A4000HardwareGuide

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A4000HardwareGuide

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```
                        Amiga 4000 Hardware Guide 2.0
                 compiled by Warren Block
```

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1.2 introduction

```
                                    Introduction
```

```
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  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.

  This guide is specifically for the Amiga 4000; however, at the prompting of
  several other individuals, I've compiled a short A1200 hardware FAQ to
  address those same old questions I see popping up in c.s.a.hardware all the
  time. Both are or will be available in the hard/misc directory of Aminet.

  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 freely share this information with everyone.

Comments on this document should be addressed to the
                Editor
                .

1.3 common problems

                                        Common Problems

                Fan Problems

                -5V Power Problems

                Video Banding Problems

                Green Display Problems

                Backplane Problems

                Cable Routing Problems

                Battery Problems

                Zorro-III DMA Problems

                SCSI Reselect Problems

                Dead Machine Problems

```
                     Slow 2091 Problems
```

1.4 fan problems

```
                                    Fan Problems
```

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.

1.5 -5v power problems

```
                                  -5V Power Problems
```

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

The easiest way to replace this component may be to clip off the leads
close to the body of the defective part, then trim the leads of the
replacement and solder it to the old pins.

```
                                     New 7905 regulator
                         Solder           (side view)
                          here                  |
  Old leads on motherboard       \              |
                            \        \       --------
                             \      -------|         |---
                         XXXXXXXXX       --------
                         X
                         X
```
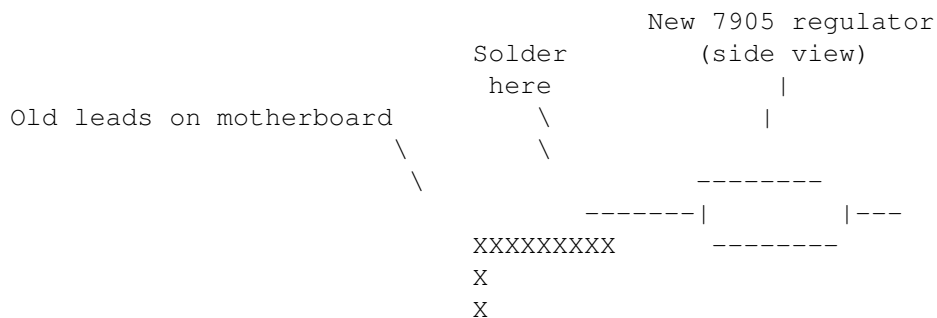
X

1.6 video banding problems

Video Banding Problems

  Display on monitor has faint, darker vertical bands or stripes. See the
  Tips section for the
                Video Banding Modification
                     .

1.7 green display problems

Green Display Problems

  Video output from the A4000 has a greenish tint. This may be caused by the
  Sync On Green jumper (J500) being in the wrong position. Unless the monitor
  is set up to receive sync signals piggybacked on the Green video input,
  pins 1-2 of J500 should be jumpered. See Internals/
                Motherboard Jumpers
                     .

1.8 backplane problems

Backplane Problems

  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.

1.9 cable routing problems

Cable Routing Problems

  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.

1.10 battery problems

Battery Problems

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.

1.11 zorro-iii dma problems

Zorro-III DMA Problems

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: it is unclear whether there is a problem with Zorro-II
boards and the revision 9 Buster; Zorro-II or Zorro-III video boards that
do not use DMA should not encounter this problem, which is not to say that
there might not be others! Problems may also be encountered with the
           2091
              or GVP Series II SCSI controller boards. To isolate this problem ←
                , check
disk transfers to Chip RAM with a program like Diskspeed 4.2.)

There can be a software component to this problem, also. Check that
libs:68040.library is at least version 37.30. Note that due to the way
the library version numbers are handled, version 37.4 is an earlier
version. The later 37.30 library handles Zorro transfers better.

1.12 scsi reselect problems

SCSI Reselect Problems

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).

1.13 dead machine problems

                            Dead Machine Problems

  A4000 does nothing on power-up; keyboard light, power light, and hard drive
  spin-up show that power supply is working, but screen is gray or black, and
  disk drive doesn't click. Possible cause: the motherboard is not supported
  very well near the internal IDE connector. Solution: gently lift the
  motherboard near this connector. Installing an insulating support
  underneath the motherboard near here will be a more permanent solution.

1.14   slow 2091 problems

                               Slow 2091 Problems

  2091 SCSI controller in A4000 performs very slowly. Solution: the 2091
  controller has problems with the A4000 environment (see
                2091 Reference
                in
  the Boards section). Several utilities are available in the "hard"
  directory of Aminet that can help speed up the 2091's performance in an
  A4000.

1.15   common questions

                              Common Questions

                              Memory Questions

  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, 80 ns or
            faster. All Fast RAM SIMMs must be the same size. To fit
            properly, these SIMMs must be single-sided modules. (These
            specifications describe the motherboard memory; expansion boards
            may use other types of memory.)

