# Ontrack®

*Defining Data Availability Solutions Worldwide*

# EasyRecovery™

**- SOPHISTICATED DATA RECOVERY -**



## CONTENTS

# 1. OVERVIEW

## 1.1. Features

EasyRecovery is NON DESTRUCTIVE and READ ONLY. The analysis process does not put any data onto your crashed drive. Recovered data is restored to another destination (disk, diskette, network,). It is recommended that another IDE hard drive be used as a destination option.

EasyRecovery is software for retrieving data from crashed hard drives.
It can help when the drive has been:

- **hit by a virus**
- **formatted**
- **'fdisk'ed**
- **zapped by a power failure**
- **damaged by applications**

NOTE: Be aware of strange noises coming from your hard drive. If you hear a strange noise or grinding sound, turn off your computer immediately and call Ontrack. Further operation may damage your hard drive beyond repair or cause irretrievable data loss.

EasyRecovery scans the drive even if there is physical damage. However, if you have mission critical data on a drive with hardware damage we recommend using Ontrack Data Recovery services rather than any software.

EasyRecovery can recover data from drives without readable boot sectors, readable FATs or readable directories. It can recover data if you are unable to start Novell's SERVER.EXE. It can also handle drives that are no longer recognized by the operating system.

EasyRecovery automatically creates a VIRTUAL DRIVE in memory. This virtual drive looks like a normal file manager. In it you can see the lost directories and files from your crashed drive. Files and directories can be viewed and copied to a safe medium. Never use the drive with data problems as the copy destination.

The extensive use of our sophisticated pattern recognition technology enables EasyRecovery to put the right pieces of data together again. Even disks with very little administrative information left can still yield files of high quality.

## 1.2. Versions of EasyRecovery covered:

Each version of EasyRecovery is an independent program available for download from the Ontrack web site. All basic documentation is within the downloadable file, however additional FAQ's are also on the web site.

EasyRecovery works from a DOS command line to recover files from DOS, Windows 3.x, Windows 95/98, Windows NT, or Novell. It is not recommended that EasyRecovery be used in a DOS box within Windows.

EasyRecovery for FAT16 works on DOS and Windows 3.x and Windows 95, 98 and NT partitions that use FAT 16. All files will be recovered, however, long filenames will be truncated to DOS 8.3 characters.

EasyRecovery for FAT32 works on WIN95B or Windows 98 platforms with 32-bit FAT. EasyRecovery for FAT32 only works on 32-bit FAT systems. Please note that in order to copy files to a FAT 32 partition, EasyRecovery must be booted to DOS 7 (Windows 95B or Windows 98) boot files. EasyRecovery for FAT 32 supports recovery of long file names.

EasyRecovery for NTFS works on any Windows NT system on NTFS only, workstation or server platforms. EasyRecovery will copy files compressed with native NTFS compression. Please note that EasyRecovery is a DOS program and cannot copy to a NTFS destination.

EasyRecovery for NOVELL works on NOVELL 3.XX and 4.XX only, with and without file compression. Please note that EasyRecovery is a DOS program and cannot copy to a Novell volume.

EasyRecovery for ZIP DRIVES is similar to EasyRecovery for FAT 16, but only works on ZIP or JAZ drives.

## 2. SYSTEM REQUIREMENTS

### 2.1. EasyRecovery for FAT16

- 286 processor and up (486 or higher recommended)
- 4 MB RAM and up (16 MB recommended)

### 2.2. EasyRecovery for FAT32

- 486 processor and up
- 8 MB RAM and up (16 MB recommended)

### 2.3. EasyRecovery for NTFS

- 386 processor with co-processor (486 or higher recommended)
- 8 MB RAM and up (16 MB recommended**)**

### 2.4. EasyRecovery for Novell

- 386 processor and up (486 or higher recommended)
- 8 MB RAM and up (16 MB recommended)

### 2.5. EasyRecovery for ZIP/Jaz

- 486 processor
- 4 MB RAM and up (16 MB recommended)

## 3. INSTALLATION

### 3.1. Boot diskette - Zip/Jaz only

On the EasyRecovery for Zip/Jaz boot disk you must create an AUTOEXEC.BAT file consisting of:

- **lh guest.exe**

GUEST.EXE is the DOS based driver program from Iomega, the manufacturer of Zip and Jaz diskettes. This program can be found on your Iomega driver diskette. Updated version can be downloaded from Iomega's internet address http://www.iomega.com.

### 3.2. General considerations

Make sure you have specified the correct drive parameters in BIOS setup. (Check the Troubleshooting section of this document).

Boot the computer to the EasyRecovery diskette and the program will automatically load. We recommend you have a destination device configured before starting the program.

