

A1200

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COLLABORATORS

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REVISION HISTORY

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Chapter 1

A1200

1.1 A1200 Hardware guide - Contents

Search

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(           ...           The A1200 Hardware Guide           ...           )
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| Introduction~~~~~ What is this thing? Also Development History |
| ** Disclaimer **  READ THIS! Pretty Important                 |
| Availability~~~~~ Where to get the latest version             |
| Author~+~Credits~ Information on Author and Contributors     |
|
|-----|

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Contents

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| Motherboard          Info, Layout, Mods, Revisions and more! |
| Connector Pinouts   Internal, external, pinouts             |
| Drives               Hard/Floppy/CD/Removable:              |
|                     Info, types, FAQ, compatibility        |
| Expansion Boards    References, compatibility, FAQ          |
| Interfaces           SCSI, IDE, Serial, floppy:            |
|                     Info, types, compatibility             |
| Internal Pinouts    Pinouts for major IC's.                 |
| Networking          Info, types, options available         |
| Power Supply        Information and FAQs                    |
| Towers              Info, types, availability, compatibility |
| Zorro Boards        Info, types, compatibility             |
|
| Miscellaneous       Stuff that didn't fit anywhere else.   |
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1.2 Introduction

The A1200 Hardware Guide

Distribution

This guide has been released as an information document. You are free to post it or send it wherever you want as long as credit for the work remains with myself and the people listed in the credits section. In addition, magazines wanting to include this guide on cover disks should ask permission first. I think that covers everything ;)

Introduction

This guide is designed as a ultimate reference for A1200 Hardware queries. It was written by me, but includes information from many sources, most importantly the usenet comp.sys.amiga.hardware group, and quite a few individuals have contributed directly. See the Credits for a complete list.

I hope to be able to continue updating this for as long as I still own my A1200.

Long live Macinto... erm... Amiga :)

History

v1.0: 02/02/97

OK, so this version was released with a version string of "v0.999ß" but it was actually v1 :)

Well, not much history here.

v1.5: 18/05/97 Internal Release

Added a bit more on Zorro boards.

Added some stuff on manual errata - thanks whoever suggested that!

Took out the Monitors stuff, as it wasn't really relevant.

v1.8 21/06/97 Internal Release

Scrapped anything that wasn't strictly A1200 Hardware

(i.e. stuff on the history, bits slagging Escom off etc)

More stuff on drives.

v2.0 September 1997

Biiiiiiig rewrite!

No section is exactly like it was!

Added Networking, Towers, Internal Pinouts.

Added more stuff on the Motherboard

Changed from external FAQ to my own internal one for ease of updating.

Changed to manual guide creation, as the automatic program (no names)

seems to get a perverse thrill from screwing my menus up.

Some ramblings....

It's now 10 past midnight and I think it's all finished. Only the music is keeping me awake now. I've spent the past 3 hours fixing broken links, and if I see another curly bracket I'll scream. You lot had better be happy. Already I've been thinking about what goes into the next version.... who'll be the first with a Blizzard 603e reference for me, eh? Oh, bugger, forgotten to create an index. Wonder if Ged can do it with an Arexx script? Summat like 120 nodes... erk! Goodnight.

1.3 Help with the A1200 Hardware Guide

Help:

You just sort of press the buttons and stuff? How hard can it be?

OK. Pressing "Contents" takes you to the most local Menu from wherever you are. For example, whack it while in Removable Drive Options, and it takes you back to the Drives menu. It's worth noting that two successive presses takes you back to the main menu in all cases.

Help gets you here, while Index always takes you to the alphabetical index. It cannot be more simpler.

1.4 The All-Important Disclaimer

Disclaimer

The information contained within this document is, as far as I know, correct. However, I, or the people who contribute an individual section, cannot be held responsible for any errors which may be contained within this document. You are advised to check details before embarking on a big project armed only with this guide. Be sensible!

1.5 Guide Availability

Guide Availability

This Guide is available from several locations.

AmiNET: <hard/misc/A1200Hardware.lha>

Pure Amiga: <ftp://ftp.pureamiga.co.uk/information/hardware/A1200Hardware.lha>

My Homepage: <http://www.fuchal.demon.co.uk/amiga/index.html>

I will post a notice to usenet comp.sys.amiga.hardware and the Pure Amiga mailing list when a new version is released. If anyone is on any other lists that haven't heard about this guide, spread the word! :)

1.6 About the Author, and Credits

About the Author:

Chris Appleton, age 18 and currently studying/living in Norwich, UK although I'm from Nottingham. I've had an Amiga since about 1991, and an A1200 of some description since 1993. I'm a terrible fidget, and I can't keep my hands off it, hence the upgrade to my current system of an A1200T, Apollo 1240 with 8mb, 850mb HD, 8x CD, Zip drive and various other bits.

I can be contacted via email : c.appleton@uea.ac.uk | In order of
chris@fuchal.demon.co.uk | reply quickness!
chrisf@pureamiga.co.uk V

Credits:

A huge thankyou and a pint of whatever to everyone who has helped with this guide, from sending in accelerator references (most of which got in, despite my wonderful ability to lose them) to giving little snippets of information. I'm astounded to have recieved no negative comments, but whatever you have to say, say it!

So, these wonderful people are:

Testers 'n' Suggesters who at various points checked the guide, found errors and told me what else to add (to get wrong):

Philip Ayres
Warren Block
Brad Rogers
Madhu Surendranath

Contributors who bunged things in for me.

Everyone who did accelerator references, who are:

Andreas Vespermann
Anthony Keeley
Brad Rogers
David Bump
Duncan Gow
PJ Goddard
Stefan Gregson
That bloke who wrote the A1200INFO docs and was suggesting stuff.
That bloke who wanted the PCMCIA pinouts.
That bloke... etc. Get the feeling I'm not good with names? :)

1.9 Zorro Board Information

Zorro Board Information

Perhaps the biggest difference between the A4000 and A1200 is the smaller machine's lack of expansion slots. The Amiga uses a custom slot called Zorro, as opposed to the PC's ISA or PCI slots.

Big-Box Amiga owners are quite used to slotting in a new card, and there are many available - SCSI controllers, accelerators, GFX cards and sound cards are available from many manufacturers. So what hope have all you little 1200 peeps out there got? A while back the first A1200 Zorro Busboard hit the streets, which was nice but had all sorts of problems with compatibility. Now we have quite a wide range, explained in the Options Available section, which are really quite foolproof.

Basically, they fit in the "trapdoor" expansion slot - although it's worth noting that you must have some kind of tower case for your A1200, so it's not really a trapdoor any more. Anyway, they fit there, and have a passthrough for your accelerator which theoretically remains unaffected.

Then you have a rather large expanse of circuit board, broken up by a couple of long slots - your Zorro slots. Now, theoretically again, software shouldn't be able to tell your A1200 from an A4000, so all the drivers that come with SCSI controllers, port expanders, GFX cards should work as normal.

There are different versions of Zorro, the two notable ones being Zorro-II and Zorro-III, the latter being found in the A4000 and A4000T. It is possible to get cards which feature either one of these, however the Zorro-II boards are at the minute more reliable.

1.10 Zorro Board FAQ

Zorro Board Frequently Asked Questions

Can I use xxxxxx card in my xxxxx busboard?

Erm, that's a good question! I don't know, ask around - usenet, retailers, friends. If you still can't find out, there's a good chance it will work (that's why they are called Zorro boards after all), and if it does, tell me so I can add it here :)

Is that Zorro-III board any good?

Supposedly, yes. You should note however that you will need to insert an A4000 accelerator or whatever into the A4000 CPU slot to enable the ZorroIII functions, otherwise it works as a ZorroII board.

1.11 Zorro Board Compatibility

Zorro Board Compatibility

There are two sources of incompatibility which must be overcome. The first is the obvious incompatibilities between some Zorro cards, and the busboard. I have to say I haven't heard of any major problems, although in this version of the guide I haven't conducted any major enquiries to reinforce this. I would appreciate anyone with compatibility comments dropping me a line.

The other compatibility problem is with the accelerator you'll be plugging into the busboard. Most accelerators work fine, although this depends on the model and revision busboard you are using. However, I have heard some stories about Apollo cards not working as they should sometimes (a bit disappointing since I have an Apollo 1240), so it's definitely worth checking with dealers of both your card and the board.

I'm afraid I'm not able to bring you any definite compatibility problems - manufacturers are unwilling to say what works with their cards and there don't seem to be many firm reports on usenet. However, I am interested in compiling a list of three problem areas:

- Which Zorro cards work in which Zorro busboards
- Which Accelerators work with which Zorro Busboards
- Which A4000 Accelerators work in the new MicroniK Z3i busboard.

If you want to add your experiences, please contact me!

1.12 Towers Index

Towers Index

Information
Frequently Asked Questions

Options Available
DIY Towers
Tower Kits
Tower Systems
Prebuilt A1200T's

Related Sections: Zorro Board Index

1.13 A1200 Tower Systems

A1200 Towers - Systems Available

A Tower System, as I see it, is a set of modular items which have been custom designed to accept an A1200 motherboard, with none of the hacksaw modification found with the kits on offer.

These have really one main advantage - they are tried and tested and usually have a warranty. If you get all your kit bits from different sources, exactly where do you go if you get a problem? Exactly, you don't get that with a system.

Infinitiv Case

These days, there is one main option - the MicroniK Infinitiv system. This features:

- Zorro II or III boards
- Video Slot Option
- Custom Designed Plastic Case
- 200W Power Supply with power converter - no wire splicing
- 1.76Mb Floppy Drive Available
- And some other stuff too

It's available from Blittersoft, with price depending on specs.

Other Cases

There were some other cases available some years ago. However, these should be seen as a last resort - even though they were a good quality metal case with Zorro and other stuff, they were quite beta-ish - the Zorro compatibility was specially iffy. They were turned out by a few manufacturers, one of them being Ramiga, and (I think) Eagle.

1.14 Prebuilt A1200 Towers

A1200 Towers - Prebuilt Models

One of Amiga International's actions was to licence the Amiga technology out to other developers - in short, this meant other people could use the Motherboard or various parts to make "clones".

While the towers features below don't really fall into the Clone bucket, they are sort of developed A1200's, as they now have Zorro slots, SIMM sockets and

even an A4000-style CPU slot. They are available from MicroniK, in the UK that means contacting Blittersoft.

Model	Features	Approx. Price
A1300	OS3.1, 2Mb Chip Memory, 200W PSU, Mouse, External Keyboard, 880k Floppy	£350
A1400	As above plus 5x ZorroII slots, 2x ISA, 2x PCI and option of Video Slot (adds £40)	£470
A1500	As A1300 but 5x ZorroIII, 1x ISA, 2x PCI, Video Option, A4000 CPU slot, SCSI-II, 1x SIMM	£600

Note that you will still need to add the price of a decent processor, some Fast RAM, a hard drive, CD-Rom drive and a monitor. Expect complete packages to appear soon.

1.15 A1200 Tower Kits

A1200 Towers - Kits Available

There is very little difference between "kits" and "systems", but I hope to keep them apart as they are different to assemble.

The Kits are generally PC Full-Tower Cases, which have been modified in some way to accept the A1200 Motherboard. Often this is slid in complete with the base of the plastic case, to serve as a mounting point, but I think some are available which just take the stripped-down motherboard. There are many different ways of mounting the motherboard, with each having advantages and disadvantages. These usually involve the placing of ports - a design which has an accessible CPU slot will often leave the PCMCIA port unusable.

Zorro is often available for these cases, and generally it works. You should note though it is often difficult to fit in a DIY Kit option, more so than for the custom-designed systems.

Options Available

Eyetech Tower

This takes the whole motherboard and bottom case, and slides it into a modified PC case. The ports are accessible, as is the PCMCIA slot. Zorro is available in two different configurations: single-slot or multiple-slot.

Contact Eyetech for more details.

Intrinsic Tower

Chroma T-Case

A fairly new design, the T-Case is again a modified PC case, but this time you can either convert it yourself or pay a little extra and get a converted case. It takes the entire motherboard and lower case for mounting ease. All the ports are available, including the PCMCIA port, and Chroma state that plenty of room is available for busboards and Zorro, although they don't sell them themselves.

For more info and prices, contact Chroma

1.16 A1200 Tower Information

A1200 Towers - Information

The A1200 Tower these days is a bit like a modem or a hard drive - everyone has one! Well, it can seem like that occasionally, as Aminet is full of conversion guides and lots of magazines have done features on how to hack-your-own. So what does it offer? The best features are:

- Built-in 200W power supply - more than enough for your Amiga and drives
- Plenty of drive bays - my full tower for example has 10 bays in total!
- Everything internally, no squirrel, CD-Rom, external floppy cluttering the desk.
- Ability to use the Blizzard 1240T/ERC - a big bonus in itself!
- Zorro cards, video cards and even A4000 CPU cards can all be used.

There are two starting points - either buy a PC case and hack-it-yourself, or get one of the growing number of aftermarket cases. The latter is more expensive, but it is often re-assuring to have someone to ring up and ask for assistance if it doesn't all work! But the hardy bunch of hackers out there like to do it their own way - my tower was conceived in 1995, when it was a pretty novel idea - and this can save lots of money.

1.17 A1200 Tower FAQ

A1200 Towers Frequently Asked Questions

Hey, what's the advantage of a DIY job?

Well, the only real advantage is cost. Typically a PC case will set you back £60 with cabling another £20. The basic tower systems such as the Infinitiv start at around £150. You can see there is a large cost advantage, however you do have to be competent and occasionally you'll wonder if it's all worth it (usually when you have your computer in bits...)

Is there anything between these, for a scared DIY-er?

You might want to try one of the kits now appearing. Retailers/manufacturers like Eyetech, Chroma and Infinity Systems will sell you a pre-converted PC tower case, suitable for slipping a motherboard into, along with all the cabling. This is probably the best method, since it also gives you limited backup if it goes wrong.

Is it worth getting a Zorro thingie for my tower?

Maybe. I don't have one, but then again I don't really have a need for one at the minute. You might if you are into graphics or networking, as I see these two to be far far easier with a Zorro board and the right card plugged in.

1.18 DIY A1200 Towers

A1200 Towers - The DIY Way

So, you're wondering about doing it yourself eh? Well, for a starter I'm not going to give you a complete step-by-step on how to do it, so nur. But then again, the best idea is to track down as much information as possible, look on Aminet and in magazines - then if anyone has got something wrong or slightly out of place, you can compare it to others and get a feel for the whole job.

Finding a tower case is pretty simple - most PC cases are fairly similar inside, whatever the outside looks like, so it's not a problem just to go for the cheapest one. Mine cost £55 from a computer fair (a great source of items, look in your local papers for venues), and it's worth paying the extra for a "Full Tower", as the extra space is a real boon when it comes to mounting.