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

                              IDE Hard Drive Questions

  Question: Can the A4000 support two IDE hard drives?
    Answer: Yes, since IDE supports a master/slave drive setup. 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. The
            maximum supported size of a hard drive is 2G (~2000 megabytes).

  Question: Can "EIDE" or "Fast ATA" hard drives be used in the A4000?
    Answer: Yes. These are just revised versions of IDE, and should work fine
            with the A4000's on-board IDE controller.

                        SCSI Hard Drive Questions

  Question: Does the A4000 come with a SCSI or SCSI-2 hard drive controller?
    Answer: No. The A4000T (tower) model did come with a built-in SCSI-2
            controller, though. The A4091 and FastLane expansion boards are
            common SCSI-2 controllers for the A4000, and the
                2091
                  is a fairly
            common SCSI-1 controller.

  Question: Why doesn't SCSI work on the A4000?
    Answer: It does. But because of a bug in early versions of the Zorro-III
            DMA controller (the "Buster" chip), DMA SCSI controllers didn't
            work properly. This problem can be fixed (by replacing the early
            revision 9 Buster with a revision 11 version) or avoided
            altogether (by using a SCSI controller that doesn't use the
            Zorro-III bus, like the one built into the
                Warp Engine
                            accelerator).

  Question: What are SCSI terminators?
    Answer: Terminators are resistor packs attached at both ends of the SCSI
            chain. The resistance reduces ringing and noise on the bus, and
            is necessary for reliable operation. Terminators that install
            directly on a drive are usually black or yellow SIPs (Single
            In-line Package), and there may be one, two, or three of them. An
            alternate method is to package the resistors into a connector
            which may be plugged into an external SCSI port. These
            terminators may be of several types: a Centronics 50-pin
            connector, a DB-25, or a high-density 50-pin "SCSI-2" connector.
            Finally, there are "passive" terminators like the SIP packs
            described above, and "active" terminators that incorporate a
            voltage regulator to do a more precise job. An active terminator
            may work when a passive one won't, but they tend to cost somewhat
            more than the passive variety.

  Question: What is the proper setup for SCSI termination?
    Answer: Both ends of the SCSI chain need to have terminators, and there
            should be none in the middle. If you have a controller and one
            hard drive, there should be terminators on each. For a larger
            chain, just make sure that the end devices are terminated, and
            those in the middle are not. Don't forget that the controller

counts as a device on the chain. (Now, the catch: some SCSI
devices are not very compliant with the SCSI specification, and
require oddball setups. Devices made within the last couple of
years are usually pretty compliant.)

Question: Can a SCSI-1 drive be used with a Fast SCSI-2 controller?
  Answer: Yes, and vice versa. SCSI-1 and SCSI-2 (and Fast SCSI-2) are
          compatible. Of course, a SCSI-1 drive won't go any faster when
          plugged into a Fast SCSI-2 controller; neither will a Fast SCSI-2
          drive connected to a SCSI-1 controller go any faster than SCSI-1.

Question: What is the pin-out for a DB25 SCSI connector? What about the
          standard 50-pin SCSI header?
  Answer: See the Drives/
              SCSI Pin-Outs
               section for both.

Question: Will SCSI hard drives meant for the Mac work on an A4000?
  Answer: Yes. The cable included with most external Mac hard drives is a
          DB25-to-Centronics 50 adapter, and this will work on a SCSI
          controller with DB25 external SCSI port. Software is available
          for accessing an existing Mac filesystem, so file interchange
          with a portable SCSI device is possible.

                                CD-ROM Questions

Question: Will an EIDE CD-ROM drive work with the A4000's IDE interface?
  Answer: Not unless you can locate a replacement for the scsi.device
          driver, which isn't capable of dealing with CD-ROM drives. SCSI
          is usually simpler to set up. Beware of pseudo-IDE CD-ROM drives,
          like the older Mitsumi, Panasonic, and Sony drives which will not
          work unless you have a special interface board for them.

1.16 tips

                                      Tips

          Connecting VGA Monitors

          Video Banding Modification

          Processor Board Mounting

Processor Cooling

1.17   connecting vga monitors

Connecting VGA Monitors

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 a TTL gate.
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 picky monitors.

A4000 VGA Video Cable

A4000 DB23   VGA HDD15

Red   (Pin 3) -------------------------------- Red (Pin 1)

Green (Pin 4) -------------------------------- Green (Pin 2)

Blue (Pin 5) -------------------------------- Blue (Pin 3)

Grounds (Pin 16-20) --------------------------- Grounds (Pin 5-8,10,11)
                                               and ground for inverter.
                                               Also use a .01 uF ceramic
                                               decoupling cap between
                                               +5V and ground at the
                                               chip power supply pins.

