

# The Complete Amiga 500+ User Guide

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## Introduction

Welcome to the Commodore Amiga A500+. The first replacement of the A500 Amiga. 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 A500+ is based on the Motorola 68000 7.14MHz Processor with 1MbRAM, a single 880K floppy drive with support for three more floppy drives and a Custom Chipset that provides the Sound and Graphics.

The new A500 Plus now supports the new Kickstart 2.0 and Workbench 2.0 upgrade from Kickstart/Workbench 1.3 and the new Enhanced Chipset (ESC) with up to 2MB of Chip RAM supported, and new high resolutions support for Productivity modes (640 x 470), Super HiRes (1280 x 200/256) and interlace modes. The Blitter can also now copy regions bigger than 1024x10124 pixels in one operation.

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:

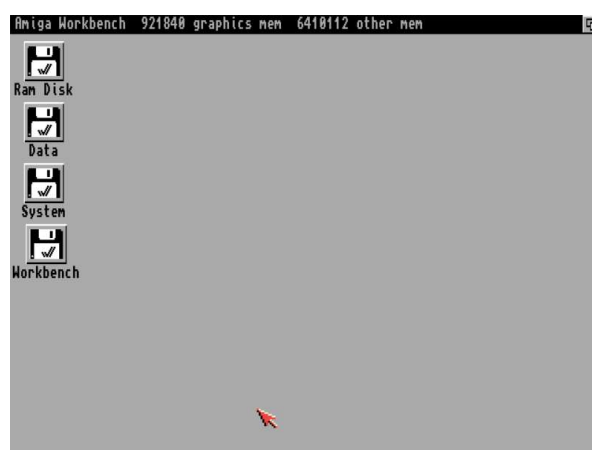


Figure 1

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 A500+
- 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 on the top left hand 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, if you have a TV Set then plug it into the RF or Composite 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 at the back. Plug any Joystick onto Port 2 next to it.

The stereo speakers can be plugged into the Left and Right speaker sockets in the middle 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 Drive socket on the back of the Amiga. Further drives can be added to other drives. If you have an external hard disk, remove the cover from the Expansion port on the left-hand side of the Amiga and slot in the drive.

Now switch on the power and press the power switch located on the Power Supply for the Amiga and switch on the monitor.

If you do not have disks inserted 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 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

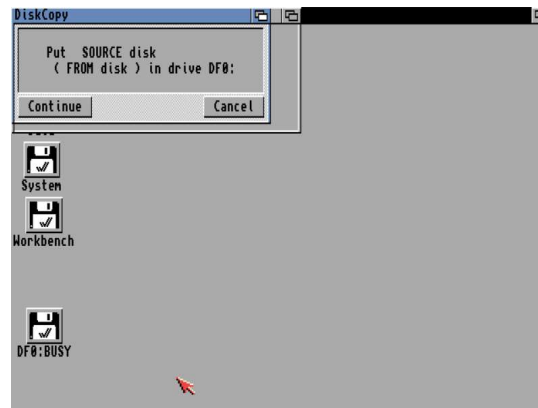


Figure 3

It will say >Put 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 not 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 Put DESTINATION (TO disk) in drive DF0:. Press the eject button to remove your original Workbench disk, and insert your Blank disk (the hole should be covered on this disk). Click on Continue to write and then verify 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 2.04

### Contents

1. The Menus
2. The Mouse
3. WB Programs
4. Amiga DOS
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). Some menus are also accessible via keyboard shortcuts using the left Amiga key and a Letter or character (shown in brackets).

### 1.1 Workbench menu

#### 1.1.1 Backdrop (B)

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

#### 1.1.2 Execute Command (E)

This displays an input box where you can enter any Amiga DOS command or launch any Workbench program by entering its name. For example, typing NewShell which 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 (Q)

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 (N)

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 (K)

Close the current window

### 1.2.4 Update

Update icons in the current window.

### 1.2.5 Select Contents (A)

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 (O)

This opens or runs the currently selected file or drawer.

