

# **AEFDISK32 v1.3 DOCUMENTATION**

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# Legal Stuff

## ***Disclaimer***

Using this program comes without any warranty. The author and distributors will not accept responsibility for any damage incurred directly or indirectly through use of this program. In other words: use at your own risk!

## ***Copyright***

The author, Nagy Daniel, exclusively owns all copyrights.

You are NOT allowed to sell, modify and reverse engineer either version of the program without the author's written agreement!

You are NOT allowed to distribute the registered version of the program without the author's written agreement!

You can distribute the shareware version freely as long as no money is asked for it and all files in the package are intact.

Permission is granted to distribute the shareware package on shareware collection CD-ROMs or DVDs.

The shareware version can be used on one computer for a 30 days evaluation period. Registering this product is necessary after the evaluation period is over.

# Introduction

Aefdisk32 for Windows is a command line controlled disk partitioning utility. It was designed to help automating partitioning tasks and OS deployment.

## ***Files in the package***

AEFDISK32.EXE - Executable for x86 platforms  
AEFDISK64.EXE - Executable for x64 platforms  
AEFDISK32.PDF - English documentation  
AEFDISK32.URL - WEB page URL  
WHATSNEW.TXT - Version history

## ***Features***

- Creating all types of partitions, with absolute or relative sizes
- Deleting partitions based on their type or place in the partition table
- Formatting FAT/NTFS partitions quickly
- Hiding and unhiding FAT, NTFS/HPFS partitions
- Changing a partition's type ID
- Activating a partition
- Installing standard loader code in the Master Boot Record
- Saving/restoring boot sectors
- Displaying partition information
- Displaying physical disk information
- Completely command line controlled
- Automatic calculation of free space and available partition entry
- Handling as many harddisks as Windows supports
- Support for max 2 TB harddisks or RAID arrays

## ***Requirements***

- WinNT4, WinPE, Win2000, WinXP, Win2003, WinPE2, Vista, Win2008
- Local administrator rights
- At least one harddisk (Windows basic disk)

If you use WinPE, be sure to insert fmifs.dll (from the system32 or system64 directory) into the WinPE image, because it is needed for formatting.

## ***Restrictions***

- Windows dynamic disks not supported
- GUID partition tables not supported

# Usage

WARNING! Playing with partitions is a risky job! Use this program only if you know what you're doing! Be sure to read the documentation! If you use it on a disk with important partitions, back up all data first!

## Installation

You can copy these files (this docs and the executable) together wherever you like. This program doesn't need any additional settings. Just execute it. Both the shareware and the registered version use the system registry to store some data, so it is recommended to run it before creating a WinPE image, which uses aefdisk32.

## Command line usage

Syntax: aefdisk32 [harddisk number] [switches] <command1> [command2] ...

Valid commands are:

/init	- initialize a blank disk
/pri:<size>:<type>[:n]	- create primary partition
/ext:<size>[:5][:n]	- create extended partition
/log:<size>[:type]	- create logical drive
/delete:<n>	- delete an entry
/deltype:<type>[:n]	- delete partition(s) of specified type
/delactive	- delete active partition
/delall	- delete all partitions on a disk
/notdel:<type>[,types]	- delete all except specified type(s)
/activate:<n>	- activate a partition
/deactivate	- delete active flag
/changetype:<type>:<n>	- change type of partition
/hidefat[:n]	- hide FAT partition(s)
/hident[:n]	- hide NTFS/HPFS partition(s)
/unhidefat[:n]	- unhide FAT partition(s)
/unhident[:n]	- unhide NTFS/HPFS partition(s)
/format[:n][:label]	- format partitions, can be a switch
/allsize	- prints the HD size in MBs
/freesize	- prints the size of unpartitioned space in MBs
/psize:<n>	- prints the size of n-th partition in MBs
/ptype:<n>	- prints the type of n-th partition in hexadecimal form
/putactive	- prints the number of the active partition
/numhds	- prints the number of available HDs
/mbr	- install the standard DOS MBR loader
/sort	- sorts the partition table in physical order
/save:<filename>	- save the MBR to a file
/restore:<filename>	- restore the MBR from a file