                         |\ |\
 Horizontal Sync (Pin 11) ----| >o---| >o--------- Horizontal Sync (Pin 13)
                         |/ |/

                         |\ |\
 Vertical Sync (Pin 12) ------| >o---| >o--------- Vertical Sync (Pin 14)
                         |/ |/

 +5V (Pin 23) -------------------------------- Power supply for
                                               inverter chip.

1.18   video banding modification

                                    Video Banding Modification

----

  Video Banding Modification: Many (most?) A4000s show some faint vertical
  bands on the display. There is a modification to prevent this, but, like
  anything else, it has advantages and disadvantages.

  Advantages:
    Removes vertical bands from display.
    Simple modification.
    Relatively easy to disable.

  Disadvantages:
    Interferes with operation of attached genlocks and deinterlacer
    boards like the Amber A2320 board (see Boards/
                A2320 'Amber' Reference
).

  The modification involves connecting pin 15 of the video port connector
  through a 100 ohm, 1/4 watt resistor to ground. This can be done inside the
  A4000, but it's safer and more versatile if the modification is performed
  on the DB23-to-HDD15 adapter that was included with the A4000. That way the
  adapter can be unplugged from the machine if a genlock or Amber board is to
  be used.

  There are two grounds on the adapter PC board: shield ground and video
  ground (pins 16-20). Since all the other components on the board use the
  video ground, it seems reasonable to use it for this modification, rather
  than the more-easily-reached shield ground. The resistor fits nicely on the
  bottom of the adapter PC board, running from pin 15 to pin 18 of the
  connector's soldered pins.

1.19   processor board mounting

                                  Processor Board Mounting

  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 the motherboard, the
  processor board, and the person removing it. 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.

                --   --

```
          / |   | \
         /  |   |  \          <-- Clip off one "prong" of this
         \  |   |  /              side to make processor board
          \ |   | /              removal easier.
        -------------
        |           |
        -------------
           |     |
           |     |
           |     |
           |     |
           |     |
           |     |
           |     |
           |     |
           |     |
      ----------------------
      |                    |       <-- Note that the larger disk is the
      ----------------------           bottom end (clips into motherboard).
         / |   | \
        /  |   |  \
        \  |   |  /
         \ |   | /
          --   --
```
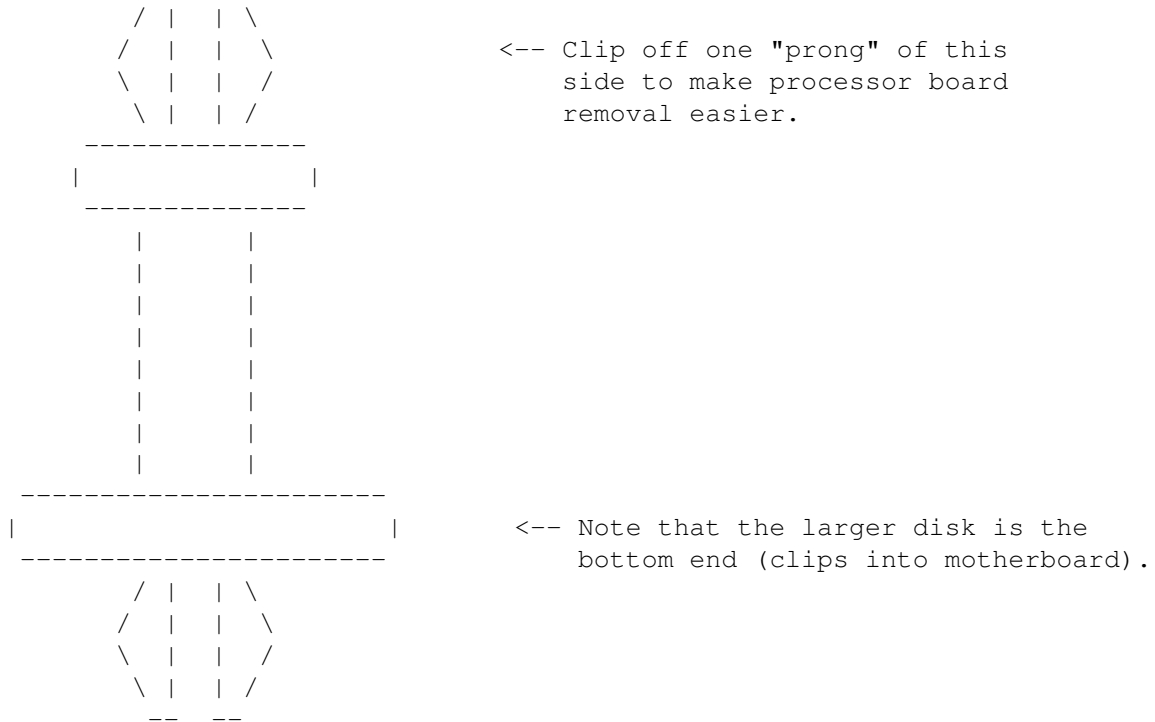
1.20   processor cooling

```
                           Processor Cooling
```

 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. In the United States, you can save a
 few dollars by ordering it from large mail-order companies like PC
 Connection.

