# EAC – Exact Audio Copy

Introduction

EAC is a new audio grabber for CD-ROM drives. The main differences towards most other audio grabber:

- Low registration costs (just a postcard and a stamp)
- It works with a new technology, reading audio CDs almost perfectly. If there are any errors that can't be corrected, it will tell you on which time position the (possible) distortion occurred, so you could easily control it with e.g. the media player

I am writing this software, because I am fed up with these other audio grabber. I always had to listen to all grabbed waves, because other audio grabber will do only jitter correction but CD-ROM drives reading scratched CDs often produce distortions. Listen to all waves would be a waste of time. So in march I decided to write my own audio grabber, mainly for me and my friends private usage. So if you don't like this software – don't use it! I don't want to make any profit with it, I just want to use (and share) the best grabber (that's in my eyes the most exact grabber) ever programmed. Most important for me is feedback from the users, more about that later at registration chapter.

Features of EAC

- Usage of the Windows 95 and Windows NT ASPI Interface, so both SCSI and ATAPI CD-ROM drives are supported
- Hidden sector synchronization (jitter correction)
- Secure, fast and burst extraction method selectable. Fast extraction should get the same speed as other grabber, but is probably not exact anymore. Burst mode just grabs the audio data without any synchronization.
- Read error and complete lost of sync detection and correction in secure modes, as far as possible
- Output of time positions of all non exact corrections and listen to these positions
- Copy of ranges of music data, not only tracks
- Automatic Speed reduction on errors and fallback afterwards
- Normalization of extracted audio
- Usage of the Windows Audio Compression Manager (ACM Codecs) for direct compression e.g. to MP3 waves
- Support for the BladeEnc DLL that is usable like an ACM Codec for online MP3 compression
- Support of external MP3, VQF, RA and AAC encoder for automatic compression after extraction
- Batch compression and decompression of/to WAV files
- Compression offset support for exact compression/decompression
- Detection of pre-track gaps
- Detection of silence in pre-track gaps
- Automatic creation of CUE sheets for CDRWin, including all gaps, indices, track attributes, UPC and ISRC
- CD player functionality and prelistening to selected ranges
- Automatic detection of drive features, whether a drive has an accurate stream and/or does caching
- Sample Offsets for drives with no accurate streams, including the option of filling up missing samples with silence
- Option for synchronizing tracks for non-accurate stream drives
- Filename editing with local and remote CDDB database and cdplayer.ini support and more features like ID3 tagging
- Lyric database support from www.lyrics.ch
- Browse and edit local database
- Certified Escient ® CDDB(TM) Compatible
- Local CDDB support
- Record and Loop Record functions for recording from LP, radio, etc.
- Automatic rename of MP3 files according to their ID3 tag
- Catalog extraction function
- Multisession (CD-Extra) support
- CD-Text support
- ID3 Tag editor with drag and drop possibility from track listing and database
- Glitch removal after extraction
- Small WAV editor with functions for delete, trim, normalize, pad, glitch removal, pop detection, interpolation of ranges, noise reduction, fade in/out, undo and more
- Program is Cardware, so feel free to copy
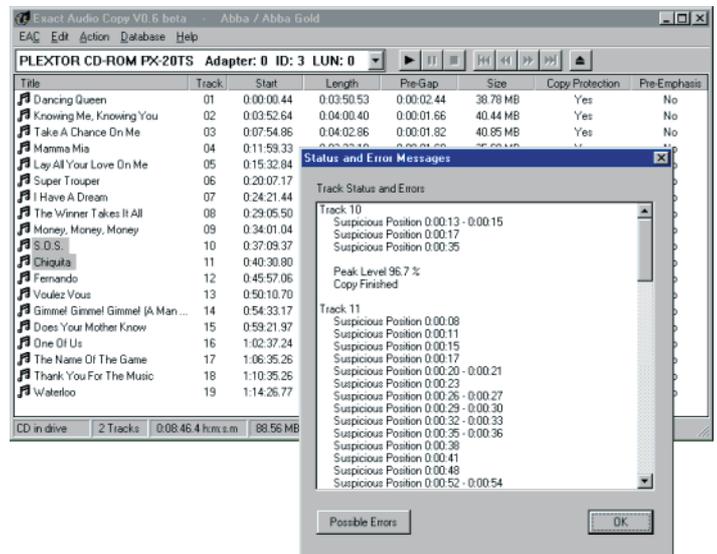
Known Bugs

- On some computers the whole system hangs after a short period of time. I didn't find the solution to this problem yet, because it never happened on my computer. It is possible that any cd-player program causes these problems. So try to stop any play in progress before starting EAC.
- On some CD-ROM drives occur extreme jitter errors so the extraction will slow down to a non acceptable value (e.g. Mitsumi FX240)

Planned For The Next Release

- Bug fixes again...
- Improvement of the audio editor
- C1/C2 error correcting Secure Modes
- Audio CD recording functions
- Index based extraction
- More features to come