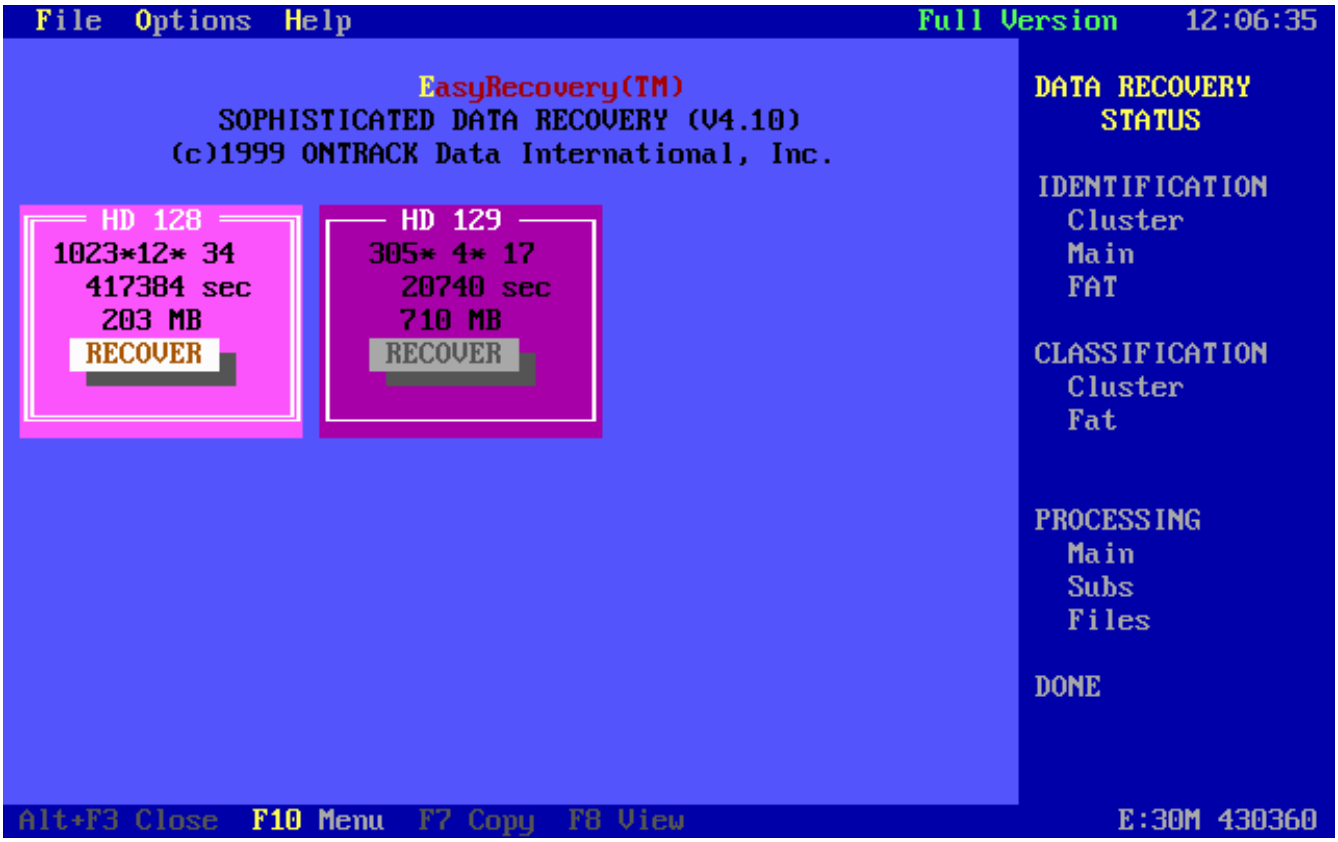
### 3.3. Specify swap area

By default EasyRecovery uses extended memory as swap area. If for some reason there is not enough extended memory available, you can specify a swap area on disk. Select OPTION -> DATA RECOVERY, tag 'DISK', specify path.

**IMPORTANT: Do not swap to the drive you intend to recover.**

### 3.4. Select Drive To Recover.

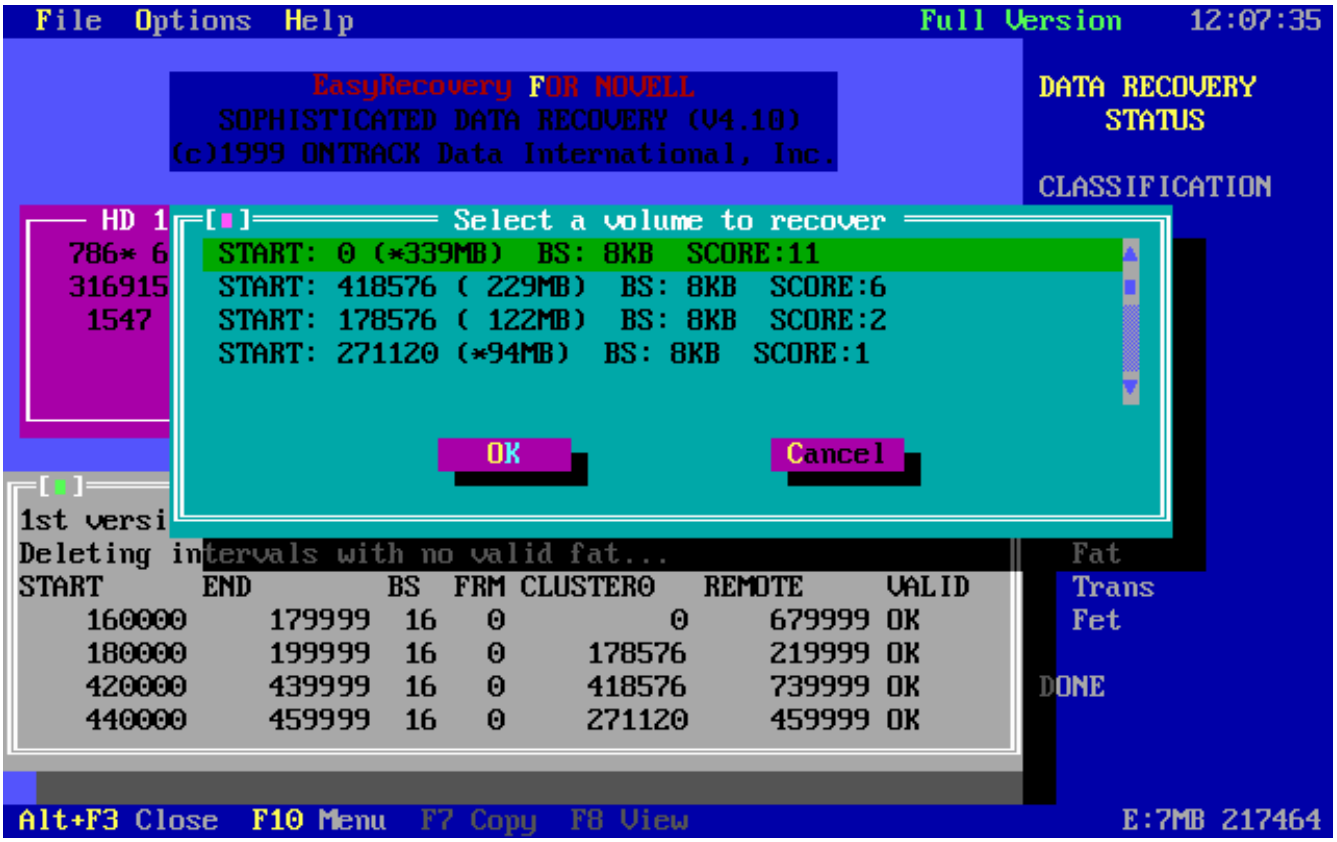
HD 128 is normally C:, the first SCSI drive or Primary Master IDE drive, and 129 is the second SCSI drive or IDE drive and so on.
You can toggle between the drives using the TAB key.
Select RECOVER or hit Enter for the drive you want to recover:




EasyRecovery starts processing. Depending on your system's speed and the size of your drive and the amount of work EasyRecovery has to do this can take from 15 minutes to several hours.

**EasyRecovery for NOVELL and NTFS ONLY:**
Depending on your system's speed and the size of your drive and the amount of work EasyRecovery has to do the partition analysis phase can take up to 24 hours.

When the partition analysis phase is done, you will be shown a window showing what the lost Novell volume(s) or lost NTFS partition(s) might have been:




Select the entry that describes your lost volume best.

- **The best choice in NTFS will say "Boot Record Approved".**
- **The "Boot Record Approved" suggestion is followed by other possibilities, each listed by their probability score.**
- **The best choice for Novell will have a high score, no asterisk in the partition size, and an appropriate starting cluster number.**
- **Entries with a high score are better than low ones.**
- **Entries without an asterisk are better than entries with an asterisk.**
- **The number after START: is the beginning cluster of the partition.**
- **Ignore entries that start at 0.**

After you select the partition, EasyRecovery continues processing.

