

# CDx

**CD-ROM System  
for Amiga® computers**



**Owners Manual**

**xetec**

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits of a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna
- Relocate the computer with respect to the receiver
- Move the computer away from the receiver
- Plug the computer into a different outlet so that computer and receiver are on different branch circuits

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4.

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CDx installation/software manual written by Marty Flickinger

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# **CDx**

**CD-ROM System  
for Amiga<sup>®</sup> computers**

**CDx-650I**

**CDx-650E**

**CDx-650LE**

**CDx-Driveless**

**CDx Disk Set**



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# INTRODUCTION

- *Equipment Required*
- *Intro to the CDx CD-ROM*
- *Inventory*
- *Disc Handling*
- *Disc Loading/Unloading*
- *Cleaning*

Congratulations on purchasing a **CDx** system, the premiere CD-ROM system for Amiga® computers. Here's an overview of its features:

- Extremely high capacity (up to 650 Megabytes per disc)
- Uses rugged, read-only, removable optical discs
- Makes accessing discs as easy as accessing a floppy
- Reads three industry standard CD-ROM formats: HFS, High-Sierra, and ISO 9660 (including IBM® and Macintosh® discs)
- Plays most CDTV® discs using exclusive CDTV emulation software
- Plays conventional audio CD's out separate audio outputs using included *CD Remote* program or other methods
- Supports all SCSI CD-ROM drives (plus audio support on most)
- Can be interfaced using most popular SCSI controllers
- Two free discs included, *Fish & More Volume I* and *Fish & More Volume II*, totalling over 740 Megabytes of programs and data
- Programmer support device allows flexible control of system. "C" and ARexx™ source code and documentation included.

## Equipment Required

You will need the following equipment to add a complete CD-ROM system to your Amiga:

- SCSI CD-ROM drive
- CDx-compatible SCSI controller
- Chassis & power supply (for external models)
- CDx Install Disk
- CD-ROM disc(s)

Depending on which version of CDx system you purchased, you should have received some or most of the above items.

## Intro to the CDx CD-ROM

In the early 1980's, the introduction of the Digital Compact Disc (CD) revolutionized the music industry with its unprecedented clarity and small size. Soon thereafter, the same technology was applied to computer data, and the CD-ROM (Compact Disc Read-Only Memory) was born.



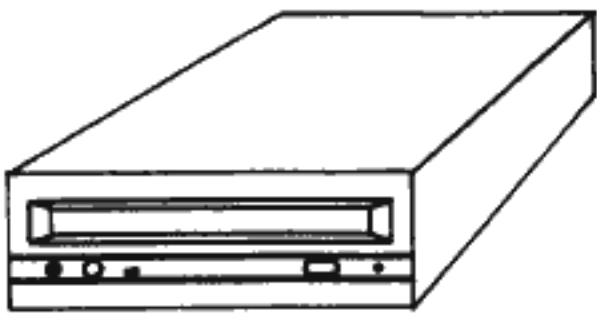
A CD-ROM disc is constructed of a combination of metal and plastic with microscopic pits molded into it to represent 0's and 1's. In the drive, a low-power laser reads the pits and converts them to a stream of bytes, automatically correcting any errors that might occur in the data. The data is then able to be transferred via the SCSI bus to your SCSI controller and then into your Amiga memory.

The CDx software controls this entire operation. Its filesystem, called *CDxFileSystem*, takes care of adapting the "foreign" format of CD-ROM discs to AmigaDOS. It also handles disc changes automatically so that you can switch discs as easily as you would a floppy. Other software is included to do special things like controlling the playback of audio CD's and running CDTV titles.

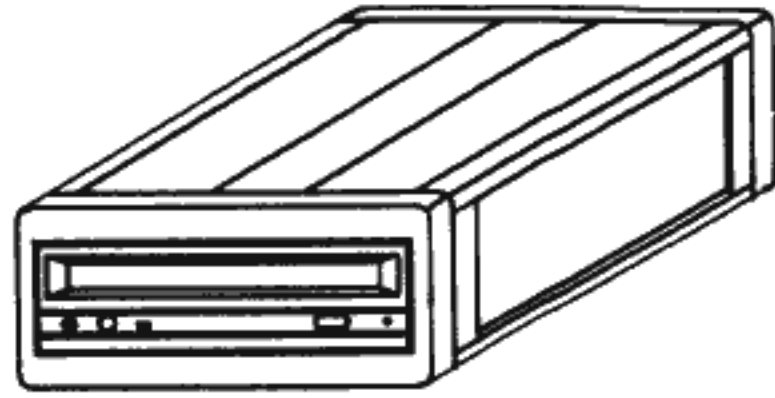
## Inventory

This manual covers various CDx systems from the "do-it-yourself" *CDx Disk Set* to the complete *CDx-650* models. Before proceeding, use the table below and figure 1 to identify the components in your package. Find the column in the table that corresponds to your purchase and check off each box as you locate the item.

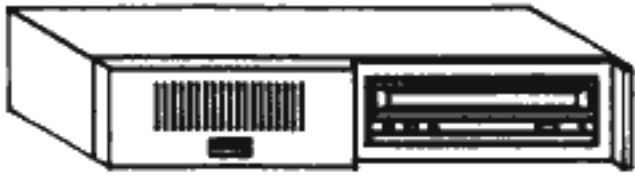
Item	Description	Package					
		CDx Disk Set	CDx-650I	CDx-650E	CDx-650LE	CDx-Driveless E	CDx-Driveless LE
(A)	CD-ROM Drive (internal)		<input type="checkbox"/>				
(B)	CD-ROM Drive Enclosure (small)			<input type="checkbox"/>		<input type="checkbox"/>	
(C)	CD-ROM Drive Enclosure (large)				<input type="checkbox"/>		<input type="checkbox"/>
(D)	SCSI Data Cable (shielded)			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(E)	SCSI Data Cable (ribbon)		<input type="checkbox"/>				
(F)	Audio Cable		<input type="checkbox"/>				
(G)	Power Cord				<input type="checkbox"/>		<input type="checkbox"/>
(H)	Fish & More CD-ROMs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(I)	Disc Caddy		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(J)	CDx Install Disk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(K)	Manual	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(L)	Registration Card	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(M)	Misc. Hardware		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>



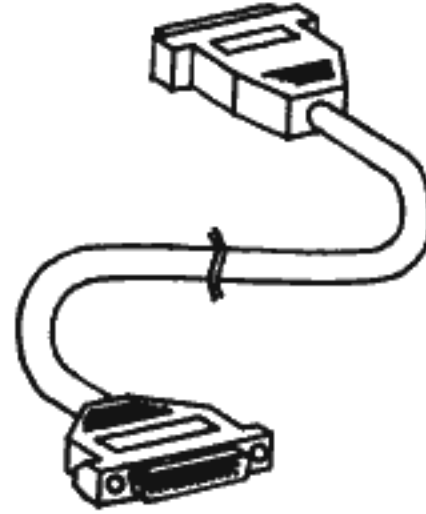
Ⓐ CD-ROM Drive (internal)



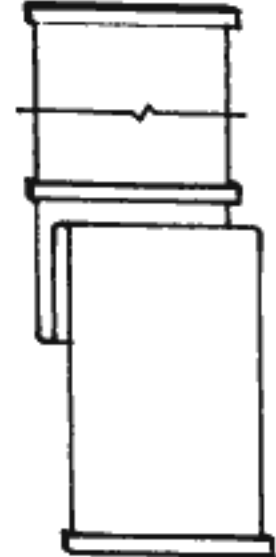
Ⓑ CD-ROM Drive Enclosure (small)



Ⓒ CD-ROM Drive Enclosure (large)



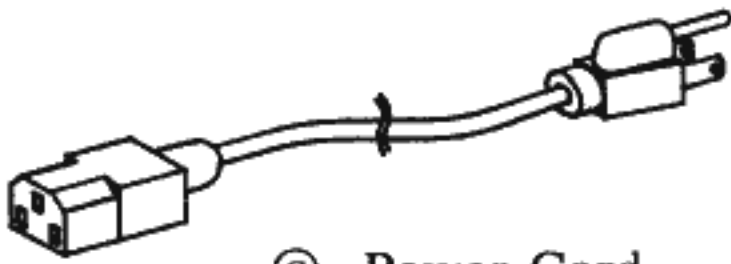
Ⓓ SCSI Data Cable



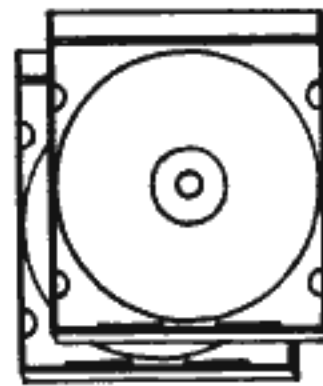
Ⓔ SCSI Ribbon Cable



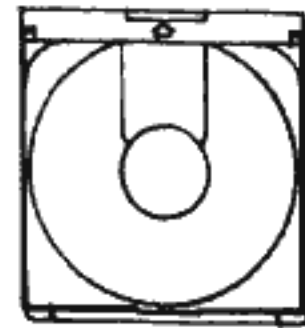
Ⓕ Audio Cable



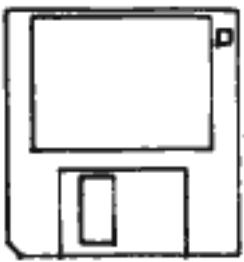
Ⓖ Power Cord



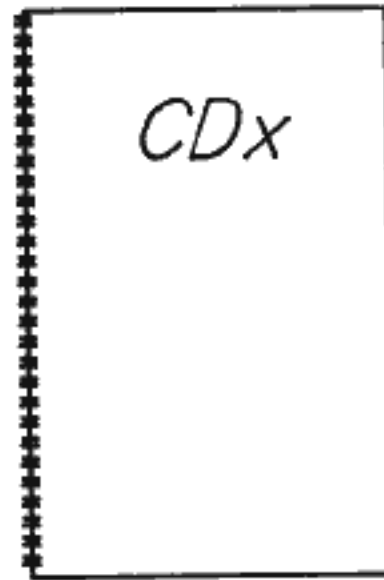
Ⓗ Fish & More CD-ROM discs



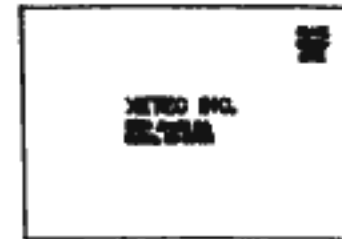
Ⓘ Disc Caddy



⓵ CDx Install Disk



Ⓚ Manual



Ⓛ Registration Card



Ⓜ Misc. Hardware

**Fig. 1 - Various CDx Package Contents**

## Disc Handling

Opening a disc *jewel case* (the disc storage box) can be frustrating for some people. It's very easy if you hold it correctly:

- 1) Place the case in your right hand, disc facing up, spreading your fingers and thumb so you're holding the case by the spines (where the disc title is).
- 2) With your left hand, grab the front cover by its clear sides and pull open.
- 3) Remove the disc by grabbing it by its edges and gently pulling. A slight rotation of the disc back-and-forth will make removal easier.

Always handle discs by their edges or the center hole. Avoid contact with the optical surface (the bottom of the disc). Also, do not lay the disc on its optical surface except in the jewel case.

## Disc Loading/Unloading

Before loading a disc into your drive, it must be placed in a disc caddy:

- 1) To open the disc caddy, squeeze the two tabs inward with one hand while lifting the center flange upward. See figure 2.
- 2) With the label side up, place the disc in the caddy by tucking one corner under the "lip" near the metal door. The disc should rest flat in the caddy.
- 3) Close the caddy lid. Be sure that both corners are snapped fully shut.

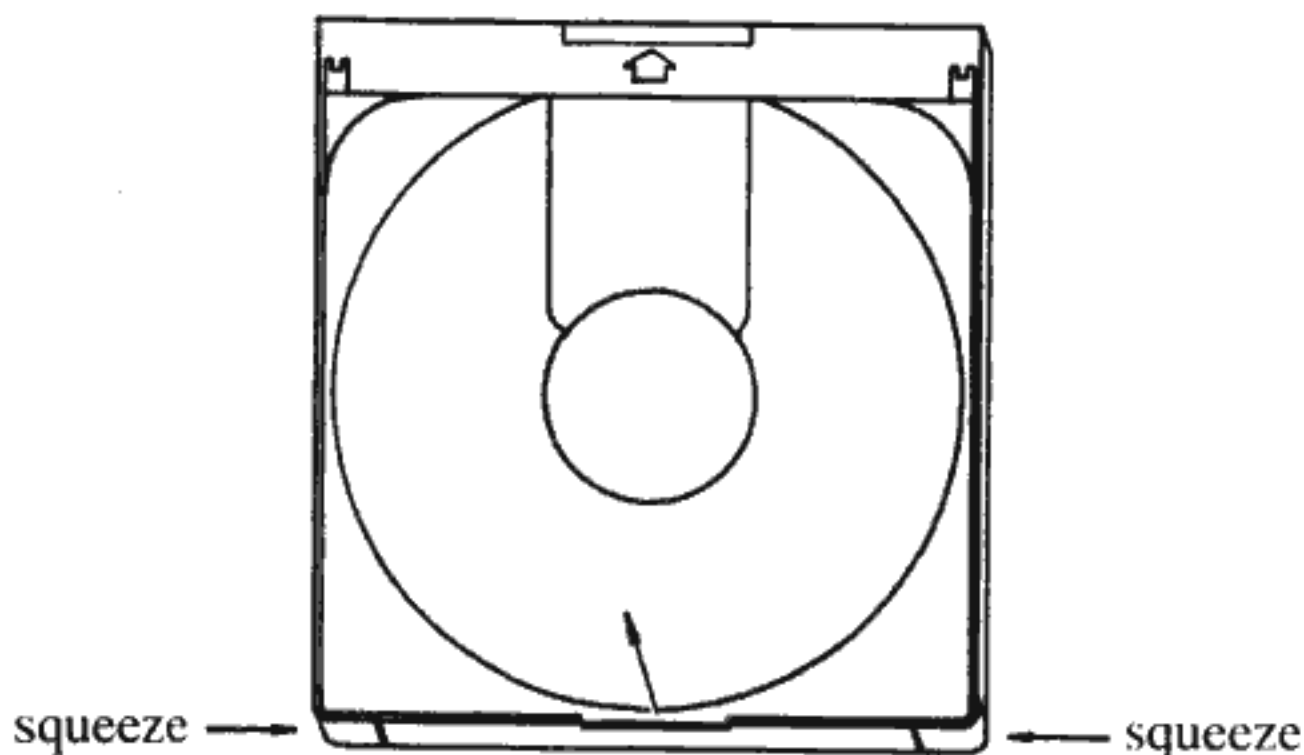


Fig. 2 - Opening the Disc Caddy

A disc caddy can be inserted into most drives only while the drive is on.

- 1) Hold the caddy so that the clear window faces up, and the arrow and metal shutter are toward the drive.
- 2) Gently insert the caddy into the drive's opening, pushing it as straight as possible (push on the caddy's center, not on an end).
- 3) When the caddy is nearly in, most brands of drives will grab the caddy and finish loading it. If yours does, do not "help" the caddy in, let the drive do it or you may cause damage. Some drives require you to push the caddy in fully until it "snaps" into position. Do it slowly and cautiously the first time until you know what to expect from your drive.

The disc caddy can be removed from the drive in several ways:

- 1) Push the "Eject" button."
- 2) Using the *CD Remote* disc player program.
- 3) From the CLI using the *CDeject* command.
- 4) From a "C" or ARexx program.
- 5) With the drive off, push a paperclip in the emergency release hole located near the eject button (location may vary on different drives).

Although it's best to only eject a disc when it's not being accessed, doing so during accessing cannot in any way damage the data on the disc. The program accessing the disc, however, may not like this very much. Normally, you will get a "Read error" requester, which you can just cancel. Some programs may not handle a "Cancel" very well (i.e. could act strangely or crash), so beware.

## Cleaning

Discs should not need to be cleaned as long as they are handled correctly and are always kept in a caddy or their jewel case.

If a disc becomes soiled by fingerprints, dust, or dirt, it can be wiped (always in a straight line, from center to edge) with a clean and lint-free, soft, dry cloth. Never use a solvent or abrasive cleaner.

Cleaning of the CD-ROM drive should not be needed unless the drive is subjected to a harsh environment. This may be a good time to quit smoking! Should the drive lens need cleaning, lens cleaners can be purchased at most stores selling audio CD players.

# HARDWARE INSTALLATION

- *Precautions*
- *Typical CD-ROM Systems*
- *Before Installation*
- *Preparing the CD-ROM Drive*
- *CDx-650I Installation*
- *CDx-650E Installation*
- *CDx-650LE Installation*
- *CDx-Driveless Installation*

## Precautions

Your CD-ROM system has been designed to make installation as simple and logical as possible. Nevertheless, read this manual very carefully, paying particularly close attention to the first few chapters.

A danger when installing your CD-ROM hardware is static discharge. Before handling or installing the components, you should prepare yourself so that you do not damage them by your touch. First, a carpeted floor is always dangerous! Leather-soled shoes also seem to be a problem. Static problems multiply when the humidity is low (generally in winter). A good rule to remember is any time you have walked any distance, discharge yourself before touching your computer or any peripheral. Large metal objects (such as a table) are a good place to discharge, as is anything connected to earth ground (like the screw in the cover of a wall switch).