/saveboot:<n>:<filename>	- save boot sector to a file
/restoreboot:<n>:<filename>	- restore boot sector from a file
/show	- show partition table
/dump	- hexadecimal dump of partition table
/debug	- logs activities to aefdisk32.log in temp. dir.
* /register "name" serial	- register aefdisk32
/info	- show logical characteristics
/?	- this help message

Valid switches are:

* /rel	- use percentages at size definition
/format	- format new partitions
/dynamic	- leave space for Win2000/XP dynamic volume
/nolimit	- disables FAT limit check

\* - available in registered version only.

- n is a valid partition number. From 1 to 4 it means a primary partition. From 5 it means a logical drive
- Harddisk number is a number starting from 1. The default is 1.
- The /rel and /format switches are effective for the commands that follow them.
- The type is hexadecimal. Don't append a 'h' at the end

## ***Creating partitions:***

You can create partitions with the /pri, /ext or /log commands. Aefdisk32 automatically finds the largest unpartitioned space and creates new partitions there. If there is an existing partition in the middle of the harddisk and the new partition should be created in the smaller unpartitioned chunk, create a dummy partition in the larger first.

The /pri command can be used to create primary partitions. The size and type must be specified, partition number is optional. If the specified size is 0 then all available space will be allocated. If you create a primary partition on a new disk, be sure to set it active using the /activate command.

The /ext command can be used to create an extended partition, which can contain many logical drives. Only one extended partition is allowed per harddisk. You can force aefdisk32 to create type '5' extended partition, even if it'd end beyond 8 gigs (WindowsNT 4.0 cannot handle type 'f' extended partitions). If the specified size is 0 then all available space will be allocated.

The /log command can be used to create logical drives in an extended partition. The extended partition must exist before using this command. If the type is not specified, this command will create FAT16 or FAT32 drives, based on the size. The 0 as size cannot be used here, so creating the largest possible logical drive needs the /rel switch (registered version only).

## ***Deleting partitions:***

You can delete partitions with the /delete, /deltype, /delactive, /delall and /notdel commands. Do not put deleting commands after the /rel switch! All deleted partitions will be unmounted automatically.

The /delete command deletes the specified partition entry.

The /deltype command deletes a partition or partitions of the specified type. If the entry number is not specified, then all partitions of the specified type will be deleted. If the entry number is also specified, then the partition will be deleted only if the specified type matches the partition type.

The /delactive deletes the active partition.

The /delall command deletes all partitions on a harddisk.

The /notdel command deletes all partitions except the specified types separated with commas. You can specify up to 20 types to be excluded.

## ***Relative sizes (registered version only):***

The /rel command can be used to avoid specifying absolute MB sizes. If the /rel command is used then all size definitions will be treated as percent values from 1 to 100.

This switch can be used with the /pri, /ext and /log commands. This switch calculates the unpartitioned space and divides it as specified. Check out the examples section.

## ***(Un)Hiding FAT, NTFS/HPFS partitions:***

The /hidefat command hides FAT partitions on a harddisk. If the partition entry is specified, then this command tries to hide only that partition. If no partition is specified, this command will hide all primary FAT partitions. The /unhidefat command has similar behavior for unhiding. /hident and /unhident are the same but for NTFS/HPFS partitions.

Hiding a partition not only removes the drive letter assignment, but alters the partition's boot sector, which means, that the OS won't recognize these partitions even after you reboot! You have to use an unhide command if you want to access a hidden partition.

## ***Formatting FAT/NTFS partitions:***

The /format command allows formatting FAT and NTFS partitions. FMIFS.DLL is needed for formatting. If you use aefdisk32 under WinPE/WinPE2, be sure to add this DLL to WinPE! This parameter can be used as a command or a switch:

1) If the partition number is not specified, then this command acts as a switch, and must appear before any partition creation command on the command line. In this case all partitions, which are created will be immediately formatted.

