The Amiga CD32 FAQ 2000

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Official Web Site: http://www.amigaemulation.com/cd32
Mirror Site(s): http://website.lineone.net/~cd32/
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Translations Available: French | Spanish | German | Portuguese | Italian

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INTRODUCTION

The original CD32 FAQ Parts 1 and 2 stopped being updated late 1996. Interest in the CD32 and the Amiga platform in general deteriorated between 1996 and 1998 so it made sense that the FAQ was 'as done as it was going to get' and lay dormant for a couple of years. The late 1990's, however, recognized a surge in classic gaming - arcade, console, and computer. Emulators have been written for nearly all classic gaming outlets - including the great Amiga computer.

As PC compatible computers got faster (breaking 1Ghz and beyond shortly), it became quite feasable to emulate the Amiga computer. Pretty well, too. Emulation has breathed new life into the Amiga and also the CD32. Being an active and avid CD32 owner myself and seeing the rise in interest, I figured it might be time to resurrect the CD32 FAQ and give it a much needed facelift and update for the 21st century.

The FAQ has been translated into HTML for a number of reasons. One, HTML is the language of the Internet - and the Internet is where people are. Two, people expect to be able to navigate documents quickly and easily. HTML allows for this. Three, we can add life to the FAQ with images and media. This will help the beginners to the system see a real picture, and not just an ASCII drawing. Four, HTML is universal. People emulating CD32 on an Amiga, PC, Mac, or BeOS can all see the FAQ the same.

There are many new areas to the FAQ, like PC emulation of the CD32. I understand that the die-hard Amiga fans (I've been there, folks) might feel threatened or offended by this inclusion into 'an Amiga FAQ'. Despite the evil ways of the PC (grin), emulation of the Amiga platform has really stirred an interest. Many who have tried it emulated have decided to buy a real Amiga. Software is trading and selling like it was the 'good ol' days'. The newsgroups are ALIVE. It seems only right to include the emulation community within this updated 'new for the 21st century' FAQ. I hope I have your support.

I've been trying to update references and information as much as possible - delete dead information (like links and companies and 'Escom stuff'), offer new information, answer questions I've been seeing asked on the newsgroups and email. As always, I welcome ALL new information, corrections, etc. Email me here with this information.

This FAQ is based LARGELY on the original CD32 FAQ Parts 1 and 2. I removed much of the data I felt was probably grossly out of date, and this included the contributor's list of email addresses. I do not want these people to be left out - much of this new FAQ is thanks to them. If you contributed to the original FAQ and wish to have your contact information available here, please let me know and I'll get you in ASAP.

If you would like to translate the FAQ (and hopefully maintain that localization of it) into other languages, I welcome your help! Please email me and let me know you are working on it. I'd like to at least have the languages Spanish, French, German, Italian, and Portuguese.

Thank you for continued support and efforts in keeping the Amiga alive and well.

- Shane R. Monroe

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TECHNICAL SPECIFICATIONS

Q: What are the technical details of the CD32?

A: As read below ...

Internal Details:

CPU

> Motorola 68EC020 clocked at 14.32Mhz. 32 bit data path. 24 bit address space (limited to additional 8M of 'fast' RAM due to CD32 system design).

FPU

> None.

MMU

> None.

ROM

> 1M (8 megabits) of operating system.

RAM

> 2M (16 megabits) of 'chip' RAM. 1K of 'flash' RAM.

CD-ROM Drive

> Multi-session, double speed, top loading, caddy-less design. Max transfer about

330K/s. Custom controller based (not IDE or SCSI).

Operating System

Kickstart/AmigaDOS version 40.6, release 3.1. Customisations for CD32 specifics. Custom chipset AGA custom chipset from 4 chips. Chips are called Akiko, Alice, Lisa, Paula. See the Jargon List for what they do.

Internal Details:

Aux Port

1 x 6 pin mini-din type. Combined serial/keyboard connector.

Controller Ports

2 x 9 pin D type. Accepts CD32 joypads, Amiga mice, joysticks, Megadrive joypads, Master System joypads.

Video Outputs

Composite, S-Video, RF (for televisions). French CD32s have a combined SCART & S-Video port in place of the S-Video port.

Audio Outputs

2 x RCA standard fixed output level. 1 x mini stereo headphone jack adjustable output level.

Expansion Port

1 x microchannel. For FMV cartridge or other system expansions.

Add-Ons Details:

CD32 Joypad

Custom 11 button wire based, 9 pin D style. 1 supplied, additional joypads can be purchased separately.

CD32x & SX-1

Adds enough connectors and ports to make it possible to use your CD32 as a computer.

FMV Cartridge

Play CD-i Digital Video or Video CDs.

Keyboard

Most Amiga keyboards can be plugged into a CD32.

Mouse

All Amiga mice can be plugged into the CD32. Some games will be easier to control.

Serial Link

Connected to the Aux port, allows you to use the CD32 as an external CD-ROM drive for other computers.

CONTROLLERS

Q: What's the Competition Pro CD32 joypad like?

A: It's completely compatible with the C= CD32 joypad. Some good things said about it are that it's shaped like a Megadrive joypad, the diagonals are easier to get to, it feels less delicate, it has turbo and auto fires, and it has a slow motion button. Some bad things said about it are that it's shaped like a Megadrive joypad and the diagonals are more difficult to get to. Obviously a bit subjective.

The CD32 Competition Pro Joypad

Q: Where can I purchase a CD32 Competition Pro Joypad?

A: In the U.S., try Centsible Software (they bought out just about everyone including Paxtron). Any U.K./Germany/Other retailers out there still carry them? Let me know.

Q: Is it possible to plug other types of controller into the controller port?

A: Yes, but you'll lose access to most CD32 joypad buttons.

CD32	Megadrive/Genesis	Master System	Joystick	Amiga mouse
Select	B	A	Fire	Left Button
Stop	C	B	(Second fire)	Right Button
Play			(Third fire)	Middle Button
Shuffle				
Loop				
Rewind				
Forward				

Q: Is it possible to connect a 6-button Megadrive or SNES joypad to the CD32?

A: As far as I know, it can't be done unless you're good with a soldering iron, but if anyone has managed to do this then I'll stick the details in here.

Q: Is it possible to use the CD32 joypad on normal Amigas?

A: It works fine. Some newer Amiga games are even taking advantage of the extra buttons (shuffle, loop, etc...). Many older Amiga games that use the keyboard for weapon select will use the stop button instead (eg. Project-X, Apydia, Turrican 2).

Q: Is it possible to both connect both a joypad and a mouse and use them together?

A: The joypad should be plugged into controller port 1 and the mouse should be plugged into controller port 2.

Q: Is it possible to connect more than two controllers?

A: There are rumours of being able to daisy-chain 8 or even 16 CD32 joypads together, but nothing's been seen. What will work is if you connect some kind of interface that gives you a parallel port (eg. SX-1) and plug in an Amiga four-player adaptor in there. The good point is that you can play the Amiga version of Dynablaster, if you have a floppy drive. The bad points are that it's a bit expensive and CD32 joypads won't work when plugged into the four player adaptor (but they still work if you plug them into the side controller ports).

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SOFTWARE

Q: What CDs will work with the CD32?

A: CD32 ones (um), many CDTV ones, music CDs, Karaoke CDs, CD+Gs (like a music CD but it has pictures or lyrics displayed in time with the music), Photo CDs (if you load up a photo CD reader first), and Video CDs (if you have the FMV cartridge plugged in). Also it can read CDs meant for other computers such as the PC and the Mac, but it's up to you to tell it how to make sense of the files on the CD (maybe by using something like datatypes). You won't be able to play games for other computers though.

Q: Where can I buy CD32 software?

A: In the U.S., try Centsible Software (they bought out just about everyone including Paxtron). I'll add more vendors as I get confirmation. Outside the U.S. and have a good source? Let me know. Another good source are online auctions. I always see a handful for sale on eBay. I also buy, sell, and trade and I have a list online here.

Q: Is there a list of all CD32 software currently made?

A: Both The CD32 Zone and the Amiga CD32 Source are trying to keep the most up-to-date accurate lists available. In addition, the Amiga CD32 Source website is trying to compile all the UNRELEASED stuff too!

Q: How can I try to convince a game to work in PAL or NTSC?

A: Connect an Amiga mouse into controller port 2, hold down both mouse buttons, and press the reset button. You'll be given a boot menu where you'll be able to choose either PAL or NTSC. If you have a keyboard then you can press any key to switch the boot menu between PAL and NTSC so you can see what you're doing. This is useful for NTSC CD32 owners who want to run games that use the PAL area of the screen. Multisystem TVs connected to any video output on or 1084s connected to the S-Video output will work. TVs/monitors connected to the CD32 through the French CD32's or SX-1's or CD32x's or TP9's (see diagram at end of FAQ) RGB connector will also work fine. TVs/monitors connected to the CD32 through the composite or S-Video outputs won't work though. The problem is that the PAL colour signal is still sent at the NTSC frequency.

The CD32 Boot Menu

Let's put it in simple terms; You are not going to likely play PAL games on a NTSC TV. EXPECT PROBLEMS if you try using the above method. Problems like B&W display, rolling picture that can't be stabilized, and missing video area where important information like score and lives might be kept.

Q: Are there any games with NTSC problems?