Also be careful when piecing together your own system, as improper cabling or incompatible connector pinouts can possibly cause damage to your CD-ROM drive and SCSI controller. See Appendix D for the pinout of the SCSI connector on the CDx enclosure. Also be careful when "rigging" your own power supply for the drive. Be absolutely sure that 5 and 12 volts appear on the proper pins!

## Typical CD-ROM Systems

Whether you purchased a complete system or are piecing everything together yourself, it would be good at this point to see a few examples of correctly assembled CD-ROM systems in various configurations (figures 3 thru 7). Notice the cabling and termination details. These should help you plan out your CD-ROM system, as well as helping you plan for future purchases (such as an additional hard drive).

Detailed installations are provided later in this chapter for the *CDx-Driveless* kit as well as complete internal and external systems.

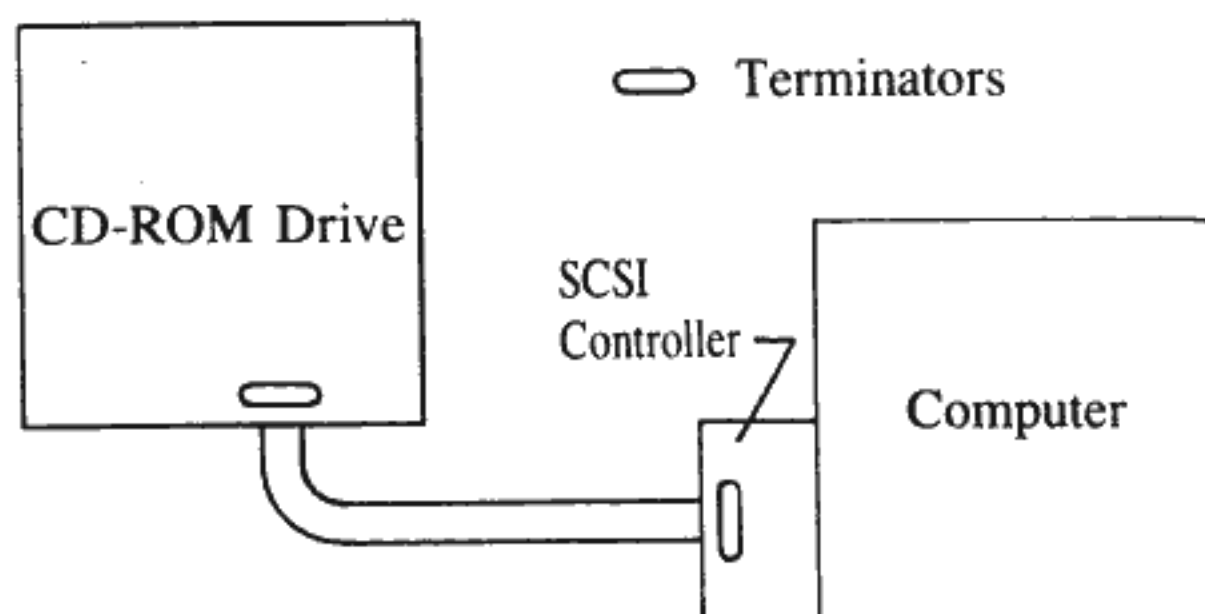
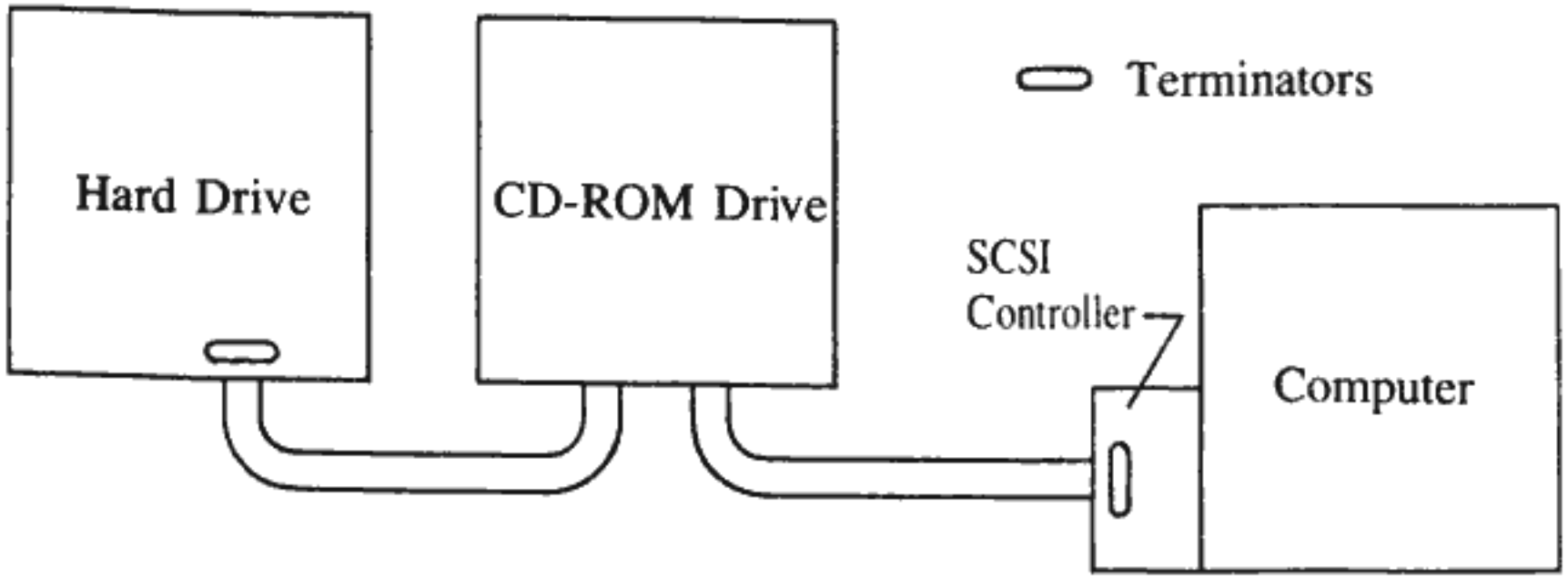
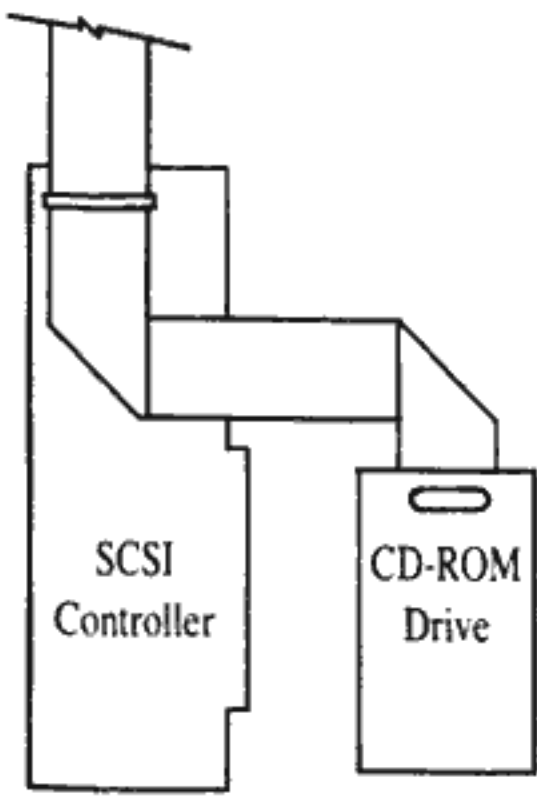


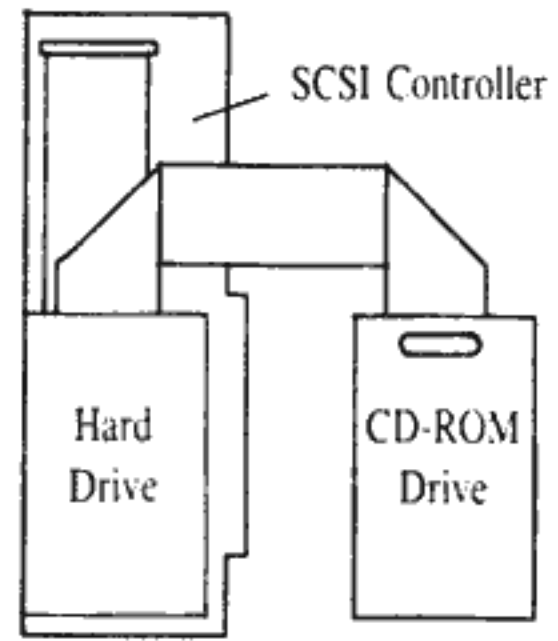
Fig. 3 - External System



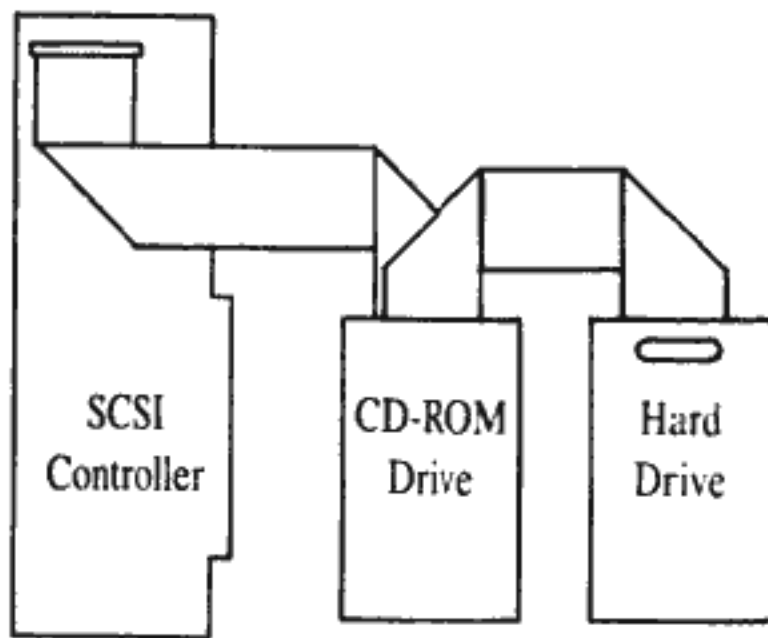
**Fig. 4 - Expanded External System**



**Fig. 5 - Internal System**



**Fig. 6 - Internal with On-card Hard Drive**



**Fig. 7 - Internal with Bay-mounted Hard Drive**

## Before Installation

To use a SCSI CD-ROM on your Amiga system, you will need a SCSI controller (host adaptor) that is compatible with the CDx software included. See the chapter on *Software Installation* for information about determining if your current SCSI controller is suitable. Usually, incompatible controllers can be made compatible with an updated driver or ROM from its manufacturer. If not, Xetec offers inexpensive controllers for most models of Amigas.

If the SCSI controller is not already installed, do so at this time, following the manufacturer's instructions that came with it.

Before proceeding to install the CD-ROM drive, make sure your computer, SCSI controller, hard drive, and other peripherals are working properly. This will prevent a misdiagnosis of other problems later.

## Preparing the CD-ROM Drive

Before completing installation of your CD-ROM, you need to be sure that it is configured properly for your SCSI bus.

First of all, the drive's terminators must be present or removed, depending on your system layout (see *Typical CD-ROM Systems* above). The drive terminators are usually a set of three socketed resistor packs near the SCSI connector, although some drives have active termination controlled by a DIP switch.

Since your CD-ROM drive may be sharing the SCSI bus with other drives, you also need to ensure that it has a unique SCSI ID (or unit) number. This is usually set by a group of three DIP switches or jumper locations. Unit 7 is usually taken by the SCSI controller. The A-3000 internal drive usually uses 6, while the first drive on other SCSI controllers is usually set to 0. You must pick some number from 0 to 7 that is not used by your controller or any device on the bus. The *SCSI Lister* program in the *Utils* drawer of the CDx Install Disk should show the unit number of each device on the bus (except the controller).

If you purchased one of the complete Xetec CDx systems, refer to the following instructions for setting the DIP switches to alter the termination and SCSI ID number. For other drives, consult their documentation for specific information.

Unless otherwise noted, all complete CDx systems (internal and external) are shipped with the following settings:

Termination: off (removed)  
SCSI ID: 5

These settings should be acceptable for nearly all systems. If not, you will need to adjust the DIP switches on the rear of the drive.



### Adjusting the CDx-650I DIP switches

- 1) Refer to the diagram below to set the DIP switches as desired.

### Adjusting the CDx-650E DIP switches

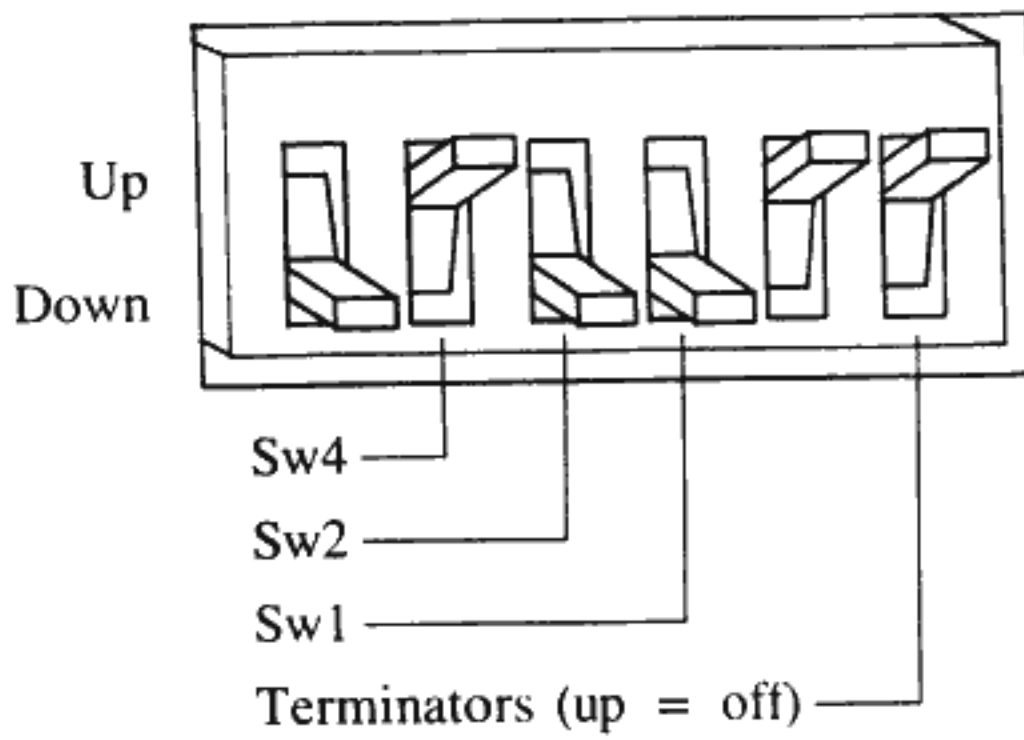
You will need to remove the rear panel of the enclosure to gain access to the DIP switches on the rear of the CD-ROM drive:

- 1) Disconnect any cables from the back of the drive and unplug its wall adaptor.
- 2) The plastic bezel on the rear of the unit has two tabs that extend onto the side of the enclosure. One of these tabs has a small notch in it. Insert a small screwdriver into this notch and *gently* pry the tab away from the chassis side until the bezel can be pulled rearward free from the chassis.
- 3) Remove the two screws that are now exposed on each side. Pull the rear panel assembly slightly until it comes free and can be moved out of the way. Do not disconnect any cables.
- 4) Refer to the diagram below to set the DIP switches as desired.
- 5) Slide the rear assembly back into place and replace the two screws. Snap the plastic bezel back into place.

### Adjusting the CDx-650LE DIP switches

You will need to remove the cover of the CDx-650LE chassis to gain access to the DIP switches on the rear of the CD-ROM drive:

- 1) Disconnect any cables from the back of the enclosure, including the power cable.
- 2) Gently place the unit on its top (upside-down). Remove the four screws that are in the extreme corners. *Do not remove any of the screws away from the edge.*
- 3) Carefully flip the unit right-side up. Remove the top of the enclosure by sliding it forward (toward the front panel).
- 4) Refer to the diagram below to set the DIP switches as desired.
- 5) Reverse procedure to reassemble the unit.