Mounting the motherboard is a bit tricky, and it pays to take your time here. Basically, it needs to be solid so it won't fall or move. A good hint is to leave the metal sheilding on - it makes it far easier to handle, and ensures stray wires and screws don't attack your board.

The keyboard is a fun bit - I really recommend buying a external keyboard interface like the Eyetech EZ-Key, which lets you connect a PC keyboard and features remapping of the special Amiga keys. The alternative is to wire an Amiga keyboard (like the A2000, 3000, 4000 or CDTV models) directly in - the route I took, since it was before the days of converters. It involves somehow conencting a socket to two pins on a chip on the motherboard (KBData and KBClock) - either by soldering, which is very scary, or by clipping a PLCC socket onto the top of the chip, and soldering onto there.

Finally, just extend the ports to the back of the case (easily done using IDC cables and sockets) and put all your drives in. There are a few solutions to the floppy drive - either use the original one and make do without a facia, or get an EZ-DF0 from Eyetech which lets a PC floppy work on the Amiga (DD mode), or sometimes you can use an external drive internally, minus it's housing.

Like I said, the DIY method is a lot of work but worth it if you're low on funds. Get hold of stacks of information - from Aminet, the WWW, or both

CU-Amiga and Amiga Format have done guides detailing the ins and outs.

DISCLAIMER - No-one's forcing you to do this, so don't if you feel unsure. I do not guarantee the correctness of any fact I've just mentioned. Don't blame me if you blow your entire neighbourhood up.

1.19 Power Supply Index

Power Supply Index

Information
 Updated Supplies
 DIY Conversions

Related Sections:
 Power Input Pinouts

1.20 Power Supply Options

Aftermarket Power Supplies

A number of Amiga developers have released aftermarket power supplies for the Amiga range. Most of these are actually PC units, with an Amiga cable and often a case to keep it all nice. If you're a hacker you may find it cheaper to hack-your-own, but these models will keep everything neat and tidy, and ultimately have a warranty if you're not too sure of your abilities!

Retailer	Model	Rating	Switch	Monitor	HD Lead	Lead	Price
Wizard	Power Box	250W	Yes	Yes	1m	Lots	£50
Power Computing	PSU	200W	No	Yes	1m	1*	£70
Prima	Atom	200W	Yes	Yes	??	None	£60
Datel	Goliath	200W	Yes	Yes	1m	None	£60

Key: Switch = Is the unit switching?

Monitor = Does the unit have monitor power passthrough?

HD Lead = Does the unit have any provisions for connecting drives?

* The Power Computing unit doesn't have a lead for drives as such, but it does have a 12v/5v/GND output socket.

1.21 Power Supply Information

Power Supply Information

The powersupply supplied with the A1200 is a similar design to the one supplied with all smallbox Amigas... the everpresent brick. But it does its job and it keeps your feet warm as well. Actually, it's different in that it only supplies 23W, less than the A500 - the reason for this is that the A1200 was designed to be more energy efficient than the A500.

Unfortunately, Commodore probably never predicted how far we'd take our 1200's. The original power supply is OK usually, and can normally handle a hard drive as well. Add an external disk drive, an 030 and more Ram and you'll definately have problems. It just runs out of juice. Luckily, the A500 supply can be used instead, and supplies rather more... the other alternative is either converting a PC supply to work with an A1200, or buying one of the aftermarket super-supplies available.

The 5-pin square DIN plug is a rather special design, and very hard to get hold of. However, if you have a little chat with Intrinsic they apparently can sort you out with the cables and plugs, and other bits like a PC PSU -> Amiga Socket converter.

1.22 Power Supply Conversion

Converting PC Power Supplies

If you're running out of power, but don't want to spend loads on a aftermarket unit, then you could consider converting your own. The advantage is simply price - if you look hard enough PC units can be had for a tenner, and the rest is just work on your part. The only disadvantage is that usually you will have to cut your original power lead off.... meaning there's no way back!

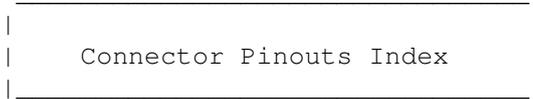
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|                                     |  
|                               Disclaimer                               |  
|                                     |  
| This information is, as far as I know, correct. However, I take no  |  
| responsibility for damaged caused to your equipment, property or yourself |  
| resulting in you attempting this conversion.                         |  
|                                     |  
|-----|
```

Right. Firstly you need the PC unit. I suggest going to computer fairs, or asking your local dodgy PC dealer, as they are often found lying around. A secondhand one should be OK if it's cheaper. Also, look out for the new 65W units, although these don't have a monitor passthrough they will also work and are usually cheaper.

Open it up, and locate the wire bundle. This is usually opposite the power input. You need one of each of these wires: +5v, +12v, -12v, GND, PWRGOOD. For the normal colours used, see the table below. You can either desolder the rest of the wires, or leave them in place (you can of course use the drive power

connections for external drives)

1.23 Connector Pinouts Index



Internal Ports

- ~IDE~Controller~Port~::~::~::~
- ~Floppy~Drive~Port~::~::~
- ~Floppy~Drive~Power~Port~::~::~
- ~Expansion~Edge~Connector~::~::~
- ~Partial Clock~Header~::~::~
- ~LED~Connector~::~::~

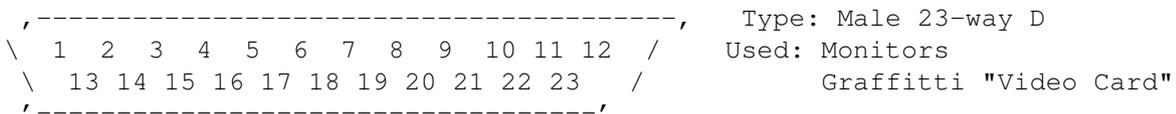
External

- ~Power~In~::~
- ~Video~Out~::~
- ~Parallel~::~
- ~Serial~::~
- ~Floppy~Drive~::~
- ~Joystick~/~Mouse~::~
- PCMCIA Connector

For internal IC pinouts, see Internal Pinouts Index

1.24 Video Port Pinouts

Video Port Pinout



1: _XCLK	External Clock	13: GNDRTN	Return for /XCLKEN
2: _XCLKEN	External Clock Enable*	14: _PIXELSW	Genlock Overlay*
3: RED	Analog Red**	15: _C1	Clock Out*
4: GREEN	Analog Green**	16: GND	Video Ground
5: BLUE	Analog Blue**	17: GND	Video Ground
6: DI	Digital Intensity*	18: GND	Video Ground
7: DB	Digital Blue*	19: GND	Video Ground

8: DG	Digital Green*	20: GND	Video Ground
9: DR	Digital Red*	21: -12V	-12v DC (10mA)
10: _CSYNC	Composite Sync*	22: +12V	+12v DC (100mA)
11: _HSYNC	Horizontal Sync*	23: +5V	+5v DC (100mA)
12: _VSYNC	Vertical Sync*		

Pin 13 can be considered Digital Ground

Signals marked * are 47 Ohm

Signals marked ** are 75 Ohm

1.25 Serial Port Pinouts

Serial Port Pinout

-----,													Type: Male 25-pin DIN		
\	1	2	3	4	5	6	7	8	9	10	11	12	13	/	Used: Modems / Slip links
\	14	15	16	17	18	19	20	21	22	23	24	25	/		Printers
-----,													MIDI Carts		

1: SHIELD	Shield Ground	14: ---	
2: TXD	Transmit Data	15: ---	
3: RXD	Recieve Data	16: ---	
4: RTS	Request to Send	17: ---	
5: CTS	Clear to Send	18: AUDI	Amiga Audio In (Right)
6: DSR	Data Set Ready	19: ---	
7: GND	System Ground	20: DTR	Data Terminal Ready
8: CD	Carrier Detect	21: ---	
9: +12V	+12v DC (20mA Max)	22: RI	Ring Indicate
10: -12V	-12v DC (20mA Max)	23: ---	
11: AUDDO	Amiga Audio Out (Left)	24: ---	
12: ---	Speed Indicate (NC)	25: ---	
13: ---			

1.26 Power Input Pinout

Power Input Pinout

-----,				Type: 5-pin Female Square DIN
|	1		4	|
|		3		|
|	2		5	|
-----,				

- 1: +12v DC
- 2: Shield Ground
- 3: -12v DC
- 4: Ground

5: +5v DC

Pin 2 is directly connected to the connector shield.

1.27 PCMCIA Slot Pinout

PCMCIA Slot Pinout

Type: PCMCIA Slot (Type 2), 68 pin

Used: Squirrel, Whippet.

1	GND	Ground	35	GND	Ground
2	D3	Data Bus Bit 3	36	CC_CD1	Card Detect?
3	D4	Data Bus Bit 4	37	D11	Data Bus Bit 11
4	D5	Data Bus Bit 5	38	D12	Data Bus Bit 12
5	D6	Data Bus Bit 6	39	D13	Data Bus Bit 13
6	D7	Data Bus Bit 7	40	D14	Data Bus Bit 14
7	CE1		41	D15	Data Bus Bit 15
8	A10	Address Bus Bit 10	42	CE2	
9	OE		43	--	
10	A11	Address Bus Bit 11	44	RFU IORD	I/O Read
11	A9	Address Bus Bit 9	45	RFU IOWR	I/O Write
12	A8	Address Bus Bit 8	46	A17	Address Bus Bit 17
13	A13	Address Bus Bit 13	47	A18	Address Bus Bit 18
14	A14	Address Bus Bit 14	48	A19	Address Bus Bit 19
15	WE PGM		49	A20	Address Bus Bit 20
16	BSY IREQ		50	A21	Address Bus Bit 21
17	+V	+5v	51	+V	+5v
18	VPP1		52	VPP2	
19	A16	Address Bus Bit 16	53	A22	Address Bus Bit 22
20	A15	Address Bus Bit 15	54	A23	Address Bus Bit 23
21	A12	Address Bus Bit 12	55	A24	Address Bus Bit 24
22	A7	Address Bus Bit 7	56	A25	Address Bus Bit 25
23	A6	Address Bus Bit 6	57	--	
24	A5	Address Bus Bit 5	58	RESET	Reset
25	A4	Address Bus Bit 4	59	WAIT	Processor Wait
26	A3	Address Bus Bit 3	60	--	
27	A2	Address Bus Bit 2	61	REG	
28	A1	Address Bus Bit 1	62	BVD2 SPKR	
29	A0	Address Bus Bit 0	63	BVD1 STSCHG	
30	D0	Data Bus Bit 0	64	D8	Data Bus Bit 8
31	D1	Data Bus Bit 1	65	D9	Data Bus Bit 9
32	D2	Data Bus Bit 2	66	D10	Data Bus Bit 10
33	WP IOIS16		67	CD2	
34	GND	Ground	68	GND	Ground

1.28 Parallel Port Pinout

Parallel Port Pinouts

```

-----,
\ 1 2 3 4 5 6 7 8 9 10 11 12 13 /
\ 14 15 16 17 18 19 20 21 22 23 24 25 /
-----,
Type: Female 25-pin D
Used: Printer, Samplers,
      LED Display hack,
      QuickCam Interface
NOT Zip Drive!!!!

```

1: _STROBE	Strobe	14: +5V PULLUP	+5v DC (10mA)
2: D0	Data Bit 0	15: ---	
3: D1	Data Bit 1	16: _RESET	Reset
4: D2	Data Bit 2	17: GND	Signal Ground
5: D3	Data Bit 3	18: GND	Signal Ground
6: D4	Data Bit 4	19: GND	Signal Ground
7: D5	Data Bit 5	20: GND	Signal Ground
8: D6	Data Bit 6	21: GND	Signal Ground
9: D7	Data Bit 7	22: GND	Signal Ground
10: _ACK	Acknowledge	23: GND	Signal Ground
11: BUSY	Busy	24: GND	Signal Ground
12: POUT	Paper Out	25: GND	Signal Ground
13: SEL	Select		

1.29 Mouse / Joystick Port Pinout

Mouse/Joystick Port Pinouts

```

-----,
\ 1 2 3 4 5 /
\ 6 7 8 9 /
-----,
Type: Male 9-pin D
Used: Mouse, Joystick (Ana/Dig), Lightpen
      Performance Meter Hack.

```

	Mouse	Light Pen	Digital Joystick	Analogue Joystick
1:	V-Pulse	--	_Forward	Button 3
2:	H-Pulse	--	_Back	--
3:	VQ-Pulse	--	_Left	Button 1
4:	HQ-Pulse	--	_Right	Button 2
5:	Middle Button	Pen Press	--	Pot X
6:	Left Button	_Beam Trigger	_Button 1	--
7:	+5v	+5v	+5v	+5v
8:	GND	GND	GND	GND
9:	Right Button	Button 1	Button 2	Pot Y

Not all buttons are compulsory in all devices

1.30 pinoutsled

LED Connector Pinouts

5-pin SIL Male

```

,-----,      | Accelerator
| 1 2 3 4 5 |   V Slot
'-----'

```

1: Power LED
 2: Floppy Access LED
 3: Hard Drive Access LED
 4: Key (No Pin)
 5: Common Ground

1.31 Internal Floppy Drive Pinout

Internal Floppy Header Pinouts

```

,-----,
| 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 |
| 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 |
'-----'

```

Type: 34-way Male
 DIL Header
 Used: Internal DD Floppy

1: GND	Ground	18: DIR	Head Direction
2: _CHANGE	Disk Change	19: GND	Ground
3: GND	Ground	20: _STEP	Step the Head
4: _IN USE	Disk Access LED	21: GND	Ground
5: GND	Ground	22: _DKWDO	Disk Write Data
6:	--	23: GND	Ground
7: GND	Ground	24: _DKWEO	Disk Write Enable
8: _INDEX	Disk Index Pulse	25: GND	Ground
9: GND	Ground	26: _TRK0	Head Over Track 0
10: _SELO	Select Drive 0	27: GND	Ground
11: GND	Ground	28: _WPROT	Disk is Protected
12: _SEL1	Select Drive 1	29: GND	Ground
13: GND	Ground	30: _DKRD	Disk Read Data
14:	--	31: GND	Ground
15: GND	Ground	32: _SIDE	Side Select
16: _MTR0	Motor Control	33: GND	Ground
17: GND	Ground	34: _RDY	Disk Ready

1.32 Internal IDE Pinouts

Internal IDE Header

Type: Male 44-way High Density DIL Header
 Used: IDE Devices
 DataFlyer SCSI Controller

Catweasel HD Floppy Controller

