A4000HardwareGuide

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	TITLE : A4000HardwareGuide	

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REVISION HISTORY

NUMBER	DATE	DESCRIPTION	NAME

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A4000HardwareGuide

1.1 "

Amiga 4000 Hardware Guide 1.0
January 1995

1.2 Introduction

Introduction To The A4000 Hardware Guide

Editor
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Disclaimer

Working on computer hardware can be dangerous, both to the computer and to yourself. If you are not a qualified technician, please do not attempt to perform any of these procedures yourself. Neither myself nor any of the people listed in the
Credits
make any claim that any of these tips actually work. In fact, they will probably destroy your computer or your self-confidence. Neither is any claim made that any of the information presented here is error-free, so if you do attempt any of these modifications or fixes and damage yourself or the computer, neither myself nor any of the persons listed in the Credits section will be held responsible.

Introduction

The Amiga 4000 Hardware Guide was compiled from online messages posted by many different folks, various hints and tips I've collected elsewhere, and from my own experiences with the 4000. So it is by no means complete. Corrections or additions are welcomed.

The purpose of the guide is to help make A4000 troubleshooting easier by gathering all kinds of Amiga 4000 hardware information into a single, easy-to-use guide file.

At this point, this guide is specifically for the Amiga 4000; however, many of the tips apply to other Amigas, and it would not be difficult to expand the scope of the guide to include them specifically.

All of the people who have contributed are listed under
Credits
.
I can't thank them enough! At this point in time, information of this type can be very valuable in keeping A4000 systems alive and running, and they have been gracious enough to share this information with everyone.

Questions about this document should be addressed to the
Editor
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1.3 Internals

A4000 Internals

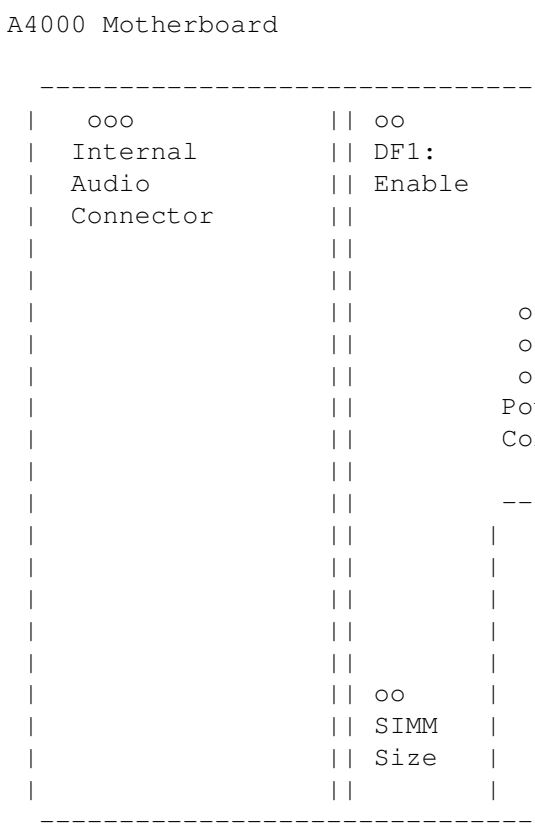
Motherboard Jumpers

Connector Pin-Outs

Power-Up Self-Test

1.4 motherboard jumpers

Motherboard Jumpers



Jumper Listing:

J351: DF1 Enable
Closed: Enable low-density (880K) floppy as DF1.
Open: No DF1 *OR* for high-density (1.76M) DF1.

J852: Fast RAM SIMM Size (Chip RAM is always 2M.)
256K: 1M SIMMs.
1M : 4M SIMMs.

CN404: Internal Audio Connector
Audio signals attached here will be mixed with the A4000 audio output. It has been reported that standard audio levels from CD-ROM drives are lower in level than the A4000 audio itself, and that setting the Amiga system volume lower (to 32 instead of 64)

will help match the levels.

Pin 1: Audio In (Left)
Pin 2: Ground.
Pin 3: Audio In (Right)

Other Jumpers (Not Shown Above)

J100: CLK90 Clock Source
1-2 Closed: Internal (68020/68030)
2-3 Closed: External (68040)

J104: CPU Clock Source
1-2 Closed: Internal
2-3 Closed: External

J151: ROM Speed: 160 or 200 ns ROMs.
1-2 Closed: 200 ns ROMs (default).
2-3 Closed: 160 ns ROMs.

J213: Chip RAM: 2M or 8M
1-2 Closed: 2M Chip RAM (default).
2-3 Closed: 8M Chip RAM. This option was apparently for use with the never-released AAA chip set, and won't work in a normal A4000.

J500: Sync On Green
1-2 Closed: Sync on green disabled.
2-3 Closed: Sync on green enabled.

J501: Lisa Sync
1-2 Closed: Unknown...
2-3 Closed: Default.

J502: Select DAC Sync
1-2 Closed: DAC syncs on green.
2-3 Closed: DAC uses standard signal (default).

J850: Enable DSACK (Used with 68020)
1-2 Closed: DSACK Enabled for 68020. U860 and U152 also required.
2-3 Closed: No DSACK.

J975: "Options" connector. Apparently for some type of expansion, perhaps for use with mouse or joystick-type peripherals.

Power Supply Connector Wires:

Yellow: +5V
Orange: +12V
Blue: Ground
Red: -12V
Brown: Power Good (???)