A:

Lock 'n' Load - most of the games (about 80%) are PAL only.
Nick Faldo's Golf doesn't let you see the bottom of the screen, so you can't even take shots properly because the meters are covered up.
Video Creator has the bottom of the screen missing. Also the animations become slowly out of sync with the music because of the difference in speed between NTSC/PAL machines. Almathera MAY work on an NTSC version of Video Creator (anyone know the status of this? -Ed)

(There are many many more - please report them to us here. -Ed)

Q: Are there any games definitely without NTSC problems?

A: (This is the original list from the FAQ. We've added our own notes. Email us with others. -Ed)

Alien Breed
Tower Assult (Game attempts to change into PAL on its own - will flake out most TVs and composite monitors. -Ed)
Battle Chess
Banshee (Bottom of the screen is cut off, making enemies behind you impossible to see. Barely playable. - Ed)
Bubba 'n' Stix
Bubble 'n' Squeak
Chaos Engine (NTSC)
Defender of the Crown 2
Fire and Ice
Global Effect
Guardian
Gunship 2000
Insight Technology
Labyrinth of Time
Litil Divil
Lotus Trilogy
Microcosm
Pinball F./Sleepwalker (NTSC)
Super Stardust (Difficult to change weapons with bottom of the screen cut off. Barely playable. - Ed)
Ultimate Body Blows
Winter Olympics
Zool

Just remember, though. Even if a PAL game displays ok in NTSC, the timing of the game might be off enough to cause problems, music/sound skipping, etc.

Q: What CD32 bundles are/were available?

A: Read below ...

Original...

Diggers
Oscar

Dangerous Streets...

Dangerous Streets
Diggers
Oscar
Wing Commander

Spectacular Voyage...

Chaos Engine
Microcosm

(Early versions also had the games from Dangerous Streets included.)

Critical Zone...

    Cannon Fodder
    Diggers
    Liberation
    Microcosm
    Oscar
    Project-X
    Ultimate Body Blows

Q: What multimedia software is available for the CD32?

A: (We've added links to the corresponding CD Covers on the [Amiga Emulation Zone](#) for your convenience. Many more covers there. - Ed)

CD32 Specific...

    [Grolier's Encyclopedia II](#)
    [Guinness Book of Records II](#)
    [Insight: Technology](#) (released for CD32, CDTV compatible)
    [Video Creator](#)
    Video Creator Update 1 (Amiga CD32 issue 2)
    Video Creator Extras (AUI December 1994 - on floppy

Various CDTV Titles...

    Advanced Military Simulator
    [American Heritage Dictionary](#)
    Animals in Motion
    Connoisseur of Fine Arts
    [New Basics Electronic Cookbook](#)
    Stamps of France and Monaco
    Timetable of Business, Politics
    Timetable of Science, Innovation

Various CDTV titles that require a mouse...

    Dr Wellman
    [Fruits and Vegetables](#)
    [Garden Plants](#)
    Guinness Disc of Records
    Illustrated Holy Bible
    Illustrated Works of Shakespeare
    [Indoor Plants](#)
    Musicolor

> [Trees and Shrubs](#)
>
> Women in Motion

Various CDTV titles that require a keyboard and disk drive...

> Inter Office

Q: What educational software is available for CD32?

A: Read below ...

CD32 specific...

> MicroFrench CD32 (Contains video sequences, but you don't have to own a FMV cartridge to view them. More languages are planned.)

Various CDTV titles...

> A Long Hard Day at the Ranch
> Cinderella
> [Fun School 3](#) (under 5's)
> Fun School 3 (5 to 7)
> Fun School 3 (over 7's)
> Heather Hits a Home Run
> [Moving Gives me a Stomach Ache](#)
> [Mud Puddle](#)
> North Polar Expedition
> Scary Poems for Rotten Kids
> Tale of Benjamin Bunny
> [Tale of Peter Rabbit](#)
> [Thomas' Snowsuit](#)

Various CDTV titles that require a mouse...

> A Bun for Barney
> Barney Bear Goes Camping
> [Barney Bear Goes to School](#)
> LTV English
> My Paint
> [Paperbag Princess](#)

Various CDTV titles that require a keyboard...

> Asterix English for French 1
> Asterix English for French 2
> Asterix French for English 1
> Asterix French for English 2

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AUDIO CDS

Q: Is it possible to directly read the audio data from music CDs into memory?

A: Nobody's managed to do this. The next best thing is to buy an SX-1, plug a sampler into the parallel port, start a CD playing with one of the CD players from aminet:/disk/cdrom, then sample directly to hard drive.

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CD+GS & KARAOKE CDS

Q: Where do I get CD+Gs from?

A: CD+G discs used to have a little sticker on the case, but the companies stopped this on the grounds that it confused the general public... The only places you'll probably find them now are in bargain bins or the odd mail order music store. You can find a list of known CD+G music CDs at The CD32 Zone.

Q: Can I use Karaoke CDs?

A: Yep. They're the same thing. If you work or you know anybody working in a pub then you could get hold of the CDs for their Karaoke machine. Just search your favorite search engine for "karaoke cdg" and you will find PLENTY of people to sell you CDs.

Q: How do I play CD+Gs/Karaoke CDs?

A: If you have a CD+G disc, you'll be able to tell immediately - the music player will disappear and the graphics will appear as soon as you press play. Use the up and down directions to change language and select to return to the music player. The rest of the controls work as normal. Once you're back at the player, a "CD+G" button will appear in the bottom left corner - hit select on that to return to the graphics.

Q: How do CD+Gs/Karaoke CDs work?

A: The CD+G format is an extension of the standard RED-BOOK audio format. On an audio disc there is an area known as the subchannel. This area is used to store data for the cd player like elapsed time etc. Some of this area is normally unused. In CD+G discs the subchannel is used to store the CD+G data. This data consists of commands and graphics that are interpreted by the player to produce the CD+G display. You can see pictures of actual CD+Gs being played at The CD32 Zone.

Fleetwood Mac - Behind the Mask CD+G

PHOTO-CDS

Q: Is it possible to display Photo CDs without expanding to a computer?

A: Yep, use one of these CDs before the Photo CD...

Weird Science Network CD
Photolite
Eureka

Olaf Barthel wrote:

In Winter 1994 I wrote a commercial program for this purpose. It can read both plain Photo CDs (such as the golden Photo CD Master discs) and interactive Photo CD portfolio discs. The program uses technology licensed from the Eastman Kodak Corporation. It is called "FolioworX Player" and retails for about DM 100,-. Blittersoft is the official distributor in the UK.

This is a quick description made after reading Asimware's info sheet (it's probably better to read the full thing for yourself if you're interested before making up your mind):

Asimware's Photo CD Manager costs US $39.95/CDN $47.95 and works on the CD32 and any Amiga with Kickstart 2 or above. It displays thumbnail images in groups of 10 on a sort of tape deck display. From this you can choose one or as many pictures as you want and view them as a slide show in any order. If you've got a CD32 or an AGA Amiga it displays them in 262144 colours, otherwise 4096.

VIDEO CDS

Q: What does the FMV cartridge do?

A: If you plug in the FMV cartridge, you can play Video CDs in almost the same way as you play music CDs. It's really a 24 bit display card that can be genlocked with normal CD32 graphics, so you can superimpose your own images over it (this is a feature of Video Creator, apparently). You may also view the FMV tracks on certain discs like the *Commodore Demo CD* and *Cannon Fodder* from Sensible Software. (See the actual clips at [The CD32 Zone](#) - Ed.)

The FMV Expansion Cartridge

Q: Where can I get a FMV Expansion Cartridge?

A: GOOD LUCK. These are as rare as hen's teeth and are usually expensive when you DO find one. Estimates were that only about 13,000 were made. Try online auctions and newsgroups.

Q: Will the Phillips CD-i FMV module work in the CD32?

A: This has been of some debate on the newsgroups. To the best of my knowledge, the CD-i FMV will not work in a CD32. Doesn't seem right that two completely competative companies would have interchangable hardware. But if anyone knows for sure differently, let me know.

Q: Where do I get Video CDs from?

A: Try http://www.videocds.com - they seem to have a WIDE selection. I'm quite stunned that VCD is so well supported. You may be able to find them locally, but I wouldn't hold your breath.

Q: Can I use CD-i Digital Video CDs?

A: Yep. Some don't quite follow the standard though, so if you get rubbish on certain ones you can upgrade your FMV cartridge's ROM to the latest version (40.30) which can cope with the non-standard CDs. The dealer that you bought the FMV cartridge from should be able to do this for you at a cost of about 5UKP. (Anyone know where this can be downloaded from these days? I seriously doubt you'll find a dealer to do it - if you do, please let me know. -Ed.)

Q: What are the differences between Video CDs and CD-i Digital Video CDs?

A: You won't get the bookmarks that you find on the CD-i. That's because the bookmarks are really a CD-i program. Instead you can search through the disc using the normal music player controls. CD-I's Video CDs are also encoded using Mode 2 type exclusively. This means you will not be able to play them in most VCD players and if you also have a PC, you will not be able to play them there either. VCDs can be read by the native filesystem on most computers - CD-I's cannot be.

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MAGAZINES

Q: Are there any Amiga/CD32 magazines with CD-ROMs?

A: In the UK (check your usual sources of foreign Amiga mags elsewhere)...