```

-----
| 1  3  5  7  9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 |
| 2  4  6  8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 |
-----

```

1: _RESET	Drive Reset	23: _IOWR	IO Write
2: GND	Ground	24: GND	Ground
3: D7	Data Bit 7	25: _IORD	IO Read
4: D8	Data Bit 8	26: GND	Ground
5: D6	Data Bit 6	27: WAIT	IO Channel Ready
6: D9	Data Bit 9	28:	--
7: D5	Data Bit 5	29:	--
8: D10	Data Bit 10	30: GND	Ground
9: D4	Data Bit 4	31: _IDE_IRQ	Interrupt Request
10: D11	Data Bit 11	32:	--
11: D3	Data Bit 3	33: A1	Address 1
12: D12	Data Bit 12	34:	--
13: D2	Data Bit 2	35: A0	Address 0
14: D13	Data Bit 13	36: A2	Address 2
15: D1	Data Bit 1	37: _IDE_CS[1]	IDE CS 1
16: D14	Data Bit 14	38: _IDE_CS[2]	IDE CS 2
17: D0	Data Bit 0	39: _IDE_LED	Drive active LED
18: D15	Data Bit 15	40: GND	Ground
19: GND	Ground	41: VCC	+5V DC
20:	--	42: VCC	+5V DC
21:	--	43: GND	Ground
22: GND	Ground	44:	--

1.33 Floppy Drive Power Port Pinout

Internal Floppy Power Pinout

```

,-----, | Accelerator
Male Polarised 4-pin | 1 2 3 4 | V Slot
,-----,

```

```

1: +5v
2: GND
3: GND
4: +12v

```

1.34 CPU Expansion Slot Pinouts

CPU Expansion Slot Pinout

Type: 150-way Male Edge Connector

Used: Accelerators, RAM Expansions,
Failed Action Replay Cart, Commodore CD-Rom Drive

1: Reserved	Address Bus Bit 31	76: D2	Data Bus Bit 2
2: Reserved	Address Bus Bit 30	77: D1	Data Bus Bit 1
3: Reserved	Address Bus Bit 29	78: D0	Data Bus Bit 0
4: Reserved	Address Bus Bit 28	79: GND	Ground
5: Reserved	Address Bus Bit 27	80: VCC	+5v DC
6: Reserved	Address Bus Bit 26	81: _IPL2	Int Pri Lvl 2
7: Reserved	Address Bus Bit 25	82: _IPL1	Int Pri Lvl 1
8: Reserved	Address Bus Bit 24	83: _IPL0	Int Pri Lvl 0
9: GND	Ground	84: Reserved	--
10: VCC	+5v DC	85: _RST	Processor Reset
11: A23	Address Bus Bit 23	86: _HLT	Processor Halt
12: A22	Address Bus Bit 22	87: Reserved	--
13: A21	Address Bus Bit 21	88: Reserved	--
14: A20	Address Bus Bit 20	89: SIZE0	
15: A19	Address Bus Bit 19	90: SIZE1	
16: A18	Address Bus Bit 18	91: _AS	Address Strobe
17: A17	Address Bus Bit 17	92: _DS	Data Strobe
18: A16	Address Bus Bit 16	93: R_W	Proc. Read_Write
19: GND	Ground	94: _BEER	Bus Error
20: VCC	+5v DC	95: Reserved	--
21: A15	Address Bus Bit 15	96: _AVEC	
22: A14	Address Bus Bit 14	97: _DSACK1	Data Send Ack.
23: A13	Address Bus Bit 13	98: _DSACK2	Data Send Ack.
24: A12	Address Bus Bit 12	99: CPUCLKA	CPU Clock
25: A11	Address Bus Bit 11	100: E CLOCK	Perip Enable Clk
26: A10	Address Bus Bit 10	101: GND	Ground
27: A9	Address Bus Bit 9	102: VCC	+5v DC
28: A8	Address Bus Bit 8	103: FC2	Function Code 2
29: GND	Ground	104: FC1	Function Code 1
30: VCC	+5v DC	105: FC0	Function Code 0
31: A7	Address Bus Bit 7	106: _RMC	
32: A6	Address Bus Bit 6	107: Reserved	--
33: A5	Address Bus Bit 5	108: Reserved	--
34: A4	Address Bus Bit 4	109: Reserved	--
35: A3	Address Bus Bit 3	110: Reserved	--
36: A2	Address Bus Bit 2	111: _BR	Bus Request
37: A1	Address Bus Bit 1	112: _BG	Bus Grant
38: A0	Address Bus Bit 0	113: Reserved	--
39: GND	Ground	114: _BOSS	
40: VCC	+5v DC	115: _FPUCS	FPU CS
41: D31	Data Bus Bit 31	116: _FPUSENSE	FPU Sense
42: D30	Data Bus Bit 30	117: CCKA	
43: D29	Data Bus Bit 29	118: _RESET	General Reset
44: D28	Data Bus Bit 28	119: GND	Ground
45: D27	Data Bus Bit 27	120: VCC	+5v DC
46: D26	Data Bus Bit 26	121: _NETCS	
47: D25	Data Bus Bit 25	122: _SPARECS	
48: D24	Data Bus Bit 24	123: _RTCCS	
49: GND	Ground	124: _FLASH	
50: VCC	+5v DC	125: _REG	Register Enable
51: D23	Data Bus Bit 23	126: _CCENA	
52: D22	Data Bus Bit 22	127: _WAIT	Interrupt
53: D21	Data Bus Bit 21	128: _KBRESET	Keyboard Reset

54: D20	Data Bus Bit 20	129: _IORD	IO Read
55: D19	Data Bus Bit 19	130: _IOWR	IO Write
56: D18	Data Bus Bit 18	131: _OE	
57: D17	Data Bus Bit 17	132: _WE	DRAM Write Enbl.
58: D16	Data Bus Bit 16	133: _OVR	Override SysDec
59: GND	Ground	134: XRDY	Ext. Data Ready
60: VCC	+5v DC	135: _ZORRO	
61: D15	Data Bus Bit 15	136: _WIDE	
62: D14	Data Bus Bit 14	137: _INT2	Interrupt Req.
63: D13	Data Bus Bit 13	138: _INT6	Interrupt Req.
64: D12	Data Bus Bit 12	139: GND	Ground
65: D11	Data Bus Bit 11	140: VCC	+5v DC
66: D10	Data Bus Bit 10	141: SYSTEM1	Ground
67: D9	Data Bus Bit 9	142: SYSTEM0	Ground
68: D8	Data Bus Bit 8	143: _xRxD	
69: GND	Ground	144: _xTxD	
70: VCC	+5v DC	145: _CONFIG OUT	
71: D7	Data Bus Bit 7	146: AUDIO GND	Audio Ground
72: D6	Data Bus Bit 6	147: AUDIO L	Left Audio
73: D5	Data Bus Bit 5	148: AUDIO R	Right Audio
74: D4	Data Bus Bit 4	149: +12V	+12v DC
75: D3	Data Bus Bit 3	150: -12V	-12v DC

Signals marked "--" are shown not connected on the schematics.

Signals with no description are still present - I couldn't find the name.

Pins 1 to 8 are marked Reserved in the A1200 Manual but are shown connected to the Address Bus.

1.35 Clock Header Pinout

Clock Header Pinout

See Complete Header Pinout also.

<pre> ,-----, | 20 22 24 26 28 30 32 34 36 38 40 | | 19 21 23 25 27 29 31 33 35 37 39 | '-----' </pre>	<p>Type: 22-pin Male DIL Header Used: Clock Cartridge Fast Serial Port HD Floppy Controller</p>
--	--

19: GND	Ground	30: A2	Address Bus Bit 2
20: +5v	+5v DC	31: D23	Data Bus Bit 23
21: INT6	Interrupt Request	32: D22	Data Bus Bit 22
22: _SPARE_CS		33: D21	Data Bus Bit 21
23: _RTC_CS	Real Time Clock CS	34: D20	Data Bus Bit 20
24: _PWR_BAD		35: D19	Data Bus Bit 19
25: _IORD	IO Read	36: D18	Data Bus Bit 18
26: _IOWR	IO Write	37: D17	Data Bus Bit 17
27: A5	Address Bus Bit 5	38: D16	Data Bus Bit 16
28: A4	Address Bus Bit 4	39: GND	Ground
29: A3	Address Bus Bit 3	40: +5V	+5v

NOTES:

Why does it start at 19?

Because the header does. Look closely and the marker for pin 1 is right down on a row of solder-holes (unless you have a very early release). Since the header starts at 19, I did too.

So why the blank holes on the PCB?

I've explained this in the Miscellaneous section.

What else goes in here?

Apart from an aftermarket clock, there are two main bits which fit here. One is the HyperCOM fast serial port array (1 or 2 ports), with optional parallel port, and the other is a HD floppy drive adapter marketed by Eyeteck. Oh, and there's the possibility of an Ethernet Controller being released in the future.

1.36 External Floppy Drive Pinout

External Floppy Header Pinouts

```

,-----,
\ 1  2  3  4  5  6  7  8  9 10 11 12 /
\ 13 14 15 16 17 18 19 20 21 22 23 /
,-----,
Type: 23-way Female D
Used: External Floppies
      Copying Carts

```

1: /RDY	Disk Ready	13: /SIDE	Select Disk Side - 0 Upper
2: /DKRD	Disk Read Data	14: /WPRO	Disk is Write Protected
3: GND	Ground	15: /TK0	Position Head over Track 0
4: GND	Ground	16: /DKWE	Disk Write Enable
5: GND	Ground	17: /DKWD	Disk Write Data
6: GND	Ground	18: /STEP	Step Head - Pulse ( _| )
7: GND	Ground	19: DIR	Sel Head Direction - 0 In
8: /MTRXD	Disk Motor Control	20: /SEL3	Select Drive 3
9: /SEL2	Select Drive 2	21: /SEL1	Select Drive 1
10: /DRES	Disk Reset	22: /INDEX	Disk Index Pulse
11: /CHNG	Disk Removed	23: +12V	+12v DC (160mA Max)
12: +5V	+5v DC (250mA Max)		

Pins 8-10 and 16-21 are Open Collector

1.37 Networking Index

Networking Index

Information

The Internet

Ethernet Networks

AmiLink Networks

Serial/Parallel Networks

Linking Amiga->PC

Frequently Asked Questions

1.38 Networking with Parallel or Serial

Networking - Parallel and Serial Systems

This is really the starting point if you're getting into Networks. These systems use the parallel or serial ports of two machines to run a connection directly between. The way they are used is mostly the same, depending on the software, but usually goes something like this:

The cable is hooked up and both machines boot. The software, such as Parnet or Sernet, is run and one machine is designated master. The other machine is slave. Then, the drives are remapped or assigned to be available to both sides. For example, if the slave has a hard drive with two partitions - DH0: and DH1:, then the master will be able to directly read or write to that drive, usually an invisible system where the icons appear on the workbench, as if the drive was connected to that computer.

Of course, it's going to be slow, especially with Serial. And with serial, more problems are added - you need two pretty good machines to get good transfer rates, perhaps 030's minimum. Also, the other big drawback is that only two machines are allowed - really a living room solution.

Another Parallel solution is Liana, which has the bonus of being a SANA-II compliant system. This means instead of using custom software like Parnet, you can use any TCP stack, like Miami or AmiTCP. So it's very easy to create a Amiga section of a network, such as

PC <---ethernet---> Mac <---ethernet---> A4000 <---Liana---> A1200

1.39 Networking Amigas to PCs

Networking - Amiga to PC

Sometimes you'll have to network an Amiga to a PC, usually to transfer files to large for floppy. In this situation, probably the best solution is PC2Amiga, available from Aminet. It creates a network consisting of just the two computers via a serial, parallel or serial+parallel cable, and then mounts the PC drives as drives and drawers on the Amiga. For example, copying a file "foobar.txt" from the Amiga's sys:tools directory to the PC C: drive would involve just

