# PARAGON DISK WIPER™ 10

## USER MANUAL

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## INTRODUCTION

Data security nowadays is the burning issue not only for companies and government agencies, but rank and file people as well. Our personality is now fully embedded in computer technology. It is computer you apply to when at work, it is also computer you use at home for entertainment or as a reservoir for containing some valuable data such as personal correspondence, banking account information, credit card numbers, financial records, whatever… It is obvious that this kind of data should in no way be available to others. That is why, when disposing of a storage device (a hard disk or a flash memory drive), the crucial thing is to make sure it does not contain any information, because simple deletion, or even reformatting do not guarantee data security at all. To do that, you need a specially designed tool.

Paragon Disk Wiper™ 10 is a fast, convenient and reliable solution providing irreversible destruction of data on separate partitions or entire hard disks (IDE, SCSI, SATA, USB, etc.) as well as any type of flash memory devices.

In this manual you will find the answers to many of the technical questions, which might arise while using the program.

## WHAT'S NEW IN DISK WIPER 10

- ❑ **Support of the Windows Installer MSI package**. It is the latest engine for the installation, maintenance and removal of software on Windows-based operating systems. With its help you can now install the product remotely or in the silent mode, make use of powerful deployment capabilities, etc.

- ❑ **Improved 64-bit support**. You don't need to reboot your computer from the Wiping CD every time an operation cannot be accomplished under 64-bit Windows any more. The program will automatically reboot to a special mode to complete the operation.

- ❑ **Support of GUID Partition Table (GPT)**. It is the next generation of a hard disk partitioning scheme developed to lift restrictions of the old MBR. GPT disks are now supported by Windows Vista, Server 2008, Mac OS X and Linux.

- ❑ **Support of the latest Linux kernel**. It offers support of a wider range of hardware configurations, including the brand new Intel ICH9 chipset.

- ❑ **Integration of the Linux/DOS wiping media directly to the installation package**. You can now burn it with the Wiping Media Builder any time you want.

- ❑ **A context sensitive hint system for all functions of the program**. You can now get a detailed description to any setting, control, or field of the program just by clicking the hint button and then the object you need.

## DISK WIPER EDITIONS

The product is being released in several editions, Personal and Professional, which vary in price and provided functionality:

- ❑ The Personal edition does not enable to use national government and military data erasure standards, but only two wipe algorithms (Paragon's and customized).

- ❑ The Personal edition does not support dynamic disks

- ❑ The Personal edition does not support scripting, i.e. it cannot perform batch tasks in the unattended mode.

- ❑ Generate Script, Save to Scheduler, Send Log Files, and View Logs program's dialogs are unavailable in the Personal edition.

- ❑ There is no possibility to send notifications by e-mail on the carried out operations in the Personal edition.

> ⚠️ **Please take into consideration the mentioned above peculiarities of the certain versions when working with the program.**

## PRODUCT COMPONENTS

In order to cope with different tasks, the product contains several components:

- ❑ **Windows based set of utilities** is the crucial part of the product. With the help of an easy to use launcher you may find and run the required tasks.

- ❑ **Linux/DOS based Wiping CD** is a multi-platform bootable media that enables to run utilities under Linux or PTS DOS. Both platforms have their strong sides, for instance Linux can boast support of FireWire (i.e. IEEE1394) or USB devices. It enables to burn CD/DVD disks. However there can be some difficulties with detecting new hardware. DOS in its turn has no problems of that kind but is limited in features. The Linux/DOS Wiping CD requires no installation and can be of great help when the system fails to boot. Besides it offers a Windows XP like environment.

## FEATURES OVERVIEW

This chapter dwells upon key benefits and technical highlights of the product.

### KEY FEATURES

Let us list some of the key features:

#### USER FRIENDLY FAULT MINIMIZING INTERFACE

- ❑ **Graphical representation of the data** to gain a better understanding.

- ❑ **A handy launcher** to easily find and run the required tasks.

- ❑ **Comprehensive wizards** to simplify even the most complex operations.

- ❑ **A context sensitive hint system** for all functions of the program.

- ❑ **Previewing the resulting layout of hard disks before actually executing operations** (so-called virtual operations).

#### PARTITION/HARD DISK MANAGEMENT FACILITIES

- ❑ **Basic functions for initializing, partitioning and formatting hard disks** (create, format, delete). Instead of the standard Windows disk tools, the program supports all popular file systems.

- ❑ **Mount a partition** (assign a drive letter) of any file system type to make it available for your operating system.

#### WIPE FACILITIES

- ❑ **Data wiping** to successfully destroy all on-disk information including the standard bootstrap code and other system service structures.

- ❑ **Free space clearing** to destroy any remnants of deleted files/directories left on disk without affecting the used data.

## AUTOMATIZATION FACILITIES

❑ **Task scheduling** to automate routine operations. It can be particularly effective when you have to repeat a sequence of actions on a regular basis.

> ⚠️ **Scheduling is only available for the Windows installation of the program.**

❑ **Scripting** to make the program create a script of any set of operations you need. Besides support of all operations available in the interactive mode, the unattended mode provides some additional features, such as conditional execution, subroutines, repeatable iterations, disk/partition properties analysis, errors management, etc.

## AUXILIARY FACILITIES

❑ **File Transfer Wizard** to make such operations as transferring of files/directories or burning of them to CD/DVD as easy and convenient as possible. Providing access to Paragon backups as regular folders, it may also help to replace corrupted data from a previously created image in case of an operating system failure.

❑ **Wiping Media Builder** to create a Linux/DOS bootable media, which can later be used to boot and irreversibly destroy the on-disk data. Moreover, with its help you can save data from partitions of your hard disk directly to compact discs or burn ISO-images. The utility supports various formats of laser discs: CD-R/RW, DVD-R/RW, DVD+R/RW, DVD-R, DVD+R double layer, Blu-ray and can handle multi-session burning.

❑ **Boot Corrector** to tackle most of your Windows boot problems caused by a human factor, program error or a boot virus activity. It enables to correct the Windows System Registry in the offline mode, i.e. when it's not been started up. Besides it can help you out with other operating systems for instance, when a boot virus has corrupted the MBR (Master Boot Record).

> ⚠️ **Some features may be unavailable in the version of the product you have. To learn more about it please consult the Disk Wiper Editions chapter.**

## SUPPORTED TECHNOLOGIES

Along with using innovative technologies from outside, Paragon has developed a number of its own original technologies that make its products unique and attractive for customers:

❑ **Paragon Power Shield™** technology to provide data consistency in case of a hardware malfunction, power outages or an operating system failure.

❑ **Paragon UFSD™** technology to browse partitions of any file system including hidden and unmounted, modify and copy files and folders, etc.

❑ **Paragon BTE™** technology to set tasks for execution in the Windows blue screen mode, thus saving from the need to use a bootable media when modifying system partitions.

❑ **Microsoft Dynamic Disk** (simple, spanned, striped, mirrored, RAID-5) to offer more management flexibility without the partition limitation of basic disks. Dynamic storage can be particularly beneficial for large-scale businesses when dealing with many physical hard disks involving complex setup.

- **GUID Partition Table** (GPT). It is the next generation of a hard disk partitioning scheme developed to lift restrictions of the old MBR. GPT disks are now supported by Windows Vista/7, Server 2008, Mac OS X and Linux.

> ⚠️ **Some features may be unavailable in the version of the product you have. To learn more about it please consult the [Disk Wiper Editions](#) chapter.**

## SUPPORTED FILE SYSTEMS

Paragon Disk Wiper 10 provides support of major file systems presented on the market today:

- Full read/write access to FAT16/FAT32 partitions.

- Full read/write access to NTFS (Basic and all five types of Dynamic Disks) under Windows 95/98/ME, Linux and PTS DOS. Compressed NTFS files are also supported.

- Full read/write access to Ext2FS/Ext3FS partitions under all versions of Windows, DOS 5.0 and later.

- Basic partitioning operations (create, format, delete) for Linux Swap.

## SUPPORTED MEDIA

- Support of both MBR and GPT hard disks (up to 1,5 TB tested)

- IDE, SCSI and SATA hard disks

- CD-R, CD-RW, DVD-R, DVD+R, DVD-RW, DVD+RW, DVD-R, DVD+R double layer and also Blu-ray discs

- FireWire (i.e. IEEE1394), USB 1.0, USB 2.0 hard disks, ZIP® and Jazz® disks

- PC card storage devices (MBR and GPT flash memory, etc.)

# GETTING STARTED

In this chapter you will find all the information necessary to get the product ready to use.

## SYSTEM REQUIREMENTS

### WINDOWS BASED SET OF UTILITIES

To use the Windows utilities, you should install them first. But before that, make sure your computer meets the following minimum system requirements:

- Operating systems: Windows 2000/XP/Vista/7/Server 2000/2003/2008 and XP SP2/Vista/7/Server2003/2008 64-bit

- Internet Explorer 5.0 or higher

- Intel Pentium CPU or its equivalent, with 300 MHz processor clock speed

- 128 MB of RAM

- Hard disk drive with 100 MB of available space

- ❑ SVGA video adapter and monitor

- ❑ Mouse

## LINUX/DOS BASED WIPING CD

To use the Paragon Linux/DOS Wiping CD on your computer (it doesn't matter what operating system is installed), make sure that it meets the following minimum system requirements:

- ❑ IBM AT compatible computer with i486 or higher CPU

- ❑ 256 MB of RAM

- ❑ SVGA-compatible monitor

- ❑ Mouse (recommended)

- ❑ On-board BIOS supports booting from CD first

## INSTALLING THE PROGRAM UNDER WINDOWS

As we have already mentioned only Windows components of the product require installation. So to install Paragon Disk Wiper 10 under Windows, please do the following:

1. **Run Setup Application**. Click on the DriveBackup.MSI file. This application will guide you through the process of the program installation. The setup utility is compiled with the InstallShield SDK, hence it contains the standard user interface and set of installation steps.

> ⚠ **In case there is some previous version of the program installed on the computer, the program will offer the user to uninstall it first.**

2. **Starting Setup**. The Welcome page informs that the application is being installed. Click the Next button to continue.

3. **Confirm License Agreement**. The License Agreement page displays the Paragon License Agreement. Read the agreement and then select the appropriate option to accept. If you do not agree with any conditions stated there, the installation process will be interrupted. By clicking the Print button, the License Agreement may also be printed out.

4. **Provide Customer Information**. On the Customer Information page you are to provide the standard information, i.e. a user name and an organization. Besides you need to decide whether to make the program available for all users of this computer (if several) or only for the current one.

5. **Select an Installation Folder**. The Destination Folder page allows you to choose a folder where the program will be installed. By default, the installation folder will be created as:

   **C:\Program Files\Paragon Software\Paragon Disk Wiper 10**. To select another folder, click the Change… button.

   After you have selected the required folder, click the Next button to continue.

> ⚠ **Do not install the program on network drives. Do not use Terminal Server sessions to install and run the program. In both cases, the program functionality will be limited.**

6.  **Confirm Installation**. On the Ready to Install the Program page click the Install button to start the installation or the Back button to return to any of the previous pages and modify the installation settings.

7.  **Copying Files**. The Copying Files page shows the overall progress of the installation. Click the Cancel button to abort the setup.

8.  **Finishing the Installation**. The Final page reports the end of the setup process. Click the Finish button to complete the wizard.

## STARTING THE PROGRAM UNDER WINDOWS

To start Paragon Disk Wiper 10 under Windows, please click the Windows Start button and then select **Programs > Paragon Software > Paragon Software Disk Wiper™**.

The first component that will be displayed is called the Launcher. In general it enables to run wizards and utilities, to specify program settings, to visualize the operating environment and the hard disk configuration, to launch the help system or to go to the program's home page.

> ⚠ **To know more on the subject, please consult the [Windows Components](#) chapter.**

## BOOTING FROM THE LINUX/DOS WIPING CD

The Linux/DOS Wiping CD can be used to boot your computer into Linux or PTS DOS to get access to your hard disk for maintenance or recovery purposes. On the disk you can also find the PTS DOS safe mode, which may help in a number of non-standard situations such as interfering hardware settings or serious problems on the hardware level. In this case, only basic files and drivers (such as hard disk drivers, a monitor driver, and a keyboard driver) will be loaded.

### STARTUP PROCEDURE

To start working with the Linux/DOS Wiping CD, please take the following steps:

1.  Insert the Linux/DOS Wiping CD into a CD/DVD drive;

2.  Reboot the computer;

3.  Launch a boot mode you need (Normal, Safe, Low-Graphics Safe) in the Boot menu.

> ⚠ **By default the Normal Mode will be automatically initiated after a 10 second idle period.**

4.  Click on the required operation to start. Hints on the selected at the moment item will help you make the right choice.
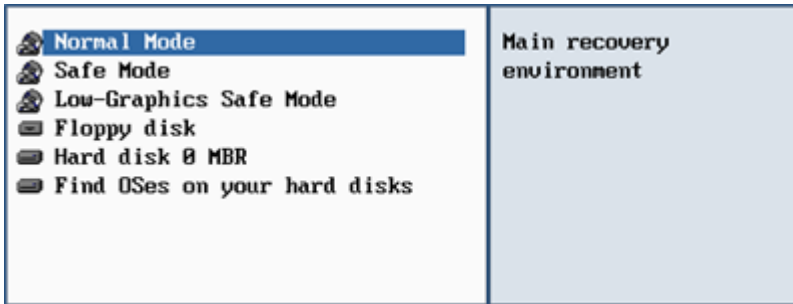
> ⚠ **To automatically boot from the Wiping CD make sure the on-board BIOS is set up to boot from CD first.**

### BOOT MENU

After you have inserted the Wiping CD into a CD/DVD drive and restarted the computer, the Boot menu appears.

```
Normal Mode              Main recovery
Safe Mode                environment
Low-Graphics Safe Mode
Floppy disk
Hard disk 0 MBR
Find OSes on your hard disks
```

The Boot menu contains the following commands:

❑ **Normal Mode**. Boot into the Linux normal mode. This mode uses the full set of drivers (recommended).

❑ **Safe Mode**. Boot into the PTS DOS mode. This mode can be used as an alternative of the Linux normal mode if it fails to work properly.

❑ **Low-Graphics Safe Mode**. Boot into the PTS DOS safe mode. In this case, only the minimal set of drivers will be included, like hard disk, monitor, and keyboard drivers. This mode has simple graphics and a simple menu.

❑ **Floppy Disk**. Reboot the computer from a system floppy disk.

❑ **Hard Disk 0**. Boot from the primary hard disk.

❑ **Find OS(s) on your hard disks**. The program will scan hard disks of your computer to find any bootable operating system.

To move within the menu, please use the arrow keys of the computer keyboard.

**To automatically boot from the Wiping CD make sure the on-board BIOS is set up to boot from CD first.**
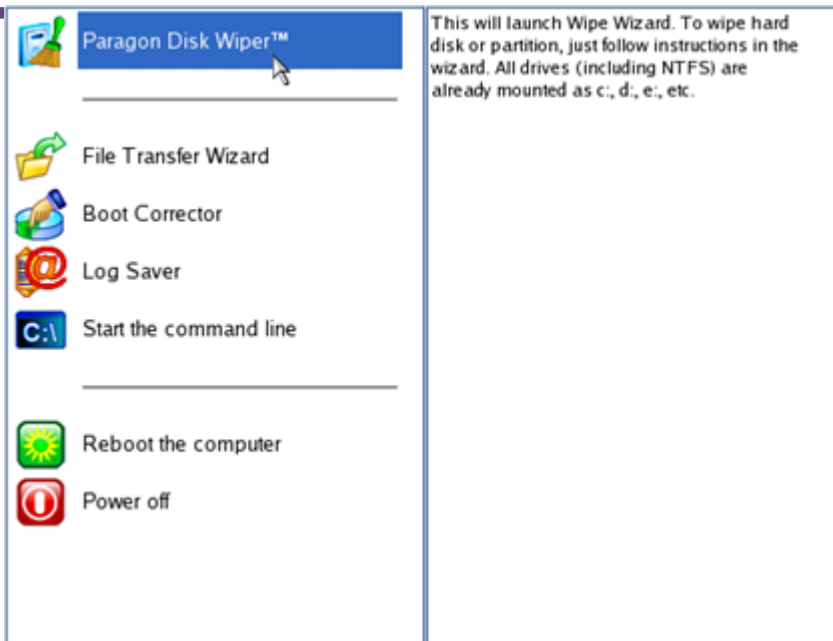
**While working with the Wiping CD you might experience some inconvenience caused by possible video artifacts. It is just a result of changing video modes and in no way will affect the program functionality. If this is the case, please wait a bit and everything will be OK.**

## NORMAL MODE

When the Normal mode is selected, the Linux launch menu appears:

- **Wipe Wizard** (enables to destroy all on-disk information or only remnants of deleted files/directories);

- **File Transfer Wizard** (allows coping files/folders to another disk or a partition as well as recording them to CD/DVD);

- **Log Saver** (helps to collect and send the necessary log files to the Technical Support);

- **Command Line** (allows experienced users to execute any operation);

- **Reboot the computer**;

- **Power off the computer**.

To move within the menu, please use the arrow keys of the computer keyboard.

## SAFE MODE

When the Safe mode is selected, the PTS DOS launch menu appears. It has nearly the same functionality as for the Normal mode except the **Log Saver** command. Besides due to certain limitations of the PTS DOS environment, there is no possibility to burn CD/DVD disks.

## LOW GRAPHICS SAFE MODE

When the Low Graphics mode is selected, the PTS DOS launch menu appears. It has the same functionality and looks similar to the Safe mode but graphically simpler.

```
🪟 Disk Wiper 10 Professional      This will launch Wipe
                                   Wizard. To wipe hard disk
🖼 File Transfer Wizard            or partition, just follow
🖼 Boot Corrector                  instructions in the wizard.
⬛ Start the command line

🖥 Reboot the computer
```
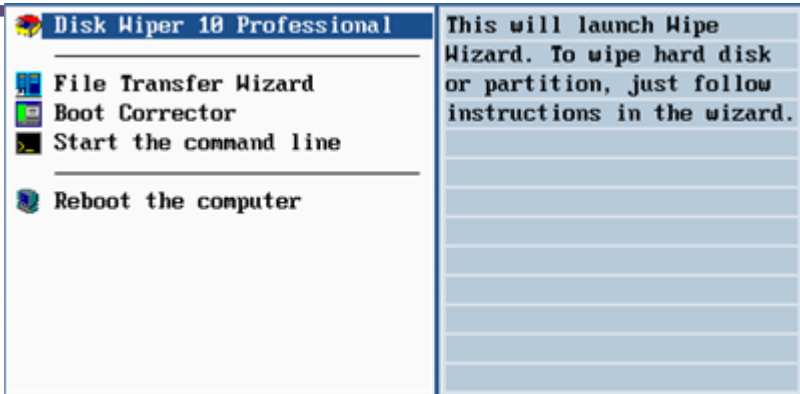
## BASIC CONCEPTS

This chapter explains terms and ideas that show how the program works. To understand these helps to obtain a general notion of the operation performance and makes it easier for the user to operate the program.

### DATA SANITIZATION

Data security is a two-sided problem. It is to be made clear, that providing confidentiality implies not only information to be stored properly, but also be destroyed according to certain rules. The first step to protecting yourself is to know exactly which security precautions work and which do not.

Many people believe the misconception that repartitioning a disk will result in complete destruction of its contents. Actually that is not quite so. Repartitioning the drive only alters references to partitions in the Partition Table, leaving all file data intact. In fact, there are a number of programs available to successfully recover previously deleted partitions.

Formatting a drive also does not guarantee data destruction. Formatting procedure implies modification of the Master File Table (MFT) that keeps track of where file contents are stored on the disk and verification of each sector for consistency. Even a low-level format does not actually erase the file contents for good, since they can still be resurrected from their deleted state with minimal effort by using the popular today Magnetic Force Microscopy technology.