Amiga CD! (included with Amiga User International) - Monthly. Some sections of issue 3
are CDTV and A570 compatible. Issue 3 was the last issue. They're still waiting for the
Commodore issue to sort itself out, so maybe it'll start up again now that it has.
Amiga CD32 - Not regular. Issues 1 and 2 are available through Amiga Format's back issues
page. Issue 3 was planned to be out on December 1st. It hasn't been seen yet.
Amiga Power CD32 - Not regular. Issue 49 has a CD32 version with some demos, a load of
PD games, and a load of reviews of the all time top 100 games. It sounds like there could be
more CD32 versions some time soon(ish).
Amiga Shopper - One off. Has a CD on the front with a load of graphics, fonts, sound
samples, music, etc... You really need a CD32x or SX-1 to do anything useful with this.
CD Gold - One off. A CD-ROM based magazine for CD32, CDTV, A570, and any CD
Amiga. There was only one issue published, the pilot issue.
CD32 Gamer - Monthly. There are two versions - the normal one and one which costs
5UKP more and has a full game attached to the front of the mag.

Q: Are there any other magazines for the CD32?

A: Amiga Pro/32 is now Amiga Pro. No more CD32 specific section. Most other Amiga mags have a
small 1 or 2 page CD32 specific section each month. (Anyone have any web-based Online/E-Mags going
on for CD32? Please let me know. -Ed.)

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INTERNET

Q: What Usenet newsgroups are dedicated to CD32 discussion?

A: Two...

comp.sys.amiga.cd32

Using the CD32 as a slave drive.
Add-ons for the CD32 (eg. FMV addition).
Technical talk about the CD32.
Serious issues for the CD32.

rec.games.video.cd32

People's opinions about games.
Hints and tips for games.
Rumours and lists of new/future games.

If your site doesn't carry the groups, ask your system admin. You can also try DejaNews on the web.

Q: What on-line mags are available?

A: Three...

Amiga Report   aminet:/docs/mags/ar*.lha

CD32 Bits   aminet:/docs/mags/cd32bits*.lha

CD32 View   aminet:/docs/mags/cdvw*.lha

Q: Are there any CD32 pages on WWW?

A: Yep.

The CD32 Zone maintains an active list of useful CD32 websites. Please check there for a current list.

Check out the Amiga CD32 Source.

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JARGON

AGA

Advanced Graphics Architecture. The name given to the latest custom chipset for Amigas, which allows 8 bit (256) and HAM8 (262144) colour graphics from a palette of 16.7 million. The CD32 uses AGA chipset as do the Amiga 1200 and 4000 computers.

Akiko

This chip handles the data coming from the CD drive and includes the functions of the CIA chips in other Amigas. It's also more famous for chunky to planar conversion. Chunky and planar are two different methods of storing the screen in memory. Chunky is often used for 3D games. Planar is useful for scrolling games, and it's the method used by the CD32. This chip quickly converts from one to the other, helping developers to port code across from other platforms that use chunky. (To date, no game has made use of it that I know of it really other than Wing Commander. -Ed.)

Alice

The replacement for Agnus in older Amigas. Contains the Blitter and Copper, amongst other things.

AmigaDOS

The part of the CD32's operating system that's on CD-ROM (or floppy or hard drive). Developers must obtain a license to distribute even a small part of AmigaDOS on their CD-ROMs - it's copyrighted.

Audio CD

Your normal CD that holds music. Given a different name for computers because there's so many different types of CD about. The CD32 can play these. You may also hear this referred to as "Red Book" format or "CDDA" (Compact Disc Digital Audio).

Blitter

BLock Image TransfER. Special part of the graphics chip hardware which speeds up many

operations, by moving blocks of Chip RAM around with DMA, while performing logical operations on them. Lines and area fills are among the most popular uses for the Blitter.

Boot

Putting the CD-ROM in the drive and automatically launching a program without having to go through the operating system (eg. Workbench, MS-DOS, Finder, etc...) and all the messing around with keyboards and mice that it entails. CDs will only boot for the computer that they were written for, even though the files on the CD are readable on all CD-ROM machines (ISO-9660). If you intend to use the CD32 as a CD-ROM for other computers and you don't have other storage devices (such as floppy or hard drives) available, you must find CD-ROMs that boot up and load communications software (such as Parnet, Sernet, or Twin Express).

Bootblock

A small piece of copyrighted code that must be on a CD-ROM in order for it to boot. Developers must have a licence to use the bootblock.

C-Cube

This is supplied in the FMV cartridge. It decompresses the MPEG-1 picture from the Video CD and puts it on the screen. It's also found in the CD-i's FMV cartridge.

CD+G

Compact Disc + Graphics. A standard music CD with the addition of graphic pictures that can be viewed with an appropriate player. CDTV and CD32 both play CD+G discs. CD+G discs were never plentiful, and may not even be produced any more. Learn more about CD+Gs at [The CD32 Zone](#).

CD-i

Compact Disc - interactive. System for multimedia developed by Philips; made available to the public shortly after CDTV was. Not expandable to a popular computer platform such as CD32 is expandable to an Amiga. CD-i software titles cannot be played on a CD32 and vice-versa. There is a new cut-down version of the CD-i (smaller box, less connectors) that looks remarkably similar to the CD32...

CD-i Digital Video CD

A Video CD for the CD-i. The difference is that the they also have bookmarks of interesting parts of the film on them. These can also be played on the CD32 with FMV cartridge, but the bookmarks are missing.

CISC

Complex Instruction Set Chip. Contains lots of nice instructions, but it ain't so good in the speed department.

CD+MIDI

Similar to a standard music CD, but it also holds information for driving MIDI instruments.

CD-ROM

Compact Disc - Read Only Memory. A 5 inch polycarbonate disk with aluminium coating, laser etched with holes for storing computer data. ISO-9660 CD-ROMs can also hold music tracks that can be played with a normal music CD player as well (or both - often called 'mixed mode' or 'hybrid' discs - many CD32 discs are hybrids).

CDTV

Commodore Dynamic Total Vision. The previous CD based machine by C=. It wasn't exactly a storming success, mainly due to poor marketing (and the price). Many CDTV discs will work on the CD32, but some need a mouse and others need a keyboard. Microcosm was originally a CDTV project. C= gave Psygnosis some financial backing to develop it, but the CDTV version never saw the light of day, except for some promotional demos.

CDXL

C='s attempt at getting motion video on the CDTV before low cost MPEG decoder chips became available. The CD32's version of CDXL can cope with more colours and cover more of the screen. CDXLs can be about two-thirds of the size of the screen (although they can be scaled up slightly to fill more, but the side effect is that they look blocky) and they can also hold mono or stereo sound. (Anyone know of a playback method on the PC? Or an XL->MPG converter? I am still a licensed developer, but no longer have my developer floppy discs. Anyone out there help out? - Ed.) A list of games that have these animations are available at The CD32 Zone.

Chip RAM

Random Access Memory available to both the CPU and Amiga custom chipset inside the CD32 (and all previous Amigas). The CD32 ships with the maximum amount of chip RAM that the AGA chipset can handle - 2M.

Copper

CO-ProcEssoR. All Amigas feature a special co-processor as part of their custom chipset, which allows some graphic chip functions such as colour palette manipulation to happen asynchronously to other tasks, freeing the CPU for other work.

CPU

Central Processor Unit. The brains for managing data and its manipulation inside a computer. Amigas, CDTV, and CD32 have all used the Motorola 68000 series of CPUs.

Datatype

Allows the OS to support any graphic, sound, text, or animation format, once the datatype information is copied to the proper folder on the Workbench disk or hard drive. Programs

can ask the OS to load the file for them without knowing anything about the file format themselves. This can come in very useful if you want to read ISO-9660 CDs generated on other computers (once you've upgraded your CD32 to a computer, of course).

DMA

Direct Memory Access. Allows other chips apart from the CPU to access the RAM, at the same time as the CPU. This frees up the CPU for doing other work, whilst the Blitter is copying memory for example.

Fast RAM

Random Access Memory available to the Amiga's CPU, but not the custom chipset, thus faster for compute intensive tasks as no time sharing between the custom chipset and CPU is involved. Adding fast RAM should almost double the speed of the CD32 for non-graphics intensive work. The CD32 ships with no fast RAM, but third party expansion boxes may allow for up to 8M of fast RAM expansion if you do not have the FMV cartridge, or 4M if used with the FMV cartridge.

Flash RAM

RAM which can have data stored such that it survives being powered down. CD32 uses flash RAM to allow saving high-scores or game position information for the next time you play. Also known as NVRAM (Non Volatile).

FMV

Full Motion Video - just what it says. Full screen moving pictures. Often mis-used by journalists to mean any picture, including those that have 10 colours and are around the size of a postage-stamp, that's spooled from the CD-ROM.

FMV Upgrade

A plug in cartridge that gives the CD32 capability to play MPEG-1 encoded CDs such as CD-i Digital Video (Star Trek VI, Top Gun) or Video CDs. Note: Only about 13,000 of these cartridges where made (which means if you don't have one, you probably aren't going to get one). If you find one for sale, expect to pay big bucks for it.

GIF

Graphic Interchange Format. GIF compression is a standard for storing still pictures with 8 bit colour (256 colours on screen at once) and no loss in picture quality. One of the few formats that allow for 'transparency' colors as well.

HAM6 or HAM

An earlier version of HAM8, found on A500s, A2000s, and A3000s, that remains for compatibility. This allows up to 4096 colours on screen at once.