Extraction Technology

In secure mode, this program reads every audio sector at least twice. That is one reason why the program is so slow. But by using this technique non-identical sectors are detected. If an error occurs (read or sync error), the program keeps on reading this sector, until eight of 16 retries are identical, but at maximum one, three or five times (according to the error recovery quality) these 16 retries are read. So, in the worst case, bad sectors are read up to 82 times! But this will help the program to obtain best result by comparing all of the retries. If it is not sure that the stream is correct (at least it can be said at approx. 99.5%) the program will tell the user where the (possible) read error occurred. The program also tries to adjust the jitter artifacts that occur on the first block of a track, so that each extraction should be exactly the same. On drives found to have the "accurate stream" feature, this is guaranteed. Of course, this is a little bit more complex, especially with some CD drives which have caching. When these drives cache audio data, every sector read will be read from cache and is identical. I initially implemented two ways of dealing with the caching problem. First there is an extra option for resetting the cache for

use the the old secure mode (the one being kept for compatibility reasons). In the current beta version, the cache will still be reset by resetting the drive completely. You might imagine that this would slow down the reading process very badly.

That is why I implemented three new read modes in version 0.85beta. One really fast mode (up to half of maximum speed) is only for non-caching, accurate stream cdrom drives. The second one could be used for caching, accurate stream drives and the last one will work with drives that don't have accurate streams, or do caching. The last two will be much slower, when no read errors occur it will usually something around a third to a fourth of the drives maximum speed.

For my testing, I am using a Plextor 14/32 drive that does no caching and a Teac R56S-600 drive that does caching. Furthermore the Plextor 14/32 supports the "accurate stream" feature, so it produces no jitter artifacts on any stream. For more information on this have a look at the table at the end of this document.

This program is really damn slow in secure mode in comparison with other grabber, but the program checks every sector over and over to get the correct data with high certainty. If you don't like this feature of EAC and prefer fast copies instead of secure copies, you should use the fast or burst extraction option in the options menu. But of course in fast mode, the program will no longer be able to find read errors. Only if a read error occurs in a sector synchronization area, will a sync error will still be displayed. Fast mode is sector synchronized with 2 blocks of 23 as synchronization blocks. Burst copy is even worse, no synchronization is done, enabling extraction at maximum speed of the drive. No error checking of any kind can be performed. At least I implemented a small help. If the stream ever breaks, it will tell the user in the status report by showing up suspicious positions. Of course this is only heuristic; there needn't be any errors on that positions; moreover there could be errors that are not found at all.

A new option for selecting the error recovery quality will determine how often these blocks of 16 reads will be done before giving up and working with the results obtained so far. For bad CDs, low error recovery quality will be fastest, but high recover quality should give best results.

Gap Technology

In the new versions of EAC it is possible to detect pre-track gaps. These are the pauses between two tracks. Usually they are two seconds long and a cd player will display a negative time during this pause. By enabling the option 'Detect Pre-Track Gaps' it will be possible to detect all gap-lengths by reading the sub-channel information. Because this information is not stored on the cd directly retrievable, EAC has to search for the position a track ends. This search is quite fast, but it still takes on average a second per track. That's why I made it possible to disable it in the options. Besides that option you can choose to add the gaps to the previous track nevertheless. Otherwise you can choose either to append the gap to the correct track or to leave it out . A benefit of performing the detection and getting the gap times is the selection of a range to copy. There the correct times will be displayed. A last word on this topic: because these pre-track gaps are found out by testing positions, it could occur that not 100% exact values are calculated, but in most cases it will be correct.

Automatic Feature Detection Technology

From version 0.8 beta on it is possible to autodetect cd-rom drive features. For each drive the program builds a separate drive options page. On this option page this function can be called.

There are two different features that will be checked by EAC, first if the stream is accurate and second if the drive caches audio(!) data. Even if the drive has a cache (drive specifications), it does not automatically means that the drive uses that cache also for audio extraction.