2) If the partition number is specified, only that partition will be formatted, if it already exists. In this case, an optional volume label can be specified. If the specified partition number is 5 or higher, then it'll mean a logical drive. 5 means the first logical drive and so on.

## ***Informational commands***

The following commands print the requested information to the standard output, which can be parsed by external utilities, so they can be useful to include aefdisk32 in installation scripts. The output is in KEY=VALUE form for easy parsing.

- The /allsize command prints the HD size in MBs  
ALLSIZE=size
- The /freesize command prints the size of the unpartitioned space in MBs  
FREESIZE=size
- The /psize command prints the size of the specified partition in MBs  
PSIZEXX=size (where XX is the number of the partition)
- The /ptype command prints the type of the specified partition in hexadecimal form  
PTYPEXX=type (where XX is the number of the partition)
- The /putactive command prints the number of the active partition  
ACTIVE=number
- The /numhds command prints the number of available HDs  
NUMHDS=number

## ***Other commands and switches:***

- The /init command creates an empty partition table and notifies Windows about the change. This is usually needed in case of brand new or zeroed disks.
- The /activate command activates the specified primary partition.
- The /deactivate command clears the active flag if any.
- The /changetype command changes the specified partition's type ID to the specified value. It doesn't touch the file system, only the ID in the partition table. This can be useful to make diagnostic partitions visible or hidden.
- The /save command saves the MBR to a specified file.
- The /restore command restores the MBR from a specified file. Combining this command with others is NOT recommended!
- The /saveboot commands saves the boot sector of the specified partition to a file. For FAT32 partitions, 3 physical sectors are saved, else 1.
- The /restoreboot command restores the boot sector from a file. The partition type and boot sector type must match and the partition must be formatted before using this command. This can be used to make a partition bootable or use an internationalized boot sector instead of the default.

- The /mbr command installs the standard loader code on the specified harddisk. It's like the original 'fdisk /mbr' command.
- The /sort command sorts the partition table. Sorting is based on the partitions' physical location. The first partition on the disk will occupy the first partition entry and so on. Empty entries will be placed to the end of the partition table. This command is useful to maintain partition numbering compatibility with other partitioning utilities, which number partitions based on physical location on disk.
- The /show command prints some information about the partition table of the specified harddisk.
- The /dump command shows the hexadecimal dump of the partition table.
- The /debug command logs all activities to aefdisk32.log in the system's default temporary directory.
- The /register command registers aefdisk32 via command line. This is useful if you run the registered aefdisk32 in scripts and don't want to interactively register it (WinPE). Don't use this command together with other commands!
- The /info command shows the logical characteristics of the harddisk and checks if extended BIOS is available.
- The /dynamic command leaves 10Mb unpartitioned space at the end of the harddisk if you specify 0 as partition size. This is useful if you want to convert the drive later from static to a dynamic disk.
- The /nolimit switch disables FAT size checking. This may be useful when creating FAT partitions larger than 2 gigs.

## **Examples:**

- aefdisk32 2 /delall /pri:200:6 /pri:300:7:4 /activate:1

Delete all partitions on the second harddisk and then create two primary partitions. The first is a 200 MB BIGDOS partition, and it is created in the first available entry. The second is a 300MB NTFS partition, and it is created in the fourth entry. The first primary partition will be active.

- aefdisk32 /init /pri:30000:7 /ext:1000 /log:1000

Initialize this brand new disk and create a 30GB primary NTFS and a 1000MB extended partition with one 1000MB logical drive.

- aefdisk32 /dynamic /pri:0:c

Find the largest available space and create a FAT32 partition there. Leave 10MB unpartitioned space at the end of the harddisk for Win2000/XP dynamic volume conversion.

- aefdisk32 /rel /pri:30:6 /ext:70 /log:40 /log:60

Calculate the available unpartitioned space first. Then create a primary BIGDOS partition, which occupies 30% of the free space. The remaining 70% space is assigned to an extended partition. In the extended partition, there are two logical drives. The first occupies 40% of the extended partition, the second occupies 60%.

