

WinDAC32 Version 1.31

Christoph Schmelnik's
Digital Audio Copy
for Win32

Sorry about my terrible English. If my teachers could read this, they would get Nightmares.

This Program is SHAREWARE.

You can test it for a period of 30 days, after that you must register it.

You are allowed to copy the Shareware Version of this program and distribute it on all medias, but registered Users are not allowed to copy their Version except to make a personal Backup.

THE AUTHOR (Christoph Schmelnik) DOES NOT UNDERTAKE ANY LIABILITY FOR ANY DAMAGE CAUSED BY THIS PROGRAM. THERE IS ALSO NO GUARANTEE OF AN ERROR FREE PROGRAM EXECUTION.

This is new !!!!!!!!

If someone has protected the name 'Digital Audio Copy' or have used it before me (but I did not find something like this during my searches) he should write me before he runs to his lawyer. I'am sure that we could solve those problems without applying for injunction or claiming damages.

OVERVIEW

1. Functions/Changes
2. System requirements
3. Installation
4. Using WinDAC/special notes/copy modes/compression
5. Scripting
6. Where can you download the latest versions?
7. Problems/Speed
8. List of tested drives
9. Registering
10. The tool StripHdr
11. Notes

1. Functions

- Copy Audio Tracks from CD
- Save Data in Wave files

- Convert Audio Data from 44kHz 16 Bit Stereo to
 - 11 or 22 kHz Samplefrequency
 - 8 or 16 Bit per Sample
 - Mono (even the separatet Channels)
- Kill Zero-Samples at the beginning and end
- Copy selected tracks in different Wave files
- Use all recognized CDROM drives simuleously
- Show information to all tracks
- Full drive control (eject, play ...)
- Show main drive states
- Copy selected sectors of the CD(*)
- Execute a script after copying a track
- Compress audio data directly using the windows audio compression manager
- Select the copy speed

(*) only available for registered users

Changes since Version 1.04

- Bugfix: converting waves: There was an error while writing mono/mixed wave files
- Added: Statusbar: The actual track is displayed in the Statusbar
- Added: ASPI: For Windows NT no longer a ASPI manager is needed, because now WinDAC is able to work with the special NT interface for SCSI device access. This results in some changes in the GUI and the program logic

Changes since Version 1.10

- Bugfix: Copy: Using of less than 3 Sectors per Read causes a protection failure.
- Changed: Copy: The polling for the Burst-Mode is so modified to take lower CPU time,
- Changed: Copy: Any read command on Audio Data times out after 12 seconds, because without this the applications hangs on some drives.
- Added: Copy: Now ATAPI CDROM drives are supported. This means not that this program work with all ATAPI CDROM drives.
- Changed: CD Access: The TOC of the CD is read in a different way to avoid a bug in the Philips Firmware.
- Changed: Drive Detection: If a SCSI drive response a illegal value for the supported memory window, a valid value is assumed.
- Bugfix: Configuration: In the Wave format configuration the "Kill zero samples" tab couldn't detect changes.
- Added: Scripting: Now it is possible to create and edit scripts, which are executed after copying each track.
- Added: Statusbar: If more than one track is selected, the required disc space for the selection is displayed in the statusbar.
- Added: Configuration: Now you can configure the default filename.

Changes since Version 1.20

- Changed: Copy: Up to 5 read retries on errors in Normal- and Synch-Mode.
- Changed: Copy: Prevent the disc from being removed during copy if possible.
- Changed: Copy: The message box indicating to low disk space can be ignored.
- Added: Copy: New drive types are supported (new TOSHIBA drives, TEAC, MATSHITA, RICOH, PLASMON, KODAK).
- Added: Copy: Select the copy speed for most drives if possible.
- Added: Copy: Display actual copy speed during copy process.
- Added: Converting waves: Support for the installed Audio CoDecs over the Windows Audio Compression Manager.
- Changed: Toolbar: The toolbar is display in the "97" style if possible.
- Added: Drive window: Display Pre-Emphasis flag for each track.
- Added: Drive window: Configure displayed columns in drive window.
- Bugfix: User Interface: General Protection Fault in Context Menus and during maximize/restore fixed.
- Added: Extras: Tool added to strip the wave header from wave files to get RAW files (or to make a pure MP3 file out of a MP3 encoded Wave file).