HAM8

Hold And Modify - 8 bit. An Amiga screen mode which can have up to 262144 colours on

screen at once by changing some colour registers on each succeeding pixel on a given scanline. This is most useful for static pictures or predefined animation sequences, as it is difficult to constantly compute the best pixel colours in constantly changing action games. HAM8 is often used to display JPEG format pictures or predefined animations (CDXLs) with better than 8 bit colour (256 colours), often up to near 18 bit (262144 colours) quality.

IFF

Interchangable File Format. Developed by Electronic Arts and put into the public domain. Any IFF file can be read in by any program that understands the IFF format (if it's suitable - there's no point in a graphics package loading in an IFF sound file, for example). Took off on the Amiga in a big way, so much so that any program that doesn't understand IFF is guaranteed not to sell. Didn't do so well on the PC for some reason (perhaps it was too good an idea...). Note: The PC programs ACDSee and Paint Shop Pro will both support this filetype.

ISO-9660

The different computer manufacturers got their act together and agreed on a standard format for CD-ROMs, unlike the mess that we're still left with today for floppy disks. You can read any CD32, CDTV, Mac, or PC CD-ROM in any of the others. Although the files are readable, the file formats are still different for each computer (unless it's the CD32/CDTV), but if you have some conversion programs or datatypes you can display the graphics, play the sounds, or show the text from the CD-ROM. ISO-9660 CDs are also cunningly compatible with Audio CDs, so you can play tracks 2 onwards (track 1 is computer data) in a hi-fi, and computers can mix the music from the Audio CDs with the sound output. (These are also know as 'mixed mode' or 'hybid' discs. MANY CD32 discs are hybrids.)

JPEG

Joint Photographic Expert Group - JPEG compression is a standard for storing still pictures with 24 bit colour (16.7 million colours on-screen at once).

Kickstart

The part of the CD32's operating system that's in ROM. It contains all the code needed to access the CD-ROM and multitask, as well as other things that will never see the light of day unless you add a keyboard and some kind of storage (floppy or hard drive).

Lisa

Handles the screen display. There's a palette of 16.7 million colours - each colour made of one of 256 shades of red, green, and blue. From that any power of 2, up to 256, or 4096 (HAM6), or 262144 (HAM8) colours can be displayed. The resolution can be most combinations of 320, 640, or 1024 across and 256, 512, or 1024 down (although there are other modes available).

MPEG

Motion Picture Expert Group - they've decided the format of MPEG-1 and MPEG-2

compression. MPEG-1 is the accepted standard for video compression on CDs... It uses a variety of techniques to achieve staggering compression ratios while still maintaining good picture quality. Other parts of the MPEG standard include synchronized digital audio to make the format useful for movies on CD-ROM. MPEG-2 isn't used on CDs but it looks even better. (Note: MPEG-2 is the format used on modern day movie DVDs which CANNOT be played by the CD32, even with the FMV card.)

NTSC

The television standard used in America. NTSC screens cannot be as deep PAL screens. This can lead to problems when some software written in PAL countries is run on a CD32 using a NTSC screen. The software may use the bottom section of the screen that NTSC owners cannot see. This is entirely the fault of software companies, there are enough ROM routines in the CD32 to tell the program what TV standard it is running under and the program should make allowances.

PAL

The television standard used in most of Europe and Australia.

Parnet/Sernet

Freely distributable networking solutions for Amigas. Uses the parallel ports (Parnet) or serial ports (Sernet) to allow one to mount drives on multiple machines. In this way the CD32 can access the keyboard and hard drives of another Amiga, and the Amiga can access the CD32's CD drive. CDTV was often used as an external CD drive for Amiga computers via Parnet. A version of Parnet is now available for PC computers, allowing you to link from CD32 to PC.

ParNFS

An Amiga only update to Parnet. This new version is faster and has some bug fixes.

Paula

Gives you four channel stereo sound. Each channel can have 64 volume levels and can play either waveforms or sound samples at almost any pitch or octave from RAM. This chip is used to create sound effects, or play music from memory often when the CD-ROM is tied up for some reason (a CD-ROM cannot be used to load game code AND play CD music at the same time).

Photo CD

Transfering pictures taken from a camera onto CD. These can be read by the CD32 if you can find a CD-ROM with a photo CD reader on it, use it as a slave drive, or expand it to a computer and download the proper (freely distributable) software. The Communicator is bundled with a Photo CD reader called Photolite - this is available seperately too. Also Weird Science's Network CD has a Photo CD reader on it.

RAD

RecoverAble RAM Drive. An area of RAM that doesn't lose its data when reset. Any area of RAM can be used as RAD. Games can use it to save data in, so it's possible to play a game of Liberation, save your place in RAD, reset, play another game, then return to Liberation later. Some games don't like RAD being there though.

RAM

Random Access Memory. Specialized computer chips that can store information for as long as they powered on or the CD32 isn't reset. RAM chips and be read and written to by the CPU or the AGA chipset.

RISC

Reduced Instruction Set Chip. A CPU that contains only a limited set of instructions. The idea is that each instruction is so simple that it doesn't take long to execute and any of the more complicated ones that are missing can be built up out of the simple ones.

ROM

Read Only Memory. Specialized computer chips that store data and instructions for computer operation and cannot be erased or written over.

Shovelware

Taking an Amiga game, putting it on CD-ROM with no improvements whatsoever (i.e. video clips, CD audio, etc.), and usually charging more than the original disk version.

Slave drive

Connecting the CD32 via serial or parallel link to another computer and using networking software such as Parnet, Sernet, or Twin Express so that the other computer can read the CD-ROM in the CD32.

Spool

Quickly taking data from the CD-ROM and shoving it on the screen or sending it to the audio output, or both. Eg. CDXLs or the Microcosm tunnels.

3DO

Three Dimensional Objects (I think). Another CD-ROM based multimedia/games system developed by Electronic Arts and former Amiga people. This also is not expandable to a regular computer system. Slightly more expensive for the both hardware and software than the CD32. It has more limited screen resolutions. (It is even more orphaned than the CD32. -Ed.)

Twin Express

A program to transfer files from one computer to another through a serial link. The front end works similar to FTP. There are versions of Twin Express for the PC and Amiga.

Video CD

If you have a FMV cartridge you can play these. There were 100 films available in August '94, and in the THOUSANDS in March 2000 - and they are still making new ones. At the time of writing, Disney's TARZAN was available!

EXPANSION

Q: Is it possible to use the Aminet, Fred Fish, etc... CDs without an expanded CD32?

A: Yes...

Maarten Ter Mors has written a step by step guide of how to do this. It's available from aminet:/docs/misc/Aminet4_CD32.txt. There can be problems booting from some CDs if you use an unexpanded CD32 though. Maarten wrote:

There was a little something I missed in the CD32 FAQ. Because of (yet another) strange oddity in the Commodore 3.1 CDFileSystem, you can only use CD-ROMs with a *lower* or equal ISO revision than the disc you booted from (this is irrelevant to SX-1 users, for they are likely to boot from harddrive or floppy).

The Aminet 4 CD and the GoldFish CD-ROM set by Fred Fish are two examples of discs that use a higher revision than, say, the Weird Science Network CD. This means that you can't access the discs properly or at all. The solution is booting from a RAD: recoverable RAM disk. I was asked by Urban Mueller (who does a lot of the good work on the Aminet CDs) to write a step-by-step guide to set one up.

Joop van de Wege has another answer (Aminet 5 & Communicator)...

I haven't read the notice yet but I found out for myself how to do it and its not a hassle. I'm just too lazy to write a small script file to copy the 2 files and execute the mount command.

Step 1: copy your mountlist entry CR0: to snet:ram
Step 2: copy L:amicdromfilesystem to snet:ram
Step 3: mount cr0: on the cd32 side
Step 4 and last one: start copying files from cr0: to whereever you want them, run programs, read guide files, search for ......

And another from David Law of Weird Science (Aminet & Network CD)...

We have found that CBM's filesystem in general does not cope too well with the Aminet CDs. This may be due as you say to ISO revision numbers. The easiest fix is to remount the CD drive as CD1: with AmiCDRom filesystem and access the Aminet CD's as `CD1:` or `Network:CD1/` with Sernet. When trying this be sure to set the 'T' flag in the line 'Startup' of the mountlist. This will ensure that the trackdisk device is used to access the CD drive. AmiCDRom filesystem for some reason thinks that the CD drive is a SCSI device otherwise and will probably crash the machine.

The best way to do this is setup a drawer on your amiga with the following files in. [Call it RAM:CD1 for the mount list below - Dan.]

```
CD1             AmiCDRom Mountlist file.
CD1.info        An icon for the above.
cdrom-handler   The filesystem handler.
Mount           WB3.1 Mount command.
```

Just ensure that the mountlist points to 'Ram:cdrom-handler' and not 'L:cdrom.handler' and that the icon points to 'Ram:Mount' as the mount command on the NetworkCD is WB1.3 and is not suitable.

The Mountlist file is...

```
/* AmiCDROM filesystem */

Handler = Ram:CD1/cdrom-handler
Stacksize = 10000
Priority = 10
GlobVec  = -1
Mount = 1
Startup = "DEVICE=cd.device UNIT=0 ML T R"
```

The version of Mount should be 38 or above (use 'Version Mount' to check).