```
"copy sys:tools/foobar.txt pc:c/foobar.txt"
```

The network speed is acceptable, but you'll never be able to pretend the drives are local ones... evne a directory listing on a totally serial-based network can take upto 30 seconds or more.

1.40 Internet Networking

Networking - The Good Old Internet

It's unarguable that the Internet is the worlds largest network. And the greatet thing about it is that anyone can be a part of it. Don't let anyone tell you you can't, either - the Amiga is well upto the job, perhaps better suited than some other platforms. The biggest pity is that no-one has told this to some ISP's (Internet Service Providers), who wil tell you the Amiga is about as useful as a chocolate teapot.

All you really need is a modem. This device converts the digital signals your computer lives on into analoge waveforms that phone lines can handle. There is another one the other end, at your ISP, which changes the analogue back into digital (or vice-versa, depending on the direction of data). Oh, and of course an ISP - won't go into details, but there are some providers that don't mind you using Amigas, such as Demon, and some that only support Amigas, such as Wirenet. These are infinitely better than the ones who say "Amiga? Bwahahaha!".

A fast serial port is a big bonus, but not required. It really depends on your modem speed, 14400 is a complete minimum these days, 28800 is nice, 33600 is lovely, but you should perhaps refrain from buying a 56k modem until it's sorted out which standard is the dominant one. A normal A1200 serial port can handle a DTE rate of 38400 no sweat, which is suitable for 14400 and 28800 modems. Add an 030 and you can see 57600 DTE, but with anything from fast (50MHz upwards) 030, and especially with faster 040's and 060's you'll see big benefits from a fast buffered serial port.

That's about as far as the hardware goes - add a TCP stack like Miami or AmiTCP and you're away.

1.41 Networking Information

Networking Information

Networking is perhaps one of the quickest-growing subset of computing. With the revolution of the Internet, where everyone wants fast connections and information availability, networking is what everyone is sort of using, even if they don't know it.

Of course, besides the Internet networking is also used to connect two or more computers together locally (a LAN - Local Area Network) in order for them to share resources, be it a hard drive, printer or processor. This kind of system is often used in colleges and universities.

So what the hell can you do with your A1200? Well, like it shows in the index, quite a bit. There is hardware available for everybody, from the cheap-but-slow SerNet if you're a casual networker, to professional Ethernet cards if PC compatibility is your game. Yes, that's right, you can network your Amiga to lesser systems like PC's and Macs quite easily, either with Ethernet or, given time and the right software, a parallel-based system. The world (or your living-room) could be at your fingertips.....

1.42 Networking Frequently Asked Questions

Networking - Frequently Asked Questions

Can I use Ethernet on my A1200?

Yes, but be prepared to look hard for a card. See Ethernet Networking for more information.

How can I connect my A1200 to another Amiga to transfer files?

The cheapest way is probably Parnet or Sernet - this just uses a straight connection between two Amigas where each others drives are directly accessible.

See Serial/Parallel Networking for more information.

How do I connect my A1200 to a PC to transfer files?

PC2Amiga is probably your best solution. It creates a serial or parallel network (or one using both) and transfers files as per Parnet or Sernet.

1.43 Ethernet Networking

Networking - Ethernet Systems

Think of Networking and a lot of you will think Ethernet. It's considered to be

a good system, because if its relatively cheap hardware for the PC and cheap cabling. But you hardly ever hear of A1200 Ethernet hardware, so is it possible?

Well, yup. The A1200 was blessed with a PCMCIA port, which is underused except for the Squirrel. Also, PC Notebook users have a wide range of Ethernet PCMCIA cards available.... getting the picture? Unfortunately, it's like one of those Magic-Eye pictures... not straightforward and very likely to give you a headache :)

There do exist some PCMCIA Ethernet solutions for the A1200. One of these is the Hydra Systems card, however I understand this to be no longer available. White Knight" link "retailers_white-knight"} do sell a A1200 PCMCIA card, unfortunately ←
I don't have any more details
on this. As you can see, it's a very hit-and-miss affair.

As far as other solutions go, it's very sparse. Nothing is available as yet, but there are two systems reportedly in development:

- * The Ateo Busboard will eventually have a Ethernet card available for it, alongside the GFX card and SCSI controllers announced.
- * Digital Lightyear Technologies are producing some Ethernet hardware for other Amigas, and may well produce an Ethernet controller to fit on the A1200 "clock" port.

1.44 Networking with AmiLink

Networking - The AmiLink System

AmiLink has been called the "Poor Mans Ethernet", but it is a title it doesn't really deserve. For a start it can be just as expensive :)

It was developed by AmiTriX, and uses the only port available on every Amiga - the external floppy disk drive port. This 23-pin beauty is quite capable of speedy transfer rates, not quite Ethernet but it certainly beats serial and parallel based systems. It uses a small converter, which plugs into the floppy drive port and has an Ethernet style BNC plug on the end. All you need is a connector for each network node, and suitable lengths of cable to go between them.

Using it is very simple. The drivers supplied are fully SANA-II compatible, and therefore you can use Miami or AmiTCP to link the machines together. Quite a lot of knowledge of network terminology will be required for this though.

1.45 Motherboard Index

Motherboard Index

The mouse port is usually a separate part. On some machines it is a square bit of circuit board, which plugs into a right-angle connector, while on others it is just a port on the end of a IDC cable, which plugs into a DIL header on the motherboard. Both connections are in the position indicated above.

On very early machines, it's part of an extended motherboard and so no additional piece is used. I guess Commodore redesigned it because there was a lot of wasted PCB there.

Revisions

Two main revisions of the A1200 motherboard were produced, Rev 1D and Rev 2B. They only differed in the type of RAM chips used for the Chip RAM. There was quite a shortage of RAM chips, and so measures were taken to ensure that production could keep going whatever chips were available. One took 8bit RAM, while the other took 16 bit and production was switched depending on what was available.

(Thanks to Dr. Peter Kittel for that)

1.47 Motherboard Manual Errata

Motherboard Manual Errors

Page ix: "Features [...] Factory-installed Motorola Floating Point Unit (FPU) Available"

This was never an option offered by Commodore, although the motherboard can take one if properly installed.

"Built-in de-interlacing of NTSC and PAL video modes
We wish! The A1200 has no provision for de-interlaced displays internally.

Page xi States that A1200's come with 'The Amiga Hard Drive Users Guide'. Only HD models come with that.

States that A1200's come with 'Arexx Users Guide'.
Nope.

Page 1-7 "23pin to 15pin adapter included with the A1200"
The A1200 never came with one of these, pity!

Page 3-1 "All RAM automatically configures"
Not necessarily - some early accelerators needed software to add the RAM to the system.

"Chip RAM on 1Mb machines....."
No A1200's were ever shipped with 1Mb Chip RAM, and the piggy-back board was never produced.

Page 3-2 PCMCIA Expansion indicates that ROM applications can be used - no ROM applications were ever released to the public.

Page A-1 Again, "optional FPU" was never offered.

"Fast Memory: 4Mb in CPU slot": 8Mb is possible with no CPU changes.
 "Chip Memory: 1Mb or 2Mb": No 1Mb machines made it to the public.

Page A-2 "AT IDE (40-pin Header)" should read "44-pin header".

1.48 Motherboard Specifications

Motherboard Specifications

The standard specifications of the A1200 are as follows:

CPU: Motorola 68EC020 rated at 16MHz
 Speed: 14MHz (14.318MHz NTSC or 14.188MHz PAL)
 Memory: 2Mb "Chip" RAM, 70 or 80ns
 Drives: 880k internal Double-Density, Double-Sided floppy drive
 Keyboard: 96-key Amiga keyboard with processor on motherboard\$^1\$
 Ports: External
 PCMCIA - 68-way Card slot
 Power - 5-pin SqDIN
 Video - 23-pin Male D
 RF Output - Phono
 Composite Video - Phono
 Audio - 2x Phono (Left/Right)
 Serial - 25-pin Male D
 Parallal - 25-pin Female D
 External Floppy - 23-way Female D
 Mouse/Joystick - 9-pin Male D (2x)
 Internal
 IDE - 44-pin high density DIL header
 Clock Header - 22-pin DIL header\$^2\$
 Floppy - 34-pin DIL header
 Floppy Power - 4-pin polarised SIL
 Status LEDs - 5-pin SIL header
 Expansion Slot - 150-way male Edge Connector

Expandability:

Processor: Any MC680X0 on suitable accelerator card,
 Soon PowerPC cards will be available.
 Memory: 8Mb Fast on standard Machine
 Upto 256Mb on accelerated (030 or higher).
 Actual figure depends on accelerator used.

\$^1\$ As opposed to the A500, where the processor was on the keyboard.

\$^2\$ This header demonstrates Commodore's finest quality control - motherboards were shipped with the header on the wrong side of the port, the header twice the size or no header at all.

1.49 Modifications that can be made

Motherboard Modifications

As with most machines, the A1200 left the factory with a few design flaws. Most of these won't affect anybody, but they can stop some accelerators from working. Here are the modifications that should be made for a "perfect" A1200;

REV 1D.4

Budgie REV -01

- > Remove E123C and E125C from the A1200 motherboard

Budgie REV -02

- > Remove E123C and E125C from the A1200 motherboard
- > Remove XR358 470 ohm pull-up resistor
- > Add 470 ohm pull up resistor at pin 43 of U, ie the Alice chip

REV 2B

Budgie REV -01 and -02

- > Remove E123C and E125C from the A1200 motherboard
- > Add 470 ohm pull-up at pin 43 of U2, ie the Alice chip
- > Change R118 from 470 ohm to 220 ohm

Many thanks to the unknown contributor! It was posted to Usenet, unattributed, and I took it from there.

1.50 Internal Pinouts Index

Internal Pinouts Index

Chips

U1	68EC020 CPU
U2	Alice
U3	Paula
U4	Lisa
U5	Gayle
U6A	ROM 0
U6B	ROM 1
U7	Odd CIA
U8	Even CIA
U20	Budgie

Other Stuff

- Test Access
- Complete Clock Header
- Keyboard Matrix Plan

1.51 Test Access Points Pinout

Test Access Pinouts

Type: All Cases 10-way solder buckets (no header)

Pin	TP1 Pinout	TP2 Pinout	TP3 Pinout
1	CPU Clock	Colour Clock	_DBR
2	_Address Strobe	Colour Clock Quad.	Register Addr Bus 8
3	_Data Strobe	_RAM Enable	Register Addr Bus 7
4	Processor Read/Write	_Chip Register Enabl	Register Addr Bus 6
5	_Data Send Ack. 0	_Blitter Slowdown	Register Addr Bus 5
6	_Data Send Ack. 1	_OEB	Register Addr Bus 4
7	_ROM Enable	_Row Addr. Strobe	Register Addr Bus 3
8	_CDIS	_Col Addr. Strobe	Register Addr Bus 2
9	_Keyboard Reset	_DWE	Register Addr Bus 1
10	Ground	Ground	Ground

It is highly inadvisable to actually use these unless you know what you are doing. Make sure you have the right end of the row for starters!

1.52 ROM 1 Pinout

ROM1 Pinouts

Type: 62408

Position: U6B

1	i	A20	Address Bus Bit 20	22	VCC	+5v	
2	i	A19	Address Bus Bit 19	23	b	D20	Data Bus Bit 4
3	i	A9	Address Bus Bit 9	24	b	D28	Data Bus Bit 12
4	i	A8	Address Bus Bit 8	25	b	D21	Data Bus Bit 5
5	i	A7	Address Bus Bit 7	26	b	D29	Data Bus Bit 13
6	i	A6	Address Bus Bit 6	27	b	D22	Data Bus Bit 6
7	i	A5	Address Bus Bit 5	28	b	D30	Data Bus Bit 14
8	i	A4	Address Bus Bit 4	29	b	D23	Data Bus Bit 7
9	i	A3	Address Bus Bit 3	30	b	D31	Data Bus Bit 15
10	i	A2	Address Bus Bit 2	31	GND	Ground	
11	i	_ROMEN	ROM Enable	32	VCC	+5v	
12	GND	Ground		33	i	A18	Address Bus Bit 18
13	i	_OE		34	i	A17	Address Bus Bit 17
14	b	D16	Data Bus Bit 0	35	i	A16	Address Bus Bit 16
15	b	D24	Data Bus Bit 8	36	i	A15	Address Bus Bit 15
16	b	D17	Data Bus Bit 1	37	i	A14	Address Bus Bit 14
17	b	D25	Data Bus Bit 9	38	i	A13	Address Bus Bit 13
18	b	D18	Data Bus Bit 2	39	i	A12	Address Bus Bit 12
19	b	D26	Data Bus Bit 10	40	i	A11	Address Bus Bit 11
20	b	D19	Data Bus Bit 3	41	i	A10	Address Bus Bit 10
21	b	D27	Data Bus Bit 11	42	i	A1	Address Bus Bit 1

|

1.53 ROM 0 Pinout

ROM0 Pinouts

Type: 62408

Position: U6A

1	i	A20	Address Bus Bit 20	|	22	VCC	+5v
2	i	A19 + A1	Address Bus Bits 19 + 1*	|	23	b D20	Data Bus Bit 20
3	i	A9	Address Bus Bit 9	|	24	b D28	Data Bus Bit 28
4	i	A8	Address Bus Bit 8	|	25	b D21	Data Bus Bit 21
5	i	A7	Address Bus Bit 7	|	26	b D29	Data Bus Bit 29
6	i	A6	Address Bus Bit 6	|	27	b D22	Data Bus Bit 22
7	i	A5	Address Bus Bit 5	|	28	b D30	Data Bus Bit 30
8	i	A4	Address Bus Bit 4	|	29	b D23	Data Bus Bit 23
9	i	A3	Address Bus Bit 3	|	30	b D31	Data Bus Bit 31
10	i	A2	Address Bus Bit 2	|	31	GND	Ground
11	i	_ROMEN	ROM Enable	|	32	VCC	+5v
12		GND	Ground	|	33	i A18	Address Bus Bit 18
13	i	_OE		|	34	i A17	Address Bus Bit 17
14	b	D16	Data Bus Bit 16	|	35	i A16	Address Bus Bit 16
15	b	D24	Data Bus Bit 24	|	36	i A15	Address Bus Bit 15
16	b	D17	Data Bus Bit 17	|	37	i A14	Address Bus Bit 14