The test for the accurate stream feature should be always correct, but testing on cache will give some problems with drives that extracts audio very slowly (under 4X speed). If results are uncertain (given e.g. two different results on different tests), you should assume that the drive does caching. The new secure mode for non-accurate and/or caching drives should work for all drives. The other new read modes are only something faster. If testing on accurate stream will give only sometimes a negative result, then you could nevertheless try to use the accurate secure mode.
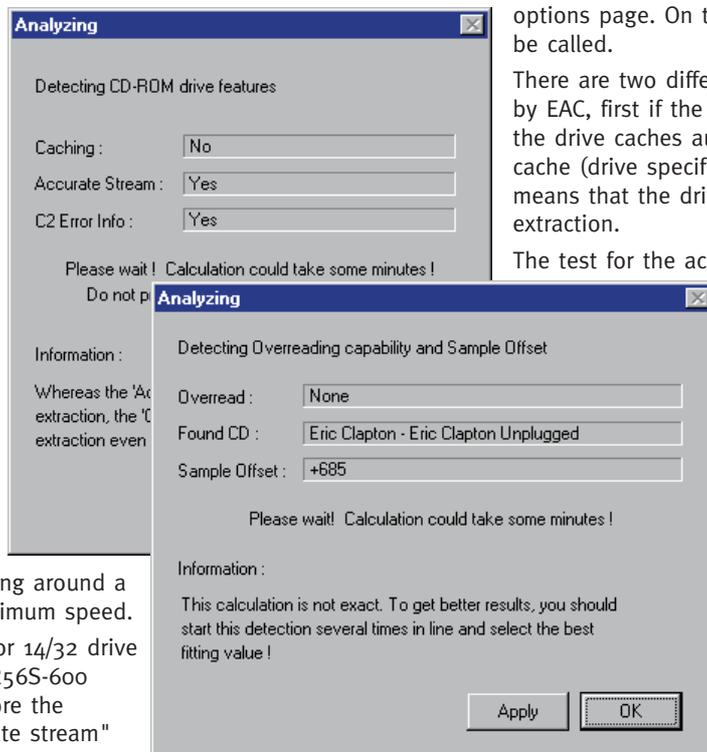
Track Synchronization Technology

Usually cd audio extraction programs will extract one track after another. This could make some problems on CD-ROM drives that are not accurate on a CD which has no gaps. When this option is enabled in the EAC options, EAC will synchronize a track with a preceding track if there is no silence at the track junction, so track transitions will be free from jitter artifacts (e.g. on live recordings).

Offset Technology

'Sample Offset' is another new feature of EAC. Because most drives lack the 'accurate stream' feature, it will help to get always the same wavs as another reader. Some drives can not position the head correctly. That means if the program tells the drive to read block 10000 it will probably read data somewhere in block 9998 instead. But this is not visible to the reading program, it won't know if it is really the data it wanted. Usually the head will be set always to a fixed offset before or after the correct read position. So it is possible to detect this offset once and use it for all CDs coming afterwards. Because it is a hard task to determine the exact absolute offset for each drive, I determined it once on my Plextor 14/32. To find out the offset of any other drive the offset is calculated relative to that absolute offset. To implement an offset

detection for other drives I took some bytes from some common CDs I and my friends own. These are the reference each CD-ROM drive has to compare with. Of course I have implemented only a limited selection of CDs that can be used to detect this offset, a list follows below. Sometimes there are different versions (releases) of the same CD, but only the same press like the one I used will work. That is why in the table below show also a code, that is written on the inner ring of the music CD, that should identify the release of a CD. The red codes are from CDs that does not work with this test. In time I will add more CDs to test this offset. Drives that have jitter are furthermore not able to position their heads correctly. So you should activate the secure or fast extraction method and moreover if your drive does caching, activate no-caching emulation. The 'Searching Track Start' algorithm tries to find the correct start position even if jitter occurs. But this is not always possible, mainly if the drive jitters too much. But it can be shown that nearly 80% of the reads will get the same results. A drive's characteristic offset can be found automatically from the CD from on the list of reference CDs. Because of the mentioned jitter error the value given back is also not 100% sure. You should start the test several times and remember to activate emulate no-caching if necessary. Then you should get one value that occurs more often than other values. YOU SHOULD USE THIS TEST ON TWO DIFFERENT CDS AT LEAST! BOTH TESTS SHOULD GIVE BACK THE SAME VALUE! My Plextor 14/32 has an offset value of +679 samples, that means that 679 samples usually are missing at the end of a wav file.

As different models of common CD-R writer usually do not add the same offset on writing, it seems that also big CD manufactures also do not always press the same offset on their CDs. So I determined the most common offset of pressed CDs and integrated it into the offset detection routines.

Sound Editor

Since version 0.8 EAC includes a small wave editor that will have some neat functions that could be handy when handling extracted audio files. At the moment only uncompressed 16 bit 44.1 kHz stereo samples files could be used. Following some functions are described more in detail.

Glitch Removal

Since version 0.6beta it is possible to remove glitches from extracted wave files. This will work only on uncompressed files.

What are glitches? Glitches are single samples that are completely out of the wave stream. Best to see on these pictures, which is a really extreme example that probably won't occur with EAC.
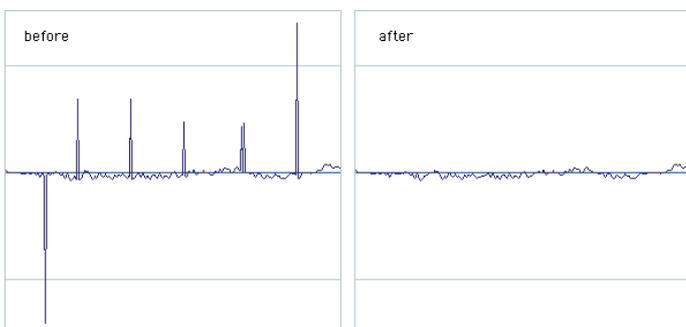
Only these glitches are removed. When hearing a wave file with glitches it is usually a high frequent 'tick'. Linear interpolation is used for removal of these glitches. Pops and other artifacts are more deep in the sample structure and are not removed yet, but is also planned for future releases. Pops occurs mainly in a lost of sync, where two parts of a wavefile are joined that does not fit correctly at these points of change of parts.

