

HD95COPY and FAT32CP

HD95COPY is a program to backup and restore FAT16 partitions.

FAT32CP is a program to backup and restore FAT32 partitions of MS Windows 95 (OSR2).

For the user these programs are nearly identical. The following statements about HD95COPY are also valid for FAT32CP unless otherwise stated.

1 The problem

1. How can you backup / restore a drive containing long filenames from DOS level?

2. There are many networks (e.g. in schools) where all PCs are identically configured. It seems to be useful to configure ONE PC and to copy this installation to all other PCs over the network. For DOS or Windows 3.x it has been easy to do by help of xcopy or pkzip.

But Windows 95 supports long filenames - which are invisible for DOS and therefore are not copied.

You can use the Backup program of Windows 95. But it requires Windows to be installed. What can you do, if your harddisk is still empty or Windows will not start?

2 The solution

It's easy by help of HD95COPY. This program reads your harddisk sector by sector and stores this data together with some needed information on your network server or on any other medium you can access using a drive letter. From there you can do a restore on all other workstations.

If you like you can span the backup file over some removable media, e.g. ZIP disks.

(The performance is very high because only clusters are stored which are actually used!)

To do a restore you don't have to install Windows - HD95COPY is a DOS program!

3 Requirements

1. Hard disks don't have to be identical. But the drive where you get the backup from and the drive where you restore it to must have the same cluster size (the cluster size of the drive where you store the backup file might be different).

(If you use FAT32 the cluster size is always 4 KB - up to a partition size of 4 GB.)

2. The hard disk you want to restore to must not contain bad sectors in the area where the data are written to. Outside this area bad sectors are treated correctly: they are not "copied" by backup; if the target drive has bad sectors, they stay marked.

(In FAT32CP the treatment of bad sectors is not implemented.)

3. HD95COPY requires MS-DOS version 5 or higher. Even with MS-DOS 5 you can backup a hard disk containing Windows 95!

(FAT32CP requires DOS 7.1 from Windows 95 OSR 2)

4 Installation

No special installation is needed. I suggest you copy HD95COPY.EXE to the path where you want your backup file stored.

I suggest to create a bootable floppy disk. Copy to it FORMAT.COM and all drivers you need to connect to your network and, if you want, your mouse driver. Then you can boot from this floppy, format your hard disk, start HD95COPY (from your network) and set up your hard disk.

5 Useful hints

All data are backed up and restored as they are - even destroyed data! Therefore it is strongly recommended that you check your hard disk before doing a backup, e.g. using SCANDISK (if your system is Windows 95 you MUST use SCANDISKW.EXE of Windows 95 !!!). You also should do a virus scan.

You should run HD95COPY directly from DOS, not in a DOS session. Windows always keeps some files open, there could be errors when backing up them.

HD95COPY has been tested very carefully by different people with numerous types of hard disks and computers. However, if you think of the unnumerous types of hardware and software, reliability in all cases cannot be assured.

6 Backup

Defragment your hard disk you want to get the backup from (if you use Windows 95, use DEFRAGW.EXE of Windows 95, not the DOS utility!!!)

If you want to backup to a network log in to get write access to the path of the backup file.

Start HD95COPY and choose a backup file by clicking on "file / backup file" and typing a name (without extension; .HD2 or .F32 is automatically added). The default drive is the drive you started the program from; but you could even select another one just by adding the path (e.g. U:\BACKUP\TEST.HD2 or U:\BACKUP\TEST.F32)

Click on "Drive" and select the drive to get the backup from.

Click on "Backup".

7 Restore

If you create a partition with FDISK do not forget to activate the primary partition (FDISK option 2)!

If you use FDISK of Windows 95 OSR2 you are asked whether FDISK should support FAT32. If you answer "yes" FDISK creates any partition bigger than 512 MB as FAT32 drive and each partition less than 512 MB as FAT16 drive. You can change this behaviour if you start FDISK using command line parameter /FPRMT. Then you are asked for each drive whether you want to convert it.

If you restore from a network log in to get at least read access to the path of the backup file.

If you use removable media load the drivers.

Start HD95COPY and choose a backup file by clicking on "file / backup file". To change the drive type in the drive (e.g. F:) and press Enter.

Click on "Drive" and select the drive to write the data to.

Click on "Restore".

If you select "overwrite boot sector of drive C: " the bootsector of C: is written, even if you restore another drive (the backup file contains in every case the bootsector of C:, even if you backed up another drive).

When restore is finished, you boot the PC.

By clicking on "HD-Info" you can see some information about your hard disk.

