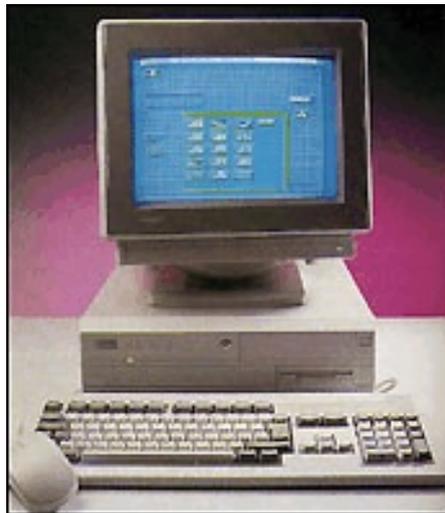


The Complete Amiga 4000 User Guide

by Peter Hutchison © 2007



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Introduction

Welcome to the Commodore Amiga A4000, one of the top Amiga models of its time. It was affordable and easy to use. It had a wide range of software, in particular, games which Jay Minor, the creator of the Amiga, had designed it for.

The Amiga A4000 is based on either the Motorola 68030 25MHz , 68040 25MHz or the top end 68060 50MHz Processor with 2Mb RAM, a single 880K floppy drive with support for three more floppy drives, Zorro cards and a Custom Chipset that provides the Sound and Graphics.

The Amiga runs the Operating System called Amiga OS which consists of the Kickstart ROM which contains some essential libraries and devices needed to load Workbench which is the desktop:

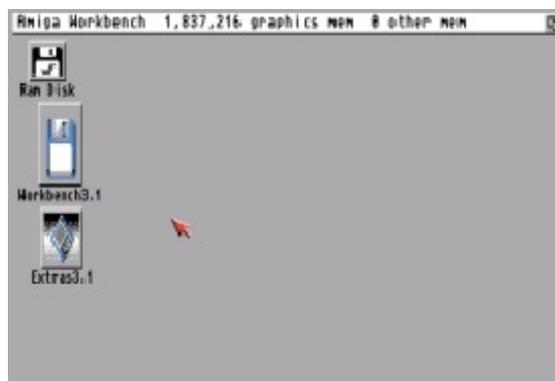


Figure 1

You can a while menu bar at the top and all the disks mounted on the right hand of the screen. The Ram Disk is a special one which is a disk in memory basically. More on Workbench will be explained later.

Setting up the Amiga for First Time

Before setting up the Amiga make sure you have the following items ready:

- Amiga A4000
- Monitor or TV Set
- Mouse
- Power Supply
- Joystick (optional)
- Speakers (optional)
- External Disk drives (optional)

With the Amiga facing you, first plug the square end of the Power Supply cable to the Power socket at the back of the Amiga. Plug the other end into a power socket but DO NOT switch on yet.

If you have a monitor, plug the monitor cable into the Video socket, and also plug the power cable into a power socket.

Next plug the Mouse into Port 1 of the D shaped sockets on the right-hand side. Plug any Joystick onto Port 2 next to it.

The stereo speakers can be plugged into the Left and Right speaker sockets in Audio sockets at the back. The speakers can be either stand-alone ones or part of the monitor so if necessary, plug the other ends into the Left/Right sockets on the monitor. Plug in to power supply as necessary.

Finally if you have any external floppy disk drives plug them in to the External Floppy drive socket on the back of the Amiga. Further drives can be added to other drives. The A4000 usually comes with an IDE Hard disk to run Workbench and your applications.

Now switch on the power and press the power switch located at the front of the Amiga and switch on the monitor.

If you do not have disks inserted or Workbench is not installed on your hard disk, you will see the Insert Disk screen below:

Figure 2



You can then insert either a Workbench disk or any other bootable disk such as a game into the floppy drive on the right-hand side of the Amiga (called DF0: - Disk Floppy Zero).

Insert your Original Workbench disk and wait for the workbench screen to appear. Before continuing, I recommend that you make one or more copies of your original Workbench disks to use rather than the Original as that can become damaged over time and you may need to make other copies later.

To make a copy, get hold of a blank 880K double-density disk ready, then move the white arrow (called a pointer) with the mouse over the Workbench 3.0 disk and click the left mouse button once (this will select the disk), then move the pointer to the top left of the screen and click and HOLD the right-hand mouse button and a menu appear, make sure the Icons menu is selected, move the mouse down the menu and select Copy

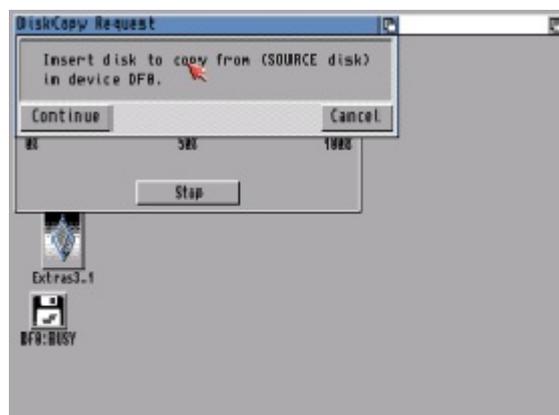


Figure 3

It will say 'Put the SOURCE disk (FROM disk) in drive DF0:', remove the disk from the floppy drive, and make sure it is your original Workbench disk, at the top there is a hole, make sure it is covered with the black tab to protect the disk during this operation. Reinsert the disk, and with the left mouse button click once on Continue.

Once the read operation is complete, it will ask you to insert the DESTINATION (TO disk) in drive DF0:. Press the eject button to remove your original Workbench disk, and insert your Blank disk. Click on Continue to write the information to your new disk.

You may need to repeat the disk swap a couple of times more until the operation is completed. Now you will have a disk called 'copy of Workbench', you can rename this by selecting the disk, then select Rename from the Workbench menu and change it to just 'Workbench'. You should put your original disk somewhere safe and then use your copy of Workbench from now on. Reboot with your new Workbench disk in DF0.

Guide to Workbench 3.0

Contents

1. The Menus
2. The Mouse
3. WB Programs
4. AmigaDOS
5. Common Problems

1. The Menus

At the top of the screen, there are three menus which are accessible when you move the pointer to the top of the screen and click the Right Mouse Button. (RMB).

1.1 Workbench menu

1.1.1 Backdrop

Turns the backdrop window on or off which surrounds the desktop.

1.1.2 Execute Command

This displays an input box where you can enter any AmigaDOS command or launch any Workbench program by entering its name. For example, typing NewShell will open a Command Shell window.