SCSI ID #	Sw 4	Sw 2	Sw 1
0	down	down	down
1	down	down	up
2	down	up	down
3	down	up	up
4	up	down	down
5	up	down	up
6	up	up	down
7	up	up	up

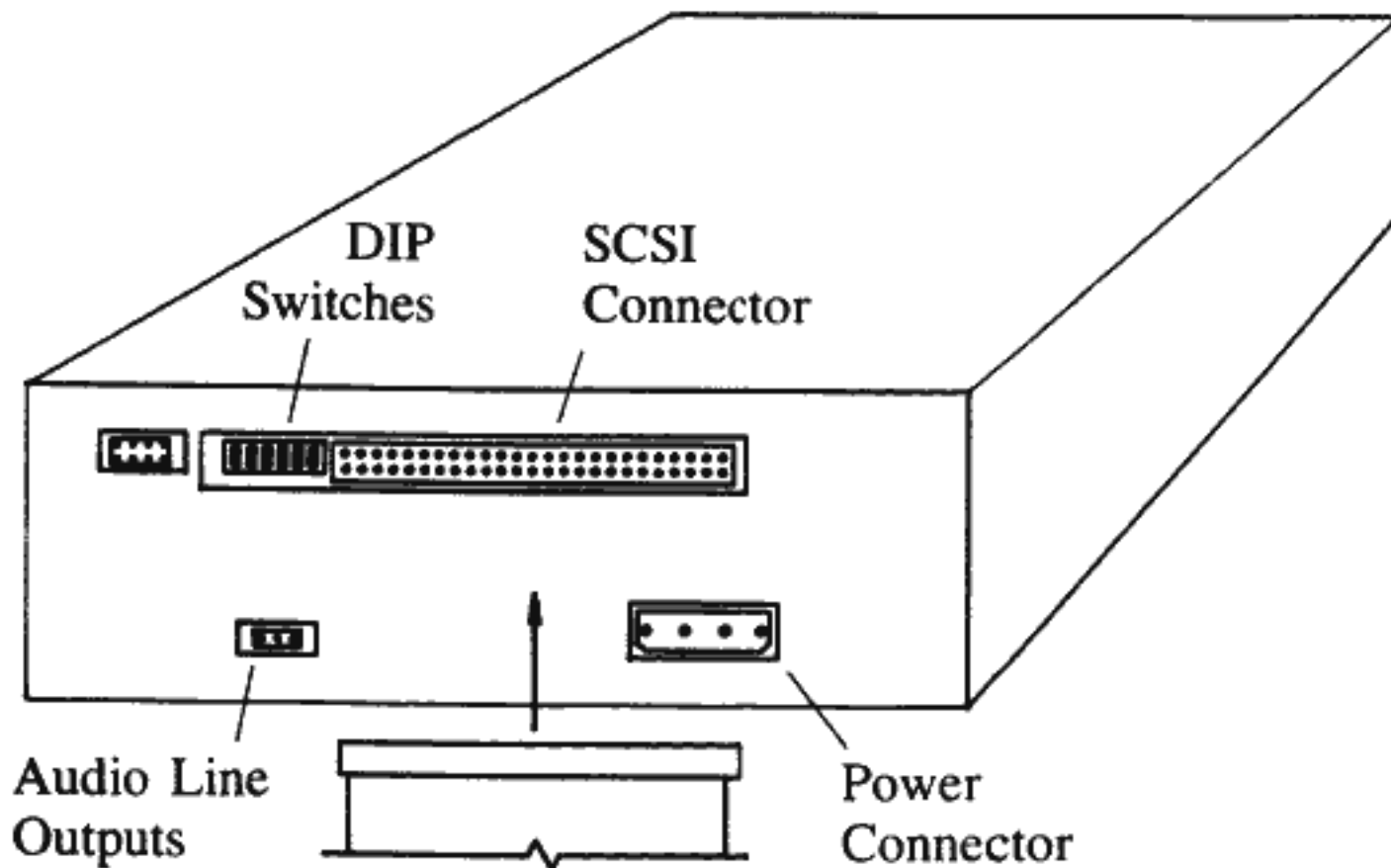
**Fig. 8 – CDx Drive Switches**

## **CDx-650I Installation**

Following are the steps for installing the CDx-650I in an A-2000:

- 1) Make sure the drive is ready for installation (see *Preparing the CD-ROM drive* above).
- 2) Determine which of figures 5, 6, or 7 will most closely match your system. Set the drive termination appropriately (see fig. 8).
- 3) Make sure power is completely turned off to all components of your computer and hard drive system.
- 4) Unplug the keyboard and mouse connectors from the front of the computer.
- 5) Remove the 5 screws that fasten the computer's cover—two on each side and one in the rear (it's the screw just next to the two slot covers). Remove the cover by pulling it towards the front of the computer and upward. Set it aside.

- 6) Carefully guide the drive into the lower drive bay. Secure the drive in place with the four screws provided (two on each side). If installed properly, the drive should be suspended a little above the bottom of the metal in the drive bay. Remove the insert in the cover to provide access to this lower slot. Temporarily install the cover to test the fit. Remove the cover and tighten the screws when all fits well.
- 7) Refer to fig. 9 and 5, 6, or 7 (p. 9, whichever is applicable for your installation). Connect the ribbon cable to the SCSI controller, CD-ROM drive, and optional hard drive as shown. Be sure that at each device, the colored stripe on the cable corresponds with the end marked as pin 1. If you must remove older cables to install this new cable, you can usually rely on the orientation of the stripe to determine pin 1. If you're unsure about the correct orientation of any connector, get help before you turn anything on! A reversed connector can cause damage. Note in fig. 5 that the free connector is left unconnected.



**Fig. 9 - CDx-650I Drive Back View**

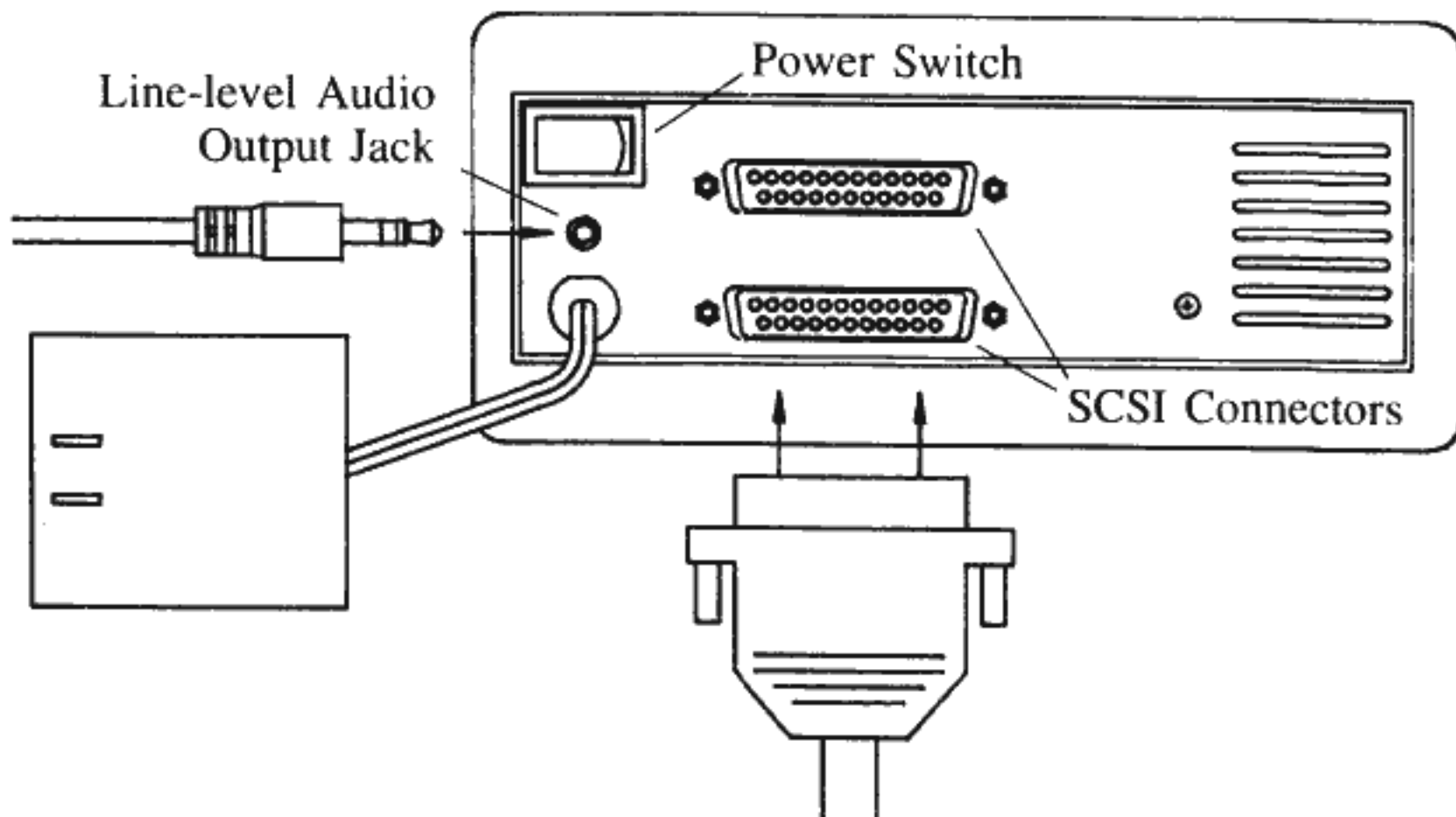
- 8) Find a free 4-wire power connector on a cable coming from the power cage. Plug it into the back of the CD-ROM drive (notice that two of the corners are beveled for correct insertion).
- 9) The only CD-ROM audio output provided is a headphone jack on the front of the drive. If you want external access to the drive's line-level audio outputs, you can use the included audio connector shown in figure 10. Extend this cable to the length you need and install the desired plugs or jacks on the other end.
- 10) Replace the computer's cover and the five screws. Replace the keyboard and mouse connectors.



**Fig. 10 - CDx-650I Audio Cable Specs**

## CDx-650E Installation

- 1) Make sure the drive is ready for installation (see *Preparing the CD-ROM drive* above).
- 2) Determine which of figures 3 or 4 (p. 8) will most closely match your system. Set the drive termination appropriately (see fig. 8).
- 3) Make sure power is completely turned off to your computer and all external devices.
- 4) Locate the 25 pin external SCSI connector on your SCSI controller (or on the rear of the computer). If a cable is already plugged into it, remove it. Now take the cable included with your CD-ROM drive and plug one end into this connector. Secure the cable with the attached screws.
- 5) Attach the other end of the included cable to one of the connectors on the back of the CD-ROM drive. See Fig. 11. Again, secure the cable with the attached screws.



**Fig. 11 - CDx-650E Back View**

- 6) If you have an external hard drive (that you disconnected in step 4) plug the free end of its data cable into the CD-ROM's remaining connector and tighten the screws. This configuration is shown in fig. 4, p. 9.

### **CAUTION!**

Unless the wall adaptor is labeled otherwise, it is designed for:

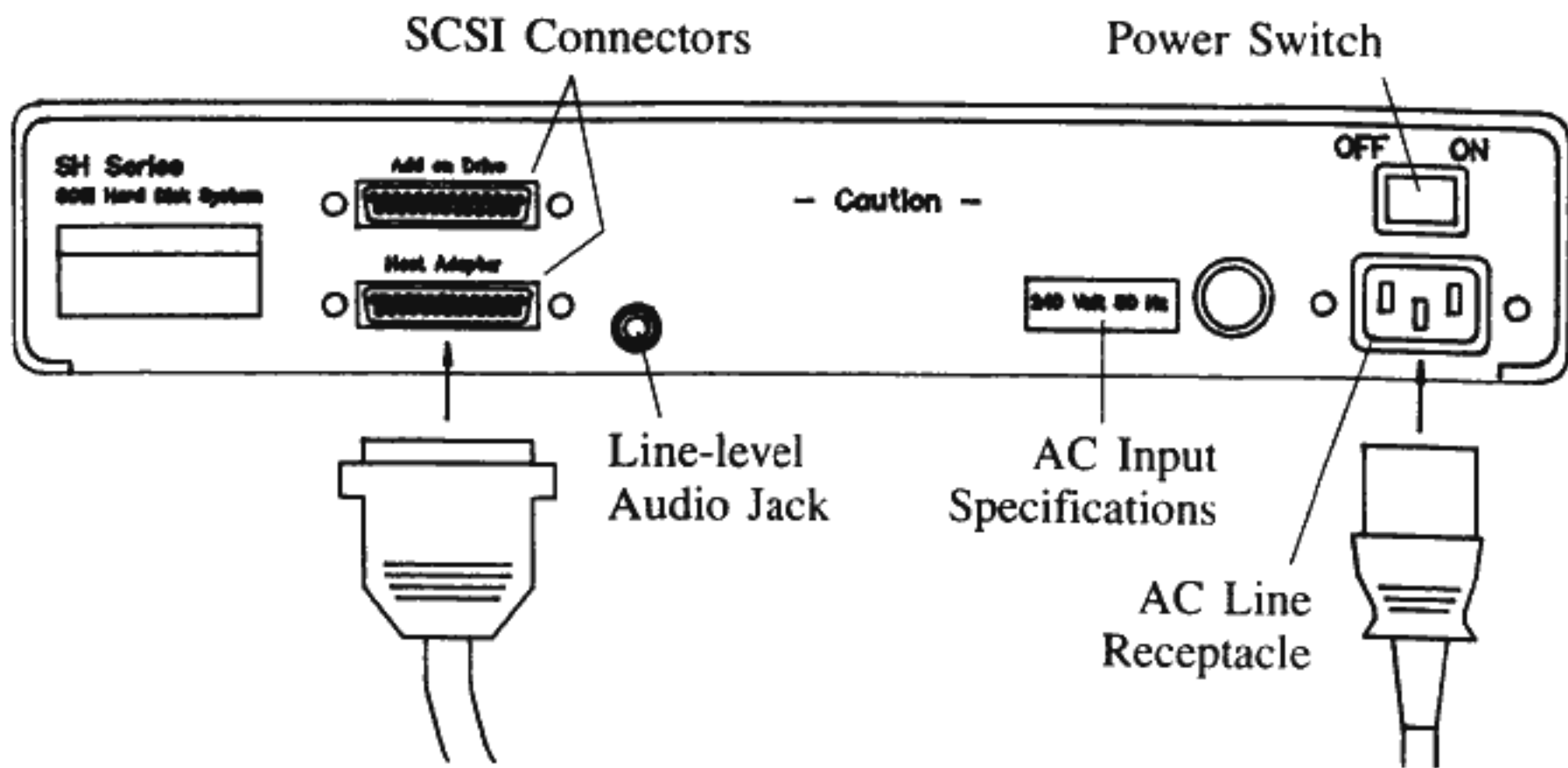
120 volts A.C. 60 Hz

Do not plug it into any other voltage or frequency outlet.

- 7) Make sure the Power Switch is in the *Off* position and plug the wall adaptor into a proper outlet.
- 8) To connect the drive's line-level audio outputs into your monitor or stereo amplifier, use an adaptor cable to convert the 3.5mm stereo jack on the back of the drive to standard "RCA" audio connectors. Such a cable is available from Radio Shack (cat. no. 42-2481A). Do not plug headphones into this rear connector.

## **CDx-650LE Installation**

- 1) Make sure the drive is ready for installation (see *Preparing the CD-ROM drive* above).
- 2) Determine which of figures 3 or 4 will most closely match your system. Set the drive termination appropriately (see fig. 8).
- 3) Make sure power is completely turned off to your computer and all external devices.
- 4) Locate the 25 pin external SCSI connector on your SCSI controller (or on the rear of the computer). If a cable is already plugged into it, remove it. Now take the cable included with your CD-ROM drive and plug one end into this connector. Secure the cable with the attached screws.
- 5) Attach the other end of the included cable to one of the connectors on the back of the CD-ROM drive. See Fig. 12. Again, secure the cable with the attached screws.



**Fig. 12 - CDx-650LE Back View**

- 6) If you have an external hard drive (that you disconnected in step 4) plug the free end of its data cable into the CD-ROM's remaining connector and tighten the screws. This configuration is shown in fig. 4, p. 9.

**CAUTION!**

The CD-ROM power supply has been configured for either

**120 volts/60Hz**

or

**240 volts/50 Hz**

Check the ratings marked on the back of the enclosure near the AC receptacle (see Fig. 12) before plugging in the unit.

- 7) Make sure the Power Switch is in the *Off* position. Plug a power cable into the AC receptacle on the back of the drive and into the proper wall socket (cable included for 120V/60Hz installations).
- 8) To connect the drive's line-level audio outputs into your monitor or stereo amplifier, use an adaptor cable to convert the 3.5mm stereo jack on the back of the drive to standard "RCA" audio connectors. Such a cable is available from Radio Shack (cat. no. 42-2481A). Do not plug headphones into this rear connector.