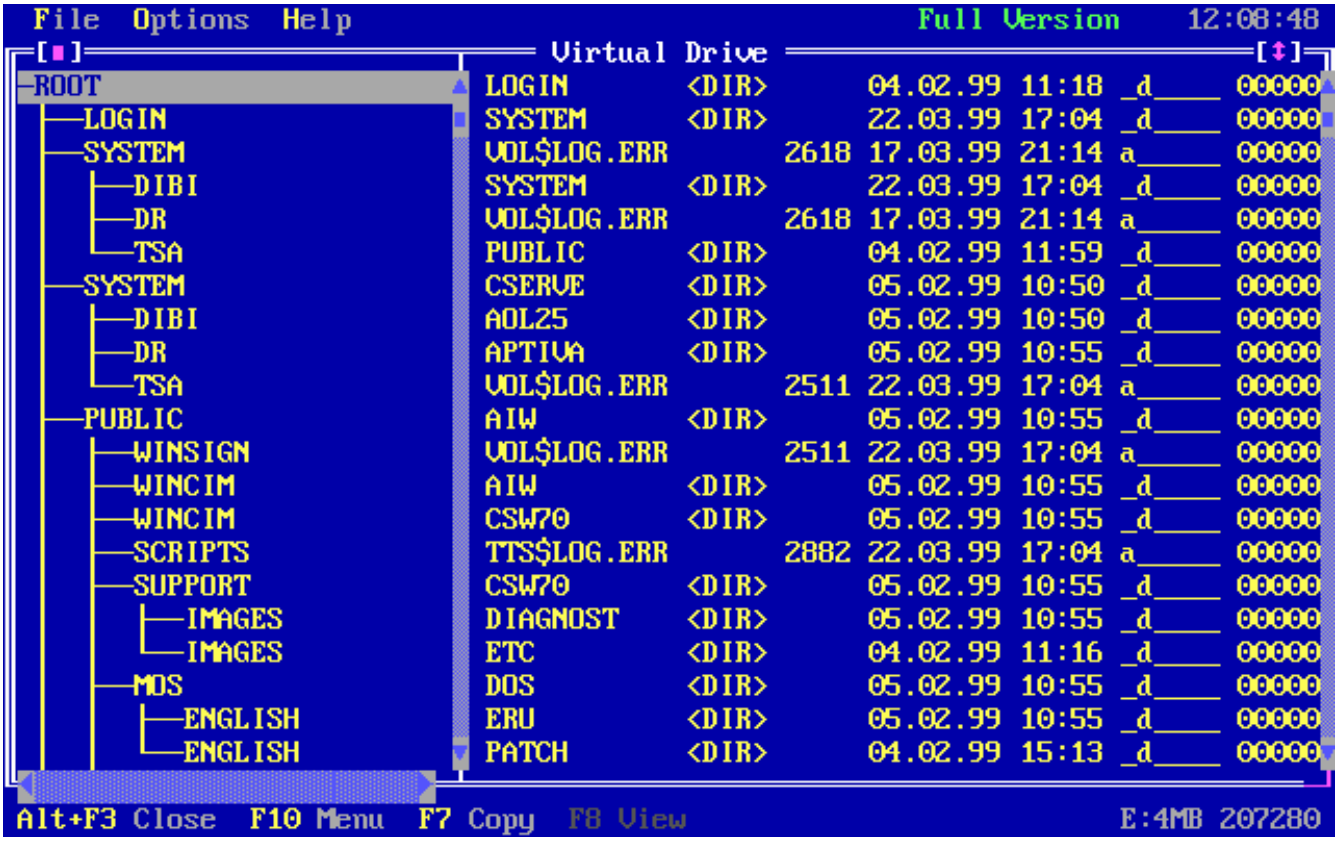
See "VOLUME SELECTION WINDOW" (Section 7) for further information, or if the recovery is not successful.

### 3.5. How to copy some or all files to a safe medium

When EasyRecovery finishes it's analysis, you will see the virtual drive and you can view, and copy the files to any DOS-available destination by highlighting a file or directory and pressing the F7-key. Caution: Do not copy to the same drive as the one you are recovering.

## 4. RESULTS

The virtual drive is like a file manager window. It will look similar to this:




On the left you can see the directory names. If for some reason your root directory was destroyed, there can be some dummy root directory names ("00123456" or "CLU01234"). You will find the files from the missing directories in these dummy directories. This does not affect the quality of these files.

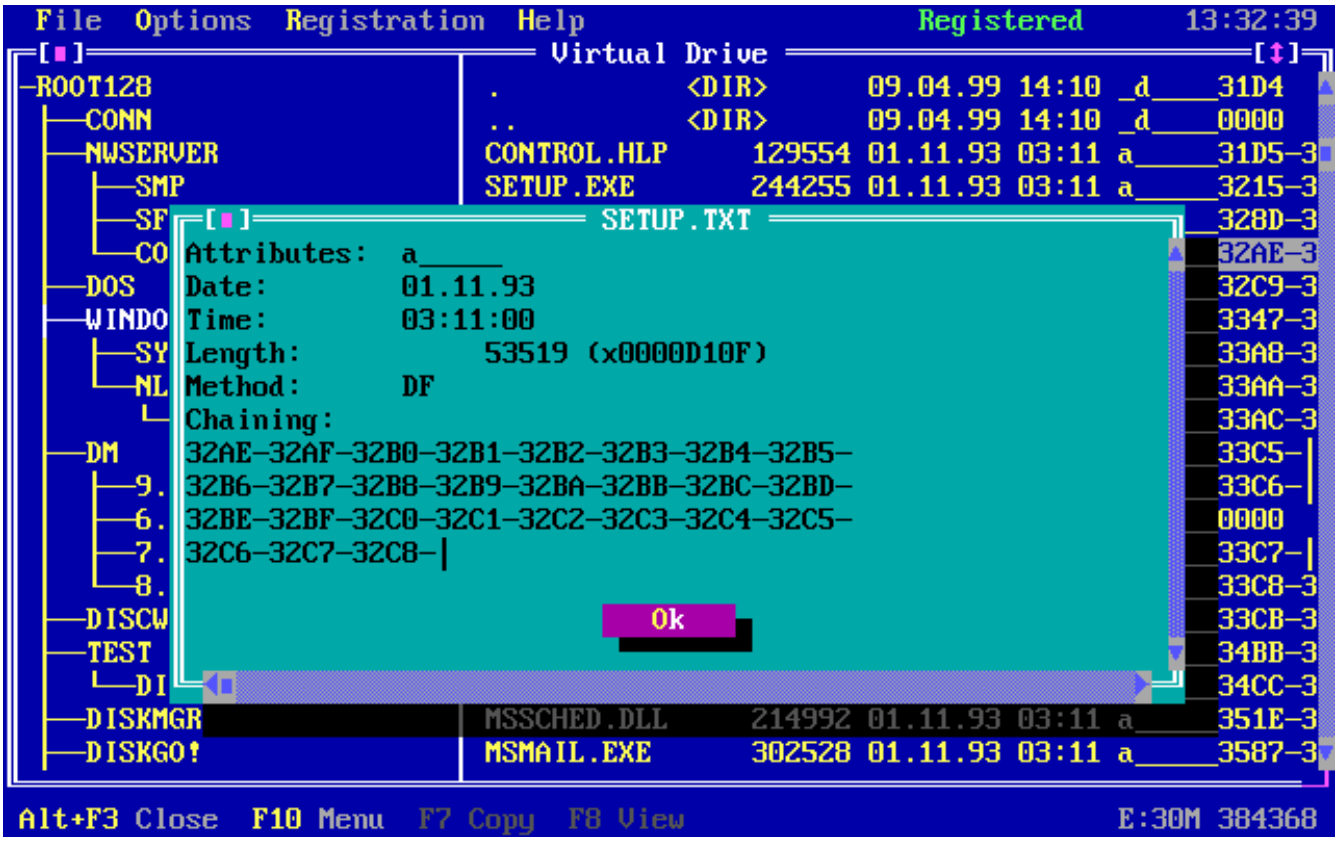
The right-hand side of the window contains the file and subdirectory entries of the directory you selected on the left-hand side.