1.1.3 Redraw All

This redraws all the icons on the desktop.

1.1.4 Update All

Reload all the icons and redraw them.

1.1.5 Last Message

Display the last error or information message on the title bar.

1.1.6 About

Display Kickstart and Workbench versions and Copyright information.

1.1.7 Quit

Exit Workbench, this will quit workbench and leave the workbench screen open. You should open a command window before quitting otherwise a reboot is required.

1.2 Window menu

1.2.1 New Drawer

Create a new drawer (or directory or folder) in the current window.

1.2.2 Open Parent

Open the parent window of the current window.

1.2.3 Close

Close the current window

1.2.4 Update

Update icons in the current window.

1.2.5 Select Contents

Select all the icons in the current window.

1.2.6 Clean Up

Tidy up the icons into a standard left to right and top to bottom layout.

1.2.7 Snapshot

1.2.7.1 Window

Save the current window size and position in icon information

1.2.7.2 All

Save the window and all icon size and position information in their respective icon files.

1.2.8 Show

1.2.8.1 Only Icons

Displays files that have an icon file and hides all other files.

1.2.8.2 All Files

Display all files in window whether or not they have an icon file or not.

1.2.9 View By

1.2.9.1 Icon

Display files using Icons only.

1.2.9.2 Name

Display files using Name and displays protection flags, size and date and time last changed.

1.2.9.3 Date

Display files in date order using same format as Name with the newest files at the top.

1.2.9.4 Size

Display files in size order using same format as Name with the smallest files at the top.

1.3 Icons

1.3.1. Open

This opens or runs the currently selected file or drawer.

1.3.2 Copy

Copies one or more files and prefixes file(s) with Copy_of_ e.g. Copy_of_MyFile

1.3.3 Rename

Changes the name of the file. A Rename dialogue box appears with the current name

1.3.4 Information

Displays information about the file, drawer or disk. Includes information about the icon, type, size, comment and protection flags.

1.3.5 Snapshot

Saves the current position of file within window.

1.3.6 Unsnapshot

Removes positioning saved information from a file.

1.3.7 Leave Out

Places the file on the desktop but the file is still located in its original location. A backdrop file contains a list of files left out.

1.3.8 Put Away

Returns a file left off the desktop back to its original location.

1.3.9 Delete

This deletes a file or drawer permanently. It does not use the Trashcan.

1.3.10 Format Disk

Formats or prepares a disk to be used to store files and drawers.

1.3.11 Empty Trash

Empties the content of the Trashcan folder on the boot disk.

1.4 Tools

1.4.1 ResetWB

Reloads Workbench and redraws the screen

2. The Mouse

On the Amiga mouse there are two buttons: the Left Mouse Button (LMB) and the Right Mouse Button (RMB). Moving the mouse will move the arrow or pointer on the screen.

2.1 Using the Right Mouse Button

To use the menus, press down the RMB and move the pointer to the title bar at the top of the screen. Move the pointer over one of the menu names and some menu items will appear. Now, still with the RMB pressed, move the pointer down to the selected menu item and release the RMB to select that item.

2.2 Using the Left Mouse Button

This button is mainly used to select and move icons around and click on gadgets (or buttons).

2.2.1 Clicking

To select an icon, move the pointer over the desired icon and then click the LMB once. The icon will change to a reverse or an alternative image to indicate it has been selected.

When using gadgets such as those on windows (there are four gadgets on a window: Close, Window-to-Front, Window-to-Back and Resize) move the pointer over the desired gadget and click once to use that gadget. The gadget will change briefly and also change the window.

2.2.2 Double-Clicking

This is sometimes a tricky technique to use and requires a steady hand. This method is used to open disks, drawers and files or run programs. To do this, move the pointer over the desired icon and in quick succession (without moving the pointer) click on the LMB twice. This should open the icon.

2.2.3 Dragging

This technique allows you to move objects such as icons around the screen or resizing windows. Select an icon with a single click, now keep the LMB down and move the pointer, the icon will now be dragged with the pointer. If you let go of the pointer the icon will be dropped into it's new position.

2.2.4 Multiple selection

You can select more than one icon at a time. To do this, click on the first icon, press the SHIFT key down (either one) and then click on the second, third, fourth icons etc. to select multiple icons

You can also select a whole group of icons by pressing the LMB at the top left of the icons and while keeping the LMB down moving the pointer towards the bottom right. An expanding box will appear and the icons in it will be selected.

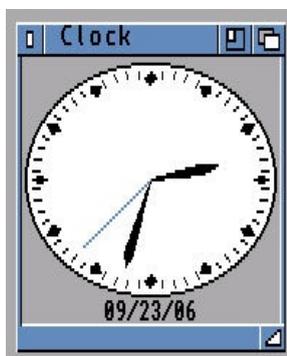
3. The Programs

Here I will give a brief explanation of the programs provided with Workbench 1.3.

3.1 Workbench Disk

3.1.1 Utilities Drawer

3.1.1.1 Clock



This displays an analogue or digital clock showing the present time and/or date. From the menu you can select Analog, Digital 1 or Digital 2 (difference being is that one displays time in a window, the other

displays time in the window bar). You can also set the mode (12 or 24 hour), display seconds or not, the date and whether to set an alarm for something.

3.1.1.2 Multiview

This program can view pictures, animations, sound and other documents using Workbench's Datatype library which can be expanded to any number of file formats from basic ILBM, 8SVX, AmigaGuide, FTXT, ANIM and CDXL to modern types such as GIF, JPEG, PNG, BMP, Wave, Mpeg and other formats. Datatypes can be downloaded from the internet and installed.

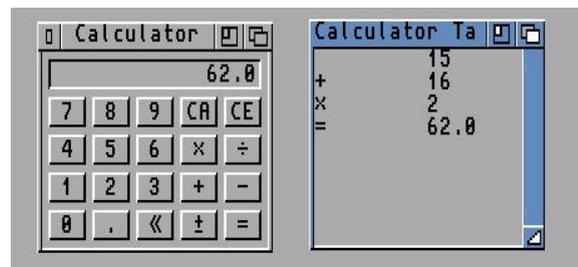
You can run the program and then open a file from the file dialogue box, if the file has an Icon file you can set its Default Tool to use Multiview to open and view the file automatically or you can click on the file, press shift and double click on Multiview to view the file with Multiview.

3.1.1.3 More

This program can be used from the command line to view text files with page breaks between screen's worth of text.