## CDx-Driveless Installation

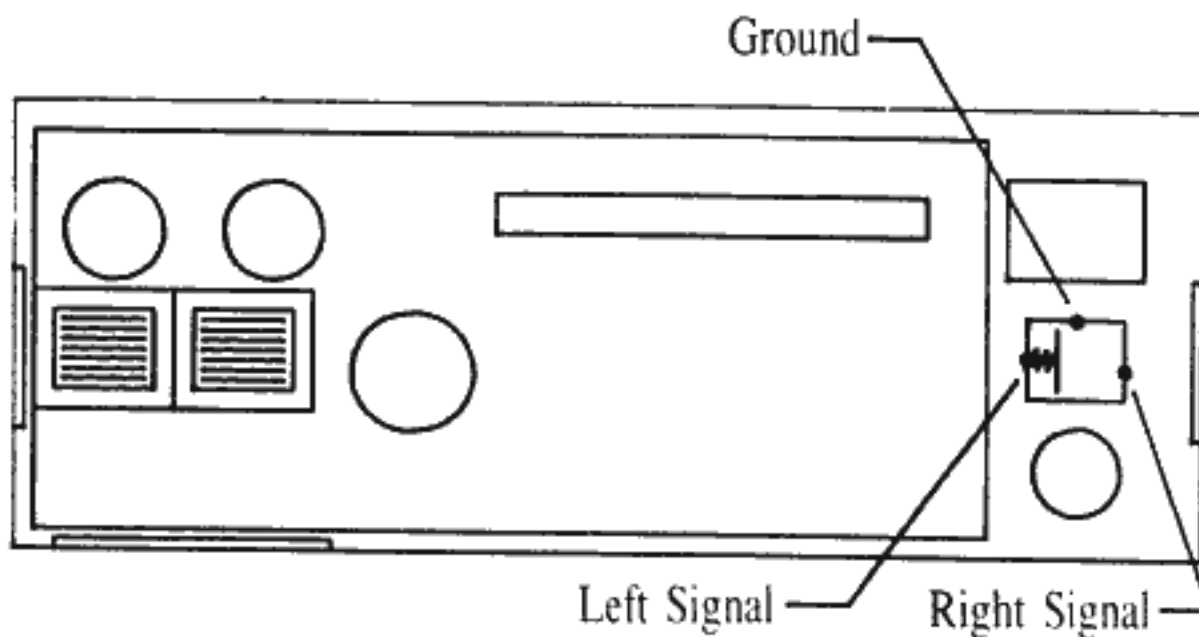
Due to variations from drive to drive, the following steps may not be suited perfectly to your particular drive. Do not force anything, especially when it comes to physically screwing into the drive or inserting the drive into the enclosure.

- 1) The plastic bezel on the rear of the enclosure has two tabs that extend onto the side of the chassis. One of these has a small notch in it. Insert a small screwdriver into this notch and *gently* pry the tab away from the chassis side until the bezel can be pulled rearward free from the chassis. Do the same for the bezel on the front of the enclosure.
- 2) Remove the two screws that hold the rear assembly in place. Remove the assembly and set it aside (as well as the two screws).
- 3) Locate the two included 6" metal rails. Mount the rails (smooth side out) to either side of your CD-ROM drive using the mounting screws that came with it. If no screws were included, use either the set of four metric or four #6-32 screws included with the enclosure, whichever are appropriate. **WARNING: some drives may not operate properly or may be damaged if the rail-mounting screws are too long.** Check your drive's documentation to see if the included screws are safe to use.

Note that the rails may be installed in either of two orientations, and that each results in a different rail height on the drive. The correct orientation is usually the one that causes the rails to sit low on the drive. If one placement doesn't allow the drive to be inserted properly (step 5), flip the rails and try again.

- 4) Before proceeding, make sure the termination, SCSI ID number, and any other drive switches or jumpers are set as desired (see *Preparing the CD-ROM Drive*, p. 10).
- 5) Insert the rear of the CD-ROM drive into the enclosure, lining up the rails on the drive with the rail slots in the enclosure. Gently slide the drive in until the back of the drive almost protrudes out the other end. A snug fit is normal, but you should not have to use much pressure.
- 6) If your drive has a line-level audio output connector and you want this brought out to the outside, you will need to obtain the appropriate connector and wire it to the 3.5mm jack mounted on the back panel assembly (removed in step 2). See fig. 13 for wiring details (consult your CD-ROM drive documentation for the other end).

- 7) Connect the back panel assembly (removed in step 2) to your drive as follows. Plug the white plastic power connector into the drive's 4-pin connector. Next, plug the audio connector (optional, from step 6) into the drive's audio output connector. Last, plug the ribbon cable into the drive's SCSI connector, making sure the colored stripe on the cable corresponds to pin 1 on the connector (check your documentation). Note that this may require a twist in the cable, depending on your drive.
- 8) Pull the drive forward in the chassis slightly as you guide the back panel assembly into the rear of the chassis. Line up the assembly's holes with those on the sides of the chassis and replace the two screws removed in step 2. **Do not use any other screws** or you may damage the power supply.
- 9) Line up the holes in the drive rails with those on the sides of the chassis (at the front). You may need to compress the cables behind the drive a little to accomplish this. Use two of the short #6-32 flat-head screws in these holes to fix the drive in place.
- 10) Carefully replace the plastic bezel on the rear of the chassis. Do the same for the front bezel.
- 11) Now follow the instructions for the CDx-650E (p. 14) to complete the installation.



**Fig. 13 - CDx-Driveless Audio Jack Specs**



# SOFTWARE INSTALLATION

- **CDx Install Program**
- ***Installing the CDx Software***
- ***Modifying Options***
- ***Updating the Software***
- ***Installing Multiple Drives***

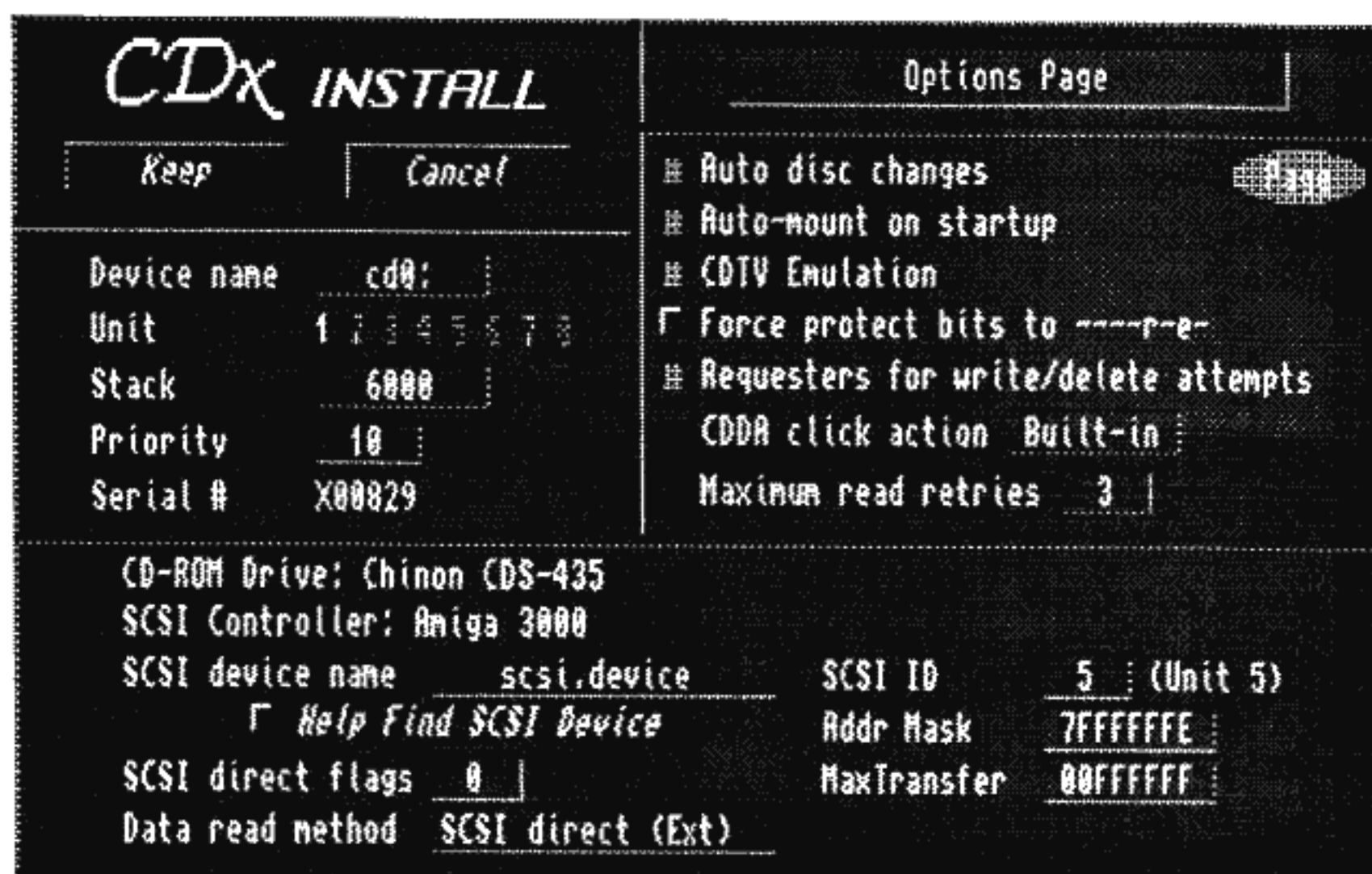
The CD-ROM drive must be interfaced to your computer with a SCSI controller that is compatible with the included CDx software. Since CD-ROM drives are so different from hard drives, you cannot simply use the software provided with your SCSI controller. Even if that software supports CD-ROM drives, the data on most CD-ROM discs is formatted in a way that AmigaDOS can't recognize.

The CDx software, once installed in your system, will work together with your controller's software to access discs and make them usable from application programs, as well as CLI and Workbench™

## *CDx Install Program*

Before you can access discs with your CD-ROM drive, several important programs and files must be installed in your system. The *CDx Install* utility has been provided to make this step as easy as possible. It gives you a nice graphic display of all your options and does all the nasty technical work for you.

To run the *CDx Install* program, just pop in the CDxInstall Disk and open its window. Double-click on the *CDx Install* icon and a screen similar to fig. 14 should appear.



**Fig. 14 – CDx Install Screen**

First, let's cover the various information that you *must* provide to *CDx Install*, as well as the many options that you can adjust if you want. Then in the next section, *Installing the CDx Software* (p. 27), you will actually perform the installation.

## On-line Help System

*CDx Install* has a built-in help feature to assist with all the values and options under your control. You can receive help with most items by holding down either *Alt* key and clicking on the item of interest. A window of information will appear. Click on its *OK* button when you are ready to resume.

## Setting the CD-ROM Drive

The first thing you need to do is specify the model of CD-ROM drive the software will be controlling. The current setting is displayed on the line in the lower box that reads "*CD-ROM Drive:*". The default setting is the model of drive included in complete CDx-650 systems (the Chinon CDS-435 at the time of this printing).

If you or your dealer provided a different drive, you need to adjust this setting. To set your specific model, click on this same "*CD-ROM Drive:*" line and a list like figure 15 will appear. To find your model of drive, you can scroll through the list by dragging the scroll bar on the left side of the list, or press the up or down arrow buttons. To select your drive, click on it to highlight it, then click the *Pick* button (or just double-click on your selection). If you want to exit the list without picking a new drive, click on *Cancel*.



**Fig. 15 – CD-ROM Drive List**

If your drive is not listed, you have several options. If your drive is SCSI-2 compatible, you can use the *Other SCSI-2 drives* setting. If not, you can select the *Others (Data Only)* setting, but this will not allow you to play audio CD's, and CDTV titles using audio tracks will not be emulated fully. If your drive doesn't have the ability to play audio CD's, you *must* use this setting. If, however, your

drive does have this ability, the best way to try to get the audio features working is to select one of the other drives in the list, in hopes that it is closely compatible to your drive. Most drives by the same manufacturer are usually software compatible, so it often works to select another model of drive made by the manufacturer of your unlisted drive.

If you are not sure what model of drive you have, you can use the ***Help Find SCSI Device*** button to list the make and model of all devices on your SCSI bus (see ***Help Find SCSI Device*** below).

### **Setting the SCSI Controller**

The next step is to supply information about the SCSI controller being used to interface the CD-ROM drive. This data, in the lower part of the window, can be hand-adjusted. Much simpler, however, is to just pick your controller from a list like you did for your CD-ROM drive. To do this, click on the “***SCSI Controller:***” line in the lower box and a list of SCSI controllers will appear.

This list operates just like the list of CD-ROMs. If you see your controller in this list, select it and click on ***Pick***. This will cause most of the data in the ***CDx Install*** screen’s lower box to be filled in for you. Notice that some entries are darkened; these are SCSI controllers that are known to ***not*** work with the CDx software (you cannot select any of these).

If your particular SCSI controller is not listed, it may or may not be compatible. A good way to find out is to try the ***Help Find SCSI Device*** feature (see below).

### **Setting the SCSI ID**

The final piece of information the CDx software needs in order to talk to your CD-ROM drive is the SCSI ID at which your drive appears on the SCSI bus. Enter in this box the ID you set the drive’s switches for during installation (complete CDx-650 systems are usually 5). Your controller’s equivalent unit number for the SCSI ID you set is shown in parentheses.

If you are not sure what value to enter, use the ***Help Find SCSI Device*** feature to help you find the CD-ROM drive to be controlled and automatically enter its ID.

### **Help Find SCSI Device**

This handy feature can assist you in several aspects of setting up the CDx software. It will help you find your SCSI controller’s device driver name, test your controller for software compatibility, display the make, model, and revision of your SCSI devices, and help you pick which drive the CDx software is to control. Wow!

To begin the magic, click on the ***Help Find SCSI Device*** button. This will bring

up a list of all the device drivers currently in your system. Those that may possibly be the driver for your SCSI controller are highlighted. Select from these the driver that “looks” appropriate (it usually resembles the name of the controller or its manufacturer) and click on **Pick**. (If you have already set the correct driver name in the *SCSI device name* box, you can skip this part by clicking on **Cancel**.)

Next you will be asked if you want to scan for all drives on the bus controlled by the device driver you picked (or that was already set). If you answer “yes”, the program will pause momentarily, then display a list of the devices that it finds at units 0 thru 6. Any CD-ROM drives found will be highlighted. You can double-click on a drive to have its SCSI ID automatically entered for you, or click **Cancel** if you were just browsing around.

If the program crashes, locks up, or does not find your devices, your controller’s driver probably does not support the standardized *SCSIDirect* command — contact the manufacturer for an updated driver or ROM.

### Using Other SCSI Controllers

If earlier you found and picked your SCSI controller from the list of supported controllers, you may skip the following technical discussion and move on to **Setting User Options**, p. 24. If not, but your SCSI devices show up successfully using **Help Find SCSI Device**, your controller probably will be compatible anyway. You must, however, fill in the following details concerning your controller:

**SCSI device name** — the name of the SCSI controller’s device driver as it appears to the Amiga operating system. These nearly always end with *.device* (*scsi.device* for example). This entry must be **exact** — the spelling and case (upper or lower) are very important.

This name is automatically entered for you when you pick a driver name from the list while using **Help Find SCSI Device**.

**SCSI direct flags** — this decimal value, usually 0, is logically OR’ed into the value for *scsi\_\_Flags* sent to the controller software (only applies when **Data read method** is set to one of the *SCSI Direct* modes). Use this value to set any bits that may be required for proper support of the SCSI direct command. (A familiarity with the *scsidisk* standard is required in order to choose a meaningful value.)

**Data read method** — determines which method the CDx software should use with your SCSI controller to request the reading of data sectors from the CD-ROM. This option can make or break compatibility with each SCSI controller. In other words, if your drive isn’t working properly with your SCSI controller, adjusting this option could make things fly. Conversely, if your drive is working and you adjust this setting, it could quit working properly. Click on this option to select from the three settings:

<b>DoIO (in 2K blocks)</b>	Uses standard CMD_READ I/O requests. SCSI controller must be able to handle devices with 2048 bytes/block.
<b>SCSI direct (Std)</b>	Uses SCSI direct (28) to send a group 0 standard read command.
<b>SCSI direct (Ext)</b>	Uses SCSI direct (28) to send a group 1 extended read command.

Very few SCSI controllers work properly using the *DoIO* method, since CD-ROM drives use 2048-byte sectors, and most controllers can only handle devices with 512-byte sectors. Controllers that *can* handle 2K reads, however, may operate more efficiently when using the *DoIO* method, which may improve the performance of your CD-ROM drive.

**Addr Mask** — this hexadecimal value specifies legal memory addresses that can be used when reading data using the SCSI controller and its driver.

**MaxTransfer** — this hexadecimal value specifies the largest number of bytes that the SCSI controller and its driver can transfer in one shot. A good way to find this value as well as *Addr Mask* for your controller is to see what values were used for one of your hard drive partitions (use the included *DeviceList* utility to list the info for each system device).

### Setting User Options

All remaining settings in the *CDx Install* window have been set to default values, but can be adjusted to suit your needs. The options in the box on the right side are actually just one of three pages of options. To gain access to the other pages, just click on the purple *Page* button. The other two current pages of options are shown in figure 16.