8 Backup and Restore with command line parameters

You can use the following command line parameters:

/INI to show parameters for HD95COPY.INI

/INIFILE=xxx to use another INI file

/D=<drive>

/F=<backup file> (.HD2 is automatically appended)

/F=\$\$\$ date as name of the backup file, e.g. 97-06-22.HD2

/B if you want to backup without any question

/Y if you want to restore without any question

/LANG=D if you want menus and messages in german

/REG automatic update of the registry

/REG=QNET use station number of QuickNet

/REG=ENV use room and station number set in environment variables

example:

HD95COPY /D=C /F=H:\BACKUP\APRIL97 /Y /REG=QNET

HD95COPY /REG (no restore, only updates the registry)

9 Backup / Restore of a compressed drive

If you compress a drive with DRVSPACE3 you get two drives:
- the compressed drive (e.g. D:)
- a "host drive" (usually H:, not visible in Windows but in DOS)

Backup the host drive, not the compressed drive!

To restore the drive it is sufficient to restore to a formatted (but not compressed) drive. If it is already compressed you restore to the host drive.

Example (D: compressed, H: host drive)

Backup H: to a backup file

Restore:

if the drive is already compressed restore to H:
if the drive is not yet compressed restore to D:
(this way you automatically get a compressed drive after restart!)

The target drive has to be greater or equal than the source drive. If it is greater the compressed drive will be the same size than the drive you backed up, but you get additional space on the host drive. You can assign it then to the compressed drive using DRVSPACE3.

10 Verify

After creating the backup file you can test its integrity by comparing it with the data on the drive.
(In the current version of FAT32CP this function is not available)

11 Updating the registry

When you did a restore all computers are configured identically. But if you use Microsoft Network or IP-addresses computername and IPaddress have to be unique. Furthermore, if some rooms are connected to a network it could be useful to give each room a unique workgroupname.

The idea is to assign a unique room number and a station number to each PC and to calculate these strings from these numbers.

/REG: You are asked for room and station number in a dialog.

/REG=QNET: If you use QuickNet its room and station number are used.

/REG=ENV: Use the values of the environment variables %ROOM% and %PC%. Now you can proceed like this: Use a program to read the Ethernet address of your network card, use it to get room and station number from a file on the server and set the environment variables appropriately. Then you call HD95COPY with parameter /REG=ENV. This way the restore can be done automatically by a user who does not anything about it!

How are the strings like computername or IP address are built from room and station number? You can define it in HD95COPY.INI (FAT32CP.INI) if you do not want to use the default values (see below). E.g. the line COMPNAME=PC%PC%-%ROOM% has the effect that PC 7 in room 12 is named "PC7-12".

If you want to use this function you have to boot the computer under DOS 7 (Windows 95) to get access to the registry.

You can click on menu IPAddr oder use command line parameter /REG.

To execute this function HD95COPY finishes and calls REGEDIT. This Programm requires a lot of memory, especially if the registry grows bigger. Therefore for booting to DOS you should load HIMEM.SYS and EMM386.EXE NOEMS in CONFIG.SYS and add the line DOS=HIGH,UMB. If REGEDIT fails there is no error message, but nothing is done!

11.1 Options in HD95COPY.INI / FAT32CP.INI

(See these options by entering HD95COPY /INI)

Key	Meaning	default
WINDIR	Windows directory	C:\WINDOWS
REGEDIT	registry editor	REGEDIT.EXE
IPMASK	IP net mask	255.255.255.0
IP3BYTES	Bytes 1,2 and 3 of IP address	192.168.0

IPSTART	last byte of IP address of PC 1	101
IPSTARTxxx	(see following text)	
GATEWAY	last byte of gateway IP address	1
IPKEY	(see following text)	0000
COMPNAME	computername	PC%ROOM%-PC%
WORKGROUP		WG%ROOM%
COMMENT	description of station	PC%PC% in %ROOM%
LOGONNAME	Username for network logon	
HOSTNAME	IP Hostname	
EXEC	Program to start after restore	
PCxxx-yyy	(see following text)	

(xxx is room number, yyy station number)

If you use NOCHANGE as value for COMPNAME, WORKGROUP, COMMENT or IPKEY the corresponding keys in the registry are not changed.

11.2 IPSTARTxxx

IPSTART804=25 has the effect that in room 804 the PC number 1 gets 25 as last byte of its IP address.
(overwrites IPSTART=)

11.3 IPKEY

The key for the IP address in the registry might be

HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\Class\NetTrans\0002

In this case set IPKEY=0002

You find this value (which could be different) as you start regedit and search for "IPAddr".