3.2 Tools Drawer

3.2.1 Calculator



Here is a simple calculator, you can press the buttons to enter values or use the keypad. The symbols are CA (Cancel All), CE (Cancel Entry), * (Multiply), / (Divide), + (Add), - (Subtract), . (Decimal point), <- (Backspace), +/- (Change sign), = (Equals)

The Calculator Tape window can display equations as you enter them, useful for long calculations.

3.2.2 CMD

The CMD program is useful if you wish to redirect printing to a file. Run this program before printing and any output will be sent to RAM:cmd_file. Additional options can be set in the Tool types including:

DEVICE = parallel or serial

FILE = location of file output

SKIP = skip flag

MULTIPLE = store multiple prints

NOTIFY = notify flag

3.2.3 GraphicDump

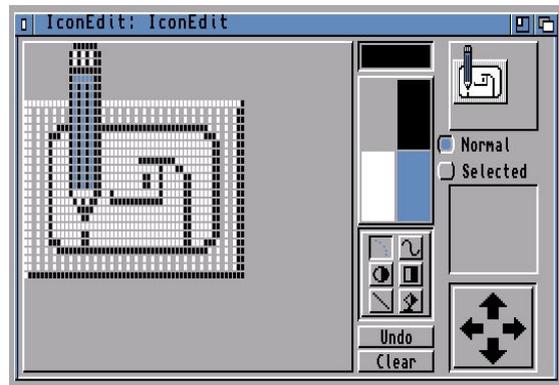
GraphicDump can be used to print pictures to a printer. This is mainly for IFF ILBM pictures, use Multiview for other formats. Picture size can be set using SIZE Tool Type.

3.2.4 IconEdit

IconEdit is used to modify file icon or .info files on the Amiga. Most Workbench 3.x icons are 4 colour icons but can be expanded to multicolour icons via the Extras, Color Palette menu. You have the main drawing area on the left. In the middle you have the currently selected Colour (black in this case), the colour palette below and the drawing tools: freehand drawing, curves, circles (outline or filled),

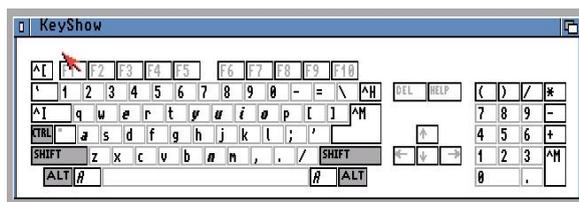
rectangles (outlined or filled), straight lines and the fill tool.

Each icon has two images, normal and selected, selected icons are used when a user selects an icon, and it usually displays a depressed icon rather than a raised icon (the shadow around the edge makes the difference).



3.2.5 KeyShow

This displays a graphical representation of the keyboard on the screen with the characters that each key represents including those when Ctrl, Shift or Alt is pressed. Pressing any of the keys does not enter characters in to applications unfortunately.



3.2.6 InitPrinter

This will initialise any attached printer with the printer's initialisation command using the currently selected driver in the Printer preferences.

3.2.7 Lacer

This program will toggle between interlaced and non-interlaced screen modes. Used primarily for video recording and genlocking.

3.2.8 Printfiles

This program allows you to print text files from Workbench. To use it to select the files you wish to print (use Shift key when selecting multiple files), then hold down shift and click Printfiles to print them. Use the tool type `FLAGS=formfeed` or `FORMFEED=true` if you want files to start on a new page.

3.2.9 Prepcard

This tool is used to prepare PCMCIA memory cards as static RAM cards or system memory. A Ram Card can hold files like a normal disk and is accessed via the device `CC0:`, cards prepared as system memory is added to both Chip and Fast memory, you need to reboot before you can use that memory.

3.3.0 Memacs

Memacs or MicroEmacs is a full screen text editor which allows you to write short documents, script files and program files if necessary.

The figure below shows Memacs with `s:startup-sequence` file loaded for editing.

```

MicroEMACS V2.4
SVEK: startup-sequence 39.9 (9.8.92)
; (Cloanto © Amiga Forever Edition

C:SetPatch QUIET
C:Version >NIL:
C:AddBuffers >NIL: DFB: 15
FailAt 21

C:MakeDir RAM:T RAM:Clipboards RAM:ENV RAM:ENV/Sys
C:Copy >NIL: ENVARC: RAM:ENV ALL NOREQ

Resident >NIL: C:Assign PURE
Resident >NIL: C:Execute PURE

Assign >NIL: ENV: RAM:ENV
Assign >NIL: T: RAM:T
Assign >NIL: CLIPS: RAM:Clipboards
Assign >NIL: BEXX: S:
Assign >NIL: PRINTERS: DEVS:Printers
Assign >NIL: KEYMAPS: DEVS:Keymaps
Assign >NIL: LOCALE: SYS:Locale
Assign >NIL: LIBS: SYS:Classes ADD
Assign >NIL: HELP: LOCALE:Help DEFER

IF NOT EXISTS SYS:Fonts
-- MicroEMACS -- main -- File: s:startup-sequence -----
[Read 61 lines]

```

3.3.1 ShowConfig

This program displays system configuration about your Amiga including:

- a) Processor make and model
- b) Custom Chip set versions
- c) RAM type and sizes
- d) Expansion boards

3.3 Commodities Drawer

3.3.1 Exchange

This program lists the commodity programs in memory and can control commodities by displaying commodity options, end a commodity and so on.

3.3.2 ClickToFront

This allows users to click anywhere in a window and click to bring it to the front of other windows without having to use the window gadgets. By default the ALT key needs to be pressed before clicking a window (this can be changed). Move it to the Startup drawer to autorun it on boot up.

3.3.3 MouseBlanker

This will blank the mouse pointer if not in use.

3.3.4 AutoPoint

This allows you to select a window by just moving the mouse pointer over it and does not require a click to activate it.

3.3.5 Fkey

This program assigns text strings to function keys and it is useful for Shell users. Up to 20 possible macros can be programmed. Special characters can be used:

- \n Return
- \r Return
- \t Tab
- \0 Zero
- <key> Key combination eg Shift+Letter

3.3.6 NoCapsLock

This disables the Caps Lock key so you will need to use Shift for Capital letters.

3.3.7 Blanker

This program will blank the screen after 60 seconds of inactivity.