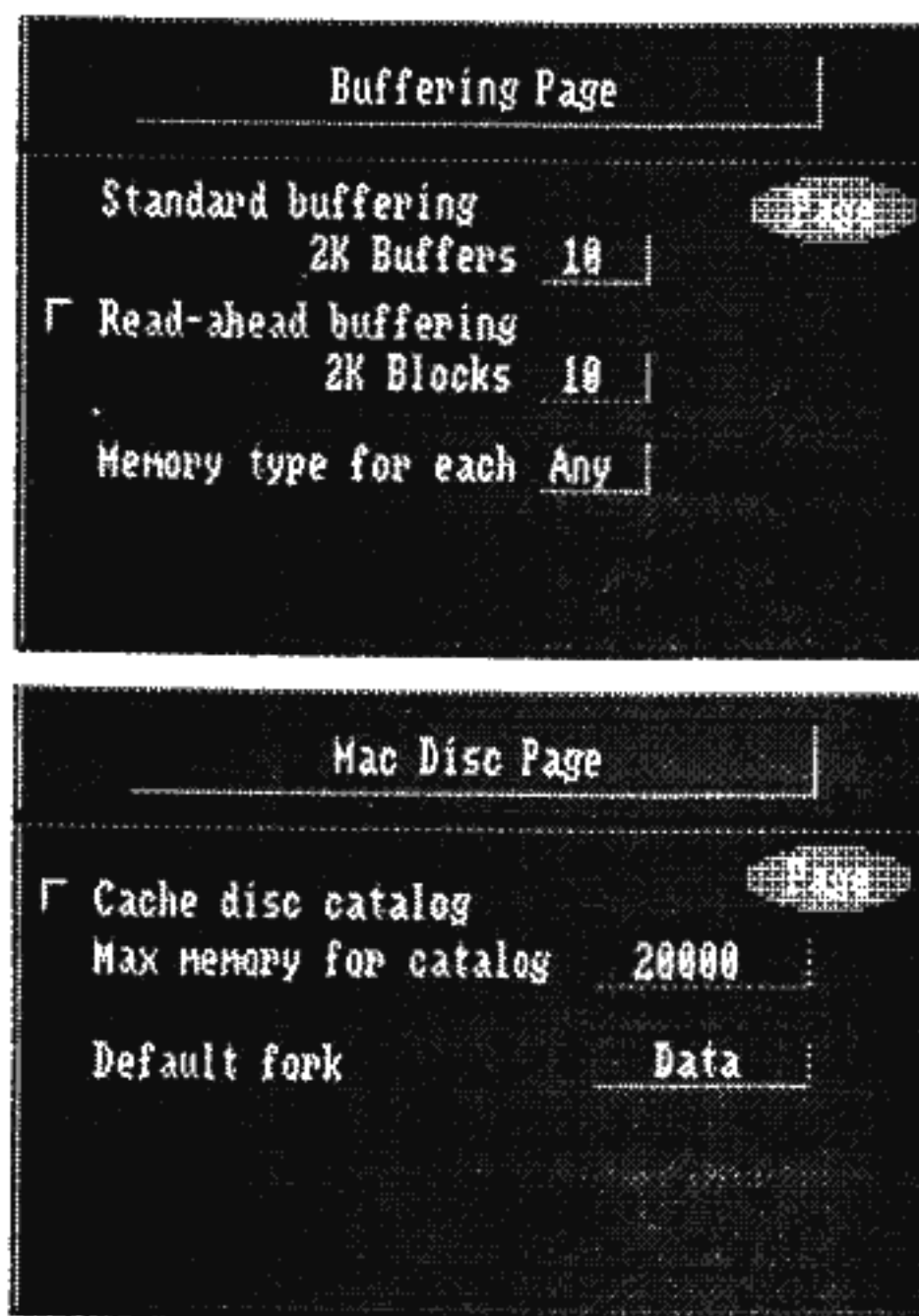
As new features are added to the software, new options or entire pages of options may be added. If you find any options not covered here, check the *ReadMe* file on the CDx Install Disk for their documentation.

Some of the following options are values and some are switches. The values are adjusted as usual — click on it to get a cursor, then use editing and typing to enter new values. The switches turn on or off each time you click on them. Note that a switch is on when it is pressed inward and glows red.

**Device name** — enter here the device name you want to use when accessing CD-ROM discs from applications or the CLI. We recommend *cd0:*, but if you prefer *cdrom:* or something else, you can change it. Be warned, however, that some CDTV® titles expect the drive to be called *cd0:* and won't work otherwise (unless you trick them with an *ASSIGN*).

**Stack** — size of the stack for the *CDxFileSystem*.

**Priority** — process priority for the *CDxFileSystem*.



**Fig. 16 – Buffering and Mac Disc Option Pages**

**Auto disc changes** — if selected, the CDx software will automatically detect disc insertions and removals and act appropriately. This may cause a periodic flickering of your SCSI activity LED, but makes swapping discs as simple as changing floppies. If you don't change discs very often (like once per day on a BBS), you may opt to shut off auto disc changes. If you do so, you must inform the CDx software whenever you insert or eject a disc (using *diskchange cd0:* or *CDchange*).

**Auto-mount on startup** — this option lets you decide whether you want the CD-ROM drive mounted in your system automatically every time you boot your computer. If this option is on, a line will be added to your startup-sequence which will mount the drive for you. By shutting this option off, you retain control over if and when the drive is mounted. If your memory is at a premium, you may not want the CD-ROM mounted unless you are going to be using it. If you shut this option off, you will not be able to access data discs or play audio CD's until you issue a "*mount cd0:*".

**CDTV Emulation** — this option allows you to disable or enable the CDx software's CDTV emulation. Usually, this should be turned on so that CDTV titles will think they are running on a true CDTV machine.

Some discs may be written to detect whether running on a CDTV or on an Amiga computer. If the disc's documentation shows extra features when running on an Amiga, you may need to shut off CDTV emulation so that the disc knows it really is running on an Amiga.

This option really only sets the default state of the CDTV emulation switch. You can quickly switch it on and off from disc to disc using the *CDTVemul* utility (see p. 42 for more information).

**Force protect bits to ----r-e-** — this option, when on, causes all files accessed from a disc to have their *Write* and *Delete* privilege bits cleared. This may be necessary for certain programs to execute properly from read-only media like CD-ROMs. If this option is shut off, files on discs such as the **Fish & More** volumes will have the originally intended protect bits. Some discs (especially discs from non-Amiga platforms) may not have protect bits encoded into them, in which case all files get *Read* and *Execute* privilege bits only, regardless of the setting of this option.

**Requesters for write/delete attempts** — this option determines how attempts to delete or modify parts of a CD-ROM disc are handled. If turned on, requesters will appear as they would for a write-protected floppy. If shut off, operations that intend to write, delete, or modify the disc will be ignored.

**CDDA click action** — when a CDDA disc (your basic audio CD) is inserted, an icon labeled *CDDA* appears on Workbench (only under 2.0 systems and later). This option selects what happens when you double-click on this icon:

**Built-in** Enables a “cheap and dirty” audio CD player. The first double-click will start the disc playing, and subsequent ones will cause play to skip to the next track, until the last track is surpassed, at which time audio play will stop.

**Script** Causes a script to be executed which, by default, brings up *CD Remote*, the full-featured audio CD player. You can change this script, however, to do just about anything you can dream up. See p. 48 for details and an example.

**Maximum read retries** — this value governs how the *CDxFileSystem* will act when having trouble reading data from a disc. Enter here the maximum number of times it should retry a data read before giving up (and displaying the “read error” requester — see p. 32 for more info). Note that this value does not affect the CD-ROM drive’s own built-in error correction/retry scheme (if any). If the drive’s built-in retries fail, the CDx software performs the specified number of additional retries.

**Standard buffering, 2K Buffers** — specifies number of RAM buffers that the *CDxFileSystem* can use for buffering. Using more buffers can reduce disc seeking by reading recently-read data from RAM rather than from disc whenever possible. Be frugal, these are 2048-byte blocks, not 512 like hard drives and floppies!

**Read-ahead buffering, 2K Blocks** — this option is both a value and a switch. When turned on, the *CDxFileSystem* performs anticipatory (look-ahead) reads. The idea is to read in enough data at one time so that a lot of seeking can be eliminated (since most CD-ROM drives read data much more efficiently than they seek). The value of this option sets the size of the reads



(in 2K blocks) to be buffered for future use. Notice if the switch is turned off, no extra memory is consumed regardless of the set value.

The performance of your system will greatly depend on processor speed, SCSI controller used, and the size of the read-ahead buffer selected. The drive used in the complete CDx-650 systems has a quick enough seek, however, that in all installations tested so far, read-ahead buffering actually degraded performance.

**Memory type for each** — click this box to select the type of memory to be used for both standard and read-ahead buffering. Choices are *any*, *chip*, and *fast*.

**Cache disc catalog** — when a Macintosh® HFS disc is loaded, this switch determines whether to read the disc's catalog into RAM. The disc catalog describes the layout of the files on the disc and is required to get directories or locate a particular file. If this option is turned on, part or all of the disc catalog will be copied to RAM when the disc is first inserted, thereby making subsequent accesses substantially faster. With this option turned off, files are located by referencing the catalog on the disc, which results in extra disc accesses and slower overall performance.

If a catalog is cached to RAM, it is freed back to the computer's free memory when the disc is ejected.

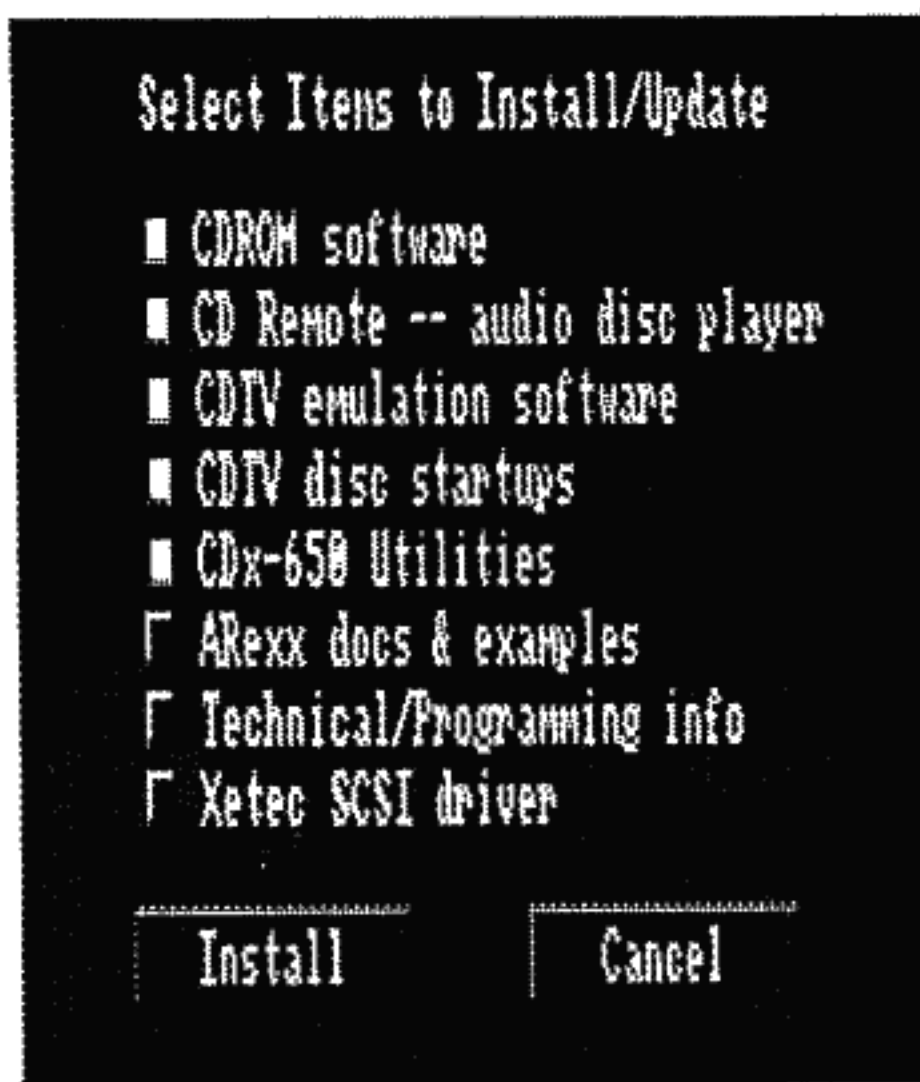
**Max memory for catalog** — this value sets the desired maximum amount of RAM (in bytes) that you want to allot for caching HFS disc catalogs. Keep in mind that this RAM is only consumed while an HFS disc is loaded, and that it is only a maximum value — if the disc catalog is smaller, only the needed RAM will be allocated. If the disc catalog is too large, as much of the catalog will be loaded as possible. The rest will be accessed from disc when necessary.

**Default fork** — for HFS discs, this selects which of a file's fork to access by default (*Data* or *Resource*). This default can easily be overridden. For more information about accessing Mac HFS discs, see page 35.

## Installing the CDx Software

Now that you are familiar with the *CDx Install* user options, it's a simple matter to install the CDx software in your system.

Hopefully you already have the CD-ROM hardware connected, so if you have not done so already, boot your computer as you normally do (off a boot floppy, hard drive, etc.). It's important how you booted your system when installing the CDx software, since it automatically installs itself onto whatever partition ended up being *SYS:*. If your system is setup for several optional boot methods, you can install the CDx software onto each drive by repeating the following bootup—installation process for each method of booting you use.



**Fig. 17 – Installation Menu**

Using the CDx Install Disk, bring up the *CDx Install* program and enter all necessary data such as the type of SCSI controller, type of CD-ROM drive, and its SCSI ID. Also adjust any options that you wish to change.

When all values and options are set appropriately, click on the *Keep* button. If the program suspects a problem with your SCSI controller settings, you will receive a warning (you should find and correct the values). If all seems well, the installation menu will appear (fig. 17). This gives you control over what parts of the CDx software you want installed in your system. This allows users who boot from a floppy or from a cramped hard drive partition to still be able to install the software by cutting out some of the extras. On boot drives where space is not at a premium, we recommend installing *all* parts of the CDx software.

Here is a brief description of each entry:

**CD-ROM software** — the really important stuff — the *CDxFileSystem* as well as the lower level *cdx.device*. You should always install these files.

**CD Remote -- audio disc player** — the full-featured audio CD player. You should install this if you have an audio-capable CD-ROM drive and wish to play audio CD's using the *CD Remote*.

**CDTV emulation software** — several devices and libraries that must be installed to run some CDTV titles. Note that if this software is not installed, CDTV emulation will not work, not even if you turn the emulation switch "on" during installation or with *CDTVemul*.

**CDTV disc startups** — the icons for starting CDTV titles automatically, including icons specifically crafted for discs requiring special startups.

**CDx-650 Utilities** — *CDx Install* program as well as various utilities for use from the CLI.

**ARexx docs & examples** — info for those interested in controlling the CD-ROM using ARexx.

**Technical/Programming info** — info for programmers interested in accessing and controlling the CD-ROM drive. Includes docs and “C” examples.

**Xetec SCSI driver** — this entry only appears if a Xetec SCSI controller was selected during setup. Only choose this option if you have just added a Xetec controller as a dedicated interface for the CD-ROM.

Click on each entry in the installation menu to turn its switch on or off (pushed in for “on”). When you are satisfied with your choices, click on the *Install* button.

*CDx Install* will first check to make sure that your *SYS:* partition is writable and that it has enough room to receive all the files you requested. If they will not fit, a requester will appear showing how much additional room is needed. You will need to free up the needed space or select fewer entries and try again.

If *CDx Install* calculates that all the files will fit on your drive, copying begins. If you are installing to a floppy on a single-drive system, you will be prompted for disk changes every so often. When complete, a message will appear stating that all your selected files have been installed successfully.

Next, your hardware settings (controller and CD-ROM information) as well as your option settings are all automatically saved. A message to this effect will appear when done.

That’s it! You’re installed. The CD-ROM drive should be mounted after the next reboot. (If you want to mount it immediately without rebooting, just type *mount cd0:* or whatever device name you specified.)

## Modifying Options

If you ever wish to modify any of the values or options originally set during installation, just call up *CDx Install* again (either from the CDx Install Floppy or from your system drive if you chose to install it).

Your current settings will appear, which you can then edit. Click on the *Keep* button to save the new settings or *Cancel* to abort. If the program asks you if you want to re-install the CDx software, answer “no”.

*CDx Install* will attempt to immediately propagate any changes to all parts of the CDx software that may be currently running. Changes to some options may not take effect until the next reboot, so if you notice no change, try rebooting.

## Updating the Software

In order to update your CDx software to a newer version, you will first of all need to obtain the newer CDx Install Disk. See appendix C for information on obtaining one.

To replace your older software with the new release, just follow the instructions above for installing the CDx software. You *MUST*, however, use the *CDx Install* program included on the new disk. Also, when you click on the *Keep* button, the program will inform you that CDx software is already installed, and will ask you if you want to re-install it. Select "Yes" so that the new software from the floppy will overwrite the older software on your drive.

## Installing Multiple Drives

*CDx Install* has the ability to install and maintain up to eight distinct CD-ROM drives. You must currently run the program once for each drive to be installed or updated. For the first drive, just use the program as usual. For each additional drive, start the program from a CLI or shell like this:

**CDx Install 2**

for the second drive, or you can specify 3, 4, etc. up to 8. Notice the *Unit* field in the screen's left box (fig. 14). This shows which drive you are currently working with by highlighting its number. You cannot change the number except by quitting and restarting the program.

# ACCESSING DISCS

- *General Issues*
- *Using Workbench*
- *Using CLI*
- *Using Applications*
- *Applying Foreign Discs*
- *Macintosh HFS Discs*

# General Issues

Now that your CDx CD-ROM system is connected and installed, you are probably anxious to begin using it. This chapter covers the various ways that you may go about accessing CD-ROM data discs.

Once the CD-ROM drive is mounted, *cd0:* is just as much a part of your computer system as is *df0:*. In fact, your CD-ROM drive will often resemble a floppy drive in the way it behaves in the system (except that it's read-only and incredibly larger).