1.5 connector pin-outs

```
                              Connector Pin-Outs

------------------------------------------------------------------------------

 Note: Signals shown with a star (*) in front of them are active-low. I
 recommend that you independently verify the information shown here with a
 logic probe, meter, or scope before using it, in case there are any errors.

------------------------------------------------------------------------------

 Serial Port (DB25 Male)

   Pin 1: Shield Ground
   Pin 2: Transmit Data
   Pin 3: Receive Data
   Pin 4: RTS
   Pin 5: CTS
   Pin 6: DSR
   Pin 7: Data Ground (Do not connect to shield ground.)
   Pin 8: CD
   Pin 9: +12V (20 mA maximum.)
  Pin 10: -12V (20 mA maximum.)
  Pin 11: Amiga Audio Out (Left)
  Pin 12: Unused
  Pin 13: Unused
  Pin 14: Unused
  Pin 15: Unused
  Pin 16: Unused
  Pin 17: Unused
  Pin 18: Amiga Audio In (Right)
  Pin 19: Unused
  Pin 20: DTR
  Pin 21: Unused
  Pin 22: RI
  Pin 23: Unused
  Pin 24: Unused
  Pin 25: Unused

------------------------------------------------------------------------------

 Parallel Port (DB25 Male)

   Pin 1: *Strobe
   Pin 2: Data 0
   Pin 3: Data 1
   Pin 4: Data 2
   Pin 5: Data 3
   Pin 6: Data 4
   Pin 7: Data 5
   Pin 8: Data 6
   Pin 9: Data 7
  Pin 10: *Acknowledge
  Pin 11: Busy
  Pin 12: Paper Out
```

```
 Pin 13: Select
 Pin 14: +5V Pull Up (10 mA maximum.)
 Pin 15: Unused
 Pin 16: *Reset
 Pin 17: Ground (Do not connect any of these grounds to a shield.)
 Pin 18: Ground
 Pin 19: Ground
 Pin 20: Ground
 Pin 21: Ground
 Pin 22: Ground
 Pin 23: Ground
 Pin 24: Ground
 Pin 25: Ground
```

Video Port (DB23 Male)

```
  Pin 1: *External Clock
  Pin 2: *External Clock Enable (47 ohm)
  Pin 3: Red Video   (75 ohm)
  Pin 4: Green Video (75 ohm)
  Pin 5: Blue Video  (75 ohm)
  Pin 6: Digital Intensity (47 ohm)
  Pin 7: Digital Blue  (47 ohm)
  Pin 8: Digital Green (47 ohm)
  Pin 9: Digital Red   (47 ohm)
 Pin 10: *Composite Sync  (47 ohm)
 Pin 11: *Horizontal Sync (47 ohm)
 Pin 12: *Vertical Sync (47 ohm)
 Pin 13: Ground Return (Digital ground return for pin 2.)
 Pin 14: *Pixel Switch (Genlock overlay, 47 ohm)
 Pin 15: *Clock Out (47 ohm)
 Pin 16: Video Ground (Do not connect any of these grounds to pin 13.)
 Pin 17: Video Ground
 Pin 18: Video Ground
 Pin 19: Video Ground
 Pin 20: Video Ground
 Pin 21: -5V  (10 mA maximum.)
 Pin 22: +12V (100 mA maximum.)
 Pin 23: +5V  (100 mA maximum.)
```

Keyboard Port (6-Pin Female Mini-DIN, PS/2 Type)

```
 Pin 1: Data                                        6  ---  5
 Pin 2: Unused                    Pin Layout:         |   |
 Pin 3: Ground                    (Index key          |   |
 Pin 4: +5V (100 mA maximum.)     at top.)        4    ---    3
 Pin 5: Clock
 Pin 6: Unused                                       2   1
```

Mouse/Joystick Ports (DB9 Male)

```
 Mouse:                                Light Pen:

 Pin 1: Mouse Vertical                 Pin 1: Unused
 Pin 2: Mouse Horizontal               Pin 2: Unused
 Pin 3: Mouse Vertical Quadrature      Pin 3: Unused
 Pin 4: Mouse Horizontal Quadrature    Pin 4: Unused
 Pin 5: Mouse Button 3 (Middle)        Pin 5: Light Pen Press
 Pin 6: Mouse Button 1 (Left)          Pin 6: *Light Pen (Capture Beam Pos)
 Pin 7: +5V (50 mA maximum.)           Pin 7: +5V (50 mA maximum.)
 Pin 8: Ground                         Pin 8: Ground
 Pin 9: Mouse Button 2 (Right)         Pin 9: Unused

 Digital Joystick:                     Analog (Proportional) Joystick:

 Pin 1: *Forward                       Pin 1: Button 3
 Pin 2: *Back                          Pin 2: Unused
 Pin 3: *Left                          Pin 3: Button 1
 Pin 4: *Right                         Pin 4: Button 2
 Pin 5: Unused                         Pin 5: Pot X (Horizontal Control)
 Pin 6: *Fire                          Pin 6: Unused
 Pin 7: +5V (50 mA maximum.)           Pin 7: +5V (50 mA maximum.)
 Pin 8: Ground                         Pin 8: Ground
 Pin 9: Fire Button 2                  Pin 9: Pot Y (Vertical Control)
```

External Floppy Port (DB23 Female)

```
  Pin 1: *Disk Ready
  Pin 2: *Disk Read Data
  Pin 3: Ground
  Pin 4: Ground
  Pin 5: Ground
  Pin 6: Ground
  Pin 7: Ground
  Pin 8: *Disk Motor Control
  Pin 9: *Select Drive 3
 Pin 10: *Disk Reset
 Pin 11: *Disk Change (Latched Low)
 Pin 12: +5V (250 mA maximum.)
 Pin 13: *Select Disk Side (0=Upper, 1=Lower)
 Pin 14: *Write Protect
 Pin 15: *Track Zero
 Pin 16: *Disk Write Enable
 Pin 17: *Disk Write Data
 Pin 18: *Step (Pulse: Low, then high.)
 Pin 19: Direction (0=Inner, 1=Outer)
 Pin 20: Unused
 Pin 21: *Select Drive 2
 Pin 22: *Disk Index Pulse
 Pin 23: +12V (160 mA maximum, 540 mA surge.)
```