17	b	D25	Data Bus Bit 25	|	38	i A13	Address Bus Bit 13
18	b	D18	Data Bus Bit 18	|	39	i A12	Address Bus Bit 12
19	b	D26	Data Bus Bit 26	|	40	i A11	Address Bus Bit 11
20	b	D19	Data Bus Bit 19	|	41	i A10	Address Bus Bit 10
21	b	D27	Data Bus Bit 27	|	42	i A1	Address Bus Bit 21

|

* Pin 2 has both bits 19 and 1 of the address bus connected to it, via resistors.

1.54 Paula Pinout

Paula Pinouts

Type: 8364

Position: U3

Function: Bit of Floppy, Joysticks, Audio

1	b	DRD24	DRAM Data Bus Bit 24	|	30		
2	b	DRD23	DRAM Data Bus Bit 23	|	31	i CCK	Colour Clock
3	b	DRD22	DRAM Data Bus Bit 22	|	32	i CCKQ	Colour Clock Quadr.
4	b	DRD21	DRAM Data Bus Bit 21	|	33	o RIGHT	Right Audio Out
5	b	DRD20	DRAM Data Bus Bit 20	|	34	o LEFT	Left Audio Out
6	b	DRD19	DRAM Data Bus Bit 19	|	35	i P0X	Joystick 0 X Pot
7	b	DRD18	DRAM Data Bus Bit 18	|	36	i P0Y	Joystick 0 Y Pot

8			|	37	
9	b	DRD17	DRAM Data Bus Bit 17	|	38 i P1X Joystick 1 X Pot
10	b	DRD16	DRAM Data Bus Bit 16	|	39 i P1Y Joystick 1 Y Pot
11	i	_RST	Reset	|	40 i _DKRD Floppy Read Data
12	o	DMAL	DMA Request	|	41 o _DKWD Floppy Write Data
13	o	IPL0	{Interrupt	|	42 o DKWE Floppy Write Enabled
14	o	IPL1	{Priority Level	|	43 o _TXD Serial Transmit Data
15	o	IPL2	{Bits 0,1,2	|	44 i _RXD Serial Recieve Data
16			|	45 b DRD31 DRAM Data Bus Bit 31	
17			|	46 b DRD30 DRAM Data Bus Bit 30	
18			|	47	
19	i	_INT2	Interrupt 2 Request	|	48 b DRD29 DRAM Data Bus Bit 29
20	i	_INT3	Interrupt 3 Request	|	49 b DRD28 DRAM Data Bus Bit 28
21	i	_INT6	Interrupt 6 Request	|	50 b DRD27 DRAM Data Bus Bit 27
22	i	RGA8	Register Addr. Bus 8	|	51 b DRD26 DRAM Data Bus Bit 26
23	i	RGA7	Register Addr. Bus 7	|	52 b DRD25 DRAM Data Bus Bit 25
24	i	RGA6	Register Addr. Bus 6	|	
25	i	RGA5	Register Addr. Bus 5	|	
26	i	RGA4	Register Addr. Bus 4	|	
27	i	RGA3	Register Addr. Bus 3	|	
28	i	RGA2	Register Addr. Bus 2	|	
29	i	RGA1	Register Addr. Bus 1	|	

1.55 Odd CIA Pinout

Odd CIA Pinouts

Type: 8520

Position: U7

Function: Parallel Data, Keyboard Stuff, Some Floppy functions

1	GND	Ground	|	23 o _INT2	Interrupt Request
2			|	24 i R_W	Read/Write
3	o _LED	Power LED	|	25 i _ODD_CIA	Timing Signal
4	i _CHNG	Floppy Media Change	|	26 i _ACK	Par. Acknowledge
5			|	27 i E	Peripheral Clock
6			|	28	
7	i _WPROT	Floppy Write Protect	|	29 b D23	Data Bus Bit 23
8	i _TRK0	Floppy Track 0	|	30 b D22	Data Bus Bit 22
9	i _RDY	Floppy Ready	|	31 b D21	Data Bus Bit 21
10	i _FIRE0	Joystick 0 Fire	|	32 b D20	Data Bus Bit 20
11	i _FIRE1	Joystick 1 Fire	|	33 b D19	Data Bus Bit 19
12	b PPD0	Parallel Data Bit 0	|	34 b D18	Data Bus Bit 18
13	b PPD1	Parallel Data Bit 1	|	35 b D17	Data Bus Bit 17
14	b PPD2	Parallel Data Bit 2	|	36 b D16	Data Bus Bit 16
15	b PPD3	Parallel Data Bit 3	|	37	
16	b PPD4	Parallel Data Bit 4	|	38 i A11	Address Bus Bit 11
17	b PPD5	Parallel Data Bit 5	|	39 i A10	Address Bus Bit 10
18	b PPD6	Parallel Data Bit 6	|	40	
19	b PPD7	Parallel Data Bit 7	|	41 i A9	Address Bus Bit 9
20	o _STROBE	Parallel Strobe	|	42 i A8	Address Bus Bit 8
21	i _VSYNC	Vertical Sync	|	43 i _KB_DATA	Keyboard Data
22	VCC	+5v	|	44 i _KB_CLOCK	Keyboard Clock

|

1.56 U4 Lisa Pinout

Lisa Pinouts

Type: 4203

Position: U5

Desc: AA Denise

Function: Video is just about it, really.

1	GND	Ground	|	43	o	CLOCK	
2	b	DRD6	DRAM Data Bus Bit 6	|	44	o	G4 Green Bit 4
3	b	DRD5	DRAM Data Bus Bit 5	|	45	o	G5 Green Bit 5
4	b	DRD4	DRAM Data Bus Bit 4	|	46	o	G6 Green Bit 6
5	b	DRD3	DRAM Data Bus Bit 3	|	47	o	G7 Green Bit 7
6	b	DRD2	DRAM Data Bus Bit 2	|	48	o	R0 Red Bit 0
7	b	DRD1	DRAM Data Bus Bit 1	|	49	o	R1 Red Bit 1
8	b	DRD0	DRAM Data Bus Bit 0	|	50	o	R2 Red Bit 2
9	i	_BCAS_XX		|	51	o	R3 Red Bit 3
10	i	CCK	Colour Clock	|	52	o	R4 Red Bit 4
11				|	53		GND Ground
12	i	RGA8	Register Addr. Bus Bit 8	|	54	o	R5 Red Bit 5
13	i	RGA7	Register Addr. Bus Bit 7	|	55	o	R6 Red Bit 6
14	i	RGA6	Register Addr. Bus Bit 6	|	56		VCC +5v
15	i	RGA5	Register Addr. Bus Bit 5	|	57	o	R7 Red Bit 7
16	i	RGA4	Register Addr. Bus Bit 4	|	58	o	_BURST NC
17	i	RGA3	Register Addr. Bus Bit 3	|	59	b	DRD31 DRAM Data Bus Bit 31
18	i	RGA2	Register Addr. Bus Bit 2	|	60	b	DRD30 DRAM Data Bus Bit 30
19	i	RGA1	Register Addr. Bus Bit 1	|	61	b	DRD29 DRAM Data Bus Bit 29
20	i	MDAT		|	62	b	DRD28 DRAM Data Bus Bit 28
21	o	_MLD		|	63	b	DRD27 DRAM Data Bus Bit 27
22	o	SCLK		|	64	b	DRD26 DRAM Data Bus Bit 26
23	o	14MHZ	14MHz Clock Signal	|	65	b	DRD25 DRAM Data Bus Bit 25
24				|	66	b	DRD24 DRAM Data Bus Bit 24
25	i	28MHZ	28MHz Clock Signal	|	67	b	DRD23 DRAM Data Bus Bit 23
26				|	68	b	DRD22 DRAM Data Bus Bit 22
27				|	69	b	DRD21 DRAM Data Bus Bit 21
28				|	70	b	DRD20 DRAM Data Bus Bit 20
29	o	B0	Blue Bit 0	|	71	b	DRD19 DRAM Data Bus Bit 19
30		VCC	+5v	|	72	b	DRD18 DRAM Data Bus Bit 18
31	o	B1	Blue Bit 1	|	73	b	DRD17 DRAM Data Bus Bit 17
32	o	B2	Blue Bit 2	|	74	b	DRD16 DRAM Data Bus Bit 16
33		GND	Ground	|	75	b	DRD15 DRAM Data Bus Bit 15
34	o	B3	Blue Bit 3	|	76	b	DRD14 DRAM Data Bus Bit 14
35	o	B4	Blue Bit 4	|	77	b	DRD13 DRAM Data Bus Bit 13
36	o	B5	Blue Bit 5	|	78	b	DRD12 DRAM Data Bus Bit 12
37	o	B6	Blue Bit 6	|	79	b	DRD11 DRAM Data Bus Bit 11
38	o	B7	Blue Bit 7	|	80	b	DRD10 DRAM Data Bus Bit 10
39	o	G0	Green Bit 0	|	81	b	DRD9 DRAM Data Bus Bit 9
40	o	G1	Green Bit 1	|	82	b	DRD8 DRAM Data Bus Bit 8
41	o	G2	Green Bit 2	|	83		VCC +5v
42	o	G3	Green Bit 3	|	84	b	DRD7 DRAM Data Bus Bit 7

|

1.57 U5 Gayle Pinout

Gayle Pinouts

Type: 4145F023A

Position: U5

Desc: AA Gayle

Function: Oooh, lots of control stuff

1	o	PE12		|	43	b	A14	Address Bus Bit 14
2	o	PE5		|	44	b	A15	Address Bus Bit 15
3		GND	Ground	|	45		GND	
4	o	NOISE		|	46	b	A16	Address Bus Bit 16
5	o	_CC_RESET	PCMCIA Reset	|	47	b	A17	Address Bus Bit 17
6	o	_CC_ENA	PCMCIA Enable	|	48	b	A18	Address Bus Bit 18
7	o	_REG		|	49	b	A19	Address Bus Bit 19
8	o	_WE	DRAM Write Enable	|	50	b	A20	Address Bus Bit 20
9	o	_OE		|	51	b	A21	Address Bus Bit 21
10	o	E	Peripheral Enable Clk	|	52	b	A22	Address Bus Bit 22
11	o	_FLASH		|	53	b	A23	Address Bus Bit 23
12	i	_IDE_IRQ		|	54	b	D15	Data Bus Bit 15
13	i	_IDE_CS1		|	55	b	D14	Data Bus Bit 14
14	i	_IDE_CS2		|	56	b	D13	Data Bus Bit 13
15	o	_SPARE_CS		|	57	b	D12	Data Bus Bit 12
16	o	_NET_CS		|	58	b	D11	Data Bus Bit 11
17	o	_RTC_CS		|	59	b	D10	Data Bus Bit 10
18	o	_IOWR	I/O Write	|	60	b	D9	Data Bus Bit 9
19	o	_IORD	I/O Read	|	61	b	D8	Data Bus Bit 8
20		VCC	+5v	|	62	i	_BEER	Bus Error
21				|	63	i	_KB_RESET	Keyboard Reset
22	o	CPUCLK	CPU Clock	|	64			
23	o	CCK	Colour Clock	|	65		GND	Ground
24		GND		|	66			
25	i	XRDY	External Data Ready	|	67	o	_MTR0	DF0: Motor On
26	i	_OVR	Override Sys. Decoding	|	68			
27	o	_CC_AO		|	69	b	FC1	Function Code Bit 1
28		_DEB		|	70	b	FC0	Function Code Bit 0
29		_DBR		|	71	i	_MTR	Floppy Motor On
30		_BLS		|	72	i	_SEL0	Floppy Select 0
31		_REGEN	Chip Register Enable	|	73	o	_ODD_CIA	{CIA Timing
32		_RAMEN	RAM Enable	|	74	o	_EVEN_CIA	{Signals
33	b	_AS	Address Strobe	|	75	i	_CC_CD1	
34	b	_DS	Data Strobe	|	76	i	_CC_CD2	
35	i	_DSACK1	Data Send Acknowledge1	|	77	i	_CC_BVD1	
36	b	R_W	Processor Read/Write	|	78	i	_CC_BVD2	
37	i	_DSACK0	Data Send Acknowledge0	|	79	i	_CC_WP	
38				|	80	i	_CC_BUSY_IREQ	
39	b	_HLT	Processor Halt	|	81	i	_WAIT	Processor Wait
40	b	_RST	Processor Reset	|	82		VCC	+5v
41	b	A12	Address Bus Bit 12	|	83	o	_INT6	{Interrupt
42	b	A13	Address Bus Bit 13	|	84	o	_INT2	{Requests

1.58 Even CIA Pinout

Even CIA Pinouts

Type: 8520

Position: U8

Function: Serial Port, Some Floppy functions, a bit of Parallel

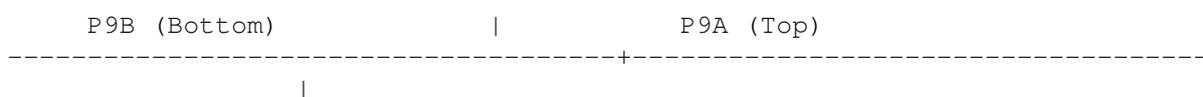
1	GND	Ground	|	23	o	_INT6	Interrupt Request	
2	i	BUSY	Parallel Port Busy	|	24	i	R_W	Read/Write
3	i	POUT	Parallel Paper Out	|	25	i	_EVEN_CIA	Timing Signal
4	o	SEL	Parallel Select	|	26	i	_INDEX	Floppy Index
5				|	27	i	E	Peripheral Clock
6				|	28			
7	i	DSR	Serial Data Set Ready	|	29	b	D31	Data Bus Bit 31
8	i	CTS	Serial Clear To Send	|	30	b	D30	Data Bus Bit 30
9	i	CD	Serial Carrier Detect	|	31	b	D29	Data Bus Bit 29
10	i	RTS	Serial Ready to Send	|	32	b	D28	Data Bus Bit 28
11	i	DTR	Serial Data Terminal Rdy	|	33	b	D27	Data Bus Bit 27
12	o	_STEP	Floppy Head Step	|	34	b	D26	Data Bus Bit 26
13	o	DIR	Floppy Head Step Dir	|	35	b	D25	Data Bus Bit 25
14	o	_SIDE	Floppy Read Side	|	36	b	D24	Data Bus Bit 24
15	o	_SEL0	Floppy Select Unit 0	|	37			
16	o	_SEL1	Floppy Select Unit 1	|	38	i	A11	Address Bus Bit 11
17	o	_SEL2	Floppy Select Unit 2	|	39	i	A10	Address Bus Bit 10
18	o	_SEL3	Floppy Select Unit 3	|	40			
19	o	_MTR	Floppy Motor	|	41	i	A9	Address Bus Bit 9
20				|	42	i	A8	Address Bus Bit 8
21	i	_HSYNC	Horizontal Sync	|	43	i	BUSY	Parallel Port Busy
22	VCC	+5v		|	44	i	POUT	Parallel Paper Out

1.59 Complete Clock Header Pinout

Complete Clock Header Pinout

This is the pinout for the complete "clock" header - the space for which is visible above and below the Chip Mem IC's.

Note that only the P9B pins 19-40 actually have a header soldered in in most machines, although some earlier revisions (such as 1B) had a complete P9B, and the earliest of prototypes had both P9A and P9B complete, probably in conjunction with 1mb Chip RAM.



1: GND	Ground	|	1: GND	Ground
2: VCC	+5v DC	|	2: VCC	+5v DC
3: DRD0	DRAM Data Bus Bit 0	|	3: DRD16	DRAM Data Bus Bit 16
4: DRD15	DRAM Data Bus Bit 15	|	4: DRD31	DRAM Data Bus Bit 31
5: DRD1	DRAM Data Bus Bit 1	|	5: DRD17	DRAM Data Bus Bit 17
6: DRD14	DRAM Data Bus Bit 14	|	6: DRD30	DRAM Data Bus Bit 30
7: DRD2	DRAM Data Bus Bit 2	|	7: DRD18	DRAM Data Bus Bit 18
8: DRD13	DRAM Data Bus Bit 13	|	8: DRD29	DRAM Data Bus Bit 29
9: DRD3	DRAM Data Bus Bit 3	|	9: DRD19	DRAM Data Bus Bit 19
10: DRD12	DRAM Data Bus Bit 12	|	10: DRD28	DRAM Data Bus Bit 28
11: DRD4	DRAM Data Bus Bit 4	|	11: DRD20	DRAM Data Bus Bit 20
12: DRD11	DRAM Data Bus Bit 11	|	12: DRD27	DRAM Data Bus Bit 27
13: DRD5	DRAM Data Bus Bit 5	|	13: DRD21	DRAM Data Bus Bit 21
14: DRD10	DRAM Data Bus Bit 10	|	14: DRD26	DRAM Data Bus Bit 26
15: DRD6	DRAM Data Bus Bit 6	|	15: DRD22	DRAM Data Bus Bit 22
16: DRD9	DRAM Data Bus Bit 9	|	16: DRD25	DRAM Data Bus Bit 25
17: DRD7	DRAM Data Bus Bit 7	|	17: DRD23	DRAM Data Bus Bit 23
18: DRD8	DRAM Data Bus Bit 8	|	18: DRD24	DRAM Data Bus Bit 24
19: GND	Ground	|	19: GND	Ground
20: VCC	+5v DC	|	20: VCC	+5v DC
21: INT6	Interupt Request	|	21: _BWE	
22: _SPARE_CS		|	22: _ROE	
23: _RTC_CS	Real Time Clock CS	|	23: _BRAS0	
24: _PWR_BAD		|	24: _BRAS1	
25: _IORD	IO Read	|	25: _BCAS_UU	
26: _IOWR	IO Write	|	26: _BCAS_UM	
27: A5	Address Bus Bit 5	|	27: _BCAS_LL	
28: A4	Address Bus Bit 4	|	28: _BCAS_LM	
29: A3	Address Bus Bit 3	|	29: BDRA0	
30: A2	Address Bus Bit 2	|	30: CCK_A	Colour Clock
31: D23	Data Bit Bit 23	|	31: BDRA1	
32: D22	Data Bit Bit 22	|	33: BDRA8	
33: D21	Data Bit Bit 21	|	33: BDRA2	
34: D20	Data Bit Bit 20	|	34: BDRA7	
35: D19	Data Bit Bit 19	|	35: BDRA3	
36: D18	Data Bit Bit 18	|	36: BDRA6	
37: D17	Data Bit Bit 17	|	37: BDRA4	
38: D16	Data Bit Bit 16	|	38: BDRA5	
39: GND	Ground	|	39: GND	Ground
40: _RESET	Reset	|	40: VCC	+5v DC

1.60 Budgie Pinouts

BudgiePinouts

Type: 391425

Position: U20

Function: Memory Stuff

1		|	65		
2	b D7	Data Bus Bit 7	|	66 b DRD26	DRAM Data Bus Bit 26
3	b D6	Data Bus Bit 6	|	67 b DRD27	DRAM Data Bus Bit 27
4	b D5	Data Bus Bit 5	|	68 b DRD28	DRAM Data Bus Bit 28

5	b	D4	Data Bus Bit 4	|	69	b	DRD29	DRAM Data Bus Bit 29
6	b	D3	Data Bus Bit 3	|	70	b	DRD30	DRAM Data Bus Bit 30
7	b	D2	Data Bus Bit 2	|	71	b	DRD31	DRAM Data Bus Bit 31
8	b	D1	Data Bus Bit 1	|	72			
9	b	D0	Data Bus Bit 0	|	73			
10				|	74			
11	o	_UDS	Upper Data Strobe	|	75			
12	o	_LDS	Lower Data Strobe	|	76			
13	i	_DS	Data Strobe	|	77			
14	i	A1	Address Bus Bit 1	|	78			
15	i	A0	Address Bus Bit 0	|	79			
16	i	SIZE_1		|	80			
17	i	SIZE_0		|	81			
18	i	R_W	Processor Read/Write	|	82			
19	o	_BCAS_XX	Budgie Col. Addr. Strobe	|	83			
20	o	_BCAS_LL	Budgie Col. Addr. Strobe	|	84			
21	o	_BCAS_LM	Budgie Col. Addr. Strobe	|	85			
22	o	_BCAS_UM	Budgie Col. Addr. Strobe	|	86			
23	o	_BCAS_UU	Budgie Col. Addr. Strobe	|	87			
24	i	_CAS	Column Address Strobe	|	88			
25				|	89			
26	o	_BRAS0	Budgie Row Addr. Bit 0	|	90	o	CPUCLK	CPU Clock
27	o	_BRAS1	Budgie Row Addr. Bit 1	|	91	o	_COAC	7MHZ Quadrature Clk
28	i	_RAS	Row Address Strobe	|	92	o	7MHZ	7MHZ Signal
29				|	93	i	_RST	Reset
30	o	_BWE		|	94	i	OSC	Oscillator Input
31	i	_DWE		|	95	o	28MHZ	28MHZ Signal
32				|	96			
33				|	97	i	XCLK	External Clock
34	i	_DBR		|	98	i	_XCLKEN	External Clk Enable
35	o	CCOA	Colour Clock Quadrature	|	99			
36	o	CCK	Colour Clock	|	100			
37	b	DRD0	DRAM Data Bus Bit 0	|	101	i	_OEB	
38	b	DRD1	DRAM Data Bus Bit 1	|	102	b	D31	Data Bus Bit 31
39	b	DRD2	DRAM Data Bus Bit 2	|	103	b	D30	Data Bus Bit 30
40	b	DRD3	DRAM Data Bus Bit 3	|	104	b	D29	Data Bus Bit 29
41	b	DRD4	DRAM Data Bus Bit 4	|	105	b	D28	Data Bus Bit 28
42	b	DRD5	DRAM Data Bus Bit 5	|	106	b	D27	Data Bus Bit 27
43	b	DRD6	DRAM Data Bus Bit 6	|	107			
44	b	DRD7	DRAM Data Bus Bit 7	|	108	b	D26	Data Bus Bit 26
45	b	DRD8	DRAM Data Bus Bit 8	|	109	b	D25	Data Bus Bit 25
46				|	110	b	D24	Data Bus Bit 24
47	b	DRD9	DRAM Data Bus Bit 9	|	111	b	D23	Data Bus Bit 23
48	b	DRD10	DRAM Data Bus Bit 10	|	112	b	D22	Data Bus Bit 22
49	b	DRD11	DRAM Data Bus Bit 11	|	113	b	D21	Data Bus Bit 21
50	b	DRD12	DRAM Data Bus Bit 12	|	114	b	D20	Data Bus Bit 20
51	b	DRD13	DRAM Data Bus Bit 13	|	115	b	D19	Data Bus Bit 19
52	b	DRD14	DRAM Data Bus Bit 14	|	116	b	D18	Data Bus Bit 18
53	b	DRD15	DRAM Data Bus Bit 15	|	117	b	D17	Data Bus Bit 17
54				|	118	b	D16	Data Bus Bit 16
55	b	DRD16	DRAM Data Bus Bit 16	|	119			
56	b	DRD17	DRAM Data Bus Bit 17	|	120	b	D15	Data Bus Bit 15
57	b	DRD18	DRAM Data Bus Bit 18	|	121	b	D14	Data Bus Bit 14