### 1.3.2 Copy (C)

Copies one or more files and prefixes the file(s) with 'Copy\_of\_' e.g. Copy\_of\_MyFile

### 1.3.3 Rename (R)

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

### 1.3.4 Information (I)

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

### 1.3.5 Snapshot (S)

Saves the current position of file within the window.

### 1.3.6 Unsnapshot (U)

Removes the positioning information from a file.

### 1.3.7 Leave Out (L)

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 (P)

Returns a file left on 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 resize 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 its 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 with in it will be selected.

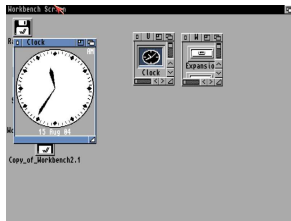
## 3. The Programs

Here I will give a brief explanation of the programs provided with Workbench 2.05.

### 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 Display

This program can view pictures in the Amiga IFF ILBM format. It can also display multiple pictures, like a slideshow, by selecting the Display program and Shift and clicking on one or picture files and then double click on the last picture to start the slide show.

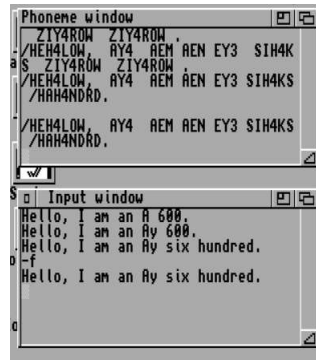
You can run the program and then open a file from the file dialogue box, if the file has an Icon file you can set its Default Tool to use Display to open and view the file automatically.

##### 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.

### 3.1.1.4 Say

This program uses the built in narrator to speak English to you by typing in words in the Input window. You can change the narrator using command such as: -m (male), -f (female), -r (robot), -n (natural), -s### (speed = 40 - 400) or -p### (pitch = 65 to 320).



### 3.1.1.5 Exchange

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

## 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 Colors

This program will configure the colours for Workbench. Unlike the Palette Preferences, this is temporary set for the current session.

### 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

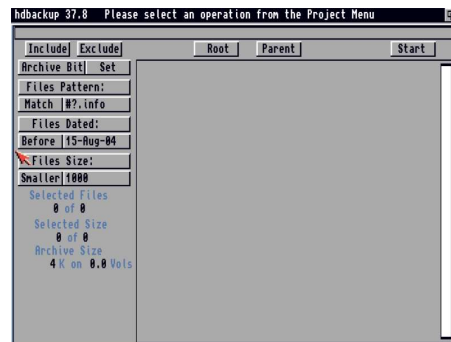
This tool is used to prepare PCMCIA memory cards as static RAM cards or system memory. A Ram Card can hold files like a normal disk and is accessed via the device CC0; cards prepared as system memory is added to both Chip and Fast memory, you need to reboot before you can use that memory.

### 3.3.0 Memacs

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

### 3.3.1 HDBackup

This program can be used to backup or restore your files on your Hard disk to Floppy disk or a tape device. It can backup using the Archive bit, file patterns, date or file size.



## 3.3 Commodities Drawer

### 3.3.1 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.

### 3.3.2 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.

### 3.3.3 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

### 3.3.4 NoCapsLock

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

### 3.3.5 Blanker

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

### 3.3.6 IHelp

Configures function keys to manipulate windows and screens. For example, F1 = Cycle, F2 = Make big, F3 = Make small, F4 = Cycle Window, F5 = Zip Window.

### 3.3.7 CrossDos (2.1 only)

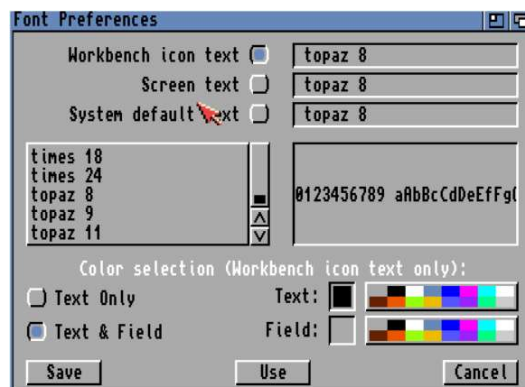
This is part of the PC Disk driver and this commodity controls text file options for Text Filtering and Text Translation. The DosDrivers for PC0 and PC1 need to be loaded.

