Acronis PowerUtilities User's Guide

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Chapter 1. Acronis PowerUtilities

1.1 About Acronis PowerUtilities

Acronis PowerUtilities, the long-anticipated utilities suite from the technology leader Acronis, includes four of the most popular system utilities available in one box:

- Acronis PrivacyExpert, the powerful privacy utility that keeps computing and surfing history completely private.
- Acronis MigrateEasy, the preeminent hard disk drive migration tool available today.
- Acronis DiskEditor, the technically advanced tool designed to edit your hard disk and its partition data manually.
- Acronis DriveCleanser, the proven solution to securely obliterate hard disks clean.

Compute and Surf Without a Trace!

Acronis PrivacyExpert provides you with complete confidentiality while working with a stand-alone or networked personal computer (PC). The confidentiality that Acronis PrivacyExpert delivers allows you to clean-up trace data and Windows by removing any evidence of your work or Internet activities.

Unlike other software Acronis PrivacyExpert also increases PC performance by cleaning out temporary files.

Acronis PrivacyExpert is PC performance improvement as a result of hard disk cleanup from numerous temporary files.

Upgrade Your Hard Disk Drive in Minutes!

It's finally time – you've put it off as long as possible, but it's now time to upgrade to a new larger hard disk drive. And if you're like most, you're not excited. You think you're in for a large project spanning several days of tedious work. Luckily for you, there's Acronis MigrateEasy, the award-winning solution that migrates all your computer data and system files to a new hard disk drive in minutes, while keeping all operating systems and applications fully functional. Why take days upgrading, when you can use Acronis MigrateEasy and be finished in minutes?

With Acronis MigrateEasy, you don't have to be a computer scientist to upgrade to a new hard disk drive. Simply make a few choices when prompted, and Acronis MigrateEasy will take care of everything automatically. It will even show you a preview of the migration can be completely assured of file and system transfer. Within minutes, your data, including applications and operating systems, will be safely on your new large hard disk drive and ready to go!

Hard Disk Problem? Not Any More

Quite often problems can arise with hard disk drives that cannot be solved without a technically advanced disk editor. Such problems include: back-up, copying, and/or recover important data areas of a hard drive; search and/or extraction of information that was removed by accident or lost due to different soft- and hardware failures or virus attack. Acronis DiskEditor, with booting up from a diskette, works even if your operating system does not.

Securely Obliterate Your Hard Disks

Getting rid of an old PC, upgrading to a new hard drive, returning a leased computer, or redeploying a PC within your company? It is truly imperative to completely destroy all data from the old hard disk.

Your confidential data should not only be safeguarded according to the strict rules, but it should also be reliably and completely destroyed when needed. You think you have deleted all the financial, corporate, and personal files, and even formatted and deleted hard disk partitions – but are they really gone from the drive? The answer is NO!

Acronis DriveCleanser guarantees the complete destruction of data on selected partitions and/or entire disks with extremely simple Windows XP-style interface and straight-forward actions.

1.2 About the Acronis PowerUtilities User's Guide

This Guide briefly describes the main features of Acronis PowerUtilities suite components, including the following chapters:

- Chapter 2 «Installing and Starting to Work with Acronis PowerUtilities» - installing, recovering and removing various suite components;
- Chapter 3 «Cleaning User Activity Traces From a Computer» working with Acronis PrivacyExpert: setting up and executing variants of complex PC and system cleanup;
- Chapter 4 «Migrating Data to a New Hard Disk» working with Acronis MigrateEasy: preparing a hard disk for installation and automatic migration of the complete data set, including operating system, applications, documents, etc.;
- Chapter 5 «Hard Disk Error Correction» working with Acronis DiskEditor: low-level access to hard disk sectors, searching disk for

data, operating with sector byte blocks, browsing and editing the Master Boot Record and boot sectors, File Allocation Table;

- Chapter 6 «Disk Data Wiping» working with Acronis DriveCleanser: guaranteed wiping of confidential data on an obsolete or unused disk, data wiping algorithms;
- Appendix A. «Hard Disk Wiping Algorithms» the necessity of strict hard disk data wiping algorithms and the detailed description of algorithms integrated into Acronis PrivacyExpert and Acronis DriveCleanser.

1.3 Software Usage Conditions

The conditions of Acronis PowerUtilities software usage are described in the «License agreement», included in this package. The supplied registration card is the confirmation of your legal purchase and usage of Acronis PowerUtilities software. Each registration card has its own unique registration number.

Based on current legislation the «License agreement» is considered a contract between a user and a software manufacturer. This contract has the legal effect and its violation may entail a court examination.

Illegal use and distribution of software will be prosecuted.

1.4 Technical Support

Users of legally purchased and registered copies of Acronis PowerUtilities receive free technical support from the Acronis Inc. In case you have problems with installation or using the software, that cannot be solved with this guide or readme, please e-mail the technical support. You will also need to send us you the registration number for Acronis PowerUtilities. This number is written on a registration card, supplied with this package.

Support URL: <u>http://www.acronis.com/support/</u>

E-mail: support@acronis.com

Chapter 2. Installing and Starting to Work with Acronis PowerUtilities

2.1 Acronis PowerUtilities System Package

Acronis PowerUtilities system package includes:

- an installation disc,
- this guide,
- license agreement,
- registration card,
- advertising materials.

2.2 Hardware and Software Requirements

To take a full advantage of Acronis PowerUtilities one should have:

- a PC-compatible computer with a Pentium CPU or similar,
- 32 MB RAM,
- VGA monitor,
- a mouse (recommended),
- free disk space for archive files.

2.3 Installing Acronis PowerUtilities Components

To install Acronis PowerUtilities suite component, please, insert the CD-ROM into the drive, select the needed component and run the installer. Please, carefully follow all the instructions.

Having answered Acronis PowerUtilities component installation wizard questions, you will be prompted to create a bootable CD-R/W or diskettes (if you purchased Acronis PowerUtilities on a bootable CD, you can skip this step).

2.4 Recovering Acronis PowerUtilities Components

If a component of Acronis PowerUtilities failed to install or run, please, execute the installation program again. The software will determine that the

component has already been installed to your PC and prompt you to recover (update) or completely remove it from the disk.

In the component installation wizard select Recover/update Acronis <component> and click Next. All necessary files will be copied to your hard disk again to properly restore software.

2.5 Removing Acronis PowerUtilities Components

To remove a component select **Acronis** \rightarrow **<components** \rightarrow **Remove <components** from the Programs menu. You will see a prompt to confirm removal of the software from your PC hard disk.

Click Yes to confirm removal. The selected component of Acronis PowerUtilities suite will be completely removed from the PC hard disk.

2.6 Acronis PowerUtilities Suite Interface

The user interface of Acronis PowerUtilities suite features standard Windows graphical user interface (GUI) elements. Please pay close attention to setting and executing clean-up variants.

2.7 Running a Suite Component

To run a suite component select **Programs** \rightarrow **Acronis** \rightarrow **Acronis** \rightarrow **Acronis** the Start menu. For example, select **Programs** \rightarrow **Acronis** \rightarrow **Acronis PrivacyExpert** to run Acronis PrivacyExpert.

In some cases you will be prompted to load a component from a bootable diskette or CD-R/W, that was created during the component installation.

Chapter 3. Cleaning User Activity Traces From a Computer

Clean-up of user PC activity traces is performed by Acronis PrivacyExpert, a part of Acronis PowerUtilities suite.

Acronis PrivacyExpert is controlled from the **main window**. It is shown on the screen after selecting **Acronis** → **PrivacyExpert** → **PrivacyExpert** from the Programs menu. The Acronis PrivacyExpert main window is a Windows dialog box split into two parts:

- The right part contains grouped lists of main PC cleanup variants user may execute with Acronis PrivacyExpert;
- The left part of the window, or **sidebar**, is an element, that was introduced in the Windows XP. It contains grouped **actions** that can be performed on objects in the right part of the window.



Main window Acronis PrivacyExpert

Clean-up variants are executed, set, scheduled, and renamed with the help of corresponding items of the main menu, toolbar, sidebar, and context menus.

3.1 Software Logical Organization: Sections

Logically Acronis PrivacyExpert consists of **several parts**, each enabling the user to perform (1) specific **variants of complex PC clean-up** from PC activity evidence or (2) **clean-up separate system components**.

10 Chapter 3 : Cleaning User Activity Traces From a Computer

3.1.1 Complex PC Clean-up

In the **One Click Clean-up** section, shown by default in the right part of the Acronis PrivacyExpert main window, the user has access to **icons of three pre-defined complex PC clean-up**.

If you need to perform:

- 1. **entire PC clean-up**, including Windows system section and sections related to working on the Internet, execute **Entire PC Clean-up**;
- 2. clean-up of sections related to working on the Internet only, execute Internet Clean-up;
- 3. Windows system section and user files/folders cleanup, execute System Cleanup.

Attention! Described clean-up variants are **fully set-up** by default and **ready for immediate work** once Acronis PrivacyExpert is installed. They were specifically created for the majority of users to take advantage of them without understanding all the complex setting details. Any of these variants can be executed by a click of the mouse!

3.1.2 Cleaning Separate System Components

Internet Components and System Components sections allow you to perform a **quick clean-up** of separate system components once you have taken specific actions on your PC.

For example, you need to clean-up the browser cache from garbage after visiting a dubious content site and remove its URL from the list of visited sites, etc. This will not take much time compare to a full, complex clean-up.