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

1.21   internals

```
                           A4000 Internals
```

                    Motherboard Jumpers

                    Connector Pin-Outs

                    Power-Up Self-Test

                    Keyboard Self-Test

1.22   motherboard jumpers

                                             Motherboard Jumpers

----

  A4000 Motherboard

```
     -------------------------------------------
    |   ooo            || oo           |        |
    |  Internal        || DF1:         |        |
    |  Audio           || Enable       |        |
    |  Connector       ||              |  Power |
    |                  ||              |  Supply|
    |                  ||              |        |
    |                  ||        ooo   |        |
    |                  ||        ooo   |  Fan   |
    |                  ||        ooo   ----------|
    |                  ||     Power Supply       |
    |                  ||     Connector          |
    |                  ||                        |
    |                  ||     ------------------ |
    |                  ||    |                   |
    |                  ||    |                   |
    |                  ||    |                   |
    |                  ||    |        Drive      |
    |                  ||    |        Bays       |
    |                  || oo |                   |
    |                  || SIMM |                 |
    |                  || Size |                 |
    |                  ||    |                   |
     -------------------------------------------
```

  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. The A4000 audio is somewhat louder than the normal line
            level output from most CD-ROM drives, presumably to make sound
            effects audible over background music. Setting the software-
            controlled A4000 audio level 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 (default?).
            2-3 Closed: Sync on green enabled (see the Common Problems section
                        for the
                  Green Display Problems
                    note on this jumper).


    J501: Lisa Sync (Wide input on the Lisa chip.)
            1-2 Closed: CSync from Agnus Pin 80.
            2-3 Closed: +5V (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 (???)
```

1.23 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 pin-out information shown here
 with a logic probe, meter, or scope before using it.


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



               Serial Port



               Parallel Port



               Video Port



               Keyboard Port



               Mouse/Joystick Ports



               External Floppy Port



               Internal Floppy Connector
```

```
                   Internal IDE Hard Disk Connector
```

1.24 serial port pin-outs

```
                        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
```

1.25 parallel port pin-outs

```
                       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
```

1.26   video port pin-outs

```
                          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.)
```

1.27   keyboard port pin-outs

```
            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


    Note: A PS/2 keyboard will not work with the A4000.
```

1.28   joystick port pin-outs

```
                         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)
```

1.29   external floppy port pin-outs

```
                       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.)
```

1.30   internal floppy connector pin-outs

```
              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
```

1.31   internal ide hard disk connector pin-outs

```
             Internal IDE Hard 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
```

1.32 power-up self-test

```
                          Power-Up Self-Test

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

Test Status      Color Shown      Description Of Error

  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, and
                                  check Chip RAM SIMMs for proper seating.
                 Blue             Custom Chip or CIA error.
                 Yellow           Processor detected error before software
                                  trapped it.
```

1.33 keyboard self-test

```
                          Keyboard Self-Test

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

Number Of Caps Lock Blinks     Description Of Error

         One                   Keyboard ROM failed.

         Two                   Keyboard RAM failed.

         Three                 Watchdog timer failed.

         Four                  Short detected in keyboard.
```

1.34 boards

                                              A4000 Boards

            A3640 Reference

            68020/68030 Processor Board Reference

            Warp Engine Reference

            A2320 'Amber' Reference

            Emplant Reference

            2091 Reference

1.35   a3640 reference

                                              A3640 Reference

----

  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.

  (See also Tips/
            Processor Board Mounting
            .)

  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.
```

1.36 68030 processor board reference

```
                                    68020/68030 Processor Board Reference


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

  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.

  A possible cost-reduced variation of this processor board has no jumpers.
  This type of board has a PLCC socket for the math coprocessor, which runs
  at the same speed as the processor.

  (See also Tips/
            Processor Board Mounting
             .)

  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.
```

1.37 warp engine reference

                                Warp Engine Reference

   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 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.

   (See also Tips/
                Processor Board Mounting
                 .)

   Jumpers:

     JP1: SCSI Termination Power

     JP2:

       A: Mode Select   (Off: 68040 enabled, On: 68040 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
```

1.38   a2320 reference

                          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. Electronically, 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). The board will only fill
  part of A4000 video slot; it looks funny this way, but it works.

  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, since it was part of the ECS chip set that was
  around when the Amber board first came out.)

  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 prove 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.

1.39 emplant reference

                              Emplant Reference

The Emplant is a Zorro-II board that, in combination with the appropriate
software, makes it possible to emulate other computers on the Amiga system.