The only way to make sure that all the data has been erased from a hard drive is to overwrite all on-disk sectors with random patterns of ones and zeros. Although this sounds complex, there is an easy way to do this.

The process of deliberately, irreversibly removing or destroying the data stored on a memory device (magnetic disks, flash memory drives, etc.) is generally known as Data Sanitization. A device that has been sanitized has no usable residual data and even advanced forensic tools should not ever be able to recover it, thus providing maximum level of security.

### DATA SECURITY STANDARDS

To irreversibly destroy all on-disk information there have been developed a number of disk sanitizing standards. They are distinguished by wiping patterns and number of passes:

1. **US DoD 5220.22-M**. US Department of Defense recommends to overwrite all addressable locations with a character, its complement and then a random character. Finally, the target data area is to be verified;

2. **US Navy standards NAVSO P-5239-26**.

   ❑ **NAVSO P-5239-26 for RLL encoded drives**. At first to write the fixed value (0xffffffff) to the target data area, then the fixed value (0x27ffffff), and then random values. Finally, the target data area is to be verified;

❑ **NAVSO P-5239-26 for MFM encoded drives**. At first to write the fixed value (0xffffffff) to the target data area, then the fixed value (0xbffffffff), and then random values. Finally, the target data area is to be verified;

3. **British HMG Infosec Standard No.5**. At first to write a single character pattern, then its complement and then a random character. Finally, the target data area is to be verified;

4. **German VSItR Standard**. Overwrite the deleted information 7 times, consistently filling it with the following patterns: 0x00, 0xFF, 0x00, 0xFF, 0x00, 0xFF, 0xAA. Finally, the target data area is to be verified;

5. **Australian ASCI 33**. Overwrite with a character (C), then verify. Overwrite with –C (the first pass character's inverse), then verify again. Overwrite everything with both C and –C once again but without verification. Fill everything with random characters;

6. **Russian GOST R 50739-95**. Destroy information by a single pass with writing random characters into each sector byte;

7. **Peter Gutmann's algorithm**. A whopping 35 passes, with 27 random-order passes using specific patterns combined with eight passes using random patterns;

8. **Bruce Schneier's algorithm**. Two passes of specific patterns followed by five passes using a cryptographically secure pseudo-random sequence;

9. **Paragon's algorithm**.

❑ Overwrite each sector with a forcefully randomized 512-byte string, new for each sector, using CSPRNG (cryptographically secure pseudo-random number generator);

❑ Overwrite each erased sector with its complement;

❑ Overwrite each sector with a 512-byte string (CSPRNG), again forcefully randomized and different from the first pass, and new for each sector;

❑ Fill each erased sector with 0xAA value. Finally, the target data area is to be verified.

> ⚠ **Military and government standards always require 100 percent residual data verification. It is necessary to make sure that the operation has been properly accomplished. Besides corrupted sectors discovered during the operation are to be logged to keep the user informed, since these sectors may contain classified information.**

All of the above-mentioned data erasure standards are implemented in the program. Besides the user has the possibility to create a customized algorithm, defining up to 4 wiping patterns, number of passes for each wiping pattern and for the group of patterns, thus providing the maximum possible security level.

> ⚠ **Some features may be unavailable in the version of the product you have. To learn more about it please consult the [Disk Wiper Editions](#) chapter.**

## DYNAMIC DISKS

As you probably know, MS-DOS, Microsoft Windows 95/98/Me/NT/2000/XP/Vista/Server 2003/2008 support four primary partitions per physical hard disk, one of which can be extended. Certainly there is the possibility to create logical drives within the extended partition. Such types of disks are called basic. Windows XP Professional, Windows 2000, Windows Vista and Windows Server 2003/2008 follow the same strategy: You can have a maximum of four primary partitions, one of which can be

an extended partition with logical drives. However, these operating systems also introduce a new disk configuration type - dynamic disk - which must be understood to effectively configure and manage hard disks.

Dynamic disk is a physical disk that doesn't use partitions or logical drives. Instead, it contains only dynamic volumes. Regardless of what format you use for the file system, only Win2K computers can access dynamic volumes directly. However, computers that aren't running Win2K can access the dynamic volumes remotely when connected to the shared folders over the network.

Dynamic disks can co-exist on a system with basic disks. The only limitation is that you cannot mix Basic and Dynamic disks on the same hard drive.

There are five types of dynamic volumes: simple (uses free space from a single disk), spanned (created from free disk space that is linked together from multiple disks), striped (a volume the data of which is interleaved across two or more physical disks), mirrored (a fault-tolerant volume the data of which is duplicated on two physical disks, and RAID-5 volumes (a fault-tolerant volume the data of which is striped across an array of three or more disks).

With dynamic storage, you can perform disk and volume management without the need to restart Windows.

**Limitations:**

❑ Dynamic disks are not supported on portable computers.

❑ Dynamic disks are not supported on Windows XP Home Edition-based computers.

❑ You cannot create mirrored volumes or RAID-5 volumes on Windows XP Home Edition, Windows XP Professional, or Windows XP 64-Bit Edition-based computers.

Thus, the dynamic disk is a new way of looking at hard disk configuration. Dynamic disks offer you more management flexibility without the partition limitation of basic disks. Dynamic disks can contain an unlimited number of volumes, but they cannot contain partitions or logical drives. Dynamic storage can be particularly beneficial for large-scale businesses when dealing with many physical hard disks involving complex setup.

> ⚠️ **Some features may be unavailable in the version of the product you have. To learn more about it please consult the Disk Wiper Editions chapter.**

## GPT VERSUS MBR

GUID Partition Table (GPT) is the next generation of a hard disk partitioning scheme developed to lift restrictions of the old MBR. Being a part of the Extensible Firmware Interface (EFI) standard proposed by Intel to replace the outdated PC BIOS, it offers a number of crucial benefits:

❑ Up to 128 primary partitions for the Windows implementation (only 4 in MBR);

❑ The maximum allowed partition size is 18 exabytes (only 2 terabytes in MBR);

❑ More reliable thanks to replication and cyclic redundancy check (CRC) protection of the partition table;

❑ A well defined and fully self-identifying partition format (data critical to the platform operation is located in partitions, but not in un-partitioned or hidden sectors as this is the case with MBR).

## 64-BIT SUPPORT

The bulk of software today is written for a 32-bit processor. It can meet the requirements of almost any end user. However that is not the case when dealing with servers processing large amounts of data with complex calculations of very large numbers. That is where 64-bit architecture comes into play.

It can boast improved scalability for business applications that enables to support more customer databases and more simultaneous users on each server. Besides a 64-bit kernel can access more system resources, such as memory allocation per user. A 64-bit processor can handle over 4 billion times more memory addresses than a 32-bit processor. With these resources, even a very large database can be cached in memory.

Although many business applications run without problems on 32-bit systems, others have grown so complex that they use up the 4 GB memory limitation of a 32-bit address space. With this large amount of data, fewer memory resources are available to meet memory needs. On a 64-bit server, most queries are able to perform in the buffers available to the database.

Some 32-bit applications make the transition to the 64-bit environment seamlessly others do not. For instance, system-level utilities and programs that provide direct hardware access are likely to fail. Our program offers a full-fledged support of the 64-bit architecture providing fault-tolerant work for such system dependent modules as Hot Processing.

## SCHEDULING

The automation of operations is particularly effective when you have to repeat a sequence of actions on a regular basis. For example, when a specific project is being developed on a computer on a day-to-day basis and a clear free space operation is made every evening so as to destroy any remnants of deleted files/directories left on disk, thus maintaining confidentiality, you will really appreciate, when this kind of routine operations will be carried out automatically without your participation.

Another aspect of any automation process is that it allows an optimization of your computer's work-load. This is especially important when operations require a considerable amount of computer resources – processor time, memory and more. A number of tasks, which can decrease the performance, can be run during the night or whenever the computer has the least work-load to perform.

The program has a special tool for scheduling. You can set out a timetable for any operation and it will start at a specified time without interrupting your current activity.

**Some features may be unavailable in the version of the product you have. To learn more about it please consult the Disk Wiper Editions chapter.**

## WINDOWS COMPONENTS

In the given section you can find all the information necessary to successfully work with the Windows version of the product.

## INTERFACE OVERVIEW

This chapter introduces the graphical interface of the program. The design of the interface precludes any mistake being made on the part of the user. Most operations are performed through the system of wizards. Buttons and menus are accompanied by easy understandable icons. Nevertheless, any problems that might occur while managing the program can be tackled by reading this very chapter.
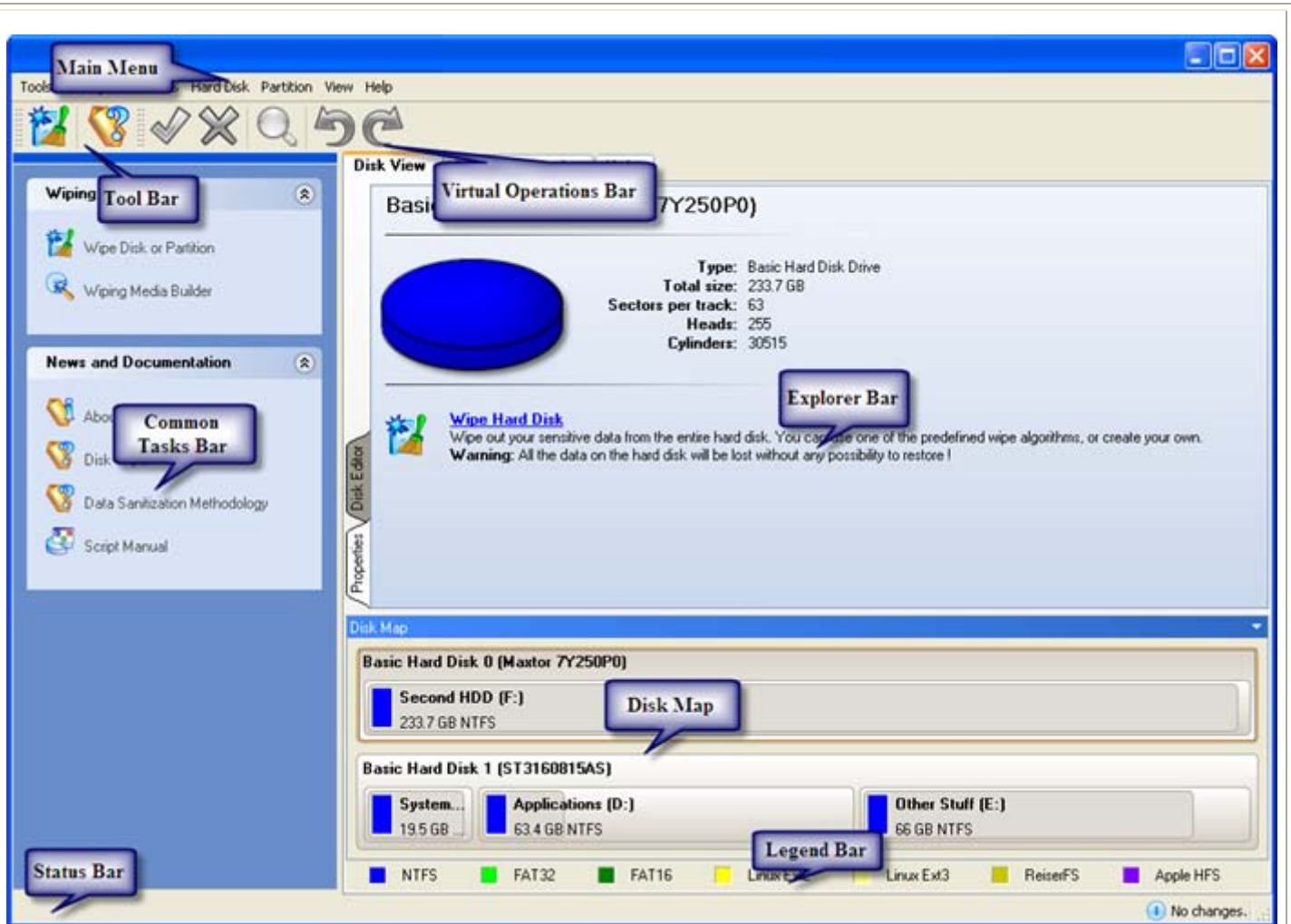
### GENERAL LAYOUT

The main component of the program is called the Launcher. It enables to run wizards and dialogs, to specify program settings, to visualize the operating environment and the hard disk configuration.

The Launcher's window can be conditionally subdivided into several sections that differ in their purpose and functionality:



1. Main Menu

2. Tool Bar

3. Virtual Operations Bar

4. Common Tasks Bar

5. Explorer Bar

6. Disk Map

7. Legend Bar

8. Status Bar

A number of panels offer similar functionality with a synchronized layout. The program enables to conceal some of them to simplify the interface management.

All panels are separated by vertical and horizontal expandable sliders, allowing the user to customize the screen layout.

## MAIN MENU

The Main Menu provides access to the entire functionality of the program. The available functions are as listed below:

| MENU ITEM | FUNCTIONALITY |
|---|---|
| **Tools** | |
| **Send Log Files** | Compress and send the log to the Paragon Support Team |
| **View Logs…** | View logs on the carried out operations |
| **Wiping Media Builder…** | Irreversibly destroy the on-disk data even when the current operating system cannot boot anymore |
| **Settings…** | Edit the general settings of the program |
| **Exit** | Exit the program |
| **Changes** | |
| **Generate Script…** | Generate a script for the task |
| **Save to Scheduler…** | Schedule pending operations |
| **Undo `the last virtual operation`** | Cancel the last virtual operation on the List of Pending Operations |
| **Redo `the last virtual operation`** | Cancel the last undo virtual operation on the List of Pending Operations |
| **View Changes…** | Display the List of Pending Operations |
| **Apply Changes** | Launch the real execution of virtual operations |
| **Discard All Changes** | Cancel all virtual operations on the List of Pending Operations |
| **Reload Disk Info** | Refresh the current information about disks |

| **Wizards** | |
|---|---|
| **Wipe Hard Disk or Partition...** | Destroy all on-disk information or only remnants of deleted files/directories |

| **Hard Disk** | |
|---|---|
| **Update MBR** | Update MBR (Master Boot Record) of the selected hard disk |
| **Wipe Hard Disk...** | Irreversibly destroy all on-disk information |
| **Edit/View Sectors...** | View/edit sectors of the selected hard disk |
| **Properties...** | Get in-depth information on the properties of selected hard disk |

| **Partition** | |
|---|---|
| **Create Partition...** | Create a partition |
| **Format Partition...** | Format a partition |
| **Delete Partition...** | Delete a partition |
| **Assign Drive Letter...** | Assign drive letter to the selected partition |
| **Remove Drive Letter...** | Remove drive letter for the selected partition |
| **Wipe Partition...** | Irreversibly destroy all on-partition information |
| **Clear Free Space...** | Destroy any remnants of deleted files/directories left on disk |
| **Test Surface...** | Test surface of the selected partition/block of free space |
| **Check File System Integrity...** | Check the selected partition for possible file system errors |
| **Edit/View Sectors...** | View/edit sectors of the selected partition |

| | |
|---|---|
| **Properties...** | Get in-depth information on the properties of selected partition |
| **View** | |
| **Toolbar** | Manage the Tool Bar representation: show / hide standard and navigation buttons, text labels and large icons |
| **Status Bar** | Display the Status Bar |
| **Common Tasks Bar** | Display the Common Tasks Bar |
| **Disk Map Legend** | Display the Disk Map legend |
| **Disk Map Location** | Select whether the Disk Map will be located on the top of the main window or at the bottom |
| **Help** | |
| **Help** | Open the Help system (you can also do it by pressing F1) |
| **About** | Open the dialog with information about the program |

**The Main Menu contents available at the moment may vary depending on the selected object.**

**Some features may be unavailable in the version of the product you have. To learn more about it please consult the Disk Wiper Editions chapter.**

## TOOL BAR

The Toolbar provides fast access to the most frequently used operations:

| BUTTON | FUNCTIONALITY |
|---|---|
| | Wipe a hard disk or partition |

| | Open the Help system |
|---|---|

## VIRTUAL OPERATIONS BAR

The program supports previewing the resulting layout of hard disks before actually executing operations (so-called virtual mode of execution). In fact, when the virtual mode is enabled, the program does not accomplish operations immediately, but places them on the List of Pending Operations for later execution.

The Virtual Operations Bar enables to manage pending operations.

| BUTTON | FUNCTIONALITY |
|---|---|
| | Cancel the last virtual operation on the List of Pending Operations |
| | Cancel the last undo virtual operation on the List of Pending Operations |
| | Display the List of Pending Operations |
| | Launch the real execution of virtual operations |
| | Cancel all virtual operations on the List of Pending Operations |

**Virtual mode is an effective way of protection from any troubles, since no operations will be executed until clicking the Apply button for confirmation, thus giving a second chance to weigh all pros and cons of this or that particular operation. The program politely reminds the user that there are unsaved changes by showing the following window:**
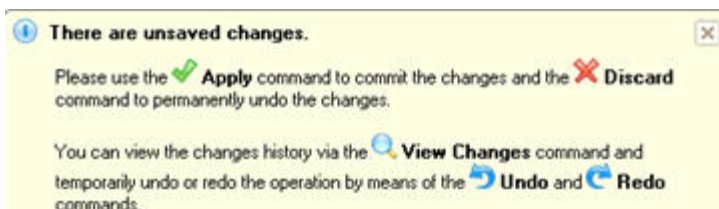


## COMMON TASKS BAR

The Common Tasks Bar is located on the left side of the main window. It is intended for easy access to the program's wizards.

The bar contains several tabs named **Wiping Tools** and **News and Documentation**. Each of these contains a separate button bar which can be folded by clicking it.

| | |
|---|---|
| **Wiping Tools** | |
| Wipe Disk or Partition | Starting the Wipe Wizard to help destroy all on-disk information or only remnants of deleted files/directories |
| Wiping Media Builder | Starting the Wiping Media Wizard to create a Linux/DOS bootable media which can be used to get access to your hard disk for maintenance or recovery purposes. |
| **News and Documentation** | |
| Disk Wiper Help | Launching the help system (you can also do it by pressing F1). |
| About Disk Wiper | Opening the page which contains information about the program. This page will be displayed in the Explorer Bar. |
| Data Sanitization Methodology | Opening a brief review on the Data Sanitization issue. |
| Script Manual | Opening a brief review on the Paragon Scripting Language. |

⚠ **Some features may be unavailable in the version of the product you have. To learn more about it please consult the Disk Wiper Editions chapter.**

## DISK MAP

The Disk Map is displayed in the Explorer Bar when the Disk View tab is selected. It is located either at the top or at the bottom of the window, depending on the state of the Disk Map Location option (Main Menu: View > Disk Map Location).

As the name infers, the Disk Map displays the layout of physical and logical disks. Physical disks are represented with rectangle bars that contain small-sized bars. These small-sized bars represent logical disks. Their color depends on the file system of the appropriate partition.



Large-sized bars display the following information about physical disks:

❑ Manufacturer,

❑    Model.

Small-sized bars display the following information about logical disks:

❑    Serial number,

❑    Drive letter,

❑    Total size,

❑    File system.

Furthermore, it is possible to estimate the used disk space by looking at the size of the bar's shaded area. The program offers to choose from several types of the disk layout scaling. It's done especially to increase the program usability. For instance, if you've got a high capacity hard drive containing both very large (more than 100 GB) and rather small (less than 10 GB) partitions, you can select the logarithmic type to make all partitions readable, otherwise (selecting the linear type) you won't be able to see small partitions at all, but thing strips. On the other hand, if the proportional disk layout is critical for you, the linear type is exactly what you need.

Nevertheless there's a compromise solution – linear scaling with the minimal limit to small partitions. So if a partition is too small it will remain readable.