## 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.

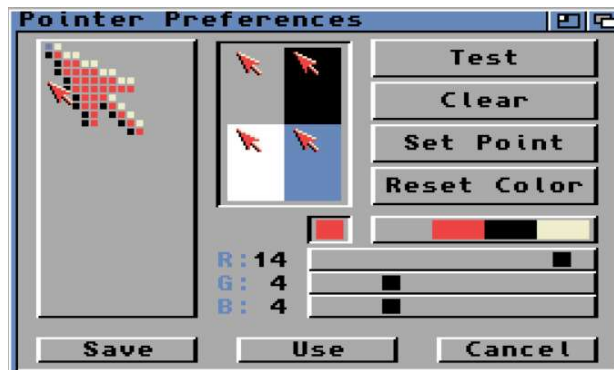
### 3.4.1 Font

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



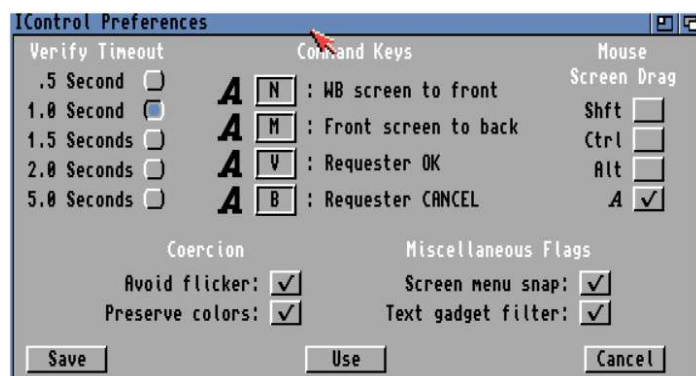
### 3.4.2 Pointer

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. The >Test= button applies the changes to the current point. The >Clear= button will erase the drawing area. The >Reset Color= will apply the default color palette to the default.



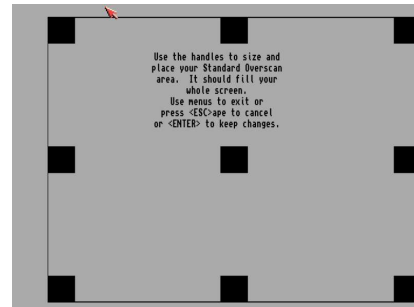
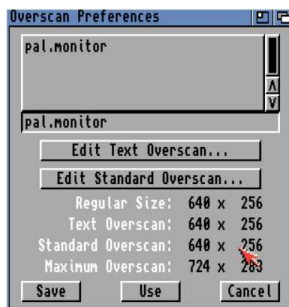
### 3.4.3 IControl

Intuition control specifies preferences for key to use for disk Verify timeout (.5 to 5 secs), Command keys, Mouse drag key, and enable options for Screen Menu Snap, Text Gadget Filter, Avoid Flicker and Text gadget filter.



### 3.4.4 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 the nine black handles to the desired size.



### 3.4.5 Printer

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

Printer Port: Parallel, Serial

Paper Type: Fanfold, Single

Paper Size: Narrow tractor, Wide tractor, Custom, DIN A4, DIN A5, US Letter, US Legal

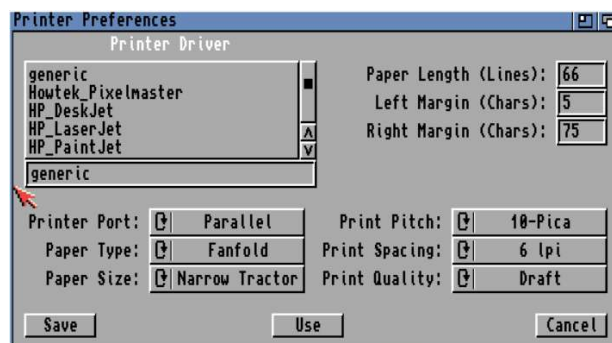
Print Pitch: Pica, Elite, Fine.