3.3.8 CrossDos

This is part of the PC Disk driver and this commodity controls text file options for Text Filtering and Text

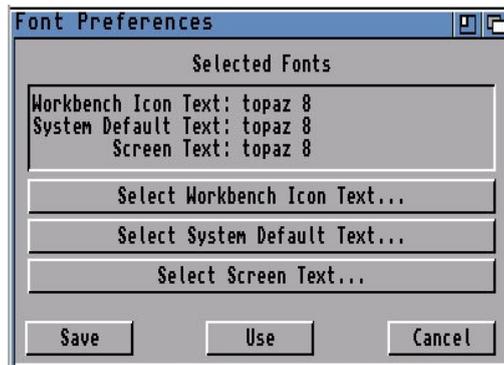
Translation. The DosDrivers for PC0 and PC1 need to be loaded.

3.4 Prefs

Workbench can be customised using Preference programs in the Prefs drawer. You can select Save to save changes and will be loaded when rebooted or clicking Use will save preferences in memory only and will be lost on next reboot.

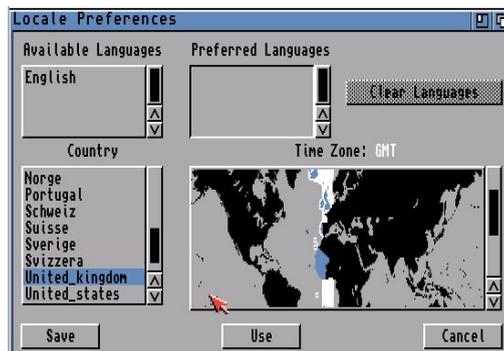
3.4.1 Font

This selects the default fonts for Workbench Icon Text, System default text and Screen text.



3.4.2 Locale

This sets the current language, country and time zone information.



3.4.3 Pointer

This preference can be used to change the shape of the mouse pointer. The Pointer can be a Low Res or High Res pointer depending on screen resolution. The 'Set Point' button determines where in the image the click point is, by default it is at the top left.



3.4.4 PrinterPS

This preference set the options for PostScript printers.

Driver Mode: Postscript, Pass Through

Copies: 1 to 99

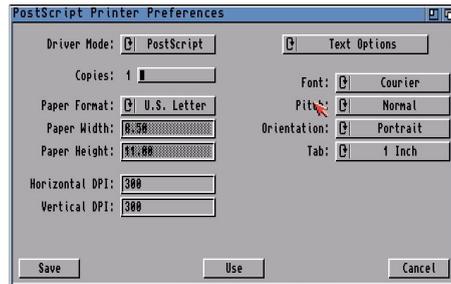
Paper Format: US Letter, US Legal, DIN A4, Custom

Text Options: Font, Pitch, Orientation, Tab

Text Dimensions: Margins, Point Size, Leading, LPI, LPP

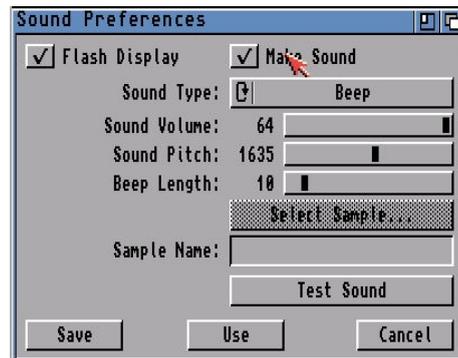
Graphics Options: Margins, Image, Shading, Dithering

Graphics Scaling: Aspect, Scaling, Centering,



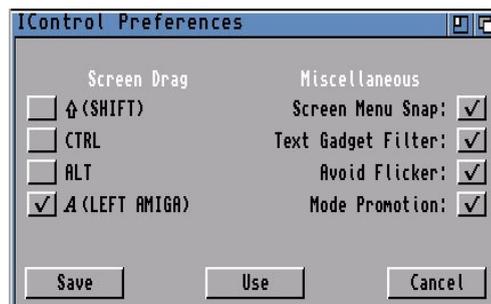
3.4.5 Sound

This preference can change preference for sounds when Workbench has an error. You have the option of Flashing the Display (ideal for those hard of hearing), or creating a sound either with a Beep or a Sampled Sound.



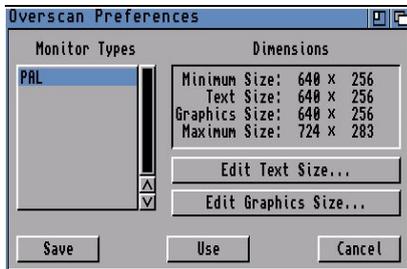
3.4.5 Icontrol

Intuition control specifies preferences for key to use for Window Drag and enable options for Screen Menu Snap, Text Gadget Filter, Avoid Flicker and Mode Promotion.



3.4.6 Overscan

Overscan sets the physical screen size, the monitor driver is loaded on the left and list of dimensions are shown and two buttons which can be used to resize the display for Text or Graphic displays by dragging one or more of nine handles to the desired size.



3.4.7 Printer

The Printer preference selects the printer driver (from Devs:Printers) and sets other options:

Printer Port: Parallel, Serial

Print Pitch: Pica, Elite, Fine.

Print Spacing: 6, 8 LPI

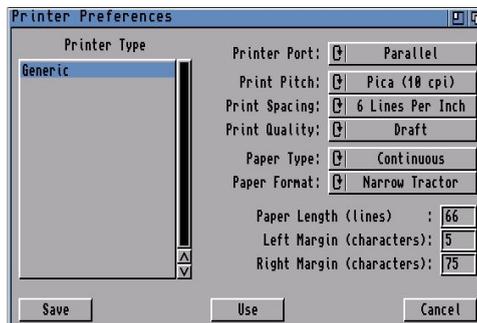
Print Quality: Draft, Letter

Paper Type: Continuous, Single

Paper Format: Narrow tractor, Wide tractor, Custom, DIN A4, US Letter, US Legal

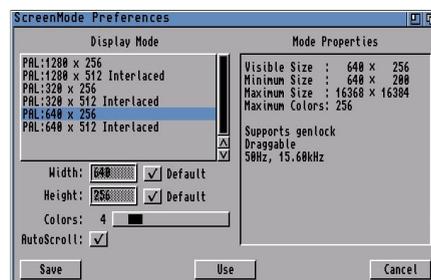
Paper Length

Left and Right Margins



3.4.8 ScreenMode

This preference sets the monitor driver and resolution and colours depth for the Workbench screen.



3.4.9 Time

This sets the current date and time and saves in a battery-backed clock (if provided) and in memory.



3.4.10 Input

Input controls certain aspects of the keyboard and the Mouse:

Mouse Speed - How fast the pointer moves around the screen.

Acceleration - Boosts mouse speed when you move it around.