Internal Floppy Connector (34-Pin Male Header)

```
  Pin 1: Ground                  Pin 18: Direction
```

```
   Pin 2: *Change                Pin 19: Ground
   Pin 3: Unused                 Pin 20: *Step
   Pin 4: *In Use 1              Pin 21: Ground
   Pin 5: Ground                 Pin 22: *DKWD
   Pin 6: *In Use 0              Pin 23: Ground
   Pin 7: Ground                 Pin 24: DKWE (Write Enable?)
   Pin 8: *Index                 Pin 25: Ground
   Pin 9: Ground                 Pin 26: *TRKD
  Pin 10: *Select 0              Pin 27: Ground
  Pin 11: Ground                 Pin 28: *Write Protect
  Pin 12: *Select 1              Pin 29: Ground
  Pin 13: Ground                 Pin 30: *DKRD
  Pin 14: Unused                 Pin 31: Ground
  Pin 15: Ground                 Pin 32: *Side
  Pin 16: *MTRI                  Pin 33: Ground
  Pin 17: Ground                 Pin 34: *Ready
```

```
 Internal IDE Disk Connector (40-Pin Male Header)

   Pin 1: *Reset                 Pin 21: Unused
   Pin 2: Ground                 Pin 22: Ground
   Pin 3: Drive Data 7           Pin 23: *I/O Write
   Pin 4: Drive Data 8           Pin 24: Ground
   Pin 5: Drive Data 6           Pin 25: *I/O Read
   Pin 6: Drive Data 9           Pin 26: Ground
   Pin 7: Drive Data 5           Pin 27: I/O Channel Ready
   Pin 8: Drive Data 10          Pin 28: Unused
   Pin 9: Drive Data 4           Pin 29: Unused
  Pin 10: Drive Data 11          Pin 30: Ground
  Pin 11: Drive Data 3           Pin 31: Interrupt Request
  Pin 12: Drive Data 12          Pin 32: Unused
  Pin 13: Drive Data 2           Pin 33: Disk Address 1
  Pin 14: Drive Data 13          Pin 34: Unused
  Pin 15: Drive Data 1           Pin 35: Disk Address 0
  Pin 16: Drive Data 14          Pin 36: Disk Address 2
  Pin 17: Drive Data 0           Pin 37: *IDE_CS1
  Pin 18: Drive Data 15          Pin 38: *IDE_CS2
  Pin 19: Ground                 Pin 39: *Active (LED driver output.)
  Pin 20: Unused                 Pin 40: Ground
```

1.6 power-up self-test

```
                          Power-Up Self-Test

-------------------------------------------------------------------------

Test Status    Color Shown    Description

  Passed       Light Gray     Initial hardware configuration tests passed.
                              Initial software tests passed. Final
                              initialization test passed.
```

Failed	Red	ROM Error: Make sure ROMs are seated properly.
	Green	Chip RAM Error: Make sure Agnus is seated.
	Blue	Custom Chip Error.
	Yellow	Processor detected error before software trapped it.

1.7 Common Problems

Common Problems

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* A4000 makes rattling noises, fan stalls on powerup, or fan does not turn. Solution: replace fan. Replacement fans: Radio Shack #273-243 or Panasonic FBK-08A12M, available from Digi-Key, Hosfelt, and others (see Sources).

  Please be aware that I've seen two styles of power supplies in the 4000; the fans may differ slightly. Some older 4000s had a power supply with a large hole for the fan, and a bolt-on grill protecting it. This power supply used an actual Panasonic FBM-08A12M. A newer power supply design has a built-in grill formed by holes in the side of the power supply; in this case, the fan is held in place by four odd-looking screws that tapped directly into the holes in the fan's plastic frame, and the fan itself is a "MAX FLOW" generic.

---

* Problems with large hard disk transfers, discolored Toaster output (pink or magenta display of white areas), system crashes, or Emplant diagnostic failures. Solution: U198 7905 -5V regulator is probably bad. Replace with new 7905 1-amp -5V regulator (see Sources).

---

* After adding or removing expansion cards, system no longer boots, displays yellow screen. Solution: too-long resistor and capacitor leads on solder side of backplane daughterboard are bent and shorting together. Remove the backplane and trim leads.

---

* Make sure that signal and power cables aren't blocking the power supply fan air intake. The floppy ribbon cable can be routed from the motherboard between the power supply connector and the power supply itself. If there is only one drive installed, excess ribbon can be pushed under it.

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* Battery (BT176) is "furry." Batteries can actually leak and destroy part of the motherboard, so replacement of corroded batteries is advised. Dalco's

3.6V 3-pin battery, part #46875, is an almost-identical part: the pins and size are identical, but it is rated for 60 mAh rather than the A4000 stock battery's 40 mAh.

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* Problems with transfers when using 4091 or Fastlane SCSI-2 controller boards. Check for revision of Super Buster; the revision 9 chip had problems with DMA transfers to or from Zorro-III boards (like the controllers mentioned above). Revision 11 of the Super Buster fixed this problem. (Note: apparently, there is no problem with Zorro-II boards.)

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* System reports "SCSI Bus Phase Error." Check that all SCSI devices support Reselect; if not, disable Reselect mode for the entire bus (how to do this varies depending on the SCSI host adapter).

1.8 tips

Tips

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* Common Questions:

Question: Can the A4000 support two IDE hard drives?
Answer: Yes. Make sure the drive jumpers are set properly for two drives.

Question: Can the A4000 use IDE hard drives larger than 512M?
Answer: Yes. The supposed "limit" of 512M is a limitation of the BIOS in MS-DOS machines, and the A4000 is not subject to this limit.