Just click on the arrow icon on the top right side of the Disk Map to select the desired scaling type.
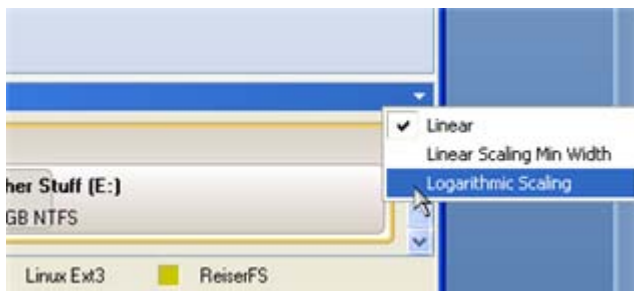


Disk Map is synchronized with the Explorer Bar. Thus by selecting a disk on the Disk Map, the Explorer Bar will automatically display detailed information on it.

## EXPLORER BAR

The Explorer Bar is located in the center of the main window which emphasizes its importance. The bar displays reference information including:

❑    The help system;

❑    General information on the product including its name, version and a list of helpful links;

❑    Detailed information about disks selected on the Disk Map;

❑    List of scheduled operations;

❑    List of scripts;

❑    Disk Editor utility.

According to these categories the Explorer Bar has several tabs:

❑ **Disk View**, which offers the user the following options:

- *Disk Editor* to view/edit sectors of the selected partition/hard disk;

- *Properties* to view detailed information on the selected partition/hard disk in the bright graphical form.

---

⚠ **You can switch between these components by clicking tabs on the left side of the Explorer Bar.**

---

❑ **Scheduled Tasks**, which gives the user the possibility of browsing and editing scheduled operations and the program scripts.

❑ **Help**, which contains the program help and general information on the product.

You can access the desired information by clicking on the appropriate tab.

The Explorer Bar is a fully-functional embedded HTML browser, which offers the possibility to address, for example, the company's website to look through important technical notes or download the latest updates without having to close the program.

The program help is also HTML-oriented. You can read it and follow external links from to get additional information.



To easily navigate through browsed pages, the program provides the following functionality:

| BUTTON | FUNCTIONALITY |
|--------|---------------|
|  | Return to the previously browsed page |

| | |
|---|---|
| | Open the next browsed page |
| | Stop loading the current page |
| | Refresh the contents of the current page |

⚠️ **Some features may be unavailable in the version of the product you have. To learn more about it please consult the Disk Wiper Editions chapter.**

## LEGEND BAR

The Legend Bar explains the color scheme used for disk and partition presentation. You can hide (or show) the bar with the appropriate Main Menu item: View > Disk Map Legend. When it is activated it can be found at the bottom of the Explorer Bar.

The program distinguishes between the following types of known file systems:

- FAT16/32,

- NTFS,

- Linux Ext2/3,

- Linux ReiserFS,

- Mac HFS.

## STATUS BAR

This is the bottom part of the main window. The Status Bar displays menu hints, for each item the cursor points to.

The user can hide (or show) the bar with the appropriate Main Menu item: View > Status Bar.

## SETTINGS OVERVIEW

The Settings dialog is available from the Main Menu: Tools > Settings. All the settings are grouped into several sections, which functions are described in the following paragraphs. The list of sections is placed on the left side of the dialog. By selecting a section from the list, you can open a set of options.

⚠️ **To get a detailed description to any setting, control, or field of the program just click the hint button and then the object you need.**

## GENERAL OPTIONS
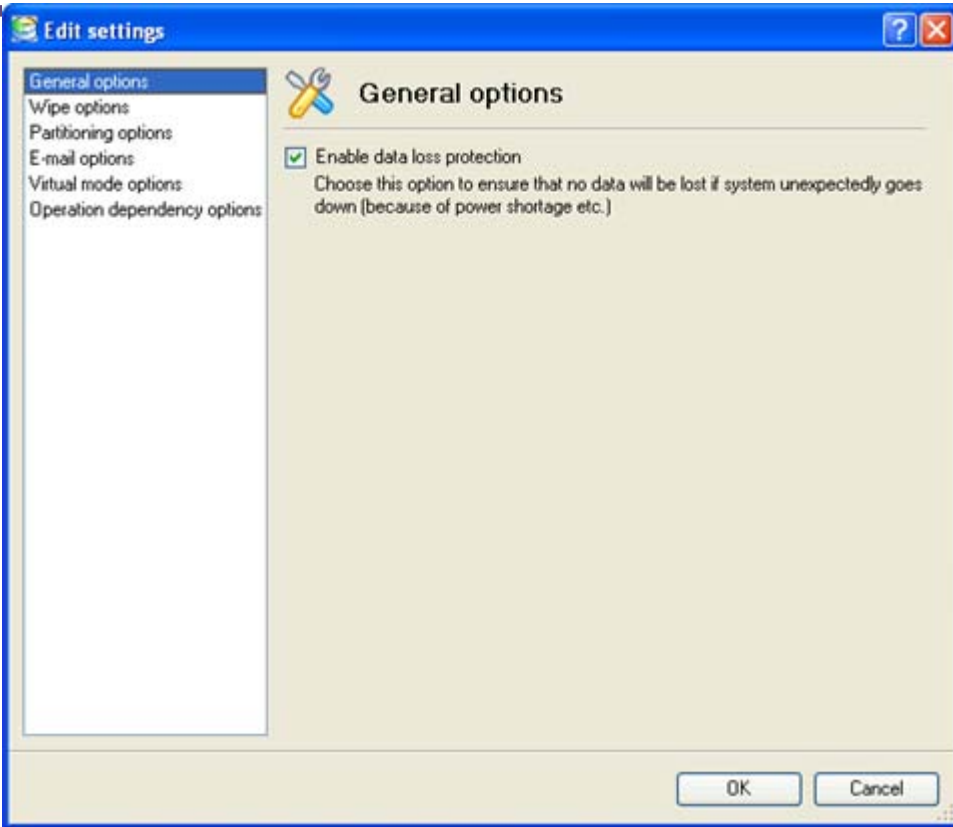
This section contains a set of general options that will be taken into account during any operation carried out with the program:

❑ **Enable data loss protection**. Mark the checkbox to make the program work in the fail-safe mode (also referred to as the data-loss protection mode), which ensures reliability for operations by maintaining a special journal. In case of a hardware malfunction, power outage or an OS failure happened in the middle of a data-sensitive operation (resize, move, merge, redistribute, change cluster size, etc.), the program will ask to insert the bootable Wiping CD and automatically complete the interrupted operation, thus reviving the corrupted partition.

⚠ **It is strongly recommended to enable this option.**

## WIPE OPTIONS
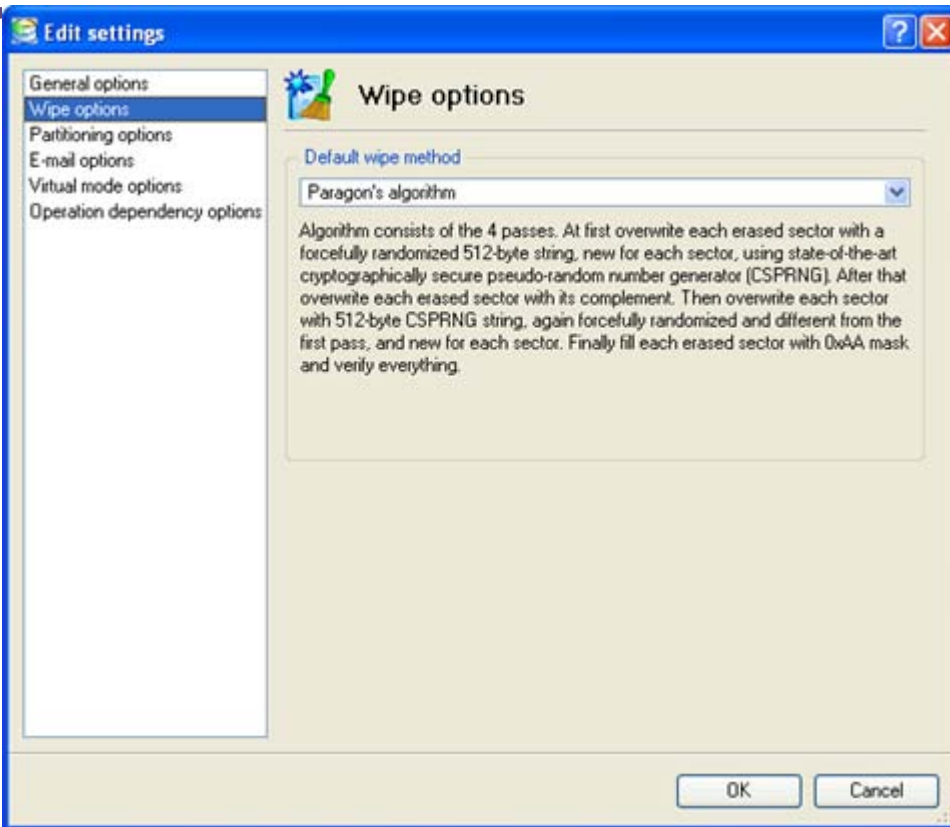
Here you can set a specific data erasure algorithm that will be used by default during wipe operations.

> ⚠ **Some features may be unavailable in the version of the product you have. To learn more about it please consult the Disk Wiper Editions chapter.**

## PARTITIONING OPTIONS
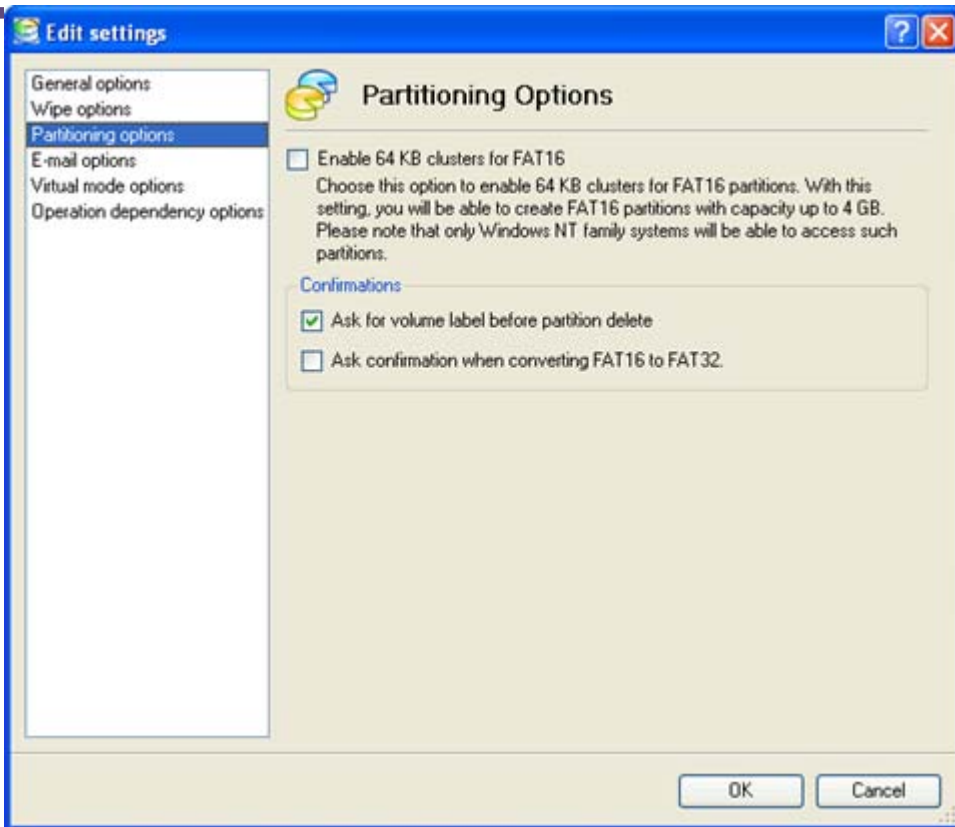
This section contains a set of options that will be taken into account during partitioning operations:

❑ **Enable 64 KB cluster size for FAT16**. Mark the checkbox to enable 64KB clusters for FAT16 partitions. Thus you will be able to create FAT16 partitions up to 4GB in size

> ⚠ **Due to the maximum cluster size of 32KB for Windows 95/98/ME or MS DOS, FAT16 partitions larger than 2GB are not reliably accessible under these operating systems.**

❑ **Request confirmation before partition deletion**. Mark the checkbox to activate an additional security mechanism. Thus when going to delete a partition you will be automatically requested to enter its label.

❑ **Request confirmation when converting FAT16 to FAT32**. Mark the checkbox to automatically request confirmation before converting FAT16 to FAT32. There are a number of situations when this kind of conversion is the only way out to accomplish the operation. For instance, you are going to migrate your system to a larger hard disk with the proportional resize of existing partitions, what is very convenient. As a result you can get original FAT16 partitions go beyond the 4GB limit. Thus without conversion to FAT32, this operation will in no way be possible to accomplish. The same goes for any copy hard disk/partition or restore hard disk/partition operation involving an extra upsizing.

## E-MAIL OPTIONS
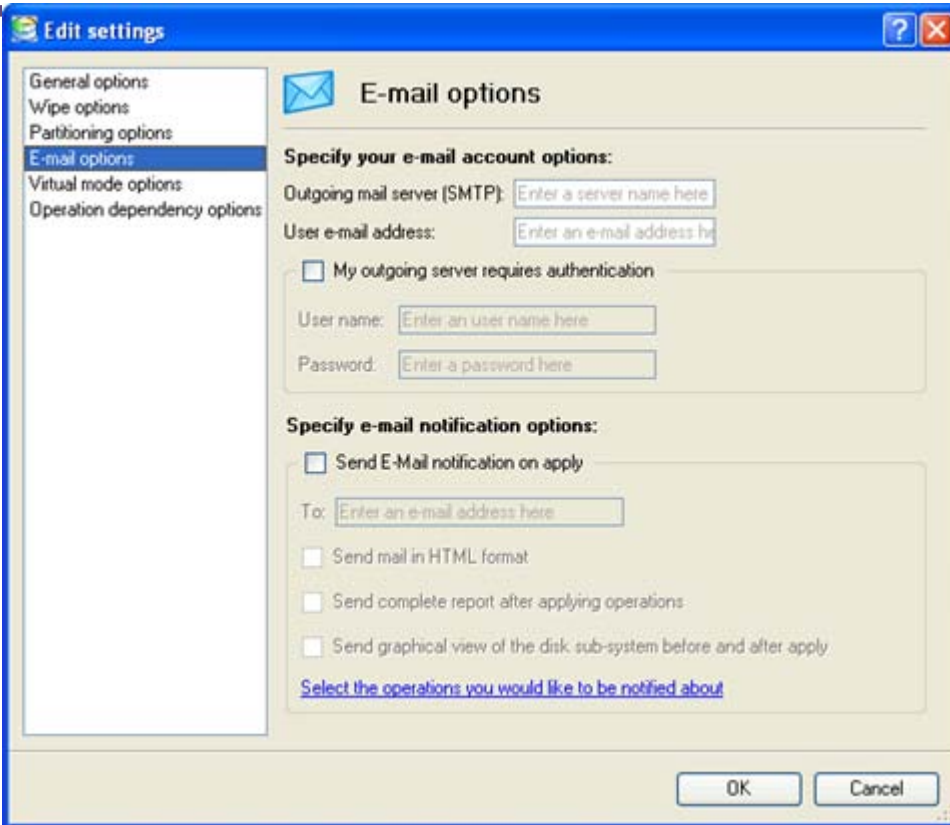
This section contains a set of options that will be taken into account during the Send log files and Send e-mail notification operations:

❑ **Outgoing mail server (SMTP)**. To send messages by using the built-in mail client, it is necessary to have access to a computer running an SMTP (Simple Mail Transfer Protocol) server. All outgoing messages are first sent to the SMTP server, which in its turn delivers them to the required recipients. The address may be represented as a traditional Internet host name (e.g.: mail.com) or as an IP numeric address (e.g. xxx.xxx.xxx.xx).

❑ **User e-mail address**. Specify an e-mail address that has been assigned by the Internet Service Provider or organization's e-mail administrator.

❑ **My outgoing server requires authentication**. Activate the option to allow the program to make authentication on the server before sending messages.

- User name. Enter the name that will be used to log in to the e-mail account.

- Password. Enter the password that will be used to access the mail server.

❑ **Send e-mail notification on apply**. Specify an e-mail to send notifications on the carried out operations.

- **Send mail in HTML format**. Activate the option to create messages in the HTML format instead of plain text.

- **Send complete report after applying operations**. Activate the option to create an in-depth report on the carried out operations and send it after performing the last operation.

- **Send graphical view of the disk sub-system before and after apply**. Activate the option to allow the program to attach two pictures of the disk layout made before and after the operation is completed.

By clicking the link at the bottom of the window you can jump to the **Operation Dependency Options**.

Some features may be unavailable in the version of the product you have. To learn more about it please consult the **Disk Wiper Editions** chapter.

## VIRTUAL MODE OPTIONS
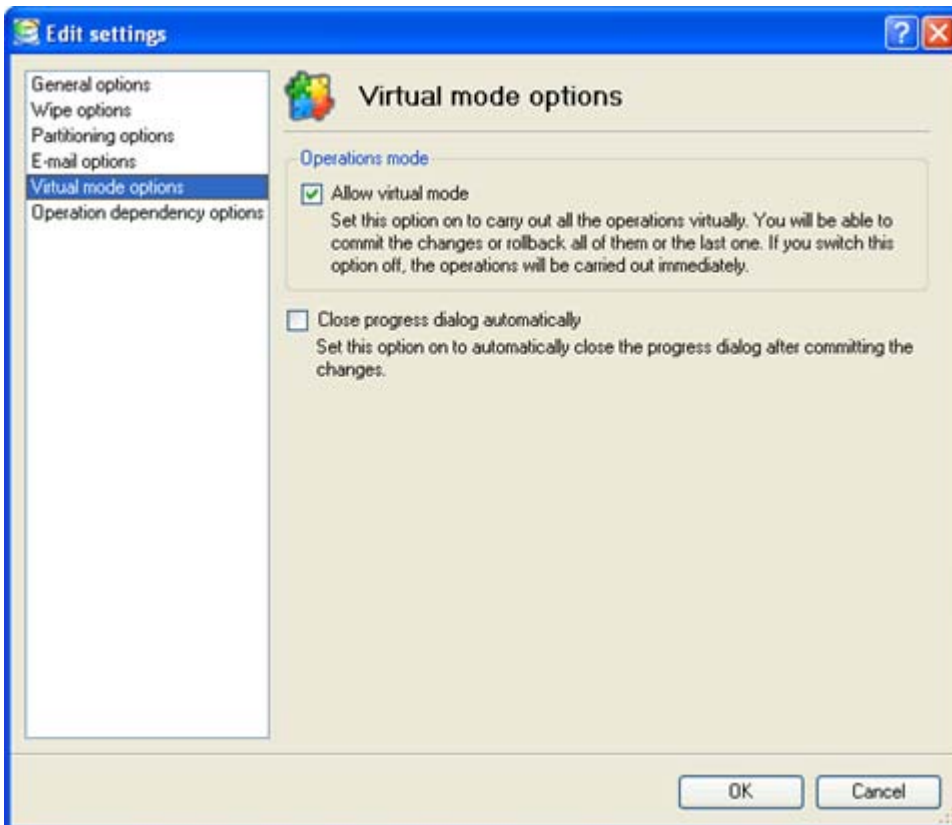


In this section you may configure the virtual mode:

❑ **Allow virtual mode**. Mark the checkbox to enable the virtual mode. It is an effective way of protection from any troubles, since no operation will be executed until confirmation, thus giving you a second chance to weigh all pros and cons of this or that particular operation.

**We strongly recommend you to enable this mode.**

❑ **Close progress dialog automatically**. Mark the checkbox to automatically close the progress dialog after accomplishing operations.