If you need to perform:

- a quick clean-up of only separate components of Windows system sections and separate user files/folders, execute one of the clean-up variants from the Components section;
- 2. a quick clean-up of **only separate** Windows components, related to working on the Internet, execute a variant from the **Internet Components** section.

Separate components clean-up takes less time than complex cleanup of entire Windows sections.

All PC clean-up variants as well as separate components cleanup are executed manually or by schedule and are set universally (see 3.2 «Executing PC Clean-up Manually», 3.5 «Executing Scheduled PC Clean-up», 3.3 «Clean-up Settings») and differ only by the number of settings..

3.2 Executing PC Clean-up Manually

There are **three ways of manually executing** complex PC and component clean-up.

PC or separate component clean-up, previously selected from the right part of the Acronis PrivacyExpert main window, can be executed by:

- 1. mouse-clicking **Start Now!** in the Acronis PrivacyExpert main window sidebar;
- 2. selecting Clean-up → Start Now! from the main menu;
- 3. selecting **Start Now!** from the task context menu.

If you are unable to see the clean-up variant or components to clean in the workspace, please scroll down to make it visible.

3.3 Clean-up Settings

3.3.1 Clean-up Settings

By changing clean-up settings, you can set Acronis PrivacyExpert for your personal needs. For example: you can select an algorithm of guaranteed data destruction that suits you by speed and reliability, enter the type of temporary files to clean, directly select browser used, disable separate component clean-up, etc. This will enable Acronis PrivacyExpert to clean your PC at **maximum speed and performance**.

Settings are described below.

3.3.2 Clean-up Settings Editor

Having selected a clean-up variant by mouse-clicking from the right part of the Acronis PrivacyExpert main window, and then Properties from the sidebar Edit list, you invoke the **settings editor**. You can also do this by selecting a clean-up variant and **Clean-up** \rightarrow **Properties** from the main menu. Finally, the settings editor can be invoked from the context menu of a clean-up variant by selecting Properties.

3.3.3 Setting PC Component Clean-up with the Editor

Below you can see the opened settings editor featuring two groups of components to clean that belong to the **Entire PC Clean-up**. There are two of such groups:

• Internet Clean-up – this group includes clean-up of sections related to working in the Internet,

• **System Clean-up** – this group includes Windows system section and user files/folders clean-up.

If you need to set up component clean-up:

1. select the component from the left part of the editor and check the **Enable <component name>** box;

Properties 🛛 🔀		
You can view and change the current settings for the would like to change from the tree.	e selected item. Choose the component you 🛛 🔅	
 Settings Internet Components System Components Paging/Swap File Recycle Bin Temporary Files Hard Disks Free Space Custom Folders/Files Custom Folders/Files Find Computers List Find Files List Recently Used Documents List Recently Used Documents List Windows Run List Opened/Saved Files History 	When you delete any files or folders from your hard disk, Windows places it in the Recycle Bin. Emptying the Recycle Bin ensures that the deleted files will not be recovered. ✓ Enable Recycle Bin cleaning	
	OK Cancel Apply	

The description of a component to clean

 set component clean-up; for this consecutively select each component clean-up setting or set-up as necessary (selecting/entering clean-up algorithm, file type, Internet browser, etc.);

Properties	
You can view and change the current settings for the would like to change from the tree.	e selected item. Choose the component you 🛛 🌉
Settings Internet Components System Components Paging/Swap File Recycle Bin Data Destruction Algorithm Files Recycle Bin Temporary Files Hard Disks Free Space Custom Folders/Files Find Computers List Find Files List Recently Used Documents List Windows Run List Copened/Saved Files History	Files Search by the criteria below. Enter all or part of the file name: *.tmp Press the Show Files button to see files to be cleaned according to your mask. Show Files
	OK Cancel Apply

«Files» setting

3. to save your settings click Apply. To discard changes click Cancel.

If you need to restore Acronis PrivacyExpert default clean-up settings:

- 1. select the component tree root Settings;
- 2. in the right part of the editor click Restore Defaults.



Restoring Acronis PrivacyExpert default settings

3.4 Separate Components Clean-up Settings

Having selected a specific component to clean from the editor, you open the list of its clean-up **settings**.

Each component to clean has several settings in Acronis PrivacyExpert (from 1 to 3 depending on a component).

Below are **common** settings for a number of components.

3.4.1 Clean-up Settings of Components Related to Working on the Internet

«Internet Browsers» and «Address» settings are common for components related to working on the Internet.

«Internet Browsers» Setting

Acronis PrivacyExpert automatically finds all supported browsers installed on your PC and by default cleans structures of all browsers related to working in the Internet.

If you have Internet Explorer installed, the structures cleaned belong to the currently logged on user.

Customize	
You can view and change the current settings for the you would like to change in the left tree then you wil	e selected item. Please click the parameter []
Settings System Cleanup System Cleanup Cookies Data Destruction Algorithm Protect Cookies Downloaded Components Last Visited Pages	Internet Browsers Detected Internet Browsers. Please select browsers you would like to clean: ✓ Internet Explorer ✓ Netscape 6.x/7.x/Mozilla Profiles
	OK Cancel Apply

«Internet Browsers» setting

Netscape Navigator and Mozilla support the so-called personal profiles. Without additional settings Acronis PrivacyExpert cleans either the «default profile» (if it is the only one existing), or the profile of a currently logged on user.

If you need to clean-up only one browser:

- 1. Set the checkbox near its name only (for example, Internet Explorer), unchecking all other boxes;
- 2. If you use a version of Netscape Navigator (or Mozilla), you should additionally select a personal profile (by clicking **Profiles...** link).

«Address» Setting

The «Address» setting is meant for cleaning up Internet cache and the last visited pages list. («Address» setting has only two system components to clean: Internet Cache, Last Visited Pages.)

You can also enter any full or partial Internet addresses separated by a semicolon as a value of the «Address» setting, for example:

*worldsoccer.com; *formula1.com;

and so on. All files downloaded from sites fully or partially corresponding to at least one of the addresses entered will be removed.



Attention! The length of a search string with full or partial Internet addresses are almost infinite! So you may enter any number of addresses like *worldsoccer.com or *formula1.com separated by semicolon.

If you need to:

 clean-up Internet cache (last visited pages list) from all files (lists, elements), downloaded from specific Internet address (site), enter addresses or their parts separated by semicolon, for example like:

cnn;*formula1*

As a result all files downloaded from <u>www.cnn.com</u>, <u>www.formula1.com</u> will be deleted.

 clean-up Internet cache from only specific file types downloaded from specific Internet address (site), enter addresses separated by semicolon, for example like:

cnn.jpg;*cnn*.gif;*formula1*.jpg;*formula1*.gif

As a result only *.jpg, *.gif files will be deleted, and, for example, *.html files will remain in cache.

Entering the Internet addresses list, you can browse files (visited pages) selected according to the list. To do this click $\underline{Show URLs}$. You will see the window with selected addresses. They will be deleted during at the selected component clean-up.

3.4.2 System Component Clean-up Settings

«Data Destruction Algorithm» and «Files» settings are common for system component cleanup.

«Data destruction algorithm» Setting

Having selected «Data Destruction Algorithm» setting you can change the **security level** provided by PC clean-up **and clean-up speed**.

For detailed information about data destruction algorithms see 3.7 «Data Clean-up Algorithms» and Appendix A. «Hard Disk Wiping Algorithms».

The highest level security algorithms are always very slow, and vice versa, the quickest algorithms provide less reliability and security.

Having mouse-clicked a setting name, you will see its available element in the right part of the editor – the selection of data destruction algorithms.



Selecting a data destruction algorithm

Mouse-clicking the drop-down list in the right part of the editor, you will see all data destruction algorithms available in Acronis PrivacyExpert.

If you need to ensure:

- 1. **the top security** for wiping PC activity evidence, select Peter Gutmann's algorithm (35 data destruction cycles), but remember that it's very slow;
- 2. **the medium level of security at an average speed** of clean-up, select VSITR or Bruce Schneier's algorithm (7 data destruction cycles);
- 3. **the fast PC clean-up**, with less security in mind, select any of 1-3-pass algorithms (see A.2 «Algorithms Used by Acronis PrivacyExpert and »).

«Files» Setting

The «Files» setting is meant to **provide** temporary **file names to clean with** Acronis PrivacyExpert (from Windows Recycle Bin and from system and user folders) and is actually a search string.

In the Windows operating system, a search string might represent a full or partial file name. A search string may contain any alphanumeric symbols, including comma, * and ? symbols, and can have values similar to the following :

- *.* to delete all files from the Recycle Bin with any file names and extensions;
- *.doc to delete files with specific extension Microsoft document files in this case;

- read*.* to delete all files with any extensions, and names beginning with «read»;
- read?.* to delete all files having 5-letter names and any extensions, names beginning with «read», the fifth letter is random.

For example, the last search string will result in removal of read1.txt, ready.doc files, but readyness.txt will remain since it has a longer pre-fix name (excluding the extension).

You can enter several different search strings separated by semicolon, for example:

*.bak; *.tmp; *.~~~;

and so on. All files with names corresponding to at least one of the search strings will be deleted.



Attention! The length of a search string with full or partial names is almost infinite! You may enter any number of filenames or their parts like *.tmp, read?.* separated by semicolon.

The «Files» setting has four system components to clean: Recycle Bin, Temporary Files, Custom Folders/Files, and Find Files List.