2. System requirements

- Installed Windows 95 or Windows NT (Version 4.0 an above)
- Installed 32 Bit ASPI Manager (included in Windows 95). Not needed for Windows NT
- SCSI CDROM drive, which is able to read digital audio data and is supported by DAC. Currently drives from the following vendors are supported: Toshiba, NEC, Hitachi, Sony, Pioneer, Plextor, Yamaha, IBM, Matsushita, TEAC, Philips, Grundig, HP, Mitsumi, Plasmon, Kodak, Ricoh (the last 7 are CD-Writers)
- ATAPI CDROM drives are supported with the help of an ASPI Manager. Ther are some problems regarding various commands under NT, if you use the NT interface to access the drive. But even not all ASPI Manager supports ATAPI drive. I have tested the ATAPI functions with the Pioneer DR-A24X.
- Hard disc with much of free space

3. Installation

You can start the program without installing (even from write protected drives like CD's), because all needed information is detected during the first start and is stored in the windows registry. So you'll need to clean up the registry if you decide to use this program no more. To make this more easy i included two installation scripts for Winows 95 and NT 4.0. To install DAC click with the right mouse button on INST95.INF for Win95 and on INSTNT.INF for Windows NT and choose install in the pop-up menu. This will cause that in the Program directory a new directory named DAC32 is created and all needed files are copied to it. The program is also added to the start menu. The deinstallation is Windows like.

4. Using WinDAC32

This is a Windows program and therefore use it like a Windows program.

This means:

- This program uses a MDI (Multiple Document Interface) userinterface. All recognized drives are displayed in its own window. In the drive windows a list of all tracks on the CD is displayed. Music and data tracks have different icons. All menu and toolbar commands works in the context of the active window.
- The title of the drive windows shows the drive name and the SCSI configuration. Drives identified with Windows NT are shown with their drive letters.
- In the drive windows it is possible to select windows like one or more tracks. For the CD-player functions only the focused track is used, but for the copy function for all selected tracks - all selected tracks are used. The right mouse button will display a context menu which allows you to play or copy a track.
- In the DAC menu it is possible to configure the CDROM drives and the general copy parameters. The copy method is configurable for all drives separated, so one drive could copy in Burst-mode and one with Sectorsynchronisation. The settings for the Wave file is global for all drives. You can also manually add or remove drives.
- The Actions menu contains all functions for direct CD access. This are CD-Player and the copy commands. The eject and reload command works only with drives with a tray. Caddy drives can only eject CD's. There are also some tray drives available which are not able to reload the CD by Software command.
- In the View menu you'll find the well known functions from windows to arrange the windows. The special funktion here is that you can select here the drives which are displayed in DAC. This is very useful for CD-Changers, because the checking of those drives will cost a lot of time. With the Refresh command DAC rereads the TOC of the actual drive.
- The Help menu is not worth of decribing. There is no online help.
- The Toolbar contains all functions for CD-control. The forward and reverse command results in a changes start position by 2 seconds.
- The Statusbar shows three things: is a CD inserted or not, the current track and the current play position. Please notice that even the first track doesn't start at second 0 but normally at second 2.
- The Copy dialogs are extended System dialogs which allow to select a filename and some other different settings. If you copy selected tracks the filename is only the base name and is extended by the current track number as shown in the dialog. In the dialog for copying selected sectors you can choose the range by time index or by sector number. You are also able to play the selected range.
- In the window displayed during the copy progress there is a detailed progress report. The animated icons indicates the current action (reading from CD, writening to disc and synchronize sectors). The status filed displays error messages and which track is currently copied. The button aborts the copy prohress or if it already done it closes the window.

