the lower part of the dialog box.

7.4 Formatting a Partition

Format partition function allows you to format the chosen partition logically, while erasing all the information that was previously stored on it.

The following steps should be taken to format a partition:

1. Choose the partition to format from the list.
2. A dialog will open where you can choose the new parameters for the selected partition.



The Format partition parameters dialog box looks and functions just like the Create partition dialog box.

3. Confirm formatting by pressing Enter or clicking the OK button in the lower part of the dialog.

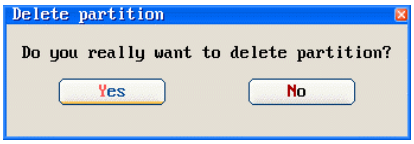
7.5 Deleting a Partition

The delete partition function allows you to delete a partition from the hard disk partition structure. The information that was stored on this partition is not erased, but may be lost if other partitions are created on the empty space. The deleted partition can only be recovered with help of special programs such as the Acronis' RecoveryExpert – automatically recover ANY deleted or lost partition with ANY file system, allowing independent work from a bootable CD or diskette even if your operating system fails to boot (see www.acronis.com for full details on purchasing this recovery software).

To reduce the probability of accidental partition deletion, the Disk Administrator asks for an additional confirmation.

Here are the steps that lead to deleting a partition:

1. Choose the partition to delete from the list.
2. Select the Delete partition function (from the menu, toolbar or with the Del key).



3. Confirm deletion by pressing Y or clicking the Yes button in the confirmation dialog box.

   Deleting a partition may lead to changes in letter sequence that can be corrected only by the creation of an additional partition.

7.6 Changing the Partition Label

If you have many partitions on a hard disk then giving them thematic names may help to identify them for easier work. For example if a partition is labeled GAMES, the type of information that is stored there is obvious.

FAT16/FAT32 partition labels may be up to 11 characters long and should abide to the MS-DOS rules for file names. Spaces are allowed in labels. NTFS partition labels are limited to 32 Unicode characters. Disk Administrator displays and allows entering only the ASCII characters. Linux Ext2/Ext3 partition labels can be up to 16 characters long, and, since their encoding is not known in advance, it is better not to use characters other than ASCII.

To change a partition label:

1. Choose the desired partition in the list.
2. Choose the Edit label function (from the menu or with the Ctrl+I hotkey).
3. Edit the label in the dialog box.

4. Confirm the operation by pressing Enter or clicking the OK button in the lower part of the dialog box.

7.7 View Details about a Partition

To get the details about a partition, you must do the following:

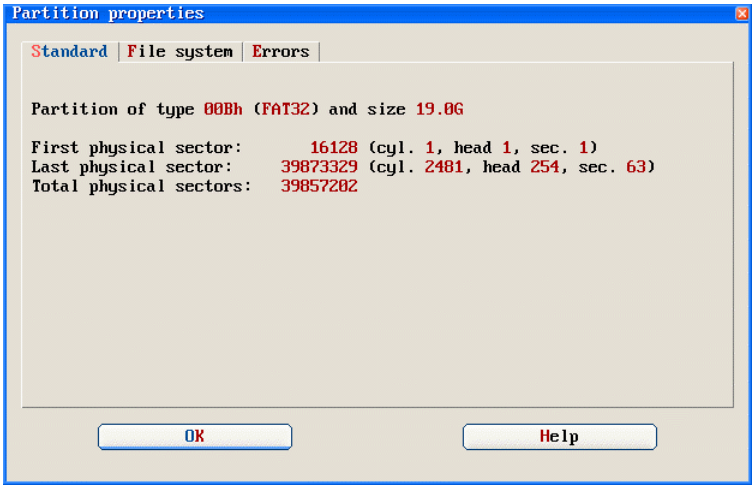
1. Choose the desired partition from the list.
2. Choose the Properties function (from the menu, toolbar or with the Enter key).
3. Press Enter or Esc or click the OK button in the lower part of the dialog box to return to the main window after viewing the partition properties.

If Properties view is required for a partition that has not yet been checked by Disk Administrator, a full file system check is invoked before displaying information.

The Properties dialog box has several sheets. You can switch between these sheets either using the mouse by clicking the desired tabs or with the keyboard by pressing Alt and the highlighted key from the tab title.

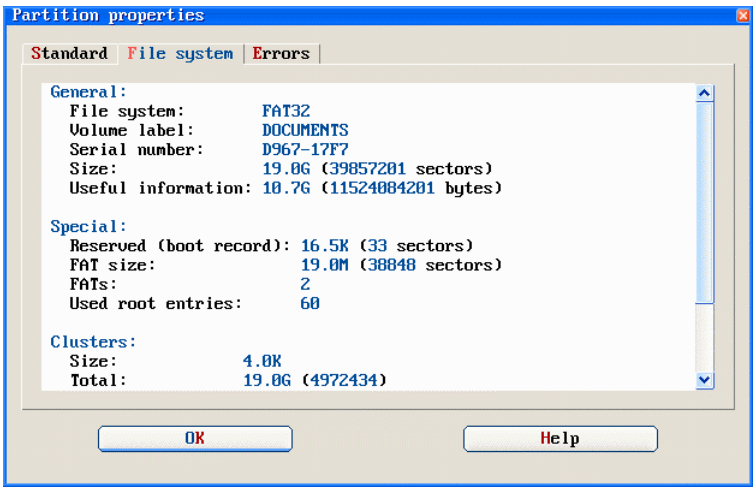
7.7.1 General Properties Sheet

This sheet shows the partition's position on the hard disk and its size in absolute sectors and in Cylinder-Head-Sector coordinates.



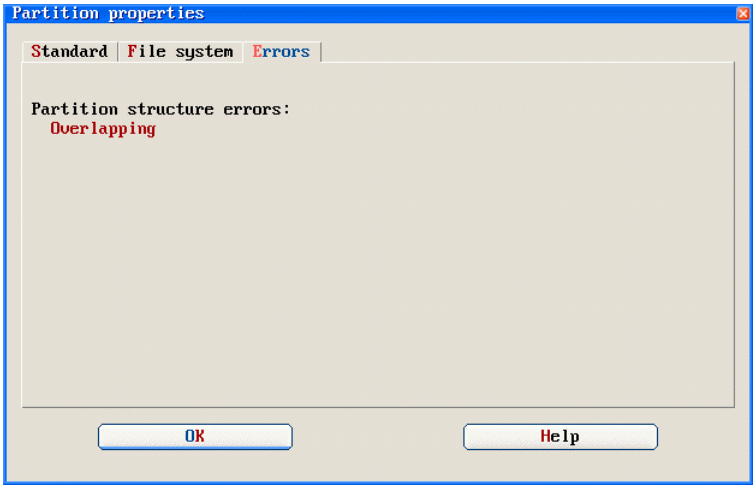
7.7.2 File System Properties Sheet

This page is not displayed for partitions with fatal errors in the file system or with a file system that is not supported by Disk Administrator, nor for free spaces and tables.



7.7.3 Errors Sheet

This sheet appears if the partition structure or its file system contains errors. These errors are listed on this sheet. If the partition has file system errors then they must be corrected with help of disk checking tools such as CHKDSK, SCANDISK or FSCK, only then can Disk Administrator continue.



7.8 Getting Detailed Information about a Hard Disk

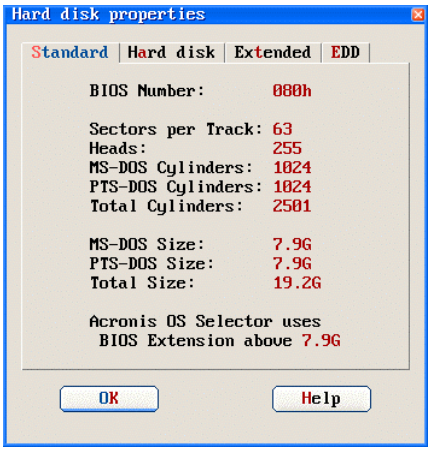
With help of Disk Administrator you can get all the information about a hard disk that is available from BIOS. This requires the following steps:

1. Choose the hard disk (if there are several of them).
2. Choose the Hard disk properties function (from the Disk menu, the toolbar or with the Alt+P hotkey).
3. Press Enter or Esc or click the OK button in the lower part of the dialog box to return to the main window after viewing the disk properties.

The Properties dialog box has several sheets. You can switch between these sheets either using the mouse by clicking the desired tab or with the keyboard by pressing Alt and the highlighted key from the tab title.

7.8.1 Standard Property Sheet

This sheet is always there and contains the information that is directly used by Acronis OS Selector:



- **BIOS number** is a hexadecimal number, which is used by BIOS functions to enumerate disks. Hard disks enumeration starts with 80h. Numbers less than 80h are usually used for floppy disk drives.
- **Sectors per Track, Heads, Cylinders** describe the geometry of a hard disk. The geometry is used to correctly invoke usual disk access functions (interrupt 13h, functions 0–8), since the latter require indication of sector number on the track, head number, and cylinder number. Maximum values that can be passed to usual disk access functions are as follows:
  - sector number – 63;
  - head number – 255;
  - cylinder number – 1023.

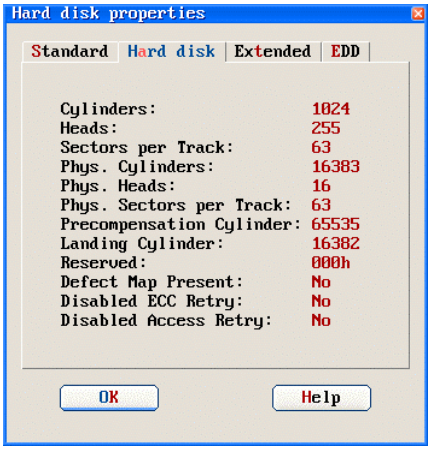
This is where the 7.9 GB maximum accessible disk size limitation for the usual functions comes from. The areas of a hard disk that lay beyond this limit can be accessed only via extended disk access functions (interrupt 13h, functions 41h–48h).

- **Total size** is the size of the hard disk that is available for Acronis OS Selector.

7.8.2 Hard Disk Property Sheet

This sheet shows the information that is stored in the BIOS hard disk parameters table. This table exists for disks number 80h and 81h and stores the values of the following parameters:

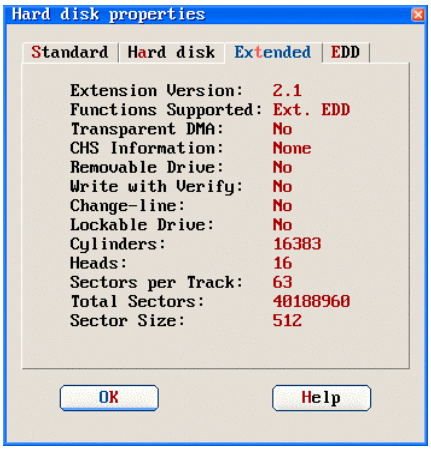
- **The number of cylinders, heads, and sectors.** These parameters usually reflect the structure of the hard disk more correctly than function 8, but not all the BIOSes fill these parameters properly.
- **Precompensation cylinder, landing cylinder, defect map, ECC and access retry.** These parameters are of no particular practical value.
- **The number of physical cylinders, heads, and sectors.** These parameters usually correspond to the hard disk structure in the «Normal» mode, but again, not all the BIOSes fill these parameters properly.



7.8.3 Extended Properties Sheet

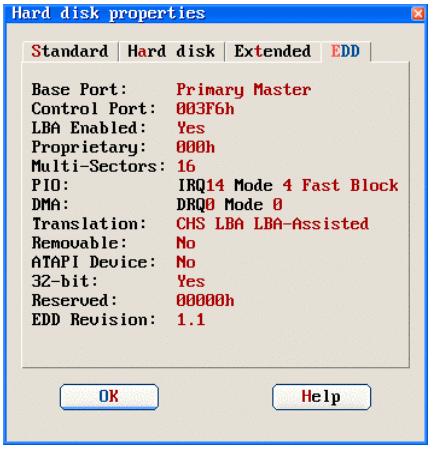
The presence of this sheet tells that the disk may be accessed with extended BIOS functions. It shows the following information:

- Physical hard disk geometry (it does not necessarily match the geometry reported by function 8). Here it does not have much practical value since extended functions work with absolute sector numbers.
- The hard disk size in sectors. This is the most interesting parameter on this sheet.
- Sector size. For all the usual hard disk this parameter is equal to 512.
- Various additional information.



7.8.4 EDD Properties Sheet

This Sheet appears for some BIOS extensions that are compatible with Phoenix specification. It gives various information concerning mainly the IDE interface parameters for this hard disk.



Chapter 8. Advanced Operations with Disk Administrator

This chapter describes the following operations with partitions:

Converting a Partition

Changing the Partition Type

Setting an Active Partition

Hiding a Partition

Resizing Clusters/Blocks

Resizing the FAT16 Root Folder

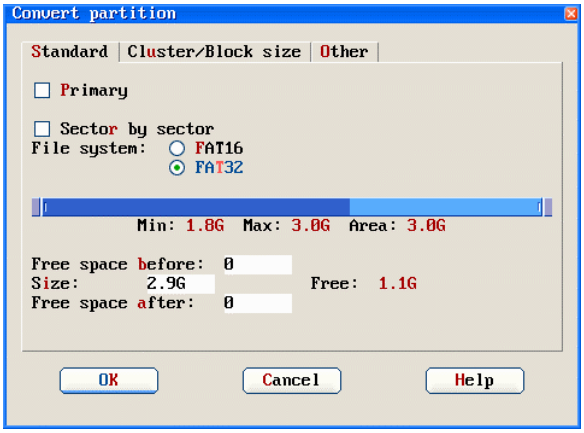
Moving a Partition in the Partition Table

8.1 Converting a Partition

Two types of partition conversion are possible with help of Disk Administrator:

1. Primary ⇔ logical.
2. FAT16 ⇔ FAT32.

The dialog, which appears when partition conversion is invoked, is functionally the same as the one for partition resizing, since Disk Administrator can perform all changes in partition and file system parameters in one operation.