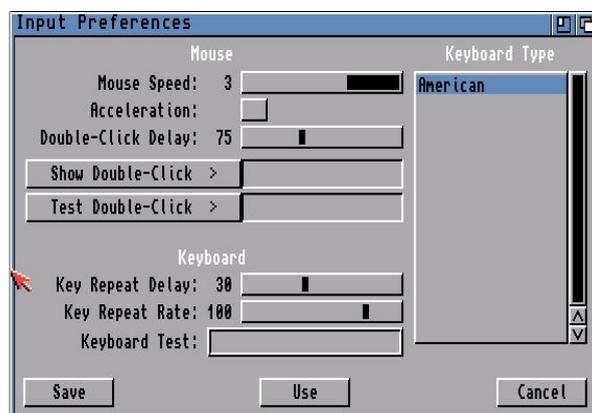
Double-click delay - Delay between clicks before it's accepted as a double click. You can use the Show and Test double-click buttons below to check in.

Key Repeat Delay - Delay before a pressed key becomes repeated again.

Key Repeat Rate - Determines how often a key is repeated on the screen.

Keyboard test - Test repeat settings.

Keyboard Type - Shows which keyboard mapping is used. Can be changed using SetKeyboard command in startup files.

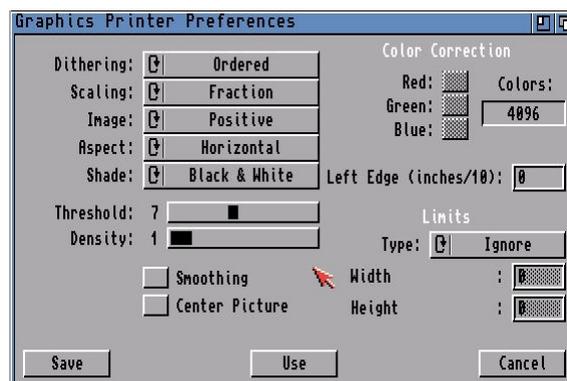


3.4.11 Palette



This preference allows you to change the default colours (shown at the top left) with new colours using either the colour wheel or the RGB sliders underneath for more fine control. The list of entries on the right determines which colour is used for what purpose, so you could use Blue or Green for text instead of Black. The Show Sample button brings up a demo window with the new colours in use before you are ready to Save or Use them.

3.4.12 PrinterGfx



Printer Graphics preference sets options for when printing pictures or diagrams using a printer (See Printer preferences).

Dithering: Ordered, Halftone, Floyd-Steinburg

Scaling: Fraction, Integer

Image: Positive, Negative

Aspect: Horizontal, Vertical

Share: Black & White, Grey Scale 1 or 2, Colour

Threshold: Determines the colours on the screen are printed as black and white.

Density: Determines the resolution in DPI of the output

Collor Correction: Corrects colour by reducing number of colours available to correct RGB imbalances

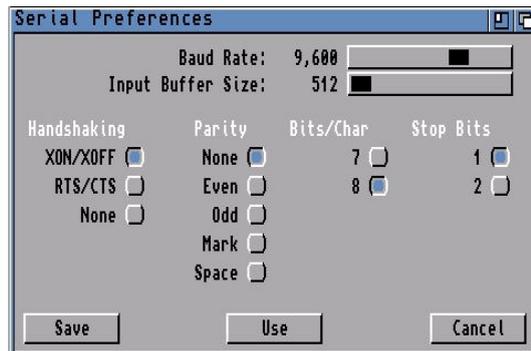
Left Edge: How far from the left edge the output starts

Limits: Determines paper edge limits. Can be Ignore, Bounded, Absolute, Pixels, Multiply

Smoothing: Smooths diagonal lines by certain dithering techniques (except Floyd-Steinburg)

Center Picture: Centres picture in the middle of the page.

3.4.13 Serial



The Serial preferences control communications through the serial port with the following settings:

Input Buffer Size: Size of the buffer in bytes to store data

Baud Rate: Speed of communication in bites/sec.

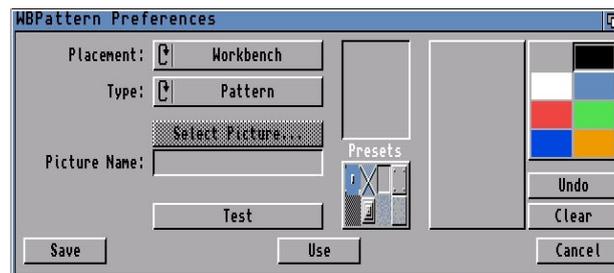
Handshaking: XON/XOFF (Software), RTS/CTS (Hardware) or None

Parity: Number or type of bits used for error checking

Bits/Char: Number of bits used for data

Stop bits: Number of bits used at the end of data

3.4.14 WBPattern



Workbench pattern preferences can display specific patterns or pictures to customize your Workbench desktop.

Placement: Workbench, Windows, Screen

Type: Pattern, Picture

Select Picture: Select a picture to use on the workbench

Presets: Predetermined patterns to use. You can create your own patterns in the empty box on the right and select which colours to use.

Test: Tests your pattern or picture.

Beyond Workbench 3.0

Workbench has been upgraded three times since 3.0: 3.1, 3.5 and 3.9. Workbench 3.5 and 3.9 have enhanced Workbench a lot and come on CD, they include:

- Multimedia Programs
- Web browser i.e Aweb
- Genesis for Internet and network access
- Amidock for program start bar
- Warp OS 5.0 for PowerPc support
- Iomega Tools for Zip and Jaz disks
- New Powerful shell
- Automatic datatype recognition
- Integrated unpacker (unarc)
- Fast search for files
- New picture datatype
- Many more tools
- HTML documentation

If Workbench is too limiting, you can replace the entire workbench with a replacement such as Directory Opus 6 which has a feature rich interface with more customisation than before and much easier to use.

There are many more libraries and programs too numerous to mention which can enhance the Workbench experience. Check out <http://www.aminet.com> for them.

Adding more Memory to the A4000

The Amiga memory is split into Chip RAM (memory used by the custom chipset to store graphics and sound) and Fast RAM (memory which is used only by the Processor).

The Amiga A4000 comes with 2MB of Chip memory, you can optionally add more 72pin SIMM memory using the 4 or 5 further slots on the motherboard or via an accelerator card. Use the 1,2 or 4 MB Fast page SIMM modules if you can.

Additional memory beyond 16Mb requires a CPU accelerator card.

See documentation with a board or device on how to install extra memory.

Upgrading the Processor

The standard 25MHz 68030 processor in the Amiga A4000 is quite slow compared to more recent processors and cannot cope with bigger applications and games. The processor is slotted on the main mother board.