Properties	
You can view and change the current settings for the would like to change from the tree.	e selected item. Choose the component you 🛛 🌉
 Settings Internet Components System Components Paging/Swap File Recycle Bin Data Destruction Algorithm Files Paraporary Files Hard Disks Free Space Custom Folders/Files Find Computers List Find Files List Recently Used Documents List Windows Run List Opened/Saved Files History 	Files Search by the criteria below. Enter all or part of the file name: *.jpg;*.gif;*.tmp; Press the Show Files button to see files to be cleaned according to your mask. Show Files
	OK Cancel Apply

«Files» setting

If you need to:

1. delete only specific file **types** from the Recycle Bin (system or user folder), enter filenames separated by semicolon, for example, as follows:

*.jpg; *.gif;

2. delete only **specific filenames** from the Recycle Bin (system or user folder), enter names, for example, as follows:

read*.txt.

This will result in removal of read!.txt, readme.txt, read1.txt, etc. files, while read.doc, readme.doc, etc. will remain.

3. delete only **specific length filenames** from the Recycle Bin (system or user folder), enter filename, for example, as follows:

read?.txt.

As a result files read!.txt, read1.txt, read2.txt, etc. will be deleted, while read.doc, readme.doc, etc. will remain.

By entering filenames, you can browse the files selected by Acronis PrivacyExpert. To do this click Show Files. You will see a window containing selected files. These files are set for destruction when you invoke the clean-up.

«Computers» Setting

The «Computers» setting is meant to clean-up the registry from search strings for finding computers in the local network. These strings keep information on what interested you in the network. So they should also be deleted to maintain full confidentiality.

«Computers» setting is the same as «Files». «Computers» setting is a string that can contain any number of full or partial computer names separated by semicolons. The deletion of computer search strings is based on a comparison with the «Computers» setting according to Windows rules (see ««Files» Setting»).

If you simply **need** to delete all local network computer search strings (suitable for the most cases):

- 1. select Find Computer List;
- 2. check the Enable the Find Computer List cleaning box;
- 3. select «Computers» setting; leave its default value unchanged *.

As a result **all** computer search strings will be deleted from the registry.



«Computers» setting

On entering «Computers» setting value you can browse the search strings kept in the registry selected by Acronis PrivacyExpert. To do this click Show Computers. You will see the window with full and partial computer names searched for in the network. They will be deleted at the registry clean-up.

3.5 Executing Scheduled PC Clean-up

Each PC clean-up variant of Acronis PrivacyExpert can be executed either manually or **automatically as scheduled**.

Having set PC clean-up as a daily procedure, to be performed for example, at the end of workday before powering the PC off, you can be sure that all evidence of your PC and Internet activity will be reliably removed each day.

Acronis PrivacyExpert features a built-in scheduler.

3.5.1 Invoking the Scheduler

Having mouse-clicked a cleanup variant in the right part of the Acronis PrivacyExpert main window, and selected **Schedule** in the sidebar **Clean-up** list, you invoke the scheduler. You can also do this by selecting a clean-up variant and **Clean-up** \rightarrow **Schedule** from the main menu. Finally, you can invoke the scheduler from the clean-up variant context menu-selecting Schedule.

Scheduler - Overall PC Cleanup	×
Select task	3
Please select parameters for the new task	
Perform this task:	
● Daily	
<u>◯ w</u> eekly	
O One time only	
◯ When my computer starts	
◯ When my computer shuts down	
	_
< <u>Back</u> <u>Next</u> <u>C</u> an	cel

Scheduler

3.5.2 Scheduler Settings

Scheduler provides the user with flexible capabilities for **automatic execution** of any PC clean-up variant.

If you need to perform automatic PC clean-up:

- daily at specific time, only during workdays or periodically over several days, set the switch on the 1st scheduler page to **Daily**;
- weekly at specific time and weekdays, say Tuesday and Friday, or periodically – in two or three weeks, etc., set the switch on the 1st scheduler page to Weekly;
- monthly at specific time and day; the ability to execute clean-up on, for example, the <first, second, third, fourth, last> <weekday> (Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday), set the switch on the 1st scheduler page to Monthly;
- 4. once at specific time (hours: minutes) and date (day-month-year), set the switch on the 1st scheduler page to **One time only**;

5. in all of the above click \underline{Next} and set additional execution settings on the 2^{nd} scheduler page.

If you need automatic PC clean-up:

- 1. at PC start-up, set the switch on the 1st scheduler page to When my computer starts;
- 2. at shutdown, the switch on the 1st scheduler page to When my computer shuts down.

If you need to disable automatic scheduled execution:

- 1. invoke the scheduler again;
- 2. on the 1st scheduler page set the switch to **Disable scheduled clean-up**.

3.6 Renaming Clean-up Variants

Enabling/disabling separate component clean-up and selecting clean-up settings, you set-up and customize your PC clean-up variant(s) as needed. That said, you may want to rename a variant to better represent PC clean-up contents.

If you want to rename a PC (or separate component) clean-up variant you can do this by following one of three methods:

- 1. mouse-clicking **Rename** on the sidebar;
- 2. selecting **Clean-up** \rightarrow **Rename** from the main menu;
- 3. selecting **Rename** from the context menu of a PC (component) cleanup variant.

As a result of any of these actions you will see the **Rename Item** window enabling you to enter a new name for PC or component clean-up variant.

3.7 Data Clean-up Algorithms

Unlike most software providing the confidentiality of PC and Internet activity, Acronis PrivacyExpert not only deletes Windows sections (files, folders, registry components, etc.), it also performs a **thorough low-level clean-up of hard disk sectors** containing Windows components selected for cleaning.

Trace Windows data and files are cleaned with the help of integrated data destruction algorithms. Acronis PrivacyExpert provides the user with eight algorithms. Five of the eight meet the most popular **national data destruction standards**:

- (1) American: DoD 5220.22-M,
- (2) American: NAVSO P-5239-26 (RLL),
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- (3) American: NAVSO P-5239-26 (MFM),
- (4) German: VSITR,
- (5) Russian: Russian Standard, GOST P50739-95.

Besides algorithms that meet national standards, Acronis PrivacyExpert provides two **far more powerful** pre-defined **algorithms** offered by top information security specialists:

- (6) Peter Gutmann's algorithm;
- (7) Bruce Schneier's algorithm.

After using the most powerful clean-up algorithms of Acronis PrivacyExpert the disk data can **in no way be recovered by any modern methods** including the most powerful magnetic microscopy!

The user is also provided with a simple, but fast algorithm to use in less important situations:

- (8) Fast.
- The algorithm operation is based on multiple rewriting of hard disk sectors containing user data with chains of logical 0 and 1. As a result previously written data is replaced by newer random data. For more information on the algorithms see Appendix A. «Hard Disk Wiping Algorithms». There you will also find information on the number of hard disk passes, provided by each algorithm, and numeric chains written in the process (see A.2 «Algorithms Used by Acronis PrivacyExpert and »).

3.8 Complex PC Clean-up

Using variants of **complex PC clean-up** described below, you can **clean a large number of various** Windows **components** that keep evidence of your PC activity.

3.8.1 Entire PC Clean-up

If you need to clean a PC of any evidence of your activity, select the Entire PC clean-up. Executing it, you'll be able to clean all Windows components accessible by Acronis PrivacyExpert:

- 1. clean Windows registry from user activity evidence;
- 2. delete temporary files from standard Windows folders;
- delete any file types from user folders on any disks connected to the PC;
- 4. clean Windows Recycle Bin;
- 5. clean Windows swap file;
- 6. clean hard disk free space;

- 7. clean the last visited pages and **last used documents** list;
- 8. delete the **evidence of searching** for files on connected disks, for networked computers, for information on the Internet;
- 9. clean Internet cache;
- 10. delete cookies
- 11. delete downloaded components;
- 12. clean Internet history and last visited pages list.

Entire PC clean-up is executed by a mouse-click on its name in the right part of the main window (for other execution methods see sections 3.2, 3.5).

3.8.2 System Clean-up

If you need to wipe the evidence of your PC activity **from its system sections**, use the **System clean-up**. Executing it allows you to:

- 1. clean Windows registry from user activity traces;
- 2. delete temporary files from standard Windows folders;
- 3. delete any file types from user folders on any disks connected to a PC;
- 4. clean Windows Recycle Bin;
- 5. clean Windows swap file;
- 6. clean hard disk free space;
- 7. clean last used documents list;
- 8. delete the **evidence of searching** for files on connected disks, for networked computers, for information on the Internet.

System cleanup can be executed by mouse-clicking the cleanup variant in the right part of the main window (for other execution methods see sections 3.2, 3.5).

3.8.3 Internet Clean-up

If you need to wipe the evidence of your Internet activity, use **Internet cleanup**. This variant allows you:

- 1. clean-up **Internet cache**;
- 2. delete cookies;
- 3. delete downloaded components;
- 4. clean Internet history and last visited pages list.

Internet clean-up can be executed by mouse-clicking its name in the right part of the main window (for other execution methods see sections 3.2, 3.5).

3.9 A Fast Cleanup of Separate System Components

Acronis PrivacyExpert enables you to perform a fast clean-up of separate system components. For example, you can clean just the Last Visited Pages or cookies. A separate component is cleaned faster than a complex PC clean-up.

Separate component clean-up is performed from Internet Components and System Components sections (see 3.1.2 «Cleaning Separate System Components»). Setting up and executing the clean-up is similar to complex clean-up set-up and execution.

Please note that the detailed description of Acronis PrivacyExpert actions for each specific component clean-up case (how and what files and folders, system or registry sections are cleaned from what data types) are included in the .pdf file on the installation CD-ROM.

Chapter 4. Migrating Data to a New Hard Disk

You can migrate your data from the old hard disk to a new one with the help of Acronis MigrateEasy, a part or the Acronis PowerUtilities suite.