58	b	DRD19	DRAM Data Bus Bit 19	|	122	b	D13	Data Bus Bit 13
59	b	DRD20	DRAM Data Bus Bit 20	|	123	b	D12	Data Bus Bit 12
60	b	DRD21	DRAM Data Bus Bit 21	|	124	b	D11	Data Bus Bit 11
61	b	DRD22	DRAM Data Bus Bit 22	|	125	b	D10	Data Bus Bit 10

62 b DRD23	DRAM Data Bus Bit 23	|	126 b D9	Data Bus Bit 9
63 b DRD24	DRAM Data Bus Bit 24	|	127 b D8	Data Bus Bit 8
64 b DRD25	DRAM Data Bus Bit 25	|	128	

1.61 U2 Alice Pinout

U2 Alice Pinouts

Type: 8374

Position: U2

Desc: AA Agnus

1 b DRD29	DRAM Data Bus Bit 29	|	43 o DRA0	DRAM Addr. Bus Bit 0
2 b DRD28	DRAM Data Bus Bit 28	|	44 o DRA1	DRAM Addr. Bus Bit 1
3 b DRD27	DRAM Data Bus Bit 27	|	45 o DRA2	DRAM Addr. Bus Bit 2
4 b DRD26	DRAM Data Bus Bit 26	|	46 o DRA3	DRAM Addr. Bus Bit 3
5 b DRD25	DRAM Data Bus Bit 25	|	47 o DRA4	DRAM Addr. Bus Bit 4
6 b DRD24	DRAM Data Bus Bit 24	|	48 o DRA5	DRAM Addr. Bus Bit 5
7 b DRD23	DRAM Data Bus Bit 23	|	49 o DRA6	DRAM Addr. Bus Bit 6
8 b DRD22	DRAM Data Bus Bit 22	|	50 o DRA7	DRAM Addr. Bus Bit 7
9 b DRD21	DRAM Data Bus Bit 21	|	51 o DRA8	DRAM Addr. Bus Bit 8
10 b DRD20	DRAM Data Bus Bit 20	|	52 VCC	+5v
11 b DRD19	DRAM Data Bus Bit 19	|	53	
12 b DRD18	DRAM Data Bus Bit 18	|	54 o _CAS	Column Addr. Strobe
13 b DRD17	DRAM Data Bus Bit 17	|	55 b A20	Address Bus Bit 20
14 b DRD16	DRAM Data Bus Bit 16	|	56 o DRA9	DRAM Addr. Bus Bit 9
15 _RESET	Reset (tied to GND)	|	57 o _RAS	Row Address Strobe
16		|	58 GND	Ground
17 o _INT3	Interrupt Request 3	|	59 b A19	Address Bus Bit 19
18 i DMAL	DMA Request Line	|	60 b A1	Address Bus Bit 1
19		|	61 b A2	Address Bus Bit 2
20		|	62 b A3	Address Bus Bit 3
21 o _DWE	Disk Write Enable	|	63 b A4	Address Bus Bit 4
22 b R_W	Read/Write	|	64 b A5	Address Bus Bit 5
23		|	65 b A6	Address Bus Bit 6
24		|	66 b A7	Address Bus Bit 7
25		|	67 b A8	Address Bus Bit 8
26 o RGA8	Register Addr. Bus 8	|	68 b A9	Address Bus Bit 9
27 o RGA7	Register Addr. Bus 7	|	69 b A10	Address Bus Bit 10
28 o RGA6	Register Addr. Bus 6	|	70 b A11	Address Bus Bit 11
29 o RGA5	Register Addr. Bus 5	|	71 b A12	Address Bus Bit 12
30 o RGA4	Register Addr. Bus 4	|	72 b A13	Address Bus Bit 13
31 o RGA3	Register Addr. Bus 3	|	73 b A14	Address Bus Bit 14
32 o RGA2	Register Addr. Bus 2	|	74 b A15	Address Bus Bit 15
33 o RGA1	Register Addr. Bus 1	|	75 b A16	Address Bus Bit 16
34 i SCLK		|	76 b A17	Address Bus Bit 17
35 i 14MHZ	14MHz Signal	|	77 b A18	Address Bus Bit 18
36		|	78 i _FIRE1	Joystick 1 Fire
37 _CDAC	7MHZ Quadrature Clock *	|	79 b _VSYNC	Vertical Sync
38 7MHZ	7MHZ Signal *	|	80 o _CSYNC	Composite Sync
39 o CCKQ	Colour Clock Quadrat.	|	81 b _HSYNC	Horizontal Sync
40 o CCK	Colour Clock	|	82 GND	Ground
41 i _NTSC	NTSC/PAL Display	|	83 b DRD31	DRAM Data Bus Bit 31
42 GND	Ground	|	84 b DRD30	DRAM Data Bus Bit 30

|

* 7MHz means 7.15909MHz on NTSC systems
and 7.09378MHz on PAL systems

1.62 68EC020 Pinouts

68EC020 Pinouts

Type: 68EC020 16MHz

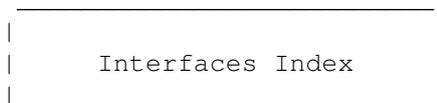
Position: U1

|

1	i	_BR	Bus Request	|	50	b	D10	Data Bus Bit 10
2	o	_BG	Bus Grant	|	51	b	D9	Data Bus Bit 9
3		GND	Ground	|	52		NC	--
4		GND	Ground	|	53	b	D8	Data Bus Bit 8
5	i	CPUCLK	CPU Clock	|	54	b	D7	Data Bus Bit 7
6	b	_RST	Processor Reset	|	55	b	D6	Data Bus Bit 6
7		VCC	+5v	|	56	b	D5	Data Bus Bit 5
8		VCC	+5v	|	57		VCC	+5v
9	o	_RMC		|	58		GND	Ground
10	b	FC2	{Function	|	59		GND	Ground
11	b	FC1	{Code Bits	|	60	b	D4	Data Bus Bit 4
12	b	FC0	{0,1,2	|	61	b	D3	Data Bus Bit 3
13	b	SIZE_0		|	62	b	D2	Data Bus Bit 2
14	b	SIZE_1		|	63	b	D1	Data Bus Bit 1
15	i	CDIS		|	64	b	D0	Data Bus Bit 0
16	i	_AVEC		|	65	i	IPL0	{Interrupt
17	i	_DSACK_0	{Data Send	|	66	i	IPL1	{Priority Level
18	i	_DSACK_1	{Acknowledge 0,1	|	67	i	IPL2	{Bits 0,1,2
19	i	_BEER	Bus Error	|	68		GND	Ground
20		GND	Ground	|	69		GND	Ground
21		GND	Ground	|	70		VCC	+5v
22	b	_HLT	Processor Halt	|	71		VCC	+5v
23	b	_AS	Address Strobe	|	72		GND	Ground
24	b	_DS	Data Strobe	|	73	b	A2	Address Bus Bit 2
25	b	R_W	Read/Write	|	74	b	A3	Address Bus Bit 3
26		GND	Ground	|	75	b	A4	Address Bus Bit 4
27	b	D31	Data Bus Bit 31	|	76	b	A5	Address Bus Bit 5
28	b	D30	Data Bus Bit 30	|	77	b	A6	Address Bus Bit 6
29	b	D29	Data Bus Bit 29	|	78	b	A7	Address Bus Bit 7
30	b	D28	Data Bus Bit 28	|	79		NC	--
31	b	D27	Data Bus Bit 27	|	80	b	A8	Address Bus Bit 8
32	b	D26	Data Bus Bit 26	|	81	b	A9	Address Bus Bit 9
33	b	D25	Data Bus Bit 25	|	82	b	A10	Address Bus Bit 10
34	b	D24	Data Bus Bit 24	|	83	b	A11	Address Bus Bit 11
35	b	D23	Data Bus Bit 23	|	84	b	A12	Address Bus Bit 12
36	b	D22	Data Bus Bit 22	|	85	b	A13	Address Bus Bit 13
37	b	D21	Data Bus Bit 21	|	86	b	A14	Address Bus Bit 14
38	b	D20	Data Bus Bit 20	|	87	b	A15	Address Bus Bit 15
39	b	D19	Data Bus Bit 19	|	88	b	A16	Address Bus Bit 16
40	b	D18	Data Bus Bit 18	|	89		GND	Ground
41	b	D17	Data Bus Bit 17	|	90		VCC	+5v

42 b D16	Data Bus Bit 16	|	91 b A17	Address Bus Bit 17
43 GND	Ground	|	92 b A18	Address Bus Bit 18
44 VCC	+5v	|	93 b A19	Address Bus Bit 19
45 b D15	Data Bus Bit 15	|	94 b A20	Address Bus Bit 20
46 b D14	Data Bus Bit 14	|	95 b A21	Address Bus Bit 21
47 b D13	Data Bus Bit 13	|	96 b A22	Address Bus Bit 22
48 b D12	Data Bus Bit 12	|	97 b A23	Address Bus Bit 23
49 b D11	Data Bus Bit 11		98 b A1	Address Bus Bit 1
	99 b A0		Address Bus Bit 0	
	100 GND		Ground	

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1.64 Serial Interface Information

Serial Interface Information

The A1200 has a bit of a flawed serial port. It's all good and fine, but it only has a single byte buffer. That's one byte. Not a lot, is it? This can cause

problems, as it needs to be cleared out into memory when full - for a 1Mb file, this means clearing it out 1024² times! And all this while your Amiga could be getting on with something else.

But now there are faster ports available. These have larger buffers, so they don't need to be serviced quite so often. Because of this, they can get up higher speeds - while the internal port bottoms out at 115200BPS (relax, it's still equal or better than a PC), these fast ports are well off the scale! Typically they can easily handle 460800BPS (exactly four times the speed of the internal port), and are even cooler because they can do this without the problems of high bandwidth screens, disk access etc slowing them down.

So in short, even if you have a 28k8 or 33k6 modem, a faster serial port is a very good thing. There are plenty of options, with/without SCSI, PCMCIA or Clock ports, with/without parallel ports. Prices range from about £50 to £100.

1.65 Serial Interface FAQ

Serial Interface Frequently Asked Questions

What's all this buffering lark about anyway?

The standard A1200 only has a single byte buffer on the serial port - that is, it can only hold 1 byte before it has to be taken away and store in memory somewhere. If you have something else taking a lot of DMA time, such as a high bandwidth display or something taking a lot of CPU time like a hard drive transfer, then the serial port rate will suffer as the buffer soon gets filled. The new "fast" serial ports generally have 32 or 64-byte buffers.

Can I use one of these with my terminal/internet program?

As long as your program lets you change the device used, yes, no problems. You just type in "HyperCOM1.device" or "surfserial.device" or whatever, instead of the internal "serial.device".

What's the deal with these 9-pin sockets? My A1200 has 25-pins on the original port.

The 9-pin standard is just a cut down port, it has all the pins used for modem communication but leaves out a lot of the junk of the 25-pin standard. 25-9 and 9-25 converters are readily available from places such as Maplins.

1.66 Fast Serial Port Options

Available Serial Port Expansions

Whippet Fast Serial Port

The Whippet fits into the PCMCIA slot of your A1200, and provides a single 9-pin serial port. It's basically a Surf Squirrel, without a SCSI controller, bit is

physically quite large and bulky.

The CPU time used is very low, because of the large buffer, but it still uses some because of the software interrupts.

The Whippet costs around £50, and is available from HiSoft.

The HyperCOM1 Serial Port Add-on

The PortPlusJNR Serial Port Add-on

I've stuck these together, as essentially they are the same product. They fit onto the "clock" header inside the A1200. Sprouting from the board is a IDC cable, on the end of which is a standard 25-pin serial port. This fits neatly into the little spare port beneath the floppy drive.

Speed-wise, it's apparently the fastest available (although there isn't much in it) because it uses hardware interrupts (which the Whippet and Surf Squirrel apparently can't). It also has a huge 32-byte buffer for faultless transfers.

The PortPlusJNR costs about £50 and is available from Eyetech

I don't have any information about HyperCOM1 availability.

Surf Squirrel Fast Serial Port

The Surf Squirrel is a combined fast serial and SCSI controller, which plugs into the PCMCIA slot of the A1200. It provides a well-buffered 9-pin serial port, along with the necessary drivers. Installation and operation is reported to be very easy, and the drivers are updated often and are well-tested.

The Surf Squirrel was actually the first fast serial port add-on, and as such should be thoroughly tried and tested by now. If you don't require the SCSI controller, then the Whippet is more or less a SCSI-less version of the Surf Squirrel.

The Surf Squirrel costs around £80, and is available from HiSoft.

1.67 SCSI Interface Information

SCSI Interface Information

SCSI controllers are often mislabelled as confusing, temperamental and over-complicated. It's true that it isn't easy to set up, but when properly setup they can offer so much it's worth it.

There are many ways of adding a SCSI interface. The fastest, but often most expensive is via a accelerator add-on: most accelerators have some provision for a SCSI interface. Then there are the PCMCIA options - the Squirrel and Surf Squirrel, finally the Dataflyer+, an elderly design which uses the IDE interface.

Once you have it, there are many devices which can use it. There are the obvious hard drives and CD-Rom drives, which are fairly similar in operation to

their IDE counterparts, except for the fact that the HD's offer greater transfer rates. You can also connect a wide range of removable media drives - Zips, Jaz's, Dittos, Travans, Flyers, Mos, the whole lot. Most drives are available in SCSI format, primarily for Mac compatibility, and these generally work off-the-shelf. Finally, there are scanners which will work on a SCSI chain, and these have good, if limited, support for the Amiga.

1.68 SCSI Controller FAQ

SCSI Controller Frequently Asked Questions

Can I autoboot from a SCSI hard drive?

This depends on your controller. Some, such as the Surf Squirrel and some accelerator controllers allow SCSI booting, others require that you load some drivers first and thus cannot boot.

Where can I find some information on SCSI chains, especially termination?

There is a document, by Warren Block, which is an excellent resource if you intend to busy yourself with matters of SCSI chain layout. Entitled the "SCSI Examples Document", it is available from Aminet and includes examples of SCSI terminations.

1.69 Available SCSI Controllers

Available SCSI Interfaces

Squirrel SCSI Controller

The Squirrel is probably the most popular SCSI controller available for the A1200. It has been bundled with many CD-Rom expansions and Zip drives as well as being sold individually.

It comprises of a PCMCIA interface and controller, which sits in a box about the size of a couple of matchboxes, and a cable terminating in a 50-pin Centronics style plug. It comes with drivers, mounting software as well as CD³ ↔ emulation software, and Audio CD players.

In short, it's a tried and tested controller, although the Surf Squirrel adds things like AutoBoot and the serial port.

The "Classic" Squirrel costs around £50, and is available from HiSoft.

Dataflyer+ SCSI Controller

Opinions seem to be divided on the usefulness of the Dataflyer+. It's a board which sits on the IDE controller, with a passthrough for your IDE drives, and can handle upto 5 SCSI drives. It does this by fooling the A1200 into thinking it has more IDE drives on, so when the OS sends stuff to them, the logic

catches this, converts it into SCSI data and sends it to the drives. It's kinda clever.

However, since the OS uses SCSI calls which are converted into IDE calls already, it means that it's converting them back - not good for speed. Also, I'm not sure how it would fare with a CatWeasel and/or 4-IDE Controller in addition.

I'm not even sure of anyone who sells it any longer.

Accelerator Controllers

This is sort of a generic section. Most accelerators have a SCSI option available for them. Because I couldn't hope to put a bit in about each one, I'll just point out their collective good and bad bits.

Basically, they're dead quick. Usually faster than any PCMCIA or the Dataflyer. This is really because they are on a dedicated port, and the device driver can take full advantage of this. They are also permanent - PCMCIA controllers can be a problem if you have a memory card, and the IDE one can be a problem if you have a slightly unusual setup, but you can always be guaranteed that a accelerator controller will fit.

On the downside, well, not much. Sometimes pricey, they range from £30 (for the Falcon) to about £100 (for the Apollo).

Contact your dealer to see about one for your card.