Print Spacing: 6, 8 LPI

Print Quality: Draft, Letter

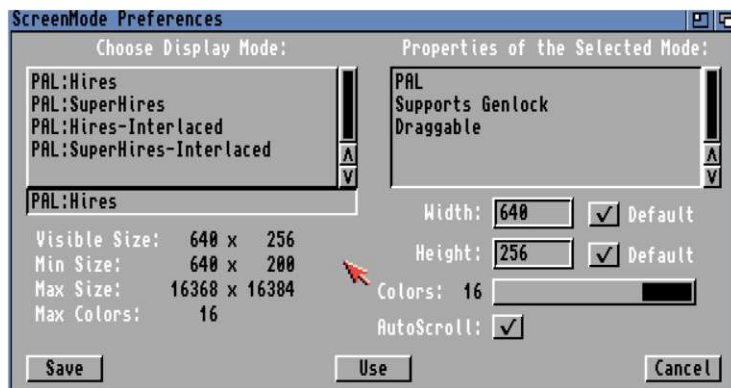
Paper Length (Lines)

Left and Right Margins (Chars)



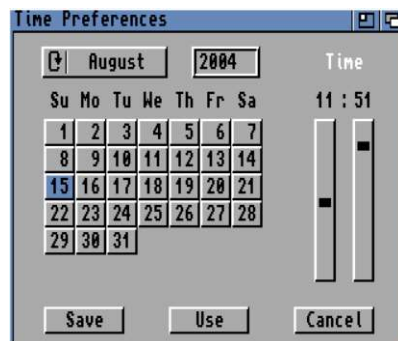
### 3.4.6 ScreenMode

This preference sets the monitor driver, display mode, resolution and colour depth for the Workbench screen.



### 3.4.7 Time

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





### 3.4.8 Input

Input controls certain aspects of the keyboard and the Mouse:

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

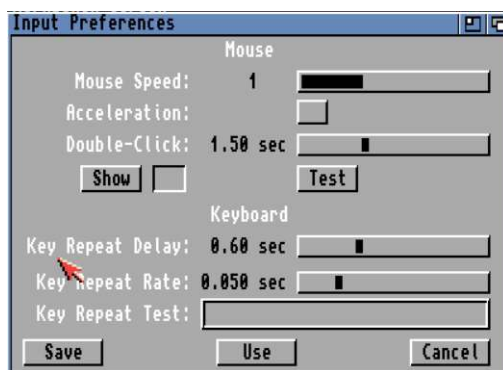
Acceleration - Boosts mouse speed when you move it around.

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

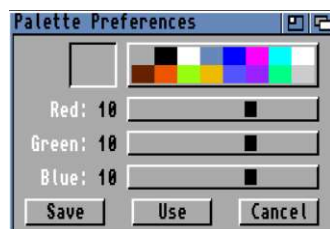
Key Repeat Delay - Delay before a pressed key becomes repeated again.

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

Key Repeat test - Test repeat settings.

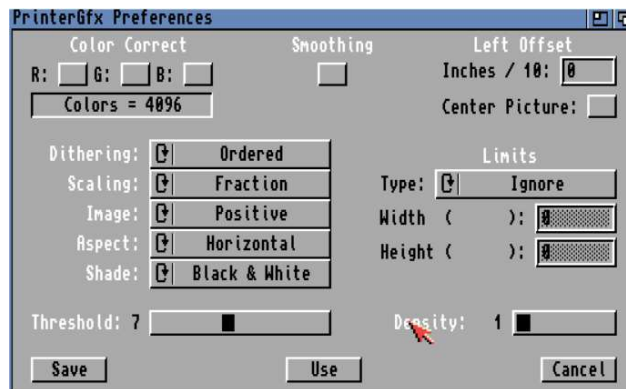


### 3.4.9 Palette



This preference allows you to change the default colours (shown at the top left) with new colours using the RGB (Red, Green and Blue) sliders underneath for more fine control.