## OPERATION DEPENDENCY OPTIONS
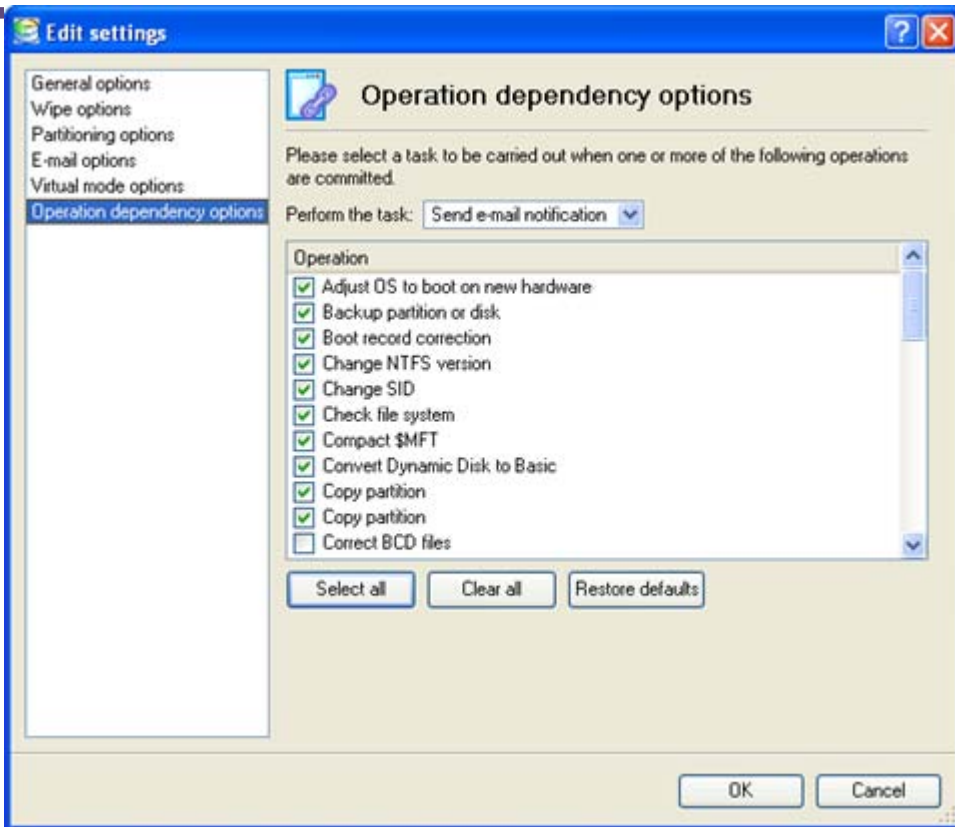
This section contains a set of options that will be taken into account when the Send e-mail notification on apply function is enabled. By marking/unmarking a checkbox opposite the required operation you can choose whether to receive an e-mail notification on its completion or not.

**You won't be notified if an operation requires the system restart.**

**Some features may be unavailable in the version of the product you have. To learn more about it please consult the Disk Wiper Editions chapter.**

## GETTING INFORMATION ON DISKS

The main tool to view in-depth information on the properties of hard disks is the Disk Map. It represents the actual state of the computer's hard disks.

Generally the hard disks are represented on the map by rectangular bars, which also contain small-sized bars. The small-sized bars represent logical disks (partitions). When you select a large-sized bar, the Explorer Bar displays information about the disk in a bright, graphical form (available if the Properties tab is selected).

**Basic Hard Disk 1 (FUJITSU MPF3102AT)**
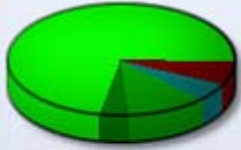
|  |  |
|---|---|
| Type: | Basic Hard Disk Drive |
| Total size: | 9.5 GB |
| Sectors per track: | 63 |
| Heads: | 255 |
| Cylinders: | 1245 |

**Wipe Hard Disk**
Wipe out your sensitive data from the entire hard disk. You can use one of the predefined wipe algorithms, or create your own.
**Warning:** All the data on the hard disk will be lost without any possibility to restore !

The model and serial number of the disk serve as the title of the browsed page. The disk layout is shown in form of a circular graph, where the color of a sector corresponds to a file system of an appropriate partition. On the right you may see a table, which contains the following information:

- ❑ Type of hard disk (basic or dynamic),

- ❑ Total size (in GB),

- ❑ Information on geometry of the disk (amount of sectors per track, heads and cylinders).

Below there is a list of available wizards. If you click a corresponding record the appropriate wizard will be started. All default values for the operation parameters will correspond to the disk's settings. The list of wizards contains a detailed description of tasks that can be performed by the wizard. This nullifies the possibility of selecting the wrong wizard.

**Logical Disk (G:)**

|  |  |  |  |
|---|---|---|---|
| Volume letter: | (G:) | Serial number: | 7493EA8F |
| Volume label: | FAT32-LINUX | Partition ID: | 0x0B FAT32 |
| Type: | Primary | Total size: | 6.8 GB |
| File system: | FAT32 | Used space: | 2.7 GB |
| Sectors per boot: | 36 | Free space: | 4.1 GB |
| Sectors per cluster: | 8 | Activity: | Inactive |
|  |  | Hidden state: | Not hidden |

**Wipe Partition**
Wipe out your sensitive data from the selected partition. You can use one of the predefined wipe algorithms, or create your own.
**Warning:** All the data will be lost without any possibility to restore !

When you select a small-sized bar (i.e. corresponding to a logical disk) the Explorer Bar will display information on it as well. The page title will contain a drive letter, which is assigned to the disk. The disk layout graph will be colored in accordance with the volume ratio of the used space to the free space (the light colored sector). The table on the right will contain the following information:

- ❑ Volume label (if available),

- ❑ Type of the logical disk,

- ❑ File system (represented by the color of the graph and the selected bar),

❑ Total size, used space and free space (in GB or MB).

Below there is a list of wizards, which may be called for this disk. All default values of parameters will correspond to the disk settings.

## BUILDING WIPING MEDIA

The Wiping Media Builder provides the possibility to prepare the Linux/DOS wiping environment on external media (CD, DVD) to boot and run utilities under Linux or PTS DOS, and that way to get access to your hard disk for maintenance or recovery purposes. Besides it enables to save data from partitions of your hard disk directly to compact discs or just burn ISO-images.

### STARTUP

There are several ways to start the Wiping Media Builder:

**Launcher**

❑ In the Main Menu: select **Tools > Wiping Media Builder…**

❑ On the Common Tasks Bar: click the **Wiping Media Builder** item of the Wizards menu.

### SETUP

The wizard offers the following steps to build wiping media:

❑ **Type of the wiping media**. You can place it on a CD/DVD disc.
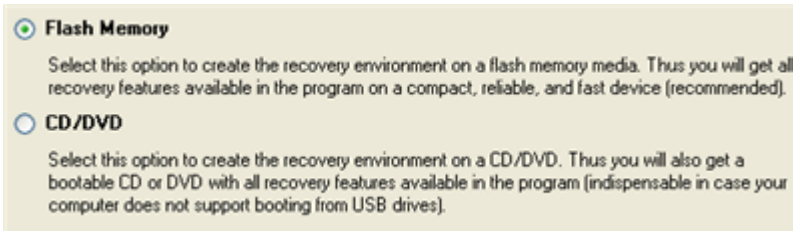


❑ **Contents of the wiping set**. You can choose whether to use the default Linux/DOS wiping environment (included in the installation package) or your own bootable image (need to provide a path to it). Besides you're free to add any data you like to the standard image what is very convenient.



❑ **A recording device**. The appropriate external media (CD/DVD) needs to be available in the system.

> ⚠ **You can make an ISO image instead of burning a CD/DVD by selecting the Emulator drive.**

- ❑ **CD/DVD writing parameters**. Writing parameters include writing speed (maximum or minimum) and the ability of ejecting the recorded disc after completing the operation.

Writing speed: Maximum ▾

☐ Eject the disc after writing

The program supports CD-R, CD-RW, DVD-R, DVD+R, DVD-RW, DVD+RW, DVD-R, DVD+R double layer and also Blu-ray discs.

> ⚠ **If the inserted disc is not empty, the wizard will suggest erasing its contents (if possible). Once the operation has been confirmed, the program will delete the re-writable disc's contents and begin the recording process.**

## RESULT

As a result of the operation, you receive wiping media.

## PARTITION MANAGEMENT

In this chapter you will find all the information necessary to carry out partitioning operations supported by the program.

### BASIC PARTITIONING OPERATIONS

Here you can learn how to accomplish basic partitioning operations (create, format, delete).

#### CREATING PARTITIONS

The program provides the ability to create a new partition by using the DOS partitioning scheme. This operation can be accomplished the Create Partition Dialog.

#### RESTRICTIONS

1. Do not use the Create Partition function in order to undelete the last deleted partition.

2. The program cannot create new partitions on Dynamic Disks. The current version of the program supports only hard disks that use the DOS partitioning scheme (in Windows 2000 and XP these disks are named Basic Disks).

3. According to the rules of the DOS partitioning scheme, the following combinations of partitions cannot be created:

   ❑ Two Extended Partitions on one hard disk

   ❑ Five or more Primary partitions on one hard disk

   ❑ If there is an Extended Partition on the disk, only three Primary partitions are allowed

4. The program allows creating new partitions only within blocks of un-partitioned space. It cannot convert a free space on an existing partition to a new partition.

## DIALOG STARTUP

In order to start the operation you should take the following steps:

**Launcher**

1. Select a block of free space on the Disk Map;

2. Call the Create Partition Dialog to set up the operation. There are several ways to do it:

   ❑ Select in the Main Menu: **Partition > Create Partition**.

   ❑ Call the popup menu for the block of free space (right click of the mouse button) then select the menu item: **Create Partition**.

## DIALOG SETUP

Initially the program suggests some consistent values for all parameters. In most cases, you can just press the Yes button to confirm the operation.
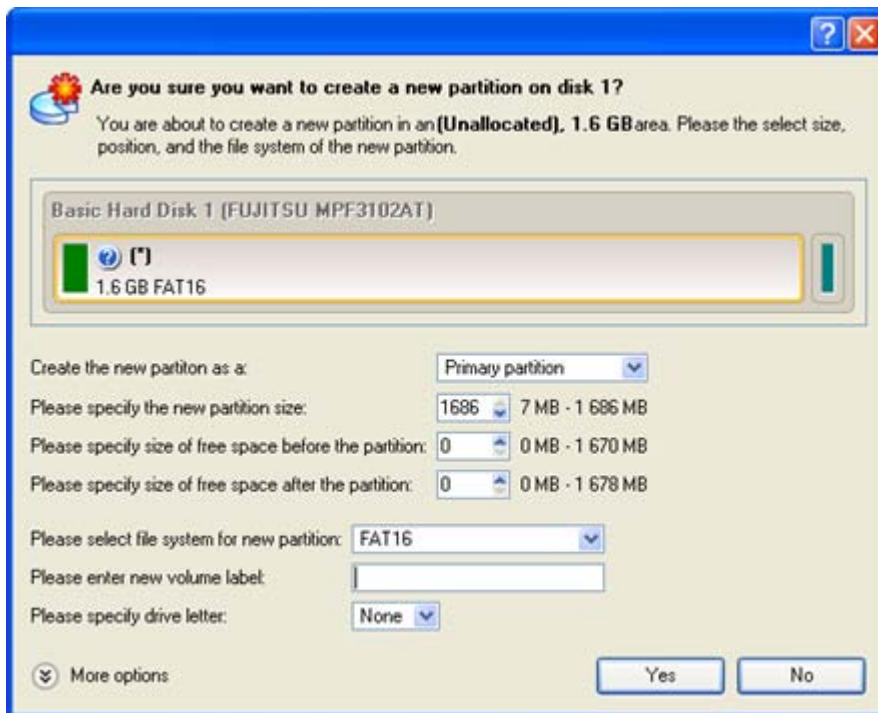


❑ **Define whether the partition will be Primary, Extended or Logical**. You can choose the desired partition type from the pull-down list. As a matter of fact, the available alternatives fundamentally depend on the selected block of free space - within the Logical free space, only Logical partitions can be created; Within the Primary free space, both Primary partitions or the Extended Partition can be created.

❑ **Partition Size**. Define the size (in Mb) of the new partition.

❑ **Free space before**. Define the position (in Mb) of the new partition relative to the beginning of the block of free space.

❑ **Free space after**. Define the amount of trailing free space (in Mb) at the end of the new partition.

> ⚠️ **Partition size and position may also be defined by using the drag-and-drop technique. To do that, just carry out the required operation on the Disk Map. The virtual operations are to be available.**

- ❑ **File system for new partition**. From the pull-down list select a file system the newly created partition will be formatted to, otherwise the partition will remain unformatted (so that it will not be ready to use).

- ❑ **Volume label**. Enter a label for the selected partition in this textual field. It is an irrelevant parameter usually used for drive identification.

- ❑ **Drive letter assignment**. The pull-down list contains vacant drive letters that can be associated with the newly formatted partition.

In addition, there is the possibility to make further detailed settings (although the default values will do in most cases). To activate the advance mode, you need to click the More options button at the foot of the dialog page. Depending on the chosen file system, the following options become available:



- ❑ **Use OS built-in routine**. Mark the option to restrict the available values according to the used OS.

- ❑ **Whether the surface test will be performed**. Define the level of the surface check to make the program find bad and unstable sectors and mark them unusable in the file system metadata.

- ❑ **The amount of sectors per boot**. This parameter is available exclusively for FAT16 and FAT32 file systems. Set the number of sectors to be reserved for the boot area on the partition with this spinner control.

- ❑ **The amount of root entries**. This parameter is available exclusively for FAT16 file system. Set the maximum amount of files/directories to be placed in the Root Directory on the FAT16 partition.

- ❑ **The amount of sectors per cluster**. Define the Cluster Size for the formatted partition with this spinner control.

> ⚠️ **Number of available options depends on the selected file system type.**

## RESULT

After the operation is completed you receive a fully functional partition.

## FORMATTING PARTITIONS

Any partition should contain some file system to be used for keeping data. The process of installing a file system is commonly known as formatting. A huge variety of file systems have been developed these days.

## SUPPORTED FILE SYSTEMS

The program provides the ability to format partitions of the following file systems:

- FAT12 & FAT16

- FAT32

- NTFS

- Ext2

- Ext3

- Linux Swap v. 2

- HPFS

This operation can be accomplished either with the Format Partition Dialog.

## DIALOG STARTUP

In order to start the operation you should take the following steps:

**Launcher**

1. Select a partition on the Disk Map;

2. Call the Format Partition Dialog to set up the operation. There are several ways to do it:

   ❑ Select in the Main Menu: **Partition > Format Partition**.

   ❑ Call the popup menu for the selected partition (right click of the mouse button) then select the menu item: **Format Partition**.

## DIALOG SETUP

Initially the program suggests some consistent values for all parameters. In most cases, you can just press the Format button to confirm the operation.
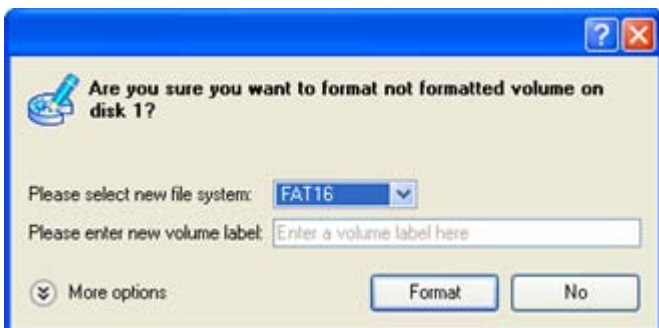


- ❑ **File system**. From the pull-down list select the desired file system type. In fact, the program displays only those file systems that can correctly be placed to the selected partition, taking its capacity into account.

- ❑ **Volume label**. Enter a label for the selected partition in this textual field. It is an irrelevant parameter usually used for drive identification.

In addition, there is the possibility to make further detailed settings (although the default values will do in most cases). To activate the advance mode, you need to click the More options button at the foot of the dialog page. Depending on the chosen file system, the following options become available:



- ❑ **Use OS built-in routine**. Mark the checkbox to restrict the available values according to the used OS.

- ❑ **Whether the surface test will be performed**. Define the level of the surface check to make the program find bad and unstable sectors and mark them unusable in the file system metadata.

- ❑ **The amount of sectors per boot**. This parameter is available exclusively for FAT16 and FAT32 file systems. Set the number of sectors to be reserved for the boot area on the partition with this spinner control.

- ❑ **The amount of root entries**. This parameter is available exclusively for FAT16 file system. Set the maximum amount of files/directories to be placed in the Root Directory on the FAT16 partition.

- ❑ **The amount of sectors per cluster**. Define the Cluster Size for the formatted partition with this spinner control.

 **Number of available options depends on the selected file system type.**

## RESULT

After the operation is completed you receive a fully functional partition formatted to the specified file system.

## DELETING PARTITIONS

With the Delete Partition Dialog you can delete a partition on a hard disk partitioned with the DOS partitioning scheme. Unlike the majority of other utilities (Windows Disk Manager included), the program can not only remove references to the deleted partition from the Partition Table, thus making it unavailable for the operating system, but also enables to irreversibly destroy its data. This feature will guarantee security of your personal information.

## DIALOG STARTUP

In order to start the operation you should take the following steps:

**Launcher**

1. Select a partition on the Disk Map;

2. Call the Delete Partition Dialog to set up the operation. There are several ways to do it:

   - ❑ Select in the Main Menu: **Partition > Delete Partition**.

❑ Call the popup menu for the selected partition (right click of the mouse button) then select the menu item: **Delete Partition**.

## DIALOG SETUP

Initially the program suggests you just to remove references to the selected partition from the Partition Table.



❑ **Enter the volume label to confirm deleting**. To confirm deletion of the selected partition, enter its Volume Label. The current volume label is displayed above.

❑ **Do not ask volume label next time**. Mark the option to inhibit confirmation next time you start the dialog.

To additionally destroy the on-partition data, click the More options button at the foot of the dialog page, so you will be able to define:
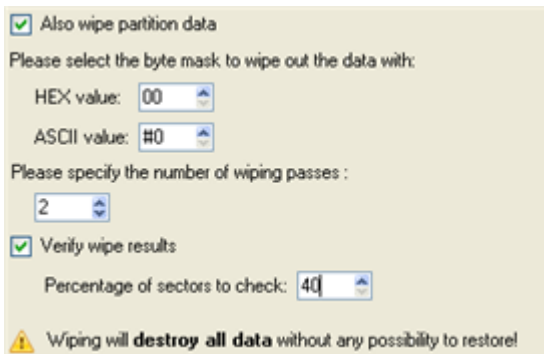


❑ **Select the byte mask….**. The HEX value spinner control enables to set a two-figure hexadecimal character value ("00" by default). The available range is from "00" to "FF". It is synchronized with the ASCII value.

❑ **Specify the number of wiping passes**. You can choose a number of passes for the wiping pattern.

❑ **Verify wipe results**. You can also choose whether to carry out residual data verification or not specifying the percentage of sectors to check.

## RESULT

By default, the operation takes only a fraction of a second. However, the program waits until Windows completes the modification of the disk layout. In case you decide to wipe the on-partition data as well, the operation will take much longer, depending on the set wipe parameters.

## HARD DISK MANAGEMENT

In this chapter you will find all the information necessary to carry hard disk operations supported by the program (Update MBR, Convert to Basic, Change Primary Slot).

## UPDATING MBR

The program enables to overwrite the current bootable code in the MBR (Master Boot Record) by the standard bootstrap code. This can help to repair a corrupted bootable code of a hard disk resulted from a boot virus attack or a malfunction of boot management software.

In order to update MBR of a hard disk you should take the following steps:

1. Select a hard disk on the Disk Map.

2. Call the Update MBR dialog to set up the operation. There are several ways to do it:

   ❑ Select in the Main Menu: **Hard Disk > Update MBR**.