The Emplant hardware performs several functions. Sockets are provided for
both DIP- and SIMM-packaged ROMs (the ROMs of the "target" computer are
installed on the board, then copied to image files, then removed). Also
provided are two Macintosh-type serial ports and a basic, no-frills, non-
autobooting SCSI-1 interface based on the 53C80 SCSI chip.

Dual serial ports and the SCSI controller are optional, and some models of
the board come without one or both of these options.

Early versions of the board came with "ST" brand serial chips or "LOGIC"
brand SCSI chips, both of which caused various problems with their
respective ports. Utilities Unlimited has offered free replacements for
these problem chips in the past. Contact them at:

     Utilities Unlimited International, Inc.
     790 N. Lake Havasu Avenue #16
     Lake Havasu City AZ 86403
     (602) 680-9004 Sales
     (602) 453-6407 Fax
     (602) 680-9234 Tech Support

A commonly-defective -5V regulator on the A4000 motherboard can cause the
Emplant board to fail diagnostic tests and not perform properly in other
ways, including unreliable operation of AppleTalk devices. See the Common
Problems section on
                -5V Power Problems
                 for more information.

Jumpers:

```
  -------------------------------------------------------------
 | JP1                              |--|  |- JP6 -|  RCA         |
 | xxxxxxxxxxxxxxxxxxxxxxxxxxx  JP2  | |  | | | |  |     |----|     |---
 | ROM SIMM Socket    -----------   | |  | | | |  |     |    | XX| Serial
 |                   | Autoboot |   | |  | | | |  |     |    | XX| Port B
 |                   |  Socket  |   | |  | | | |  |     |    |   |
 | -----------    --------------    | |  | | | |  |     |    | XX| Serial
 | | ROM/RAM |   | ROM/RAM  | JP3  |--| |--| |--|  |     |    | XX| Port A
```

```
| | Socket-1 |   | Socket-3 |    JP4                        |----|     |
| -----------   -----------                                           |X External
| | ROM/RAM  |   | ROM/RAM  | JP5                                     |X SCSI
| | Socket-2 |   | Socket-4 |           Internal SCSI Connector       |X Port
| -----------   -----------           XXXXXXXXXXXXXXXXXXXXX JMP1 |X
 ---                                  -----------------------------------|
    |                          |                                     |
    -------------------------                                        |
```

```
   JP1: ROM SIMM Address Line Selection
         Right: Default.
          Left: ???.

   JP2: ROM SIMM Write Enable
         Right: Default (gated write select).
          Left: Signal pulled up to +5V.

   JP3: Auto-Boot ROM/SRAM Socket Power/Address Select
         Upper: Supply power to 28-pin DIP.
         Lower: Supply address line for 32-pin DIP.

   JP4: ROM/RAM Socket 3/4 ROM/SRAM Socket Power/Address Select
         Upper: Supply power to 28-pin DIP.
         Lower: Supply address line for 32-pin DIP.

   JP5: ROM/RAM Socket 1/2 ROM/SRAM Socket Power/Address Select
         Upper: Supply power to 28-pin DIP.
         Lower: Supply address line for 32-pin DIP.

   JP6: Mac Emulation Audio Mode Select
         Upper: Mono.
         Lower: Stereo.

  JMP1: SCSI Terminator Power Enable
           On: Supply SCSI terminator power.
          Off: Do not supply SCSI terminator power.

   RCA: Input Connector For Audio Digitizing Circuitry
```

1.40   2091 reference

```
                                2091 Reference
```

The 2091 is a Zorro-II DMA SCSI hard drive controller that was originally
introduced with the A2000HD. Because of the 2091's high availability, it is
often found in A4000s, even though it performs very slowly in them. The
2091 apparently can't use DMA to transfer data to 32-bit Fast RAM, and so
uses a very small buffer in Chip RAM, making for extremely slow disk
transfers. There are utilities in the "hard" directory of Aminet that may
help alleviate this problem.

ROM revisions are a common problem with the 2091; 6.6 or later ROMs are
recommended.

Sixteen sockets allow for the addition of up to 2M of 16-bit Fast RAM,
using CMOS 256K x 4 DRAMs (44C256) rated at 120 ns or faster. (This is not
normally very useful on the A4000, since a SIMM added to the motherboard
RAM sockets is simpler to obtain and install, and will operate *much* more
quickly.)

Usually looked on as a cheap (sometimes very cheap) way to access SCSI
peripherals from the A4000, the 2091 is certainly better than no SCSI
controller at all.

Jumpers:

  JP1: Memory Size
        0K: Set for no memory.
      512K: Set for 512K of RAM.
        1M: Set for 1M of RAM.
        2M: Set for 2M of RAM.

  JP2: Autoboot Enable
      AUTO: Set to enable autobooting from the 2091.
       DIS: Set to disable autobooting from the 2091.