## Disc Changes

If the *Auto disc changes* option in *CDx Install* is turned on, the CDx software will watch the CD-ROM drive for disc insertions and removals and causes the appropriate steps to be taken for each. When a disc is inserted, for example, after a few seconds an icon will appear on the Workbench. When a disc is ejected, its icon will disappear, assuming nothing in the system has a *lock* on it. If so, the icon will go away as soon as the last lock is removed (just like for floppies).

If, however, the *Auto disc changes* option is turned off, you are responsible for informing the CDx software after any disc is inserted or ejected from the CD-ROM drive. There are two ways to perform this "manual disc change:"

**diskchange cd0:**                    -or-                    **CDchange**

The first method is just another use of the standard AmigaDOS *diskchange* command, whereas the other is specifically written for the CDx software. It is located in the *Utils* directory.

Note: CD-ROM auto disc changes still function even if Workbench is not loaded or is shut down.

## Read Errors

Most CD-ROM's have automatic error detection/correction circuitry and software designed to provide only good data to the *CDxFileSystem*. If the drive ever has a problem reading data (maybe due to a scratched disc, dirty read lens, etc.), the CDx software will repeat the request to the drive a number of times (specified by *Maximum read retries* — see p. 26). If it repeatedly fails to gather the requested data, a special requester will appear that may look something like this:

**Volume MegaPics  
has a read error**

Notice that it said *read* error, not *read/write* like for hard drives and floppies. If you get one of these, try cleaning the disc and the drive's lens.

Another requester you might encounter looks something like this:

**CD-ROM Read Out Of Range  
\$0010252A-\$0010253C**

This indicates that corrupt data was read from the disc. The cause of this could be a bad disc, dirty disc, dirty drive lens, or an unsupported disc format.

## Using Workbench

All data discs (in supported formats) when inserted will cause an icon to appear on Workbench. The name of the icon will reflect the title of the disc volume.

Except for CDTV discs and CD-ROMs mastered specifically for the Amiga, most discs are not useful from Workbench. If you open the disc's icon, you will usually get just an empty window. Macintosh and Windows™ icons are not compatible with Workbench and so will not appear.

Under Workbench 2.0, however, you can see the contents and wade through the disc by using the *Window/View By* menu option, setting it to *Name*, *Date*, or *Size* (not *Icon*).

Many CDTV discs contain icons that do nothing or do not work properly; these are usually icons leftover from development on Amiga systems that were never properly cleaned up. Although some discs do have functional icons, most discs must be started using the included CDTV startups (see the chapter on *CDTV Emulation*).

## Using CLI

From a CLI or shell, you can access any data disc that is of a format supported by the CDx software. Once again, the CD-ROM device (cd0:) resembles in many ways the floppy device df0:. Here are a few things you can do with the CD-ROM from a CLI:

- 1) Set it as the current directory: *CD cd0:*
- 2) List files on the disc: *DIR cd0:* or *LIST cd0:*
- 3) Copy files from the disc: *COPY cd0:pics dh0:mypics ALL*
- 4) Show information about the disc: *INFO cd0:*
- 5) Run an Amiga-compatible program by typing its name: *cd0:game*

This is just a small sample. Except for commands that attempt to delete or modify files, you can use *cd0:* with just about any CLI command.

Notice the following subtleties about accessing CD-ROM discs from CLI. Audio CD's and discs of an unsupported format both appear as *not a DOS disk*. If you attempt to access a drive when no disc is present, you will get an error like *Can't find cd0:*. If the current directory is set to some area of a disc and that disc has been ejected, any attempt to access anything relative to that current directory will cause a requester of this nature:

**Please replace volume  
MegaPics  
in any drive**

Obviously, the removed volume must be replaced in any *CD-ROM* drive.

## Using Applications

It is also quite easy to access CD-ROM discs from within your favorite application programs. All applications can be broken down into three major categories, depending on their method of loading files.

Most applications use some sort of file requester to let you specify what file to load or use. If that file requester has a *devices* or *devs* button or selection, click on it to show the computer's device list. Then just click on *cd0:* or the volume name of the disc in the CD-ROM drive to bring up the disc's directory. From that point on, use the file requester just like you would if the file was coming from a hard drive or floppy.

If the file requester doesn't have a *devs* feature, just type *cd0:[RETURN]* into the gadget labeled *Drawer*, *Drive*, or *Path*. The CD-ROM disc's directory should then begin to appear.

Lastly, for older applications (and some PD stuff) that requests you to just type in the filename, simply specify the path to be from the CD-ROM (for example, *cd0:pics/Nagel7*).

Some programs, like SID, are configurable enough to allow you to dedicate a special button just to refer to the CD-ROM.

## Applying Foreign Discs

The *CDxFileSystem* can give you access to many types of CD-ROM discs that were not mastered for Amiga systems. These discs are termed *foreign* because the data and programs on them, although accessible using the CDx software, is not always directly usable on an Amiga.

Many good-quality discs are readily available for IBM and Macintosh systems. Unfortunately, much of the data on these discs is scrambled or compressed in



a way that only the *retrieval software* can understand. The *retrieval software* is usually on the same disc as the data, but is written to run on the target system (not on an Amiga).

On a more positive note, many discs do contain data which, although foreign to the Amiga, can be translated by various means. For example, pictures or sound files from other platforms can be read in and easily translated to IFF by readily available software.

Also, many discs are available which are simply archives of data, not mastered for any one specific platform. The U.S. Government, NASA, and various universities are the largest source of these types of discs.

As we find or write utilities to translate or make use of various data from foreign discs, we will make them available on the CD-ROM/Support section of our BBS (see Appendix B).

Note that not only do most CDTV titles run on Amiga's using our emulation software, but much of the data on those discs is in a format that can be accessed directly (i.e. IFF pictures). Be careful, however, about what you do with that data, as most of it is copyrighted material.

## Macintosh HFS Discs

The *CDxFileSystem* can also read the Macintosh HFS (Hierarchical File System) format. Keep in mind that, just like IBM discs, Mac discs cannot directly run on the Amiga due to hardware differences, but much of the data can be used or imported.

The HFS format is not an agreed standard, but is the format chosen internally by Apple, Inc. For this reason, the format is heavily Mac-based and therefore requires some special measures in order to access these discs on the Amiga.

### Filename Translation

One peculiarity about HFS discs is their frequent use of special symbols in file and directory names. To further complicate matters, the Mac does not use the ISO standard international ASCII used by the Amiga. Also, the Mac allows nasty things in filenames like slashes ('/') and non-breaking spaces (look just like spaces). To alleviate all such problems, an internal translation table is used to make all HFS file and directory names suitable for processing thru AmigaDOS. Any non-standard characters are translated before you see the name. In other words, files and directory names show up in CLI and applications in their translated form. They should be accessed by this same translated form.

Tables showing the translation from Mac to Amiga character sets appear in Appendix E, p. 60 for easy reference. Notice that some characters translate nicely (® to ®), and some not so nicely († to †). These tables are especially useful as they show the key sequences needed to generate some of the more obscure Amiga characters.

Some translations to call to your attention:

- All forward slashes (/) are changed to back-slashes (\) because the slash indicates sub-directories in AmigaDOS
- Non-breaking spaces (NBSP) are changed to normal spaces to avoid confusion
- Any undocumented Mac characters are changed to '!'
- Several pairs of Mac characters map to the same Amiga character (the *logical not* and ™ both to '¬' for example)

### Filename Length

Another problem when accessing Mac discs on an Amiga is that the two machines have different limits on filename length. Files and directories on the Amiga can be up to 30 characters long, while those on the Mac can be up to 31 long. Occasionally, you will run across a file on an HFS disc that is indeed 31 characters long. Here is how such names are handled:

- When reading the name from disc (for example, when doing a *DIR*), the full name is provided (all 31 characters)
- When searching for the name (for example, to open or load the file), you can usually specify all 31 characters, although only the first 30 characters are compared.

This method of handling long names also works well in application file requesters.

### Other HFS Quirks

Some Mac developers like to tack on trailing spaces on their filenames (either intentionally or carelessly). This can lead to confusion and frustration when trying to open a file, so all trailing spaces are clipped off when filenames are translated for use in AmigaDOS.

Another problem with a few HFS discs is that they contain occasional files with a datestamp of sometime in 1904! This is obviously a CD-ROM disc mastering bug, since they show up that way on a real Mac. The Amiga has amnesia when it comes to events prior to 1978, so all such weird dates are changed to Jan 1, 1978.

## HFS Disc Catalog

Macintosh HFS discs contain a special table known as the disc catalog. This information fully describes the layout of all the files and directories on the disc. In order to access files or navigate the disc, this information must constantly be accessed and used.

To minimize the extra time required to refer to the disc catalog, you can turn on the *Cache disc catalog* option in *CDx Install*. With this on, when a Mac HFS disc is inserted, its disc catalog is retrieved and kept in memory. Although this consumes extra memory and takes a few extra seconds up front, accessing thereafter proceeds much quicker than usual. The catalog and memory are freed up again when the disc is ejected.

Since different Mac discs have widely varying disc catalog sizes (ranging from 2K to more than 250K), you are also given control over where to “draw the line” when it comes to caching the disc catalog. The *Max memory for catalog* value in *CDx Install* determines the largest amount of RAM to allow the disc catalog to consume. If you don’t care, just set it ridiculously high (like 999999). If a disc needs more RAM for the disc catalog than you have allowed, as much of it will be loaded as possible. The rest will be accessed from disc when necessary.

## **HFS Forks**

On Macintosh discs, all files have two parts (or forks): a *data fork* and a *resource fork*. The resource fork portion usually contains an application’s program code and any resources it might need, whereas the data fork holds any data for the program. For pure data files, the “goods” are usually found in the data fork.

Unlike other systems (like the Amiga and PC) where these two related files might be differentiated by different suffixes or extensions, the Macintosh lumps the two forks together, referenced by the same name.

### Fork Selection

To get access to one or the other fork, some method of specifying the fork had to be devised. This is done two ways. First of all, the *Default fork* option in *CDx Install* lets you pick which fork is assumed unless specified otherwise. To override this default, or just to be specific about the fork you desire to access, simply tack on one of the *fork specifier* suffixes:

- <sup>1</sup>     for data fork            (press Alt-1)
- <sup>2</sup>     for resource fork       (press Alt-2)

For example, for a data file called *StarsPic*, open *StarsPic*<sup>1</sup> to access the data fork, or *StarsPic*<sup>2</sup> to access the resource fork. This works in CLI as well as in applications.

## Locks and Forks

All locks on HFS discs are assigned either to the data or resource fork. When directory information is requested, info about the selected fork is given. In other words, if the lock on an HFS directory is currently set to the resource fork, a *LIST* command will return the size of the resource fork for each file listed. If set to the data fork, the size of the data fork for each will be listed.

How is the fork for each lock chosen and changed? Very similarly to how you specify the fork of a file, using the <sup>1</sup> or <sup>2</sup> suffix. For example, to examine the directory called *Images*:

*CD Images*<sup>1</sup>      to CD (lock) to Images in the data fork  
*LIST*              to list the data fork for each file

or

*CD Images*<sup>2</sup>      to CD (lock) to Images in the resource fork  
*LIST*              to list the resource fork for each file

You will find that the *fork specifiers* are very flexible. Here are some example of how they can be used:

- Specify explicit file fork to access: *COPY StarPic*<sup>2</sup> *TO RAM:junk*
- Temporarily lock other fork in the current directory: *LIST* <sup>1</sup> or *LIST* <sup>2</sup>
- Quickly change forks in the current directory: *CD* <sup>1</sup> or *CD* <sup>2</sup>
- CD to a relative subdirectory and a specific fork: *CD Images*<sup>1</sup>
- CD to an absolute subdirectory and a specific fork: *CD cd0:test/Images*<sup>1</sup>
- CD to a disc's root and a specific fork: *CD cd0:*<sup>2</sup>

## Inherited Fork Types

If you make or move a lock (like using *CD*) and do not specify the fork to lock, normally the new lock will inherit the fork type from the previous lock. For example, if you are CD'd to *cd0:Images*<sup>2</sup> and just enter *CD Space* the new lock (*cd0:Images/Space*) will inherit the "resource fork" type from the old lock.

The only exception is when you reference the root of the disc (an absolute path) such as *CD cd0:Images* or *CD :Images*. In these cases, the new fork type is determined by the default fork (set in *CDx Install*). This is to ensure that newly created locks on the disc start with the default fork type.

## Fork Type Indicators

File and directory names of HFS discs must also indicate back to the user which fork they describe. This is done by using the same **fork specifiers** used for input (<sup>1</sup> and <sup>2</sup>). For both files and directories, if they describe the default fork, no indicator is provided. But if they describe the other fork, the appropriate specifier is tacked on as a reminder.

For example, if the default fork option in *CDx Install* is set to the data fork, the command *LIST cd0:1* might produce this:

```
Directory "cd0:" on Monday 22-Jun-92
Credits          363 ----rwed 13-Aug-88 22:23:52
Desktop         empty ----rwed 13-Aug-88 22:23:57
Images          Dir ----rwed 13-Aug-88 22:26:16
© 1988 xyz Inc   49 ----rwed 13-Aug-88 22:22:18
```

while the command *LIST cd0:2* would produce this:

```
Directory "cd0:2" on Monday 22-Jun-92
Credits2        empty ----rwed 13-Aug-88 22:23:52
Desktop2       1344 ----rwed 13-Aug-88 22:23:57
Images2        Dir ----rwed 13-Aug-88 22:26:16
© 1988 xyz Inc2 empty ----rwed 13-Aug-88 22:22:18
```

Notice the different sizes of the two forks for each file.

Also, in an AmigaDOS shell, the current directory (shown at each prompt) will show the fork type similarly (if it differs from the set default).

For example, if the resource fork is the default, the command *CD cd0:Images* or *CD cd0:Images<sup>2</sup>* might produce a prompt like this:

```
TestDisc:Images >
```

where the command *CD cd0:Images<sup>1</sup>* would change it to

```
TestDisc:Images1 >
```

# Notes

# CDTV EMULATION

- *Compatibility*
- *Memory*
- *Startup*
- *Environment*
- *User Input*
- *Emulation Software*

Included in the CDx software is a set of libraries and devices that perform CDTV emulation on an Amiga. This software, together with the rest of the CDx software, your SCSI controller, and CD-ROM drive, attempt to simulate the extra features present on a true CDTV machine. Due to the modular nature of the Amiga (and CDTV) operating system, if the emulation software is written correctly, it should be impossible for a CDTV title to tell it's not really running on a CDTV.

Depending on your particular system and CD-ROM drive, a few features may not be emulated. In most cases, however, the penalty is slight, and the emulation software pretends it succeeded so the game or application will continue to run. A good example of this is the software volume control of the CD-ROM audio outputs. Most drives do not have this ability, but the CDTV title will never know this.

Some discs play digital audio tracks from the disc as well as digitized sounds from the Amiga hardware. In order to use these discs fully, you must either have the outputs from your computer and CD-ROM drive mixed together, or must run both of them to their own monitor or amplifier.

Be aware that in order to expect CDTV emulation to occur, you must make sure the emulation software is installed onto your *SYS:* drive (by selecting it from the installation menu in *CDx Install*). Also, the *CDTV emulation* flag in the same program must be turned on. If you want to override this flag, use the *CDTVemul* utility found in the *Utils* subdirectory:

<b>CDTVemul</b>	<b>ON</b>	to turn CDTV emulation on
<b>CDTVemul</b>	<b>OFF</b>	to turn CDTV emulation off
<b>CDTVemul</b>	<b>SHOW</b>	to display the current setting of this flag

## Compatibility

Most every CDTV title currently available (at the time of this writing) will work properly on a stock Amiga as long as enough memory is present and the disc is started properly (see below). Some discs will run just fine using the standard Amiga software, and some need the CDTV emulation software installed and enabled in order to run.

Most titles work on both *PAL* and *NTSC* systems, but several are written specifically for one or the other.

Also, some discs will not run properly under the 2.0 operating system. This is usually due to poor programming practices on the part of those who wrote the disc. Keep in mind that some types of software bugs don't surface under 1.3. Your remedy for a disc like this is to only run it under the 1.3 operating system (or get an updated release from the disc's manufacturer).



A few discs also have problems running on a machine with an enhanced CPU (such as a 68020, 68030, etc.). Once again, this is often due to poor programming practices, including basing the applications timing on the processor's speed. If you can disable your coprocessor and use the Amiga's standard 68000, these discs will usually run. (Sorry A-3000 users—request an updated version of the disc.)

For a current compatibility list of CDTV titles, along with footnotes for those having any of the above-listed problems, see the *ReadMe* file in the *CDTV* directory of your CDx Install disk.

## Memory

Generally, CDTV titles will only run on Amigas that have 1 Meg of chip RAM. Some may work on machines with only 512K, but certain features probably won't work (graphics- and audio-intensive features). Even if you have 1 Meg of chip RAM, a disc may not play correctly if your system is gobbling up too much of it (for background programs, drive partitions and buffering, etc.). CDTV's have about 850K of chip memory remaining after the operating system takes its share; compare your available chip RAM with this amount if having problems (use the command **avail chip** to find the amount of free chip RAM). Adding more memory to your system will usually free up more of the chip RAM because the system will use fast (non-chip) memory first.