When converting a boot partition on some operating systems you should be sure that it will remain bootable under new conditions.

8.2 Changing the Partition Type

Each record in any partition table contains a «partition type» field. This is a certain number that tentatively defines what file system and what operating system that this partition addresses. There are special type values:

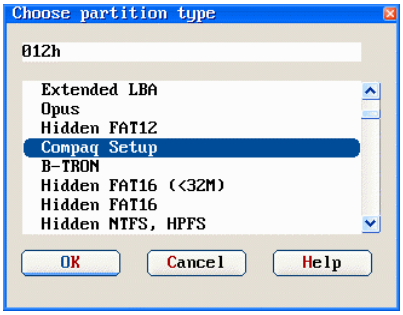
- **0 (Unused)** – This record of the table is empty;
- **5 (Extended)** – This is a link to the next table in a chain (this type is used to create chains of logical partitions);
- **15 (Extended LBA)** – This is the beginning of a chain of logical partitions, to access in which MS-DOS mode of Windows 95OSR2/98/ME operating systems uses extended BIOS functions.

Disk Administrator manages these special partition types automatically – they cannot be changed manually.

All other types can be assigned to ordinary partitions. Usually Disk Administrator assigns the partition type itself based on the file system, but sometimes it is necessary to select it manually. For example, if a partition without a file system is created, Disk Administrator assigns it its own type; or if the partition is supposed to be used by some operating system, it is necessary to assign it a corresponding type.

The following steps are necessary to change the type of a partition:

1. Choose the partition from the list.
2. Choose the Change partition type function (from the menu or with the Ctrl+T hotkey).
3. Select the desired partition type:



4. Confirm the operation by pressing Enter or clicking the OK button in the lower part of the dialog box.

Changing the type of the partition table is necessary when changing a partition table to the higher-level setting, between 5 (Extended) and 15 (Extended LBA). Only MS-DOS 7.1/8.0 and Windows 95OSR2/98/ME need type 15 entries. Older operating systems do not recognize these parameters.

8.3 Setting an Active Partition

If no boot manager is installed on your computer, then the default master boot record code located at the beginning of the first hard disk will attempt to boot an operating system from the primary partition that is marked as active. Only one primary partition may be active.

The following steps allow you to make a partition active with help of the Disk Administrator:

1. Choose the first hard disk.
2. Choose the primary partition.
3. Select the Set partition as active function (from the menu or with the Ctrl+A hotkey).

If Acronis OS Selector is installed on your computer, then the setting of an active partition will not affect anything, since OS Selector itself manages the active partition flag. This function can also be used to find the letter sequence for the chosen operating system. In this case changing active partitions should be done for the given operating system in its properties dialog. See 5.5.4 «Editing Operating System Properties».

8.4 Hiding a Partition

Hide partition function can be used for temporary blocking access to the chosen partition. Unlike similar software, the Disk Administrator allows you to hide not only primary but also logical partitions of any type.

There is also a special mode for hiding partitions from Windows NT/2000/XP operating systems. This mode should be used with care, since it is incompatible with other partition management software, including that may be supplied with these operating systems.

The following steps toggle the hidden flag for the partition:

1. Choose the hard disk.
2. Choose the partition.
3. Select the «Hide/Unhide» function (from the menu or with the Ctrl+H hotkey).

If Acronis OS Selector is installed on your computer then hiding a partition will not affect anything since Acronis OS Selector itself manages the partition hidden flag. This function can also be used to find out the letter sequence for the chosen operating system. In this case partitions should be hidden in the context of the given operating system in its properties dialog. See 5.5.4 «Editing Operating System Properties».

8.5 Resizing Clusters/Blocks

Resizing clusters/blocks is not a stand-alone operation as it is in other similar programs. Instead Acronis OS Selector combines it with the create, copy, move and resize partition functions, as this allows the performance of several different actions on a partition in one pass.

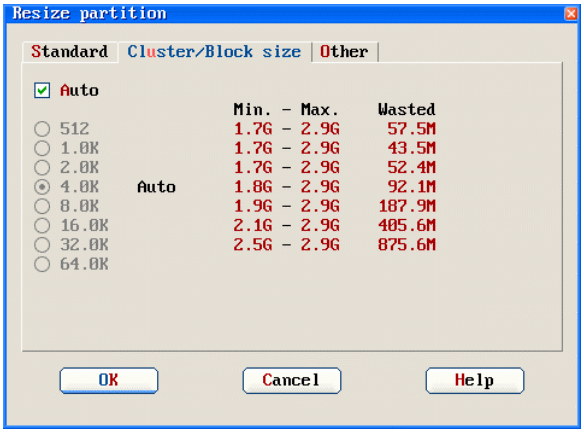
The word «cluster» is used for Microsoft file systems: FAT16, FAT32, NTFS. The word «block» is used for all other file systems.

Reducing cluster/block size may significantly reduce disk space waste since any file, even the smallest one, occupies at least one cluster/block on the disk. But reducing the cluster size for FAT32 may increase waste due to increasing the size of the file allocation table, and could also slow down file access.

For an existing partition, Disk Administrator can change the cluster size only for FAT16/FAT32 file systems. For NTFS and Linux Ext2/Ext3 file systems it is possible to choose the size of a cluster/block only when creating or formatting a partition.

When choosing the cluster size it is necessary to know that NTFS partitions with clusters larger than 4 KB do not support file compression.

Cluster/block size can be chosen on a special sheet of the partition resizing (creation, converting, copying, moving, and formatting) dialog.



For each possible cluster/block size the Disk Administrator shows the following information:

- Minimum and maximum partition size.
- Waste.
- «Larger»/«Smaller» flag appears when it is necessary to increase/decrease partition size in order to be able to change the cluster/block size.

The «Auto» checkbox is by default checked and the «Auto» label shows that the cluster/block size is set automatically. Auto-selection gives the cluster/block size that the partition would have after being formatted with the standard FORMAT command. Uncheck this checkbox to be able to choose the cluster/block size manually. Now you can choose the desired cluster/block size with the radio-buttons.

For the description of other controls that can appear on this sheet see 7.1.2 «Creating a Partition with Disk Administrator».

To resize the cluster of an existing FAT16/FAT32 partition, the following steps are required:

1. Choose the partition from the list.
2. Select the Resize partition function (from the menu, toolbar or with the Ctrl+R hotkey).
3. Switch to the «Cluster/block size» sheet in the dialog box.
4. Turn the automatic cluster/block sizing off and select the desired size by hand.
5. Confirm the operation by pressing Enter or clicking the OK button in the lower part of the dialog box.

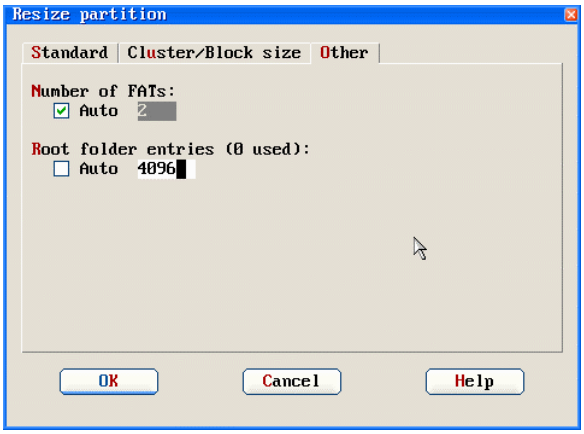
8.6 Resizing the FAT16 Root Folder

Resizing the root folder is not a stand-alone function, but is combined with creation, copying, moving and resizing a partition.

Resizing the root folder can be done only to a FAT16 file system since in other file systems the root folder behaves like any other folder, i.e. its size is changed automatically.

You may need to resize the root folder if, for example, there are many folders with long names on your hard disk. The longer the name of the file or folder, the more place it occupies in the folder. Standard root folder size is 512 entries, so if there are no more empty entries, choose the value that is more than 512.

The size of the root folder of an existing partition can be changed on the «Other» sheet of the partition resizing (creation, conversion, copying, moving, and formatting) dialog.



The Automatic checkbox is checked by default. To be able to manually select the size of the root folder, uncheck it. Now you can enter the desired size of the root folder in the input field next to the checkbox.

The following steps are required to resize the root folder:

1. Choose the partition from the list.
2. Choose the Resize partition function (from the menu, toolbar or with the Ctrl+R hotkey).
3. Switch to the «Other» sheet of the «Resize partition» dialog box.
4. Uncheck the «Automatic» checkbox on the sheet and enter the desired root folder size manually.
5. Confirm the operation by pressing Enter or clicking the OK button in the lower part of the dialog box.

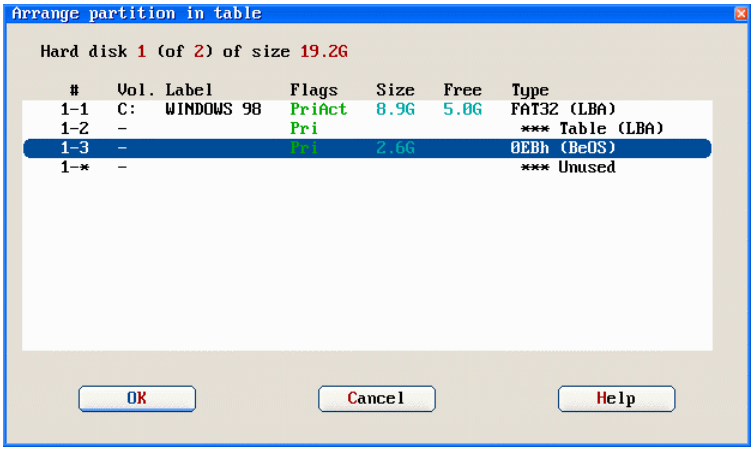
8.7 Moving a Partition in the Partition Table

You may need to change the position of a partition in a partition table (usually in the MBR) if you have installed operating systems (like DR-DOS, Windows NT/2000/XP) for which the letter or number order depends on the order of partitions in the table. No other similar software can perform this function.

Usually there is no need to change the position of a logical partition.

To change the position of a partition in the table:

1. Choose the partition from the list.
2. Choose the «Arrange in table» function (from the menu or by clicking Ctrl+G hotkey).
3. Arrange the partition in the list in the dialog box by dragging it with the mouse or with arrow keys.



Chapter 9. Particularities of Operating System Functioning

9.1 DOS-type Operating Systems

9.1.1 Supported Versions

Acronis OS Selector supports the following versions of DOS-type operating systems:

- MS-DOS 5.x–6.x;
- MS-DOS 7.0 (not a separate product but is included in Windows 95);
- MS-DOS 7.1 (not a separate product but is included in Windows 95OSR2/98);
- MS-DOS 8.0 (not a separate product but is included in Windows ME);
- PC-DOS 5.x–7.0;
- DR-DOS 7.x.

Acronis OS Selector will detect MS-DOS 7.x/8.0 as a separate operating system only if it is not a part of the installed Windows operating system but was instead installed on your computer with help of the SYS command.

Acronis OS Selector recognizes the following special cases:

- MS-DOS 5.x–6.x or PC-DOS that has Windows 95/98/ME installed over it.
- MS-DOS or PC-DOS that has Windows NT/2000 installed over it.

Acronis OS Selector may not support some DOS versions (for example the Japanese version). In these cases, system and configuration file lists should be edited (for example, font files should be added) to avoid conflicts between different copies of these operating systems.

9.1.2 Boot Sequence

DOS boot sequence consists of the following stages:

1. Boot sector (after being loaded into memory and passed control to) scans the root folder for the first DOS file. Upon finding one, it loads the first several sectors (the loader) into memory, assuming that they are positioned contiguously on the disk, and passes control to the loader.
2. The loader loads the rest of the first file (boot manager) into memory and starts it.

3. Boot manager initializes the memory, scans the partition structure and assigns letters to partitions, defining the DOS boot partition on the way.
4. Then the boot manager reads the DOS configuration file (CONFIG.SYS) and if it contains multiple configurations displays a menu on the screen prompting you to choose one of them, otherwise it just reads the configuration and loads the indicated drivers and operating system parts from the second DOS file.
5. After the configuration file has been processed, command interpreter (default COMMAND.COM) is loaded and executed. Command interpreter is a plain DOS program.

There are several differences between DOS versions from different vendors:

- MS-DOS 5.x–6.x and PC-DOS assume that their files should be the first ones in the root folder.
- MS-DOS 5.x–6.x system files have names IO.SYS and MSDOS.SYS.
- PC-DOS and DR-DOS 7.x system files have names IBMBIO.COM and IBMDOS.COM.
- MS-DOS 7.x/8.0 have one large system file IO.SYS and MSDOD.SYS becomes a configuration file.
- Letter assignment order differs for different DOS versions (see 2.9 «Assignment of Letters in Different Operating Systems»).
- MS-DOS and PC-DOS assume the boot partition as the partition to which letter C: has been assigned.
- CONFIG.SYS command set differs for different DOS versions.
- MS-DOS 7.x/8.0 starts WIN.COM instead of COMMAND.COM if the MSDOS.SYS file has BOOTGUI=1.
- MS-DOS 8.0 cannot function as a stand-alone operating system. CONFIG.SYS and AUTOEXEC.BAT files processing are blocked. It can only boot the Windows operating system. A special MS-DOS 8.0 version on the Windows ME boot disk can function as a stand-alone operating system, but a check is built into it so that it can only be booted from a diskette.