Interpolation

At first I want to note that this feature is not fully correctly implemented and would create not always clean replacements of the selected wav range. The selected range has to be pretty small, otherwise the menu entry will be disabled.

This function will work on the frequency spectrum of the wave. The spectrum of the selected range will be interpolated from spectra of ranges left and right of the selected one. This function should be used to remove detected pops.

Linear Interpolation will create a linear connection between the points of the wave in the selected range. This should only be used for very small ranges.

Automatic Detection Of Pops

This function tries to find automatically pops in the selected range. This is something slow, so you shouldn't select the complete file, but a smaller area. This algorithm is also not very good yet, it will find some pops where no are and also not found all real pops... In the next version improvements are planned that will add user definable parameters to nearly all these edit functions.

After EAC ended the search it will display a dialog with all found positions. With a double click on such a position it will select the matching range.

Noise Reduction

To reduce noise from a wave it is necessary to have a noise profile. This could either be loaded from disk (or saved after created), or created from a selected range. This range should at least something around half a second. This range used for the creation of the profile should consist of pure noise, no other sound/music should be found in the selected range.

After having a noise profile this could be used on any range of the wav (usually the complete file) to reduce the kind of in the profile analyzed noise.
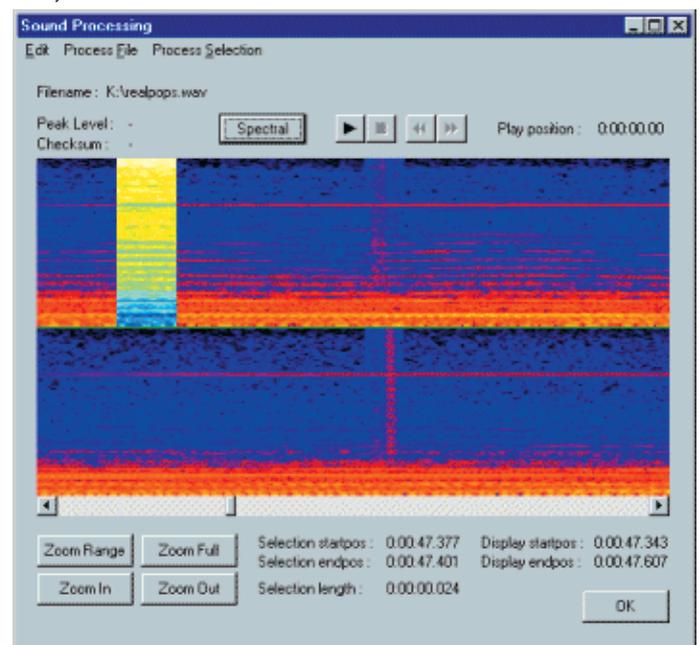
Spectral Display

If the Spectral button is selected, it takes some seconds to calculate a frequency spectrum for the displayed range. This kind of display has some advantages. E.g. pops are easily be recognized, as example you should have a look at the top of the page.

The Y axis will be used for different frequencies, at the bottom low frequencies are displayed and at the top high frequencies (up to 22.5 kHz). Further the color of a point describe the amplitude of each frequency band. If there are discontinuities in this view, there is sometimes something wrong in the wave.

Smooth Samples

This function will smooth the amplitude of a sound. This is useful for LP recordings or other pops/clicks. The amplitude is smoothed, what means that high frequent parts are filtered out. So this function will perform a kind of low pass filtering, but it won't cut of

frequencies about a special limit, but lower the volume according to its frequency. This function will also help on removing pops/clicks. This function could be called as often as needed for the same range.

Tips

Did you know:

- In the audio editor it is possible to use the time bar and the sample value bar for moving the waveform by moving the mouse while having the left mouse button pressed on these bars. With the right mouse button it is possible to zoom a range on the time or sample value bar. A right double click will zoom out the specific bar.

- Some drives make problems reading TOC information from CDs. As version 0.85 beta has some more features regarding the TOC, I implemented two more command line options to help on problems when starting EAC or inserting a CD. You could use
  -nocdtext
  -nomultisession
  and it again it is possible to combine any of the command line options.

- An unofficial EAC page that has plenty of tips for offset correction, etc. can be found under http://pages.cthome.net/home-page/eac/

- Some CD-ROM drives will perform better DAE when updating the firmware. For example the Creative DVD drives and some Teacs will perform better when a new firmware was flashed in.