Q: How do I stop my CD32 resetting when I take the CD-ROM out?

A: If you boot from CD-ROM, the CD32 resets when the lid is opened. You can either run a program such as NoReset that disables this or boot from another device, such as RAD, floppy, or hard drive.

Q: How do I use my CD32 as a CD drive or slave drive for another computer?

A: Connect a serial link (buy a ready-made link or make your own - see the diagram for the Aux port) between the CD32's Aux port and the other computer. Then run either Sernet or Twin Express on the other computer and the CD32. You'll have to find a bootable CD-ROM with one of these programs on it and you may need to run NoReset unless Sernet and Twin Express are on the same CD as the files you want to transfer.

If you have an interface attached that gives you a parallel port, you can connect a parallel link between the CD32 and the other computer, remembering to use a special Parnet cable and not a normal parallel cable (otherwise you could easily fry everything). Run Parnet on the other computer and the CD32. You'll have to find a bootable CD-ROM with Parnet on it and you may need to run NoReset unless Parnet is on the same CD as the files you want to transfer.

ParNFS is a replacement for Parnet, with bug fixes for Workbench 2 or above machines (that includes the CD32). It fixes the Dir, List, and Directory Opus bugs.

You can use The Communicator. This is a link from the CD32's Aux port to the Amiga and a CD-ROM with a series of utilities on it...

Communicator

Display text and graphics on the CD32.
Play Audio and Video CDs.
Transfer files to and from the CD32.

Twin Express

Serial file transfer program, Amiga and PC versions.

Workbench

Modified to allow the joypad to be used as a mouse.

Photolite

Display Kodak Photo CDs.

Scala driver

Allows Scala, running on another Amiga, to control the CD32.

There are two versions available. The Communicator Lite doesn't have a keyboard through port or MIDI in/out/thru.

There is a new version of The Communicator, with the original title of The Communicator 2. Improvements to the previous version are...

Virtual CD

Appears to make more than one CD-ROM accessable to the host Amiga, also stops resetting.

File Transfers

More reliable - Zmodem.
Faster - apparently it can reach up to 210000 baud.
More compatible - works better with ISO-9660 CDs.

AGA Viewer

View pictures and anims in any mode, including AGA.
Will also work for non-AGA machines.
Supports datatypes.

Workbench

A newer version (doesn't say which).

Mediapoint Driver

Allows Mediapoint, running on another Amiga, to control the CD32, including Audio and Video CDs.

Hardware

Added A2000/A3000 keyboard port.
Serial lead is DB25 to RJ10 (telephone) and is easier to remove.

The Communicator Lite 2 doesn't have a keyboard through port, MIDI in/out/thru, or status LEDs.

Q: How do I attach a keyboard to my CD32?

A: IBM keyboards won't function without a custom add-on to translate IBM keycodes to Amiga keycodes (the SX-1 has this).

Plug in an Amiga keyboard into the CD32's Aux port. Amiga keyboards are all exactly the same inside but just have a different case or plug on the end of the lead, so you'll probably need an adaptor...

A500/+ Open up the case and build your own lead from the keyboard ribbon to the CD32. The pinouts are at the end of the FAQ.

A600   Not possible.

A1000   Build your own adaptor from RJ-11 to mini-din. The pinouts are at the end of the FAQ.

A1200   Not possible.

A2000   Buy an AT to PS/2 keyboard adaptor from any PC clone shop and plug that inbetween.

A3000   Buy an AT to PS/2 keyboard adaptor from any PC clone shop and plug that inbetween.

A4000   No adaptor - just plug it in.

CDTV   Buy an adaptor - eg. from Almathera or MultiMedia Machine. Or modify the CDTV keyboard yourself. The pinouts are at the end of the FAQ.

SX-1 Users: Plug in an IBM keyboard into the SX-1's keyboard port. F11 and F12 are used instead of the Left-Amiga and Right-Amiga keys. Print Screen is used instead of the Help key. If the keyboard seems to not work, see if there is a switch on the bottom of the keyboard. Try the other position. You may also experience some sort of 'buffering' problem the first time you press a key after you boot up a CD32/SX1. My solution was just to press F11 or F12 after the first boot up and that 'clears' that buffering problem so it doesn't adversely effect the first thing you type.

Other Amiga Users: Create a Parnet or Sernet link (see above) and run PNetKeys. This re-directs all keyboard and mouse input from an Amiga window down the link to the CD32. You'll have to run a

version that does a 'Mount MOUSE:' on the CD32 - no problem if you can create your own boot disk but it could be if you're using a version from a CD-ROM.

Misc: Use Patrick Van Beem's CD32 Keyboard program. It's similar to PNetKeys but it's smaller, faster, works over Twin Express or even by itself, and converts controller input to mouse input. The program is shareware - if you find it useful you should pay $5 or fl7.50. Patrick's Email address is patrick@aobh.xs4all.nl.

Q: How do I use my CD32 as a computer?

A: Use a SX-1. This has...

> IBM-PC AT keyboard port.
> 9-pin serial port.
> Amiga standard parallel port.
> Amiga standard RGB port.
> Amiga standard floppy drive (use an external drive as DF0:. For more drives, daisy chain them from the first one).
> 2.5" internal IDE connector (drive fits inside the SX-1).
> 3.5" external IDE connector.
> SIMM socket for up to 8 meg additional RAM (restricted to 4 meg if you intend to use the FMV cartridge too).
> Audio input (karaoke).
> Internal battery backed clock.
> Pass through connector (for other devices, eg. FMV cartridge).

- If you add the SX-1, the Aux port will not work as a serial connection any more, but you can still attach Amiga keyboards to it, even if you have a PC keyboard plugged into the SX-1.
- Some external drives do not like the SX-1. Roctec and M3-A-1 drives are a problem.
  If you use a file recovery program on the SX-1 disk, you'll get more utilities.
- If you intend to have more than two devices attached to the SX-1, you should think about getting a better power supply. These can be bought separately, or you can modify another Amiga one (eg. A500) by replacing the connector at the end of the lead.
- If you add extra memory to it, it should be at least 80ms fast.
- The connector is flakey at best. If things seem wrong after plugging it in, try unplugging and re-plugging it in. Don't move the unit while powered up.
-

Or use a SX32. It's small so it fits *in* the CD32 like the MPEG module. You have a parrallel, serial, floppy, RGB and VGA-Port. You can put a 2.5" HD on it and a 2-8 MB PS/2 Simm module. Unfortunatly FMV cannot be used with it. It is also rumoured to come with an A1200 manual. Apart from that it fixes the voltage problems it is more or less like the SX-1.

Alan Redhouse wrote:
- Standard Amiga serial, parallel, FDD, RGB ports and a 15 pin VGA port.
- Uses standard Amiga K/b

- Has standard Simm socket for up to 8MB
- Has 2.5" HDD interface and mountings for an internal unit
- Everything (inc HDD) fits inside the CD32 (sockets protrude about 10mm)
- Supplied with WB3.0 on CDROM (obviously has K/s 3.1 already)
- VERY reliable - it must be the only Amiga accessory that we've picked up & plugged in and its worked perfectly first time and ever since.
- It really does become a portable Amiga.

Or use a CD32x. This is a 19" rack mounted system for CD32s used in professional applications. It includes remote monitoring of CD32x units, fault detection, and options for genlocking and MPEG. There are connectors available for...

- Networking
- RGB port
- Scart port
- Floppy port
- IDE connector
- Volume control
- Stereo input and output
- Internal battery backed clock.

Mick Tinker of Index said that they're working on a home version of the CD32x. Anyone have an update on this product? Let me know.

Q: What are the SX-1 jumper descriptions?

A: Jumper number...

1	OFF = If you have 1 or 4 megs. ON = If you have 2 or 8 megs.
2	OFF = If you have 1 or 2 megs. ON = If you have 4 or 8 megs.
3	OFF = If you have memory. ON = If you have no memory (or defeat autoconfig).
4	OFF = Normal boot time. ON = Add 10 seconds to boot time (for slow HDs).
5	OFF = If keyboard has two Alt keys. ON = If keyboard has no Right-Alt (Right-CTRL used instead).

Q: How do I connect up an external 3.5" IDE drive to the SX-1?

A: Make your own connector using the pinouts given in the manual. There's no +12V supply on the 37 pin IDE plug, but you can wire in your own power supply or take the +12V supply from the floppy port instead. Always try Redmond Cable for your odd cable needs.

Or make a 2.5" to 3.5" conversion cable, and wire in your own power supply. Conversion cables can be

bought as part of A1200 3.5" kits.

Or you can buy a box (don't know the name) from Hi-Q that sits in place of the SX-1's lid. It lets you plug in 3.5" IDE drives and it has a better power supply.

Q: Sometimes I have problems with my SX-1 and CD32 setup, causing freezing, and HD lock ups. They seems to be power related, how do I solve these?

A: They are indeed power related, but it's voltage, not wattage.

Garry Cardinal wrote:

"My SX-1 enhanced CD-32 began hanging when I added an IDE drive to it. When using the hd the system would suddenly freeze. I had a 2Mb
SIMM installed, going to another SIMM or hard disk did not correct the problem. This was all independent of FMV card presence.

My SX-1's strange behaviour persisted until I bypassed the connections between the CD-32 power switch and the SX-1.