9.1.3 System and Configuration Files

Here is the DOS system files list:

- IO.SYS (mandatory for MS-DOS);
- MSDOS.SYS (mandatory for MS-DOS 5.x–6.x);
- IBMBIO.COM (mandatory for PC-DOS);
- IBMDOS.COM (mandatory for PC-DOS);
- DBLSPACE.BIN (mandatory for MS-DOS 5.x–6.2);

- DRVSPACE.BIN (mandatory for MS-DOS 6.22–8.0);
- LOGO.SYS (optional for MS-DOS 7.x/8.0);
- COMMAND.COM (optional for all DOS versions).

Configuration files list:

- MSDOS.SYS (for MS-DOS 7.x/8.0);
- WINBOOT.INI (alternative MSDOS.SYS);
- CONFIG.SYS (for all DOS versions);
- AUTOEXEC.BAT (for all DOS versions).

9.1.4 Limitations

Different DOS versions have the following limitations:

- Only MS-DOS 7.1/8.0 supports FAT32 along with FAT16 file system.
- Only MS-DOS 7.1/8.0 support extended BIOS and hard disks larger than 8 GB – but only with FAT16 LBA, FAT32 LBA and EXTENDED LBA partitions. This can cause conflicts with other DOS versions that are installed on the same computer.
- For MS-DOS, the boot partition should be the partition to which drive letter C: is assigned, otherwise the operating system's booting will not finish.
- MS-DOS and PC-DOS have troubles accessing multiple primary partitions if the hard disk contains logical partitions that were not recognized by DOS.

Due to the limitation of boot code in most DOS–like operating systems, their boot partitions should be located in the first 2 gigabytes of a hard disk.

9.2 Windows 95/98/ME

Under Windows 95/98/ME booting always starts with MS-DOS, thus everything concerning MS-DOS 7.x/8.0 booting applies to Windows 95/98/ME as well.

9.2.1 Supported Versions

Acronis OS Selector supports Windows 95, Windows 95OSR2/98/ME and can detect their language version.

9.2.2 Booting Details and Limitations

Windows booting starts when MS-DOS executes the WIN.COM file. This program loads the Windows kernel that loads drivers, arranges memory allocation and starts the shell program (EXPLORER.EXE).

Drivers that were loaded rescan the partition structure and assign letters to partitions that were not visible from MS-DOS.

There are several differences between Windows 95/98/ME versions:

- Windows 95 contains MS-DOS 7.0, does not support FAT32 and due to MS-DOS 7.0 limitations cannot be booted from partitions that are located beyond the 1024th cylinder.
- Windows 95OSR2/98 contains MS-DOS 7.1 and supports FAT32.
- Windows Millennium Edition contains MS-DOS 8.0, which supports FAT32, but does not allow the use of MS-DOS.

9.2.3 System Folders

Main Windows part resides in the following folders:

- System (its name can be assigned during installation, default one is «Windows»).
- Applications (in English and most Eastern Windows versions its name is «Program Files», in other Western Windows versions this folder has other names).
- Backup (available in Windows ME and is called «Restore»).

Acronis OS Selector now supports multiple operating systems with folders with same names on the same partition. These folders are called system folders. A system folder is transferred to its proper location (to the root folder) only when this operating system is booted, other times it resides in the OS Selector system folder.

The above-mentioned folders are added to the system folders list automatically when an operating system is detected. You can always manually edit this list by running Setup from Boot Menu and editing the properties of the selected operating system. For example, sometimes it is useful to add the «Recycle» folder.

9.2.4 Details on Windows 95/98/ME Installation with Acronis OS Selector

One special thing about Windows 95/98/ME installation is that they always rewrite MBR code. It means that after Windows 95/98/ME installation is over, control is no longer passed to Acronis OS Selector. To avoid this Acronis OS Selector adds a call to REINSTAL.COM to the AUTOEXEC.BAT files, and it restores Acronis OS Selector MBR code. In case of malfunction you can manually re-activate Acronis OS Selector by booting from the installation media and selecting the «Activate» option. See 1.1 «Acronis OS Selector as a Boot Manager».

Automatic MBR restoration does not work in Windows Millennium Edition, because this version of Windows does not allow running programs from AUTOEXEC.BAT.

Another special thing about the installation program is that it can be run only from DOS and during the very first stage creates system and applications folders. The name of the latter is always fixed (but depends on language version of Windows). This causes problems in the following cases:

- If you wish to install another Windows 95/98/ME on the same partitions.
- If you wish to install Windows 95/98/ME on the system folders partition where Windows NT/2000/XP already resides.
- If you wish to install another Windows 95/98/ME on another system partition.

To solve these problems, and allow the user to freely choose system files and system folders partitions, and even to some degree the letter order, Acronis OS Selector Setup now includes a Windows 95/98/ME Installation Wizard, see Chapter 10.

At the very beginning of its work Windows 95/98/ME installation program runs the SCANDISK.EXE utility to check if there are any errors in the partition file systems. This utility may produce error messages about files on partitions where different DOS and Windows 95/98/ME language versions are installed. The reason is that different DOS versions have different character sets that can be used in short file names. NEVER answer affirmative to the offer to correct these errors. Disk check will not be performed if Windows 95/98/ME setup program is run with «/is» key.

9.3 Windows NT/2000/XP

9.3.1 Supported Versions

Acronis OS Selector supports Windows NT versions 3.51, 4.0, Windows 2000, and Windows XP and can also detect their most common language versions.

9.3.2 Booting Peculiarities

Operating systems of Windows NT type consist of two main parts: the boot part and the main part. These parts can reside on different partitions. Boot part consists of the operating system kernel loader NTLDR (which is also a simple boot manager), its configuration file (BOOT.INI) and initial hardware detection code (NTDETECT.COM). The partition where the boot part resides is called Windows NT/2000 boot partition.

The loader usually opens a simple menu from which you can choose Windows NT/2000 configuration or some other operating system whose boot sector is stored in a file.

Main Windows NT/2000 part resides in the WINNT system folder (this can be assigned during installation) and in the application folder (Program Files usually), whose name cannot be changed. A partition where the main part of

the operating system resides is called the system folder partition. Multiple operating systems of Windows 95/98/ME and Windows NT/2000 may conflict because of the application folder (see 9.2.3 «System Folders»).

It is possible that several different Windows NT/2000/XP are booted from one single loader.

9.3.3 System and Configuration Files

Windows NT/2000/XP system files list:

- NTLDR (mandatory);
- BOOTFONT.BIN (mandatory for those language versions that use their own font);
- NTDETECT.COM (mandatory);
- NTBOOTDD.SYS (mandatory if the system folder partition cannot be accessed with usual BIOS hard disk access function).

Configuration files list:

- BOOT.INI (mandatory).

9.3.4 System Folders

The major parts of Windows NT/2000/XP resides in the following folders:

- System (its name can be set during installation, its default value is «Winnt»).
- Applications (in English and most Eastern Windows versions its name is «Program Files», in other Western Windows versions this folder has other names).
- Personal documents and settings (in English and most Eastern Windows versions its name is «Documents and Settings», in other Western Windows versions this folder has other names).

Because application folder name cannot be changed, the ability of several operating systems to have folders with the same names on a partition was added to Acronis OS Selector. Such folders are called system folders. A system folder is moved to its place (root folder) only when the corresponding operating system is booted, otherwise it remains in the OS Selector system folder.

The above-mentioned folders are added to the system folders list automatically when an operating system is detected. Nevertheless you can always manually edit this list by running Setup from Boot Menu and editing the properties of the selected operating system. For example, sometimes it is useful to add the «Recycle» folder.

Acronis OS Selector can manage the Windows NT/2000/XP system folders only if they reside on a FAT16/FAT32 partition.

9.3.5 Limitations

Different Windows NT/2000/XP versions have the following limitations:

- For any Windows NT/2000/XP version the boot partition must be a primary partition of the first hard disk.
- Windows NT version 3.51 and 4.0 recognizes the FAT16 and NTFS file systems, Windows 2000 also recognizes the FAT32 file system.
- Boot partition of Windows NT version 3.51 and 4.0 must be located among the first 2 gigabytes of the hard disk.

9.4 Linux

Acronis OS Selector automatically detects and supports any Linux distribution if it is booted by LILO or ASPLoader installed in MBR, or if it is booted by any loader installed in the boot sector of the Linux partition.

Usually Linux itself is installed on an Ext2, Ext3 or ReiserFS partition, which can be both primary and logical, and can be located on any hard disk. Linux also requires another partition to manage its virtual memory (Linux Swap).

Strictly speaking, the loader is not a part of an operating system, its main function is to load the Linux kernel into memory and pass control to it. Since LILO is the most common Linux loader, let us describe its work in more details (ASPLoader works similar to it).

The Linux kernel is stored in some file, and the loader has to somehow load it into memory. Instead of supporting multiple file systems where the kernel might be stored, LILO developers chose a simpler and a more universal way. The loader just stores the location of the kernel file in its data structures. These structures are created by a special activation program called «lilo», and the process itself is called «activation». Since this program is run from Linux, the features of the latter allow it to easily locate any file on a disk.

The disadvantage of such technique manifests itself when a Linux partition is moved or reduced in size. In this case Linux becomes unbootable, and a Linux boot floppy is required to re-activate the loader.

9.5 Other Operating Systems

Other operating systems are usually installed on their own file systems. They can have limitations to the location of the boot partition and support of other file systems. It is useful to know this information prior to installing a new operating system on the computer.

Acronis OS Selector automatically detects even operating systems unknown to it, if they are booted from the boot sector.

Some modern operating systems have special means allowing them to be booted directly from Windows, among them BeOS and QNX.

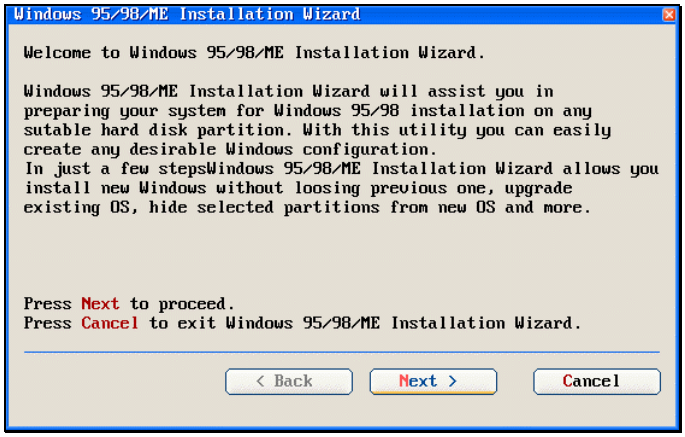
We recommend that you do not use other partition management software that maybe supplied with operating systems, together with Acronis OS Selector, since they frequently make incorrect changes to the partition structure. If you need to create a separate partition to install a new operating system, it is best to use Acronis OS Selector Disk Administrator.

Chapter 10. Windows 95/98/ME Installation Wizard

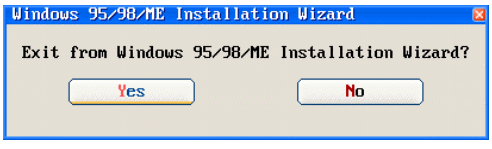
Windows 95/98/ME Installation Wizard will assist you in arranging your computer for new Windows installation with flexible prior location tunings. We strongly recommend, even advanced users, use Windows 95/98/ME Installation Wizard before Windows installation because in some cases desirable PC configuration may be impossible without it assistance.

10.1 Wizard Start

After running the Wizard you get to the intro page that describes what this Wizard is for and offers you to click the Next > button to proceed to the following page.

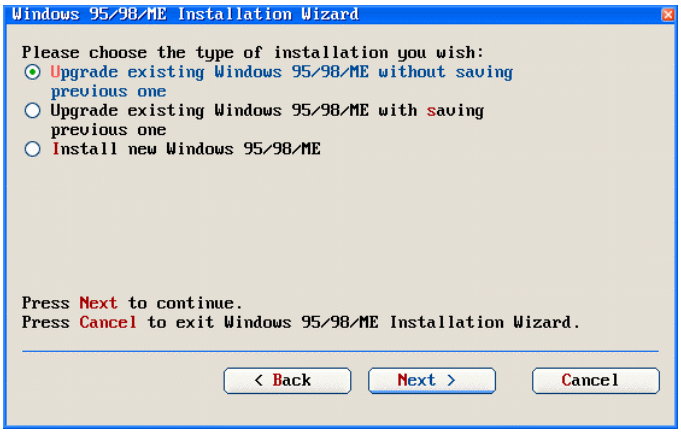


You can interrupt the Wizard at any time by pressing the Esc key or the Cancel button. In this case the Wizard will request a confirmation.



Next page allows you to choose what would you like to use the Wizard for. The following options are available:

- Upgrading an existing Windows 95/98/ME operating system without saving its old version;
- Upgrading an existing Windows 95/98/ME operating system and saving its old version;
- Installing a new Windows 95/98/ME operating system.