### 3.4.10 PrinterGfx



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

Color Correct: Corrects colour by reducing number of colours available to correct RGB imbalances

Dithering: Ordered, Halftone, Floyd-Steinburg

Scaling: Fraction, Integer

Image: Positive, Negative

Aspect: Horizontal, Vertical

Shade: Black & Write, Grey Scale 1 or 2, Colour

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

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

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

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

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

Density: Determines the resolution in DPI of the output

### 3.4.11 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 WBPatten

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

Pattern: Workbench, Windows

Test: Tests your pattern or picture.

Clear: Clear drawing area using selected colour

Undo: Undo the last change made

Color Palette: List of available colours (selected colour at the top).

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



## 4. Workbench 2.1

Workbench 2.05 can be upgraded to Workbench 2.1 which has the following minor changes:

### 4.1 Removed features

- Colors
- AddMonitor
- BindMonitor
- Say and Speak: device

### 4.2 Added features

- New Devs system to easily add new devices including DosDrivers, monitors, printers and Keymaps
- New CrossDos filesystem and device to read PC formatted disks.
- New Locale Preferences
- New PrinterPS Preferences for Postscript printers
- New Sound Preferences

## 5. Beyond Workbench 2.x

Workbench has been upgraded four times since 2.x: 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

For Workbench 3.5 or higher, you would need an accelerated Amiga A600 with at least a 68020 processor with more memory.

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.

## 6. Adding more Memory to the A500+

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 A500+ comes with 1MB of Chip memory.

You can increase RAM by adding memory via a new memory board into the expansion slot underneath the Amiga behind a trapdoor or via the expansion slot on the left hand side. The expansion side can also be a hard drive and may have room inside for memory as well E.g. A590 and GVP 530.

The trapdoor can be used to add an accelerator card with a faster 68020 or 68030 processor and 32 bit RAM such as the Viper 520 and 530 and Blizzard Turbo.

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

### 6.1 Memory Boards

AmigaKit A603

Expands memory to 2Mb of Chip RAM, real time battery clock, clockport expansion, expansion slot for Indivision scandoubler/flicker fixer,

## 7. Adding a CD ROM drive to the A500+

To add a CD or DVD ROM device to the A500+ requires another device to be connected to the expansion slot, but this can be difficult if its already occupied by a hard drive unit. Commodore produced the A590 CD drive. IDE expansion is rare on the A500 compared to later models.

Installing the **IDEFIX** software will allow you use the second IDE port and updates workbench with the necessary software to read CD/DVD disks.

## 8. Upgrading the Processor

The standard 68000 7.14MHz processor in the Amiga A500 +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.

A 68020 or higher accelerator board is required to upgrade to Workbench 3.5 or 3.9.

For faster processors such as the 68020 or 68030 then a new expansion board needs to be purchased and inserted via the trapdoor expansion slot underneath the Amiga. Due to power and space restrictions, fast processors such as the 68040, 68060 or PPC processors are not supported.

Typical boards include:

### 8.1 68000 Accelerators

ACA-500

It has a 14 MHz 68000 processor and 2MB of RAM and mass storage controller for CF (Compact Flash) cards and CD drivers.

### 8.2 68020 Accelerators

Apollo 520

It has a 25MHz 68020 processor with 68881 FPU and Up to 4MB RAM.

Hurricane 500 020

It has a 36MHz 68020 processor with 68881 or 68882 FPU and Up to 4MB RAM.

Viper 520

It has a 33MHz 68020 processor with 68881 FPU and Up to 8MB RAM. Includes one 2.5" IDE interface, Kickstart 3.0 ROMs and Mini Mega chip slot.