Question: What type of memory does the A4000 use?
Answer: The A4000 comes with a single 2M SIMM installed for Chip RAM, and has four SIMM sockets for expansion memory (Fast RAM). These sockets hold 72-pin SIMMs, either 1M or 4M in capacity (all Fast RAM SIMMs must be the same size), 80 ns or faster. To fit properly, these must be single-sided modules.

Question: Can the A4000 use 36-bit SIMMs, instead of 32-bit?
Answer: Yes. The extra parity bits are ignored.

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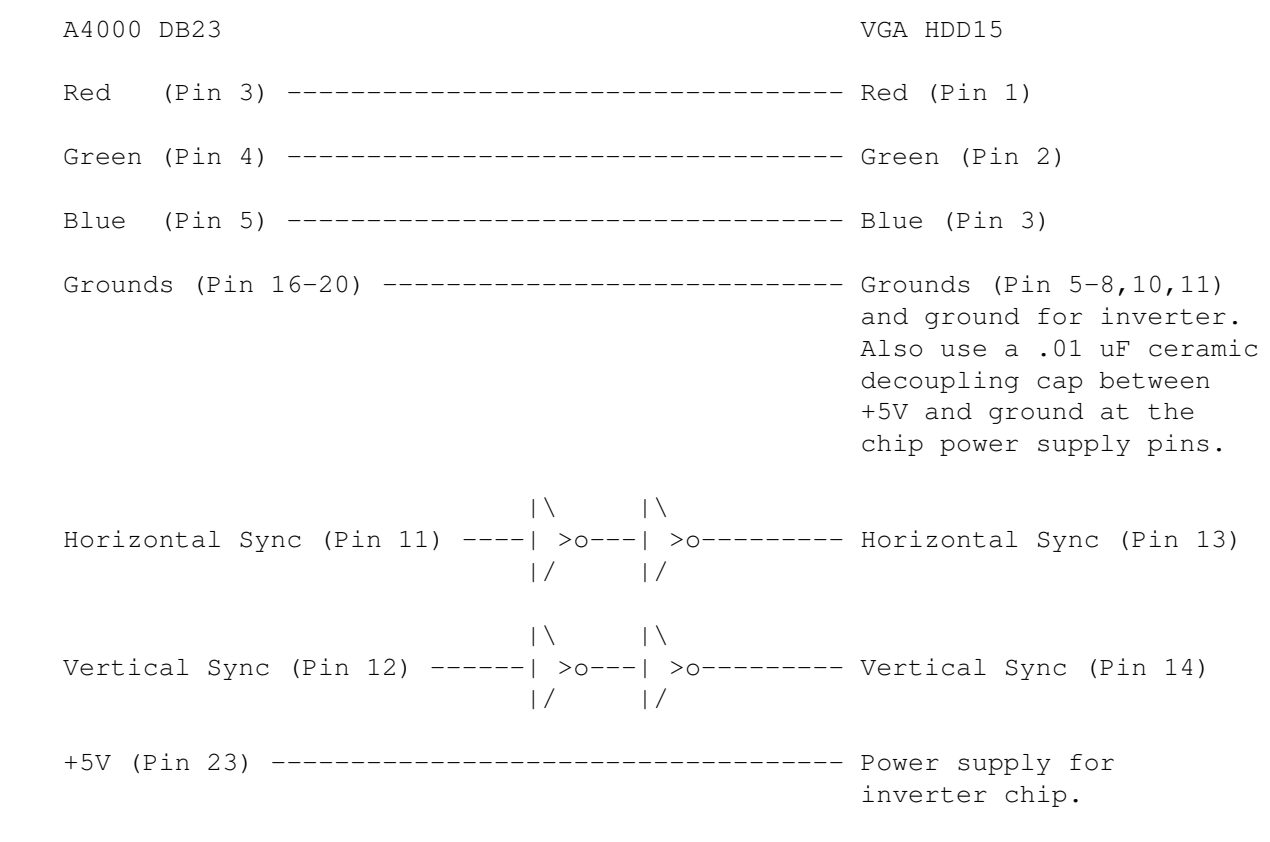
* VGA monitors can be connected to the A4000; however, since the special circuitry in the Amiga video output can mistakenly identify a monitor as a genlock and thus cause problems, a special cable or adapter is the best way to hook them up. All this cable really does is buffer the horizontal and vertical sync signals by double-inverting them through an inverter. Commodore's DB23-to-HDD15 adapter (supplied with most A4000s) used a 74HCT08 for this, but you can use a 74LS04 or other low-power TTL-level inverters (or other gates wired as inverters, of course).

Remember that most VGA monitors won't sync at 15.75 kHz, so you'll have to set the A4000 to use the Double NTSC (or Double PAL) or Multiscan video modes. Even using these modes, the video output may not work with some VGA monitors, since some of the modes use horizontal sync frequencies as low as 23 kHz, and normal VGA starts at 31.5 kHz. Using the VGAOnly monitor driver will bump these frequencies up a bit, perhaps enough to make them usable with touchy monitors.