1.70 Parallel Interface Information

Parallel Interface Information

The parallel ports available are usually options on serial ports, and as such are perhaps not as developed as they could have been. To be honest, there isn't a big point in getting one to use instead of the internal parallel port, as they don't offer much over it. Instead, the best reason for getting one is to use multiple parallel devices without the use of switchers.

For example, while a switcher to control two printers is good, what if you use a scanner and a printer, both on the parallel port? In this case you may want to scan and print at the same time, and a switcher can't do this. However, get a parallel port add-on and you can, just point the printer to the new port and the scanner stays on the old port.

We'll have to wait and see what else becomes available for the parallel port, but it's also useful for samplers that don't have a passthrough - these can be left on the internal port while the printer occupies the new port.

Technically, I don't see much difference in the new ports. They still can't run EPP devices like Zip drives, and they don't seem to offer a great speed increase. So if you just want another port, perhaps this is for you.

1.71 Parallel Interface FAQ

Parallel Interface Frequently Asked Questions

Can I use samplers on an aftermarket parallel port?

Generally no. The sampler software supplied with most samplers is hardcoded to use the internal parallel port, usually for speed reasons (it's deemed more efficient than using the device drivers).

However, printers typically can use the aftermarket port, so just stick your sampler on the internal one, problem solved.

Can I plug in my PC's parallel port Zip drive to this new parallel port I've got?

No! Aaaaaaaaaaargh!

As far as I know, the hardware difficulties were not resolved when these devices were designed, so it still isn't possible to run a PC EPP device on an Amiga parallel port. And there aren't any drivers anyway.

There is a slight possibility that a device will be released to get around this problem, which will use the parallel port plus another port to make up the number of programmable lines. I'll wait and see, but at present, see the bold bit :)

1.72 Available Parallel Port Interfaces

Available Parallel Port Expansions

HyperCOM3 Parallel Port

PortPlus Parallel Port

As with the serial ports, the PortPlus and HyperCOM models features are near as darnit identical, so again I've bundled them together.

Although these are stuck in with the Parallel ports, it actually has two serial ports on it as well. The serial ports are like those found on the PortPlusJNR, ↔ apart from a smaller 16byte buffer which doesn't make too much operating difference.

The Parallel port is squidged onto a tiny board along with the other ports, which fits internally onto the clock header. On flying leads are the ports themselves, bolted onto a pair of PC-style blanking plates. Ideal for a tower, less so for a desktop "wedge" machine.

At the time of writing, there seems to be some confusion about whether drivers are available for the parallel port - a magazine did a review and found there were no drivers, but Eyetechnic seem to have sorted this problem, for the PortPlus model at least.

This device will not let you use PC Parallel port (EPP) drives, such as the Zip, on the Amiga. It will NOT WORK!

The PortPlus costs £99 and is available from Eyetechnic Group.

I don't have any information about HyperCOM availability at present.

1.73 IDE Interface Information

IDE Interface Information

The A1200 already has a internal IDE interface, so you may be a bit puzzled why so many owners go out and buy a new one. Especially when the new one just sits on top of the old one!

Well, the internal interface was only ever designed for a single, 2.5" hard drive mounted very near to the interface. As such, and unlike PC's or the A4000, it's unbuffered - certain pins are connected straight to the CPU. No problem on Commodore's spec, but now users are bunging big hungry 3.5" drives on, and CD-Rom drives too. Certain retailers have identified the buffering problems, and released buffered interfaces.

Typically, these allow you to connect 4 devices, two "chains" of two drives with a slave and master on each. Some have options to connect a single 2.5" drive instead of the two primary 3.5" drives as well. To run a hard drive on the second channel, you'll need some additional software as the device "masks" the second channel drives from the OS - IDEFix97 will see hard drives on this channel and use them. Sometimes a better option is to put your two hard drives on the primary channel, and CD-Rom drives on the secondary.

There are also unbuffered devices available, which I would hesitate at recommending, since they aren't much cheaper

1.74 IDE Interface FAQ

IDE Interface Frequently Asked Questions

How many devices can I reliably run on a buffered interface?

Typically four: the old AlfaDuo only ran two, and the AlfaQuattro was only guaranteed for three (but could run four) but all new devices such as the Eyetech, GI-Quattro and Blittersoft models can safely run four IDE devices.

Are there any limitations on what devices I can run?

Usually you will need IDEFix97 (a demo of which is on Aminet) to run a Hard Drive or Removable Drive on the secondary channel, and in this case the drive will not be bootable.

Other than that, you can usually run whatever drives you want, as long as the proper master-slave configuration is observed.

Can I use a Catweasel with a buffered IDE device?

Possibly, although some present physical or logical difficulties. Contact your

retailer, who will have probably done tests on your particular device. I can confirm now that the Eyeteck Mk1 does not work with a Catweasel.

1.75 IDE Interfaces Options

Available IDE Interfaces

Eyeteck Buffered Interface

There are two versions of this device. The Mk1 is a small device which sits on top of the IDE port, while the Mk2 has a cable to connect it to the port, and is compatible with 060's.

They have three outputs - normally you will use the two 40-pin outputs, each of which can handle a slave and master drive. There is also a unbuffered, 44-pin direct passthrough which is used if you have a 2.5" hard drive. If you use this, it disables the entire primary channel, so it reduces your maximum to three devices.

It's fully buffered and so reduces the risk of running multiple devices. On my system, where I run a Mk1, I have had no problems. One thing to note is that for towers systems with PCMCIA, you must have a Mk2 as the earlier version physically blocks the right-angle connectors used in towers.

This is available from Eyeteck for about £40.

Blittersoft Interfaces

Blittersoft sell two types of IDE interfaces. The first is simply a tiny board which pushes over the IDE header and provides 44-way and 40-way interfaces, for four devices.

The second is a buffered version of the first, again with seeming the same connectors. It's only other feature is the buffering, and a registered copy of AtapiPnP, which probably makes it the best choice if you're specifically wanting to run CD-Rom drives.

Available from Blittersoft for £20 or £30

GI-Quatro

The GI-Quatro is a newish device, and unfortunately I don't have much information on it. All I know is it's buffered and it comes with IDEFix97, which makes it the best choice if you want Hard Drives and Zip drives and everything on it. Having said that, it does seem a bit pricey. Still, get in touch with Golden Image and I'm sure they'll tell you all about it.

Available from Golden Image for £60, including full IDEFix97 software.

1.76 Floppy Interface Information

Floppy Interface Information

The A1200 is rather at a loss these days because it only has a Double Density (DD) floppy disk drive. All PC's, and the A4000 (not the A4000T) have a High Density (HD) drive as standard, which is able to store twice as much data on a similar disk. For an Amiga, that is 1.76Mb, as opposed to 880k for the DD drives.

We are also suffering because the Amiga uses a special floppy drive, which has some differences to the DD PC drives. There are a few signals missing, and also the disk change signal is swapped from pin 34 to pin 2. As such, we can't use the £15 PC floppies, instead we have to splash out on a £40 Amiga floppy.

There are however devices which solve both these problems. The first, the EZ-DF0, allows you to connect a super-cheap PC floppy to the Amiga's motherboard header. It's a cheap solution - a PC floppy plus this board is still less cash than an Amiga floppy.

The other devices solve the first problem. They sit on an interface (ones are available for the IDE port and the Clock port) and by using special drivers and hardware, control a standard PC HD floppy transparently - the icons appear on workbench like it was an internal floppy. They also are controlled faster, unlike the A4000 HD drives they don't slow down for HD floppies (the A4000 does this because Paula can't handle the increased transfer rate).

1.77 Floppy Interface FAQ

Floppy Interface Frequently Asked Questions

Will drives connected to the floppy interface be bootable?

Depends on which controller it is. For the Catweasel and Diskplus, the answer is no because it has to load in drivers for these disks first.

For the EZ-DF0, this just slightly alters the floppy port signal, so these drives are bootable.

Will they appear as DF0:?

Again, the EZ-DF0 drives are just on the internal port, so these will appear as DF0:.

The Catweasel and Diskplus drives don't as default, but if you don't have an internal drive on the motherboard plug, then you can issue some commands on bootup which dismount the current non-existent DF0: and remount the controller's drive as DF0:.

The following questions apply to the Catweasel and Diskplus only.

Do they slow down on HD disk accesses?

Nope, both controllers will read at 300rpm on HD disks, compared to 150rpm for

the A4000 accessing HD disks.

Can I reliably expect games to work on these floppy drives?

Not really - for one they aren't bootable, and they will have some signals missing (like the Escom drives did). Also, games which hit the hardware directly won't be able to use the controller's custom drivers, and so won't be able to find the drive.

1.78 Options for Floppy Controllers

Floppy Drive Controllers

The Catweasel

The CatWeasel is an ingenious little device designed to solve the problem of getting fast, reliable high density disk access.

It's a little L-shaped board which plugs onto the IDE port on your A1200, and has an IDE pass-through, plus a standard 34-way floppy drive header. Support is via a software driver, and an install script is provided.

Supported disk drives / formats include:

- > Amiga DD
- > Amiga HD
- > PC DD
- > PC HD
- > Commodore 1541
- > Commodore 64

Also of benefit is the ability to boot from a Catweasel disk, through use of a utility, and the fact that it doesn't slow on HD disk accessing - it's 300rpm all the way.

Sadly, owners of a buffered IDE port, and also possibly the DataFlyer+ SCSI Controller will have problems using this device, for physical or software reasons.

The Diskplus

The Diskplus seems to be a rebadged version of the Catweasel - it's a HD floppy controller that sits on the IDE port. As such, I won't discuss it again. However, it does have another variant which uses the Clock Port as it's chosen interface. I don't have much information, but I think I'm right in saying it can handle different floppy formats (as per the Catweasel) and will read HD disks at full speed.

For more info, contact Eyetech.

The EZ-DF0

The EZ-DF0 is a little device which connects over the floppy drive interface on your 1200, and provides a more standard floppy drive interface.

As anyone who's tried to get a cheap floppy drive will know, you can only use either real Amiga drives, or make do with a hacked/dodgy PC drive. I believe Escom know this last one well :) Anyway, this interface turns your Amiga floppy drive header into a more industry-standard version, which you can plug any PC drive into.

It's cunningly simple. A single logic chip, a few more components on a board only slightly bigger than the components. This means a small price, but it works! It only provides access to a DD floppy, but it's really good for those with a new tower who need a faceplate, or for those who can't afford a real Amiga floppy.

The EZ-DF0 costs £15 and is available from Eyeteck

1.79 Expansion boards Index

Expansion Board Index

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Reference:

RAM Cards: Amitec
 Prima
 Magnum

68020 Cards: Apollo 1220
 Blizzard 1220

68030 Cards: Apollo 1230 Lite
 Apollo 1230 Pro
 Blizzard 1230-I
 Blizzard 1230-II
 Blizzard 1230-III
 Blizzard~1230-IV~ ~
 M-Tec 1230
 Magnum~030~~~~~ ~~~~
 Microbotics~M1230XA ~
 ViperI~1230~~ ~~~~~~
 ViperII~1230~
 Viper Mk4
 Viper Mk5

68040 Cards: Apollo~1240~ ~~~~~~
 Blizzard 1240T/ERC

Falcon 040
Magnum 68040

68060 Cards: Apollo~1260~~ ~~~~~~
Blizzard 1260
Falcon 060 (No reference but similar to Falcon 040)
Magnum 68060

Notes on Adding your own reference!
Also see some preliminary specs on the Blizzard PowerPC Cards....

Relevant Sections: Expansion~Slot~Pinouts
Power~Supply~Index

1.80 Phase 5 Blizzard 1/2

Phase 5 Blizzard 1/2 Jumper Settings