  JP3: Interrupt Select
      INT6: Select interrupt 6.
      INT2: Select interrupt 2.

  JP5: Options
      Option 1: LUN Enable. When jumpered, enables scanning for Logical
                Unit Numbers numbers at each physical SCSI address.
                Default value: Off.
      Option 2: Time-Out Length. When jumpered, enables longer time-out
                for slow-starting drives. Default: Off. (Note: When on,
                this jumper disables parity during the message in phase.)
      Option 3: Reserved. Factory default: Off.

  JP201: Factory use only.

 For pin-out information on the internal 50-pin header and external DB25
 SCSI connectors, see Drives/
               SCSI Pin-Outs
                  .

1.41 drives
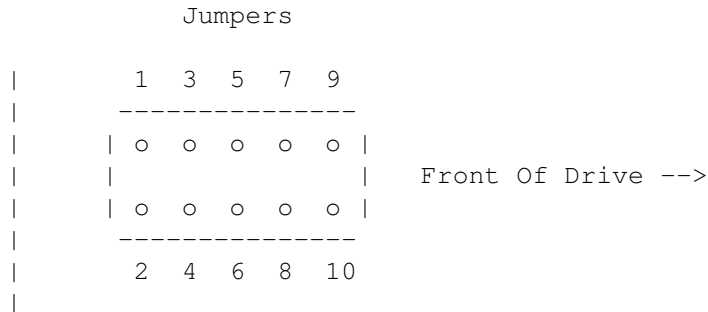
                                        Drives

                    Seagate ST3096A/ST3144A Reference

```
                    External SCSI Connector



                    SCSI Pin-Outs
```

1.42   seagate st3144a reference

```
            Seagate ST3096A/ST3144A 120M IDE Hard Drive Reference
```

```
  The Seagate ST3096A (80M) and ST3144A (120M) are the stock drives included
  with most AA4000s.


                        Jumpers

              |      1   3   5   7   9
              |      ---------------
              |     | o   o   o   o   o |
              |     |                   |   Front Of Drive -->
              |     | o   o   o   o   o |
              |      ---------------
              |       2   4   6   8  10
              |
               -----------------------------------------------------
```
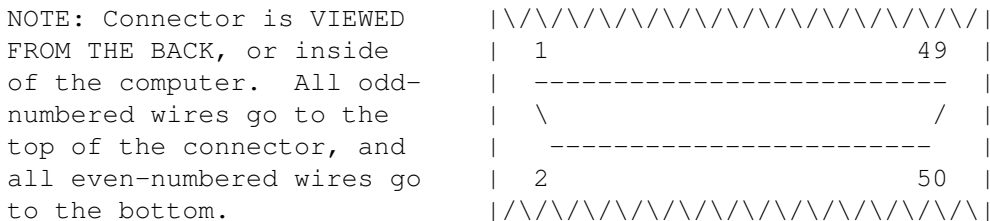
```
  Single drive:     Pins 3-4 jumpered.
  Two-drive master: Pins 3-4 jumpered and pins 5-6 jumpered.
  Two-drive slave:  Pins 3-4 open and pins 5-6 open.
  LED connected:    Pins 9-10 must be jumpered to connect to an activity LED
                    on the controller. Without this jumper, the drive will
                    work, but there will be no activity light (unless you
                    connect an LED to the connector on the front of the
                    drive itself).
```

1.43   external scsi connector

```
                               Building An External SCSI Connector
```

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

  NOTE: Connector is VIEWED      |\/\/\/\/\/\/\/\/\/\/\/\/\/|
  FROM THE BACK, or inside       | 1                    49 |
  of the computer.  All odd-     | ------------------------ |
  numbered wires go to the       |  \                    /  |
  top of the connector, and      |   ----------------------   |
  all even-numbered wires go     | 2                    50 |
  to the bottom.                 |/\/\/\/\/\/\/\/\/\/\/\/\/\|
```

Procedure: obtain the connector from
             Redmond Cable
             . 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 cable leads from the controller
to an internal drive, and then to this connector, the internal drive must
be unterminated for this port to be functional. When used in this
configuration, the external device plugged into this port needs to be
terminated. Half-pitch terminators are available from
             Dalco
             ; using one of
these would allow you to operate the A4000 with or without an external SCSI
device without having to open up the computer to change termination.

1.44 scsi pin-outs

                              SCSI Pin-Outs

  Internal 50-Pin SCSI Header Pin-Out

  All odd pins are grounds, except for pin 25, which is unused.

   Pin 2: *Data 0
   Pin 4: *Data 1
   Pin 6: *Data 2
   Pin 8: *Data 3
  Pin 10: *Data 4
  Pin 12: *Data 5
  Pin 14: *Data 6
  Pin 16: *Data 7
  Pin 18: *Parity
  Pin 20: Ground
  Pin 22: Ground
  Pin 24: Ground
  Pin 26: Terminator Power
  Pin 28: Ground
  Pin 30: Ground
  Pin 32: *ATN
  Pin 34: Ground (Unused?)
  Pin 36: *BSY