For faster processors such as the faster 68040 or 68060 then a new expansion board needs to be purchased and inserted via the trapdoor expansion slot underneath the Amiga.

Typical boards include:

1. 68040 Accelerators

Apollo 3040 or 4040

Supports the 40MHz 68040 and can have upto 128Mb of Fast RAM using 4 slots for Fastpage or EDO ram. The 040 includes an MMU and FPU.

BSC TurboMaster 4053

Supports the 40MHz 68040 and can have upto 112Mb of Fast RAM using slots for Fastpage ram. The 040 includes an MMU and FPU.

Commodore A3640

Supports the 25MHz 68040 (or 680LC40) but no additional ram. The 040 includes an MMU and FPU, the LC (Low Cost) version only has the MMU.

GVP A3040 (T-Rex)

Supports the 40MHz 68040 and can have upto 64Mb or 256Mb of 64 pin GVP SIMMs. You will need a extra RAM board to maximise memory. The 040 includes an MMU and FPU.

Hardital Powerchanger

Supports the 25 or 40MHz 68040 but does not support extra ram. The 040 includes an MMU and FPU.

Macrosystem WarpEngine

Supports the 28, 33 or 40MHz 68040 and can have upto 128Mb of Fast RAM using 4 slots for Fastpage or EDO ram. The 040 includes an MMU and FPU. This card also has a fast SCSI-2 connector as well for peripherals.

Phase 5 Cyberstorm Mk-I

Supports the 25 or 40MHz 68040 or the 50MHz 68060 and can have upto 128Mb of Fast RAM using 4 slots for Fastpage. The 040 includes an MMU and FPU. This card also has a fast SCSI-2 connector as well for peripherals.

Phase 5 Cyberstorm Mk-II

Supports the 40MHz 68040 or the 50MHz 68060 and can have upto 128Mb of Fast RAM using 4 slots for Fastpage. The 040 includes an MMU and FPU. This card also has a fast SCSI-2 connector as well for peripherals.

PPS Mercury

Supports the 28,33, 35MHz 68040 and can have upto 32Mb of 30 pin Static Column, Fast Page of Nibble RAM using 4 slots. The 040 includes an MMU and FPU.

RCS X-Calibur

Supports the 25,33 or 40MHz 68040 and can have upto 128Mb of Fast RAM using 4 slots for Fastpage RAM. The 040 includes an MMU and FPU.

Sonnet Quaddoubler

Supports the 40 or 50MHz 68040 but no extra memory. The 040 includes an MMU and FPU.

2. 68060 Accelerators

Apollo 3060/4060

Supports the 50 or 66MHz 68060 and can have upto 128Mb of Fast RAM using 2/4 slots for Fastpage or EDO ram. The 060 includes an MMU and FPU.

Amiga Tech 4060

Supports the 56MHz 68060 and can have upto 128Mb of Fast RAM using 4 slots for Fastpage or EDO ram. The 060 includes an MMU and FPU. This card is designed for the A4000T model.

GVP 4060 (T-Rex II)

Supports the 50MHz 68060 and can have upto 128Mb of 72 pin Fast RAM using 4 slots for Fastpage or EDO ram. The 060 includes an MMU and FPU.

Phase 5 Cyberstorm Mk-I

Supports the 40MHz 68040 or the 50MHz 68060 and can have upto 128Mb of Fast RAM using 4 slots for Fastpage. The 040 includes an MMU and FPU. This card also has a fast SCSI-2 connector as well for peripherals.

Phase 5 Cyberstorm Mk-II

Supports the 40MHz 68040 or the 50MHz 68060 and can have upto 128Mb of Fast RAM using 4 slots for Fastpage. The 040 includes an MMU and FPU. This card also has a fast SCSI-2 connector as well for peripherals.

3. PowerPC Accelerators

All of these are dual-processor boards and come with 68040 or 68060 to run the OS functions.

DCE Cyberstorm PPC 604e

Supports dual processor from the 680x0 and PowerPC processor range: 25 or MHz 68040 or 50 or 60MHz 68060 and 150,180,200 or 233MHz PPC 604e. Supports FPU and MMU in both processors. Supports upto 128Mb of ram using 4 SIMM slots which much be populated in pairs.

Upgrading Expansion on the A4000

The A4000 comes with 4 Zorro 3, 3 inactive ISA, 1 CPU slot and a Video slot where you can add accelerators, graphics, network, SCSI, video and sound cards to your Amiga. The ISA slots can be activated using an additional Bridgeboard such as the Golden Gate card.

The bus board allows users to use industry standard PCI cards with the A4000 such as graphics cards, network cards, SCSI and USB cards as long as an AmigaOS driver is available.

DCE G-Rex 4000D/T

This busboard supports upto 4 Zorro 3 slots, 4 PCI slots (2.1 compliant) and 1 video slot (AGA compliant). There are two versions: one for desktop and one for tower. A wide range of drivers for many cards exist incl. Graphics, TV/Capture, Network, Sound and USB cards.

Elbox Mediator PCI 4000D/Di

This busboard supports upto 7 Zorro 3 slots, 6 PCI slots (2.1 compliant) and 1 video slot (AGA compliant). There are two versions: one for desktop and one for tower. A wide range of drivers for many cards exist incl. Graphics, TV/Capture, Network, Sound, Mixers, MPEG2 decoders and USB cards.

Micronik A4000 PCI

This busboard supports upto 7 Zorro 3 slots, 3 ISA slots and 3 PCI slots (2.1 compliant) and 1 video slot (AGA compliant).

Upgrading the Kickstart and Workbench

The Amiga A1200 can be upgraded to latest Kickstart and Workbench as follows:

From	To	Requirements
Workbench 3.0	Workbench 3.1	Kickstart 3.1
Workbench 3.0 or 3.1	Workbench 3.5 / 3.9	Kickstart 3.1, 6M RAM, 68020 processor, Hard Disk, CD ROM

In most cases a new Kickstart ROM Chip set needs to be installed.

You can also replace the old OCS chips with ECS (Enhanced Chip Set) but you cannot install AGA Chip Set.

Instructions

Removing the Cover: (see The C= Amiga A4000 User's Guide)

1. Use a Phillips-head screwdriver to remove the two screws at the upper corners of the rear of the main unit.
2. Grasp the cover on both sides and slide it backwards and up.