A4000 VGA Video Cable



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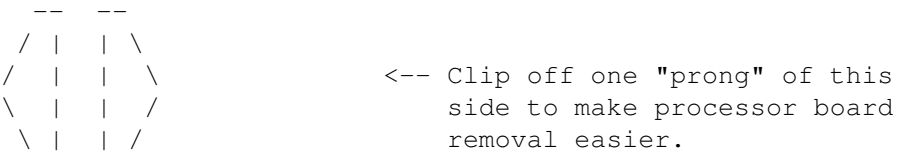
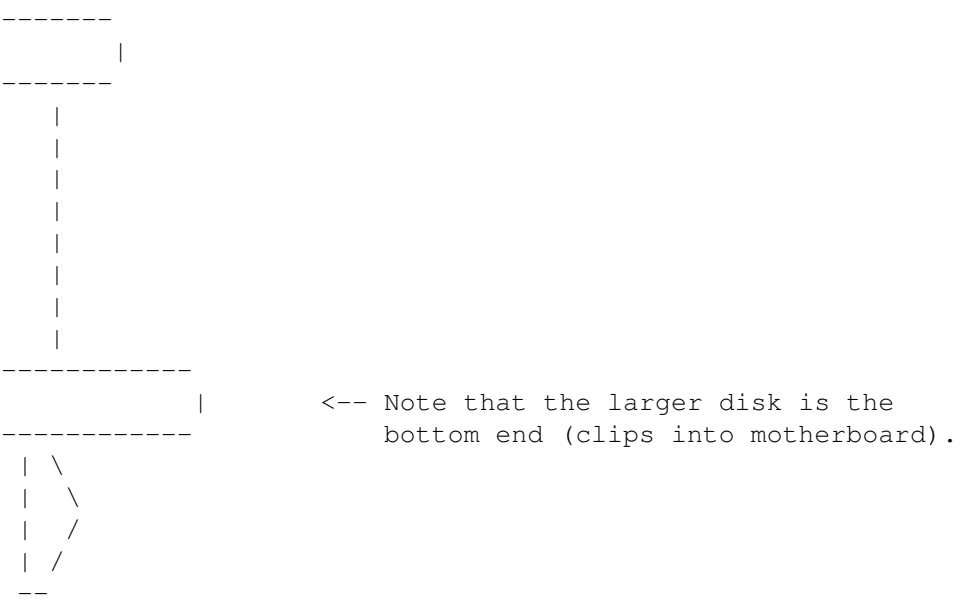
* The nylon standoffs that hold the A3640 processor daughterboard in place grip the board very, very tightly, making removal difficult and prone to flexing this fragile board. Pushing the two halves of the standoff together with needle-nose pliers makes it somewhat easier to remove the processor board, but it may still be a fight, putting stress on both the motherboard and the processor board. After removing the board, you can clip off one "prong" of the side that plugs into the processor board. If you leave one of these prongs in place, the processor board will still be held firmly in place, but removal will be much easier, next time, anyway. If you are afraid that the processor board will not be held firmly enough, do this modification on only two of the standoffs.





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* A company called PC Power & Cooling makes a stick-on cooling fan for the 486 processor that just happens to fit the 68040 perfectly. The fan uses a stick-on backing to attach to the chip, so you don't have to mess with little clips or spring wires. It spins on ball bearings instead of a bushing, so life expectancy is claimed to be 50,000 hours instead of the ordinary bushing fan's 5000 hours. A disk-drive power connector powers the fan. Finally, it's only .6 inches high, no more than the heat sink that comes with the A3640 processor board. PC Power & Cooling calls it the "CPU-COOL," and they sell it for $24.

  PC Power & Cooling
  5995 Avenida Encinas
  Carlsbad CA 92008
  (800) 722-6555
  (619) 931-6988 Fax

1.9 Boards

A4000 Boards

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* A3640 Reference (See Tips .)

  The A3640 is the stock 68040 processor board that comes with most A4000s. It contains a 25 MHz 68040; some boards came with the 68LC040, which is a 68040 with no built-in math coprocessor functions. The A4000 User's Guide has instructions on upgrading from a 68EC040, which has no math coprocessor or memory management unit (if any A4000s were ever shipped with 68EC040

processors, there were very few of them). Some A3640 boards (notably, revision 3.1 boards with U209 marked as "-02" or "-03") can be used in A3000 or A3000 tower computers.

Jumpers:

J100: Enable CDIS* MDIS* (???)
1-2 Closed and 3-4 Closed: Enable CDIS* MDIS* (default).

J400: Enable MAPROM: Enable remapping circuit for loading Kickstart into Fast RAM with a developer utility program.
1-2 Closed: MAPROM enabled (default).
3-4 Closed: MAPROM disabled.

---

* 68020/68030 Processor Board Reference (See Tips .)

This processor board is the board supplied with the A4000/030. It may contain a 68030, 68EC030 (functionally equivalent to the 68030 but without a memory management unit), or even a 68020 processor. The 68020 option was apparently for an extremely low-cost version of the A4000; it is unlikely that any boards using the 68020 were ever sold.

Jumpers:

J100: FPU Select
1-2 Closed: Use FPU in the PLCC socket.
2-3 Closed: Use FPU in the PGA socket.

J101: FPU Clock
1-2 Closed: Use optional on-board oscillator at U103 for FPU clock.
2-3 Closed: Use CPU clock as FPU clock.

J103: MAPROM Enable
1-2 Closed: MAPROM disabled.
2-3 Closed: MAPROM enabled (requires U100).

J201: 68020 Select
1-2 Closed: 68020 not selected.
2-3 Closed: 68020 selected.

J202: 68030 Select
1-2 Closed: 68030 selected.
2-3 Closed: 68030 not selected.

J203: 68020/68030 Select
1-2 Closed: 68030 selected.
2-3 Closed: 68020 selected.

---

* Warp Engine Reference (See Tips .)

The Warp Engine is a popular 68040 processor board that replaces the A3640. It includes four 72-pin SIMM sockets and a Fast SCSI-2 host adapter.

Memory: Any combination of 4M, 8M, 16M, or 32M 72-pin SIMMs, either 32-bit or 36-bit wide. Add them starting with SIMM4 and working down to SIMM1. It is advised that you put your largest SIMM in the SIMM4 socket.

SIMM Speed: For a 28 MHz Warp Engine, 80 ns SIMMs are adequate. A 33 MHz Warp Engine requires 70 ns SIMMs, while a 40 MHz board needs 60 ns.