Always check the contents of the file before you copy by viewing it with the hex-viewer (F8).

You can copy the recovered files from the right side or entire directories from the left side of the virtual drive window. If you want to retrieve the whole drive you should select "ROOT" on the left side and press F7-Copy.

**Caution: Do not copy to the same drive as the one you are recovering.**

The quality of the recovered files depends on the condition of the drive. The recovery quality of a single file can be checked by selecting the file in the right part of the window and pressing the space bar:




The characters next to "Method:" tell you something about the quality of this single file.

- **F - FAT approved. This file has been recovered using a valid FAT entry. This is a very good sign. In all probability this file is good.**
- **D - Directory entry found. A directory entry was found for this file. This is usually a minimum requirement for good file quality.**
- **S - Confirmed by signature. Some kinds of files (for example, EXE files have “MZ” as leading characters) have signatures. An 'S' indicates that this signature is present.**

Always check the file quality before you copy by viewing it with the hex-viewer (F8).

## 5. RESTRICTIONS

EasyRecovery for FAT16 can only work on drives with 16-Bit FATs.

EasyRecovery for FAT32 can only work on drives with 32-Bit FATs, not FAT 16.

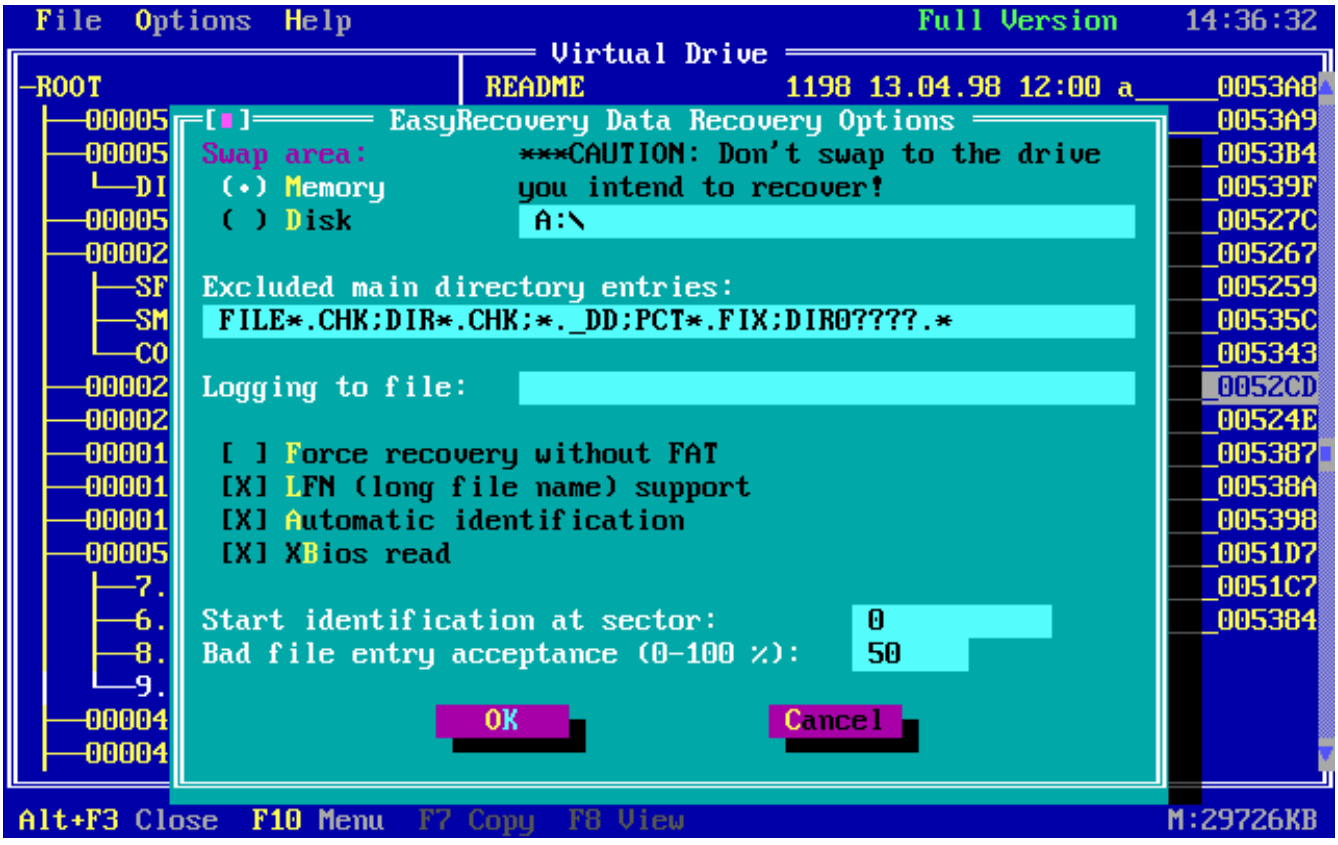
EasyRecovery for NTFS can only work on drives with NTFS File-systems, not FAT16 or FAT32 partitions.

EasyRecovery for NOVELL can only work on drives using Novell 3.xx or 4.xx.

EasyRecovery for ZIP/JAZ can only work on drives with 16-Bit FATs, which applies to most Zip or Jaz diskettes.

## 6. OPTIONS

There are several options you can change in the OPTIONS->DATA RECOVERY screen:




This example is from the FAT 32 version.

### 6.1. Swap Area

EasyRecovery does all its analysis in conventional memory, swapping out its results to extended memory. This is the recommended configuration. However, there can be cases where there will not be enough extended memory available, if for example there are very many files or a complex directory structure. In that case EasyRecovery can be configured to swap to disk. However, do not swap to the disk you are recovering.