Removing the front bay: (see The C= Amiga A4000 User's Guide)

1. Disconnect the keylock and the LED assembly wiring from the motherboard.
2. Remove the front faceplate. The faceplate has several plastic tabs that hold it to the metal chassis. Squeezing the tabs and pushing them through the chassis holes will release the faceplate. You may need a small pair of pliers to do this.
3. Disconnect the power and ribbon cables from the existing drive(s) in the front area.

CAUTION: Note the orientation of the connectors before you remove them so that you can replace them properly when you are done.

Removing the Processor Module: (see The C= Amiga A4000 User's Guide)

1. The A4000 CPU slot is located on the right side of the motherboard. The processor module occupies this slot, mounted horizontally parallel with the motherboard.
2. Hook your fingers under the module at either end of the slot and lift.
CAUTION: Do not lift elsewhere on the processor module, or you may crack the module or its connector.

Installation of the ROM chips:

1. Locate the ROMs in the front left of the motherboard, just left of the CPU slot, between RAMSEY and the oscillator.
2. The left ROM-socket is marked as U176, the right ROM-socket is marked as

U175. Note the marking and orientation of the installed ROMs, then remove them from the socket.

3. Align the ROMs with the sockets in their correct marking and position. Press firmly into place. **WARNING:** Be cautious not to bend pins.

4. The installation is now complete.

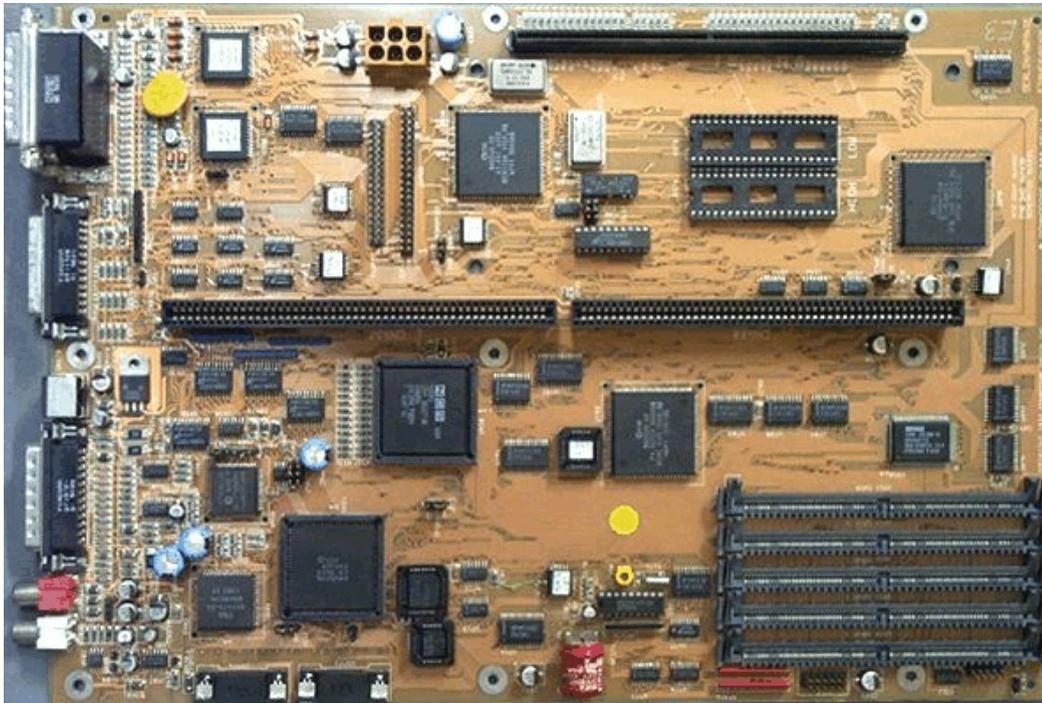
Reassembling: (see The C= Amiga A4000 User's Guide)

1. Reassemble the system in reverse order.

CAUTION: It is advisable to test the system after assembling the sub-chassis, but before replacing the top case.

The Motherboard

The Amiga 4000 has had several revisions including B,D for A4000D and 4 for A4000T. This is the revision 1 motherboard:



Chips and Components:

- IDE connector - Supports 3.5" Hard drives natively but can support larger 3.5" drives with a converter
- ALICE chip - Supports 2MB of Chip RAM, the Blitter and 25 DMA channels (large left hand chip)
- GAYLE chip - IDE controller chip (large middle chip)
- LISA chip - Supports AGA chipset, 256 colours, HAM8, Sprites etc (large right hand chip).
- BUDGET chip - Supports DRAM and Bus Controller (Center of board with VLSI on it)
- Keyboard MPU - The keyboard controller ship
- Motorola 68EC020 - Main Central Processor (surprisingly one of the smallest chips)
- Kickstart ROM Chips - The A1200 had two 256K ROM chips that held part of AmigaOS and allow the Amiga to boot from Floppy or Hard disk.
- DRAM Chips - 2MB of Chip RAM included from NEC
- Keyboard connector slot - The white slot on the right
- CIA Chip (391078) - Controls ports such as Serial, Parallel and Mouse ports
- PAULA (391077) - Controls the sound and the floppy drive
- CIA Chip (391078) - Second CIA chip for controlling ports
- Floppy drive connector

Jumpers for A4000

Jumper	Description	Setting	Description
J100	CLK 90 clock source	1-2	Internal (020/030)
		2-3	External (040)
J104	CPU Clock source	1-2	Internal
		2-3	External

J151	ROM Speed	1-2	200 ns
		2-3	160 ns
J213	Chip RAM Size	1-2	2 MB
		2-3	8 MB (non functional)
J351	Second internal floppy drive	ON	No second drive or second drive is 1.76MB
		OFF	Enabled 2 nd drive is 880K
J352	Redirect DF0:	1-2	Internal DF1: and DF0: External DF2: and DF3:
		2-3	Internal DF1: and DF2: External DF0: and DF3:
J850	Enable DSACK	OFF	Required if CPU is 020. Requires U860 and U152
		ON	No DSACK
J852	RAM SIMM Size	1-2	2 or 4 MB SIMMs
		2-3	1 MB SIMMs
J212	Video type	1-2	NTSC
		2-3	PAL
J214	VBB/MA10	1-2	Supplied VBB to Alice
		2-3	Alice supplies MA10 for 8MB Chip (non-functional)
J500	Video Sync	1-2	Sync on Green disabled
		2-3	Sync on Green enabled
J501	LISA Sync	1-2	Reserved
		2-3	Default
J502	DAC Sync	1-2	DAC sync on green
		2-3	DAC uses standard signal

Backward Compatibility

Compatibility with older software can be done in two ways: Hardware and Software.