4.1 Preparing for Migration

To use the Acronis MigrateEasy application effectively you have to know at least the basics of **hard disks** and how the computer works with them. Below we will provide only the most necessary information, without covering the technical details of inner structure of hard disks.

If you have difficulties with understanding what the application does to hard disks, please refer to Appendices at the end of this Guide. Those appendices contain both information on hard disk organization and on how data are stored on it.

At the end of the Guide you will find a **Glossary** with explanations of **terms** from this Guide that may be unknown or unclear to you.

4.2 Hard Disk Partitions and File Systems.

It would be quite inconvenient if you could only access the entire hard disk, so a mechanism was created that allows you to divide the hard disk into several parts for storing different types data or operating systems. This is done by partitioning hard disks into partitions.

An operating system provides the user with ability to work with data by supporting some type of **file system** on a partition. Most operating systems support several file systems. For example, Windows 98/Me support FAT16 and FAT32 file systems, Windows NT/2000/XP support both FAT16/32 and NTFS file systems. The popular Linux operating system supports Ext2, Ext3, and ReiserFS (and some other) file systems.

Acronis MigrateEasy works only with **hard disks and the partitions contained on them**. This means that:

- 1. You will never see files, nor folders while working with MigrateEasy, but only hard disks, their partitions, and the properties of both (disk numbers, letters, capacities and sizes, etc);
- 2. When moving all your data to a new disk, MigrateEasy works not with files and folders, but with more basic disk structure elements.



For more details on hard disk partitions and their usage by operating systems, see the Guide Appendix in the .pdf file on the installation CD-ROM.

4.3 Installing a Hard Disk on Your Computer

To upgrade the disk subsystem of your computer you need to install the new disk in the PC case and plug it into power supply block and mother board.

Before installing and fixing the hard disk you have to install a **jumper** on a special connector of the disk board to which power and data cables attach.

Usually the jumper on your old disk is installed in the **Master** position. To upgrade the disk first you have to install the new disk as **Slave** and later position the jumper based on how you are going to use it (Master if the disk will be the boot disk, or Slave if it will be just an extra storage).



More details of hard disk hardware installation can be found in the Guide Appendix in the .pdf file on the installation CD-ROM.

4.4 BIOS Set-up

It is not enough to properly position jumpers on the hard disk and connect it to power supply and data cables, you must also properly configure your hard disk in **BIOS** (Basic Input/Output System).

You can enter the BIOS setup program by pressing the key combination that is displayed right after you turn on your computer.

Hard disks can be configured in the Standard CMOS Set-up section of the BIOS set-up menu. If you have set the hard disk jumper to Slave and have connected the data cable to the Primary IDE plug of the motherboard, it may only be necessary to set the TYPE and MODE parameters for the Primary Slave disk to Auto (this information is usually sufficient for BIOS to properly detect and configure modern hard disks.)

After the new disk is configured in BIOS, save the settings.



For more details about BIOS set-up and possible errors (including error messages) see the Guide Appendix in the .pdf file on the installation CD-ROM.

4.5 Starting Work with Acronis MigrateEasy

To start a migration process under Windows, select **Start → Programs →** Acronis → MigrateEasy → Acronis MigrateEasy.

If you do not have a Windows operating system installed, you should create a bootable diskette or CD-R/W, and re-boot your PC from it, to start a migration process. Further steps will be the same.

All operations with hard disks are done according to **scenarios** that are created as a result of user's choices and actions. Before you actually run a scenario, no real changes are made to the existing configuration. You can return to previous stages of scenario creation and change the parameters at any stage of the program.

The program can work only if two or more hard disks are installed on your computer. This means that if you have only one hard disk, you get the following message:



The next Wizard page is the page that actually starts the work on transferring data to the new hard disk. Let us first describe the main scenarios of working with MigrateEasy.

4.6 Migration Scenarios

Before starting the program, you have to know for sure, what you can expect from it. Below we describe the details of each of possible work scenarios. Here we will list only the **main** scenarios and their outcomes.

4.6.1 Auto Upgrade

The results of auto upgrade scenario are as follows:

- 1. An **exact copy** of the source disk is created on the destination disk. It means that literally everything is copied:
 - Disk partitions, file system types, volume labels;
 - All folders and files, installed operating systems and applications.

If the capacity of the new disk is larger than that of the old one, partitions from the old disk are transferred to the new one with proportional increase in size.

- 2. Destination disk is made bootable (if of course the source disk was bootable in the first place) and active.
- 3. All data remains intact on the source disk!

4.6.2 Manual Upgrade

Manual upgrade provides you with more flexibility. You can choose how to use the **new** disk and what to do with data on the **old** hard disk drive.

- 1. First you can choose from one of two main ways to configure the new hard disk:
 - The disk is installed as a boot disk;
 - The disk is installed as additional data storage.
- 2. Next you have to define the way to transfer partitions and data. MigrateEasy offers you the following options:
 - Partitions and data are transferred «as is»;
 - Disk space on the new disk is distributed proportionally among the partitions that are transferred from the old disk;
 - Manual.
- 3. You can also choose what to do with the old disk:
 - Leave partitions (and data) on the old disk;
 - Delete partitions (and data) from the old disk.

If you decide to transfer partitions to the new disk and delete them from the old one, you can repartition the old disk to use it for some other purposes.

Transferring partitions «as is» means that for each partition of the old disk **an exact copy** is created on the new disk, i.e. the type, size, file system, and label of the partition remain the same.

«Disk space on the new disk is distributed proportionally» means that if the capacity of the new disk is larger than that of the old one, a copy is created on the new disk for each of partitions on the old disk, but the size of each partition is increased proportionally to the ratio between the new and old disk capacities, so that the partitions occupy all the destination disk.

4.7 Auto Upgrade

The automatic upgrade will make an exact copy of your old hard disk by proportionally resizing all partitions to match your new hard disk size. This function is suitable for most users.

You get to the **Upgrade Mode** page right after the welcome page.

🍣 Acronis MigrateEasy
Upgrade Mode You can choose between fully automated and manual upgrade modes.
Select the hard disk upgrade mode. You can find the description of your selection below. Press Next when ready to proceed:
< Back Next > Cancel

Select upgrade mode (Auto/Manual)

Switch the radio button on this page to the **Auto** position and press the Next button.

Then you must specify which disk the data is transferred from.

😻 Acronis I	MigrateEasy			×
Source Hard	l Disk			3
Select you	ır old hard disk fro	m the list below.		1
Select the so	urce (old) hard dis	k from the list of available drives the	n press Next .	
Drive	Capacity	Model	Interface	
🥪 Disk 1	12,73 GB	ST313620A 3.07	IDE(0) Primary Master	
🆘 Disk 2	9,366 GB	FUJITSU MHN2100AT 7255	USB	
9,366 GB	U. WORK (E:) 7 2,321 GB FA	T32 Unallocated 7,032 GB		
Primary	/	Logical	Unallocated	
			< Back Next > Cancel	

Select source hard disk

Markings on this page help you to understand which disk should be the source and which the destination one (check for disk numbers, volume labels, partitions and file systems on disks).

In the lower part of the window you see the graphical representation (as rectangles of various sizes) of the partitions of the selected hard disk, and also the unallocated space. Along with the number of the disk you see some additional information: partition number, volume label (e.g. SYSTEM), file system type (e.g. FAT16 or FAT32), size of partition in gigabytes (GB). Partition types (Primary and Logical) and unallocated space are shown in different colors. All this information prevents you from being confused as to where from and where to you are transferring your data.

Select the disk to which the data will be transferred on the **Destination disk** page.

On this page you cannot select the disk that you have designated as the source disk on the previous page, so it is grayed.

If only two disks are installed in your computer, you are able to select only the second disk.

💐 Acronis /	MigrateEasy			
Destination Select you	Hard Disk Ir new hard disk f	rom the list below.		S
Select the de	stination (new) h	hard disk from the list of available drives	then press Next .	
Drive	Capacity	Model	Interface	
🆘 Disk 1	12,73 GB	ST313620A 3.07	IDE(0) Primary Master	
🌍 Disk 2	9,366 GB	FUJITSU MHN2100AT 7255	USB	
12,73 GB	WINDOWS (C:) 12,72 GB FAT32	(LBA)		U., 7.,
Primary	/	📕 Logical	Unallocated	
			< Back Next >	Cancel

Select destination hard disk

On the next step the program checks if the destination disk is free. If it is not free, the program notifies you about it. You get to the **Nonempty destination disk** page. It means that the destination disk contains some partitions, and at least some of them may contain data.

💐 Acronis MigrateEasy	×
Nonempty Destination Hard Disk You have chosen a destination hard disk that already contains some partitions.	þ
The destination drive you have chosen contains some partitions which could have useful data. Hard disk upgrade is possible only if the destination hard disk is empty. In order to proceed with the upgrade you should either allow Acronis MigrateEasy to delete all the partitions on the destination hard disk or press Back and choose another destination hard disk.	
Description Delete all partitions on the destination hard disk. Will destroy all your data on the destionation hard disk. Make sure you have chosen the right destination disk.	
< Back Next > Cancel)

Nonempty destination hard disk

In this case you should:

- press the Back button and select another destination disk on the Select destination disk page;
- 2. allow the program to delete the existing partitions from the disk by checking the **Delete partitions on the destination disk** checkbox.

The **Hard disk drives structure** page showing the partitions of the source disk **before** transfer and of the destination disk **after** transfer appears.