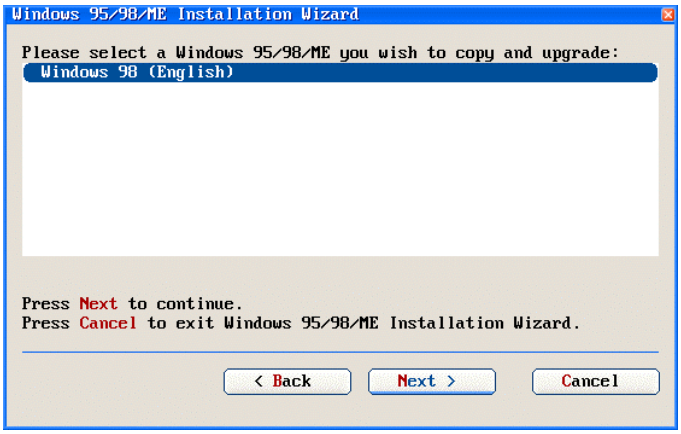
Select the desired option and press Next > to proceed to the following page. All the following actions of the Wizard depend on your choice.

10.2 Preparation to Upgrading Windows 95/98/ME without Saving its Old Version

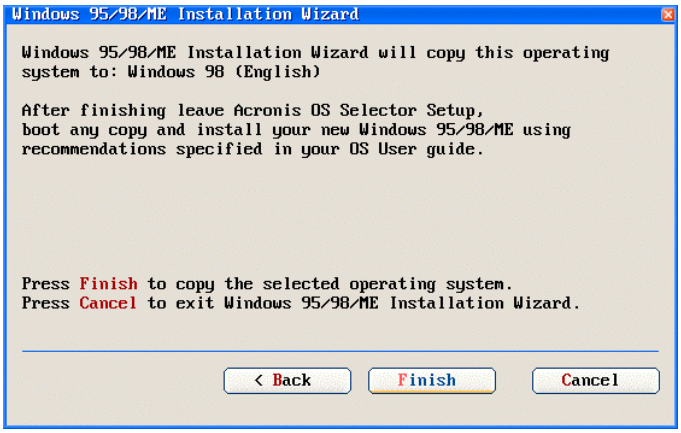
No additional actions are required from Acronis OS Selector to allow upgrading the operating system without saving its old version. You can just boot the operating system that you wish to upgrade, and perform all the actions that are necessary for upgrade. Acronis OS Selector will automatically make all the appropriate changes in Boot Menu configuration list after reboot.

10.3 Preparation to Upgrading Windows 95/98/ME with Saving its Old Version

In this mode Windows 95/98/ME Installation Wizard first prompts you to select the operating system that you wish to upgrade.



Choose the operating system from the list and click the Next > button. On the following page the Wizard summarizes your choice and tells you about its following actions.



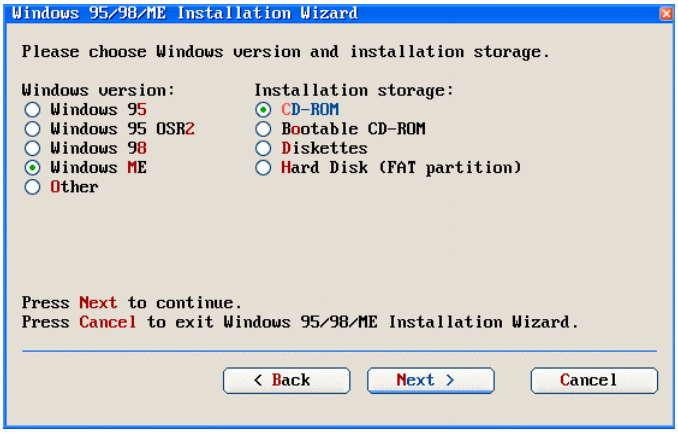
Confirm your decision by clicking the Finish button. The Wizard quits and the selected operating system will be copied. After the copying is over you can exit Setup, boot any of the copies and perform upgrade from it. The other copy remains like it was right after the copying finished.

10.4 Preparation to New Windows 95/98/ME Operating System Installation

Since Acronis OS Selector supports various non-standard ways to position Windows 95/98/ME operating systems and also allows positioning several such operating systems so that they share system folder partitions, some preparatory actions are necessary in almost all cases. This is what the third mode of the Wizard is about.

You should keep in mind that in order to prepare to install a new Windows 95/98/ME operating system the Wizard needs some DOS-compatible operating system (DR-DOS, MS-DOS, PC-DOS) or, even better, a different version of Windows 95/98 (not Windows ME!), or the Wizard may be unable to continue.

First you are prompted to select which version of the Windows operating system (Windows 95, Windows 95OSR2, Windows 98 or Windows Millennium Edition) you are going to install and to select the version of its installation package (CD-ROM, bootable CD-ROM, diskette set or a hard disk).

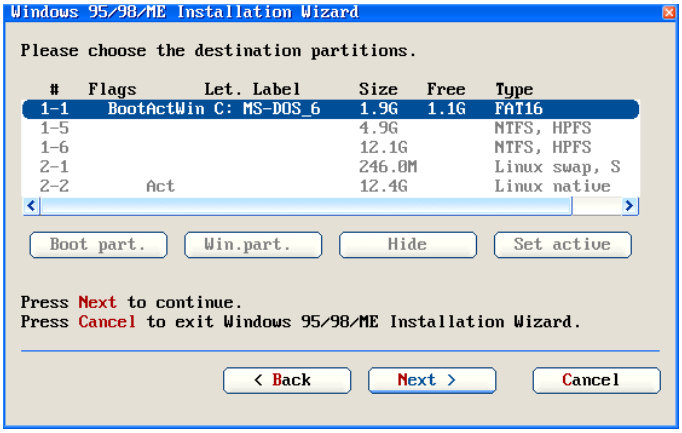


Make your choice and click the Next > button.

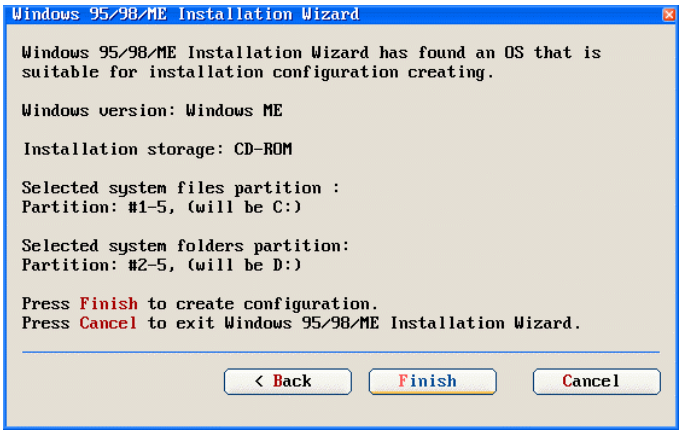
On the following page you will be able to configure the partition for the would-be installed operating system context. The following actions can be done with the list and the buttons below it:

- Selection of the boot partition (partition where the system files of the operating system will reside). You can select a logical partition, but then some of the partitions may become unavailable (the Wizard automatically marks these partitions as hidden). Boot partition is selected with the Boot part. button and is marked as «Boot» in the list.
- Selection of the system folders partition (the partition where the main part of the operating system will reside – usually these are the WINDOWS and Program Files folders). System folders partition is selected with the Win.Part. button and is marked as «Win» in the list.

- Selection of hidden partitions (partitions that will be inaccessible to the operating system and would not have letters assigned to them). Hiding partitions is done with the Hide button, and they are grayed in the list.
- Selection of active partitions. If even one hard disk other then the first one has multiple primary partitions that are available to the operating system, toggling the Active flag affects the letter assignment order. A primary partition is set as active with the Set active button and is marked as «Act» in the list.



After configuring the partitions for the would-be installed operating system click the Next > button to proceed to the last page of the Wizard. There all your choices will be summarized (Windows version, installation package type and the numbers and letters of the boot and system folder partition).



Now click the Finish button, and a special «Windows … installation» configuration will be created. You have to boot this configuration to start the installation of the new operating system. In some cases manual editing of the configuration created may be required. For example if the CD-ROM driver that is provided with Acronis OS Selector (PTSATAPI.SYS) does not support your CD-ROM drive, you have to edit the CD-ROM driver loading line in the CONFIG.SYS file and enter the name of your driver there.

Chapter 11. Installing/Updating Windows NT/2000/XP

11.1 Installing A New Windows NT/2000/XP

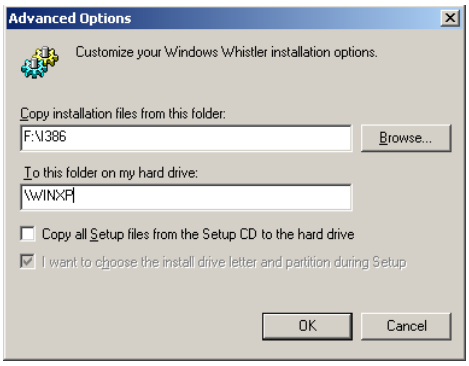
Prior to installing a new Windows NT/2000/XP it is necessary to decide where on the hard disk it will reside. If it has to be installed on a new partition (most probably NTFS), it is better to create it in advance with help of Acronis OS Selector Disk Administrator.

11.1.1 Starting the Installation

Now you can proceed to the installation. The installation of an operating system can be initiated in three different ways:

1. Run the setup program (WINNT32.EXE) from an existing Windows 95/98/ME or Windows NT/2000/XP operating system. In this case a wizard appears, and on its first page you have to select the type of installation for the new operating system:

Next you can edit the name of the folder to which the operating system will be installed (WINNT by default); it is also useful to permit installation partition selection there:



Next the wizard creates an installation configuration and prompts you to reboot the computer to start the installation.

1. Run the setup program (WINNT.EXE) from DOS operating system. It is recommended that you load some disk caching driver, for example SMARTDRV.EXE with 32768 parameter (buffer size), prior to installation.

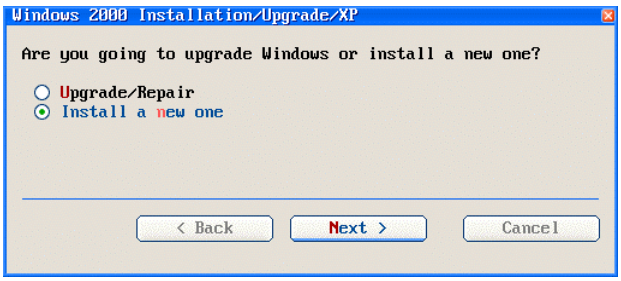
   The setup program copies all the operating system files to a temporary folder and also creates an installation configuration and reboots the computer.

For Windows NT operating systems the DOS mode setup program should be run with /B key, otherwise instead of creating an installation configuration it will offer to create 3 installation diskettes.

2. Boot from the bootable CD-ROM. This way of installation differs from the previous ones because it does not create a special installation configuration and starts the 1st stage of installation instead.

If you want to install the operating system in a certain boot context, you have to create a new boot from floppy section, create the boot context for it, boot this section from the Boot Menu, and reboot the computer to boot from CD-ROM before getting to the Boot Menu.

For the 1st and 2nd methods of installation, after the computer is rebooted control is passed to Acronis OS Selector Setup. This detects the installation configuration and if any Windows operating system is already installed on your computer, and prompts you to enter additional information:



Select «Install a new one» item, and Setup will add the installation configuration to the Boot Menu.

11.1.2 1st Installation Stage

Installation gets to the 1st stage either after the installation configuration is selected in the Boot Menu, or the computer is booted from an installation CD-ROM or installation diskette.

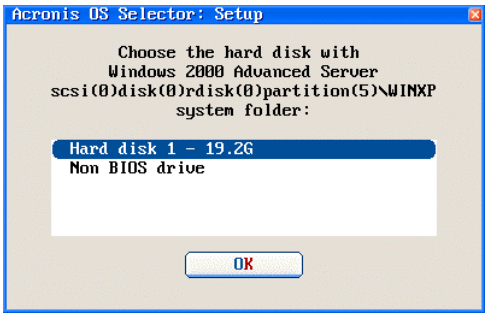
On the 1st stage you are prompted to select what do you want the installation program to do. Select «Start installation» on this stage.

Next you are prompted to choose a partition on which to install the operating system. Choose the partition, then choose what has to be done with this partition during the installation (format, convert to NTFS, or leave unchanged).

There is no problem if you want to choose a FAT partition where other Windows are installed, even with the same system folder names, since Acronis OS Selector automatically resolves such conflicts. But in this case you should not choose to format this partition or convert it to NTFS!

Next the installation program checks the selected partition, performs primary file copying, and reboots the computer. At this stage MBR can be overwritten, so you should boot from the Acronis OS Selector boot media and re-activate it. By the end of this stage the installation configuration is deleted, and a normal operating system configuration appears, i.e. for Acronis OS Selector Windows NT/2000/XP operating system installation is completed.

Here the Setup might need information about the hard disk where you have placed the system folders of the operating system. This is done to provide for cases when Windows NT/2000/XP hard disk cannot be accessed via BIOS functions, and is therefore invisible to Acronis OS Selector.



11.1.3 2nd Installation Stage

If on the 1st stage you have chosen to convert the partition to NTFS, this conversion is done before the 2nd stage and requires an additional reboot.

During this stage the rest of the files are copied, hardware is detected, and additional system configuration information is collected. For Acronis OS Selector this stage is recognized as an already-installed operating system, and when it is over the system is fully installed.

11.2 Installing Windows 2000/XP Via Upgrading Windows 95/98/ME

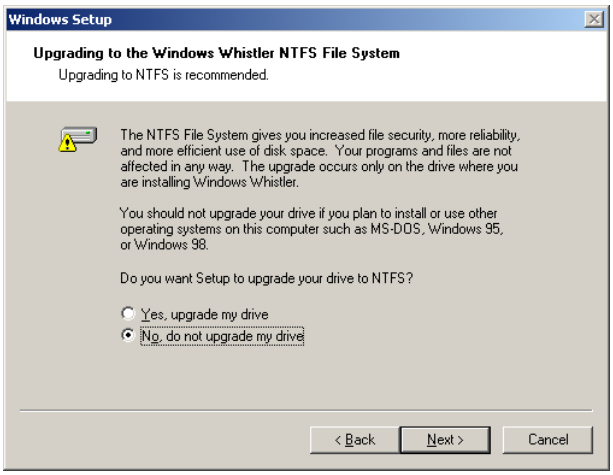
Windows 2000/XP installation program can upgrade Windows 95/98/ME and preserve its configuration.