Special notes

- If there is a ASPI manager installed under Windows NT, all drives are detected twice, once from the ASPI manager and once from the NT interface. To show only one of them, disable the unwanted drives in the "view/drives" dialog or remove the ASPI

drives in the DAC Menu

- The NT detected drives couldn't be removed, added or configured (regarding the drive letter, etc.)
- Don't configure a drive with a hostadapter number greater or equal than the number of your installed hostadapters
- For the NT detected drives it isn't possible to use the burst-copy mode.
- Besides the problem that some SCSI drives return 0 for the supported Memory window, there are some drive/driver combinations reporting a legal but incorrect value (mostly too high). The first problem should be solved in the actual version, but for the second one there is no chance to detect this by the program. This problem could be found on NT with some older SCSI Hostadapters and also with Windows 95 and some exotic Cards (e.g. PCMCIA). To solve this decrease the value for the "Sectors per Read" in the drive settings. In most cases it is enough to replace the default value of 27 with 26.
- To detect ATAPI drives with NT and the ASPI Interface, use a special ASPI driver. The new ASPI manager from Adaptec ignores ATAPI drives, so use an older one.
- You can find an old ASPI Version on the Internet at:
<http://www.nectec.or.th/pub/info/thailand-gis+maps/software/aspi32.exe>
- Some Audio CoDecs couldn't be selected, because they don't support audio data in CD quality for input.
- The Pre-Emphasis flag is displayed, but it is totally ignored during copy.
- For the speed selection the same drive mappings as for the copy command is used. This is not sure to be correct, but I don't have information about this.
- For some drives the selectable speeds are detected automatically by the time the type is selected. This is only working with a CD inserted.
- The displayed speed in the drive configuration is not surely correct for the speed to be copied audio data. Some drives are able to read data sectors in different speeds, but are limited to a predefined speed for audio data.
- The speed displayed in the copy window is not the pure read speed, it indicates the effective copy speed including converting and writing data.
- If there are any problems with the drive configuration caused by the speed selection, the complete speed selection function can be disabled by adding the DWORD-Value "DisableSpeed" with the value of 1 at "HKEY_CURRENT_USER\Software\CASH\WinDAC32\Settings" in the Registry.

The copy modes

Here is a little graphic showing how the modes are working:

Mode: Normal

Time	:	1	2	3	4	5	6	7	8	...	N
Read	:	x		x		x		x			
Synch	:										
Write	:		x		x		x		x		x

Mode: Sectorsynchronisation

Time	:	1	2	3	4	5	6	7	8	...	N
------	---	---	---	---	---	---	---	---	---	-----	---

```

Read       : x x      x      x
Synch     :      1-2    2-5
Write     :      x      x      x

```

Mode: Burst

```

Time      : 1 2 3 4 5 6 7 8 ... N
Read     : x x x x x x x x x
Synch    :
Write    :      x x x x x x x x      x

```

This means:

In normal mode data is read alternating from CD and written to the hard disc. This results in slight pauses between each read.

The second mode is used to correct the problems of some drives with these pauses, because the drives have to reposition each time the laser and they are not able to do this exactly. This is done by reading the sectors overlapped and find the end of the first block at the beginning of the second one. This mode is rather slow.

The burst mode tries to prevent these pauses while writing away the data of the last sector reading the next one. This is the fastest and best method and therefore the default setting for all drives.

Converting

The conversion of the read data could be done in several ways. The selectable formats are displayed in a drop down list. If there are none Audio CoDecs (Compressor(Decompressor) installed in the system only the internal functions for uncompressed wave formats are available. The settings for this functions are available over the configuration button and are the same as used in older WinDAC32 (1.20 and below) versions. For the installed CoDecs the available subformats are displayed in a drop down list. Additionally a flag for high and low quality is available. This option is not available for all CoDecs and indicates the Compressor to work in real time mode (low quality) or not. I could only recognize an effect using the Fraunhofer MPEG Layer 3 CoDec, but this is even on a P166 far away from real time (0.8X against 0.3X at high quality). Although my ears are not the best, I recommend you to wait a little bit longer for the results. Unfortunately this CoDec is only in a version for very low bitrates available for free (included in Microsoft Netshow), but to test if the professional version is worth the large amount of money it should be enough.

Let me say some words about the relationship between compression and copy modes. Because of the fact that compression takes a lot of CPU time it should be clear, that this couldn't always be done in the time the data is read (especially at high reading speed >4X a 80486 has a hard job with even simple CoDecs like ADPCM). This could cause pauses between each read command and therefore the Burst-mode is only usable if the drive has no problems to find the exact read position after a break. So the Normal- and Burst-mode do nearly the same. The Synch-Mode has by definition no problems with breaks, because it restarts for each read command at a new position.