🦥 Acronis MigrateEasy 🛛 🔀
Hard Disk Drives Structure
You can see your source hard disk layout before upgrade and the destination hard disk layout after 💜
Please review the source hard disk layout before upgrade and the destination hard disk layout that will be created during the upgrade procedure.
Before upgrade:
U. WORK (E:) Unallocated 9,366 GB 7 2,321 GB FAT32 7,032 GB
After upgrade:
U. WORK 12,73 GB 7 12,72 GB FAT32
Erimary E Logical E Unallocated
To continue with the hard disk upgrade, press the Next button.
< <u>Back</u> <u>N</u> ext > <u>C</u> ancel

Hard disk drives structure

29999

Pay attention! So far the program has not performed any real actions, but only creates an upgrade scenario in a dialog with the user.

If the structure shown does not suit you, you can go one or several steps back by pressing the \boxed{Back} button and enter other parameters of the scenario.

The text of the created scenario is shown on the next page.



Final upgrade scenario

This is the last page of the Wizard, next the scenario will be executed. So far the program has not performed any actions and has only created the upgrade scenario. Please notice that the Next button of the Wizard is now called Proceed. If you are not sure that you have entered the correct upgrade parameters, it is time to stop and think if everything has been done correctly. If you press the Proceed button, you will be unable to reverse the results of performing the scenario.

After pressing **Proceed** MigrateEasy takes care of everything automatically. To complete the execution of all processes, MigrateEasy will reboot your system.

After the upgrade process is over, you get the **Upgrade completed** message.

Now you should turn the PC power off and change the positions of hard disk jumpers, including that of the new disk, to match its purpose.

4.8 Safety

Please pay close attention to the following. Operations with disk can be unsafe with respect to data integrity. If power goes off or you accidentally unplug your PC, or power the computer off, or press the **RESET** button while data transfer is in progress, the process will be unfinished, data (partitions) will not be transferred, and the new disk will most probably be unusable. Hence, you should take precautions during the transfer process! Automatic transfer mode is completely safe for data on the old hard disk (source disk), since in this mode the program does nothing with it except for reading data (the disk is not repartitioned, the partitions are not resized).

We recommend you refrain from deleting data from the old disk before you are sure that they were correctly transferred to the new disk, and that the latter is fully functional (the computer boots from the disk, all applications are launched properly, and files can be opened with applications).

4.9 Manual Upgrade

The manual mode of Acronis MigrateEasy upgrade gives you full control of program performance and capabilities (see 4.6.2 «Manual Upgrade»). Auto upgrade should be sufficient for most Acronis MigrateEasy users, but if you require additional flexibility, use Manual Upgrade of hard disk.

In general manual hard disk upgrade is similar to automatic mode. User should carefully follow the upgrade wizard instructions. If you have questions, the detailed instructions for manual hard disk upgrade are provided in the .pdf file on the installation CD-ROM.

Chapter 5. Hard Disk Error Correction

Hard disk error correction can be performed with Acronis DiskEditor, a part of the Acronis PowerUtilities suite.

Acronis DiskEditor assumes user's relatively high qualification and knowledge of hard disk logical structures and data storage methods. Thus this chapter only describes its interface and functionality.

5.1 Beginning to Work with the Program Acronis DiskEditor

Working with the Acronis DiskEditor program begins with the **Open** dialog window that users see after clicking the Acronis DiskEditor line in the program group of Programs desktop start menu.

Acronis Dis	Acronis DiskEditor: Open 🛛 🔀									
Choose a di	sk or partition:									
1 27,96 GB	1 3,907 GB	5 5,86 GB 0xb (F	6 5,86 GB 0xb (F	7 5,86 GB 0xb (F	Unallocated 6,465 GB					
2 1,59 GB	1 0,977 GB 0xb	1 0,977 GB 0xb (FAT32) 5 0,613 GB 0xb (FAT32)								
		<u>oř</u> (⊆ancel	Help]					

The window of partition or disk selection

By default the program automatically marks the first hard disk for working. You may select any other disk or individual partition – by clicking the left mouse button on a corresponding rectangle.

1000

The difference between selecting the entire disk or a partition only is the following: if you select the entire disk you will be able to view and edit data storage structures of the **entire disk** – Partition table, File Allocation Table of all disk partitions, the root folder, data area. If you select a partition only, you will be able to view and edit only data storage structures of **this partition** – File Allocation Table, the root folder and data area of the selected partition.

5.2 Main Window of the Program

The main window, showing numbers of disk and sector where the internal program cursor is positioned, usually contains information and the working of various modes.

Below the main window of the program is the view as Partition table mode.

🖉 Acronis DiskEdito	ur: (disk 2, sectors 0 - 3335471)	×							
]] Disk Edit View	Search Help								
<u>ା</u> ର ନ୍ତ୍ର 📄 (🖺 🗟 🔓 🔎 🏸 🔶 🎯								
Western (Windows)	▼								
OS Selector checksum: 00h Valid: 00h									
OS Selector structure	OS Selector structure size: 0 Valid: 14								
Windows NT serial nu	mber: 0BA76960h								
OS Selector serial nu	mber: 00h								
	Partition type Boot Begin Begin End E cylinder head sect cylinder h								
Enter (08h	FAT32 0 1 1 507 63								
Enter 05h	Extended S08 0 1 826 63								
Enter 00h	Unused 🔽 🔽 0 0 0 0 0								
Enter 00h	Unused 🔽 🔽 0 0 0 0 0								
Partition table signature	(0AA55h): 0AA55h	~							
<									
Sector: 0	Position: 0 View: Partition table								

The main window in the view as Partition table mode

To make the information contained in this field sensible, the current sector should be the MBR or the extended Partition table.

The next figure shows the Partition table as a single dump (hexadecimal byte values are on the left, and the corresponding characters are on the right).

🖉 Асго	nis E)iskl	dita	or: (disk	2,	sect	ors (0 - 3	333	i471)					
]] <u>D</u> isk	<u>E</u> dit	⊻ie	ew	<u>S</u> ear	ch	Help)										
ß	Ъ) (ß	1				1		Ŗ	Ą		9			
Wester	rn (Wi	indov	ıs)		~												
Absolute s	ector	0 (cy	rlinde	r 0, ŀ	nead	O, se	ctor :	l)									_
0000:	33	СО	8E	DO	BC	00	7C	FΒ	50	07	50	1F	FC	ΒE	1B	7C	3ÀŽĐ₄. ûP.P.ü¾. —
0010:	BF	1B	06	50	57	В9	E5	01	FЗ	A4	СВ	ΒE	ΒE	07	Β1	04	ζPW¹å.ó¤Ë¾¾.±.
0020:	38	2 C	7C	09	75	15	83	С6	10	E2	F5	CD	18	8B	14	8B	8, .u.fÆ.âõÍ.‹.‹
0030:	ΕE	83	C6	10	49	74	16	38	2 C	74	F6	ΒE	10	07	4E	AC	îfÆ.It.8,tö‰N¬
0040:	ЗC	00	74	FA	вв	07	00	В4	OE	CD	10	EВ	F2	89	46	25	<.tú»´.İ.ëò%F%
0050:	96	88	46	04	В4	06	ЗC	OE	74	11	В4	OB	ЗC	0C	74	05	-SF.'.<.t.'.<.t.
0060:	ЗA	C4	75	2 B	40	С6	46	25	06	75	24	вв	AA	55	50	В4	:Äu+0ÆF%.u\$≫ªUP′
0070:	41	CD	13	58	72	16	81	FΒ	55	AA	75	10	F6	С1	01	74	Aİ.XrûUªu.öA.t
0080:	OB	88	ΕO	88	56	24	С7	06	Α1	06	EΒ	1E	88	66	04	BF	.Sà^V\$Ç.j.ë.^f.¿
0090:	OA	00	В8	01	02	8B	DC	33	С9	83	FF	05	7F	03	8B	4E	
00A0:	25	03	4E	02	CD	13	72	29	ΒE	56	07	81	3 E	FΕ	7D	55	%.N.I.r)¾V>þ}U
00B0:	AA	74	5Å	83	EF	05	7F	DA	85	F6	75	83	BE	2 D	07	EB	²tZfïU…öuf¾ë
0000:	81	98	91	52	99	03	46	08	13	56	0A	E8	12	00	5Å	EB	S~`R™.FV.èZë
00D0:	D5	4F	74	E4	33	CO	CD	13	EB	B8	00	00	81	11	44	16	OOtä3AI.ë,D.
00E0:	56	33	F6	56	56	52	50	06	53	51	BE	10	00	56	8B	F4	V36VVRP.SQ%V<6
OOFO:	50	52	в8	00	42	8Å	56	24	CD	13	5Å	58	8D	64	10	72	PR,.BSV\$I.ZX.d.r
0100:	OA	40	75	01	42	80	С7	02	E2	F7	F8	5E	C3	ΕB	74	8D	.⊍u.B€Ç.â÷ø^Aët.
Sector: 0														Posi	tion:	0	View: Hex

The main window in the view as Hex mode

The current editing position is shown by the cursor that can be either in the left, or right part of the window.



In this section of the Guide all examples of Acronis DiskEditor's main window view modes are given for demonstration purposes.

The main menu of Acronis DiskEditor contains the following items:

- **Disk** allows you to open the window of a hard disk partition or to select a hard disk for editing;
- Edit allows you to operate with blocks of selected hard disk partitions; also allows you to save contents of a disk sector after editing;
- **View** allows you to select a view mode for more convenient presentation of data;
- Search allows you to search a partition (or a hard disk) for any line (or any sequence of characters) and go to a certain disk sector according to its absolute offset;
- **Help** allows you to get help concerning the editor window or about the program's developer and version.