We recommend you not to use this option, since these are two completely different operating systems with different drivers, and applications that were installed in one of them may not necessarily work in the other. This installation mode also **removes all the detected DOS and Windows 95/98/ME operating systems from the computer completely and without asking any questions.**

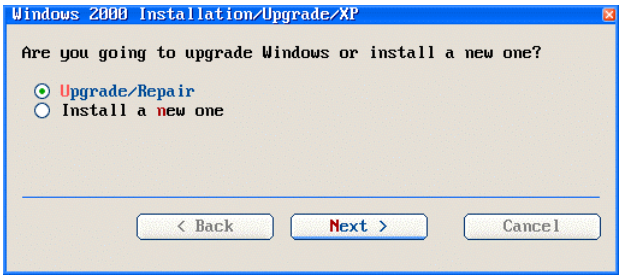
Let us elaborate on Windows 95/98/ME operating system upgrade to Windows 2000/XP.

There is only one way to start the upgrade: by running the WINNT32.EXE setup program from the operating system you wish to upgrade. Select the «Upgrade» option on the very first page of the setup wizard:

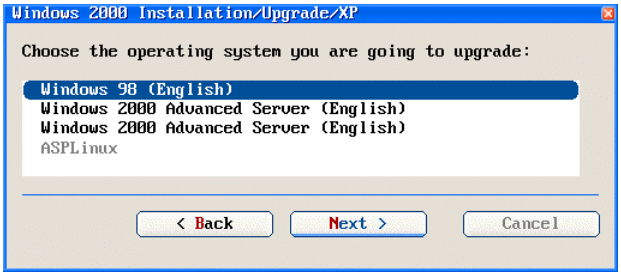
Next, when considering upgrading the disk (partition) to NTFS, you must realize that if you choose to upgrade, all other operating systems on this partition will become unbootable. Moreover, you should not upgrade to NTFS the partition that Acronis OS Selector is installed. Generally, if you have Acronis OS Selector, we recommend you not use Windows NT/2000/XP software to convert FAT to NTFS. Instead it is much better to install the operating system on a specially created NTFS partition if it is necessary.



Next the wizard checks if the upgrade is possible, detects if additional drivers have to be installed, creates a special installation configuration, and reboots the computer. Control passes to Acronis OS Selector Setup, and it requests additional information:



Choose the «Upgrade» item here. Should the wizard incorrectly detects the configuration you want to upgrade, choose the correct one on the next page:



Next you have to boot the configuration that has been created by Setup so that the installation program can continue its work. Unlike installation, upgrade does not require any intervention from the user. At this stage primary copying is done, and the computer is rebooted. After this reboot, Acronis OS Selector considers the upgrade to be over and a new menu item with the name corresponding to this operating system appears. Choose this item to continue the upgrade.

The next stage, which actually happens within the installed operating system, is a final one. Hardware is detected, files are copied, and settings are saved. Yet another reboot takes you to the new operating system.

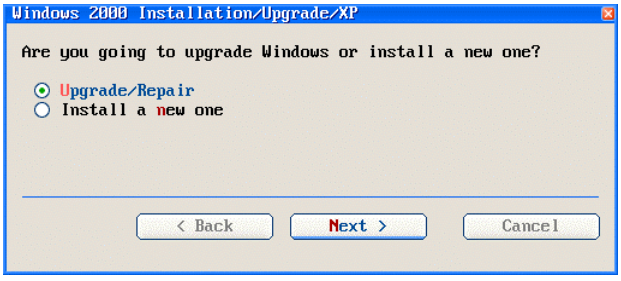
After the upgrade is over, old Boot Menu items corresponding to the old operating system will remain. You can delete them by running Acronis OS Selector Setup.

11.3 Installing Windows 2000/XP by Upgrading Another Windows NT/2000/XP

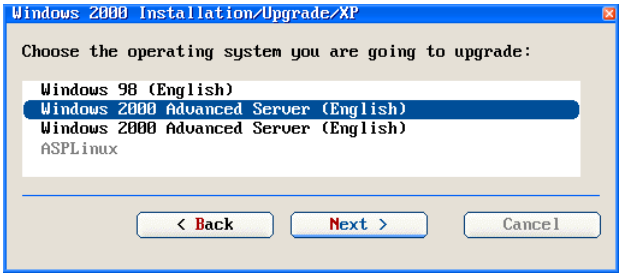
This operation system upgrade can also be initiated only by running the WINNT32.EXE setup program from the operating system you want to upgrade.

As previously described, the wizard appears after running the setup program, and you have to choose «Upgrade» on its first page:

Next, after going through several standard pages, the wizard creates a special installation configuration and reboots the computer. Control passes to Acronis OS Selector Setup, and it requests additional information:



Choose the «Upgrade» item here. Should the wizard incorrectly detects the configuration you want to upgrade, choose the correct one on the next page:



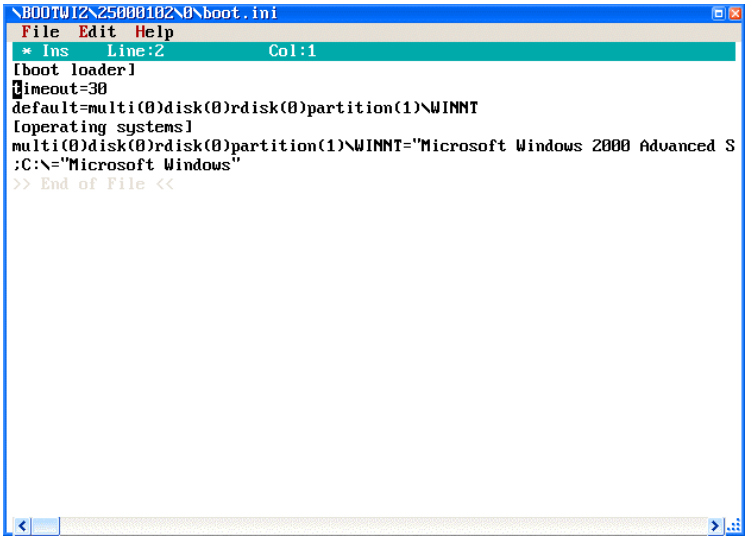
Next you have to boot the configuration that has been created by Setup so that the installation program can continue its work. Unlike installation, upgrade does not require any intervention from the user. At this stage primary copying is done, and the computer is rebooted. After this reboot Acronis OS Selector considers the upgrade to be over, and a new Boot Menu item with the name corresponding to this operating system appears. Choose this item to continue the upgrade.

The next stage, which actually happens within the installed operating system, is a final one. Hardware is detected, files are copied, and settings are saved. Yet another reboot takes you to the new operating system.

11.4 Restoring (Repairing) an Already-Installed Windows NT/2000/XP Operating System

11.4.1 Gaining Access to Windows NT/2000/XP Boot Menu

When adding a Windows NT/2000/XP operating system to the Boot Menu, Acronis OS Selector modifies the BOOT.INI file so that the boot menu of the operating system loader does not appear. If for some reason you need access to this menu, select the necessary configuration in the Boot Menu and start editing files. In the text editor window find the «timeout=xx» line and remove the comment («;») character in its beginning:



11.4.2 Running Windows NT/2000/XP Setup Program to Restore an Already Installed Operating System

To restore an already installed Windows NT/2000/XP operating system you have to initiate the 1st stage of Windows NT/2000/XP full installation. The computer also has to be in the context of the operating system you are going to restore. Your actions depend on the way you start the setup program:

1. **WINNT32.EXE setup program is run from Windows 95/98/ME or Windows NT/2000/XP.** In this case you answer all the questions from the wizard as if you are going to install a new operating system. When control gets to the Setup for the first time, choose «Upgrade/Repair» and select the configuration you are going to restore. Next you will only boot the created installation configuration.
2. **WINNT.EXE setup program is run from DOS**. In this case no intervention is required until control gets to Setup for the first time. Here you also have to choose «Upgrade/Repair» and select the configuration you are going to restore. Next you will only boot the created installation configuration.
3. **The computer is booted from a bootable CD-ROM**. In this case you have to strictly follow these instructions:
   - Try booting the configuration you are going to restore.
   - Insert the bootable CD-ROM.
   - Reboot the computer.
   - Enter BIOS Setup and turn on booting from CD-ROM if it is not yet enabled.
   - Boot from CD-ROM before getting to Acronis OS Selector Boot Menu.

   Now the setup program is running, and you can choose the «Upgrade» operating system option. Your further actions depend on the functionality of the setup program and on exactly what you are going to do.

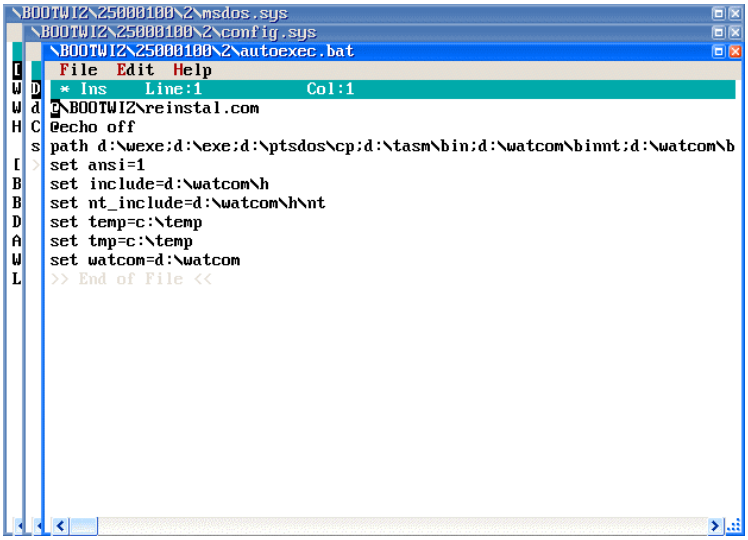
Appendix A. Text Editor

A.1 General Information

Acronis OS Selector package includes a Text Editor. Its purpose is to edit operating system configuration files before booting any operating system.

The Text Editor can be run from Acronis OS Selector Boot Menu with the «Edit files» item of the «Configuration» menu or from the toolbar or with the Ctrl+E hotkey. One window is opened for each configuration file of the selected configuration. Switching between editor windows is done either with the mouse or with Ctrl+Tab hotkey.

The Text Editor is also run when the Edit button on the «Files» sheet of the configuration properties dialog box is clicked. See 5.4.5 «Editing Configuration Properties».



A.2 Main Functions

«File» menu:

- **Save** saves the changes into a file. Hotkey is F2.
- **Close** closes the window. If some changes have not been saved, you will be prompted to save the file first. Hotkey is Esc.
- **Exit** – closes all the Text Editor windows. If some changes have not been saved, you will be prompted to save the files first. Hotkey is Alt+F4.

«Edit» menu:

- **Mark stream of text** begins or ends marking a block (a block is an uninterrupted character sequence). Marking is done with arrow keys. Marked block is shown in reverse colors. Hotkey is Ctrl+F8.
- **Mark lines of text** begin or end marking a block which consists of whole lines. Marking is done with arrow keys. Marked block is shown in reverse colors. Hotkey is F8.
- **Cut** copies the selected block to the clipboard and deletes it from the text. Hotkey is Ctrl+X.
- **Copy** copies the selected block to the clipboard without deleting it from the text. Hotkey is Ctrl+C.
- **Paste** inserts clipboard contents at the current editor position. Hotkey is Ctrl+V.

«Help» menu:

- **Contents** opens a short help on Text Editor. Hotkey is F1.

Many other functions that are standard for text editors are available aside from those mentioned above:

- Backspace deletes character to the left.
- Ctrl+Y deletes a line.
- Del deletes a character or block.
- Ins toggles Insert/Overwrite mode when typing.
- Home/End moves to the beginning/end of the line.
- Ctrl+Home/Ctrl+End moves to the beginning/end of the text.
- PgUp/PgDn moves one page up/down.
- Ctrl+PgUp/Ctrl+PgDn moves to the first/last line of the text.
- Arrow keys move the cursor one character in the corresponding direction.
- Shift+Arrow keys move the cursor one character in the corresponding direction and mark a block.
- Ctrl+Left/Ctrl+Right move one page to the left/right.