- aefdisk32 /formatfat /pri:120:83 /ext:0 /rel /log:100

Create a 120MB Linux partition, and then create an extended partition with one logical drive in the remaining free space, which is calculated automatically. The logical drive will be formatted.

- aefdisk32 2 /notdel:1,6,83 /mbr /hidefat

Deletes all partitions except the specified ones (FAT12, BIGDOS and Linux), install the loader code in the MBR, then hide all primary FAT partitions on the second harddisk.

- aefdisk32 /changetype:6:1 /reboot

Change the type ID of the 1st partition to BIGDOS then reboot. This is useful if - let's say - the first partition is a Compaq diagnostic partition and we're curious about its contents.

-aefdisk32 /register "Example User Name" 123456

Register aefdisk32 using "Example User Name" as the registration name and 123456 as the serial number. Of course this works only with proper registration codes in the registered copy of aefdisk32.

# Partition Types

These are the currently known partition types. These values are from Ralph Brown's interrupt list. (A big thanks goes to him for maintaining that impressive documentation!)

ID	Name
00h	empty
01h	DOS 12-bit FAT
02h	XENIX root file system
03h	XENIX /usr file system (obsolete)
04h	DOS 16-bit FAT (up to 32M)
05h	DOS 3.3+ extended partition
06h	DOS 3.31+ Large File System (16-bit FAT, over 32M)
07h	QNX
07h	OS/2 HPFS
07h	Windows NT NTFS
07h	Advanced Unix
08h	OS/2 (v1.0-1.3 only)
08h	AIX bootable partition, SplitDrive
08h	SplitDrive
08h	Commodore DOS
08h	DELL partition spanning multiple drives
08h	QNX 1.x and 2.x
09h	AIX data partition
09h	Coherent filesystem
09h	QNX 1.x and 2.x
0Ah	OS/2 Boot Manager
0Ah	OPUS
0Ah	Coherent swap partition
0Bh	Windows 95 OSR2 with 32-bit FAT
0Ch	Windows 95 OSR2 with 32-bit FAT (LBA-mode INT 13 extensions)
0Eh	LBA VFAT (same as 06h but using LBA-mode INT 13)
0Fh	LBA VFAT (same as 05h but using LBA-mode INT 13)
10h	OPUS
11h	Hidden 12-bit FAT partition, OS/2 FAT12
12h	Compaq/HP Diagnostics partition (FAT compatible)
14h	(using Novell DOS 7.0 FDISK to delete Linux Native part)
14h	Hidden sub-32M 16-bit FAT partition
16h	Hidden over-32M 16-bit FAT partition
17h	Hidden HPFS partition
18h	AST special Windows swap file
19h	Willowtech partition
1Bh	Hidden Windows 95 with 32-bit FAT
1Ch	Hidden Windows 95 with 32-bit LBA FAT
1Eh	Hidden Windows 95 with LBA BIGDOS
20h	OFS1
21h	officially listed as reserved, FSo2
23h	officially listed as reserved
24h	NEC DOS 3.x

26h officially listed as reserved  
31h officially listed as reserved  
33h officially listed as reserved  
34h officially listed as reserved  
36h officially listed as reserved  
38h Theos v3.2 2GB partition  
39h Theos v4 spanned partition  
3Ah Theos v4 4GB partition  
3Bh Theos v4 extended partition  
3Ch PowerQuest PartitionMagic recovery partition  
40h VENIX 80286  
41h Personal RISC Boot  
41h Power PC Reference Platform Boot  
42h SFS (Secure File System) by Peter Gutmann  
45h EUMEL/Elan  
46h EUMEL/Elan  
47h EUMEL/Elan  
48h EUMEL/Elan  
4Dh QNX4.x  
4Eh QNX4.x 2nd part  
4Fh QNX4.x 3rd part  
4Fh Oberon  
50h OnTrack Disk Manager, read-only partition  
51h OnTrack Disk Manager, read/write partition  
51h NOVELL  
52h CP/M  
52h Microport System V/386  
53h OnTrack Disk Manager, write-only partition??  
54h OnTrack Disk Manager (DDO)  
55h EZ-Drive  
56h GoldenBow VFeature  
56h DM converted to EZ-BIOS  
57h DrivePro  
5Ch Priam EDisk  
61h SpeedStor  
63h Unix SysV/386, 386/ix  
63h Mach, MtXinu BSD 4.3 on Mach  
63h GNU HURD  
64h PC-ARMOUR protected partition  
64h Novell NetWare 2.xx  
65h Novell NetWare 3.xx or 4.xx  
67h Novell  
68h Novell  
69h Novell  
70h DiskSecure Multi-Boot  
71h officially listed as reserved  
73h officially listed as reserved  
74h officially listed as reserved  
75h IBM PC/IX  
76h officially listed as reserved  
7Eh F.I.X