### 6.2. Excluded Main Directory Entries

This option tells EasyRecovery to ignore files entries that have been created during a previous run of another disk repair utility (Norton, Scandisk, etc.).

### 6.3. Logging (Logfile)

Use this option to create a log file of EasyRecovery's processing.
Be aware that if this option is enabled, the resulting text file can be very large.

### 6.4. Force recovery without FAT

This option usually will not be tagged on. During its structure recognition, EasyRecovery tries to reconstruct the remaining FAT fragments. However, if EasyRecovery finds an old FAT that is not the FAT of the system you want to recover, it may be better to do the recovery without FAT than with FAT.

### 6.5. LFN (long file name) support

By default the LFN support is enabled. See section 9.1 for configuration instructions. If you do not need long file names or your file system did not support them, you can switch this option off. This speeds up the recovery.
NOTE- EasyRecovery for NTFS does not have this check box, but does support LFN recovery.

### 6.6. Automatic Identification (Verify correct file system structure)

The first thing EasyRecovery does is to retrieve the original structure of the file system: location of FAT1, FAT2, main directory, number of sectors per cluster, number of clusters. If you tag off this option, EasyRecovery shows you what kind of file system it thinks it found. Confirm the suggestion, then look at it by pressing OK. If you do not select the structure EasyRecovery found, you can continue the identification procedure by pressing SEARCH AGAIN. After a while EasyRecovery will make another suggestion.

### 6.7. Start Identification At Sector X (multi partition problem)

By default EasyRecovery starts its identification procedure at sector 0 and looks at the first partition on a drive. However you may want to recover a different partition. If so you can enter a value in this field.
Example: Take a 600 MB drive with two partitions, the first is 400 MB and the second is 200 MB. You want to recover the second (200 MB) partition. The first partition uses 400 MB space on the hard drive. These are approximately 800000 sectors (one sector has 512 bytes). Consequently you should enter the value 800000 in this field. You should tag the "Automatic Identification" off so you can verify if EasyRecovery retrieved the correct file system structure.

### 6.8. Bad File Entry Acceptance

EasyRecovery uses statistical algorithms to decide if file entries are included into the recovery process. If this option is set to 0 EasyRecovery is very strict. If it is set to 100 EasyRecovery is very loose. 50 is a good value. Increase it if EasyRecovery misses some files in the resulting virtual drive. Decrease it if EasyRecovery is returning invalid files.

### 6.9. Restart from last / Keep for next session - EasyRecovery Full for FAT32, Novell or NTFS Only.

The scanning of the drive can take up to several hours. It might be a good idea to keep the results of the drive scan for a future run of EasyRecovery for Novell or EasyRecovery for NTFS. For doing this select OPTION -> DATA RECOVERY, tag KEEP FOR NEXT SESSION.

You always must select this option BEFORE hitting the RECOVER button.

This generates two files: SCAN_RES.RST and INTERVAL.RST.

FAT32 version, select FILE -> SAVE RECOVERY after EasyRecovery presents the Virtual Drive screen.

If you want to use scan results from a previous session tag RESTART FROM LAST. Specify a directory if you tagged one of these options.

### 6.10. Valid FAT Required - EasyRecovery for Novell Only

By default, EasyRecovery for Novell expects to find a valid FAT, or at least FAT fragments on the drive. If EasyRecovery for Novell does not find the volume you want to recover, un-tag this option. However, a recovery without any FAT will be poor.

### 6.11. DET maintenance mode - EasyRecovery for Novell Only

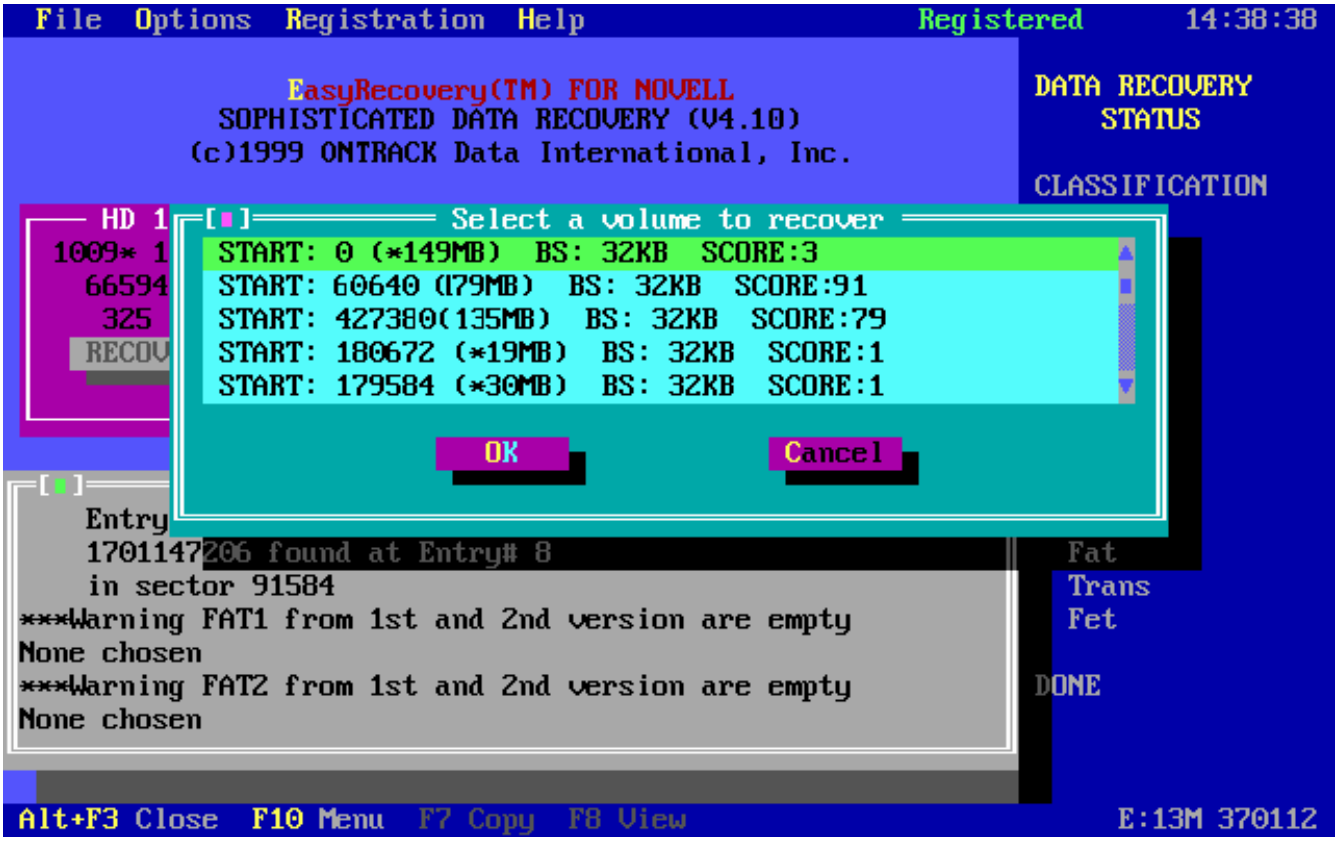
By default EasyRecovery for Novell uses Novell's "directory entry tables (DET)". It might happen that these DETs are corrupt. If you miss files in the "Virtual Drive", tag this option on. Please note that this option does not effect the recovery quality of a single file.