   ❑ Call the popup menu for the selected hard disk (right click of the mouse button) on the Disk Map, then select the menu item: **Update MBR**.
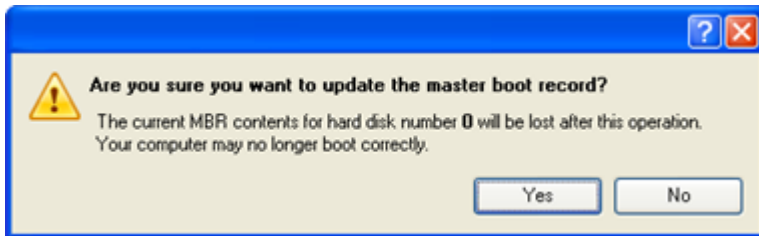


3. The operation will be performed immediately after confirmation.

## WIPE TASKS

In this chapter you will find all the information necessary to wipe a hard disk/partition of any file system or only destroy any remnants of deleted files/directories left on disk without affecting the used data, thus providing high level of security.

The operation can be accomplished with the Wipe Wizard or corresponding dialogs.

### WIZARD STARTUP

**Launcher**

   ❑ In the Main Menu: select **Wizards > Wipe Hard Disk or Partition…**

### WIZARD SETUP

The wizard offers the following steps to accomplish the operation:

   ❑ **The hard disk/partition to wipe**. Select a hard disk/partition the data of which you want to destroy.

Please choose an object for wiping. It can be a whole hard disk, a single partition or a block of unallocated space. You can set to wipe all data on the partition or only unoccupied space on it (see the next step).

**Basic Hard Disk 0 (Maxtor 7Y250P0)**

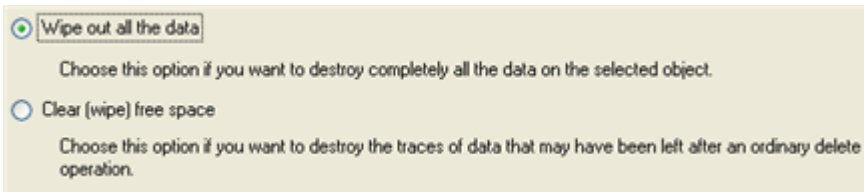Local Disk (F:)
233.7 GB NTFS

**Basic Hard Disk 1 (ST3160815AS)**

... 19.5 ...   Applications (D:) 63.4 GB NTFS   Other Stuff (E:) 66 GB NTFS

❑ **Wipe mode**. This section enables to switch between two options:

⊙ Wipe out all the data

    Choose this option if you want to destroy completely all the data on the selected object.

○ Clear (wipe) free space

    Choose this option if you want to destroy the traces of data that may have been left after an ordinary delete operation.

- **Wipe out all data**. Select the option to irreversibly destroy all on-disk data of the selected object.

- **Clear (wipe) free space**. Select the option to destroy any remnants of deleted files/directories left on disk without affecting the used data.

---

⚠️ **The Clear Free Space operation is available only for Logical and Primary partitions of known file systems.**

---

❑ **Wipe method**. Here you can select a specific data erasure algorithm or create a customized method by marking the appropriate option.

⊙ Specific algorithm

US DoD 5220.22-M

    You can see the algorithm description and set the level of verification on the next page.

○ Create your own Data Sanitization method

    You can create your own Data Sanitization method.

- In case you preferred to use a specific algorithm, the next page of the wizard enables to get detailed information on the selected algorithm, choose whether to carry out residual data verification or not specifying the percentage of sectors to check and estimate the time required to accomplish the operation.

- In case you preferred to create a customized algorithm, the next page of the wizard enables to define up to 4 wiping patterns, number of passes for each wiping pattern and for the group of patterns. The Mask spinner control allows you to set a two-figure hexadecimal character value ("00" by default). The available range is from "00" to "FF". You can also choose whether to carry out residual data verification or not specifying the percentage of sectors to check.



❑ **Revise your changes**. This page informs on all the actions to be made in the wizard in a bright, graphical form.



## WIZARD RESULT

After the operation is completed you can see a well informative summary page, providing structurally divided in-depth information on all the actions made in the wizard.
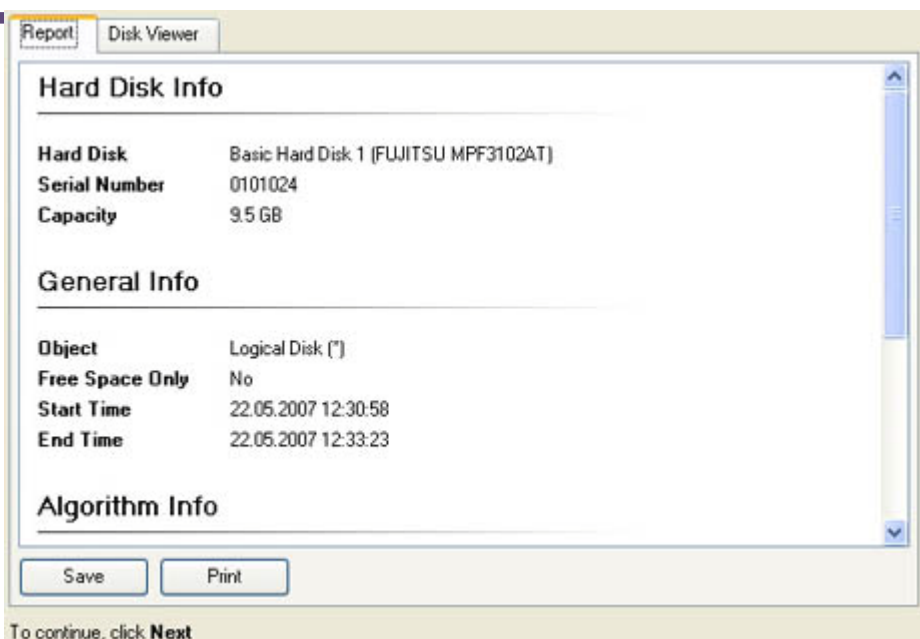
The program also enables to store the resulted report. To do that, just press the Save button and choose the exact location in the opened dialog.

To make sure that all on-disk data is irreversibly destroyed call the Disk Viewer dialog by clicking the appropriate tab and see it for yourself.



---
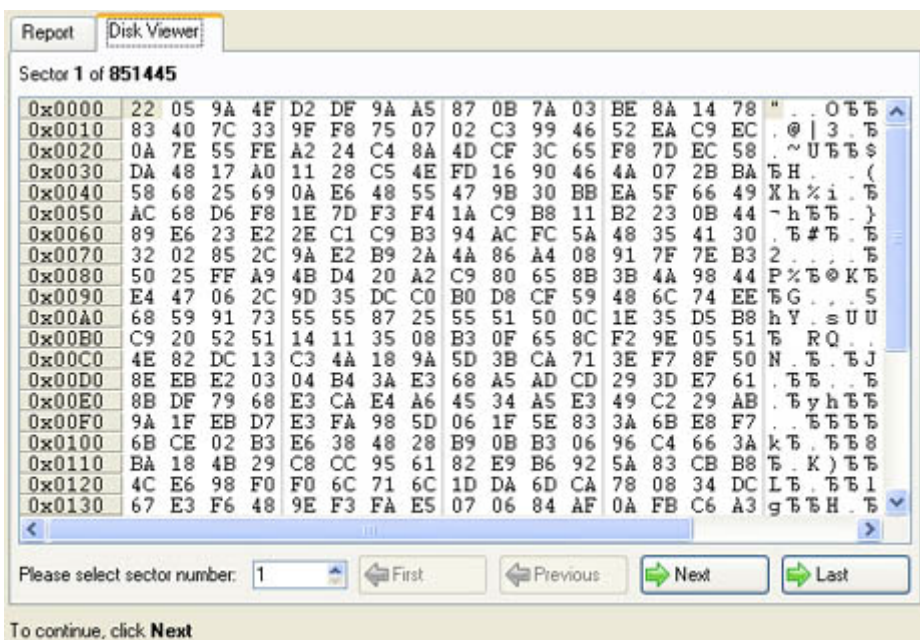
⚠ **The Summary page will be available only when the Virtual operations are disabled.**

**Some features may be unavailable in the version of the product you have. To learn more about it please consult the [Disk Wiper Editions](#) chapter.**

---

**Available operation scenarios:**

❑  [Hard Disk Utilization](#)

## TASK SCHEDULING

Automation of operations can really help you out when you've got to accomplish certain routine operations on a regular basis as it enables to execute them without your involvement while optimizing your computer's work-load.

### SETTING A TIMETABLE

Thanks to the embedded Scheduler, you can set a timetable for execution of any operation. It has two categories for time settings (these correspond to appropriate items in the Schedule type menu):

❑ **Initiating the operation by an event**:

- One time only (i.e. the Once item)

- When the system starts (i.e. the At System Startup item)

- When the user logs on (i.e. the At Logon item).

❑ **Initiating the operation periodically (i.e. Daily, Weekly, Monthly)**.
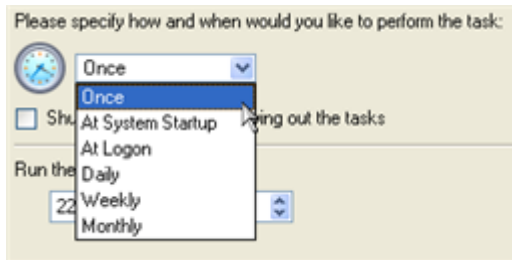


You need to select one of the variants. Depending on your choice, the scheduler displays a form that enables to set a timetable.
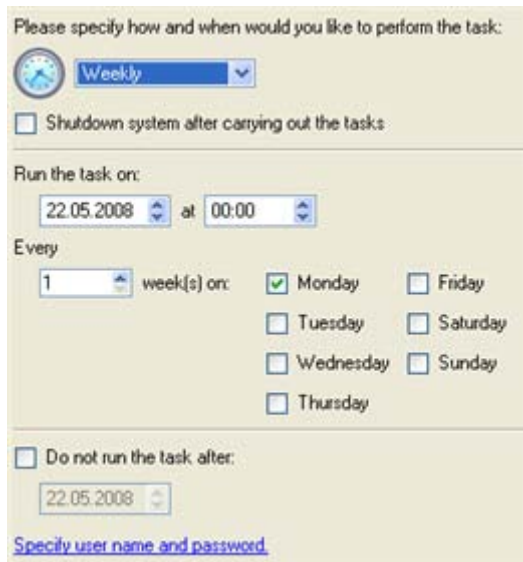


**To run the task in the log-off mode, please specify administering login info by following the appropriate link in the left lower corner of the page.**

**The Shutdown System on Complete option enables to automatically switch off the computer on the successful accomplishment of the operation.**

## MANAGING TASKS

All scheduled tasks are placed in a separate list, which can be retrieved by clicking the Scheduled Tasks tab in the Explorer Bar:
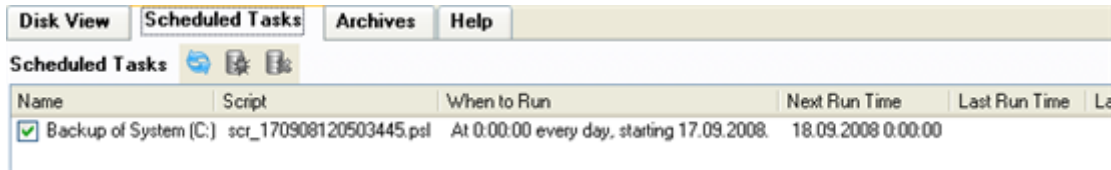


On every task you can get in-depth information, including:

- ❑ The task name

- ❑ The full path to the generated script of the task

- ❑ Scheduled time of launch

- ❑ Statistics on the last launch

- ❑ Scheduled time of the next launch

- ❑ Used account information

- ❑ Comments to the task

To easily manage tasks, the program enables to arrange them according to a certain characteristic just by clicking on the required property.

---

⚠ **This feature can be particularly beneficial when the Scheduled Tasks list contains too many items.**

---

You can also enable/disable, rename, delete, refresh or modify properties of the selected task.

## TASK EDITOR

With the Task Editor you can easily modify properties of scheduled tasks. To do that, you should take the following steps:

**Launcher**

1. Select a task on the Scheduled Tasks list.

2. Call the Task Editor dialog. There are several ways to do it:

   - ❑ Click the **Properties** button on the Scheduled Tasks list.

   - ❑ Call the popup menu for the selected task (right click of the mouse button), then select the menu item: **Properties**.
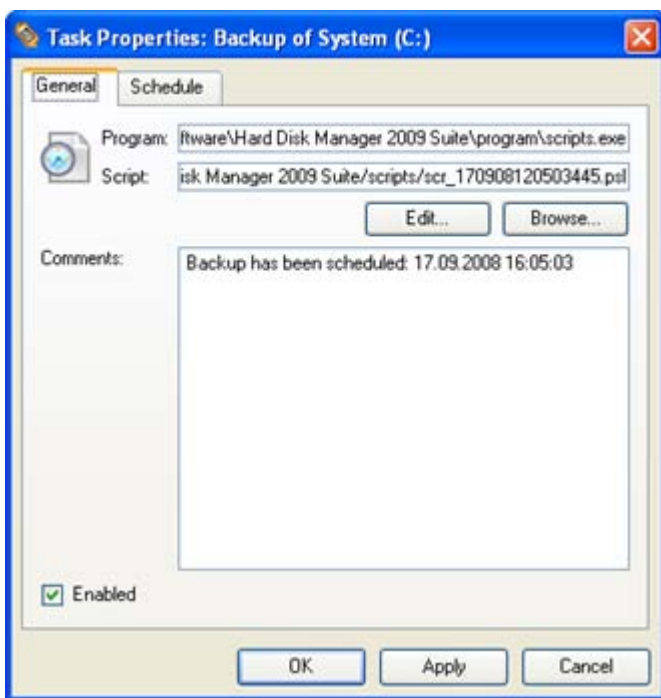
3. In the opened dialog window you can see two tabs - General and Schedule. Click the General tab to modify:

❑ Full path to the macro-command program-interpreter, which describes the scheduled task;

❑ Command line for starting the interpreter (i.e. the task described in macro-language)

❑ Comments referring to the task

❑ The option of enabling/disabling the task.

By clicking the Schedule tab you can modify the task timetable.

In order to apply the changes, you need to click the Apply button at the foot of the dialog.

## CREATING A SCHEDULED TASK

You can set a timetable for execution of any operation. For backup and copy operations the program offers handy wizards, while all the others can be scheduled with the Save to Scheduler dialog.

To create a scheduled task you should take the following steps:

**Launcher**

1. Make sure the virtual mode of execution is enabled;

2. Carry out with the program all operations you need to schedule;

3. Call the Save to Scheduler dialog in the Main Menu: **Tools > Save to Scheduler…**;
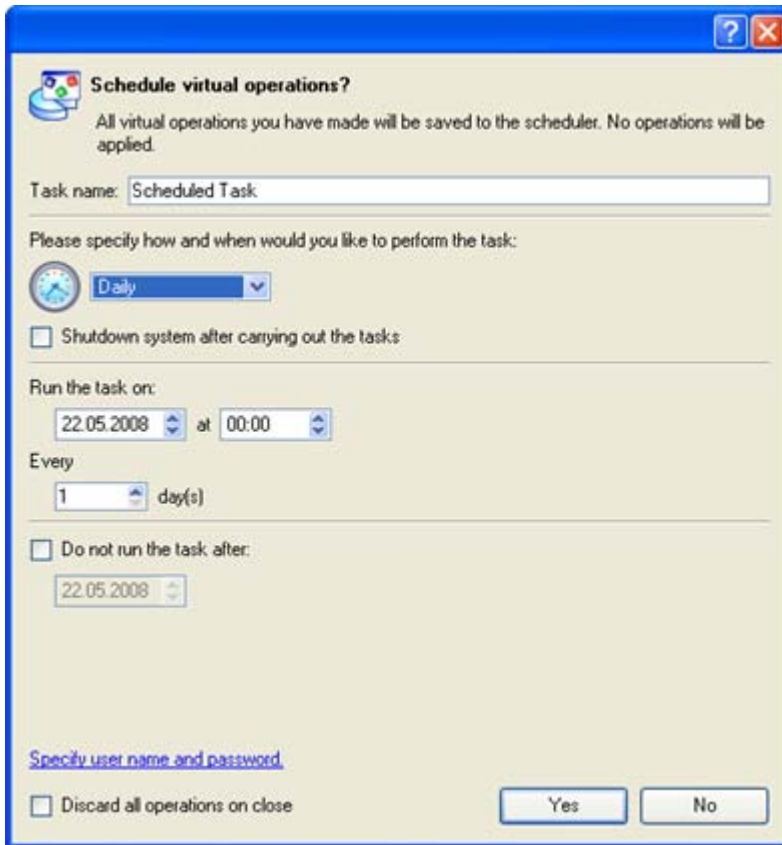
4. In the opened dialog enter the required task name and specify the task timetable;

5. The operation will be performed immediately after confirmation.

---

⚠ **This command is unavailable if there are no operations on the List of Pending Operations.**

**Some features may be unavailable in the version of the product you have. To learn more about it please consult the [Disk Wiper Editions](#) chapter.**

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## SCRIPTING

The program actions can also be represented in form of a script. The script describes the appropriate operation with macro-language commands. There is an interpreter utility - SCRIPTS.exe, which is included in the program installation package. This utility works in the unattended mode, which enables to automate operations.

### STARTUP

You have no need to write a script since the program has a convenient interface for such a task. In order to generate a script on the base of the entered parameters of the required operation, you should take the following steps:

**Launcher**

1. Make sure the [virtual mode of execution is enabled](#);

2. Carry out with the program all operations you need to be scripted;

3. Call the Generate Script dialog in the Main Menu: **Tools > Generate Script…**.

Initially the program suggests some consistent values for all parameters. In most cases, you can just press the Generate button to confirm the operation.
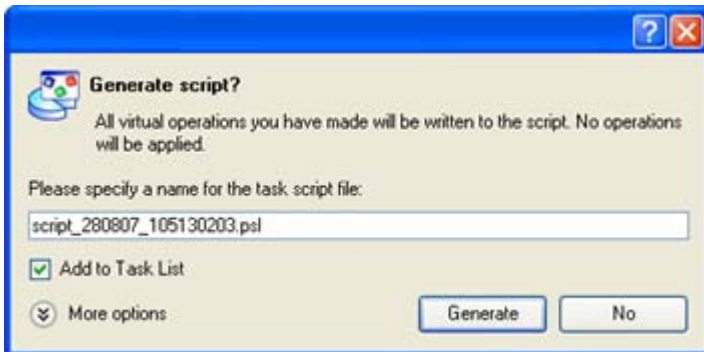


❑ **Script file name and location**. By default, the program offers to add the script to the Task List with a name containing its creation date and time. Unmark the Add to Task List checkbox to define an exact location and a filename for the script file. The default file extension that is reserved for scripting files is .psl, which however can be modified.

In addition, there is the possibility to make further detailed settings (although the default values will do in most cases). To activate the advance mode, you need to click the More options button at the foot of the dialog page, so you will be able to define:
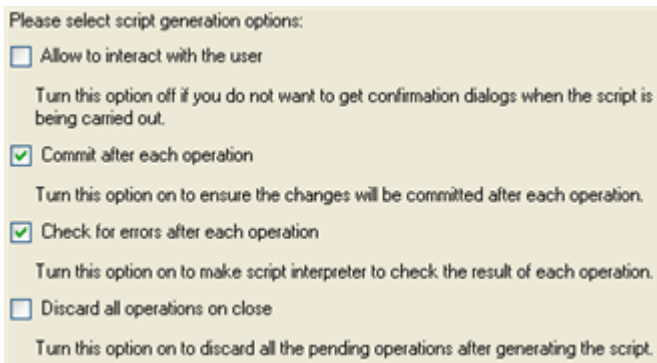


❑ **Interaction with the user**. Mark the option to pause the script interpreter during the execution to prompt the user's confirmation or other input. Otherwise the program will not stop using default values for parameters if needed.