### 8.3 68030 Accelerators

DCE Viper 530

It has a 50 MHz 68030 processor, optional 68882 FPU at 50 MHz, up to 128 MB of RAM using 1 72pin SIMM slot and 4 IDE/ATAPI devices and 1 fast SCSI2 connectors.

## 9. Upgrading the Kickstart and Workbench

### 9.1 Kickstart 2.x revisions

Version	Revision	Year	Notes
2.05	37.210	1991	Early versions for Kickit or Rekick
2.05	37.299	1991	No PCMCIA or IDE hard disk support!
2.05	37.300	1991	No support for HDDs > 40 MB!
2.05	37.350	1992	Lastest bug free version.

### 9.2 The Amiga A500+ can be upgraded to latest Kickstart and Workbench as follows:

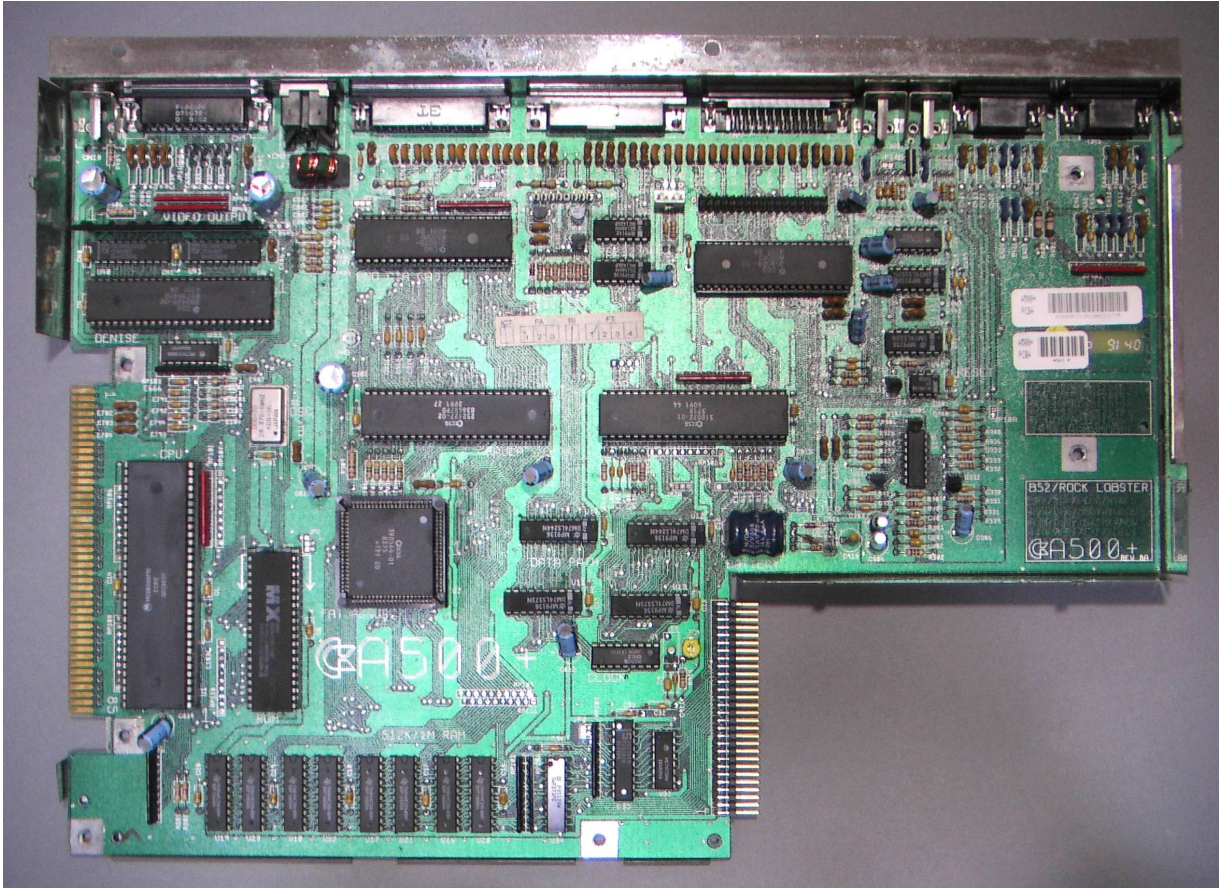
From	To	Requirements
Workbench 2.x	Workbench 3.1	Kickstart 3.1
Workbench 2.x	Workbench 3.5 / 3.9	Kickstart 3.1, 6M RAM, 68020/030 accelerator, Hard Disk, CD ROM