I soldered a standard PC power supply female molex connector to the power switch on the CD-32 (switched side) and soldered a standard male molex
connector to the SX-1 +12 and +5 power supply distribution system as close as possible to the 2.5" hard disk connector and ram socket.

(Of course, observe antistatic precautions. Those faint of heart, take this text to a qualified service provider for the appropriate action.)

When I was done, my problems disappeared. My configuration: CD32, SX-1 (with extra switch for memory test jumper plugging DB25 hole), 20Mb Connor 2.5, 4Mb 32 bit simm, FMV card, A500 Power Supply"

You can also try a CD32 'Big Foot' Power Supply.

Q: How do I read Mac CD-ROMs?

A: Get aminet:/disk/cdrom/AmiCDROM-1.15.lha, unarchive it, use the following options in the installer...

Device	cd.device
Unit	0
Memory options	Use any memory available
Other options	Use Rock Ridge names, if possible.
	Use trackdisk.device instead of SCSI-direct.
Map filenames	Don't map filenames
General buffers	5
Read() buffers	5
Diskchange time	3

CD-DA icon command	None
CD-DA icon position	Workbench chooses
Configure Mac options	Yes
Mac options	Convert Mac characters to Amiga characters.
	Examine CD first for a HFS partition.
Data fork extension	Leave empty
Rsrc fork extension	Leave empty
AmigaDOS device name	CD1:, MAC0:, whatever you like.
Automount	Yes: Mac CDs are recongnised all the time.
	No: You must click on the Storage/DOSDrivers/CD1 (or whatever) icon before using Mac CDs.

Two icons will appear for each CD you insert - one is the CD32/CDTV/PC partition and the other is the Mac partition. If there is no Mac partition then both icons will be the same CD32/CDTV/PC partition.

Q: Is there an RGB output on the CD32 to connect my multisync monitor?

A: There are easily accessable RGB signal test points on the CD32's circuit board. The diagram is at the end of the FAQ. The SX-1 and CD32x both have RGB connectors on them.

Peter Kittel wrote:
"If you have the French version of the CD32, you have RGB at the S-Video jack. In this case, this jack is no more of standard "Hosiden" type, but is a Mini-DIN with 8 pins. The four extra pins carry R,G,B, and CSync."

an159209@anon.penet.fi wrote:
"Cables (maybe with extra logic) are being sold in France, which allow you to connect your CD32 to a 1084, presumably using that SCART-RGB output."

Q: Can Amiga 1200 trapdoor or PCMCIA expansions be used with CD32?

A: No. The CD32 does not have the same expansion connectors as the A1200.

Q: Where can I find the programs mentioned above?

A:

CD32 Keyboard		Patrick Van Beem
NoReset	Communicator (CDReboot OFF)	Eureka
	Network CD	Weird Science
	Video Creator *	Almathera
Parnet	Amiga CD! 3	AUI
	Network CD	Weird Science
Photo CD reader	FolioworX Player	Olaf Barthel
	Network CD	Weird Science
	Photo CD Manager	Asimware
	Photolite	Eureka
Sernet	Network CD	Weird Science
Twin Express	Amiga CD! 3	AUI
	Network CD	Weird Science
Workbench 3.?	CDPD 3	Almathera

	Demo 2	Almathera
Workbench 3.0	CDPD 4	Almathera
	Lock 'n' Load	North West PD
Workbench 3.1	Demo Disc V2 *	Commodore
	Legendry Design demo CD	Creative Computers

For CDs marked with a *, you'll need to connect an Amiga mouse into controller port 2, hold down both mouse buttons, and press the reset button. You will be given a boot menu where you should boot with no Startup-Sequence. Then use the keyboard to run the program wanted.

If you want to run Workbench, you've already got Kickstart 3.1, so you just need to get hold of the Workbench software. All of the versions will work, but the later the version the better.

The C= Demo Disc V2 is available from Claude Mueller - Email him for prices. Claude's Email address is claude.mueller@hdclick.link-ch1.ch. (Anyone know if this guy is still around? Let me know. -Ed.)

EMULATING A CD32

Q: Which machines stand a chance of running CD32 games?

A: You may get away with running shovelware stuff if you have an OCS or ECS Amiga, but many CD32 games expect at least an '020, 2 meg of chip RAM, and an AGA chipset - an A1200 or A4000.

The A1200 might be more compatible than the A4000 - some programs may fall over because of the differences in memory and CPUs.

A good fast PC with a fat DirectX compliant video card along with WinUAE (Amiga emulator) can play a good number of CD32 games with a lot of configuration changes.

Q: What are the differences between the Archos, CD1200, CD4000, and Squirrel CD drives?

A: The Archos drive uses the PCMCIA slot, emulates Akiko through software (but as far as I know only Wing Commander uses it and that crashes, hmm...), needs you to install the CD-ROM file system to your Workbench before you can use the drive, needs a utility (supplied) to boot CD32 CDs, and doesn't have FMV capability.

The CD1200 isn't available yet. It uses the A1200's trapdoor slot, has Akiko, has Kickstart 3.1, boots straight from CD-ROM, and doesn't have FMV capability. (This drive was officially canned. I haven't heard anything otherwise. -Ed.)

Peter Kittel wrote:
"The CD1200 is a prototype CD-ROM drive for the A1200, which makes the A1200 CD32-compatible. This is still in prototype, was shown on a few fairs, and as of now it's uncertain whether it ever will get produced. With it you get CD32 software compatibility, but no hardware compatibility. Especially there is no chance to add the FMV cartridge to it." (It never made it past prototype. Escom didn't think it was worthy enough to continue, but instead a $2700 A4000T was. -Ed.)

The CD4000 isn't available yet. It's a card that fits into one of the A4000's Zorro 3 slots and a CD drive that slides into a drive bay, has Akiko, has Kickstart 3.1, boots straight from CD-ROM, and has FMV capability. (Anyone have any dirt on this drive? Bet it never shipped. -Ed.)

The Squirrel uses the PCMICA slot, doesn't appear to emulate Akiko, needs you to install the CD-ROM file system to your Workbench before you can use the drive, needs a utility (supplied) to boot CD32 CDs, and doesn't have FMV capability. It's also a full SCSI interface. If you'd like to add other SCSI devices (such as tape storage, scanners, etc...) then it could be a better choice than the Archos. Also software updates are regularly uploaded to Aminet (unlike Archos' where you have to try to convince your dealer to give you a free copy).

Q: What's good/bad about a CD drive using the PCMICA or trapdoor slots?

A: If your CD drive uses the PCMICA slot, you've got a RAM board in the trapdoor slot, it's got more than 4 meg of fast RAM, and it doesn't Autoconfig properly, then the drive may refuse to work or you could lose all memory above the 4 meg barrier because the PCMCIA slot and the memory both try to use the same address space. You could only use 4 meg or you could ask your dealer for an upgrade.

Some trapdoor accelerators don't Autoconfig properly either. Notably Amitek, Blizzard, and GVP ones. Amitek offer a free upgrade to fix this problem. The Blizzard 1230III and the GVP 1230 '030 boards work fine, don't know about other Blizzard and GVP boards. All of the Microbotics boards work.

If your CD drive uses the trapdoor slot then you can kiss goodbye to RAM expansions and accelerators.

Q: What do I need to do to run a CD32 game if I don't have the Archos, CD1200, CD4000, or the Squirrel CD drive?

A: If you have a SCSI CD drive then you can assign CD0: to the CD drive (if it isn't already), assign the standard directories (C:, DEVS:, ENVARC:, FONTS:, L:, LIBS:, S:, SYS:) across to the CD-ROM and execute S:Startup-Sequence.

Or if you have a Parnet or Sernet link to a CD32 or CDTV, you can assign CD0: to NET:CD0, assign the CD-ROM's name to NET:, assign the standard directories, then execute S:Startup-Sequence. It's slow, though, so if you have a big hard drive, it's probably better to go for the next option...

Or it should be possible to copy all of the CD-ROM to your hard drive by using a Parnet, Sernet, or Twin Express link to a CD32 or CDTV, assign CD0: and the CD-ROM's name to the directory that you copied to, assign the standard directories to the equivalent place on the hard drive, and execute S:Startup-Sequence.

The game may have an icon to double click to run it. In that case you don't need to assign or execute anything.

Alternatively, there's a program called Cache-CDFS that's distributed in Germany. It works on the A1200 or A4000. It sits between the CD32 game and the Amiga's SCSI, IDE, or PCMCIA CD-ROM drive. Most CD32 games should work once it's installed, but there have been some problems reported with

NEC 3x CD drives. It's commercial. Nobody's said how good the emulation is. You can contact the author, Oliver Kastl, by Email. Oliver's Email address is 100447.3361@compuserve.com.

Almathera are selling a bug-fixed and English language version. Video Creator will also work once it's been installed.

Also, there's another available, called CD-Boot. This works on the A1200 or A4000. It sits between the CD32 game and Amiga's SCSI, IDE, or PCMCIA CD-ROM drive. You can create config files for each CD. It's commercial. One person said that the success rate was 2 out of 7 games. You can contact the author, Thomas Kessler, by Email. Thomas' Email address is kessler@fim.uni-erlangen.de.

AsimCDFS: This is a quick description made after reading Asimware's info sheet (it's probably better to read the full thing for yourself if you're interested before making up your mind):

Asimware's AsimCDFS can emulate CDTVs and CD32s, but the how good it is depends on the individual machine. But it also has a music CD player, music CD support (so the music looks like AIFF, MAUD, and RAW files), and Photo CD support (so the pictures look like normal IFF ILBM files).