Appendix B. Disk Editor

This appendix describes the Disk Editor, which is built into Disk Administrator, and its following functions:

Running Disk Editor

Navigating Disk Editor

View Modes

Simple Editing and Undoing Changes

Editing in the Partition Table Mode

Using Blocks and Clipboard

Search

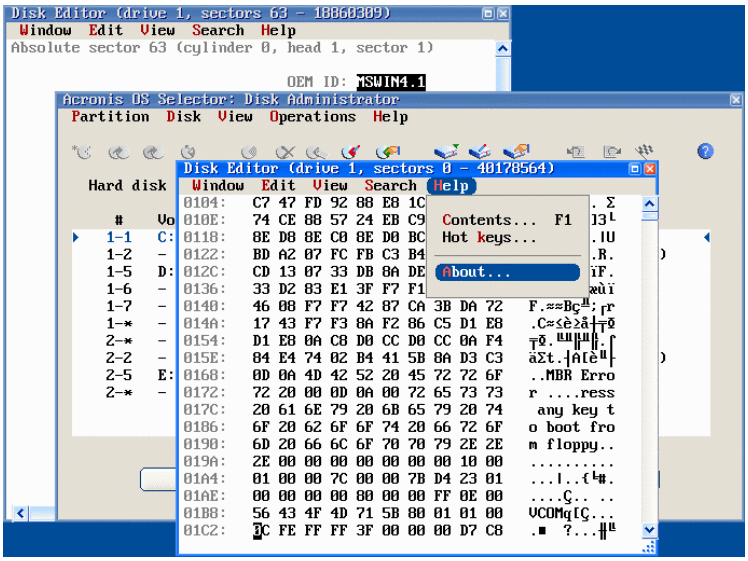
You should remember that the Disk Editor is to be used in emergency situations only – for example to recover lost information. Its utilization requires the user to have real knowledge of file systems and partition structure. Incorrect use of the Disk Editor may corrupt the operating system and/or wipe-out data!

B.1 Running Disk Editor

Disk Editor is part of the Disk Administrator and can be run to edit separate partitions, tables and free space, or whole hard disks. To run the Disk Editor against a partition, you should choose the desired partition and then either select «Edit» in the «Partition» menu or the context menu, click the corresponding icon on the toolbar or use the `Ctrl+E` hotkey. To run the Disk Editor against the whole disk, choose the desired hard disk and then either select the «Edit» item from the «Disk» menu, clicking the icon on the toolbar, or pressing the `Alt+E` hotkey.

B.2 Navigating Disk Editor

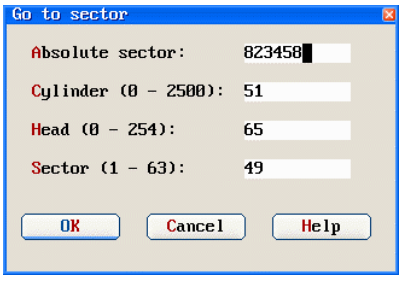
The Disk Editor is multi-window – you can switch to the desired window either by clicking it with the mouse or by moving through the window sequence with Ctrl+Tab keys.



B.3 View Modes

The information in the Disk Editor window can be presented for viewing and editing in several different modes. Choose the desired view mode from the «View» menu.

Regardless of mode, at any time you are editing or viewing, you can switch to the beginning of the edited area by pressing Alt+A or selecting «Go to begin» item in the «Search» menu. Alt+P hotkey or the «Go to» item of the «Search» menu will take to any specified sector.

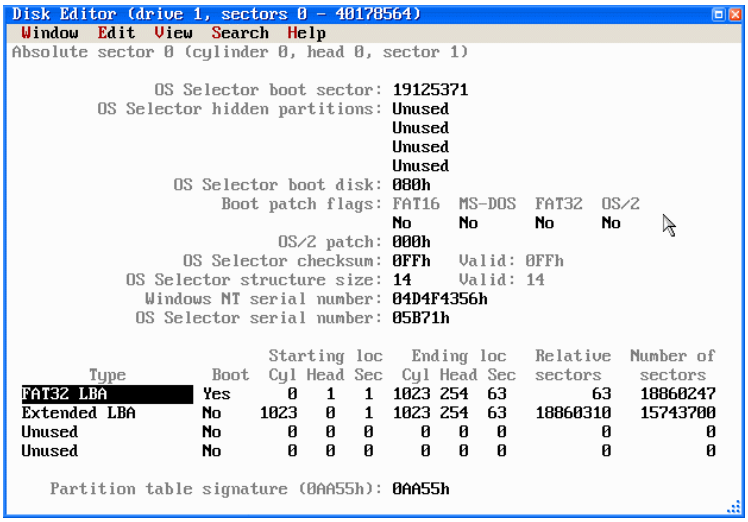


B.3.1 Hexadecimal Mode

In this mode all the edited area is presented as a single dump (hexadecimal byte values are shown to the left, and corresponding characters are shown to the right). Current editing position is shown by the cursor either in the left or in the right part of the window. You can switch between these two panes either by clicking the desired position with the mouse or by pressing Tab. You can move the cursor either using the scroll bar on the right side of the window and then clicking on the desired position or with the arrow keys and PageUp and PageDown keys.

B.3.2 Partition Table Mode

This mode assumes that the current sector is the MBR or an extended partition table. The upper part of the window shows the fields that are specific to Acronis OS Selector, and the lower part shows the partition table itself.

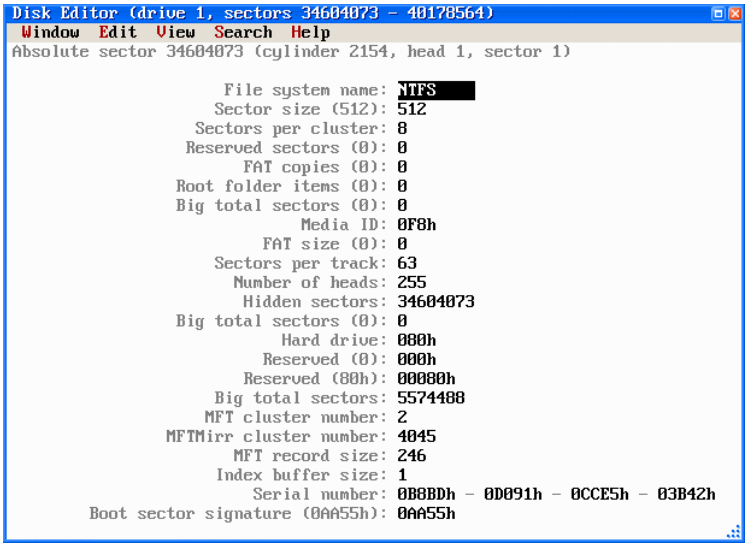


Click on the desired position with the mouse to move the cursor there or use the arrow keys. You can go to the next or previous sector by pressing PageUp or PageDown.

In the partition table mode you can also switch to the partition that is referenced by the highlighted partition table entry. To do so either double-click any field of the chosen entry or press Enter when the cursor is positioned in the desired entry. You can return back by pressing Ctrl+Backspace.

B.3.3 FAT16/FAT32/NTFS Boot Sector Mode or FAT32 FS Info Sector Mode

This mode assumes that the current sector is the corresponding sector of the file system. In this case the editor window contains info fields of the sector.

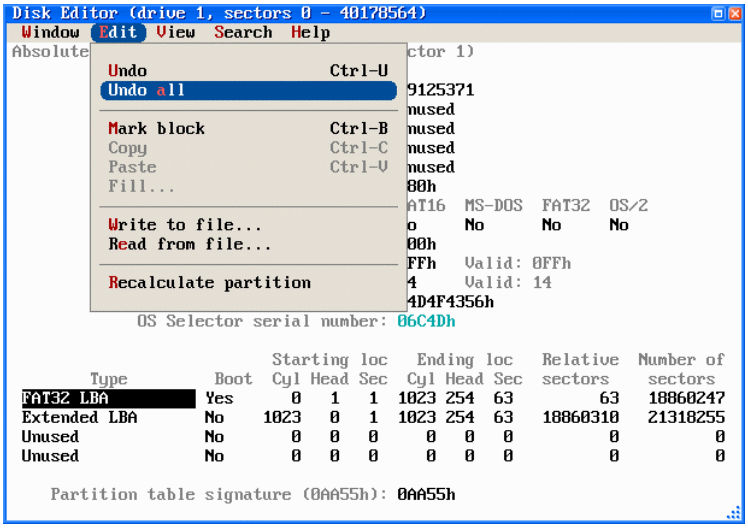


Arrow keys or mouse clicks allow you to move inside one sector. You can go to the previous or the next sector by pressing PageUp or PageDown.

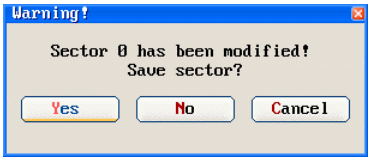
B.4 Simple Editing and Undoing Changes

In any mode the information that is shown in the window may be edited. In the hexadecimal mode any place of any sector can be browsed and edited in the same way, but in the partition table or boot sector modes, the information that is edited is treated in a specific way that depends on the type of the field.

All the changes are shown in different color. At any time you can either undo the changes by pressing Ctrl+U or Alt+Backspace or by selecting the «Undo» or «Undo all» items in the «Edit» menu or save to disk by pressing Ctrl+W or selecting the «Save sector» item in the «Window» menu.



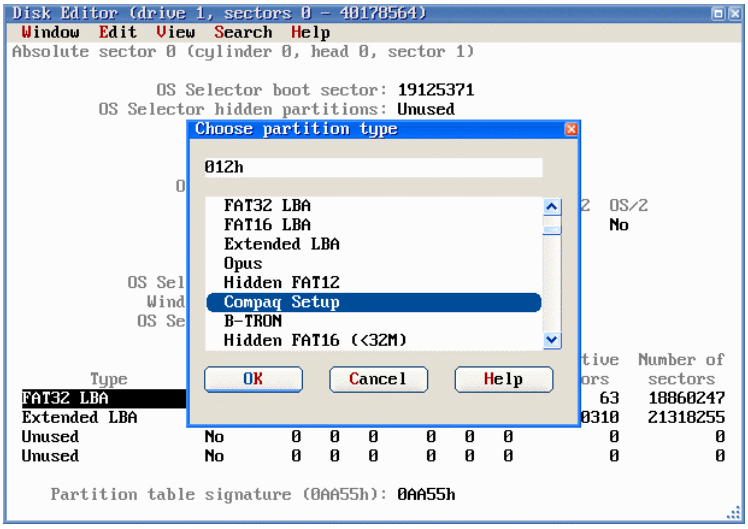
If any changes remain unsaved by the time you quit the editor or switch to another sector, the confirmation dialog box appears.



All the changes that were saved are immediately shown in the main Disk Administrator window.

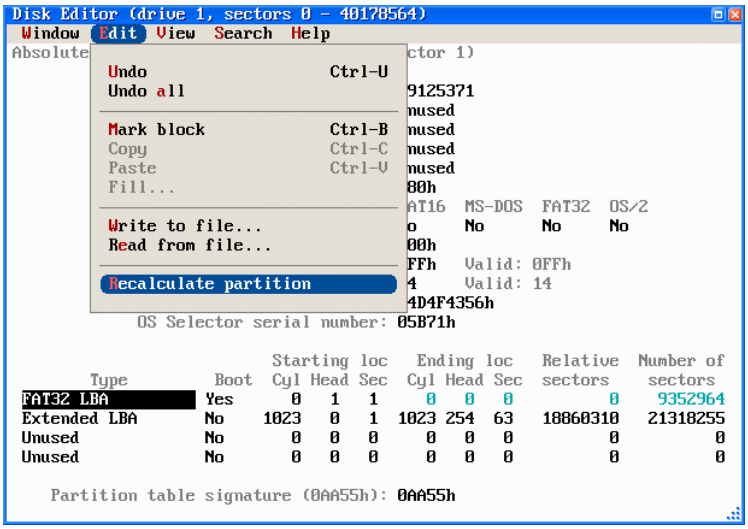
B.5 Editing in the Partition Table Mode

Additional editing features are available in the partition table mode. The partition type can be changed by left-clicking the partition type field or pressing Space while there. Doing so brings forth the Choose partition type dialog box that allows you to either choose the partition type from the list or enter its numerical value.



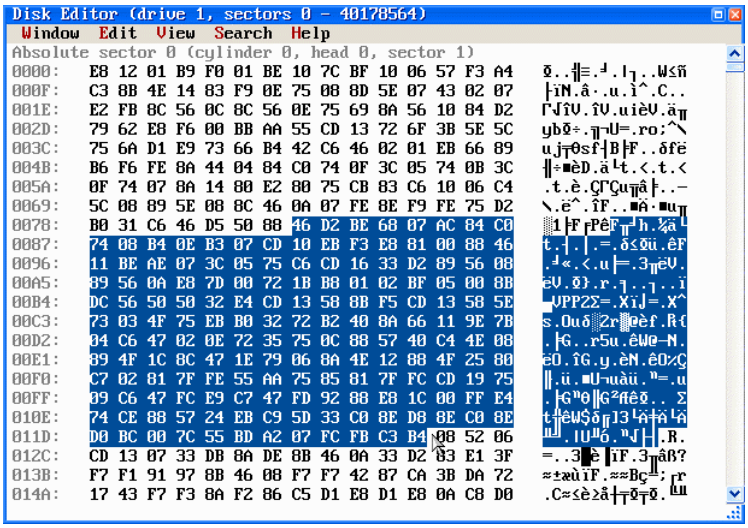
Status flag can also be toggled with left click or Space bar.

You can also calculate the value of the unknown fields of the partition table entry from the known ones. You may need this when constructing the partition table manually. To do this make all the unknown fields equal to zero and select «Recalculate partition» item in the «Edit» menu.



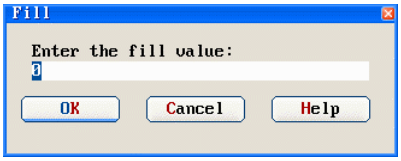
B.6 Using Blocks and Clipboard

Any browsing mode allows you to select blocks either with the mouse, by clicking and holding the left button when moving the mouse, or with the keyboard by moving around the window with the arrow keys while the Shift key is pressed. You can also move the cursor to the beginning of the block, press Ctrl+B, then move the cursor to the end of the block and press Ctrl+B again.