11.4 PCxxx-yyy

If you want to set a special registry key for one station (e.g. another VGA resolution) you export this key from regedit to a file. Use the name of this file as parameter, e.g.

PC143-12=U:\VGA640.REG

means that when restoring PC 12 in room 143 the content of file U:\VGA640.REG is imported in the registry.

11.5 Computername, Workgroup, Comment

You can define strings to describe these values. %ROOM% is replaced by the room number, %PC% by the station number. A dialog asks for them. E.g.

COMPUTERNAME=PC%PC%in%ROOM%

assigns the computername "PC7in423" to PC 7 in room 423.

WORKGROUP=WG%ROOM%

assigns "WG423" to this PC.

COMMENT=pc %PC% in room %ROOM%

assigns "pc 7 in room 423" to this PC.

WORKGROUP=WORKGROUP assigns the workgroup name "WORKGROUP" to all PCs.

WORKGROUP=NOCHANGE: The name of the workgroup is not changed.

11.6 Station number and room number for QuickNet.

If you use command line parameter /REG=QNET the station number and room number of QuickNet are used instead of asking for them by a dialog (You can define a fixed station number under QuickNet).

11.7 Station number and room number from environment variables.

If you use command line parameter /REG=ENV the station number and room number are taken from environment variables %ROOM% and %PC%.

11.8 Example for HD95COPY.INI / FAT32CP.INI

IPKEY=0002

COMPNAME=ADMIN%PC%

COMMENT=Admin %PC%

WORKGROUP=Administration

LOGONNAME=WIN%PC%

EXEC=H:\COPYLOG.BAT

It means, you use mainly the default values. E.g. PC 7 gets the name "ADMIN7", the comment "Admin 7" and IP address 192.168.0.107. It belongs to workgroup "Administration". Logon as user WIN7.
After restore H:\COPYLOG.BAT is executed.

12 Version history

12.1 HD95COPY

Version 1.1
first version
support only for C:

Version 2.1 - 2.3:
command line parameters for automatic backup and restore
support for all drives
support of removable media

Version 2.4:
new feature: updating the registry
command line parameter /REG
new options for INI file

Version 2.5 - 2.6:
skipping of unused clusters

Version 2.6b
Set backup file to readonly
No error message if backup file is readonly

Version 2.6c
New command line parameter /REG=ENV
There is a bug in Borlands libraries: If your processor speed is too high (200 MHz) you get run time error 200.
This version contains a patch to fix this bug.

Version 2.6d
Sorry, there has been a bug. Under certain circumstances there have been problems to restore from removable media. The bug has been in the restore procedure, so you can still use your backup files - they are ok!

Version 2.6e
New INI-parameter LOGONNAME.

Version 2.7a
New INI-parameter INIFILE.

Version 2.7b
Enhanced performance by caching FAT

Version 2.7c
Bug fixed (wrong calculation of free space)

Version 2.7d
With low available memory sometimes run time error 203 occurred, which now should be avoided by better memory allocation.

Version 2.7e
Error message when the drive you store the backup file is the same as the drive you want to backup / restore

Version 2.7f
Bug removed: Verify from removable media show sometimes an error where no error was. But the backup file

was ok, and the restore was performed correctly!

Version 2.7g
New INI-parameter EXEC
Backup / restore of compressed drives

Version 2.7h
Bug removed (wrong counting of clusters)

Version 2.7i,j
There has been another bug in the counting. Under certain circumstances the program asked during restore to insert disk 1 (but the backup / restore was ok because all was written at that time).

Version 2.7k
new INI parameter HOSTNAME

12.2 FAT32CP

Version 1.1
first version
Function "verify" not yet supported
No special treatment of bad sectors

Version 1.2
New command line parameter /REG=ENV
An error in the documentation of Microsoft had the effect that partitions were not treated correctly if they did not use the standard parameters. This bug is now corrected. It affected only the restore, therefore you can use backup files generated by version 1.1.

Version 1.6d
Sorry, there has been a bug. Under certain circumstances there have been problems to restore from removable media. The bug has been in the restore procedure, so you can still use your backup files - they are ok!
(No, you did not miss any versions; I just adjusted the version number to HD95COPY.)

Version 1.6e
New INI-parameter LOGONNAME.

Version 1.7a
New INI-parameter INIFILE.

Version 1.7b
Enhanced performance by caching FAT

Version 2.7e
(to synchronize the version number of FAT32CP and HD95COPY)
Error message when the drive you store the backup file is the same as the drive you want to backup / restore

Version 2.7f
Error in calculating the license type removed.