- The WAV comparison feature could also be used to determine a combined reader/writer offset for exact audio duplication. This offset will be different for each pair of reader/writer.
  To determine the offset, you need an already copied audio CD where the WAV files were extracted with 0 offset.
  Now extract the same range (somewhere in the middle of a track) with your preferred audio drive of the original and the copied CD.
  When extracted call compare WAV files and have a look at the number of the first missing/extraneous samples. This number will be the combined reader/writer offset. To determine whether the number should be positive or negative, you have to look if the samples are missing or are extraneous. If the original wav file has extraneous samples at the beginning, the offset should be negative otherwise positive (if the file of the copied CD has extraneous samples the offset should otherwise be positive, etc.) To check the correct offset, you could enter the offset value in the options and extract again the same range from the copied CD and compare it again with the range of the original CD, both should then be the same...

- With the WAV editor it is also possible to compare the actual file with another WAV file. This has the advantage that the differing positions could automatically be selected by double-clicking the position in the list box. This will make correction of badly read tracks very easy.

- EAC will crash on some systems. Therefore I implemented some command line options that will disable some functions that could crash the system. You could combine any of these options, I hope that works for this version. I will try to remove these problems in the next version... The options are
  -nostopcommand
  -notestunit
  -nospeedsel
  -noreadsub
  e.g. EAC -noreadsub -notestunit
  You should have CDs already inserted in ALL your drives when starting EAC. On some systems it will still crash if no CD is present when EAC is running.
  Furthermore, you might want to disable the flag 'DMA Transfer' from system properties, hardware manager for each CD-ROM drive in the system.

- On some systems EAC will not find a matching read mode. In that case select the correct read command in the drive options menu directly. If your drives seems to still make a bus reset (red blinking LEDs for some seconds) or still does not find a matching read mode, please tell me about it!

- The lyrics server address changed a while ago, so I added an option to change the address. But I couldn't test if the new server worked because a few days ago it was forced to close down, at least for the moment.

- If a CD has songs from various artists, you could select the option 'Various Artists' from the 'Edit CD Information's' menu. This will enable split track names. The first part of each track name is then the artist name and the second part is the song title. Both parts are separated by the character '/'. For example : Metallica / Nothing Else Matters

- The caching that is supported by Windows 95/98/NT does not affect a cache that is included in a CD-ROM drive. Even if you reduce or disable this Windows cache, it does not affect grabber that use the ASPI interface. So you can't make your drive non-caching, in what EAC understands by this, by changing that cache.

- CDDB servers require an E-mail address in the CDDB options. If a server times out or does not respond, you can select another CDDB server from the list supplied in the list box. From time to time you should update the server list by pressing the button below that list box.

- If your computer doesn't show any drives or shows an access violation after starting EAC, it is often the ASPI interface. There are many versions out there which will work (more or less reliably) with EAC. Changing the interface could help. To install a new ASPI, you should choose one from Adaptec. If you do not own an Adaptec SCSI adapter you should download the file "aspiw95.exe" (after locating it on the internet, e.g. with help of a search engine), or perform a search for "ASPIME" or "ASPI_ME" on the internet or have a look at the page of Official Undernet... I did not tried ASPI installation on NT yet, so I can't guarantee success!
  If this still does not help, you should probably look around to find a matching one... There should also be ASPI interfaces for NT4 out there.

- You can open two instances of EAC, enabling you to read audio data from two different CD-ROM drives simultaneously.

- To exactly position the sliders in selecting a range to copy, you could move the sliders secondswise by clicking left or right of the sliders (same as pressing the ‹page up› and ‹page down› keys) and blockwise by pressing the ‹cursor left› and ‹cursor right› keys.

- If your drive caches audio data, you have to use the appropriate extraction mode, or if you still use the old secure mode, you have to enable the option 'disable CD-ROM drive cache'. If not, only the same result as 'Fast Extraction' is achieved (No error detection).

- To detect if your drive has the accurate stream feature, you should set the options 'secure extraction' and 'emulate cache'. After reading a track (a few percent should also be enough) the status window will report if it has or not.

Drive Specs

CD-ROM drive name	offset	overreads	cache	accur. stream
Acer CD640A 40x	?	?	no	yes
Afreey 50x CD-ROM	?	?	no	yes
Asus CDS-400 40x	?	?	no	yes
EPO CDS-840 40x	?	?	no	yes
Hewlett Packard 8100i	?	?	no	yes
Hitachi GD-2500 DVD	?	?	no	yes
HP 7100	1566	-	no	yes
Liteon LTN301 32x	?	?	no	?
Matushita CW-7502	?	?	yes	yes
Memorex CDRW-2216	?	?	no	yes
Phillips CDD 3600	1263	-	yes	yes
Pioneer 24x DR-A02S	1582	I/O	no	yes
Pioneer DVD303S	691	I	yes	yes
Plextor CD-ROM PX-32TS	679	I/O	no	yes
Plextor CD-ROM PX-40TS	676	I/O	no	yes
Plextor Ultraplex Wide	?	?	no	yes
Ricoh MP6200	?	?	no	yes
Ricoh MP7040	?	?	no	no
Ricoh MP7040S	685	-	no	yes
Samsung SCR 3211	?	-	no	yes
TEAC CDR56S-600	687	I	yes	yes
Yamaha CRW4416E	?	?	no	yes

Overread feature "I" stands for Lead-In / "O" stands for Lead-Out

About Me

I am a student of computer science and mathematics here at the University of Dortmund. At the moment I have some preparations on aural examinations and the start of an one year project group. Beside the usual work at the university as a student, I started work for VOB (CDWizard) on Jukebox driver.