5.3 Working in Mult-iwindows Mode

The disk editor features multiple windows: from **Disk** menu of Acronis DiskEditor you can open several main windows, each of them showing various hard disk sectors.



Disk menu

You can switch between various Acronis DiskEditor windows with the help of the mouse, clicking the necessary window, or consistently advancing windows with the help of Alt+Tab key combination.

🖉 Асто	nis Di	iskEdito	or: (di	isk 2				33	354	71)									
]] Disk	Edit	⊻iew	Search	ιE	lelp														
5	3				P		2	R	5	Ģ	>	G)						
Wester	rn (Wi	Acr	onis I	Disk	Edito	- ог: (disk	2,	sect	ors	204	831	9 - 3	3334	463	9)			
Absolute s	ector	Disk	Edit	Vie	ew	Sear	ch	Help)										
0000:	9 3	11	5	100	. I		-	1	3	-			0			-			
0010:	38	14/	79	4			-	14			1	9	14	-	> (9			
0030:	EE	West	ern (W	indov	vs)		~												
0040:	ЗC	ähsolute	sector	2048	3319	(cylin	der 5	ns t	head	1 se	ctor 3	0							
0050:	96	0000:	B B	58	90	4D	53	44	4F	53	35	2E	30	00	02	08	24	00	ëx.MSDOS5.0\$.
0060:	3A	0010:	02	00	00	00	00	F8	00	00	ЗF	00	40	00	ЗF	00	00	00	ø?.@.?
0070:	41 OP	0020:	01	AO	13	00	E6	04	00	00	00	00	00	00	02	00	00	00	æ
0000:	0.0	0030:	01	00	06	00	00	00	00	00	00	00	00	00	00	00	00	00	
0010:	25	0040:	80	00	29	00	77	EE	80	4E	4F	20	4E	41	4D	45	20	20	€.).wî€NO NAME
00B0:	AA	0050:	20	20	46	41	54	33	32	20	20	20	33	C9	8E	D1	BC	F4	FAT32 3EZN⊶cô
0000:	88	0060:	7B	8E	C1	8E	D9	BD	00	70	88	4E	02	8A	56	40	B4	08	{ ZAZU%. ^N.SV@ '.
0000:	D5	0070:	CD PC	13	73	05	2F	FF	FF	OC.	F1 CD	00	UF	50	61	40	05	UF	1.3.*SnI.4401. mõeso:s+tài at .
00E0:	56	00000.	C9	66	F7	EL F1	5r 66	89	46	FS	83	75	16	00	75	38	83	78	ffiaftFafa uSfa
OOFO:	50	00A0:	24	00	77	32	66	8B	46	10	66	83	CO	OC.	BB	00	80	B9	<pre>*.w2f<f.ffå.».€<sup>1</f.ffå.».€<sup></pre>
0100:	OA	0080:	01	00	E8	2 B	00	E9	48	03	AO	FA	7D	Β4	7D	8B	FO	AC	è+.éH. ú}′}<ð¬
Sector: 0	1	0000:	84	со	74	17	зc	FF	74	09	B4	OE	BB	07	00	CD	10	EB	<i>"</i> Àt.<.t.′.»Í.ë
		OODO:	EE	AO	FB	7D	EB	E5	AO	F9	7D	EB	EO	98	CD	16	CD	19	î û}êå ù}êà~Í.Í.
		00E0:	66	60	66	3 B	46	F8	OF	82	41	00	66	6A	00	66	50	06	f`f;Fø.,J.fj.fP.
		OOFO:	53	66	68	10	00	01	00	80	7E	02	00	OF	85	20	00	Β4	Sfh€~
_		0100:	41	BB	AA	55	88	56	40	CD	13	OF	82	10	00	81	FB	55	A»*USV0I,ûU
		Sector:	20483	19												Posi	tion:	0	View: Hex

Acronis DiskEditor as a multiwindow editor

Selecting **Properties** item in **Disk** menu allows you to get access to the window with main properties of the computer hard disk selected for working (or of selected partition of the given disk).

H	Hard disk properties 🛛 🔀									
	Standard		_							
	System name:	\\.\PhysicalDrive1								
	Model:	QUANTUM FIREBALL_TM1 A6B.								
	Sectors per track:	63								
	Heads:	64								
	Cylinders:	828								
	Total size:	1,59 GB								
	<u> </u>									

The Hard Disk Properties window

The main hard disk properties displayed in this window are:

- System name disk's system name,
- Model hard disk model,
- Sectors per track number of sectors per a track,
- Heads number of heads,
- Cylinders number of cylinders,

- Total size hard disk capacity,
- Interface interface type (ATA, SCSI),
- Controller controller type.

5.4 Edit Hard Disks

Edit menu of Acronis DiskEditor's main window allows you to access the main operations with blocks of given hard disk sectors. You can edit hard disk data directly in the fields of any view mode (see the **View** menu). You can operate with data blocks using **Edit** menu in the view as Hex mode.



Edit menu

Any view mode allows you to select blocks with the help of the mouse by clicking and holding its left button, or with the help of the keyboard advancing the window with Shift key pressed.

Simply changing data in the hexadecimal or character area, in the view as Hex mode of the main window or in any fields of other view modes, does not lead to changes in the given disk sector. Having performed such changes, you will see that the **Save sector** item in **Edit** menu will become enabled as well as the appropriate toolbar button.

🖉 Асто	nis DiskEdito	ог:									
]] <u>D</u> isk	Edit <u>V</u> iew	<u>S</u> earch	Help								
	りUndo Ctrl-Z										
	🗐 Undo <u>a</u> ll										
Weste	Mark block	Ctrl-B									
Absolute s	🛅 Сору	Ctrl-C	he								
0000:	📔 Paste	Ctrl-V	ŧ								
0010:	Filler		P								
0020:	Coursesta	. cule	ŧ								
0030:	ave secto	or Ctri-S	Ľ								
0040:	识 <u>W</u> rite to fil	e	t								
0030:	Read from file										
0070:	Recalculati	e nartition	F								
0080:	B6 D1 80	E2 3F	F7								

Save sector operation

This feature allows you to save the results of your sector editing or to reject it.

If you have made changes in a hard disk sector and decided to exit the editor without saving them, you will see a warning about saving your changes.

🖉 Acronis Dis	kEditor	: (disk 2, sectors 0 - 33354)	71)					X
∐ <u>D</u> isk <u>E</u> dit	⊻iew ≦	earch <u>H</u> elp						
B	b (] 🖬 🔓 🔉 🔎 🍂	? → G)				
Western (Wind	ows)	×						
OS Select	or check	sum: 00h Valid: 00h						^
OS Selector s	tructure	size: 0 Valid: 14						
Windows NT s	erial n	Varning!			\mathbf{X}			
OS Selector s	erial n	Sector 0 has been modified! Do you wish to save it?		Cancel	_	Begin sect	End cylinder	E he
Enter	0B					1	508	63
Enter	05h	Extended	× 🗌	508 0		1	826	63
Enter	00h	Unused	~	0 0		0	0	0
Enter	00h	Unused	~	0 0		0	0	0
Partition table sig	gnature (0AA55h): 0AA55h						*
<								>
Sector: 0			Po	sition: 466	View: F	Partition	table	148

Saving modified sector

5.5 Write Block to a file and Read From a File

Write to file... and Read from file... menu items allow you to save the selected block to a file or to read the block from a file and save it to a disk sector.

The selection of **Write to file...** item results in opening the **Write to file** window (the saved block should be preliminary selected). In this window enter the file name and its path, or locate a file by clicking the **Browse...** button. The file size will be calculated automatically. To save a file click the OK button.



Write to a file window

To read a block from a file, and insert it into a disk sector, you must place the cursor on the necessary sector byte and then select **Read from file...** menu item. The selection of this menu item will result in opening the **Read from file**.

In this window enter the file name and its path or locate a file by clicking the Browse... button. To insert file contents to sector from the current cursor position (or considering offset in the file) click the OK button.

🖉 Acro	nis D	iskl	dite		disk			ors (D - 3	335	471						
∐ <u>D</u> isk	Edit	⊻ie	ew	Sear	ch	Help)										
9	3	R		6			à	3	5	0	Ŗ	7) (9			
Weste	rn (Wi	ndov	ıs)		~												
Absolute s	ector	0 (cy	linde	r A F	ead I	ì se	ctor 1	ñ.									
0000:	33	со	Re	ad f	rom	file											🛛 P. ü‰. —
0010:	BF	1B															Ë%%.±.
0020:	38	2 C	F	ile na	me:	R	T-\1BL(nck :	тхт							F	öí.‹.‹
0030:	EE	83						o citi	101		1			_			ö¾N¬
0040:	ЗC	00	9	<u>O</u> ffsel	t in fil	e: ()										.ëò%F%
0050:	96	88	5	Size:		5	512				1						'.<.t.
0060:	ЗA	C4		- 110 100 1		1											\$»"UP
0070:	41	CD			C		602			_	<i>C</i>	a a l	-	C		tala.	u.öA.t
0080:	OB	8A			L		UK				Gau	icel			[leib	ë.^f.¿
0090:	AO	00				14									-		(N
UUAO:	25	03	4E	U2	CD	13	72	29	BE	56	07	81	3E	FE	7D	55	<pre>%.N.1.r)¾V>þ}U</pre>
0080:	AA	74	5A	83	LF	05	/F	DA	05	16	75	83	BE	2D	07	EB	-t4f1UOuf%e
0000:	DE	98	91	52	22	03	40	12	13	50	DA OO	61	12	11	58	LB	orranifa p
00000:	D5	11	14	E4	33	CU	ED	13	EB ED	50	DU	10	01	11	44 0P	10	UUCASALLE,D.
00100:	50	33	r b po	35	30	04	50	24	53 CD	12	DE	TU	UU	50	10	72	$v_{30}v_{VKF}$
0100.	01	40	75	00	42	OA OA	00	02	ED E2	10	TO	50	00	PD	74	00	An DEC Atation
0100:	-OA	70	10	01	74	00	07	02		ri	ro	30	03	ED	171	00	.eu.bey.a-ø Aet
Sector: C	1													Posi	tion:	0	View: Hex

Read from a file window

5.6 View

Information in the Acronis DiskEditor window can be viewed and edited in several different modes. You can select the appropriate view mode with the help of **View** menu.