Version 2.7g
New INI-parameter EXEC
Backup / restore of compressed drives

Version 2.7h
Bug removed (wrong counting of clusters)

Version 2.7i,j
There has been another bug in the counting. Under certain circumstances the program asked during restore to insert disk 1 (but the backup / restore was ok because all was written at that time).

Version 2.7k
new INI parameter HOSTNAME

13 Messages and Errors

13.1 "You need more than 1 medium"

HD95COPY recognizes if you select a removable medium to store the backup file. This messages tells you that you will need more than one medium to complete the backup.

13.2 "You backed up drive ... "

You can restore to another drive than you got the backup from. But be careful, the INI files and registry contain paths with drive letters!

13.3 "This is disk ... of current backup"

If you back up to removable media and you insert e.g. disk 2 again as disk 4, it cannot be overwritten. Or else you would lose that part of your backup.

13.4 "Drive ... has bad sectors (without data)"

The target drive has bad sectors, but they are outside the used part of the disk.

13.5 "Drive ... has bad sectors to write on"

In this case usually a restore is not possible, if you did not get the backup from that disk.
You should format the disk before restoring - or better, change your hard disk!

13.6 "Errors in data structure"

The target disk contains bad sectors which could not be written. Use SCANDISK (of Windows 95) to correct it - or better, change your hard disk!

13.7 "Invalid available space on drive ... "

If you backup to a disk (especially on a network) that is bigger than 2 GB, DOS could report a wrong size of the available space. If you are sure there is enough space you can decide yourself to continue.

13.8 "You can use this program only for FAT16 (FAT32)"

If you start the program drive C: is checked for the correct file system. (You can use HD95COPY only for FAT16, FAT32CP only for FAT32).

If your hard drive contains partitions of type FAT16 and FAT32 you can define the "correct" drive by command line parameter /D:

Example: C: is FAT32, D: and E: are FAT16. You want to back up drive E:. You use HD95COPY with command line parameter /D=E.

13.9 Different file system version for backup and restore

FAT32 contains a file system version number (which is currently 0.0). It could be that this number is changed in a later version of Windows 95. If it happens to you please contact the author of the program to check whether it is necessary to adapt the program.

13.10 Please use different drives as source and target.

You cannot save the backup file on the same drive you just back up or you restore to.

14 Disclaimer

HD95COPY has been developed and tested very carefully. But I expressly disclaim any warranty of any kind and any liability for consequential damages. You use this program on your own risk.

15 License

HD95COPY is NOT free software. It is distributed as SHAREWARE. You can test the program for 30 days. If you find it useful and decide to use it you have to register. If you continue to use the software after the evaluation period without purchasing a license, you are in violation of international copyright laws.
(If you use the shareware or single user version, you can do a restore only to one station at a time.)

The purchase of a license never gives you the right to pass the license on to anyone else!

If you pay by bank transfer please send me an Email, a FAX or a letter to tell me your exact address. The informations I get from the bank are sometimes not complete!

The registration fee for HD95COPY 2.7 or FAT32CP 2.7 is

for a single user license

ATS 300,- in Austria

(DM 50,- or US\$ 40,-)

(if you pay by check please use ATS or US\$; otherwise the bank fees are very high!)

The single user license gives you the right to use the program at one computer.

for a network license for one organisational unit (e.g. one department, one classroom)

ATS 990,-

(DM 150,- or US\$ 120,-)

(if you pay by check please use ATS or US\$; otherwise the bank fees are very high!)

The network user license gives you the right to use the program at all computers connected by a local area network up to 25 machines.

for a site license

ATS 2500,-

(DM 400,- or US\$ 300,-)

(if you pay by check please use ATS or US\$; otherwise the bank fees are very high!)

The site license gives you the right to use the program at all computers of a firm at one location.

You may pay by

- mail or money order to

Gottfried Siehs

Tiergartenstrasse 99

A-6020 Innsbruck

Austria / Europe

- check

- bank transfer to:

PSK Bank Innsbruck, Konto-Nr. 7786.901, BLZ 60000

(Dr. Gottfried Siehs)

(If you pay by bank transfer please use ATS; otherwise the bank fee is very high!)

15.1 License for HD95COPY and FAT32CP (bundle)

If you purchase a license for both programs together you get 50% off of one program. E.g. a network license is US\$ 180,- (120 + 60).

16 Updates

You find the latest version at

<http://www.geocities.com/SiliconValley/Lakes/8753>

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