```
Pin 38: *ACK
Pin 40: *RST
Pin 42: *MSG
Pin 44: *SEL
Pin 46: *C/D
Pin 48: *REQ
Pin 50: *I/O


External DB25 SCSI Connector Pin-Out

 Pin 1: *REQ
 Pin 2: *MSG
 Pin 3: *I/O
 Pin 4: *RST
 Pin 5: *ACK
 Pin 6: *BSY
 Pin 7: Ground
 Pin 8: *Data 0
 Pin 9: Ground
Pin 10: *Data 3
Pin 11: *Data 5
Pin 12: *Data 6
Pin 13: *Data 7
Pin 14: Ground
Pin 15: *C/D
Pin 16: Ground
Pin 17: *ATN
Pin 18: Ground
Pin 19: *SEL
Pin 20: *Parity
Pin 21: *Data 1
Pin 22: *Data 2
Pin 23: *Data 4
Pin 24: Ground
Pin 25: Terminator Power


External Centronics 50 Connector Pin-Out

Pins 1-12 and 14-25 are grounds.

Pin 26: *Data 0
Pin 27: *Data 1
Pin 28: *Data 2
Pin 29: *Data 3
Pin 30: *Data 4
Pin 31: *Data 5
Pin 32: *Data 6
Pin 33: *Data 7
Pin 34: *Parity
Pin 35: Ground
Pin 36: Ground
Pin 37: Ground
Pin 38: Terminator Power
Pin 39: Ground
Pin 40: Ground
Pin 41: *ATN
Pin 42: Ground (Unused?)
```

```
Pin 43: *BSY
Pin 44: *ACK
Pin 45: *RST
Pin 46: *MSG
Pin 47: *SEL
Pin 48: *C/D
Pin 49: *REQ
Pin 50: *I/O
```

1.45   monitors

                                                    Monitors

            1081 Reference

            1084 Reference

            1085 Reference

            1940/1942 Reference

            1950 Reference

            1960 Reference

            Idek Iiyama Vision Master 17 (MF-8617) Reference

            Mitsubishi DiamondScan AUM-1381A Reference

1.46   1081 reference

                                             1081 Reference

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

Similar to the
              1084
              , with SCART and composite video connectors. Probably
made by Philips. The 1081 may have only been distributed in Europe.

A common problem is for the monitor to "pop," then go dark. Hitting it may
bring back the picture. This is often caused by cold or cracked solder
joints on the flyback transformer, which resoldering should cure.

1.47   1084 reference

                          1084 Reference

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

The 1084 and its variants (1084S, 1084S-P, 1084-P, 1084S-P2, 1084-D, and
2080) are all 15.75 kHz monitors. They do not handle AGA "double"
screenmodes, nor will they display the deinterlaced output from the A2320
Amber board or the motherboard deinterlaced output on an A3000. However,
they will show all normal 15.75 kHz displays, and many (most? all?) of the
1084 versions have a separate input for composite video.

Common problems:
  * The door covering the front-panel controls is typically broken off.
  * The attached cables or connectors on some models tended to fail,
    causing loss of color.
  * Failed or insufficient insulation may cause arcing.

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

Other notes:

* The 2080 was a long-persistance phosphor variation.
* The 1084-D may have been made by Daewoo of South Korea.

Pinouts:

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

1.48   1085 reference

1085 Reference

The 1085(S) is a cost-reduced version of the 1084, with lower resolution
(.52 mm dot pitch) and no non-glare screen treatment. Like the 1084, the
1085 is a fixed-frequency 15.75 kHz monitor, and is not compatible with
most AGA screen modes.

Pinouts (DB9):

        Pin 1: Ground
        Pin 2: Ground
        Pin 3: Red
        Pin 4: Green
        Pin 5: Blue
        Pin 6: Unused
        Pin 7: Composite Sync
        Pin 8: Unused
        Pin 9: Unused

1.49   1940 reference

1940/1942 Reference

This monitor is a 13-inch bisync (not true multisync) monitor built by
Samsung for Commodore. It has two ranges of sync frequencies to match both
normal (15.75 kHz) and doubled screen modes. The 1942 differs from the 1940
only in that it has a smaller dot pitch. MonEd may be useful in getting the
picture to fill the entire screen. Both variations feature stereo speakers.

Specifications:

    Sync Frequency: 15.6-15.8 kHz and 27.3-31.5 kHz Horizontal
                    47 Hz to 75 Hz Vertical

        Dot Pitch: 0.39 mm (1940)
                   0.28 mm (1942)

     Sound Output: 1.0 W RMS/Channel at 5% max. THD

  Input Connectors: One permanently attached DB15 and Audio R/L

  Pinouts (DB15):

        Pin 1: Red
        Pin 2: Green
        Pin 3: Blue
        Pin 4: Unused