9.3 In most cases a new Kickstart ROM Chip set needs to be installed. See these instructions.

- a) Place the A500+ unit upside down on a flat surface.
- b) Use a screwdriver to remove the case screws.
- c) Turn the unit to normal, face front position. Do carefully flip backwards the top cover and then the keyboard assembly.
- d) 9.3.4 **IMPORTANT:** Take care not to damage the cables to the top cover or the ribbon cables to the keyboard assembly.
- e) The main printed circuit board - protected by a shield - is now in full view.
- f) The operating system ROM ICs are labelled and located at position U6A (under) and U6B (upper), just at the blank of the shield. The old ROM chips should be marked: @1992 V3.0 37.350 (or older)
- g) Note the orientation of the old operating system ROM, then remove it from the socket.
- h) **IMPORTANT:** You should be aware of the fact that there are spare pins at the sockets. You have to align the ROM IC to the right side of the socket so that there are spare pins at the left of the ROM ICs.
- i) Align the 3.1 ROM with the socket, and press firmly into place. Be cautious not to bend pins.
- j) Installation is now complete.

## 10. The Motherboard

The Amiga 500+ has had several revisions including the 8A and 8A.1. A Picture of the A500+ 8A1 revision motherboard is shown below. Very early boards still used the OCS chipset when Commodore was trying to get rid of old stock.



From the left (top to bottom):

Denise or Super DENISE chip (39081) - supports ECS graphics supporting HAM6 (4096 colours) and EHB (Extra half bright) for 64 colours.

Expansion slot for external Hard Drives or CD drive.

Motorola 68000 CPU - Main Central Processor

Kickstart ROM Chip - The A500 had one 512K ROM chip that held part of AmigaOS and allow the Amiga to boot from Floppy or Hard disk.

CIA Chip (391078) - Controls ports such as Serial, Parallel and Mouse ports

PAULA (391077) - Controls the sound and the floppy drive

AGNUS chip (31069) - Supports 2MB of Chip RAM, the Blitter and 25 DMA channels (large center chip)

CIA Chip (391078) - Second CIA chip for controlling ports

GARY – IO chip.

DRAM Chips – 512KB, 1MB or 2MB of Chip RAM included from NEC.

Expansion slot in trap door.

Mouse and Joystick ports

## 11. 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.

## 12. Adding a Hard Disk to A500+

The Amiga 500+ supports Hard disks, as there is space for a 2.5" drive or you can use CF (Compact Flash) cards as Hard Disks. Workbench 2.x can use up to 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) and upgrade to Workbench 3.x which has a newer FFS (Fast File System).

**Warning:** If you use a large drive on Workbench 2.0/3.0 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 HDToolbox, the program will create a partition for use by AmigaOS. The program can be found on the Install disk in the Tools drawer, if you do not have HDToolbox, you can download HDInstTools from Aminet instead.



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 HDToolbox.

Change Drive Type - This is used to read the correct drive configuration from the hard disk including, heads, cylinders, the 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 HDToolbox.

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 but

use a new version which supports larger disks. Try the one supplied with a new filesystem such as Smart File System (SFS) from <http://strohmayer.org/>.

## 13. Installing Workbench onto a Hard Disk

Boot off the Install disk and run the InstallHD script to install Workbench 2.0 or if you have an older version of Workbench run the UpgradeWB script to update Workbench.

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.