In my spare time I like spending time with my friends and playing computer and board games. Of course I also work on some computer projects like this one. Further I do a lot of sports like cycling, walking, inline skating and some martial arts.

I am using now a Pentium II 400, total of 2.5 GB IDE harddisks, 4.3 GB SCSI harddisk, 128 MB RAM, Plextor 14/32 CD-ROM drives, Teac R56S-600 CD-R drive, Asus V3400 TNT 16 MB video card, Creative SB Live! soundcard, Windows 98 and Stony Brook Modula 2.

Registration

As I mentioned before, this program is and will be Cardware. This means, using the program will cost you no money, but a nice picture postcard from your hometown or a beautiful countryside nearby (perhaps it will also be possible to use a nice stamp for sending the postcard). This support helps me developing the software to more and more functionality and safety. Please tell me what you like (or dislike) and please don't forget your e-mail address. If I ever decide that not enough users registrate (to my subjective decision), I will add nag screens which key codes will remove to registrated users. So if I have already your e-mail address, it will be much easier to send you your personal registration code. Of course, this will only be done if there isn't enough support. But I released until now also some other programs and so I am already disillusioned.

Of course I would greatly appreciate any donations made freely by you to help me to improve EAC by using the donations for compiler updates etc.

If you want to registrate in order to support me please use this address:

Andre Wiethoff, Stockumer Str. 412, 44227 Dortmund, Germany

Legal Limitations

Even if you are free to copy the program for private purposes, it is not allowed to

- Make changes to the executable and distribute it
- Disassemble / decompile the executable
- Spread it together with other programs on CD-ROM, web sites or any other media without my permission. It is allowed to put it up on free FTP sites or make links directly to my homepage. Of course you can pass a copy of it to your family and friends.