The following operations can be performed with the selected block:

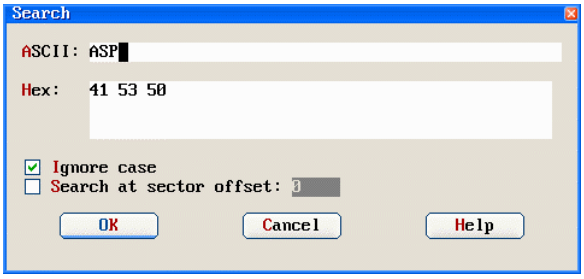
- Copy it to the clipboard (item «Copy» of the «Edit» menu or the Ctrl+C hotkey).
- Fill it with a certain byte (item «Fill…» of the «Edit menu»).



If some information is present in the clipboard it can be inserted at any place in any Disk Editor window by selecting the «Paste» item from the «Edit» menu or with Ctrl+V hotkey.

B.7 Search

Disk Editor allows you to search for specific information in the edit area. You can start the search by choosing the «Search for object» submenu of the «Search» menu, or by manually specifying what you want to find. Select «Search…» item in the «Search» menu or press Ctrl+S. This opens the search parameters dialog box.



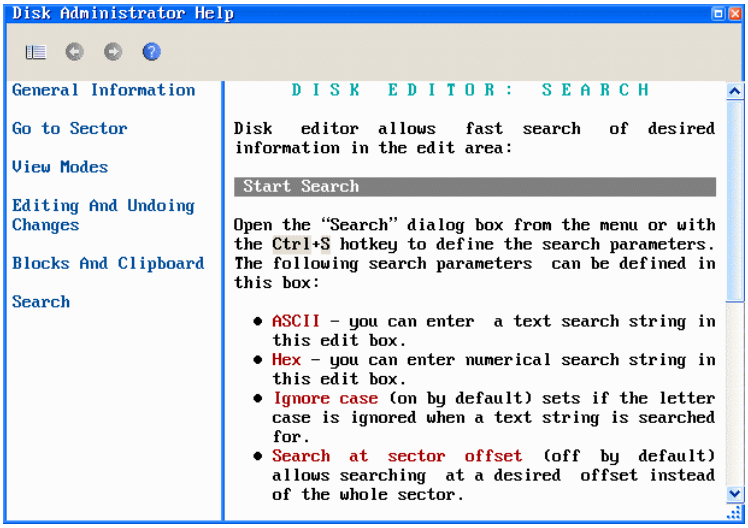
Search string(s) can be specified both in symbolic and numerical formats. Search can ignore case and search for the given sub-string only at given offset inside the sector.

After the search ends, the cursor will be moved to the position of the string that has been found, or it remains where it was if the string was not found. You can continue the search from current position by selecting «Search again» item in the «Search» menu or pressing the Ctrl+G hotkey.

Appendix C. Acronis OS Selector On-Line Help

C.1 Controls

On-Line Help window is divided into three parts.



In the upper part there is a graphical or text toolbar with Contents, Back, Forward and Help buttons.

In the left part, the table of contents is found. It may be absent if the current document has no table of contents. You can toggle table of contents display by clicking the Contents button. Table of contents width may be changed by dragging the vertical line that separates the table of contents from the text of the document.

In the right part is the text of the document. When the table of contents is not displayed, a larger portion of the window is devoted to the document.

C.2 Using the Mouse

If the text of the document or the table of contents does not fit into their part of the window, scroll bars appear the right and/or below it. You can scroll the text with their help.

A document may contain links to other documents or other parts of the same document. Links in the text of the document are color highlighted. Mouse pointer changes shape when pointing at a link. Click a link to follow it.

After following a link you can return to your previous position by clicking the Back button on the toolbar. Reverse is done with the Forward button.

On-Line Help itself is opened when you click the Help button.

Click the close window button in the upper right corner to quit the On-Line Help.

C.3 Using the Keyboard

On-Line Help may be controlled without using the mouse.

Text of the document may be scrolled with arrow keys and PgUp and PgDn keys. Use Home and End keys to get to the beginning/end of the document.

Ctrl+Tab switches you between the table of contents and the document.

To follow a link press Tab or Shift+Tab keys until the desired link becomes highlighted and press Enter.

After following a link you can return to the previous document by pressing the Backspace key.

Short help on On-Line Help itself is opened when you press the F1 key.

Press Esc to quit the On-Line Help.

Click the Back button or the Backspace key to return to the previous page.

Appendix D. Compatibility with Other Software

This appendix describes the fine points of using the Disk Administrator together with the following software:

DOS FDISK

Norton Utilities

Disk Compression Software

Other Boot Managers

Anti-virus Software

Disk Overlay Software

D.1 DOS FDISK

Many operating systems like MS-DOS, PC-DOS, DR-DOS, Windows 95/98/ME, OS/2 and many UNIX versions have in their packages programs that are usually called FDISK. They are provided for partitioning the hard disk. Many of these programs have limitations that cause them either to work incorrectly or not work at all in the following areas:

- Partitions located beyond cylinder 1024 and extended BIOS installed on the computer are unsupported by FDISK. In this case FDISK might not list all the partitions and report errors in partition structure.
- Partitions located beyond the geometry that are given by function 8 of Int 13h if extended BIOS is not installed on the computer. In this case FDISK may either refuse to run or report errors in partition structure.
- Primary partitions that are located between two logical ones. In this case FDISK may report either extra free spaces or overlapped partitions.

If you have installed Disk Administrator, you will not need to use programs like FDISK.

D.2 Norton Utilities

Some programs from the Norton Utilities package, mainly Norton Disk Doctor, may report partition structure errors, for example invalid logical partition parameters or partitions that cannot be accessed. You should ignore these messages and deny attempts to fix the error since Norton Disk Doctor may damage the partition structure.

D.3 Disk Compression Software

You can safely use the Disk Administrator together with disk compression software such as Staker or DriveSpace (DoubleSpace). Should you need to reduce the size of a partition where a compressed disk is located, first reduce the size of the compressed space by means of the compression software and then reduce the size of the partition with the Disk Administrator. Should you need to increase the size of such a partition, first increase the size of the partition with the Disk Administrator and then increase the amount of compressed space with help of the compression software.

D.4 Other Boot Managers

Acronis OS Selector is not compatible with other boot managers. You must remove any other boot managers from your computer before installing it. You may however use Acronis OS Selector Disk Administrator together with some boot managers. To do this you should keep in mind:

- Deleting, moving or resizing a partition may lead to a situation when the boot manager will refuse to boot.
- Partitions that are hidden by means of Disk Administrator might be invisible to the boot manager and to most operating systems that are installed on the computer.

D.5 Anti-virus Software

Since Disk Administrator and Acronis OS Selector frequently change the contents of partition tables and boot sectors, many anti-virus programs will report virus attacks. In these cases ignore their warnings and do not agree with attempts to «cure» these areas.

It is better to completely turn off BIOS virus protection when Acronis OS Selector is running.

D.6 Disk Overlay Software

There are programs like Ontrack DDO, Microhouse EZ-Drive or Pro-Drive, Maxblast, WD DDO, Seagate DDO and other. These programs are often provided with hard disk and are necessary for normal access to these disks regardless of BIOS. They actually replace a part of BIOS that works with hard disks and fix some bugs related to extended functions and reporting correct disk geometry.

Acronis OS Selector is fully compatible with such software. If you are going to install it on your computer or are running Disk Administrator from the installation diskette, the diskette should be loaded by means of these programs after their loading and not by means of BIOS. Usually pressing Space or Ctrl when the computer is booted does this. Failure to do so will cause the Disk Administrator to report incorrect hard disk information.

Appendix E. FAQ (Frequently Asked Questions)

- **I have installed Linux on my computer, and now I am unable to get into the Acronis OS Selector Boot Menu (after reboot I get directly into Linux). How can this problem be solved?**

  Obviously, you have installed LILO on MBR, so the Acronis OS Selector MBR was erased. You must boot from the Acronis OS Selector installation media and select the «Activate» option. Then run Setup to add Linux to Boot Menu configuration list.

- **I wanted to resize a FAT partition, but when I select the «Resize» item from the menu, «File system: incorrect file size» error message appears and resize is not possible. What should I do?**

  Acronis OS Selector Disk Administrator allows operations with s partition's file system only if there are no errors in it. You should first use CHKDSK or SCANDISK program from your operating system to fix all the errors on the partition and only then should you start Disk Administrator to resize the partition.

- **I have a hard disk with Windows 2000 which consists of one NTFS partition so that there is no place where other partitions can be created. I have purchased a new hard disk, have plugged it in as Slave and tried to install Windows 98 on it, but could not do that. Then I set booting from disk D: in the BIOS Setup, and Windows 98 installed without any problems. Now I have to always change the boot order in BIOS Setup when I want to boot another operating system, and it is very inconvenient. Can Acronis OS Selector help me in this case?**

  Yes, it can. Choose the boot order in BIOS Setup when Windows NT hard disk is the first. Next install Acronis OS Selector. It will then detect Windows 98 on the second hard disk and will be able to boot it from there. If you have primary FAT partitions on the first hard disk, Acronis OS Selector will be unable to automatically detect Windows 98. In this case you should use the OS Detection Wizard to hide those partitions and add Windows 98 manually.

- **The Guide says that few operating systems update MBR during installation, but any Windows 95/98 completely removes the old MBR and replaces it with its own one. Does it happen only to me, or is it common on any computer where Windows is being installed?**

  In most cases Acronis OS Selector adds a call to a special REINSTAL.COM program to the AUTOEXEC.BAT files, and it restores the MBR contents if it is overwritten (however, this feature does not work with Windows ME, where the AUTOEXEC.BAT file is not processed). You will not have to be concerned with restoring MBR if you use the Windows

Installation Wizard that is built into Acronis OS Selector to install Windows 95/98/ME.

- **Are there any ways to change Acronis OS Selector configuration from DOS or Windows?**

  No, and there are several reasons to that. First, Acronis OS Selector may be installed on a separate partition that is not available to other operating systems, and second, Setup uses special Acronis OS Selector Loader features that are unavailable in any operating system. Also, the way the hard disks appear from an operating system may differ drastically from the way BIOS sees them.

- **A 13-gigabyte hard disk is plugged into my computer, so I have been using the Maxtor MaxBlast utility to access more than 8 gigabytes. This program is installed in MBR. Will it work with Acronis OS Selector?**

  Acronis OS Selector is fully compatible with drive overlay programs such as MaxBlast, DM6 DDO or EZ-Drive. Of course Acronis OS Selector should be installed on a hard disk after such program is installed and loaded into memory.

- **How can I uninstall Acronis OS Selector?**

  Usually there is no need to uninstall Acronis OS Selector, since it occupies very little space, but makes work with operating systems more flexible. Fast operating system configuring and partition structure managing tools are always close at hand. If you find that you generally do not need to select an operating system in the Boot menu, you can select the Boot At Once mode (see 5.7 «Acronis OS Selector Options») or temporarily de-activate Acronis OS Selector (see 5.9 «Deactivating Acronis OS Selector»).

  If you still have need to uninstall Acronis OS Selector, never do it manually, but instead invoke the Acronis OS Selector uninstallation routine. To do so, reboot the computer, enter the Acronis OS Selector Boot menu, start Setup from it, and choose the «Uninstall Acronis OS Selector…» item from the «Other» menu of the Setup. You can also initiate Acronis OS Selector MERGE uninstallation by booting from the Acronis OS Selector installation media.

- **I have a Windows 98 operating system installed on a FAT32 partition of my computer, and I also want to install Windows 2000 so that it uses NTFS file system. Can Acronis OS Selector help me in this case?**

  Yes, it can. You have to install Acronis OS Selector and run Disk Administrator from its Boot menu. Next select the FAT32 partition, decrease its size, and create an NTFS partition in the resulting free space. Now you can install Windows 2000 by selecting the new partition in its Setup program.

- **Several people use my computer. Can I somehow limit their access to software?**

  Yes, a quite flexible password system is built into Acronis OS Selector. You can set separate passwords in the Boot Menu (this password is required every time the computer is booted) to each boot configuration. You can also set a special administration password (this one is required to start Setup or Disk Administrator).

  Of course, this protection is not absolute, and it is better to use it along with other protection means that are built into operating systems.

- **How can I create an OS Selector recovery diskette?**

  For Acronis OS Selector, a recovery diskette is its installation media – this can be either a CD-ROM or a diskette. You can easily create an installation diskette by running the Acronis OS Selector installation program from any operating system that is compatible with MS-DOS with respect to direct floppy disk access. In other operating systems you can create an installation diskette from a corresponding diskette image file.

  The installation media not only allows installing Acronis OS Selector, but also performs other actions such as upgrading Acronis OS Selector, activating/de-activating it, uninstalling it, and running Disk Administrator.

- **I have installed OS Selector on my computer, but I cannot find it in the «Start» menu. How can I run it?**

  Acronis OS Selector is not a usual application. It does not register with Windows operating systems, and you do not have to run it. Instead, you will see it after rebooting your computer. It will detect operating systems installed on your computer and will prompt you to select one of them in the Boot Menu. You should change the settings of Acronis OS Selector or uninstall it only by running Setup from the Boot Menu.

- **I deleted the BOOTWIZ folder, and now every time I boot my computer I get an error message, and then Windows is booted. How can I get rid of this error message?**

  You should not have deleted Acronis OS Selector in the manner you did, since you could have lost all your operating systems. You can get rid of the error message by executing «FDISK /MBR» from any 95/98/ME or MS-DOS, or by re-writing the MBR code some other way.

- **I already have OS Selector, and I would like to install Linux on my computer. Where should I install LILO: to MBR or to the boot sector of the partition? Maybe I do not have to install it at all?**

  Acronis OS Selector is not a substitute for Linux's LILO, so it is better to install LILO (or any other similar Linux loader) to the boot sector of the partition to which you plan to install Linux itself.