❑ **Commit after each operation**. Mark the option to commit changes after each operation.

❑ **Check for errors after each operation**. Mark the option to insert a special code in script, which checks the status of the last executed operation and stops the script processing if there are errors of any kind.

❑ **Discard all operations on close**. Mark the option to empty the List of Pending Operations after generating the script.

## RESULT

After the operation is completed you receive a new script file. It is placed into the specified destination, its features defined in the dialog.

**This command is unavailable if there are no operations on the List of Pending Operations.**

**To learn more about scripts please consult the Paragon Scripting Language manual.**

**Some features may be unavailable in the version of the product you have. To learn more about it please consult the Disk Wiper Editions chapter.**

## EXTRA FUNCTIONALITY

This chapter describes the supplementary functionality available in the program.

## VIEW PARTITION/HARD DISK PROPERTIES

The program enables to obtain in-depth information on the properties of hard disks and partitions. Besides the general information, such as capacity, used space or file system type it provides the possibility to get info on hard disk geometry, cluster size, exact partition location, etc.

There are several ways to get properties on a partition/hard disk:

**Launcher**

1. Choose a partition/hard disk on the Disk Map, then select in the Main Menu: **Partition/Hard Disk > Properties…**;

2. Call the popup menu for the selected partition/hard disk (right click of the mouse button) on the Disk Map, then select the menu item: **Properties…**
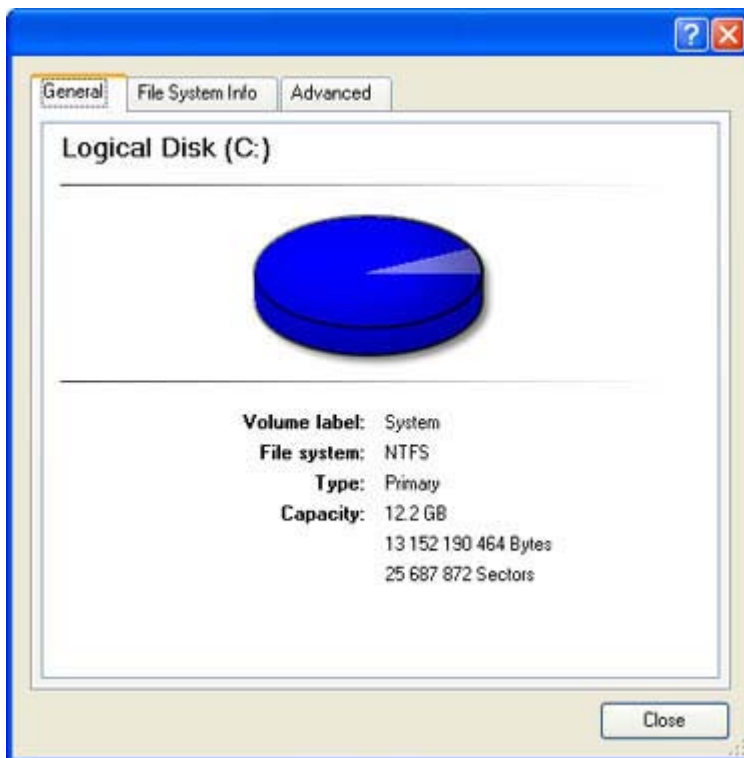


In the opened dialog information will be grouped according to its properties, thus by clicking tabs you can get information you need.

## MOUNT PARTITION

The program enables to assign or remove drive letters of existing formatted partitions.

### ASSIGN DRIVE LETTER

In order to mount a partition you should take the following steps:

**Launcher**

1. Select a partition on the Disk Map.

2. Call the Add Drive Letter dialog to set up the operation. There are several ways to do it:

   ❑ Select in the Main Menu: **Partition > Assign Drive Letter…**

   ❑ Call the popup menu for the selected partition (right click of the mouse button) on the Disk Map, then select the menu item: **Assign Drive Letter…**

3. Specify a drive letter for the selected partition. Initially the program suggests some consistent value for this parameter. So you may just press the Yes button to confirm the operation.



   However you can manually define the required letter by selecting it from the pull-down list of available drive letters.

4. The operation will be performed immediately after confirmation.

### REMOVE DRIVE LETTER

In order to un-mount a partition you should take the following steps:

**Launcher**

1. Select a partition on the Disk Map.

2. Call the Remove Drive Letter dialog to define appropriate settings. There are several ways to do it:

   ❑ Select in the Main Menu: **Partition > Remove Drive Letter**.

   ❑ Call the popup menu for the selected partition (right click of the mouse button) on the Disk Map, then select the menu item: **Remove Drive Letter**.

3. The operation will be performed immediately after confirmation.

**Modifying drive letter of the system partition will result in inability to boot the operating system.**

**After having processed partitions with installed software, some programs may not run properly.**

## TEST SURFACE

The program enables to test surface of existing partitions and blocks of free space for bad or unstable sectors. If found any it automatically marks them unusable in the file system metadata, thus minimizing the risk of data loss.

In order to start the surface test you should take the following steps:

**Launcher**

1. Select a partition or a block of free space on the Disk Map.

2. Call the Test Surface dialog to set up the operation. There are several ways to do it:

   ❑ Select in the Main Menu: **Partition > Test Surface…**

   ❑ Call the popup menu for the selected partition (right click of the mouse button) on the Disk Map, then select the menu item: **Test Surface…**

3. From the pull-down list choose the level of the surface check.
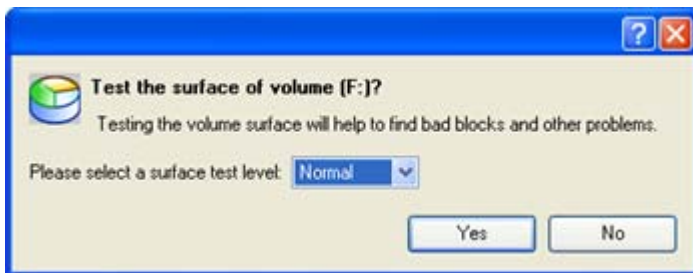


4. The operation will be performed immediately after confirmation.

## CHECK FILE SYSTEM INTEGRITY

The program allows you to check integrity of a file system. It can be used to detect possible file system errors before performing any operation on a partition.

To start the system integrity check you should take the following steps:

**Launcher**

1. Select a partition on the Disk Map

2. Call the Check File System Integrity dialog to set up the operation. There are several ways to do it:

   ❑ Select in the Main Menu: **Partition > Check File System Integrity**

   ❑ Call the popup menu for the selected partition (right click of the mouse button) on the Disk Map, then select the menu item: **Check File System Integrity**.

3. Initially the program suggests some consistent values for all parameters. In most cases, you can just press the Yes button to confirm the operation.
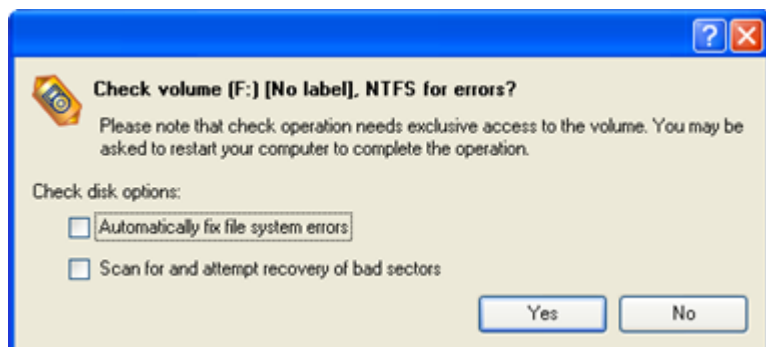


❑ **Automatically fix file system errors**. Mark the checkbox to automatically fix any found error without requesting a confirmation.

❑ **Scan for and attempt to recover bad sectors**. Mark the checkbox to additionally process sectors marked bad in the file system metadata for the purpose of their possible recovery.

4. The operation will be performed immediately after confirmation.

## EDIT/VIEW SECTORS

With the built-in Edit/View Sectors tool the program enables to view/edit sectors on existing partitions/hard disks providing the possibility to directly access and modify sectors, save and restore sectors from specified files, navigate through the system metadata, etc.

In order to edit/view sectors of a hard disk/partition you should take the following steps:

**Launcher**

1. Select a hard disk/partition on the Disk Map.

2. Call the Edit/View Sectors dialog to set up the operation. There are several ways to do it:

❑ Click the **Disk View** tab and then choose **Disk Editor**.

❑ Select in the Main Menu: **Partition/Hard Disk > Edit/View Sectors**.

❑ Call the popup menu for the selected partition/hard disk (right click of the mouse button) on the Disk Map, then select the menu item: **Edit/View Sectors**.
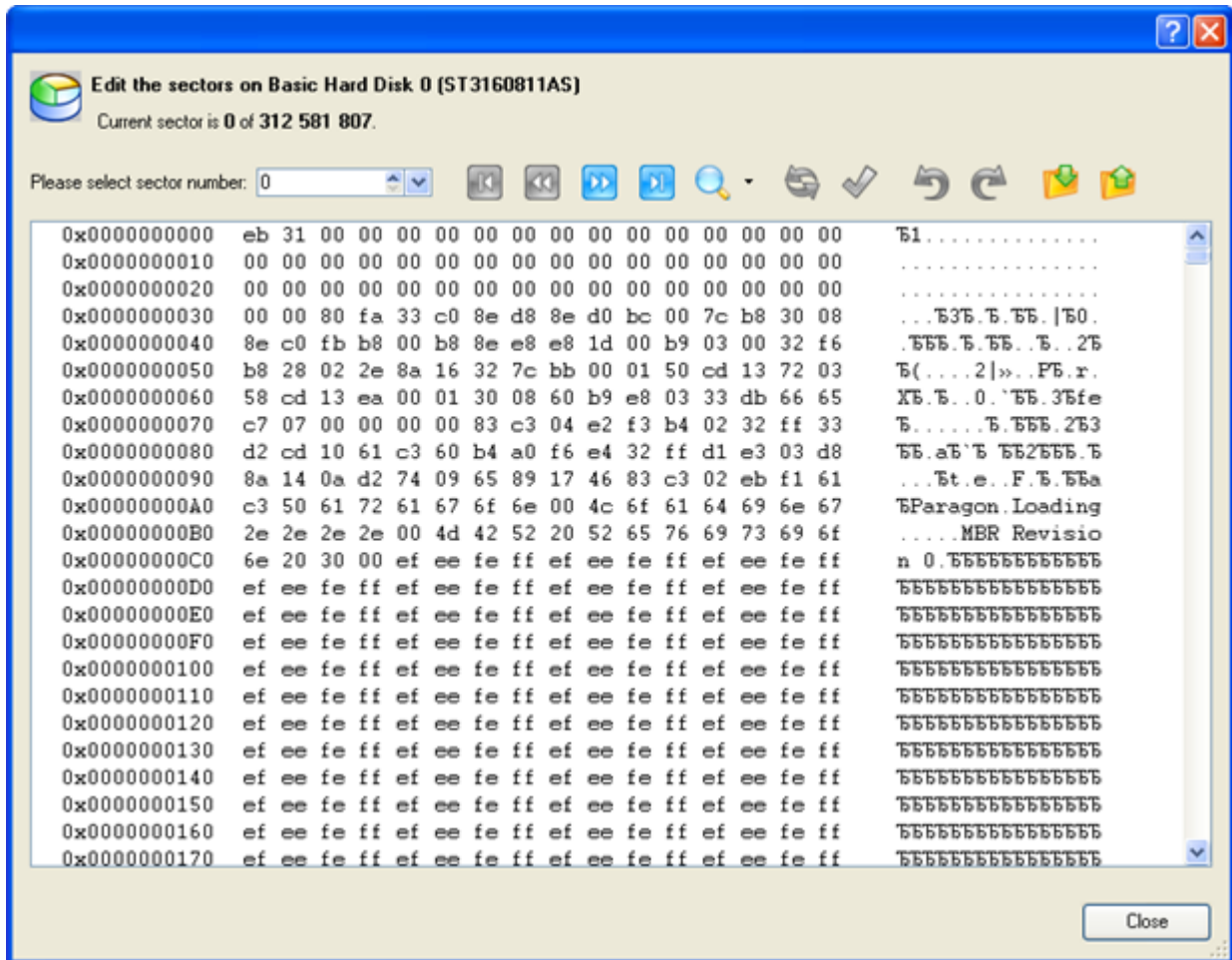
⚠ **Careless use of the Edit Sectors function may result in the irreversible data corruption.**

## SEND LOG FILES

The program enables to simplify the procedure of sending support requests to the Paragon Support Team. In case of having difficulties with handling the program, you, with the help of this very function, can address the company support engineers and provide them with all the information they need such as the disk layout, performed operations, etc. in order to tackle the encountered problem. Information of that kind is stored in Log files.

In order to send log files to the Paragon Support Team you should take the following steps:

**Launcher**

1. Call the Send Log Files dialog in the Main Menu: **Tools > Send Log Files**;

2. Provide a customer name and a product serial number;

3. Give a detailed description on the encountered problem.

By clicking the Send button the built-in mail client will generate a template request with attached compressed log files and then send it to the Paragon Support Team.

## LOG FILES

Log files are simple textual files that can be opened by any text editor. There are several log files automatically generated by the program:

| | |
|---|---|
| **Stubact.log** | **Contains in-depth information on parameters and performance of all operations carried out by the program** |
| **Pwlog.txt** | Besides brief overview on operations it also contains detailed information about the state of all hard disks |
| **Cdb.log** | Contains low-level information on the CD/DVD devices used in the system |
| **BioNTlog.txt or Bio95log.txt** | It is an OS-dependent supplementary log file derived from Bioxx.dll. It may contain valuable information on Windows family operating systems |

**Log files do not contain any confidential information on the operating system settings or the user documents.**

**The Send Log Files function is only available when outgoing mail server (SMTP) and the user e-mail address are properly set. To learn more about it please consult the Settings Overview chapter.**

**Some features may be unavailable in the version of the product you have. To learn more about it please consult the Disk Wiper Editions chapter.**

## VIEW LOGS

With a handy dialog you can study logs on any operation carried by the program. To make this job as easy as possible, all the information is structurally divided, besides there is the possibility to see the disk layout before and after an operation, what is very convenient.

**Launcher**

In order to view logs on carried out operations call the View Logs dialog in the Main Menu: **Tools > View Logs…**
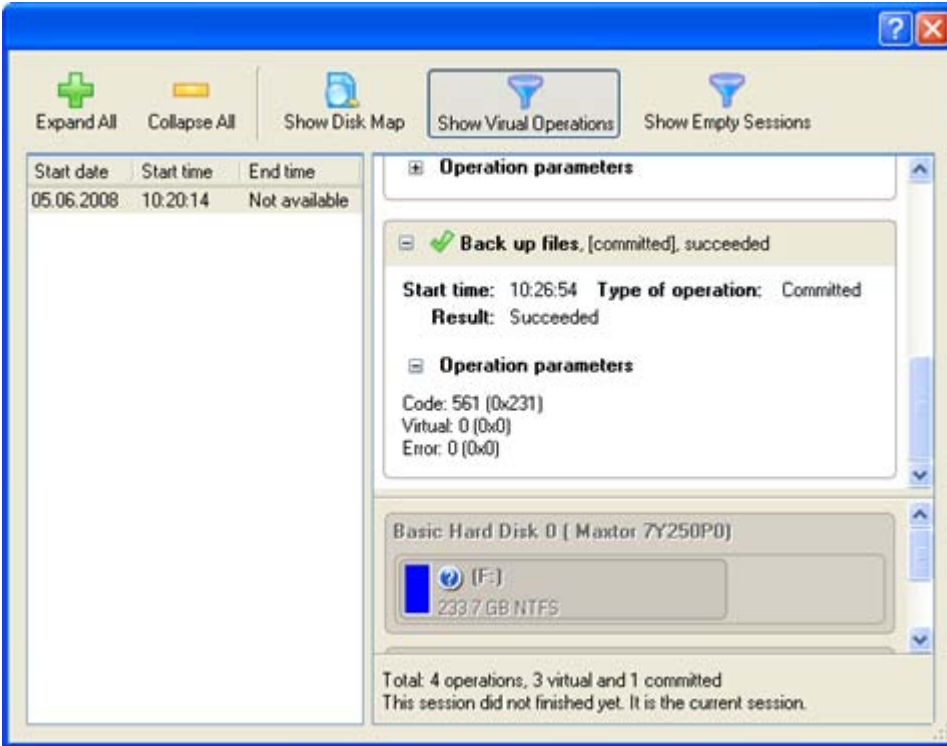


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⚠ **Some features may be unavailable in the version of the product you have. To learn more about it please consult the [Disk Wiper Editions](#) chapter.**

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## TYPICAL SCENARIOS

This chapter lists a number of the most frequently used scenarios that may be accomplished with the program. You can find here useful recommendations and descriptions of operations.

### RECOVERY SCENARIOS

#### FIXING MBR AFTER A BOOT VIRUS ATTACK

Let's assume that the MBR (Master Boot Record) of your hard disk has been corrupted as a result of a boot virus attack, thus your system fails to boot.

To fix the MBR of your hard disk, please do the following:

1. Insert Paragon Linux/DOS Wiping CD (the BIOS must be enabled to boot the system from the CD/DVD device).

2. Restart the computer.

3. In the boot menu select **Normal Mode** to use the Linux wiping environment (more preferable) or **Safe Mode** to use the PTS DOS wiping environment (in case you've got problems with Linux). Moreover you've got the option to boot into the **Low-Graphics Safe Mode** (PTS DOS safe mode) to cope with a serious hardware incompatibility. In this case, only the minimal set of drivers will be included, like hard disk, monitor, and keyboard drivers. This mode has simple graphics and a simple menu.

```
Normal Mode                         The PC booting
Safe Mode                           will be proceeded in
Low-Graphics Safe Mode              08 seconds
Floppy disk
Hard disk 0 MBR
Find OSes on your hard disks
```

> ⚠ **By default the Normal Mode will be automatically initiated after a 10 second idle period.**

4. In the Linux launch menu select Boot Corrector. You can find it in PTS DOS as well.

Paragon Disk Wiper™

File Transfer Wizard

Boot Corrector

Log Saver

Start the command line

Reboot the computer

Power off

Boot Corrector allows you to cure the majority of boot problems for Windows 2000/XP/Server 2003/Win Vista/ 2008 Server/Win 7. The key advantage of Boot Corrector is that it can correct the Windows System Registry without Windows loaded. It also helps with other operating systems when common boot problems take place.

5. On the Wizard's Welcome page, select the **Correct the Master Boot Record (MBR)** option.

Please choose the operation:

○ Search for Windows installations to correct
◉ Correct the Master Boot Record (MBR)
○ Correct the partition boot record
○ Modify partition parameters
○ Correct boot parameters (boot.ini, BCD)

To begin, click Next.