```
 Pin  5: Unused
 Pin  6: Red Ground
 Pin  7: Green Ground
 Pin  8: Blue Ground
 Pin  9: Unused
Pin 10: Digital Ground
Pin 11: Digital Ground
Pin 12: Unused
Pin 13: Horizontal Sync
Pin 14: Vertical Sync
Pin 15: Unused
```

1.50   1950 reference

                              1950 Reference

  Information needed! Connector pinouts, specifications?

  The 1950 monitor was actually produced by a company called AOC. Parts may
  still be available direct (although there have been conflicting reports).
  The AOC model of the monitor was known as the AOC CM314.

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

  A sync problem may be caused by the monitor detecting sync on the Green
  input and then disabling the horizontal and vertical sync inputs. Removing
  the 10K R854 resistor or the 10uf C812 capacitor on the small vertical
  board may fix this.

  The analog/TTL switch appears to be prone to failure. However, if switching
  the switch brings back the picture, it may actually be that the 74LS123
  (IC805) on the same board is failing. The suggested course of action is to
  first replace (or at least resolder) this chip first, since it's a commonly
  available part.

  Another common problem is the failure of a multifunction sync chip.
  Replacements should be available from Sony.

1.51   1960 reference

                              1960 Reference

  Information needed! Connector pinouts, specifications?

  The 1960 may have been made by Daewoo (Korea) or a Taiwan company.

A common problem involves a component that is insulated with eletrical tape
(inadequately) from the factory, resulting in arcing. Replacing this
insulation can cure the problem.

Typical failures also result from cold solder joints on the 1960 boards,
which can be repaired by resoldering.

The screen size adjustment pots may be prone to failure, making adjustments
difficult.

1.52   idek iiyama vision master 17 (mf-8617) reference

                                    Idek Iiyama Vision Master 17 (MF-8617) 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/
                A2320 'Amber' Reference
                 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
```

1.53   mitsubishi diamondscan aum-1381a reference

```
                            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/

            A2320 'Amber' Reference
            ).

  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
```

1.54   sources

Sources For Components

Opinions in this section are strictly 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
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

              Dalco Electronics

              Digi-Key Corporation

              Hosfelt Electronics

              JameCo Electronic Components

              JDR Microdevices

              Marlin P. Jones & Associates

              MCM Electronics

              Memory World

              Parts Express

              Redmond Cable

1.55 altex electronics

```
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.

1.56 dalco electronics

```
Dalco Electronics
275 Pioneer Boulevard
Springboro  OH  45066
(800) 445-5342
(513) 743-9251 Fax
```

Extremely large selection of connectors, cables (including the relatively rare SCSI-2 and 2.5-inch IDE hard disk varieties), and pretty much everything in the way of computer assemblies. Oriented towards computer end-users. They will custom-build cables. Service is good, prices are excellent, and their catalog is filled with basically neat stuff.

1.57 digi-key corporation

```
Digi-Key Corporation
701 Brooks Ave. South
P.O. Box 677
Thief River Falls  MN  56701-0677
(800) 344-4539
(218) 681-3380
```

Huge assortment of electronic components, including chips, heat sinks, cables, connectors, fans, and every other electronic part you can think of except DB23s. Prices tend to be a little higher, which is offset somewhat by the fact that they have such a large selection. Their catalog can be considered a reference work. Oriented towards electronics designers and experimenters.

1.58 hosfelt electronics

```
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.
```

1.59 jameco electronic components

```
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.
```

1.60 jdr microdevices

```
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, inexpensive, and nice on the phone.
```

1.61 marlin p. jones & associates

```
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.
```

1.62 mcm electronics

```
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.
```

1.63   memory world

```
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! Prices tend to be excellent.

1.64   parts express

```
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.

1.65   redmond cable

```
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.

1.66   editor

Editor And Compiler Of The A4000 Hardware Guide

```
Warren Block
602 St. James
Rapid City  SD  57701-3658
(605) 342-1632 (voice)
wblock@silver.sdsmt.edu
```

Music that may have contributed to the mood of this guide, and that has
definitely influenced me:

Pink Floyd: Wish You Were Here, Meddle, The Division Bell
Peter Gabriel: Us, Shaking The Tree

1.67 credits

Credits

People who have contributed information to this document, either directly
or by posting public Usenet or BBS messages that have revealed information
that was incorporated into this document:

Chuck Baker	Dr. Peter Kittel
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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!

Finally, a special note of thanks to Urban Müller, the main administrator
of Aminet, for the Aminet itself.

1.68 Index

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-5V Power Problems

1081 Reference

1084 Reference

1085 Reference

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