🖉 Асто	nis Di	skl	kEditor:
]] <u>D</u> isk	<u>E</u> dit	⊻ie	/iew <u>S</u> earch <u>H</u> elp
ß	Ъ	۲	as <u>H</u> ex F2 as <u>P</u> artition table F6
Weste	rn (Win		as FAT <u>1</u> 6 bootsector F7
Absolute s	ector C		as FAT <u>3</u> 2 bootsector Alt-F7
0000:	33		as FAT32 FS info sector
0010:	BF		as <u>N</u> TFS bootsector B
0020:	38 ;		as FAT <u>f</u> older
0030:	EE :	¥	<u>T</u> oolbar C
0040:	3C	¥	Encoding
0050:	96 8	4	 Status line
0060:	3A (, ,<u>,</u> ,, ,, ,, ,, ,, ,, ,, ,
0070:	41	CD) 13 58 72 16 81 FB 55

View menu

The editor offers 7 view modes:

- As Hex,
- As Partition table,
- As FAT16 boot sector,
- As FAT32 boot sector,

- As FAT32 FS info sector,
- As NTFS boot sector,
- As FAT folder.

5.7 Search

Search menu allows you to search a hard disk for some line and to go to a disk sector according to its absolute offset.

🖉 Acronis DiskEdite	DF:
]] <u>D</u> isk <u>E</u> dit <u>V</u> iew	Search Help
6	Search Ctrl-F
	Rearch again F3
Western (Windows)	→ <u>G</u> o to Alt-P
Absolute sector 0 (cylinde	Back Ctrl-L
0000: 3 3 CO 8E	
0010: BF 1B 06	50 57 B9 E5 O1

Search Menu

Selecting **Search** item in the same menu will give you access to functions of searching lines in the disk being edited. (You can do the same by pressing Ctrl+F key combination.) Search parameters can be set in the **Search** dialog window.

•

Search dialog window

A search line can be set both as char, and numeric (hexadecimal) value. During a search you can ignore letter case, as well as search for a given line at a given offset inside the sector.

During search, disk data is interpreted according to the encoding selected. If you selected a search mode without letter case matching, not only case but also elements above characters will be ignored for Roman character sets.

After the search process is finished, the current position will be moved to where a line was found, or will remain the same if no lines were found. You can search for the next line from the current position by selecting **Find next** item in the **Search** menu or by pressing F3 key.

You can go to the necessary sector according to its absolute offset by selecting the **Go to...** line the **Search** menu (or by pressing Alt+P key combination). Selecting this line opens the **Go to...** dialog window.

Go to sector								
Absolute sector (0 - 3335471):	4095							
Cylinder (0 - 827):	1							
Head (0 - 63):	1							
≦ector (1 - 63):	1							

Go to sector...

The transition is performed by entering absolute sector offset, or cylinder, head, and sector numbers. The listed parameters are bound by this expression:

 $(CYL \times HDS + HD) \times SPT + SEC - 1,$

Where CYL, HD, SEC are numbers of cylinder, head, sector in the CHS coordinates (Cylinder – Head – Sector); HDS is the number of heads per disk, SPT is the number of heads per track.

You can return to sector from another one by selecting the **Back** item in the **Search** menu (or by pressing Ctrl+Backspace key combination).

5.8 Working with Different Encodings

The main window of the program features a list of encodings available in Acronis DiskEditor. This list is shown closed and dropped down below.



The closed and dropped down list of encodings

The list of encodings is intended for correct interpretation of hard disk sector contents. Selecting the necessary encoding, you will be able to view sector contents correctly. This is interpreted in the right part of program's main window in the hex mode.

5.9 Other Acronis DiskEditor Capabilities

The description of other Acronis DiskEditor capabilities, in particular, main window view modes for working with MBR, FAT, files, folders and subfolders are provided in the .pdf file on the installation CD-ROM.

Chapter 6. Disk Data Wiping

Getting rid of an old PC, upgrading to a new hard drive, returning a leased computer, or redeploying a PC within your company? It is truly imperative to completely destroy all data from the old hard disk.

Acronis DriveCleanser guarantees the complete destruction of data on selected partitions and/or entire disks with extremely simple Windows XP-style interface and straightforward actions.

6.1 Confidential Information on Hard Disks: Storage and Access

Today more and more amounts of confidential information are created in the digital form and consigned to storage on computers. Documents that were previously created with the help of printing machines or table database files are now stored on computer hard disk drives.

The enormous amount of personal data, including such important things as personal banking account information, credit card numbers, business application, data-banking, financial, accounting, and industrial – are all stored on hard disks. It is impossible to enumerate all documents and data that in no circumstances should not left behind on a hard disk drive for criminals or rivals to possibly retrieve.

The main feature of these documents is that all of them contain **confidential information**.

6.1.1 Confidential Information: Destruction

Information not only has to be **stored** according to specially developed rules, but also destroyed according to the strict rules to provide confidentiality.

Computers are usually upgraded more than once during their lifetimes. In doing so, very often the computer disk subsystem is upgraded first due to the ever-increasing amounts of data stored on the hard disk drive. When a hard disk of larger capacity is installed on the computer, all data from the old disk can be transferred to the new one, but quite often the data also remains on the old disk.

Careless storage of a hard disk that is no longer needed can result in the loss of confidential information. The best solution is to completely destroy data on the old disk after it is moved to the new disk. Destroy! Not to erase information, not to delete needless files, but to destroy confidential data! (The difference between file deleting and information destruction will be explained later.) The following real-life passage illustrations this idea:

Jack V., a computer consultant from Brighton, bought a used notebook computer for \$400.00 at the clearance sale of a bankrupt Internet company. It was clear that the hard disk drive contained data about the company. This data included social security numbers and salary levels of the company's forty-six employees, plus pay roll records, strategic company plans, confidential board of directors minutes, and other internal documents.

There have been many cases like this concerning the sales and purchase of used computer.

6.1.2 Data Deletion by Means of an Operating Systems

There is a considerable difference between file deletion with operating systems (with the help of file managers) and data destruction with the help of specialized erasing programs.

The point is that operating systems, such as Windows, do not materially delete anything from a hard disk when **deleting a file**: the name of the deleted file in the File Allocation Table (FAT) is substituted by the name which is not assumed as a correct one by the operating system. The file only becomes invisible for a user and the cluster chain that contains file data is considered to be free. But the information contained within the hard disk sectors stays permanent. It is not very difficult for someone to recover it.

File deletion under the Linux operating system is somewhat more reliable, but even in this case it is possible to obtain software tools to recover any important information.

Neither **partitions deletion** on a disk nor even disk **formatting** solves this problem. When partitions are deleted on a hard disk the information of Partition table (if it is a primary partition) or File Allocation Table is deleted. The information contained within sectors however remains untouched and can be recovered with the help of software tools.

Reliable information destruction on hard disks is possible only while using specially designed programs that implement specially designed erasing algorithms.

6.1.3 Guaranteed Destruction of Confidential Information: Standards

The Acronis DriveCleanser application offers the guaranteed destruction of confidential information on magnetic hard disks with the help of special algorithms.

Acronis DriveCleanser algorithms guarantee compliance with most known national standards:

- (1) American: U.S. Standard, DoD 5220.22-M;
- (2) American: NAVSO P-5239-26 (RLL);
- (3) American: NAVSO P-5239-26 (MFM);
- (4) German: VSITR;
- (5) Russian: GOST P50739-95.

Besides algorithms corresponding to national standards, Acronis DriveCleanser supports pre-defined algorithms proposed by well-known and authoritative specialists in the field of information security:

- (6) Peter Gutmann's algorithm data on hard disk is destroyed with 35 passes;
- (7) Bruce Schneier's algorithm data is destroyed with 7 passes.

The Acronis DriveCleanser also supports simple but fast algorithms for information destruction that provide a single hard disk pass with all sectors zeroed.

The major feature of the Acronis DriveCleanser is the opportunity for you to create your own algorithms for **data destruction**.

Detailed information on data destruction standards is given in **Appendix A. «Hard Disk Wiping Algorithms»** of this Guide.

6.2 Working with Acronis DriveCleanser Software

Working with Acronis DriveCleanser starts with the welcome screen. The screen informs you about the basic features of the software; they are:

- 1. Wiping selected partitions of a hard disk (disks) with one of the predefined wiping algorithms;
- 2. Creating and using custom wiping algorithms.



The Acronis DriveCleanser welcome window

All actions on hard disks are performed on the basis of **scripts** created during the dialogue with the user. No data destruction occurs, until you execute the created script. You may return to a previous stage of script creation, from any stage of working with the software, and select other partitions and/or disks to wipe or to change the wiping algorithm.

The following window will contain the list of hard disks connected to your computer, and their partitions with main parameters (disk capacities and partition sizes, file systems and labels).