## 7. SPECIAL ISSUES

### 7.1 EasyRecovery - Novell only

**VOLUME SELECTION WINDOW**

In this window you have to choose which volume you are going to recover. It is the most important decision you have to make during the data recovery process:




Select the entry that describes your lost volume best.

Every entry contains the following information:

- **Start sector of this volume (to be more exact: start of first FAT of this volume)**
- **Size of this volume**
- **Block size used by this volume**
- **Score (entries with high scores are more likely to be valid than others)**
- **An '*' indicates an inconsistency between the found FAT and the data**

Entries with a high score are better than low ones.

Entries without an asterisk are better than entries with an asterisk

Please note that the proposed volumes are not necessarily real existing volumes. EasyRecovery uses advanced pattern recognition algorithms to decide which structure was the most likely.

Example: Suppose you want to recover the first attached hard drive (HD 128). It is a 325 MB drive that had this design before the crash:

- 1 small DOS partition with 10MB
- 1 NetWare partition with two volumes:
  - One volume with about 180MB
  - One volume with about 135MB

Now calculate what value for START to look for. The NetWare partition begins after the small DOS partition. Therefore it begins approximately at sector 20000 (1 sector = 0.5KB). However, the start of the file system is defined by EasyRecovery as the location of cluster 0. This is usually the location of the start of the first FAT, not the start of the partition. The disk space used for additional administration outside of the file system takes about 20MB. Therefore the start of the first volume (cluster 0 of the first volume's file system) is somewhere at sector 60000. The 2nd entry of the window will be correct for the 1st volume. The displayed size (179MB) is similar to the actual size (180MB).

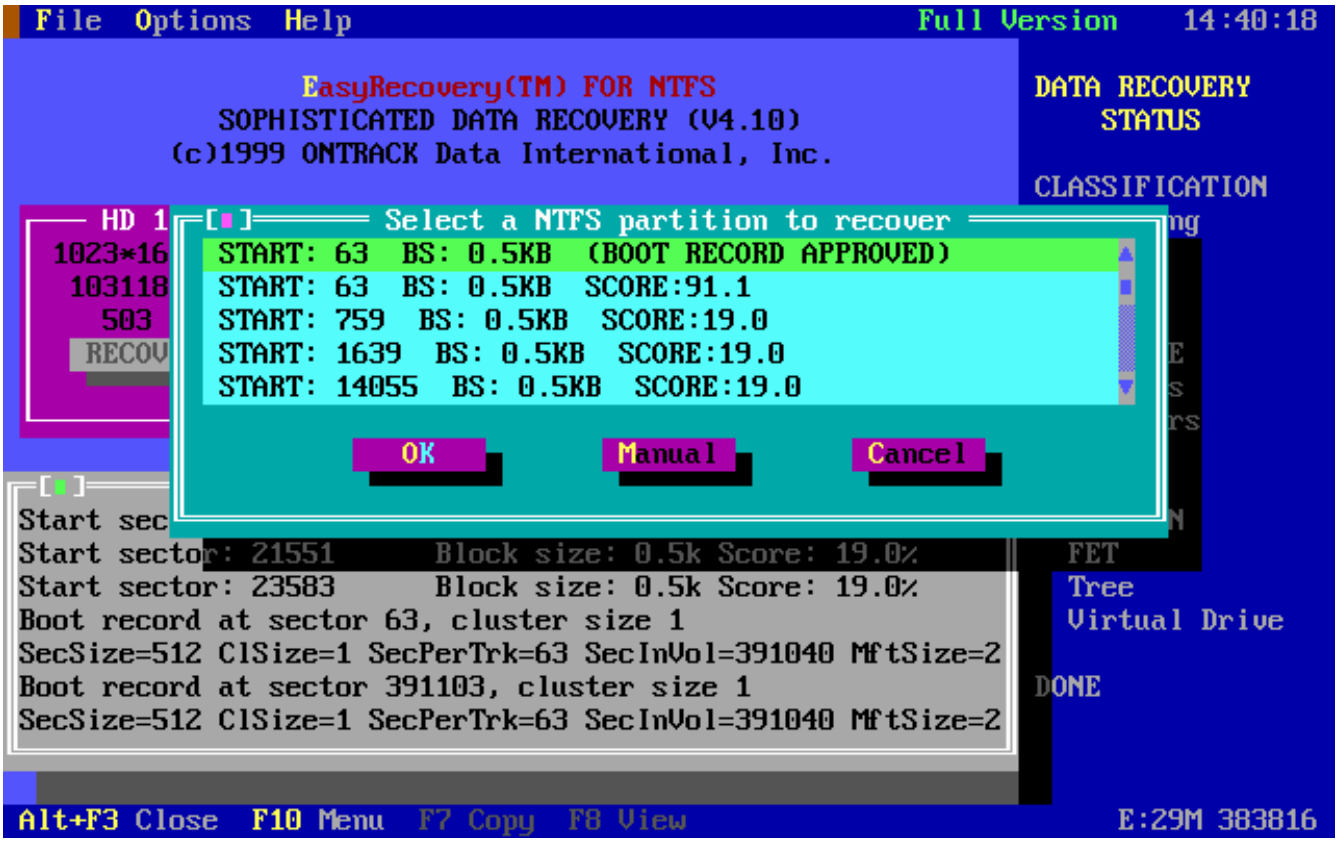
If you want to recover the 2nd volume, add the size of the first volume (175-180 MB) to the 60000 from the calculation above. This is a value of about 425500. Entry three is the correct entry for the 2nd volume.


If the volume you want to recover is definitely not listed see section 8.3, "Drive structure recognition routine fails".

## 7.2 EasyRecovery - NTFS only

### PARTITION SELECTION WINDOW

In this window you have to choose which partition you are going to recover:




Select the entry that best describes your lost partition.

Every entry contains the following information:

- **START: Start sector of this NTFS partition**
- **BS: Block size used by this NTFS partition**
- **SCORE: (entries with high scores are more likely to be valid than others) <OR>**
- **BOOT RECORD APPROVED**

EasyRecovery uses two different drive structure recognition routines. One searches for signatures ("BOOT RECORD APPROVED") the other uses pattern recognition routines and creates a list of possible partitions ("SCORE: XXX%").

Entries with a high percentage are better then low ones.

It is best to have a BOOT RECORD APPROVED and a high percentage entry describing the same partition (START: 63, BS: 0.5KB in our example above).