SIMM Types: Single or double-sided SIMMs will work, although the double-sided 16M SIMM is not recommended due to high power consumption. (This probably also applies to double-sided 32M SIMMs; the Warp Engine manual doesn't say so, perhaps because they are very rare at present.)

Upgrading: All that is required to convert a 28 MHz Warp Engine into a 33 MHz or 40 MHz Warp Engine is to replace the oscillator and processor.

Jumpers:

JP1: SCSI Termination Power

JP2:

A: Mode Select (Off: 040 enabled, On: 040 disabled)
B: SIMM Type (Off: double-sided, On: single-sided)
C: SIMM Bank Size (Off: 16M, On: 4M)
D: Wait State (Off: no wait state, On: 1 wait state)
E: reserved
F: MMU Disable (Off: MMU enabled, On: MMU disabled)
G: Cache Disable (Off: caches enabled, On: caches disabled)
H: SCSI Config (see below)
J: SCSI Config (see below)
K: SCSI Config (see below)

JP3: reserved

JP4: used for A3000 version *only* (connects to pin 21 of U350)

SCSI Configuration Jumpers (H, J, K on JP2)

K	J	H	(0=Open, 1=Closed)
0	0	0	SCSI autoboot disabled
0	0	1	10-second delay, LUN scan, not synchronous
0	1	0	10-second delay, LUN scan, 200 ns synchronous
0	1	1	10-second delay, LUN scan, 100 ns synchronous
1	0	0	no delay, LUN scan, 200 ns synchronous
1	0	1	no delay, LUN scan, 100 ns synchronous

```
    1  1  0    no delay, no LUN scan, 200 ns synchronous

    1  1  1    (default) no delay, no LUN scan, 100 ns synchronous
```

```
* A2320 "Amber" Reference

  The A2320 is a video deinterlacer board originally built for the A2000. It
  is essentially the motherboard deinterlacer circuitry from the A3000 on a
  board. Based on the Amber chip used in the A3000, the board is often
  referred to as the Amber board. Physically, the board is designed to fit
  into the video slot of an A2000. Electrically, it works fine in an A4000.

  Why would you need a separate deinterlacer board when the A4000 already has
  AGA circuitry that can scan-double? If you have a VGA or multisync monitor,
  there are two main reasons:

  A. Not all programs can be mode-promoted to "double" screens through
     software (games, for instance). The Amber board will scan-double all
     15.75 kHz screens.

  B. The AGA "double" modes are not truly double in frequency. A 640x200
     "doubled" screen syncs at about 27.5 kHz, not the 31.5 kHz that you'd
     expect. Some multisync monitors can't sync this low. With an Amber
     board, the output is 31.5 kHz, the same as "stock" VGA.

  Physical Mounting

  A modified "slot cover" can be attached to the back panel of the Amber board
  to allow it to be attached securely to an A4000 slot. You'll also need to
  trim a bit off the "top" of the Amber's metal panel to allow clearance for
  the A4000 case (a nibbling tool is useful here).

  Don't remove the enable/disable switch! The Amber gets confused by some of
  the "doubled" screen modes, and rather than passing them through, tries to
  double them to 55 kHz or above! On these modes, you'll need the disable
  switch to force the board to pass the video through. (Productivity mode is
  passed through correctly, though.)

  Disadvantages

  The Amber board was designed before AGA came out, and doesn't really under-
  stand AGA. As noted above, some modes are not passed through properly unless
  the board is disabled with the switch. Also, I believe that AGA screens with
  more than 32 colors or HAM-6 will have the colors quantized to a certain
  degree, although I haven't really been able to test this (it hasn't been a
  problem so far). Games that use the AGA color abilities but don't allow for
  promoting their screens to doubled modes are the only likely sources for
  this trouble.
```

1.10 Drives

Drives

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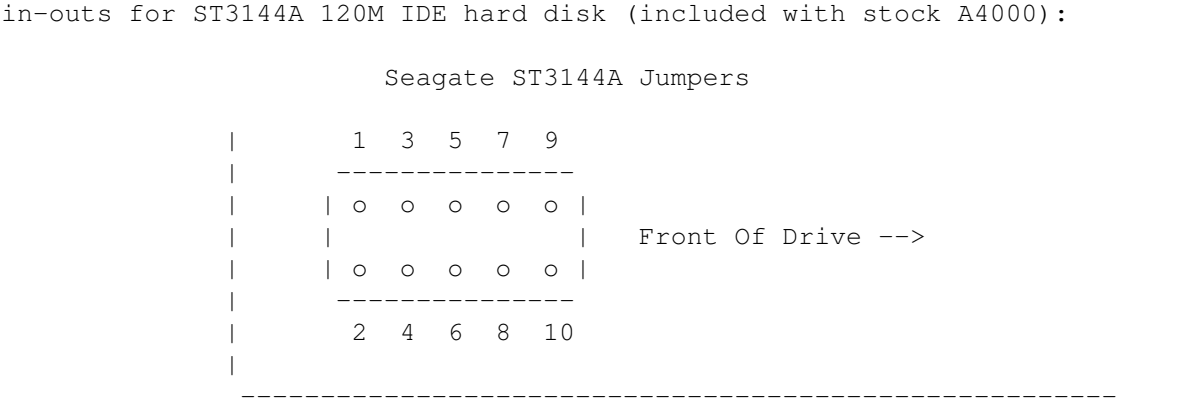
* Pin-outs for ST3144A 120M IDE hard disk (included with stock A4000):

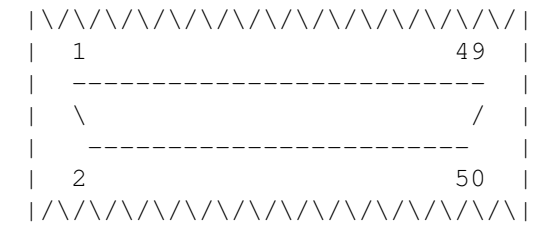


Single drive:	Pins 3-4 jumpered.
Two-drive master:	Pins 3-4 jumpered and pins 5-6 jumpered.
Two-drive slave:	Pins 3-4 open and pins 5-6 open.
LED connected:	Pins 9-10 must be jumpered to connect to an activity LED on the controller. Without this jumper, the drive will work, but there will be no activity light (unless you connect an LED to the connector on the front of the drive itself).