80h Minix v1.1 - 1.4a  
 81h Minix v1.4b+  
 81h Linux  
 81h Mitac Advanced Disk Manager  
 82h Linux Swap partition  
 82h Prime  
 82h Solaris x86  
 83h Linux native file system (ext2fs/xiafs)  
 84h OS/2-renumbered type 04h partition (hiding DOS C: drive)  
 84h Hibernation partition  
 85h Linux extended partition  
 86h NTFS volume set  
 87h HPFS Fault-Tolerant mirrored partition  
 8Ah Linux Kernel Partition (used by AiR-BOOT)  
 8Eh Linux Logical Volume Manager partition  
 92h Amoeba  
 93h Amoeba file system  
 94h Amoeba bad block table  
 99h DCE376 logical drive  
 A0h IBM Thinkpad hibernation partition / PQMagic  
 A0h Phoenix NoteBIOS Power Management "Save-to-Disk" partition  
 A1h officially listed as reserved  
 A3h officially listed as reserved  
 A4h officially listed as reserved  
 A5h FreeBSD, NetBSD, BSD/386  
 A6h OpenBSD  
 A7h NEXTSTEP  
 A9h NetBSD  
 AAh Olivetti Fat 12 1.44Mb Service Partition  
 B1h officially listed as reserved  
 B3h officially listed as reserved  
 B4h officially listed as reserved  
 B6h officially listed as reserved  
 B7h BSDI file system (secondarily swap)  
 B8h BSDI swap partition (secondarily file system)  
 BEh Solaris boot partition  
 C0h CTOS  
 C0h REAL/32 secure small partition / DR-DOS secondary  
 C1h DR DOS 6.0 LOGIN.EXE-secured 12-bit FAT partition  
 C4h DR DOS 6.0 LOGIN.EXE-secured 16-bit FAT partition  
 C6h DR DOS 6.0 LOGIN.EXE-secured Huge partition  
 C7h Syrix Boot  
 CAh FAT-32 (?)  
 CBh reserved for DRDOS/secured (FAT32)  
 CCh reserved for DRDOS/secured (FAT32, LBA)  
 CEh reserved for DRDOS/secured (FAT16, LBA)  
 D0h REAL/32 secure big partition  
 D1h Old Multiuser DOS secured FAT12  
 D4h Old Multiuser DOS secured FAT16 <32M  
 D5h Old Multiuser DOS secured extended partition  
 D6h Old Multiuser DOS secured FAT16 >=32M

D8h	CP/M-86
DBh	CP/M, Concurrent CP/M, Concurrent DOS
DBh	CTOS (Convergent Technologies OS)
DEh	Dell diagnostic
DFh	RadiSys DTS
E1h	SpeedStor 12-bit FAT extended partition
E3h	DOS read-only
E3h	Storage Dimensions
E4h	SpeedStor 16-bit FAT extended partition
E5h	officially listed as reserved
E6h	officially listed as reserved
EBh	BeOS partition
F1h	Storage Dimensions
F2h	DOS 3.3+ secondary partition
F3h	officially listed as reserved
F4h	SpeedStor
F4h	Storage Dimensions
F5h	Prologue multi-volume partition
F6h	officially listed as reserved
FDh	Linux raid partition
FEh	LANstep
FEh	IBM PS/2 IML
FFh	Xenix bad block table