List of Included Reference CDs

Artist	Album	Catalog
2 Unlimited	Real Things	ZYX 20302-2 02
4 Non Blondes	Bigger, Better, Faster, More!	756792112-2
ABBA	Gold - Greatest Hits	517007-202
ABBA	The Hits 3	PWKS 507
AC/DC	Ballbreaker	755961780-2
Ace Of Base	Happy Nation - U.S. Version	H-5328 / MRCD3239 A
Adiemus	Songs Of Sanctuary	
Alice Cooper	The Last Temptation	01-476594-1013
All Saints	All Saints	556004-2 01
Angelic Upstarts	Reason Why	GRAM CD 004 MPO 01
Anouk	Urban Solitude	DNCD 99680
Art Garfunkel	The Art Garfunkel Album	1004611A4
Back Street Boys	Millennium	A0100279604-0101
Bad Religion	Stranger Than Fiction	12-477343-10 12
Billy Joel	River Of Dreams	01-473872-10 11
		probably wrong offset
Blind Guardian	The Forgotten Tales	8416262@1
Blind Guardian	Nightfall In Middle Earth	EMI UDEN 8458992 @ 1
Blind Guardian	Immaginations From The Other Side	840332 2 @ 1
Blur	13	UDEN 4991292 @ 1
Bjork	Debut	521 323-202
Bobo In Thite Wodden Range		Cosmic Ceiling
Bon Jovi	Crossroad	522 936-2 0117-468451-1021
Britney Spears	Baby One More Time	A100272308 0101
Bruce Hornsvy And The Range		The Way It Is
Celine Dion	Falling Into You	S0148379210- 0101
Celine Dion	Let's Talk About Love	S0148915910-0101 182
Celine Dion	The Colour Of My Love	4747432
Chemical Brothers	Brothers Gonna Work It Out	EMI UDEN 8465992 @ 1
Chris de Burgh	Beautiful Dreams	L003 540 432-2 01
Chris de Burgh	Best Moves	
Clanned	Legend	PD 70188 2893 644 01 #
Clanned	Magical Ring	B-7664/PD 70003
Cranberries	Everybody Else Is Doing It, So...	514 156-2 00A L7
Cranberries	No Need To Forgive	524051-2
Crash Test Dummies	God Shuffled His Feet	H-6338/4321165312 B1
Culture Club	The Best Of Culture Club	
Depeche Mode	101 (CD 1)	C-6402/881800-1 A
Depeche Mode	101 (CD 2)	C-6403/881800-2 A
Depeche Mode	A Broken Frame	
Depeche Mode	Black Celebration	
Depeche Mode	Construction Time Again	
Depeche Mode	Some Great Reward	
Depeche Mode	Songs Of Faith And Devotion	
Depeche Mode	Speak & Spell	
Depeche Mode	Depeche Mode Singles 86-98	CD 1 : 4845742@1
		CD 2 : 4845752@1
Des'ree	Supernatural	S0100249129-0101 29
DEUS	The Ideal Crash	524 643-2 01
Die Fantastischen Vier	499	S4942386000-0101 35
Dire Straits	Communiqué	800 052_2 70 L7
Dire Straits	Love Over Gold	
Dream Theater	Awake	756790126-2 WME
Dream Theater	Images And Words	756792148-2 WME
EA80	Zweihundertzwei	P+O-8884-A2
Enigma	The Cross Of Changes	H-5504-1/8392362
Enya	The Memory Of Trees	063012879-2 WME
Eric Clapton	Eric Clapton Unplugged	936245024-2
Eric Clapton	Pilgrim	936246577-2 01/98
Eric Clapton	Strictly The Blues	
Eric Clapton	Timepieces	8000142 04
Everything But The Girl	Walking Wounded	
F.Mercury & M.Caballe	Barcelona	837277-201
F.R. David	Greatest Hits	
Falco	Falco 3	229244362-2.2 WME
Falco	The Hit-Singles	L012 398423479-2 05/98
Fine Young Cannibals	The Raw & The Cooked	828 069-2 01
Fisher Z	Going Red For A Salad	CDP 794132 2 AR 1
Fool's Garden	Dish Of The Day	L046 8225442 @4
Foreigner	Records	756780999-2.2 R
Frankie goes to H	Welcome To The Pleasuredome	450994745-2 WME
Fugees	The Score	S0100184186-0101 12
Genesis	Calling All Stations	8446072 @1
Genesis	Invisible	
George Michael	Faith	CDEPC-460000 41
George Michael	Older	841392 2 @ 2
Gloria Gaynor	The Very Best Of Gloria Gaynor	L134 5196652 02
Guns'N'Roses	Appetite For Destruction	F-0932/GED24148B
H-Blockx	Time To Move	I-3486/4321187512D
Helloween	Keeper Of The Seven Keys-PartI	N 0061MPOo1 @@9
Helloween	Master Of The Rings	I-5687/CSC7150-2 A
Herbert Tachezi	J.S.Bach, Toccata U. Fugue	903174780-2
INXS	The Greatest Hits	526 230-2 01
James Horner	Back To Titanic	S0106 069110 - 0101
Jamiroquai	Synkronized	S 0100280704-0101 51
Janet Jackson	The Velvet Rope	84476229
Jennifer Rush	Credo	
Jennifer Rush	Movin'	
Joan Osborne	Relish	526 699-2 01
Joe Cocker	Organic	
John McLaughlin, Al Di	Friday Night In San Francisco	800 047-2 02
John Miles	Rebel	820 080-2 03
Kate Bush	Hounds Of Love	
Kate Bush	The Red Shoes	
Kate Bush	The Sensual World	
Keb' Mo'	Just Like You	S0148411710-0101
Kruder & Dorfmeister	The K & D Sessions - Disc 1	SNV K 7073 CDA 02
Kruder & Dorfmeister	The K & D Sessions - Disc 2	K7073CD B-II #1
Lauryn Hill	Miseducation Of Lauryn Hill	S0148984310 0101
Leonard Cohen	So Long, Marianne	
Litfiba	Mondi Sommersi	EMI 8557422
Lou Reed	New York	759925829-2
Madonna	Bedtime Stories	936245767-2 WME
Madonna	Like A Prayer	
Madonna	Ray Of Light	936246847-2
Manowar	Fighting The World	756790563-2 WME
Manowar	Kings Of Metal	756781930-2 WME
Manowar	Triumph Of Steel	756782423-2.2 WME
Mariah Carey	Butterfly	S0148853710
Marillion	Fugazi	CDP 7 46027 2
Marla Glen	This Is Marla Glen	
Meat Loaf	Bat Out Of Hell II	839067 2@3
Meredith Brooks	Blurring The Edges	EMI UDEN 8369192
Metallica	Load	532618-202
Metallica	Master Of Puppets	838 141-2 01
Metallica	Metallica	510 022-2 00B L7
Metallica	Reload	
Metallica	S & M (CD 1)	07314 546 798-2 01
Metallica	S & M (CD 2)	07314 546 799-2 01
Michael Jackson	Bad	CDEPC-450290 123 A1
Michael Jackson	Dangerous	01-465802-10 83
Michael Jackson	Thriller	85930 41
Michael Jackson	Thriller	35 8P-11 91A2
Mike Oldfield	Crises	CDV2262 100441 02
Mike Oldfield	Heaven's Open	
Mike Oldfield	Music Wonderland	
Mike Oldfield	Orchestral Tubular Bells	S VVIPD 101 01
Mike Oldfield	The Songs Of Distant Earth	
Mike Oldfield	Tubular Bells 2	4500990618-2