---

* Pin connections for external SCSI-2 half-pitch connector:

NOTE: Connector is VIEWED FROM THE BACK, or inside of the computer. All odd-numbered wires go to the top of the connector, and all even-numbered wires go to the bottom.



Procedure: split the 50-pin SCSI ribbon cable connectors back a couple of inches. Start with pin 1, lay it in the crimp-on pins at the upper left of the connector (again, viewed from the back of the connector). By placing the two sides of a small pair of needle-nose pliers on the wire on either side of the crimp pins, you can gently force the wire down into the V-shaped gap between them. Locate wire #2, then use the same procedure to connect it to the other side of the connector. Repeat for all 50 wires, then clip the plastic retaining clips onto the connector and give it a final squeeze to make sure all wires are making contact.

You can cut a hole in the A4000’s "Expansion" port cover on the back of the machine to hold this new connector (a "nibbling" tool works well for this).

Don’t forget proper SCSI termination: the devices at both ends of the chain should be terminated. If the internal SCSI device on the bus before this connector is not terminated--and it shouldn’t be if you want this connector to be functional--external devices plugged into this port should be

terminated. You could also plug a half-pitch terminator directly into this new external port.

1.11 Monitors

Monitors

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* 1084(S) Reference

Information needed! Who made it? Common problems? Pinouts for other connectors? Tips?

The 1084 and 1084S are 15.75 kHz monitors. They do not handle AGA "double" screenmodes, nor will they display the deinterlaced output from the A2320 Amber board, the Microway flicker Fixer, or the motherboard deinterlaced output on an A3000. However, they will show all normal 15.75 kHz displays, and many (all?) of the 1084 versions have a separate input for composite video.

Only the six-pin DIN connectors are used for analog RGB. Some 1084 monitors also have digital RGB (CGA) inputs.

Pinouts:

Pin 1: Green
Pin 2: Horizontal Sync
Pin 3: Ground
Pin 4: Red
Pin 5: Blue
Pin 6: Vertical Sync

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* 1950 Reference

Information needed! Connector pinouts, common problems, tips? Startup resistor location and recommended replacement value?

The 1950 monitor was actually produced by a company called AOC. Parts may still be available direct (although there have been conflicting reports).

AOC International
311 Sinclair Frontage Road
Milpitas CA 95035
(408) 956-1070

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* 1960 Reference

Information needed! Connector pinouts, common problems, tips?

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* 1942 Reference

  Information needed! Connector pinouts, common problems, tips?

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* Idek Iiyama Vision Master 17 Reference

  This is a fairly popular monitor for use with the Amiga, since it is a high quality, relatively inexpensive 17-inch monitor that can sync down to about 23.5 kHz, and therefore works with most (all?) AGA "double" screenmodes. All presets and controls are digital, set through three front-panel buttons and an LCD display. The image can easily be expanded to fill the screen in all modes. (See
  Boards
  for information on the A2320 "Amber" board that may be used with this monitor.)

  Specifications:

  Sync Frequency: 23.5 kHz to 86.0 kHz Horizontal
  50 Hz to 120 Hz Vertical

  Resolution: Maximum 1280 x 1024 at 80 Hz

  Input Connectors: Five BNC connectors and one DB15 (not high density)
  (A cable is included to connect a HDD15 VGA-type
  connector to the DB15 connector on the monitor.)

  Pinouts:

  DB15:

  Pin 1: Red
  Pin 2: Red Ground
  Pin 3: Green
  Pin 4: Green Ground
  Pin 5: Blue
  Pin 6: Blue Ground
  Pin 7: Ground
  Pin 8: NC
  Pin 9: NC
  Pin 10: NC
  Pin 11: NC
  Pin 12: NC
  Pin 13: NC
  Pin 14: Horizontal or HV Sync
  Pin 15: Vertical Sync

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* Mitsubishi DiamondScan AUM-1381A Reference

  The DiamondScan is one of the few VGA-type multisync monitors that has a

composite video input, and that made it relatively common for use on the Amiga (although I believe that Mitsubishi no longer makes this model). The official scan rates cover the range from 15.6 kHz to 36 kHz, so the DiamondScan should work with all normal Amiga video modes. User controls are standard knobs and buttons, and there are no digital memory features, so using it with the Amiga means that you have to juggle the monitor's picture location settings along with the Amiga overscan and screen position settings. The DiamondScan works fine with the Amber board (see
Boards
).

One feature of the DiamondScan is particularly applicable to the video production uses of the Amiga: the "Composite/RGB Select" (pin 22) on the DB25 input. Connect this pin through a switch to ground, and then a flip of the switch will select composite video or analog RGB display without reaching for the switches on the back of the monitor.

Specifications:

Sync Frequency: 15.6 kHz to 36 kHz Horizontal
45 Hz to 90 Hz Vertical

Resolution: Maximum 800 x 560 (Rated...normally considered to be an 800x600 monitor.)