If a particular disc is showing signs of garbled or flickering graphics or icons, it is probably using *fast* RAM improperly. Since the CDTV has only chip RAM, poorly written software may not specify which type of RAM it wants, and may be getting *fast* RAM by mistake. To cure this, just disable any *fast* RAM in your system before running the disc by using the standard utility *NoFastMem*. Use it again to enable your fast RAM after finished using the CDTV disc.

## Startup

Unlike on a CDTV machine, a CDTV disc is not automatically run when inserted into your CD-ROM drive. You can access the files contained on the disc, or you may start it running whenever you like.

The simplest way to start a CDTV disc running is to use one of the *startup icons* included with the CDx software. These are only installed on your drive if you choose them from the installation menu in *CDx Install*. Most discs can be started properly by using one of the "Generic" startups. Some, however, require special startup procedures. All special startup icons provided are separated by category into separate drawers.

## Environment

Sometimes a CDTV title that is known to work will not function properly on a system, even though all the above caveats have been checked out. Often the culprit is some other program that has been run on the system or is currently running in the background. This could be due to memory consumption, or the program may have altered the system to a state that the software cannot handle (especially true of “hacks”).

Try to eliminate all “clutter” programs from your *startup-sequence* (or *user-startup*) by “commenting out” any questionable programs. If after rebooting, the disc runs fine, you may try to isolate the offending program by adding them back in, one by one.

## User Input

For most discs, the CDTV’s infrared controller functions are emulated by the Amiga’s standard keyboard and mouse in a straightforward manner:

- The left and right mouse buttons act as the *A* and *B* buttons on the controller.
- Moving the mouse is equivalent to using the four directional keys on the left side of the controller.
- The keyboard’s numbered keypad corresponds to the numbers on the controller.
- The keypad *Enter* key corresponds to the *Enter* key on the controller.
- The keyboard’s *Esc* key corresponds to the *Escape* key on the controller.

The other keys on the CDTV controller have no equivalent, although you can control playback of audio CD’s using the *CD Remote* program.

Some programs decode the keyboard more fully, such as assigning features to the function keys and accepting the keyboard arrow keys as a substitute for the controller’s arrow buttons.

# Emulation Software

## cdtv.device

This is the device that gives CDTV discs low-level access to the CD-ROM. No documentation is included for it, as it's only intended to be used by existing CDTV titles. For low-level access, use the fully documented *cdx.device*.

## bookmark.device

This device emulates the CDTV's non-volatile memory. This memory can be used to hold high scores, program options, etc. as well as the preferences for the machine. Since the standard Amiga has no such memory, our bookmark.device emulator simulates it using a disk file.

Two different levels of CDTV compatibility are possible with this device:

- 1) Simply the presence of this device (when installed in your system) allows the two "standard" CDTV utilities *rmtm* and *CDTVprefs* to function properly. This allows most CDTV discs to be started with a generic startup that employs the disc's stock startup.
- 2) To obtain full CDTV bookmark compatibility, you must fire up the other half of the bookmark memory emulator by putting

**run BookmarkMem <Size> <Language>**

in your system's startup-sequence. *Size* is the number of bytes of non-volatile memory you want to emulate. If no value is given, 2048 will be assumed (what the CDTV has). The *Language* parameter allows you to pick what language you prefer the software to use (if it's written to be multi-lingual).

If you installed the CDTV emulation software on your system drive, the *BookmarkMem* command will be in our *Utils* directory. Here's an example:

**run sys:XetecCDROM/Utils/BookmarkMem 2048 German**

## playerprefs.library

This library is included to provide additional CDTV compatibility. Various programs, including *bookit*, require this library in order to function.

## Notes

# PLAYING AUDIO CD'S

- *CDDA Icon*
- *CD Remote*
- *Audio Utilities*

In order to play audio compact discs (CD's) with your CDx CD-ROM system, you need two things — a way to hear the output and the means to control the drive.

The easiest way to listen to a CD is to plug ordinary headphones into the jack on the front panel. If you purchased a **CDx-650E** or **CDx-650LE**, you can use an adaptor cable (Radio Shack cat. no. 42-2481A) plugged into the jack on the back panel to connect the drive to your home stereo (Aux, CD, or Tape inputs). Audio line outputs are usually provided on the rear of most drives that support audio discs (you may need a special connector or cable, however).

There are many ways that you may control the playback of audio discs, ranging from using the flashy **CD Remote** program, to controlling the drive yourself from within your own programs.

## CDDA Icon

On 2.0 Amiga systems, whenever an audio CD is inserted in the drive, an icon labeled **CDDA** appears on Workbench. When this icon is double-clicked, one of two things happens, depending on the setting of the **CDDA click action** option in **CDx Install**:

**Built-in** Enables a “cheap and dirty” audio CD player. The first double-click will start the disc playing, and subsequent ones will cause play to skip to the next track, until the last track is surpassed, at which time audio play will stop.

**Script** Causes a script to be executed which, by default, brings up **CD Remote**, the full-featured audio CD player (see below).

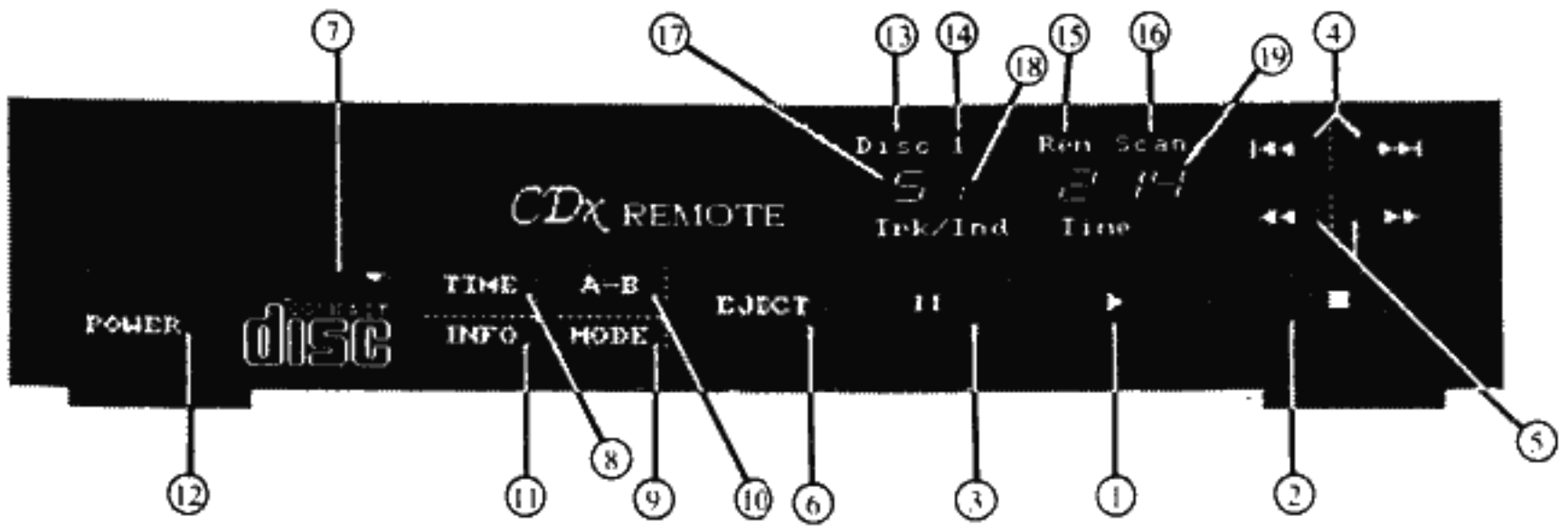
You can, however, change this script (**SYS:XetecCDROM/CDDAscript**) to do just about anything you want. For example, to always play the disc's 5th track, edit the script to read:

```
SYS:XetecCDROM/Utils/CDplaytracks >nil: 5 1
```

Notice that any commands must have an absolute path given. Also notice the output redirection to **nil:**. This prevents a console window from opening when the script is executed.

## CD Remote

This program is a full-featured audio CD player, similar in features and appearance to the CD player in your home stereo. If installed with **CDx Install**, an icon for the program can be found in the **XetecCDROM** drawer, or it can be brought up by double-clicking on the **CDDA** icon on 2.0 systems (see above).



**Fig. 18 – CD Remote Display**

When the program is started, a small screen like fig. 18 should appear at bottom of your display. For anyone who has ever used a real CD player, this player simulator should be easy to use. For those new to audio CD's, here's what each numbered item in fig. 18 performs or represents:

- ① **Play button** — begins playback from the beginning of the first track. While playing a disc, the triangle on the play button will be illuminated. Note that you cannot play a data track; play will skip to the next track or stop.
- ② **Stop button** — stops audio playback and puts the player in the idle state.
- ③ **Pause button** — while playing, press this button to pause playback. The button indicator will illuminate. Press again to resume play. If pressed while player is stopped, the first track will be cued (playback will start as soon as pause is pressed again).
- ④ **Skip backward/forward buttons** — use these buttons in play or pause mode to locate the track you want. While the player is stopped, they can be used to quickly select the first track to be played or cued (by clicking on the play or pause buttons after selecting).
- ⑤ **Scan backward/forward buttons** — while in play mode, these buttons can be used to scan backward or forward through the music at 10 second intervals as long as either is held. While the player is paused, these buttons and the two skip buttons above can be used to accurately cue a specific spot on the disc (down to the second). When the player is unpaused, playback will begin at the cued location.
- ⑥ **Eject button** — stops all disc activity and ejects the disc. The eject button on the front of the drive is usually disabled as long as *CD Remote* is running.
- ⑦ **Volume Slider** — used to adjust the playback volume (even during play). Move to the right for maximum volume. Note: many drives do not support this feature. If yours does not, when you try to move the slider it will “snap back” to the max position when you let go. Also notice that this volume and the volume knob on the front of the drive may interact with each other.
- ⑧ **Time button** — selects the time display mode (see *Time display* below).

- ⑨ **Mode button** — selects the repeat mode: *normal*, *1*, *all*, or *shuffle*. Here's how each works:
- Normal* Plays straight through to the end of the disc unless stop, scan, or skip buttons are pressed.
  - 1* Repeats the current track over and over until stopped.
  - All* Repeats entire disc over and over until stopped.
  - Shuffle* Plays tracks in a random order until stopped.
- ⑩ **A-B Repeat** — used to repeatedly play a section of the disc between any two points. During normal playback, press this button to mark the first point. An **A-** indicator should appear. When play reaches the desired second point (or when you have moved it there using the skip/scan buttons), press the **A-B** button again. Now **A-B** is displayed and the marked section plays repeatedly. To resume normal play, press this button a third time.
- ⑪ **Info button** — pressing this button will add an *Info Unit* under the *CD Remote*. This is described in detail below. To remove it, press this button again.
- ⑫ **Power button** — quits the *CD Remote* player. If a disc is playing, it will still continue to play to the end of the disc, then will stop. This enables you to bring up the player, start a disc, then shut it off, freeing all resources.
- ⑬ **Disc indicator** — lit whenever a disc is present in the drive.
- ⑭ **Mode indicator** — shows the *repeat mode* currently selected (see *Mode button*). Nothing is shown if in normal mode.
- ⑮ **Time mode indicator** — shows the *time mode* currently selected. The *time mode* determines how the playback location is displayed in the *Time display* (see below). No indicator is lit if in the normal time mode.
- ⑯ **Scan indicator** — lit when the drive is scanning for a requested track or cue point.
- ⑰ **Current track display** — shows the current track number
- ⑱ **Current index display** — shows the track's current index number. A track can be sub-divided into multiple parts, each one with a different index number. This usually reads *1*, as few discs have indexed tracks.
- ⑲ **Time display** — shows the current playback disc location in minutes and seconds. The value displayed depends on the currently selected time mode:
- Normal* Elapsed time for the current track is displayed.
  - Remain* Time remaining for the current track is displayed.
  - Absolute* Elapsed time from the beginning of the disc is displayed.
  - End* Time remaining to the end of the disc is displayed.



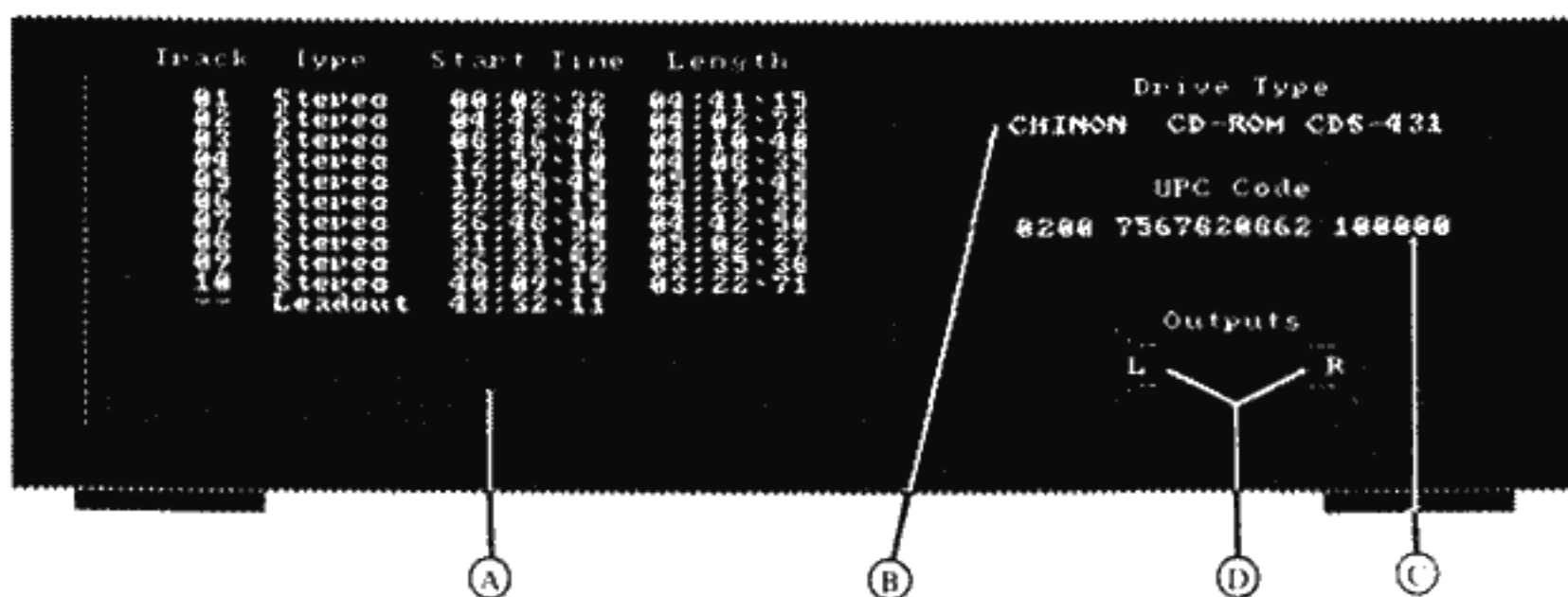


Fig. 19 - CD Remote Info Unit

The *info unit*, displayed by pressing the *Info* button, is shown in figure 19. Here are its features:

- Ⓐ **Disc contents box** — displays detailed contents of the loaded disc, including all audio and data tracks. Here is an example:

Track	Type	Start Time	Length
01	Data	00:02:00	32:25:69
ec 02	Stereo	32:27:69	05:16:07
--	Leadout	37:44:01	

In this example, the first track starts at minute 0, second 2, frame 0, and is a data track. The second track starts at minute 32, second 27, frame 69 and is a stereo audio track; its flags say it has pre-emphasis and it's OK to copy the raw audio data. The last track is the leadout, which begins at 37:44:01. The leadout is considered the end of the disc — you cannot play or read past the start of it. On discs with many tracks, you can scroll the list by clicking on the upper or lower half of it.

- Ⓑ **Drive type** — Shows the model of CD-ROM drive that the *CD Remote* is controlling.
- Ⓒ **UPC code** — about 30% of CD's have their UPC product code (the bar code on the jewel case) digitally encoded on the disc. If your CD-ROM drive supports this feature and the current disc contains its UPC number, it will be displayed in this box. Otherwise, *None* will appear.
- Ⓓ **Output selectors** — these speakers show how the CD-ROM drive's audio channels are currently routed. If your drive supports this feature, you can click on them to change what audio source is sent to each speaker (output). Your options are the *left* signal, *right* signal, or nothing. Start a disc playing and listen to the results as you adjust these. Note: each time the drive is powered on, the default output routing is restored (left signal to left output, right to right output).

## Audio Utilities

Included in the *Utils* directory are several commands that allow you to control the audio functions of your CD-ROM drive. The source code for each of these is included in the *Programming* directory for those who really want control. Note that ARexx functions are available to do similar things.

### **CDplaytracks** <start> <number>

Begins audio playback of one or more complete audio tracks. Play proceeds from the specified start track and continues until the specified number of tracks have been played. Specifying 0 for the number to play will cause the rest of the disc to play.

### **CDplay** <min> <sec> <frame> <min> <sec> <frame>

Instructs the drive to play from one spot on the disc to another and stop. These locations are specified in time from the beginning of the disc in *MSF* (minute/second/frame) format. A frame is 1/75th of a second.