≽ Acronis DriveCleanser 🛛 🔀								
Data Selection Select data to be wiped without the possibility of recovery.								
You can cho left mouse b	You can choose partitions, free space and whole drives. To select data place the mouse pointer on it then click the left mouse button. Please, select data to be wiped in the picture below.							
1	WINDOWS (C:) 12,72 GB FAT32 (LBA)			U 7				
29,366 GB	Work (E:) 3,999 GB NTFS	*	GAMES (F:) 3,003 GB FAT32	Archives (G:) 2,359 GB NTF5				
🧧 Primar	у	📕 Logical	=	Inallocated				
			< <u>B</u> ack	<u>Next > Cancel</u>				

The list of computer's hard disks (with partitions)

Next you will need to select the partitions on hard disks to be designated for data destruction.

Mouse-click the rectangle representing the hard disk partition. The red cross will appear in the top right corner of the rectangle. It means that the partition is selected for data destruction.

You may choose to destroy data on the entire disk (or several disks). For this purpose mouse-click the rectangle representing the hard disk (with device icon, disk number and its capacity).

You may simultaneously select several partitions located on different disks, or several disks.

In the **Post-wiping actions** window you may choose what to do with partition that is the subject of data destruction. Acronis DriveCleanser offers you three opportunities:

- Leave partition as is that is just to destroy data according to the algorithm which you will select later;
- Delete partition to destroy data and remove partition;
- Format to destroy data and format partition (default).

≽ Acronis DriveCleanser 🛛 🔀
Post-wiping Actions Select actions to be performed after the data is wiped.
Please select actions with the wiped partitions to be performed after data destroying is completed. Leave partions as is Delete partition Format
Description Format the wiped partitions with file systems that existed on these partitions before wiping.
<back next=""> Cancel</back>

The Post-wiping actions window

In the example below it is supposed that the switch is set to the **Leave partitions as is** position. This will allow you to see the results of the data destruction itself (without partition formatting or removal).

You need to select one of the pre-defined wiping algorithms from the list in the Algorithm selection window.

≽ Acronis DriveCleanser	
Algorithm Selection	
Select algorithm for wiping.	
You can choose the appropriate algorithm from the list of algorithms. Find the description of the chosen algorith If you want to use your own algorithm select the "Custom" ite <u>m</u> :	m below.
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U.S. Standard, DoD 5220.22-M	
NAV5O P-5239-26 (RLL)	
NAV50 P-5239-26 (MFM)	
German Standard, VSITR	
Russian Standard, GOST P50739-95	
Peter Gutmann	
Bruce Schneier	
Fast	
Custom	
Load from file	
< Back Next >	ancel

The list of pre-defined wiping algorithms

The next window represents the created script for wiping the hard disk partitions.



The window of the hard disk wiping script

The Acronis DriveCleanser software is now ready to perform the wiping procedure.

Click the **Proceed** button to execute the script for wiping the hard disk partitions.

After pressing <u>Proceed</u> DriveCleanser takes care of everything automatically. To complete the execution of all processes, Acronis DriveCleanser will reboot your system after you have pressed the <u>Proceed</u> button.

Upon completion of the data destruction execution, you will receive a message reporting the successful completion of the disk wiping procedure.



The successful completion of the wiping procedure window

6.2.1 Results of the Wiping Script Execution

Acronis DriveCleanser software gives you another method to review the results of partition and/or hard disk wiping. Acronis DriveCleanser has a built-in DiskViewer utility for viewing the hard disk contents.

The algorithms described above offer different variants for data destruction. Thus, the picture you may see on a partition and/or a disk depends on the selected data destruction algorithm.

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0020	: 00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
0030	: 00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
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OODO	: 00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
OOEO	: 00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
OOFO	: 00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
0100	: 00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
0110	: 00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
U120	: 00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		• • • • • • • • • • •
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The sector of the disk partition after the fast algorithm execution

6.3 Creating Custom Algorithms

Data wiping algorithms integrated into Acronis DriveCleanser are suitable for most users from the point of reliability and performance. Nevertheless, Acronis DriveCleanser enables user to create and save custom algorithms.

To create a custom hard disk wiping algorithm, select and mouse-click the «Custom...» item from the drop-down list of the Algorithm selection window.

≽ Acronis DriveCleanser	X
Algorithm Selection Select algorithm for wiping.	
You can choose the appropriate algorithm from the list of algorithms. Find the description of the chosen algorithm be If you want to use your own algorithm select the "Custom" ite <u>m</u> :	elow.
U.S. Standard, DoD 5220.22-1 U.S. Standard, DoD 5220.22-M NAVSO P-5239-26 (RLL) NAVSO P-5239-26 (MFM) German Standard, VSITR Russian Standard, GOST P50739-95 Peter Gutmann Bruce Schneier Fast	
Custom Load from file < <u>Back</u> <u>Next</u> > <u>Cance</u>	el

Selecting the custom algorithm creation

Follow the instructions of Custom algorithm creation wizard.

The Saving custom algorithm window enables to you to save the algorithm you created. This may be useful if you are going to use this algorithm in future.

To use the previously created and saved algorithm select the «Load from file...» item from the drop-down list in the Algorithm selection window.

If you have questions, the detailed instructions for creating custom data wiping algorithms are provided in the .pdf file on the installation CD-ROM.

Appendix A. Hard Disk Wiping Algorithms

Information removed from a hard disk drive by non-secure means (for example, by simple Windows delete) can easily be recovered. Utilizing specialized equipment, one may also be able to recover even repeatedly overwritten information. Therefore the problem of guaranteed data wiping is vital as never before.

The **guaranteed wiping of information** from magnetic media (e.g. a hard disk drive) means the impossibility of data recovery by a qualified specialist with the help of any known tools or recovery methods.

This problem can be explained in the following way: Data is stored on a hard disk as a binary sequence of 1 and 0 (ones and zeros), represented by differently magnetized parts of a magnetic disk.

Generally speaking, a 1 written to a hard disk is read as 1 by its controller, and 0 is read as 0. However, of you write 1 over 0, the result is conditionally 0.95 and vice versa – if 1 is written over 1 the result is 1.05. These differences are irrelevant for the controller. However using special equipment, one can easily read the «underlying» sequence of 1 and 0.

It only requires specialized software and inexpensive hardware to read data «deleted» this way by analyzing magnetization of hard disk sectors, residual magnetization of tracksides and/or by using current magnetic microscopes.

Writing to magnetic media leads to subtle effects summarized as follows: every track of a magnetic disk stores **an image of every record** ever written to it, but the effect of such record (magnetic layer) becomes more subtle as time passes.

A.1 Information Wiping Algorithms Functioning Principles

Physically the complete wiping of information from a hard disk involves the switching of every elementary magnetic area of the recording material as many times as possible by writing specially selected sequences of logical 1 and 0 (also known as samples).

Using logical data encoding methods in current hard disks, you can select **samples** of symbol (or elementary data bit) sequences to be written to sectors in order to **repeatedly and effectively wipe confidential information.**

Algorithms offered by national standards provide (single or triple) recording of random symbols to disk sectors that are **straightforward and arbitrary**

decision, in general, but still acceptable in simple situations. The most effective information wiping algorithm based on deep analysis of subtle features of recording data to all types of hard disks. This knowledge speaks to the necessity of complex multipass algorithms to **guarantee** information wiping.

The detailed theory of guaranteed information wiping is described in an article of Peter Gutmann, please see:

http://www.cs.auckland.ac.nz/~pgut001/pubs/secure_del.html.

A.2 Algorithms Used by Acronis PrivacyExpert and DriveCleanser

The table below briefly describes information wiping algorithms used by Acronis PrivacyExpert and DriveCleanser. Each description features the number of hard disk sector passes along with number(s) written to each sector byte.

NN	Algorithm (writing method)	Passes	Record
1.	American: DoD 5220.22-M	4	1 st pass – randomly selected symbols to each byte of each sector, 2 – complementary to written during the 1 st pass; 3 – random symbols again; 4 – writing verification.
2.	American: NAVSO P-5239- 26 (RLL)	4	1 st pass – 0x01 to all sectors, 2 - 0x27FFFFFF, 3 – random symbol sequences, 4 – verification.
3.	American: NAVSO P-5239- 26 (MFM)	4	1 st pass – 0x01 to all sectors, 2 - 0x7FFFFFF, 3 – random symbol sequences, 4 – verification.
4.	German: VSITR	7	1 st – 6 th – alternate sequences of: 0x00 and 0xFF; 7 th - 0xAA; i.e. 0x00, 0xFF, 0x00, 0xFF, 0x00, 0xFF, 0xAA.

The description of built-in information wiping algorithms

NN	Algorithm (writing method)	Passes	Record
5.	Russian: GOST P50739-95	1	Logical zeros (0x00 numbers) to each byte of each sector for 6 th to 4 th security level systems. Randomly selected symbols (numbers) to each byte of each sector for 3 rd to 1 st security level systems.
6.	P. Gutmann's algorithm	35	Peter Gutmann's algorithm is very sophisticated. It's based on his theory of hard disk information wiping (see <u>http://www.cs.auckland.ac.nz/</u> ~pgut001/pubs/secure_del.html).
7.	B. Schneier's algorithm	7	Bruce Schneier offers seven pass overwriting algorithm in his Applied Cryptography book. 1 st pass – 0xFF, 2 st pass – 0x00, and then five times with a cryptographically secure pseudo-random sequence.
8.	Fast	1	Logical zeros (0x00 numbers) to all sectors to wipe.