To convert the data in other audio formats the script interface should be used (see the next section). This also applies to the produced MPEG wave files, which could be

converted to real MP3 files with the included StripHdr tool, by deleting all wave headers. This tool could also be used to produce RAW files (used by some CD-Writer programs), because these files are nothing but uncompressed wave files without a header.

5. Scripting

I will describe the new function more detailed, because it is very complex (and still easy to use).

The main reason to use the scripting is the possibility to execute almost all commands after copying each track. One applicability is the conversion of the resulting Wave Files in other formats.

Before you can use a script, you have to create or load one. This could be done with the "Edit Script" dialog. The program keeps the last edited script, so you don't have to load one each time you start WinDAC.

The scripts could be saved and loaded in the script editor, but this is so easy that I don't have to explain it. The script editor could be also used - yes really - for editing scripts. To create a new script command, click with the mouse on the matching button (look at the tool tips), or press the "INS" Buttons. After that you can write your command in the edit field, or select a file to execute with the browse button.

To change a command click on the command in the list and edit it in the edit field.

It is also possible to change some attributes for the execution:

First you can choose if the application should wait for the new process to exit. The second attribute is the choice between executing the command through the system command processor ("COMMAND.COM", or "CMD.EXE") or not.

Even more interesting are the parameter that can be used. Currently the following parameters are supported:

%L : Last filename of the wavefile in the long format with file-extension
%l : Last filename of the wavefile in the long format without file-extension
%S : Last filename of the wavefile in the short format with file-extension
%s : Last filename of the wavefile in the short format without file-extension

There are problems mixing long and short filenames. It is not sure that there is no file with a short filename and a new file-extension. So it is possible that you overwrite the old file.

As an example have a look at the popular conversion to the MPEG 1 Layer 3 format.

The encoder only supports short filenames, so the script would look like the following:

```
1:L3enc %S %s.mp3
2:ren %s.mp3 "%l.mp3"
3:del %L
```

This means: Encode the file, restore the long filename and delete the wave file.

The first file will be: WaveDump01.wav (WAVEDU~1.WAV)

This results to (WAVEDU~1.MP3) and after renaming WaveDump01.mp3

The second file is WaveDump02.wav (WAVEDU~1.WAV)!

The short filename is selected by the system, because there is no longer a file matching

this (remember: we have deleted the last wave). And so the last MP3 file will be overwritten.

I solved this in the supplied script by moving all files to a subdirectory.

It is recommended to create for all programs you use in the script a PIF file, because otherwise, depending on the system settings, you have to close it manually after termination.

6. Where can you download the latest versions?

The latest versions of DAC are always available at the following sites:

- In the Fidonet you can request the DOS-Version with the Magic DAC and the Windows Version with the Magic WINDAC at the following Addresses:

2:2448/2009 +49 201 8535023 ISDN X75
2:2448/2010 +49 201 8535023 19.200 Zyx
2:2448/2011 +49 201 8535024 ISDN X75
2:2448/2012 +49 201 8535024 33.600 V.34+

You could also download the latest version as a Online-User.

- In the Internet from my homepage:
<http://members.aol.com/schmelnik/dac.html>

7. Problems

There are maybe still some problems with the ATAPI support. Some of the drive commands are not the same as used by normal SCSI drives. The extra defined drive type ATAPI should be used instead of the normal drive types (because those haven't changed and so they should have worked before). I have tested this type with the Pioneer DR-A24X, but it should work also with some other drives, The automatical drive detection tries to detect ATAPI drives by the reported SCSI type. Please notice that this function only works with ATAPI drives and not with the older drives with an AT-BUS interface.

It is possible that DAC refuses copying a Track (specially the first on a disc). Here you have to increase the start sector until DAC starts (only available for registered users).

Similar problems are possible at the last Track. My Toshiba refuses to read the last sector on a disc, but it is definitely present.

If you want to try a new and unknown drive and the the copy progress doesn't work, try to change the drive type in the settings. Unknown drives are mapped as SONY by default. You can also try one of the other default types: TOSHIBA, NEC, PHILIPS, TOSHNEW, RICOH, MATSHITA.

New drives are only detected if you have installed an additional SCSI controller, so you have to rescan the SCSI Bus with the Command Reset in the DAC menu.