Mike Oldfield	Voyager	
Motley Crue	Too Fast For Love	755960174-2 RSA
Musical	Highlights From Miss Saigon	
Musical	Highlights From The Phantom Of The Opera	
Musical	West Side Story	
Nazareth	The Best Of Nazareth	LA41 157 402
Nik Kershaw	The Best Of Nik Kershaw	
Ozzy Osbourne	No More Tears	01-467859-10 11
Ozzy Osbourne	Ozzmosis	S0148102210-0101 31
Paul McCartney	Off The Ground	780362 2
Pet Shop Boys	DISCO2	
Phil Collins	Face Value	2 99143 SRC 01
Pink Floyd	The Wall	CD 1 : 746036 2 3
		CD 2 : 746037 2 4
Queen	A Kind Of Magic	CDP 746267 2 AR
Queen	A Night At The Opera	789492 2 @ 2
Queen	Greatest Hits	746033 2 AR 3
Queen	Greatest Hits II	797971 2 AR @1
Queen	Innuendo	795887 2 00 @3
Queen	Jazz	789495 2 @ 4
Queen	Made In Heaven	M-4684/4835542A
Queen	News Of The World	789494 2 @ 1
Queen	Queen I	746204 2 AR 10
Queen	The Miracle	C-7698/CDP7923572 A
Queen	The Works	CDP 746016 2 AR.4
R.E.M.	Automatic For The People	936245055-2.2 WME
Rancid	...And Out Come The Wolves	Ao100183294-0101 21
Rolling Stones	Bridges To Babylon	8449092 @1
Rolling Stones	Voodoo Lounge	839782 2 @ 3
Roxette	Joyride	796048 2 Ao 2
Roxette	Look Sharp!	791098 2 00 @ 1
Sade	The Best Of Sade	
Santana	Supernatural	Z-7133/7822190802
Sesamstrasse Live	1-2-3...Wir Träumen!	A15112/4321714522
Sex Pistols	Flogging A Dead Horse	CDV 2142 / B-5399 A
Shania Twain	Come On Over	558000-2 01
Simple Minds	Glittering Prize	
Simple Minds	The Street Fighting Years	
Sisters Of Mercy	First And Last And Always	240616-2
Sisters Of Mercy	Floodland	242246-2
Sisters Of Mercy	Some Girls Wander By Mistake	9031-76476-2
Sisters Of Mercy	Vision Thing	9031-72663-2
Skeptiker	Harte Zeiten	084-80262
Soundgarden	Superunknown	540 215-2 01
Soundtrack	Armageddon	
Soundtrack	Evita	936246450 -2
Soundtrack	Pretty Woman	793492 2 AR 4
Soundtrack	The Bodyguard	G-5872/7822186992A
Soundtrack	The Rocky Horror Picture Show	
Soundtrack	Titanic	S0100239681-0101
		S0106321310-0101
Soundtrack	The Matrix	936247390-2 03/99
Soundtrack - Music	The Matrix	6026.2 P+O-42759-A1 04-99
Soundtrack	Ultima Ascension	OW684 9264 1407537
Spandau Ballet	The Twelve Inch Mixes	
Spice Girls	Spice	8421742 @ 1
Sting	Brand New Day	4904512 02 6
Sting	Fields Of Gold	540 321-2 0 1
Sting	Mercury Falling	
Sting	The Very Best Of Sting	540 321_2 00 L7
Stratovarious	Visions	TT 00312 MPO 11 @@@@ 1
Tear For Fears	Tears Roll Down	
Ten Sharp	Under The Waterline	17-468451-1021
The Alan Parsons P.	The Instrumental Works	
The Art Of Noise	Below The Waste	450995911-2 WME
The Eagles	The Very Best Of	954832375-2.2 WME
The Gathering	Nighttime Birds	77168-2
The Jam	Wasteland	PWKS4129P 10203241 02 %
The Mamas & The Papas		Monday Monday
The Police	Greatest Hits	540 030-2 00 L7
The Psychedelic Furs	Talk Talk Talk	DIDP 70008
TLC	Fanmail	73008 26055 2
Ton Steine Scherben	Keine Macht - Für Niemand !	EFA 02007-26
Ton Steine Scherben	Warum Geht Es Mir So Dreckig	EFA 02008
U96	Das Boot	513 185-2 01 /
Ultravox	Dancing With Tears In My Eyes	
Vangelis	1492	
Vangelis	Oceanic	
Vangelis	Themes	
Various Artists	Feelings 2	D-8679/77612-0
Various Artists	Rock Super Stars	8405342 - K-8890 A
Various Artists	The Tarantino Connection	R-7233/ MCD80325 A
Violent Femmes	Hallowed Ground	820093-2
Westernhagen	Affentheater	450997018-2.2 WME
Whitney Houston	The Preachers Wife	441252
Wiener Philharmoniker	Dvorak / Symphonie No. 9	
Xavier Naidoo	Nicht Von Dieser Welt	S1248986913-0101 104
Yello	Baby	848 791-2 01
Yello	Flag	836 426-2 03 #
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ZZ Top	One Foot In The Blues	936245815-2