Hardware:

a) Install a Kickstart ROM Switcher to allow you to switch between Kickstart 1.3 and later Kickstart

Software:

a) Use a SoftKicker program to load old Kickstart into memory e.g Skick

b) Use Disk to Hard disk programs such as JST and WHDLoad to copy the games to hard disk and emulate the older system.

c) Use the CPU command to turn off features such as Caches on processors such as the 68020 or later.

d) Use the Kickstart Startup screen (press both mouse buttons at startup) to select which Chipset to use.

Adding a Hard Disk to A4000

The Amiga 4000 supports IDE Hard disks, there is space for a 3.5" drive. Workbench 3.0 or 3.1 can use upto 4GB Hard disks, due to limitations of the 32 bit filesystem and the scsi.device that controls hard disks.

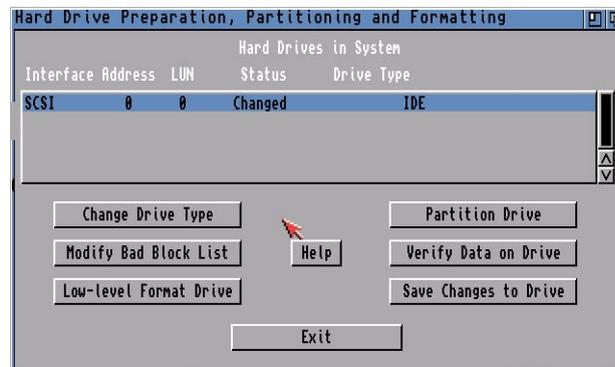
You can use larger Hard disks if you switch to a modern Filesystem such as SFS (Smart File System) or PFS (Professional File System) or upgrade to Workbench 3.5 or 3.9 which has a newer FFS (Fast File System).

Warning: If you use a large drive on Workbench 3.0 you must not partition the drive beyond the 4GB limit otherwise when you write data to the drive, it may overwrite the start of the drive!

To use your hard disk, you need to prepare the disk using HDTtoolbox, the program will create a partition for use by AmigaOS. The program can be found on the Install disk in the HDTools drawer, if you do not have HDTtoolbox, you can download HDInstTools from Aminet instead.

When you run the program, you may get something like this screen:

T



It should display entry(s) for all hard disks found. If no entries are shown then you need to change the device name for the SCSI_DEVICE_NAME in the Tooltypes in the Icon Information for HDTtoolbox.

Change Drive Type - This is used to read the correct drive configuration from the hard disk including, heads, cylinders, block size and so on. If the drive is Unknown, use this to confirm the correct size of your hard disk before partitioning it.

Modify Bad Block List - A hard disk can develop unusable areas on the surface on the Hard disk called Bad Blocks, you can add new ones found using this option.

Low-level Format Drive - Use with caution! This wipes the entire drive of data and partition information. Most modern drives do NOT require a low level format and may ignore this.

Partition Drive - Used to create partitions on your hard disk so that you can store data and programs.

Verify Data on Drive - This will check the entire disk for any bad blocks and maps them out for you.

Save Changes to Disk - Use this option to save disk configuration and partition changes to disk.

Help - A brief help window on how to use HDTtoolbox.

Click on Partition Drive and you should get a screen something like this:



Click on New Partition to create a new partition in the empty space at the top of the screen. You can resize it using the blue arrow by dragging it across the screen. If the partition will have Workbench installed, you can make it bootable by ticking Bootable.

The default File System is shown, you can switch to another filesystem using Change or you can Add or Update a filesystem using the Add/Update button for things like SFS or PFS.

The Default Setup will set up two partitions of equal size for you, if you wish.

The Advanced Options will display the actual Cylinder numbers for you for each partition (useful in case of disaster recovery and want to create partitions exactly as before).

Click OK when done.

When satisfied that your partitions are set up, click on 'Save Changes to Drive' which will write the configuration to an RDB (Rigid Disk Block) on the drive which is read when you boot up.

Reboot the Amiga and boot off Install disk again, you should get one or more new disk icons on the Workbench, select the icon and use Format Disk from the Icons menu to prepare the disk for use.

Warning! If the disk is larger than 4GB do not use the Format program supplied with Workbench 3.0 or 3.1 but use a new version which supports larger disks. Try the one supplied with a new filesystem or from Aminet.

Installing Workbench onto a Hard Disk

1. Boot off the **Install** disk and open the Install script for your language, the following languages are supported on Workbench 3.1:

English, French, Italian, German, Denmark, Netherlands, Portuguese, Norwegian, Swedish.

2. If it finds your hard disk click Proceed.

3. Select 'Install Release 3'.

4. Select the installation mode: Novice, Intermediate or Expert then Proceed.

5. Select the language to use. By default English is selected.

6. Select any Printers to use, then click on Proceed.

7. Select a Key mapping to use then click on Proceed.

8. Workbench will begin to install, it may ask for additional disks such as Extras, Fonts, Locale, and Storage.

9. Once installation is complete, eject any floppy disks and reboot the Amiga.

10. Workbench should load. Copy the **Installer** program from Install disk to the C folder for any application installations.

If you do not have an Install disk, you can manually install Workbench, by opening a Shell window, insert the workbench disk on DF0: and type:

```
COPY DF0: TO DH0: ALL CLONE QUIET
```

This will copy all the folders and files (including the important hidden drawers) from your Workbench floppy disk to your Hard disk (HD0: in this case).

You can copy the contents of the other disks as well using the same copy command, for Fonts, make sure you create a Fonts drawer on the hard disk first, and copy the fonts disk contents into that folder.

Installing a CDROM Drive

On the A4000 desktop or tower you can slave a CD or DVD ROM drive from your hard disk, to access it you need to install and activate the CDROM drivers supplied with AmigaOS:

```
L:CDFilesystem
Devs:DosDrivers/CD0
Devs:DosDrivers/CD1
```

The provided CDROM file system will read some but not all CDROM discs but not some PC ones with long file names. The CD0, CD1 drivers may be found in Storage\DosDrivers, move them to Devs\DosDrivers so that they are automatically mounted. You need something like AmiCDFS or CacheCDFS to provide better CD filesystem support.

If the CD0 driver does not work then you need to modify it, to pick up the correct device and unit number. Open a text editor and open the CD0 file, you will need to modify the lines to point to your device:

```
Device = "scsi.device"
Unit = 1
```

Note, that scsi.device is the same device as for IDE drives as well as scsi. If your CDROM is on a third party device then change the name to the new device and make sure the device is stored in Devs (or in Rom if its provided there).