6. On the next page choose the required hard disk from the pull-down list (if several) and then select the **Update the MBR executable code** option.
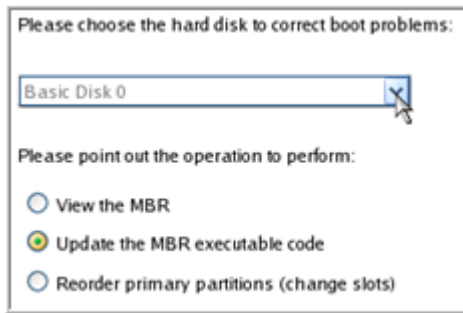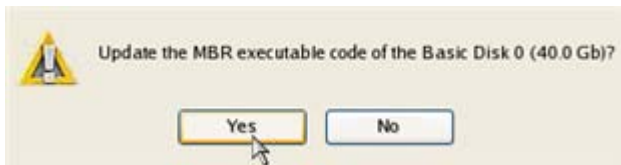


7. Confirm the operation.



8. After the operation is completed click the Report button to see a well informative summary page. The program also enables to store the resulted report. To do that, just press the Save button and choose the exact location in the opened dialog.
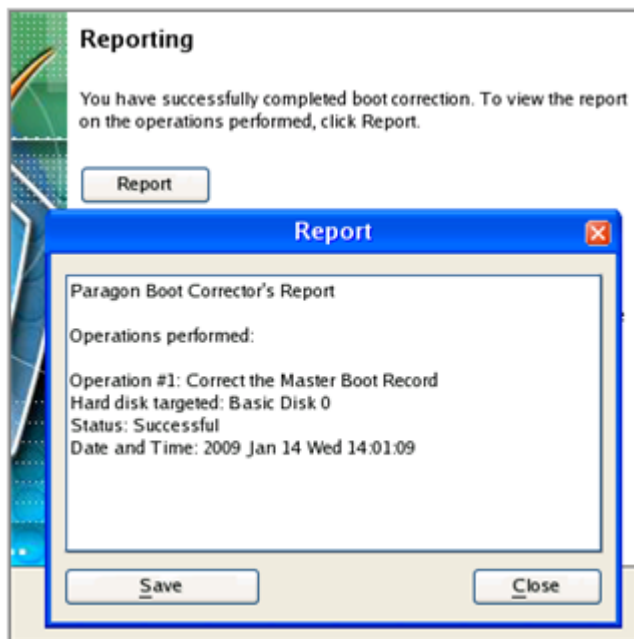


9. Click the Finish button to close Boot Corrector.

10. Eject the CD.

11. Reboot the computer.

> ⚠ **Some features may be unavailable in the version of the product you have. To learn more about it please consult the Disk Wiper Editions chapter.**

## FIXING WINDOWS STARTUP ABILITY

Let's assume that due to an unknown reason your Windows fails to complete the startup procedure. At first everything seems quite OK, you can see the standard startup messages on the screen, but at some moment it hangs up.

To fix your Windows startup ability, please do the following:

1. Insert Paragon Linux/DOS Wiping CD (the BIOS must be enabled to boot the system from the CD/DVD device).

2. Restart the computer.

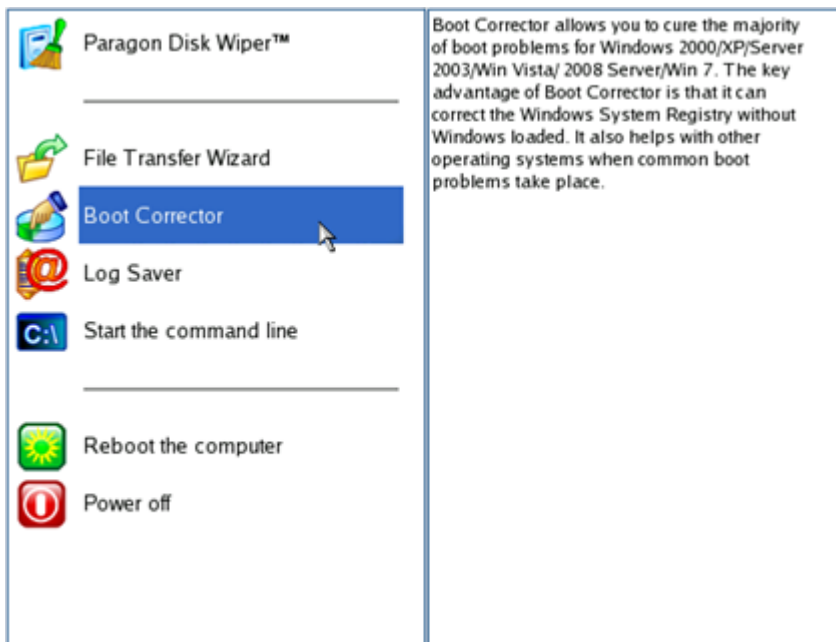3. In the boot menu select **Normal Mode** to use the Linux wiping environment (more preferable) or **Safe Mode** to use the PTS DOS wiping environment (in case you've got problems with Linux). Moreover you've got the option to boot into the **Low-Graphics Safe Mode** (PTS DOS safe mode) to cope with a serious hardware incompatibility. In this case, only the minimal set of drivers will be included, like hard disk, monitor, and keyboard drivers. This mode has simple graphics and a simple menu.
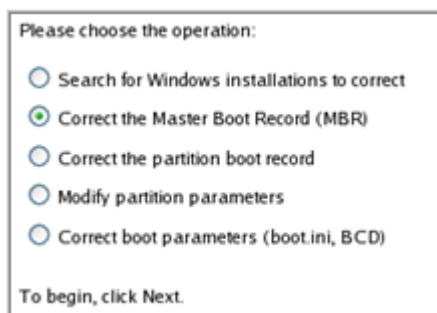


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⚠ **By default the Normal Mode will be automatically initiated after a 10 second idle period.**

---

4. In the Linux launch menu select Boot Corrector. You can find it in PTS DOS as well.
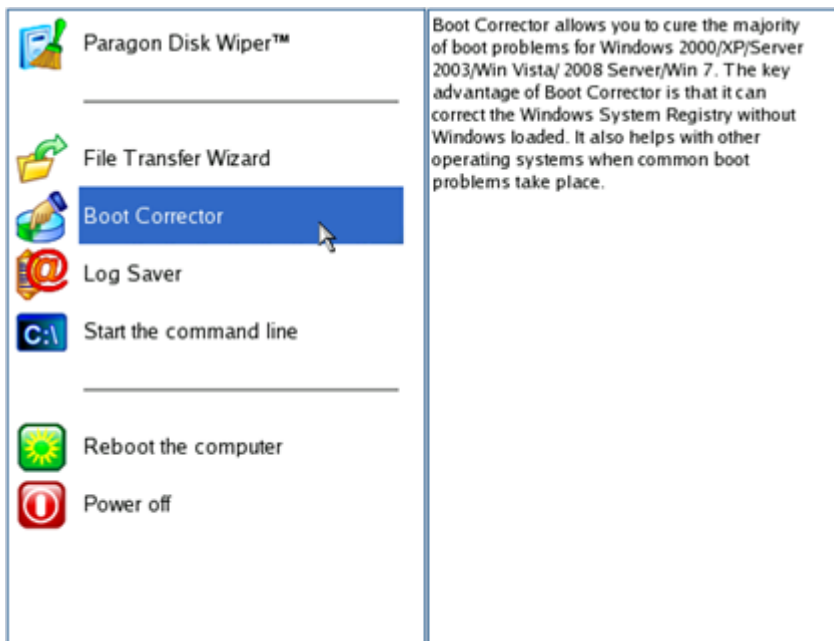


5. On the Wizard's Welcome page, select the **Search for Windows installations to correct** option.

Please choose the operation:

◉ Search for Windows installations to correct

◯ Correct the Master Boot Record (MBR)

◯ Correct the partition boot record

◯ Modify partition parameters

◯ Correct boot parameters (boot.ini, BCD)

To begin, click Next.

6.  On the next page choose the required Windows installation from the list of found installations (if several), then select the **Edit the Boot.ini file** option. If you're not sure which installation you need, please use the Properties button to get more info on the selected item.

**Correct Windows installations**

Program has searched for valid Windows installations on your computer. The results of the search you can see below. Status S refers to a system partition (you can edit the Boot.ini file), B - a boot partition (you can correct the System Registry).

| N | Partition | Status | System root | Type |
|---|-----------|--------|-------------|------|
| 1 | Disk 0, Partition 0 | S+B | WINDOWS | WinXP |

For the highlighted Windows installation, please point out the operation to perform:                    [ Properties ]

◯ Correct drive letters in the System Registry

◉ Edit the Boot.ini file

◯ Correct the partition boot record

◯ Adjust OS to boot on new hardware

To continue, click Next.

7.  Examine the file – maybe that's where the problem is. If it contains a mistake, correct it by using the appropriate buttons.

**Edit the Boot.ini file on Hard Disk 0, Partition 0**

[boot loader]
timeout=10
default=multi(0)disk(0)rdisk(0)partition(1)\WINDOWS
[operating systems]
multi(0)disk(0)rdisk(0)partition(1)\WINDOWS="Paragon VMWare Windows XP Partition 01" /fastdetect /f

| Copy | Insert | Add | Delete |
|------|--------|-----|--------|
| Edit | Insert the sample | Add the sample | |

8.  If the Boot.ini file does not contain any mistake, please return to the Correct Windows Installations page to correct drive letters in the Windows System Registry.

**Correct Windows installations**

Program has searched for valid Windows installations on your computer. The results of the search you can see below. Status S refers to a system partition (you can edit the Boot.ini file), B - a boot partition (you can correct the System Registry).

| N | Partition | Status | System root | Type |
|---|-----------|--------|-------------|------|
| 1 | Disk 0, Partition 0 | S+B | WINDOWS | WinXP |

For the highlighted Windows installation, please point out the operation to perform:      [ Properties ]

- ◉ Correct drive letters in the System Registry
- ○ Edit the Boot.ini file
- ○ Correct the partition boot record
- ○ Adjust OS to boot on new hardware

To continue, click Next.

9. On the next page choose a hard disk from the pull-down list (if several), then the required partition. If you're not sure which installation you need, please use the Properties button to get more info on the selected item.

| Partitions List | Letters Map |
|---|---|

Below you can choose a hard disk drive and see all partitions on it. Information about drive letters assigned to these partitions is taken from the System Registry of the Windows installation selected.

Basic Disk 0 ▼   40.0 Gb, VMware Virtual IDE Hard Drive

| N | Type | Active | File System | Volume label | Size | Drive letters |
|---|------|--------|-------------|--------------|------|---------------|
| 0 | Primary | Yes | NTFS | WinXP | 3.0 Gb | C: |
| 1 | Primary | No | NTFS | Application | 9.8 Gb | E: |
| 2 | Primary | No | BackupCapsul | [No label] | 10.0 Gb | <None> |
| 3 | Primary | No | Free | | 17.2 Gb | <None> |

[ Properties ]                [ Edit letters ]

10. Click the Edit Letters button to correct an existing drive letter or assign a new one in the Windows System Registry.

| Partitions List | Letters Map |
|---|---|

Below you can ch... ...on it. Information about drive letters assigned to these... ...f the Windows installation selected.

**Drive letters** ✕

Basic Disk 0     Drive

Letters:

[ Change ]

[ Release ]

[ Add ]

Recommended to try - C:. If used, you can release it in Letters Map.

| N | Type | | Drive letters |
|---|------|---|---------------|
| 0 | Primary | b | <None> |
| 1 | Primary | b | E: |
| 2 | Primary | Gb | <None> |
| 3 | Primary | Gb | <None> |

[ Close ]

[ Properties ]                [ Edit letters ]
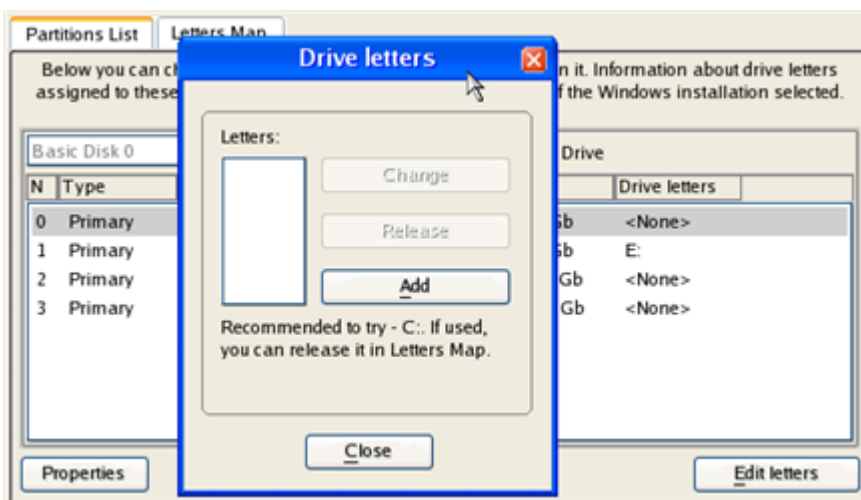
11. Once you've assigned the appropriate drive letter, close the dialog, then click the Apply button.

12. Confirm the operation.



13. After the operation is completed click the Report button to see a well informative summary page. The program also enables to store the resulted report. To do that, just press the Save button and choose the exact location in the opened dialog.



14. Click the Finish button to close Boot Corrector.

15. Eject the CD.

16. Reboot the computer.

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⚠️ **Some features may be unavailable in the version of the product you have. To learn more about it please consult the [Disk Wiper Editions](#) chapter.**

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## COPYING OF DATA FROM THE CORRUPTED SYSTEM DISK TO ANOTHER HARD DISK

To retrieve valuable information from your hard disk and copy it to another hard disk when the system fails to boot, please do the following:

1. Connect the second hard disk to the computer.

2. Insert Paragon Linux/DOS Wiping CD (the BIOS must be enabled to boot the system from the CD/DVD device).

3. Restart the computer.

4. In the boot menu select **Normal Mode** to use the Linux wiping environment (more preferable) or **Safe Mode** to use the PTS DOS wiping environment (in case you've got problems with Linux). Moreover you've got the option to boot into the **Low-Graphics Safe Mode** (PTS DOS safe mode) to cope with a serious hardware incompatibility. In this case, only the minimal set of drivers will be included, like hard disk, monitor, and keyboard drivers. This mode has simple graphics and a simple menu.

```
Normal Mode                          The PC booting
Safe Mode                            will be proceeded in
Low-Graphics Safe Mode               08 seconds
Floppy disk
Hard disk 0 MBR
Find OSes on your hard disks
```

**By default the Normal Mode will be automatically initiated after a 10 second idle period.**

5. In the Linux launch menu select the File Transfer Wizard. You can find the same wizard in PTS DOS as well.

Paragon Disk Wiper™

Copy your files or folders to another disk, partition or folder with File Transfer Wizard.

File Transfer Wizard

Boot Corrector

Log Saver

C:\ Start the command line

Reboot the computer

Power off

6. On the Wizard's Welcome page, click the Next button.

7. Select a disk where the files you need are stored from the pull-down list in the right pane of the page.

Source

C:\ (NTFS, 0 on Disk 0) (WinXP)

My computer
/ (Root dir)
/MyComputer (My computer)
/mnt (Mounted resources)
/mnt/disk (Local disks)
/media (Removable disks)
IDE CD/DVD (NECVMWa VMware IDE CDR1
C:\ (NTFS, 0 on Disk 0) (WinXP)
D:\ (NTFS, 1 on Disk 0) (Application)
E:\ (BackupCapsule, 2 on Disk 0) (UFSD dis

ntldr

Rename (F6)          Delete (F8)

8. Select files you want to copy and place them to Clipboard by pressing the left arrow-button.



Click the Calc button to estimate the resulted data size.

9. On the Select Destination Type, choose the way the data will be stored. Select the **Save data to any local drive or a network share** item.



10. On the Select Destination Path page, select a hard disk to copy the data to by pressing the standard browse button [...].



11. On the Transfer Summary page check all parameters of the operation. Click the Next button to accomplish the operation.

12. In the Progress window you can see in real-time a detailed report on all actions carried out by the program.

| Operations list: | Suboperation progress |
| --- | --- |
| 1: Transfer user data | |

Operation progress

| Time elapsed: | 00:00:03 | Time to finish: | 00:00:00 |
| --- | --- | --- | --- |
| Copied so far: | 17.0 Mb | | |

Overall progress

Transfering "/mnt/disk/hda1/Documents and Settings/User/E-Mail Database" to "/mnt/disk/hda2/E-Mail Data
Transfering "/mnt/disk/hda1/Documents and Settings/User/My Documents" to "/mnt/disk/hda2/My Document
All operations have been finished

13. After the operation is completed, close the wizard by pressing the appropriate button.

14. Eject the CD.

15. Turn off the computer.

## BURNING OF DATA FROM THE CORRUPTED SYSTEM DISK TO CD/DVD

To retrieve valuable information from your hard disk and burn it to CD/DVD when the system fails to boot, please do the following:

1. Insert Paragon Linux/DOS Wiping CD (the BIOS must be enabled to boot the system from the CD/DVD device).

2. Restart the computer.

3. In the boot menu select **Normal Mode** to use the Linux wiping environment, since it's the only mode that enables to burn CD/DVD discs.
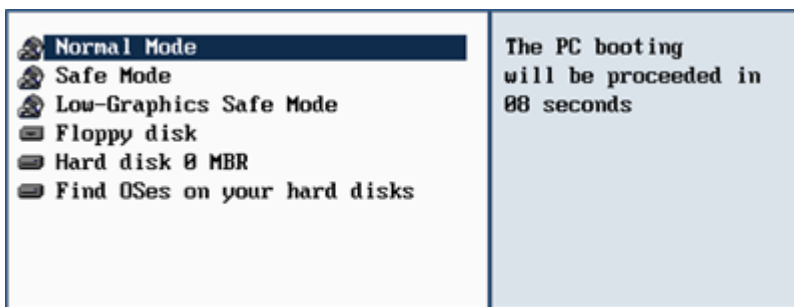


```
Normal Mode              The PC booting
Safe Mode                will be proceeded in
Low-Graphics Safe Mode   08 seconds
Floppy disk
Hard disk 0 MBR
Find OSes on your hard disks
```

> ⚠ **By default the Normal Mode will be automatically initiated after a 10 second idle period.**

4. In the Linux launch menu select the File Transfer Wizard. You can find the same wizard in PTS DOS as well.

| | |
|---|---|
| Paragon Disk Wiper™ | Copy your files or folders to another disk, partition or folder with File Transfer Wizard. |
| File Transfer Wizard | |
| Boot Corrector | |
| Log Saver | |
| Start the command line | |
| Reboot the computer | |
| Power off | |
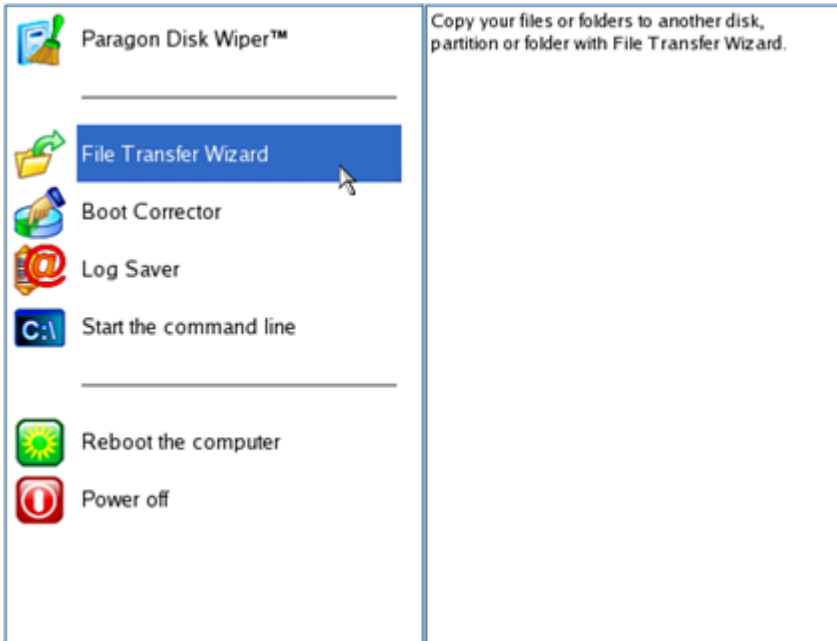
5. On the Wizard's Welcome page, click the Next button.