Your friend's PC might be able to play them as well - with limited success.

Q: What can go wrong?

A: Make sure the game can access lowlevel.library in LIBS:. If not, the game can't use the CD32 joypad, or may not even work. If it can, you can plug the CD32 joypad straight into the joystick port.

You may not be able to play the games that use the extra joypad buttons properly if you don't have a joypad to press them with...

The game tries to use nonvolatile.library to save to the CD32's NVRAM. Make sure that this can be accessed in LIBS: and you create a file called "ENVARC:sys/nv_location" - a single line of text that is the directory name of where you would like saved data to be stored.

The game could try to call some 3.1 functions that don't exist in 3.0. Upgrading your Kickstart should fix this problem.

You won't hear any CD music. There's no way around this. Sometimes the game may decide to keel over because it can't play the CD music.

The game tries to use Akiko. If you've upgraded to 3.1 and it still goes wrong then there's no way around this.

If you are using emulation under another OS, be sure you mimic the exact configuration of a CD32 - no FAST RAM, no FPU, etc. These can REALLY make a difference.

Q: Are there any incompatiblities when using an Archos CD drive?

A: Here's a list. If you've got an update, let me know and I'll put the change in here...

Works

Alien Breed Special Ed. (7)	Alien Breed T. Assault (11)
Arcade Pool (11)	ATR (11)
Banshee (7,11)	Brutal Sports Football (7)
Bubba 'n' Stix (7)	Bubble 'n' Squeak (7)
Chaos Engine (7)	D/Generation (7, 11)
Defender of the Crown 2 (7)	Diggers (7)
Emerald Mines (7, 11)	Fields of Glory (11)
Fire and Ice (11)	Flink (11)
Fly Harder (11)	Frontier (7)
Heimdall 2 (7)	Microcosm (7)
Labyrinth of Time (7)	Lemmings (11)
Lost Vikings (11)	Oscar (7,11)
Overkill/Lunar C (11)	Pinball Fantasies (11)
Rise of the Robots (7)	Roadkill (11)
Sabre Team (11)	Sensible Soccer (7)
Super Stardust (11)	Superfrog (7,11)
The Clue (11)	Trolls (11)
UFO (11)	Ultimate Body Blows (11)
Zool 1 (7)	Zool 2 (7)

Works with a bit of messing around

Arabian Nights (11)	Disable fast RAM
Beneath a Steel Sky (11)	Use a Joypad in port 1
Microcosm (11)	Load from Workbench
Jungle Strike (11)	Disable fast RAM
Kid Chaos (11)	Switch music off
Quick Thunder Rabbit (11)	Disable fast RAM
Zool 2 (11)	Switch music off

Sort of works

Guardian (7)	Crashes after one game
Project-X (7)	Crashes after a few levels
Ultimate Body Blows (7)	Crashes after one game

Doesn't work

Alfred Chicken (11)	Battle Chess (7)
Beavers (11)	Cannon Fodder (11)
Chaos Engine (11)	Chuck Rock 1 (11)
Chuck Rock 2 (7)	Defender of the Crown 2 (11)
Diggers (7)	Disposable Hero (11)
Fire Force (11)	Frontier (11)
Global Effect (7)	Guardian (11)
Gunship 2000 (7)	Impossible Mission 2025 (7)
James Pond 3 (7)	Lemmings (7)
Lotus Trilogy (7)	Liberation (11)
Litil Divil (11)	Nick Faldo's Golf (11)
Nigel Mansell (11)	Morph (7)
Out to Lunch (11)	Pinball Illusions (11)
Pirate's Gold (7,11)	Ryder Cup Challenge (7)
Simon The Sorcerer (7,11)	Sabre Team (7)
Soccer Kid (11)	Striker (7,11)
Super Putty (7)	Universe (11)

Video Creator (7)	Wembley International (7,11)
Whale's Voyage (11)	Wing Commander (7,11)

The numbers are for the version of the software. Some work on 7 but not 11, some work on 11 but not 7. There's nothing listed for version 9 at the moment, but if it works on 7 or 11 then it maybe it could work on 9, and if it works on 7 and 11 then it definately should work on 9. There's no version 8 or 10. Anyone confused? Good.

Also check out the Archos Overdrive home pages. Have a look in the Internet section for details.

EMULATING A CD32 WITH UAE

This area is currently under development and will be greatly expanded upon later.

SOFTWARE DEVELOPERS

Q: Are there any licence agreements that have to be made to produce CD32 software?

A: The first real problem is in making a bootable CD32 disc. This requires special software and license/royalty agreements which were available from the C= developer programs.

Developers who obtained these rights before the C= liquidation may be able to master the CD-ROMs with the appropriate boot/system files, for you - as your publisher.

Update: March 2000 - Gateway bought the Amiga, then turned around and sold most of it to a private party. The chances are HIGHLY unlikely another CD32 will ever roll off an assembly line, and while they are currently still making Amiga 4000T somewhere in the world, I wouldn't hold your breath.

Q: How do I master my own CDs?

A: This is a quick description made after reading Asimware's info sheet (it's probably better to read the full thing for yourself if you're interested before making up your mind):

Asimware's Master ISO costs US $550.00/CDN $720.00 and works on an Amiga with Workbench 3, a SCSI controller, 1.3 gig of HD space, 16 meg of RAM, and a CD recorder. It can create ISO 9660 CD-ROMs with 8.3 and long file names from one or more volumes, Music CDs (Red Book) from CDDA, MAUD, or AIFF files, and CDs which are a mixture of the two. It can also make CDTV and CD32 bootable CDs (you need a developer licence though). It supports Yamaha CDR100, Pinnacle RCD-202, Philips CDD-521, and CDD-522 CD recorders.

Q: What are the authoring capabilities available for the CD32?

A: Theoretically, any standard Amiga development tools for AGA machines should be useful for developing applications that run on a CD32. This would include Multimedia tools with freely distributable players, C compilers, assemblers, etc.

Q: What are the popular development tools?

A: Read below.

Popular Multimedia authoring packages for the Amiga

    AmigaVision Professional
    CanDo
    HELM
    Interplay
    SCALA Multimedia
    AMOS Professional (programming)

Popular C compilers

    DICE
    GNU C
    SAS/C

Popular 68K assemblers

    DevPacIII
    Macro68

Popular image manipulation software

    AdPro
    ImageF/X
    ImageMaster

Popular music related software

    AudioMasterIV
    Bars&Pipes Pro
    Deluxe Music 2
    MusicX
    OctaMED professional
    Sonix
    SuperJAM!
    Trackers - too many to mention

Popular 3D modelling software

    Caligari
    Imagine
    LightWave (Video Toaster)
    Real3D

Popular 'video painting' programs

> Brilliance
> Deluxe Paint IV AGA
> DCTV Paint
> EGS Paint
> Opal Paint
> TV Paint
> XI Paint

Contact the software company involved with your favourite authoring software for more information regarding CD32 specific development.
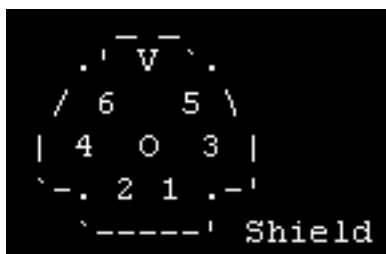
PINOUTS

CD32 Aux port
View straight on. 6 pin mini-din. Female type. Combined kboard/serial.

```
1 I / O  Keyboard data
2     O  Serial transmit
3        Ground
4        +5V DC
5 (I)/ O  Keyboard clock
6 I     Serial receive
```


Written by Klaus Hegemann, posted as part of 'CD32 expansion port info' by Anders Stenkvist in comp.sys.amiga.hardware, forwarded by Michael King.

If you wire up a keyboard and get characters constantly appearing on the screen then you've wired up the keyboard clock and data pins the wrong way around.

There are no RTS/CTS pins for high speed modems.

The serial pins are at 0/5V, if the computer you're connecting it to has a different voltage (eg. the Amiga serial port's pins are at +/-12V) then you need a level converter between the two.

The serial pins may not be properly buffered to use safely with some external devices. You could damage your CD32 if you try to hook them up without an external buffer. A diagram of a buffer is given in the posting mentioned above.

CD32 combined SCART/RGB Port
(only on French CD32s)...

Well, first you must make sure that you really have the 8-pin version of that S-Video connector (mini-DIN), this is only existant on the French version of the CD32. Now if that's ok, then here is the pinout:

1=Red, 2=Blue, 3=Audio (L or R, don't know), 4=Green, 5=Audio (L or R), 6=Luminance, 7=CSync, 8=Chroma

Taken from an Email by Peter Kittel, forwarded by Olivier Cremel.