Please note that the proposed partitions are not necessarily existing partitions. EasyRecovery uses advanced pattern recognition algorithms to decide which structure was the most likely.

If the default choice does not show correct results or you are recovering other than the first partition of a drive with more than one partition, you must look closely at the partition selection window.

Example 1 - Problems with the recovery of the one and only partition:

- The Problem: Your drive had only one partition and this partition was a NTFS partition. The default choice in the "Select Partition" window shows only invalid files.
- The Solution: Since there is only one partition the start sector should be somewhere between 0 and 100. Try the entries that have a start sector between 0 and 100.

If your drive had only one partition, it usually starts at the first sector, at the second head, and at the first cylinder.

In our example above, we have a drive with 1023 x 16 x 63 sectors.

The NT partition would usually start at (0, 1, 1). (Cylinders and heads start counting at 0, sectors start at 1).

In logical addressing starting at 0 this is sector 63.

The "block size" is usually 1 sector (=0.5 KB).

It is possible to enter the partition parameters manually in the "Select Partition" window. In our example you would have to enter "62" as the start sector and 512 (0.5KB) as the block size. EasyRecovery can also be configured to use other block sizes. Possible block sizes are 0.5KB, 1.0KB, 2.0KB, 4.0KB.

Example 2 - Problems with the recovery of other than the first partition:

- The problem: You had more than one partition on your drive and you want to recover a partition other than the first one.
- The solution: Let's suppose you have a 2GB drive. You remember the following layout:
  - 1 DOS (FAT) partition 500 MB
  - 1 NTFS partition 600 MB
  - NTFS partition 900 MB

You want to recover the last NTFS partition.

It starts somewhere at 1.1 GB (= sector 2200000). You should look for a partition starting somewhere at about 2200000.

As a last choice tag OPTIONS->FAST IDENTIFICATION off. This method might show you different entries in the "Select Partition" window.

## 8. TROUBLE SHOOTING

### 8.1. Computer frozen or Runtime error

Sometimes you may think the computer is frozen and EasyRecovery is crashed. Be patient, if EasyRecovery crashes you usually get an error message.

EasyRecovery does all its analysis in conventional memory, swapping out results to extended memory. There are instances where there will not be enough conventional memory available, such as in cases of severe corruption, or if the drive contains a very large number of small files. These are examples of situations where there can be too much analysis for EasyRecovery and available conventional memory.

- **Try recovering only part of the drive at a time by restricting the sectors in the Options box**
- **Try lowering the bad file entry acceptance setting**
- **Try swapping out to disk instead of to EMS**

There are cases that will be beyond EasyRecovery's capability. Ontrack's Remote Data Recovery is recommended in these situations.

### 8.2. Wrong Disk Size

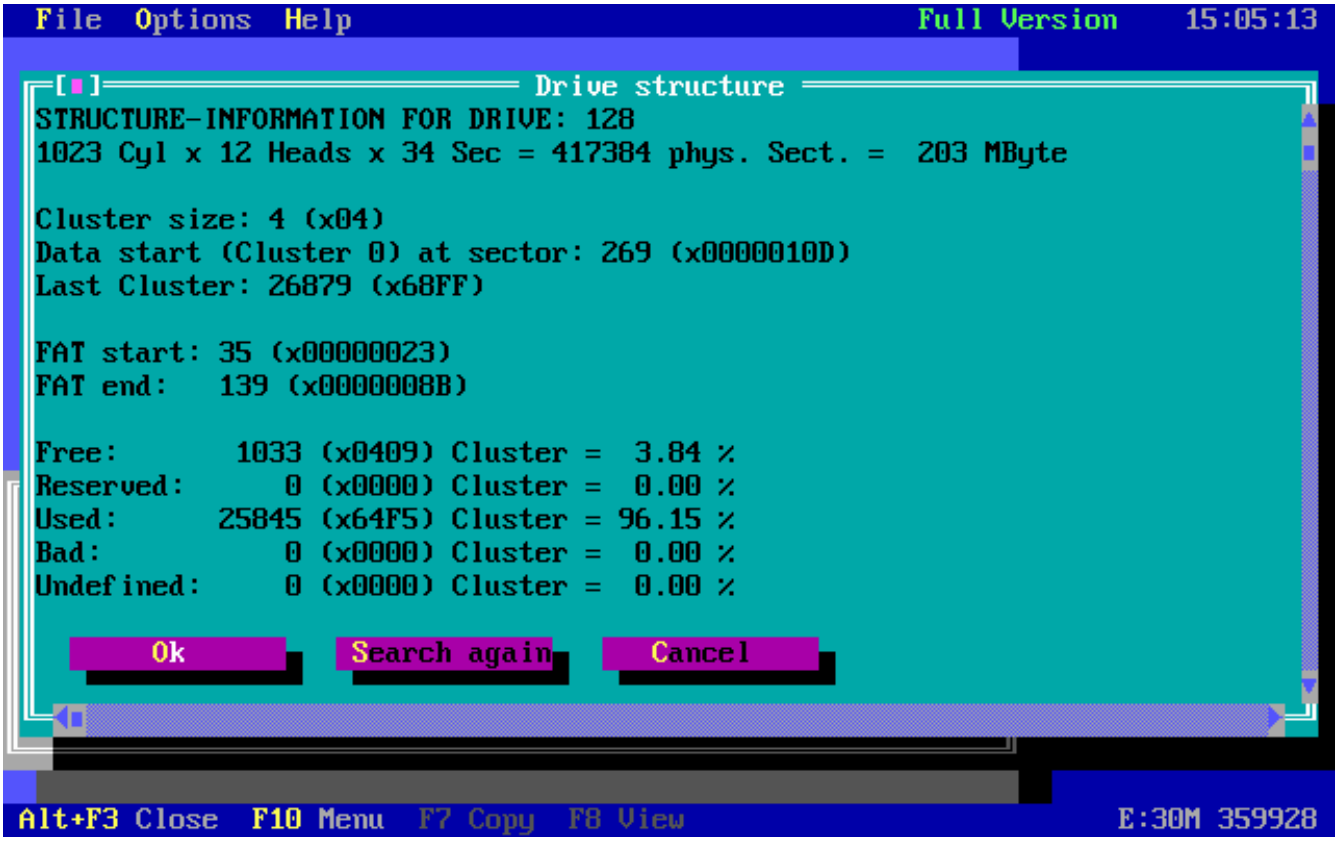
One source of problems is the wrong disk size reported from BIOS.
Check the size EasyRecovery reports your drive as:


If this size (1547 MB in this example) is not correct you won't get reliable recovery results.