6. Select a disk where the files you need are stored from the pull-down list in the right pane of the page.
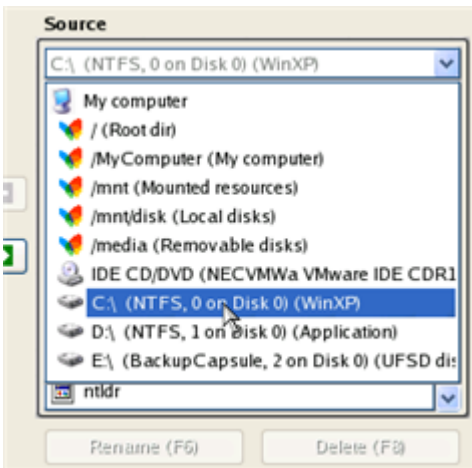


7. Select files you want to copy and place them to Clipboard by pressing the left arrow-button.

Click the Calc button to estimate the resulted data size.

8.  On the Select Destination Type, choose the way the data will be stored. Select the **Burn data to CD/DVD** item.

Please select how would you like to save the data:

○ **Save data to any local drives or a network share**
Choose this option if you want to save your data to local mounted or physical partition, to USB or FireWare external drives and to a mounted network share. You will be prompted to choose a location you want to save the archive to.

◉ **Burn data to CD/DVD**
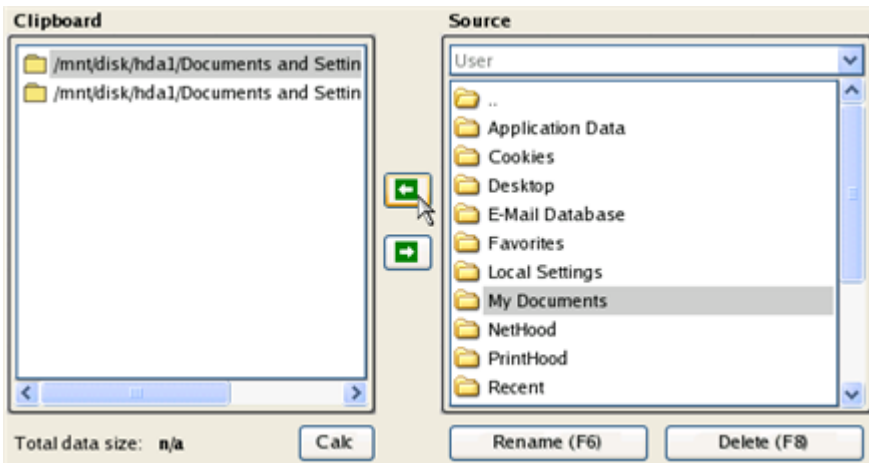Choose this option if you want the Wizard to burn the data to CD or DVD. You will be prompted to choose a CD or DVD RW drive.

9.  On the Choose a Recorder page, select a recorder from the list of available devices and then set a volume label by entering it in the appropriate field.

Select a recorder to burn data to:

| Vendor | Product | Type |
|--------|---------|------|
| Optiarc | DVD RW AD-7170A | CD-R; CD-RW; DVD-R |

Volume label:   My Data

10. On the Transfer Summary page check all parameters of the operation. Click the Next button to accomplish the operation.

11. In the Progress window you can see in real-time a detailed report on all actions carried out by the program.

| Operations list: | Suboperation progress |
|------------------|----------------------|
| 1: Transfer user data | |

Operation progress

Time elapsed:   **00:00:07**   Time to finish:   **00:00:16**

Copied so far:   **5.0 Mb**
To copy:   **12.0 Mb**

Overall progress

Creating compilation image...
Used burner: DVD RW AD-7170A   Vendor: Optiarc
Session opening...
Data burning...

12. After the operation is completed, close the wizard by pressing the appropriate button.

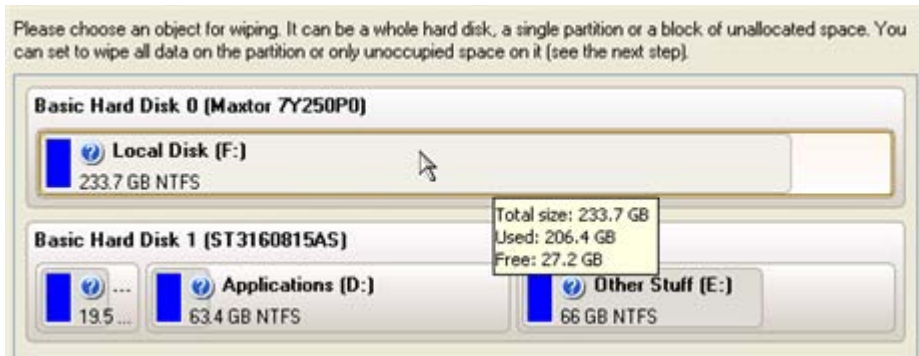13. Eject the CD.

14. Turn off the computer.

## HARD DISK UTILIZATION

To irreversibly destroy all on-disk information without any possibility to recover and that way providing the maximum level of security, please do the following:
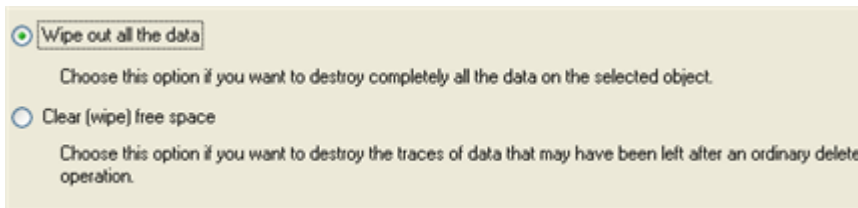
1. Launch the Wipe Wizard. There are several ways to do it:

   **Launcher**

   ❑ In the Main Menu: select **Wizards > Wipe Hard Disk or Partition…**

   ❑ On the Wizard's Welcome page, click the Next button.

2. Select a hard disk, the data of which you want to wipe out.

Please choose an object for wiping. It can be a whole hard disk, a single partition or a block of unallocated space. You can set to wipe all data on the partition or only unoccupied space on it (see the next step).

**Basic Hard Disk 0 (Maxtor 7Y250P0)**

Local Disk (F:)
233.7 GB NTFS

Total size: 233.7 GB
Used: 206.4 GB
Free: 27.2 GB

**Basic Hard Disk 1 (ST3160815AS)**

... 19.5 ...

Applications (D:)
63.4 GB NTFS

Other Stuff (E:)
66 GB NTFS

3. On the Wipe Mode page, select the wipe out all the data to irreversible destroy all on-disk information.

Wipe out all the data

Choose this option if you want to destroy completely all the data on the selected object.

Clear (wipe) free space

Choose this option if you want to destroy the traces of data that may have been left after an ordinary delete operation.

4. On the Wipe Method page select a specific data erasure algorithm or choose to create a customized one (in our case we prefer to use a certified military standard).

Specific algorithm

US DoD 5220.22-M

You can see the algorithm description and set the level of verification on the next page.

Create your own Data Sanitization method

You can create your own Data Sanitization method.
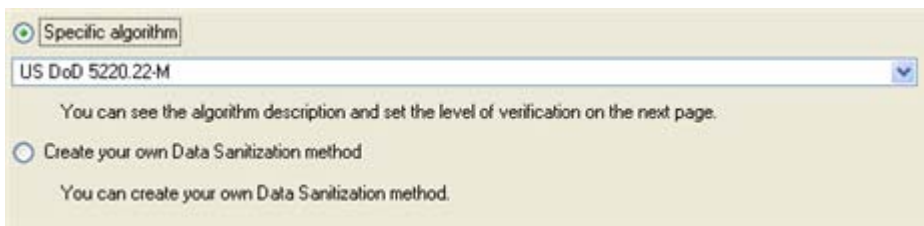
5. The next page of the wizard enables to get detailed information on the selected algorithm, choose whether to carry out residual data verification or not specifying the percentage of sectors to check and estimate the time required to accomplish the operation.

68
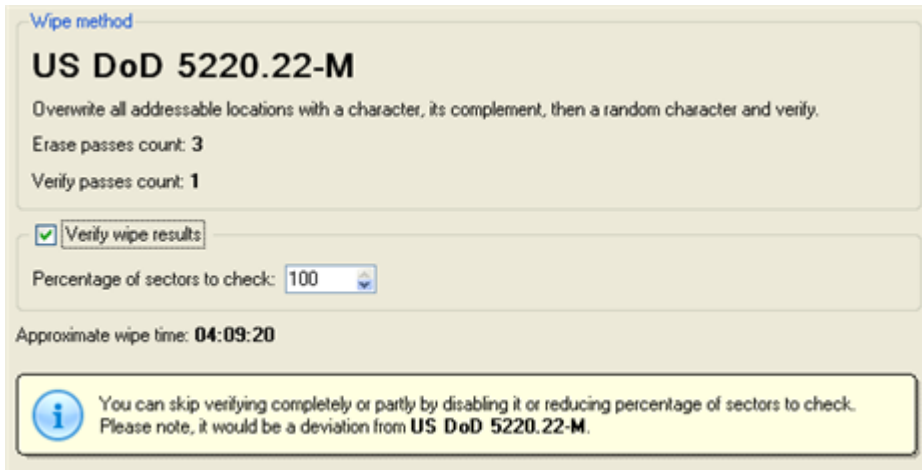


6. Review all parameters of the operation and modify them if necessary.
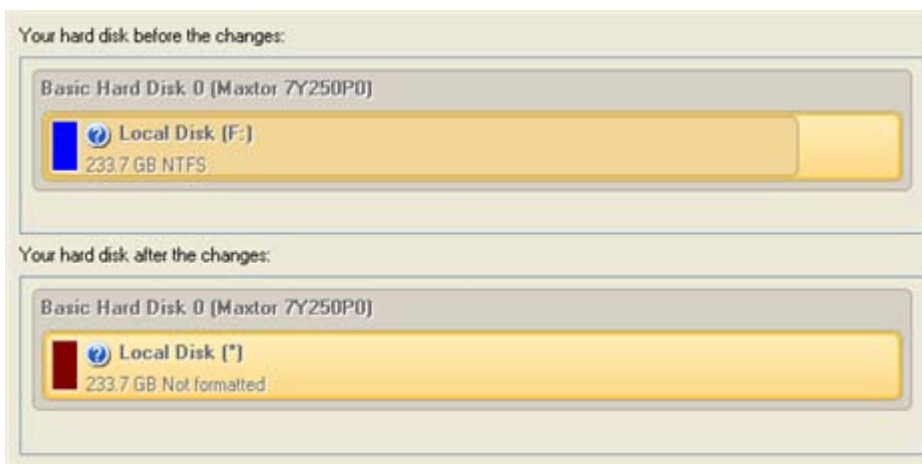


7. Complete the wizard and then apply the pending changes.

⚠ **Some features may be unavailable in the version of the product you have. To learn more about it please consult the Disk Wiper Editions chapter.**

## TROUBLESHOOTER

Here you can find answers to the most frequently asked questions that might arise while using the program.

1. I try to run an operation, but the program claims my partition is in use and suggests restarting the computer.

   There are a number of operations that cannot be performed while your partition is in use (or locked in other words). Please agree to reboot your machine to make the program accomplish the operation in a special boot-up mode.

2. I run an operation and restart the machine as required, but it just boots back into Windows without accomplishing the operation.

   Please run 'chkdsk /f' for the partition in question.

3. I cannot create a new partition on the disk.

   There can be a number of reasons for that:

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❑ The program cannot create a new partition on a dynamic disk, but only on a hard disk that uses the DOS partitioning scheme.

❑ According to the rules of the DOS partitioning scheme, the following combinations of partitions cannot be created:

- Two Extended Partitions on one hard disk;

- Five or more Primary partitions on one hard disk;

- If there is an Extended Partition on the disk, only three Primary partitions are allowed.

❑ The program allows creating new partitions only within blocks of un-partitioned space. It cannot convert a free space on an existing partition to a new partition.

4.  I cannot copy a partition.

    There can be a number of reasons for that:

    - The source or target disk you select is a dynamic disk;

    - 4 primary partitions (or three primary partitions and an extended one) already exist on the target disk.

5.  I need to copy a partition. But when selecting a place where to make a copy, I always get a crossed circle sign no matter which partition is selected.

    The program enables to copy a partition only to a block of un-partitioned space. If you don't have a block of free space on your hard disk, please delete or reduce an existing partition to accomplish the operation.

6.  I cannot do anything with my USB flash drive. I get a crossed circle sign when trying to select any area on it.

    Some USB flash drives don't have the MBR (Master Boot Record), that's the cause of your problem. To fix the issue please use the Update MBR function of our program or 'fixmbr' of the Windows installation disc to write a standard code to your flash drive.

7.  When trying to back up my system the program asks to restart the computer.

    Most likely the Hot Processing mode is disabled. Please make it active in the program settings.

8.  When backing up a partition with the VSS (Volume Shadow Copy Service) mode, the program throws "VSS could not be started for processed volume".

    Most likely you try to back up a FAT32 partition, which is not supported by VSS. Please use the Paragon Hot Processing mode instead.

9.  I cannot back up my hard disk to an external hard drive. Once started, the operation is aborted with the following error: Hard Disk management, Error Code 0x1100a. What is wrong here?

    The problem is that the Microsoft VSS service is set as the default Hot Processing mode in the program. But this service has not been started in your WindowsXP/Windows2003/Vista. Please start this service (right click on My Computer > Manage > Services > find Microsoft Volume Shadow Copy Service and make it active. Set also to start it automatically).

10. When running a backup operation with the Paragon Hot Processing mode enabled, I get an error: error code 0x1200e "Internal error during Hot Backup"

    Most likely your hard disk contains bad blocks. Please fix the issue with your HDD manufacturer's tool.

You can find a name of the tool you need here: http://kb.paragon-software.com

11. When running a backup operation with the Microsoft VSS mode enabled, I get the following error: error code 0x12016 "VSS: can't read volume data"

Most likely your hard disk contains bad blocks. Please fix the issue with your HDD manufacturer's tool.

You can find a name of the tool you need here: http://kb.paragon-software.com

12. When trying to back up to a network share, I get the following error: "i/o error" or "can't open/create file"

Please check whether you've got a permission to write to the selected destination or not.

13. When trying to restore a backup archive, I get the following error: "Can't restore to current selection" or "Archive does not fit"

Most likely you're trying to restore a backup of the whole hard disk to a partition or vice versa.

14. I set up a timetable for a task, but it fails to execute.

There can be a number of reasons for that:

- Windows Task Scheduler does not work properly. Check whether it is so or not by scheduling a simple task (call Notepad through scheduling);

- You don't have permission to write to the selected backup destination.

## GLOSSARY

**Active Partition** is a partition from which an x86-based computer starts up. The active partition must be a primary partition on a basic disk. If you use Windows exclusively, the active partition can be the same as the system volume.

In the DOS partitioning scheme, only primary partitions can be active due to limitations of the standard bootstrap.

The term **backup** originates from the time when the best way to protect valuable information was to store it in form of archives on external media. It's become now a general notion to mean making duplications of data for protection purposes.

**Bootable Archive** is created by adding a special bootable section when backing up the data to CD/DVDs. Thus you will be able to restore the data from these archives without having to run the program, but by simply booting from these CD/DVDs.

**Cluster** is the smallest amount of disk space that can be allocated to hold a file. All file systems used by Windows organize hard disks based on clusters, which consist of one or more contiguous sectors. The smaller the cluster size, the more efficiently a disk stores information. If no cluster size is specified during formatting, Windows picks defaults based on the size of the volume. These defaults are selected to reduce the amount of space that is lost and the amount of fragmentation on the volume. A cluster is also called an allocation unit.

**Extended Partition** is a partition type you create only on a basic MBR (Master Boot Record) disk. Extended partition is used if you want to create more than four volumes on a disk, since it may contain multiple logical drives.

**File System Metadata**. The servicing structures of a file system, which contain information about allocating files and directories, security information etc, are named the file system metadata. It is invisible for users and regular applications because its accidental modification usually makes a partition unusable.

**Hard Disk Geometry**. Traditionally, the usable space of a hard disk is logically divided into cylinders, cylinders are divided into tracks (or heads), and tracks are divided into sectors.

The triad of values {[Sectors-per-Track], [Tracks-per-Cylinder], [Amount-of-Cylinders]} is usually named the Hard Disk Geometry or C/H/S geometry.

Tracks and cylinders are enumerated from "0", while sectors are enumerated from "1". These disk parameters play an essential role in the DOS Partitioning scheme.

Modern hardware uses an advanced scheme for the linear addressing of sectors, which assumes that all on-disk sectors are continuously enumerated from "0". To allow backward compatibility with older standards, modern hard disks can additionally emulate the C/H/S geometry.

**Hidden Partition**. The concept of a "hidden" partition was introduced in the IBM OS/2 Boot Manager. By default, an operating system does not mount a hidden partition, thus preventing access to its contents.

A method of hiding a partition consists in changing the partition ID value saved in the Partition Table. This is achieved by XOR-ing the partition ID with a 0x10 hexadecimal value.

**Master File Table** (MFT) is a relational database that consists of rows of file records and columns of file attributes. It contains at least one entry for every file on an NTFS volume, including the MFT itself. MFT is similar to a FAT table in a FAT file system.

**MBR & 1st track of the hard disk** is the 0th sector of the disk. MBR (Master Boot Record) contains important information about the disk layout:

- The used partitioning scheme;

- The starting records of the Partition Table;

- The standard bootstrap code (or the initial code of boot managers, disk overlay software or boot viruses).

Generally, the 0th sector is used for similar purposes in all existing partitioning schemes.

The MBR capacity is not sufficient to contain sophisticated boot programs. That's why the on-boot software is allowed to use the entire 0th track of the disk. For example, boot managing utilities such as LILO, GRUB and Paragon Boot Manager are located in the 0th track.

**Partition ID** (or File system ID) is a file system identifier that is placed in the partition. It is used to quickly detect partitions of supported types. A number of operating systems completely rely on it to distinguish supported partitions.

Partition ID is saved in appropriate entries of the Partition Table and takes only 1 byte of space.

**Partition Label** (or Volume Label) is a small textual field (up to 11 characters) that is located in the partition's boot sector. This value is used for notification purposes only. It is detectable by any partitioning tool including the DOS FDISK utility.

Modern operating systems save it within a file system, e.g. as a special hidden file. Thus it is able to contain a relatively large amount of text in multiple languages.

**Partitioning Scheme** is a set of rules, constraints and format of the on-disk structures to keep information on partitions located on a hard disk.

There are known several partitioning schemes. The most popular of them is the so-called DOS partitioning scheme. It was introduced by IBM and Microsoft to use multiple partitions in the disk subsystems on IBM PC compatible computers.

Another popular partitioning scheme is the so-called Logical Disks Model (LDM) that originates from the UNIX mainframe systems. Veritas Executive accommodates a simplified version of LDM to the Windows 2000 operating system.

Windows 2000 and XP support two quite different partitioning schemes: the old DOS partitioning scheme and the new Dynamic Disk Management (DDM). The problem is that earlier versions of Windows do not support DDM. In addition, most hard disk utilities do not support it as well.

**Recovery Media** is a CD/DVD disc, a USB flash card or even a floppy disk from which you can boot for maintenance or recovery purposes.

**Root Directory** is the top-level directory of a formatted logical drive to include other files and directories. In modern file systems (Ext2/Ext3, NTFS and even FAT32) it does not differ from other directories. This is not the case for old FAT12 and FAT16 file systems.

**Serial Number**. In the DOS partitioning scheme, every hard disk and every partition has a 32-bit serial number represented by an 8-figure hexadecimal value. It is stored in the MBR and its value is assigned when the MBR sector is initialized by Microsoft standard disk managing tools, such as Windows Disk Administrator and the FDISK utility.

In fact, a hard disk's serial number is not important for most operating systems and software. It is known that Windows NT, 2000 and XP store its value in the database of assigned drive letters.

A partition's serial number is stored in its boot sector (in FAT16, FAT32 and NFTS file systems). Its value is assigned when the partition is formatted. It does not play an important role for most operating systems and software as well.