<div align="center">CDTV Keyboard Connector</div>

1   Ground
2   I / O   Keyboard data
3 (I)/ O   Keyboard clock
4   +5V DC
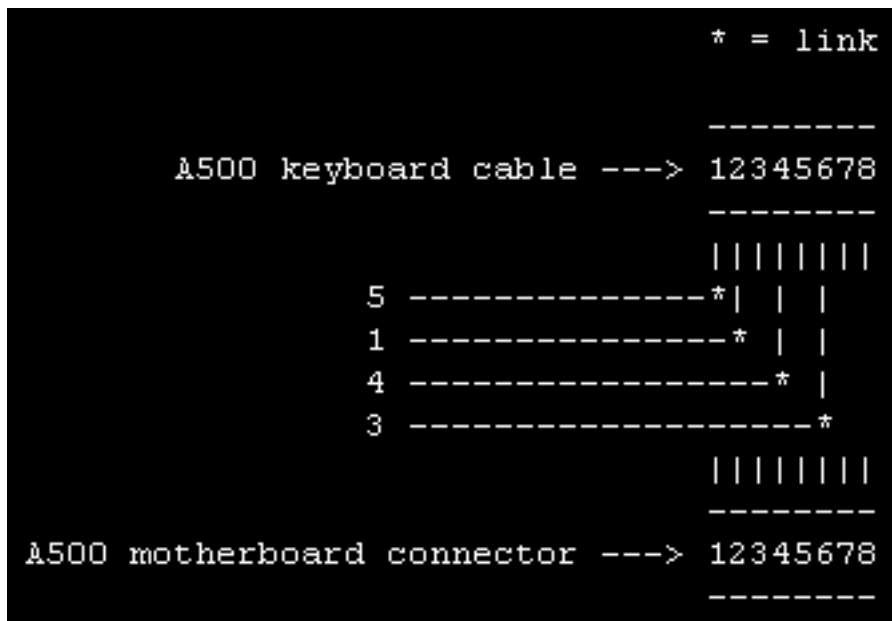5   Unused

<div align="center">To modify the CDTV keyboard to connect to the CD32...</div>

- Cut the plastic pin from the connector.
- Open the case.
- Find the connector where the cable is located.
- Switch leads 1-4 and 2-3.
- Close the case.

Taken from a posting by Paul van der Heu.

<div align="center">... A500 keyboard connector ...</div>

1 black Keyboard clock
2 brown Keyboard data
3 red   Res
4 orange +5V DC
5 yellow Unused
6 green Ground
7 blue   Power LED
8 violet Disk LED

```
                                         * = link


                                        --------
            A500 keyboard cable --->  12345678
                                        --------

                                        ||||||||
           5 --------------*|  |  |
           1 --------------*  |  |
           4 ---------------*  |
           3 -----------------*

                                        ||||||||
                                        --------
    A500 motherboard connector --->  12345678
                                        --------
```

Connect like this...

```
    A500   CD32
    1 -> 5
    2 -> 1
    4 -> 4
    6 -> 3
```

Taken from an Email by Kimmo Veijalainen.

<div align="center">...A1000 keyboard connector</div>

Viewed looking straight on into socket. RJ11 connector. Female.

```
              _ _
            _| | |_
          __|     |__
         |           |
1    +5V DC    |           |
2 (I)/ O  Keyboard clock    |           |
3  I / O  Keyboard data    |           |
4       Ground    |__|_|_|_|__|

              1 2 3 4
```

1   +5V DC
2 (I)/ O Keyboard clock
3 I / O Keyboard data
4   Ground
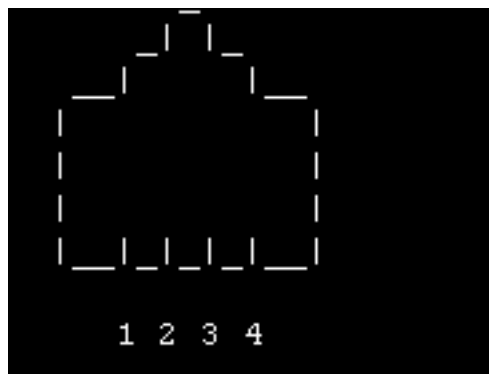
Usual stuff: I'm not responsible for blowing up Ami, etc; use at own risk, etc, etc. Having said this, it did work for me. :) Ref's used: Amiga Hardware Reference Manual (A1000) & the good ol' CD32-FAQ.

Taken from an Email by Chris Naylor.

CD32 power port
View straight on. 4 pin din.

```
         . _ _ .
        .'  V   `.
1 +5V   |1     2|
2 +12V  `.3  4.'
3 Ground   `---'  Shield
4 Unknown
```
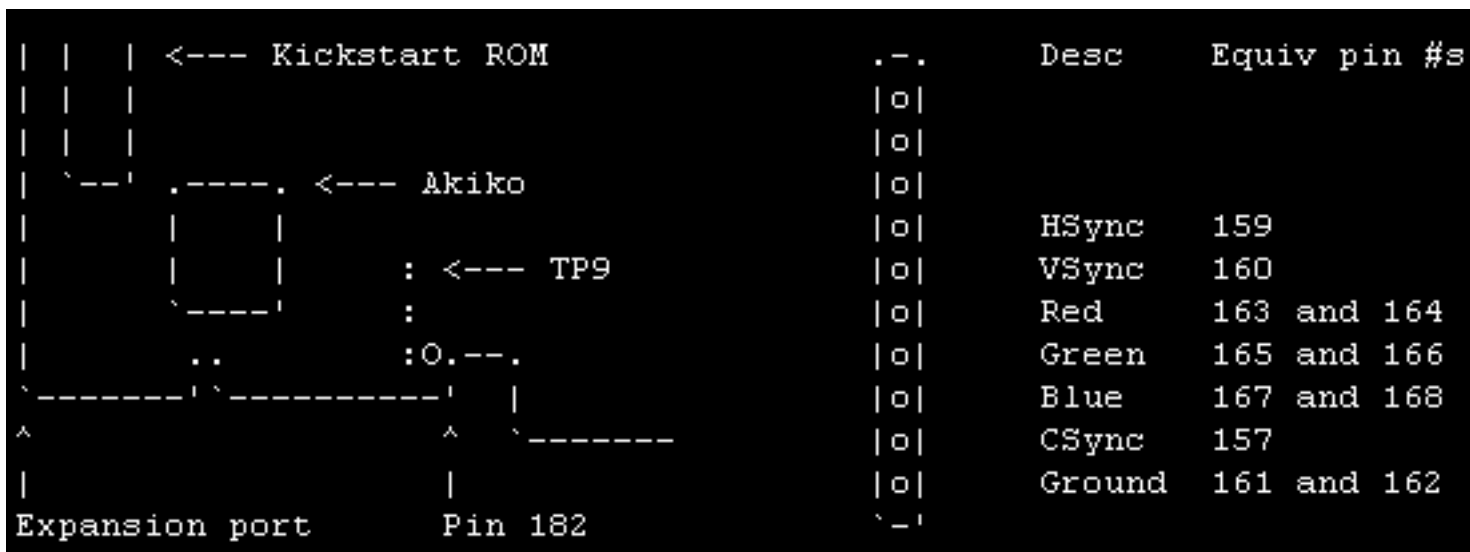
1 +5V
2 +12V
3 Ground
4 Unknown
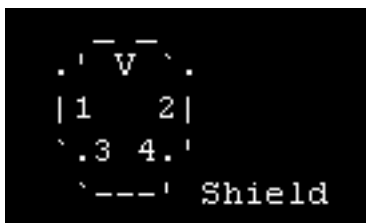
Put a ground jumper from pin 3 to the shield. You can modify another Amiga power supply (eg. A500) for this by replacing the connector at the end of the lead.

Taken from a posting by Michael Litchfield.

CD32 RGB

The RGB signals are available from a test port, TP9...

```
| | |  | <--- Kickstart ROM          .-.    Desc     Equiv pin #s
| | |  |                              |o|
| | |  |                              |o|
|  `--'  .----. <--- Akiko            |o|
|        |    |                       |o|    HSync    159
|        |    |    : <--- TP9         |o|    VSync    160
|        `----'    :                  |o|    Red      163 and 164
|        ..        :O.--.             |o|    Green    165 and 166
`-------' `----------'   |            |o|    Blue     167 and 168
^              ^   `-------           |o|    CSync    157
|              |                      |o|    Ground   161 and 162
Expansion port       Pin 182         `-'
```

The RGB signals come from the D/A conversion unit and lead directly to the expansion port. These signals are, however, not amplified. In addition they are weakened by the S-Video output unit.

As a result I (aim to) insert a 47 Ohm resistor to each colour signal connection. You may also reduce the load by interrupting the signal supply to the S-Video unit. Set pin 174 of the expansion port to GND to achieve that (174 --> u36 (4066) signal switches).

The sync signals connected to the expansion port are unbuffered. As a result you may re-synchronize your Amiga by an external tactsource. You should at least buffer the CSync line; there is no external synchronisation possible on this pin.

Hint: make use of an XOR gate chip. You may negate certain sync line(s) to adapt your Amiga to (old? :-( ) multiscan-monitors (the A4000 monitor adapter box will do the same; without the possibility of selected negation).

Written by Klaus Hegemann, posted as part of 'CD32 expansion port info' by Anders Stenkvist in comp.sys.amiga.hardware, forwarded by Michael King.

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ADDRESSES

For CD32 FAQ 2000 I removed all the old addresses from the FAQ. Most of these people aren't answering the phones anymore, websites are down, email bounces. If you have a vendor still open for CD32 business that hopefully has a valid website and email address, please pass it along. I'll be posting all the known sites that I know of shortly.

Company Name/Link	Description	Location
Centsible Software	Software, Hardware, a little bit of everything!	U.S.

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