- **Reboot your computer and enter the BIOS setup. Let it "auto detect" (if available) the drive size or enter the values manually.**
- **If the drive is bigger than 504 MB make sure the LBA mode is enabled.**
- **Some huge drives report their geometry as 16383 x 16 x 63 no matter what their actual size.**

## 8.3. Drive Structure Recognition Routine

If you only get invalid results, it could be because the EasyRecovery drive structure recognition routine has failed. Try this: Select OPTION -> DATA RECOVERY, tag 'AUTOMATIC IDENTIFICATION' off. Press RECOVER. After a while you get a window that suggests a certain drive structure:




Check the value "Cluster size". It tells you how many sectors a cluster uses. In the example above the cluster size is 4 sectors (=2 KB).

Check the value of "Data Start (Cluster 0) at sector". If you are retrieving the first partition, it should be below 300. If you try to retrieve for example the 2nd partition of a 2 GB drive with two 1 GB partitions, this value should be around 2010000.

Check the value of "Last Cluster". Do the following calculation:

(Last Cluster * Cluster Size) / 2

This is the size (in KB) of the partition you are going to recover.
In the example above the partition size is

26879 * 4 / 2 = 53758 KB

This is approximately 53 MB. Since I know that my 203 MB drive had a DOS partition of this size, this suggestion is likely to be correct.

If you are not satisfied with what you see, you can press 'Search Again'. EasyRecovery tries to retrieve another structure. Repeat this until the proposed structure seems to be correct, then select “OK”.

If you do not get satisfactory results, you should check that you really did have the appropriate file system. For example, if EasyRecovery for FAT 32 gave a message early on saying that no valid FAT could be found, it could well be that you have something other than a FAT 32 format.

### 8.4. Missing files or directories

You can change the option "Bad file entry acceptance". 0% means a very strong directory recognition routine. Use this only if EasyRecovery crashes. 100% means a very loose directory recognition routine. Use if EasyRecovery goes through but you miss some directories. 50% is a good starting value.

### 8.5. The resulting files are all invalid

If you get only invalid files, see "PARTITION SELECTION WINDOW" (Section 7).

### 8.6. No partition found: EasyRecovery FOR NTFS

If EasyRecovery for NTFS does not find any partitions, tag off the option "Fast identification". Rerun EasyRecovery for NTFS.
Read "PARTITION SELECTION WINDOW" (Section 7).

### 8.7. "Restrict sectors" must match previous setting

If you selected "Restrict sectors" *and* "Keep for next session", you must enter the same sector range for a further session using "Restart from last".

### 8.8. Other Disk Tools

You should not use any other disk repair utility before running EasyRecovery. If you did so, please 'undo'. If you cannot 'undo' you can tell EasyRecovery to ignore the file entries the disk utility created (something like FILE0000.CHK...). Select OPTION -> DATA RECOVERY, modify the field 'Exclude Main Directory Entries'.

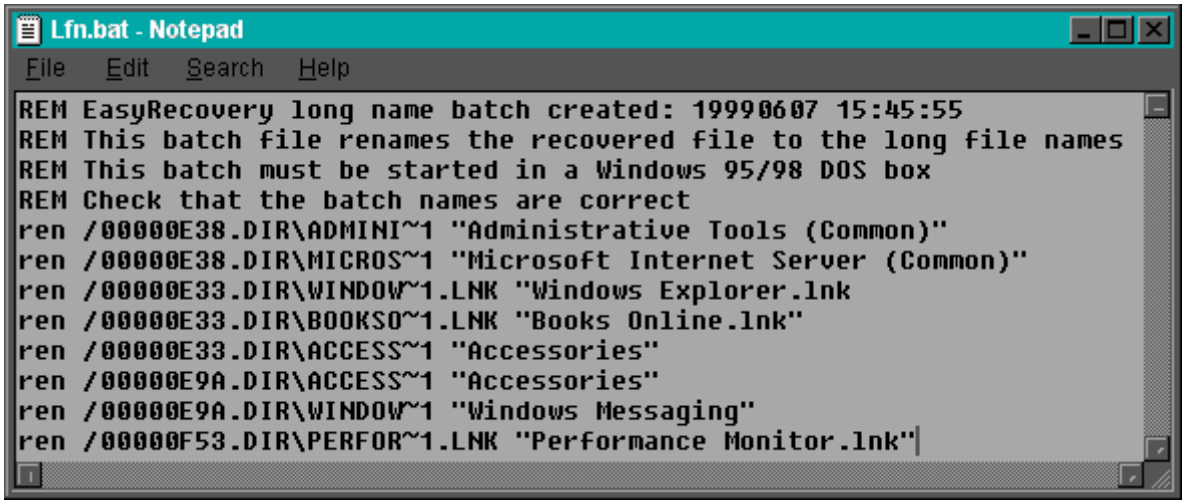
## 9. OTHER FUNCTIONS

The FILE menu contains some additional functions as described below.

### 9.1 Long File Names (LFN) - FAT32 and NTFS only

EasyRecovery is able to retrieve the WIN95 or NT long file names (LFN). EasyRecovery for FAT32 has a check box in the Options menu for LFN support that is ON by default. EasyRecovery for NTFS does not have the option to turn off support for long file name recovery. The recovery itself is done using the short (alias) names. Before copying the data to a safe medium select FILE->CREATE LONGNAME BATCH.

You will be prompted for a file name. Type in 'LONGNAME.BAT' for example (IMPORTANT: Do not write this file to the drive you are recovering). EasyRecovery will create a batch file similar to this:




Run this batch under WIN95 or NT. Make sure it shows the correct path names, especially if you copied your files to a different location.

### 9.2 Save & Load a Recovery – FAT32, NTFS and Novell only

EasyRecovery can save a successful recovery on disk using the SAVE command (F2). You will be prompted to specify a file name. Depending on the size of the drive you are recovering, this file can be up to 20 MB.

**IMPORTANT: Do not write this file to the drive you are recovering.**

After starting EasyRecovery, you can load a previous saved recovery using the LOAD command (F3). Make sure the matching drive is selected (high-lighted). Do not load the stored recovery for a different drive.

## 10. REGISTRATION

Three versions of EasyRecovery are available:

1. Full: An unlimited license allows use for an UNLIMITED PERIOD on different computers, but not at the same time.
2. Lite: Allows copying up to FIFTY FILES per execution. An unlimited number of executions may be run at a maximum of fifty files copied each run.
3. Free: Allows copying up to FIVE FILES per execution. An unlimited number of executions may be run at a maximum of five files copied each run.

## 11. NO WARRANTY

The quality of data recovery that is done by EasyRecovery depends on:

1. The physical condition of the hard drive
2. The fragmentation of the files
3. The grade of the loss of drive information

EasyRecovery data recovery software, like all software applications, has limitations. We cannot provide recovery capabilities under certain conditions. Due to the many variables associated with drive corruption, we cannot guarantee recovery in all cases.

However, downloading and running the free version allows you to see what data can be recovered before purchasing a Lite or Full version. All customers are recommended to check the files with the built-in quality control, the file information as well as the file viewer, before they buy.

We cannot grant refunds.

## 12. LICENSE AGREEMENT

Please refer to the “LICENSE.TXT” file on the diskette for the complete license agreement.