# Technical Information

## **General information:**

A harddisk can contain up to four primary partitions. The extended partition is a special primary partition, which can contain many logical drives. If you delete the extended partition, all logical drives in that will be lost too. There can be only one extended partition entry in a partition table. The partition table (which resides in the very first sector of your harddisk) describes the type, activeness, and position of the partitions. In bootable partitions, the first sector is always the so called 'boot sector' which contains a small OS loader. You can install any operating system - in theory - in bootable primary partitions. Some operating systems can be installed in logical drives too.

## **About FAT types:**

There are four types of FAT (File Allocation Table).

1: FAT12 is now obsolete, used on floppy disks and on partitions smaller than 16Mb.

2: FAT16 is the next step. It can be used if a DOS partition is between 16MB and 32Mb.

3: BIGDOS is also a 16-bit type, but allows larger partition sizes. Plain DOS and Win9x/ME use this type nowadays (OS/2, WinNT/2000/XP and Linux can also be installed over FAT, but there is no point for doing that). The maximum partition size is 2Gb for DOS and Win9x/ME, and 4 Gb for WinNT/2000/XP.

4: FAT32 is the newest, it is introduced in Win95 OEM Service Release 2. Maximum partition size is 127 Gb. It is used by Win9x/ME/2000/XP, WinNT 4.0 cannot recognize it.

With Win95 OSR2, newer types were introduced to indicate that a partition ends beyond the 8 Gb limit. These types are:

- BIGDOSx (0eh)
- Extended x (0fh)
- FAT32x (0ch)

These types are not recognized by WinNT 4.0!

# Registration

Registration benefits the following:

- Partitioning with relative size (/rel)
- No nag screen after 30 days

## ***Licensing:***

<u>Number of licenses</u>	<u>Notes</u>
1	30 USD or 20 EURO / license
2 - 5	24 USD or 16 EURO / license
6 - 10	21 USD or 14 EURO / license
11 - 20	18 USD or 12 EURO / license
21 - 50	15 USD or 10 EURO / license
51 - 1000	12 USD or 8 EURO / license
1000+	6 USD or 4 EURO / license

To arrange for a site or enterprise license for aefdisk32, please contact me.

Normally one license means one logical copy of the program. If you use only one copy to create partitions on more computers, it needs one license. If you use two copies, it needs two licenses, etc. If you use the executables on a network share, the required number of licenses is the number of client computers using that network share.

Upon registering you'll get the latest registered version, and the newer versions for free.

## ***Registration methods***

1) Check, money order, cash:

Print the registration form (the file REGISTER.FRM), fill it and send it along with the payment to the contact address. Use registered mail only. Don't send coins!

2) Bank transfer:

Print the registration form (the file REGISTER.FRM), fill it and send it to the contact address. Use the following info for the bank transfer:

Address: Magyar Kulkereskedelmi Bank Rt.

Account holder name: Nagy Daniel

Swift (BIC) code: MKKB HU HB

IBAN Account No.: HU09 1030 0002 8560 2339 1100 4013

3) Via eSellerate online. You can register via the Internet and immediately receive the registered version of aefdisk32 by going to: <http://store.esellerate.net/s.aspx?s=STR4081643600>

Multi-unit purchases for up to 1,000 users are available and transactions are via a secure server.

## ***Getting the software:***

The software is delivered as an e-mail attachment, or can be downloaded from the homepage.

## Contact

If you have any problems, questions or suggestions you can contact me through e-mail. Bug reports, ideas are also welcome!

I graduated at the University of Veszprem, department of Information Technology. My diploma was written about secure communications over insecure network connections. I was born in 1974.

E-mail address: [support@aeftdisk32.com](mailto:support@aeftdisk32.com)

Homepage: <http://www.aeftdisk32.com>