Appendix F. Glossary

Absolute sector. All the sectors of a hard disk can be numbered sequentially, starting with zero. Thus numbered sectors are called absolute.

Acronis OS Selector system folder. Acronis OS Selector keeps its own files and system and configuration files of detected operating systems in the BOOTWIZ folder on the partition that is chosen when Acronis OS Selector is first installed on the computer. BOOTWIZ folders are also created on the partitions where system folders of detected operating systems are located. These are used to move those system folders.

Acronis OS Selector Loader is stored in the BOOTWIZ.SYS file. Its purpose is to automatically detect changes in the partition structure, to execute other Acronis OS Selector modules, to create a boot context and to initiate the booting of an operating system itself.

Acronis OS Selector installation. Acronis OS Selector may be installed on a computer by booting from the installation media. BOOTWIZ folder is created on the selected partition during the installation process, files from the installation media are copied to it, Acronis OS Selector boot sector and MBR are created.

Acronis OS Selector Installation Program is a program from Acronis OS Selector package, whose purpose is to create an installation diskette and to install Acronis OS Selector on the computer.

Acronis OS Selector Installation Wizard is a part of Acronis OS Selector Installation Program that allow the user to choose the parameters of Acronis OS Selector installation or to perform some actions with an already installed Acronis OS Selector.

Acronis OS Selector uninstallation. If necessary, Acronis OS Selector may be completely removed from the computer either with Setup or with Installation Program. If partition structure has changed or operating systems that were installed before Acronis OS Selector installation were deleted after Acronis OS Selector installation, then it is impossible to revert the computer to the original state. In this case you will be prompted to select a configuration that will be booted after Acronis OS Selector is uninstalled.

Acronis OS Selector Upgrade/Repair. Acronis OS Selector Installation program allows rewriting all the executable files from its package without damaging the configuration files. So Acronis OS Selector upgrading/repairing is simply rewriting the Acronis OS Selector code while saving all the parameters.

Acronis OS Selector installation media. You have to boot from the installation media to install Acronis OS Selector on your computer. An installation media

is either a bootable Acronis OS Selector CD-ROM or a diskette that can be created by running Acronis OS Selector from any operating system that is DOS-compatible on the direct drive access level.

Active partition. One of the primary partitions of a hard disk is usually active. Default MBR code tries to boot an operating system from the active partition of the first hard disk. Letter assignment in Microsoft operating systems depends on what partitions are active. For details about active partitions see 8.3 «Setting an Active Partition».

Bad cluster. A cluster that contains bad sectors. Such cluster cannot store useful information.

Bad sector. A sector that cannot store the information written, for instance due to defects or aging of the magnetic surface.

BIOS extension. BIOSes that were released before 1994 can only support hard disks that are less than 8 gigabytes. Extended hard disk management functions were added to BIOSes to solve this problem, and now the maximum supported hard disk capacity is 2^{75} bytes.

Boot context. Before booting the selected operating system a boot manager must create its boot context. Acronis OS Selector includes the following components into the boot context:

- Boot sector;
- System files;
- Configuration files;
- System folders;
- Hidden partitions;
- Active partitions;
- LBA partition support flags.

Boot context is created in the following way:

- System and configuration files are copied from backups to their proper places (usually it is the root folder of the operation system partition);
- System folders are moved to their proper places;
- Hidden partitions are set;
- Active partitions are set;
- If the LBA support flag is present, than all partition types are changed to LBA;
- Boot sector is loaded and executed.

Boot manager is a special program that is booted before any operating system and allows the user to have multiple operating systems installed on his computer and to choose the necessary one when the computer is booted. For details on boot managers see 1.1 «Acronis OS Selector as a Boot Manager».

Boot Menu. Acronis OS Selector Boot Menu is a program that is stored in the BOOTWIZ\BOOTMENU.EXE file. It is actually a dialog box that appears when the computer is booted and allows the user to choose the configuration of an operating system that he wants to boot from a list.

Boot partition. A partition from which the initial stage of operating system booting is done (boot sector is read and executed, first file of the operating system is read and executed).

Boot record. The initial part of a partition that contains code and data necessary for booting an operating system. May consist of one or several sectors. First sector of a boot record must end with the boot sector signature (0AA55h).

Boot sector is the first sector of a disk or a partition that contains the initial code for the operation system booting. Boot sector must end with 0AA55h signature.

Bootable disk is a disk from which an operating system may be booted. A bootable disk must contain a boot sector of an operating system and the necessary system and configuration files. The «Bootable disk» term usually refers to diskettes and CD-ROMs.

Bootable partition. A partition that can host an operating system. In the beginning of such a partition there should be a boot record.

Booting is a procedure that is executed every time a computer is turned on or an operating system finishes its work or when the reset button is pressed. Booting consists of the following stages:

- Hardware diagnostics;
- Memory check;
- Built-in BIOS initialization;
- Initialization of additional hardware components and their BIOSes (video, SCSI etc.);
- Booting an operation system.

If a boot manager is installed on a computer, then it is booted instead of an operating system. Then the boot manager boots the user-chosen operating system itself.

Cluster. Information storage unit in such file systems as FAT and NTFS. Every file occupies a certain number of whole clusters, so the more the cluster size the higher the losses are that are due to file size adjustment, but the smaller the cluster the more place do the cluster distribution tables occupy.

Configuration file. **Configuration**. Most operating systems have configuration files. Usually these are files that keep different options and parameters of the operating system itself and of applications installed. Acronis OS Selector allows creating multiple configurations of one operating system by backing up configuration files for each configuration.

Configuration list is the main part of Acronis OS Selector Boot Menu. Configuration list can be adjusted very flexibly and aside from configurations contains also Boot From Floppy sections, separators and comments.

Cylinder. A group of all the tracks on all the magnetic platters of a hard disk that can be accessed without moving the magnetic head. Access to the data inside one cylinder is much faster than moving the head from one cylinder to the other.

Deactivation of Acronis OS Selector. You can deactivate Acronis OS Selector when booting from an installation media or directly from Setup. In this case you are prompted to choose an operating system configuration. After deactivation the selected configuration will be booted directly, bypassing Acronis OS Selector. Boot from the installation media to re-activate Acronis OS SelectorOS Selector.

Detection (adding, scanning) of operating systems. Every time Acronis OS Selector is executed it checks if any changes were made to the hard disk partition structure of the computer and upon finding any it scans for operating systems. Newly found operating systems are registered by Acronis OS Selector and their configurations are automatically added to Boot Menu configuration list. This is called detection of operating systems (see 5.1 «Automatic Setup Operation Mode»). Manual detection and addition of an operating system can be performed should Acronis OS Selector fail to detect that a new operating system was installed (see 5.8 «OS Detection Wizard»).

Disc. A non-magnetic storage media (compact disc, CD-RW, or DVD).

Disk. A magnetic storage media (floppy disk or hard disk).

Disk Administrator is a program from Acronis OS Selector package that allows performing various operations with hard disk partitions including on-the-fly resizing without data loss.

Diskette. Floppy disk. A removable storage media that consists of a flexible magnetic platter enclosed in a protective envelope. The most common are 3.5-inches diskettes with 1.44 megabyte capacity.

Drive. A general word that can mean both a device for accessing information on a disk (floppy disk drive) and a partition that can be accessed from an operating system (logical drive).

Folder. A table in the file system that contains description of files and other folders. Such structure allows creating folder tree that begins with the root folder.

File. A file is named information storage in the file system. In different file systems, files can be stored in different ways, with different file names and different ways to write the full path to the file in the folder tree.

File system. Data structure that is necessary to store and manage files. File system does the following functions: tracks free and occupied space, supports folders and file names, tracks the physical positions of files on the disk. Each partition may be formatted with its own file system.

Floppy disk drive. A device that is used to read and write information on a diskette.

Formatting. The process of creating service structure on the disk. There are three levels of hard disk formatting: low-level (marking the magnetic surface with tracks and sectors), partitioning and high-level (creation of file system on a partition).

Hard disk (hard drive). Fixed storage media along with integrated electronics that consists of several magnetic platters that rotate synchronously on one spindle. Hard disks have relatively high capacity and high read/write speed.

Hard disk geometry. A set of hard disk parameters that usually includes the number of cylinders, heads and sectors per track.

Head (magnetic head, read/write head). A hard disk consists of several magnetic platters, for each side of each platter there is a head that is used to read and write information on it.

Hidden partition. A partition that is somehow made invisible to the operating system. Usually partitions are hidden by changing their type.

Hypertext. A text structure that allows not only sequential browsing of each document but also moving from one document to another with help of **links** is called hypertext. Most help systems, including the Acronis OS Selector On-Line Help, are hypertext.

Drive overlay program. Some BIOS versions have trouble supporting large (larger than 8 gigabytes) hard disks. That is why hard disk manufacturers provide special programs that are installed at the beginning of a disk, are loaded before any operating systems and replace BIOS functions that are responsible for hard disk management.

Label. An optional name that can be assigned to a partition to simplify its identification. Usually has the same limitation as file names. For example, FAT partitions have labels up to 11 characters long, but may contain spaces.

Letter (of a drive, partition). All operating systems that are DOS-compatible use Latin letters to identify drives and partitions. Letters A: and B: are usually reserved for floppy drives. Starting with C: letters are assigned to hard disk partitions that can be recognized by the operating system. Separate letters may be assigned to CD-ROMs, DVDs, or other disk drives, and to network drives. A very detailed description of the letter assignment order of different operating systems is given in 2.9 «Assignment of Letters in Different Operating Systems».

Logical partition. Partition information about which is located not in MBR, but in the extended partition table. The number of logical partitions on a disk is unlimited.

Master boot record. See **MBR**.

Operating system is a set of programs that usually includes kernel, drivers, shell and system programs that is used for centralized hardware management and hiding the details of hardware management from the user and applications.

Operating system booting is initiated by loading its boot sector to memory at 0:7C00h address and passing control to it. Since every operating system has its own boot sector, it is able to perform all the necessary actions to load and initialize system and configuration files.

Since a boot manager usually supports multiple operating systems on one computer and even one partition, it has to perform some preparatory actions (create the boot context) before booting an operating system.

Operating system installation is a process during which its system folders are created, system files are copied and boot sector is created. These are the signs that allow Acronis OS Selector to automatically detect the newly installed operating systems.

Operation system upgrade. Many operating systems may be upgraded. In this case system files may change. Unlike other boot managers, Acronis OS Selector performs correctly in most cases when an operating system is upgraded.

Partition. An independent area on a hard disk where a file system can be located. A partition can be either primary or logical, depending on its position in the partition structure. One of the primary partitions of a hard disk may be active. A partition has the following attributes: type, beginning and size. Besides, some partition managing software and boot managers allow hiding partitions. Information about partitions is stored in the partition table.

Partition structure. All the partitions on a hard disk make a tree with the root in the MBR partition table. Many operating systems and programs assume that any partition table but MBR may contain not more than one partition entry and one table entry, and it simplifies the partition structure greatly – all the logical partitions form one chain.

Partition table. It is the table that contains the information about partitions and links to other partition tables. A partition table cannot have more than four entries. Main partition table is located in the hard disk MBR, and the other partition tables are called extended. Partition tables are usually stored in the first sector of a cylinder.

Partitioning. The process of creating the logical structure on a hard disk. Partitioning is usually done with programs like FDISK. Disk Administrator completely replaces FDISK where functionality is concerned and allows performing many more useful operations.

Primary partition. The partition, information about which is contained in the MBR partition table. Majority of operating systems can be booted only from the primary partition of the first hard disk, but the number of primary partitions is limited.

Root folder. The folder where the folder tree of a file system begins. Starting from the root folder one can uniquely describe the file position on the folder tree by sequentially naming all the intermediate nested folders, e.g.: \WINDOWS\SYSTEM\VMM32.VXD. Here the WINDOWS folder is a subfolder of the root folder, SYSTEM folder – of the WINDOWS folder, and the VMM32.VXD file is located in the SYSTEM folder.

Sector. It is the minimal information unit on a disk that is transferred in single read or write operation. Usually a sector is 512 bytes in size. A sector on a disk can be addressed two ways: via the absolute number (see absolute sector) or via cylinder, head and sector number on a track.

Setup. Acronis OS Selector Setup is stored in the BOOTWIZ\BOOTCFG.EXE file. Its purpose is to automatically and manually detect the operating systems, and configure their boot contexts and appearance and other general Acronis OS Selector parameters.

Status. A flag that shows if a partition is active. This flag is stored in the partition table and has no meaning for logical partitions.

System folder. Some operating systems keep most of their files in a special folder on a partition that may be different from the system one. For example for Windows 95/98/ME operating systems IO.SYS system file resides on the system partition, while other system files are located in the system folder which is usually called WINDOWS. Program Files folder can also be treated as system since it resides on the same partition as WINDOWS and also contains files that are relevant to the operating system.

System disk/partition is a disk/partition from which an operating system may be booted. Such disk usually contains the boot sector and system files of this operating system.

System file is a file that contains the code and constant data for an operating system. Each operating system has its own system file set.

Track. Disks are divided into concentric circles called tracks. Information from one track can be accessed without moving the head.

User interface is a set of principles, concepts, and means by which programs interact with the user. For example in window interface all input and output is done in windows, the mouse is utilized quite often.

Windows 95/98/ME Installation Wizard is the part of Acronis OS Selector Setup that allows the user to perform some preparatory actions before upgrading a Windows 95/98/ME operating system when saving its previous version or before installing a new Windows 95/98/ME.