### **CDpause**

Pauses audio playback

### **CDresume**

Resumes audio playback (after being paused).

### **CDstop**

Stops audio playback.

### **CDeject**

Ejects the disc caddy.

### **CDstatus**

Prints status information, including info about the current track and the current playback location.

### **CDcontents**

Prints the disc's *Table of Contents*. Each track is listed, as well as where it starts on the disc (in Min/Sec/Frm format). After the last track is the *leadout* track, which can be considered the end of the disc.

### **CDupc**

Shows the disc's encoded UPC number (if supported by your drive and disc).

### **CDvolume** <left> <right>

This command is only useful on drives that have a software-controllable volume. The *left* and *right* values can be anywhere from 0 (off) to 255 (max). If no volumes are specified, this command prints the current volume settings.

# TECHNICAL INFO

- *CDxFileSystem*
- *Programming*
- *Other Utilities*

# *CDxFileSystem*

The *CDxFileSystem* is the software responsible for adapting the various formats of data CD-ROMs so they are accessible from the AmigaDOS environment. Here is a run-down of the formats this filesystem currently supports:

## **ISO 9660 : 1988 (E)**

Level 2 interchange

Level 1 implementation

Supports logical block sizes of 256, 512, 1024, and 2048

Extended Attribute Records not supported

Supports associated files

## **High Sierra**

Level 2 interchange

Supports logical block sizes of 256, 512, 1024, and 2048

Extended Attribute Records not supported

Supports associated files

## **Macintosh HFS**

Supports any extent size

512-byte catalog blocks

## **Programming**

Included in the CDx software is the *cdx.device*. This guy makes direct CD accessing a breeze by providing CD-ROM-specific commands that are consistent, no matter what brand of SCSI controller and CD-ROM drive are being used. It does all sorts of grungy work for you, including taking into account the wide diversity of CD-ROM command formats. This frees you, the programmer, to concentrate on your application, not the “nuts and bolts.”

It may be interesting to note that the *CD Remote* and *CDxFileSystem* programs employ the *cdx.device* in order to do their things — this shows you what sort of things are possible.

### **“C” Programming**

To use the *cdx.device* from a “C” program (or 68000 assembly, for that matter), all you must do is *OpenDevice* it, then send it I/O commands using the familiar *Exec DoIO* and *SendIO* functions.

Due to the immense number of commands supported by the *cdx.device*, as well as the fact that the list is ever-growing, the latest documentation for this device appears on the CDx Install Disk in the *Programming* directory. Also in this

directory are include files and the source files for the included CLI audio utilities (i.e. CDplaytracks). Various other documentation and/or source code may also be included to aid in your successful use of this device.

## ARexx Programming

The *cdx.device* also has an *ARexx* interface that you can also use to control the drive, if you prefer. For more information about *ARexx*, consult your *Workbench 2.0* or *ARexx* documentation.

The *ARexx* port for the Xetec CDx software is called *CDX650*. You should always check if that port can be found, because there are several conditions which will cause it to be absent:

- 1) Improper installation of the CDx software
- 2) *rexsyslib.library* not found in *LIBS*:
- 3) *cdx.device* installed, but not mounted yet. This can be remedied by mounting *cd0:*, or by using the *FireUpCDx* utility.

Here's a simple *ARexx* example program (the comments in italics to the right are not part of the program, and are not entered).

```
/* CDx ARexx example */
port__name = "CDX650"
if (~show('p',port__name)) then do
    say "cdx.device not running"
    exit
end
address value port__name

options results
CDCHANGECOUNT
if (rc == 0) then
    say "Disc change count is" result
else
    say "Error"
exit
```

*1st line should always be a comment*  
*The name of the CDx ARexx port*  
*Check if the port exists*

*Okay, the port exists. Select it as the*  
*one to communicate with*  
*Allow commands to return result strings*  
*An actual CDx command*  
*Error checking/result printout*

*End of program*

Complete up-to-date documentation of *cdx.device*'s *ARexx* commands is provided on the CDx Install Disk in the *ARexx* directory. Also included here are sample programs to illustrate the use of each supported command (found in the *ARexx/CommandExamples* directory). The *OtherExamples* directory contains some more useful and interesting programs using the *ARexx* commands.

## Other Utilities

### CDxDisc <drive:>

Describes the type of disc, if any, currently loaded in the specified drive. Much more descriptive than the DOS *info* command, as it also informs you if the *CDxFileSystem* is having trouble communicating with the SCSI controller or CD-ROM drive.

### CDxSignature [<device> <unit> <flags>]

All the CDx software shares a common data structure called the *signature*. It contains information about your particular SCSI controller and CD-ROM drive. Normally, this signature is created by the *CDxFileSystem* when you mount the *cd0:* drive. If, however, you want to use other parts of the CDx software without actually mounting *cd0:*, you must use this utility to artificially generate the signature. If no parameters are specified, all information will be picked up from the *Mountlist* (created from your options in *CDx Install*). Otherwise, the parameters you give will override the *Mountlist*.

### SCSI Lister

The purpose of this utility is two-fold. First, it tests your SCSI controller's ability to handle *SCSI direct* commands (used heavily by the CDx software). Also, the program's output can tell you useful things about your SCSI bus, such as the model and revision of each device on the bus, as well as the SCSI ID number for each.

**Usage:** SCSI\_\_Lister [<flags>] [<-avoid> <-avoid> ...]

If the *flags* value is given, it will be used as the *SCSI Direct scsi\_\_Flags* value. Some SCSI controllers may not interface properly to the CDx software until the proper flags value is used (most use 0). Check with your controller's manufacturer for help picking this value.

Also, one or more *-avoid* options may be specified. The program tries to do its thing with all devices that it finds active (since it doesn't know what your SCSI controller's device might be called). The program knows the names of some devices to ignore, including standard devices like *trackdisk.device* as well as some common third party devices. If *SCSI\_\_Lister* accesses a device in your system that it shouldn't, it may just print out errors, or the system could crash. If the latter happens, you may never get to see the real results of the program; the system may hang before the SCSI device gets tested. To rectify this, use an *-avoid* parameter for each device in your system that should be ignored so that the test can proceed. For example, if you have a Cray Y-MP attached to your parallel port and a corresponding *cray.device* that you don't want this program to mess with, the command would look like:

```
SCSI__Lister -cray.device
```

# Appendix A

## Troubleshooting

Symptom	Possible Cause
System doesn't "see" drive	CDx software not installed properly <i>Auto-mount</i> option shut off Wrong SCSI device name or SCSI ID Incompatible SCSI controller/software
System locks up when accessing CD-ROM drive	Improper SCSI bus layout Improper SCSI bus termination Incompatible SCSI controller/software Incorrect <i>CDx Install</i> settings
Info for device says "Not a DOS disk" or "No disk present"	Disc isn't High-Sierra, ISO 9660, or HFS format, or is an audio CD
"Volume xxx has a read error"	Disc ejected during access Dirty or scratched disc Dirty drive read lens Other drive problem
Disc icons not appearing and disappearing	<i>Auto disc changes</i> shut off Not a valid High-Sierra, ISO 9660, or HFS disc
Disc icon opens to empty window	Disc has no Amiga <i>.info</i> icon files
Drive "hiccups" during reads	Read-ahead buffering set too large
<i>CD Remote</i> not working	Drive does not support audio Drive not supported Improper drive selected in <i>CDx Install</i>
Sound from audio CD not heard	Headphone volume knob (front of drive) turned down Improper audio cabling
Some audio features not working	Many drives don't have software control of volume and output routing
CDTV disc not working	Not enough <i>chip RAM</i> Disc incompatible with OS (1.3 or 2.0) Disc not started properly Emulation software can't handle disc

## Appendix B

### Customer Service

If you have a problem that is not covered in this manual, you may obtain help by calling customer service at (913) 827-0685 between 9 a.m. and 4:30 p.m. CST. We cannot help those who have not read this manual. Also, purchasers of the *CDx Disk Set* should know their software serial number before calling (bring up *CDx Install* from the distribution floppy to see your serial number).

Xetec also has a BBS in operation to provide support for all purchasers of CDx systems and software. The number is (913) 827-1974 (Courier HST). You can download on your first call. If, when you call, you discover that you do not already have access to the *Amiga/CD-ROM/Support* section, leave EMail or Feedback to the SysOp stating that you require access (you must give your name and software serial number).

**Do not** return any system or part thereof unless you have first called and received authorization. Any hardware to be returned will require an RMA (return materials authorization). This number helps in tracking the product and in expediting its testing and repair. Call (913) 827-0685 to obtain an RMA.

When shipping a drive, be sure to use the original carton. Include a letter describing the problem and proof of purchase, if under warranty.

The hardware warranty will only be honored if the registration card has been completed and mailed in.

## Appendix C

### Updates and Errata

To be notified of important system updates, you must be registered with Xetec. To do this, you should complete your registration card and mail it in. Bug fixes and/or enhancements are bound to follow. Updated disks are available for a small fee to cover media and shipping costs. You may obtain free updates by downloading the software from our BBS (see Appendix B).

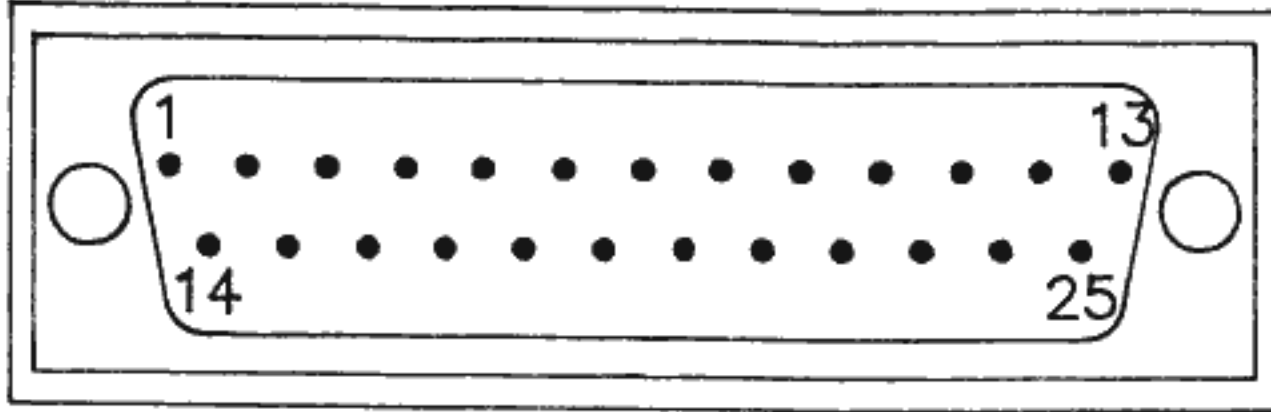
As support for new SCSI controllers and CD-ROM drives is constantly being added (as well as new features), this manual will usually need help from the *ReadMe file* on the CDx Install Disk in order to keep you abreast of the latest features and changes. To read the file, either

- 1) Enter *type readme* (from CLI), or
- 2) double-click its icon (from Workbench)



## Appendix D

### External SCSI Pinout



<u>Pin</u>	<u>Name</u>	<u>Pin</u>	<u>Name</u>
1	REQ	14	Gnd
2	MSG	15	C/D
3	I/O	16	Gnd
4	RST	17	ATN
5	ACK	18	Gnd
6	BSY	19	SEL
7	Gnd	20	DP
8	D0	21	D1
9	Gnd	22	D2
10	D3	23	D4
11	D5	24	No Connection
12	D6	25	No Connection
13	D7		

## Appendix E

### Mac-Amiga ASCII Translation

Name	Mac	Ami	Keys	Name	Mac	Ami	Keys
a acute	á	á	Alt-f a	o acute	ó	ó	Alt-f o
a grave	à	à	Alt-g a	o grave	ò	ò	Alt-g o
a circumflex	â	â	Alt-h a	o circumflex	ô	ô	Alt-h o
a dieresis	ä	ä	Alt-k a	o dieresis	ö	ö	Alt-k o
a tilde	ã	ã	Alt-j a	o tilde	õ	õ	Alt-j o
a ring	å	å	Alt-q	o slash	ó	ó	Alt-o
A grave	À	À	Alt-g A	O dieresis	Ö	Ö	Alt-k O
A dieresis	Ä	Ä	Alt-k A	O tilde	Õ	Õ	Alt-j O
A tilde	Ã	Ã	Alt-j A	O slash	Ø	Ø	Alt-O
A ring	Å	Å	Alt-Q	u acute	ú	ú	Alt-f u
c cedilla	ç	ç	Alt-c	u grave	ù	ù	Alt-g u
C cedilla	Ç	Ç	Alt-C	u circumflex	û	û	Alt-h u
e acute	é	é	Alt-f e	u dieresis	ü	ü	Alt-k u
e grave	è	è	Alt-g e	U dieresis	Ü	Ü	Alt-k U
e circumflex	ê	ê	Alt-h e	i acute	í	í	Alt-f i
e dieresis	ë	ë	Alt-k e	i grave	ì	ì	Alt-g i
E acute	É	É	Alt-f E	i circumflex	î	î	Alt-h i
n tilde	ñ	ñ	Alt-j n	i dieresis	ï	ï	Alt-k i
N tilde	Ñ	Ñ	Alt-j N	y dieresis	ÿ	ÿ	Alt-k y

**Table 1 — International Characters**

Name	Mac	Ami	Keys	Name	Mac	Ami	Keys
slash	/	\	\	trademark	™	⌘	Alt-Z
sterling	£	£	Alt-L	dagger	†	3	Alt-3
yen	¥	¥	Alt-Y	bullet	●	•	Alt-8
cent	¢	¢	Alt-4	not equal	≠	= =	
section	§	§	Alt-S	approx equal	≈	= =	
paragraph	¶	¶	Alt-p	summation	Σ	E	E
Beta	β	β	Alt-s	product	Π	¼	Alt-5
registered	®	®	Alt-r	pi	π	½	Alt-6
copyright	©	©	Alt-e	Omega/ohms	Ω	Ⓟ	Alt-t
divide	÷	÷	Alt-X	Delta	Δ	°	Alt-w
degree	°	°	Alt-w	infinity	∞	~	~
acute	´	´	Alt-f spc	less or equal	≤	<	<
dieresis	¨	¨	Alt-k spc	grtr or equal	≥	>	>
AE	Æ	Æ	Alt-A	integral	∫		Shift-\
ae	æ	æ	Alt-a	radical	√	¾	Alt-7
ord feminine	ª	ª	Alt-v	florin	ƒ	f	f
ord masculine	º	º	Alt-b	Non-break spc	NBSP	space	space
plus/minus	±	±	Alt-z	OE	Œ	O	O
Mu/micro	μ	μ	Alt-u	oe	œ	o	o
partial diff	∂	∂	Alt-d	em dash	—	—	—(under)
question down	¿	¿	Alt-M	en dash	-	-	- (dash)
exclam down	¡	¡	Alt-i	open dbl quote	“	”	”
logical not	¬	¬	Alt-Z	close dbl quote	”	”	”
guillemot left	«	«	Alt-9	open sing quote	‘	’	’
guillemot right	»	»	Alt-0	close sing quote	’	’	’
elipsis	...	.	. (period)	lozenge	◇	⌘	Alt-y

Table 2 — Special Symbols

# Appendix F

## Specifications

### CD-ROM Drive Specifications (models CDx-650I, 650E, 650LE)

<b>Drive Model</b>	Chinon CDS-435
<b>Data Capacity</b>	650 Megabytes
<b>Avg. Access Time</b>	350 ms
<b>Data Buffer</b>	64K
<b>Data Transfer Rate</b>	150 K/sec (sustained)
<b>CD Audio Format</b>	Sony/Philips "Red Book"
<b>CD-ROM Format</b>	Sony/Philips "Yellow Book" modes 1 & 2
<b>MTBF</b>	25,000 power-on hours
<b>Optical Pick-up</b>	Semiconductor Laser
<b>Head Mechanism</b>	Auto-locking linear motor drive system
<b>Frequency Response</b>	20 Hz to 20 KHz
<b>Signal/Noise</b>	75 dB
<b>Audio Line Output</b>	0.55 Vrms (typical), 10K load
<b>Headphone Output</b>	0.52 Vrms (typical), 33 Ohm load
<b>Disc Caddy</b>	4.9" x 5.3" x 0.3"
<b>Operating Temperature</b>	5 to 40C (non-condensing)
<b>Operating Rel. Humidity</b>	20% to 80% (non-condensing)
<b>Operating Position</b>	Horizontal $\pm 5^\circ$
<b>Power Requirements</b>	5VDC @.5A, 12VDC @1.6A (model <b>650I</b> ) 120 VAC, 60Hz, 20VA (model <b>650E</b> ) As marked (model <b>650LE</b> )
<b>Dimensions</b>	5.75"(w) x 8.2"(d) x 1.6"(h) (model <b>650I</b> ) 6.4"(w) x 10"(d) x 2.75"(h) (model <b>650E</b> ) 14"(w) x 12"(d) x 2.5"(h) (model <b>650LE</b> )
<b>Weight</b>	2.86 lbs, 1.3kg (model <b>650I</b> ) 5.7 lbs, 2.6kg (model <b>650E</b> ) 9.7 lbs, 4.4kg (model <b>650LE</b> )

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