Input Connectors: BNC (Composite Video)
DB9 (EGA/CGA/Mono TTL) (DB9-to-DB9 cable was included.)
DB25 (Analog RGB)

Pinouts:

DB9: (For TTL 16-Color CGA)

Pin 1: Ground
Pin 2: Unused
Pin 3: Red Video
Pin 4: Green Video
Pin 5: Blue Video
Pin 6: Intensity
Pin 7: Unused
Pin 8: Horizontal Sync
Pin 9: Vertical Sync

DB9: (For TTL 64-Color EGA)

Pin 1: Ground
Pin 2: Secondary Red Video
Pin 3: Primary Red Video
Pin 4: Primary Green Video
Pin 5: Primary Blue Video
Pin 6: Secondary Green Video/Intensity
Pin 7: Secondary Blue Video
Pin 8: Horizontal Sync
Pin 9: Vertical Sync

DB9: (For TTL Mono)

```
        Pin 1: Ground
        Pin 2: Unused
        Pin 3: Unused
        Pin 4: Unused
        Pin 5: Unused
        Pin 6: High Intensity
        Pin 7: Video
        Pin 8: Horizontal Sync
        Pin 9: Vertical Sync

      DB25:

         Pin 1: Sync Ground
         Pin 2: Red Video
         Pin 3: Red Video Ground
         Pin 4: Green Video
         Pin 5: Green Video Ground
         Pin 6: Superimpose Control (YS)
         Pin 7: Superimpose Ground
         Pin 8: Video Input Select (AV)
         Pin 9: Composite Video Input
        Pin 10: Composite Video Ground
        Pin 11: Composite Video Out
        Pin 12: Composite Video Ground
        Pin 13: PGA Mode Control
        Pin 14: Blue Video
        Pin 15: Blue Video Ground
        Pin 16: Horizontal/Composite Sync
        Pin 17: Vertical Sync
        Pin 18: Unused
        Pin 19: Unused
        Pin 20: Unused
        Pin 21: INT (+5V ???)
        Pin 22: Composite/RGB Select (TTL level: Low for RGB, high
                                      or open for composite.)
        Pin 23: Analog/TTL Select (TTL level: Low for TTL, high
                                   or open for analog.)
        Pin 24: Remote (TTL level: Low to disable Mode Switch.)
        Pin 25: Shield Ground
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1.12 Sources

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                                                Sources For Components
```

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  (Opinions in this section are solely those of the
               Editor
               .)

  This list includes sources for suppliers of parts and accessories like
  cables and connectors. If you don't know where to start, I'd suggest that
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you contact the following:

* For general or custom cables and connectors: Dalco or Redmond Cable.
* For general board-level parts (not custom Amiga): Digi-Key and JDR.
* For custom Amiga parts: Unknown at this point. Suggestions welcome!

Altex Electronics
11342 N IH 35
San Antonio TX 78233-9903
(800) 531-5369
(210) 637-3264 Fax
I've not had a lot of experience with Altex, although they seem okay, and have a pretty good selection of connectors and components at good prices.

Dalco Electronics
275 Pioneer Boulevard
Springboro OH 45066
(800) 445-5342
(513) 743-9251 Fax
Extremely large selection of connectors and cables, including the relatively rare SCSI-2 and 2.5-inch IDE hard disk varieties. Oriented towards computer end-users. They will custom-build cables. Seems like they have good service.

Digi-Key Corporation
701 Brooks Ave. South
P.O. Box 677
Thief River Falls MN 56701-0677
(800) 344-4539
(218) 681-3380
Very large assortment of electronic components, including chips, heat sinks, cables, connectors, fans. Prices tend to be a little higher, which is offset somewhat by the fact that they have such a large selection. Oriented towards electronics designers and experimenters.

Hosfelt Electronics
2700 Sunset Boulevard
Steubenville OH 43952-1158
(800) 524-6464
(800) 524-5414 Fax
Source for Panasonic replacement fans and other parts. Very low prices. I've had no experience (yet) with this company.

JameCo Electronic Components
1355 Shoreway Road
Belmont CA 94002-4100
(800) 831-4242
(415) 592-2503 Fax
Large selection of chips, power supplies, and other electronic components, including some that can be extremely difficult to find elsewhere.

JDR Microdevices
1850 South 10th Street
San Jose CA 95112-4108
(800) 538-5000 Orders (24-Hour)
(800) 538-5005 Fax
(800) 538-5002 Tech Support
(408) 494-1430 BBS
Chips, cables, hard drives, generic computer parts. Oriented towards the end-user, quick to deliver and nice on the phone.

Marlin P. Jones & Associates
PO Box 12685
Lake Park FL 33403-0685
(407) 848-8236
(407) 844-8764 Fax
Chips, connectors, electronics and computer parts, much of which is surplus. They sometimes have parts unavailable elsewhere, like blue LEDs. Oriented towards electronics experimenters and designers.

MCM Electronics
650 Congress Park Drive
Centerville OH 45459-4072
(800) 543-4330
(513) 434-6959 Fax
Large assortment of parts. Oriented towards electronic repair shops.

Memory World
3392 Progress Drive, Suite B
Bensalem PA 19020-5899
(215) 244-7930
(215) 244-7932 Fax
Source for SIMMs, ZIPs, other memory, Motorola processors. And they even know what an Amiga is! The last time I bought from them, their prices were excellent.

Parts Express
340 E. First Street
Dayton OH 45402-1257
(800) 338-0531
(513) 222-4644 Fax
Chips, cables, other parts. Oriented towards electronic repair shops.

Redmond Cable
(206) 882-2009
(206) 883-1430 Fax
Excellent source of very unusual cables and connectors. They will custom-build cables or just sell the parts. They had SCSI-2 panel mount female connectors, which I was unable to locate anywhere else.

1.13 Editor

Editor and compiler of the Amiga 4000 Hardware Guide:

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1.14 Credits

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I'd like to thank everyone for their graciousness in sharing this very valuable information with the world, and in putting up with my seemingly endless questions on the Amiga 4000. Thank you all!

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