You can't use this program with NT 3.51, because the copy dialogs are extended System dialogs and have the explorer style which is not available under normal NT 3.51 installations. But if there are many who want to use DAC with this old version of NT and don't want to upgrade to 4.0, i will fix this problem in a later version.

BTW: I couldn't test the Philips CD-Writer family, so be careful.

Here are some open problems:

First there are some drives (exactly said: this problem was reported only for some older ATAPI models of Toshiba) WinDAC32 starts at the wrong position of the track. It starts at about one minute to late and copies into the beginning of the next track. I have no idea what causes this, but i'm wondering why there are no problems like this with similar DOS tools.

Some other drives report after some time a read error (ASPI reports an error). This seems to be a timing problem. If you configure the drive to normal- or synch-mode, WinDAC32 tries to reread the sectors several times. If this has no success the copy process is aborted. In the burst-mode this is not possible. To ignore this error was also no solution for this problem, because you would get a long dropout in the resulting wave file. But who could exatly determine at which playtime of the CD this problem starts could email me this.

The next problem appears also after some time and applies to the Philips CDD2600, which is known to have some problems with reading audio data. One has no problems with this drive, but the otherone has often problems with the problem mentioned before. And a third one has the following problem: After copying the first few tracks without any problem it begins to read from all over the CD and so the results are rather funny. Even here i'm interested in the exact starting point of this behaviour and the length of each resulting passages.

I also get often the following question about some people that reports that the ASPI manager couldn't be initialized, although it could be found in the Windows system directory. I don't know how to solve this but i could say that it isn't wrong to reinstall Windows from time to time.

If you encounter other problems, E-Mail me.

Speed

High reading speed could cause some read problems, so i have integrated the possibility to select the reading speed depending on the drive capabilities. But this is not possible with all drives and with others only restricted. I couldn't test all drives, so i couldn't say which drives will work. The autodetection of the possible speeds done by WinDAC32 for some drives could cause some problems. Let me say it again: this autodetection will detect the speed for reading data sectors. The audio speed may differ from these values. Some drives doesn't support other speeds, so don't write me about this. Only if you are sure that the speed is wrong and you have technical information about this write me about this.

There seem to be a problem with some of the older versions of the newer Toshiba models recognized by WinDAC32 as TOSHNEW and reading faster than 1X. Configure such drive as TOSHIBA or limit the speed to 1X. This problem could be caused by the firmware version. I'am very interested on the used firmware and SCSI controller.

8. List of tested drives

I will no longer keep here this list because i don't release so much updates to keep the list always actual. Generally I recommend the drives from Toshiba, which can read Audio with single speed (the 12x and faster drives could read faster, currently at 4X),

the drives from Pioneer, which read with drives maximum speed (it seems that the DR-A24X is not so fast - i got only 2.7x - 3.1x) and the drives from Plextor (until the 12Plex) reading at the maximum speed of 8x (even with the 12x drives).

I think i should add a remark for the Mitsumi FX400. These drive couldn't read audio data (it's really funny how much of those drives must be sold). Since the Mitsumi FX800/810 those drives could read audio data, but even not so good.

For those who want to see the experience of others i suggest to have a look at Stewart Addison's CDDA Page (<http://www.tardis.ed.ac.uk/~psyche/pc/cdrom/CDDA.html>).

9. Registering

For registration please fill out the form in the File REGISTER.TXT and send it along with the registration fee to me.

Bank transfers from outside germany cost a lot of fees, please note this when you register.

No student editions or versions for free are available (think about the problem what to do with a P7-1300MHz machine and having no money to buy software).

Updates are available: all updates for WinDAC32 1.x are for free, but only on request. If you do not want it by email, send me a disk with an addressed and prepaid envelope (if you don't have german stamps add 3 dollar).

And remember that any donations are welcome.

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10. The tool StripHdr

New in this version and has the simple function to strip all headers from a wave file and write the pure data to a new file.

The syntax is "StripHdr InFile.wav OutFile.RAW".

What this tool is useful:

You could use this to convert the data into the RAW format for some CD Writer programs, or to make "real" MP3 files out of MPEG encoded wave files.

11. Notes

Some of the terms i used here are registered trademarks like Windows 95, Windows NT, Win32, Toshiba, Plextor, Pioneer, ...

So that's all, Enough is enough