```

      |
      |
-----
##### .. .....
##### ... | .....
      FPU Clk | RAM Config
      |
      MapROM

```

MapROM: On: Normal

Off: Kickstart ROM copied to Fast RAM.

FPUClk: 2-3: FPU Runs synchronously with CPU

1-2: FPU runs at another speed. Needs additional crystal installed.

RAM:

Bank 1	Bank 2	Jumpers
0Mb	0Mb	##..##
1Mb	0Mb	##..##
2Mb	0Mb## ·##...
4Mb	0Mb	##..##
8Mb	0Mb## ##.....
16Mb	0Mb	##..##
32Mb	0Mb	·##·##

1Mb	1Mb	##.##
2Mb	1Mb ##.....##
4Mb	1Mb	##.##
8Mb	1Mb .##...##
16Mb	1Mb	##.##
32Mb	1Mb##.##
2Mb	2Mb ##.##	.....
4Mb	2Mb##	##.....
8Mb	2Mb .##.##	.....
16Mb	2Mb##	##.....
32Mb	2Mb##	.##.....
4Mb	4Mb	##.##
8Mb	4Mb .##...##
16Mb	4Mb	##.##
32Mb	4Mb##.##
8Mb	8Mb .####.	.....
16Mb	8Mb ...##.	##.....
32Mb	8Mb ...##.	.##.....
16Mb	16Mb	##.##

1.82 RAM Frequently Asked Questions

RAM Frequently Asked Questions

How can I expand the RAM in my A1200?

Use a trapdoor card to expand the RAM. You can either get a straight RAM card, which have either fixed RAM or a SIMM socket for up to 8Mb, or the better option is to go for a combined Accelerator and RAM Expansion, which add a faster processor. This usually gives you a SIMM socket which can take higher capacity memory - depending on the board, anything upto 128Mb.

Can I use PCMCIA memory cards?

Well, yes. These can be used in an A1200, and configured as RAM. However, the PCMCIA slot is only 16-bit, whereas trapdoor RAM is 32-bit. There is quite a severe speed disadvantage with the card slot RAM.

Can I expand my Chip Mem?

Nope.

Can I use EDO/Fast Page/BEDO/Other SIMMs on my accelerator/RAM card?

Usually, yes. However some cards don't like it - personally my Apollo 1240 reacts violently to EDO RAM. Check with the manufacturer or dealer. Also note that you are unlikely to see any advantage, the vast majority (possibly all) A1200 accelerators don't take advantage of EDO or anything.

Can I make my computer faster by putting 60ns SIMMs in it?

No. Some accelerators (typically 040's and 060's) prefer 60ns RAM, and sticking 70ns in could slow these down slightly. However, if you can work fine on 70ns, then 60ns will make no difference at all.

1.83 M-Tec T1230/28 RTC

M-Tec T1230/28 RTC Reference

Reference by Andreas Vespermann



```

[|          XXXXXXXXXXXX          ||  ----  ----          J3 |   |   |
[|          |||PLCC| |PGA |          J4 | CPU |   |
[|          |||____| |____|          J5 |_____|   |
[|_____||_____||_____||_____||_____||_____||_____||_____||

```

XXXXXXXXX -> connector for SCSI-II (backpack)

```

CPU: 68030          Jumpers:  J1 Turbocard off
Manufactured Speeds: 28 MHz          J2 MEM 3
FPU Socket? Type?: PGA and PLCC          J3 Instruction Cache on
No of SIMM Sockets: 1 x 72 pin SIMM (70ns +)  J4 MEM 0
Total Possible Memory: 8 MByte (only 4 with PCMCIA?) J5 MEM 1
          J6 MEM 2
Autoconfig: Not Memory          J7 CoPro async
MMU: Y          J8 28 MHz
Real Time Clock: Y          J9 14 MHz
          J10 RTC

```

Notes:

SCSI-II host-adaptor available, 25 pin SUB-D connector extern
44 pin connector intern

```

Memory: 0 MB   no jumper (J2, J4, J5, J6)
  1 MB   J4 set
  2 MB   J4 and J2 set
  4 MB   J4 and J5 set
  8 MB   J4, J5 and J6 set

```

Notes by Author:

This card bears a remarkable resemblance to the Viper mk1, spurred on by this I raided the junk cupboard for my old Viper and sure enough, in little letters, it says "Manufactured by MTEC". This card should be able, therefore, to use the old Viper Mk1 SCSI kit, and it shares the obscure jumper memory settings.

1.84 Magnum 68030 Reference

Magnum 68030 Reference

Reference by PJ Goddard

```

|-----|
[|-----||
[|          ||
[| CPU      ||
[|          ||_____||_____||_____||_____||_____||_____||_____||_____||
[|-----| |-----|          ||          ||          ||
[|          | FPU |          ||          ||          ||
[|          |   | |-----|          ||          ||          ||
[|          |-----| |SCSI|          ||          ||          ||
[|          |-----SIMM-----|          ||          ||          ||
[|          ||          ||          ||          ||          ||

```

[|_____||_____||]

```

CPU: 68030                      Jumpers:SCSI Autoboot Y/N, RAM Y/N, Wait State Y ↔
                               /N
Manufactured Speeds: 33, 40 mhz
FPU Socket: PLCC/PGA
SIMM Socket: 1 x 72/32-pin
Total Memory: 32 mb(max), mine has 8Mb fitted.

Autoconfig: Y
MMU: Y
Real Time Clock: Y

```

Notes: Has space for a SCSI kit, the 33MHz version is now the entry-level model, ↔
not the 25MHz
as specified in advertisement! (Oh, and is only £100 for the bare board- MMU, 33MHz ↔
FPU and 33MHz
'030!)

Clocks in at about 7 MIPS- ridiculously fast for a 33MHz board- outruns my mate's ↔
40MHz GVP!
0.95 FLOPS, about 9Mb/sec memory transfer rate. Supports FASTROM through "CPU" ↔
command.

1.85 Microbotics M1230XA Reference

Microbotics M1230XA Accelerator Card

Description by David Bump

```

CPU: 68030                      Jumpers: TEST
Manufactured Speeds: 30, 40, 50mhz          FPU Speed
FPU Socket: PGA
SIMM Socket: 1 x 72-pin
Total Memory: 128mb

Autoconfig: No - Utilities supplied
MMU: Only on 30mhz and 50mhz
Real Time Clock: Yes

```

Notes:

Two programs supplied to configure memory. SetXA takes the specification values as arguments and configures the board at startup (every time), while AddXAMem automatically adds just the memory every time. A better option is AutoXA, which installs itself, reboots and configures the memory automatically on subsequent boots.

Wait states can also be set with SetXA. It will automatically set the "proper" value, but this can be overridden.

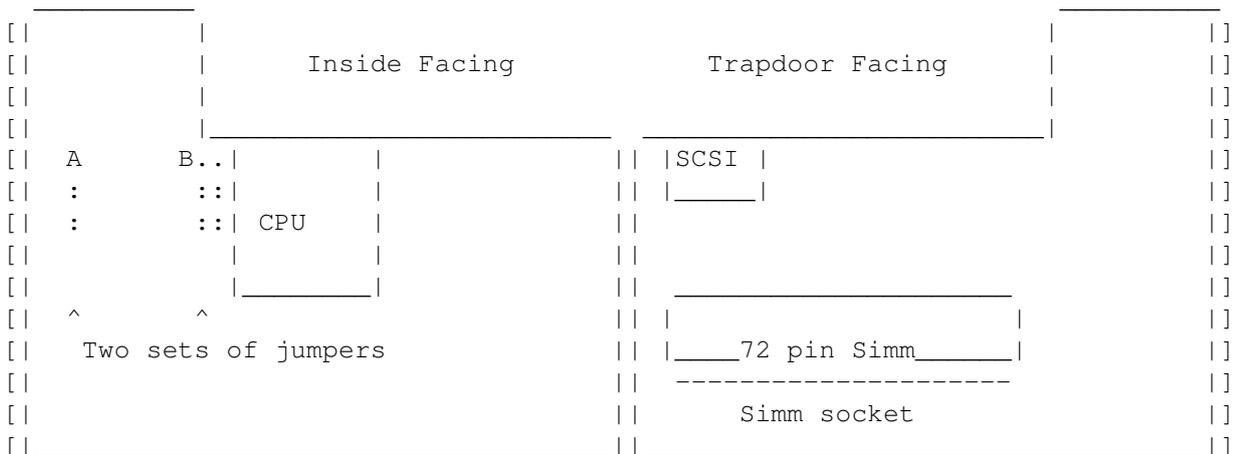
(Anyone got a layout for this card? Much appreciated - Chris)

1.86 Falcon 68040 Card Reference

Reference By: Anthony Keeley

Card & Manufacturer: Falcon 040 25MHz MacroSystems

Purchase Date: 06/08/96 (279.95)



CPU: 68RC040

Manufactured Speeds: 25MHz

FPU Socket Type: FPU built-in

No of SIMM Sockets: 1 x 72pin (accepts all 72pin variants
eg Non-Parity - Parity - EDO)

Total Accessible Memory: Manual states 128 Mb, (I suspect this is only
limited to the max size of a single memory simm)

Autoconfig: Yes, comes with 68040.library and other files

MMU: Yes, forced FAST-ROM on bootup.

Real Time Clock: NO definitely no clock (pity!)

Notes:

This card does enable the 1200 to beat the 4000 in most of AIBB's tests, and it maps rom into ram automatically, the manual i was provided with by POWER COMPUTING, didn't label any of the jumper setting but did say that tampering with the jumpers could damage the board, so i couldn't disable this option.

The board is run on a single and a very precise 50.000 MHz crystal with the clock signal being halved before reaching the CPU, I suspect that the jumpers marked 'A' would rebuild the signal back to 50MHz.

Installation of the board was extremely hard until you realise that the onboard SCSI connector makes a nice thumb hold to give a good push on.

An internally fitting fan helps to keep the CPU cool.

The SCSI chip and a connector is already present on the card, but the device drivers and Connector to the outside world are still missing, and have been since i purchased the card, something to do with Macrosystems getting it right (or was that FINGER OUT?). As to the upgrade option to turn the card into an 060, I wouldn't like to say if that is available or not.

A very reliable card upto now, It has had some teething problems, but they went away as I got more bug-fixed software.

Marks - 9/10

1.87 CPU Frequently Asked Questions

Processor Frequently Asked Questions

What's my A1200 got in at the minute?

All A1200's came from the factory with a surface mount 68EC020 processor, rated at 16MHz, running at around 14.2MHz.

The EC designation indicates that it contains no MMU (Memory Management Unit, see below).

Can I upgrade this?

Yes, although it requires an accelerator card plugged into the trapdoor port. These are available for a wide range of processors - starting at 28MHz 020's and going up through 030's and 040's to the current range-topper, a 66MHz 060. It is not possible to upgrade the CPU by swapping it for another one.

Can I fit an FPU into the FPU space on the motherboard?

Erm, probably not advisable. Although there is a space for it (U0, next to the CPU), AFAIK no A1200's were ever supplied with one and it's possible there are flaws in the design. And anyway, who's gonna solder it? If you do do it and it works however, drop me a line! :)

I currently have a EC030 chip, can I upgrade this to a 030 with MMU?

Maybe. If it's socketed then you should just be able to swap them, although getting hold of the chips is tricky. If it's soldered it's going to be more tricky, and you could well be better off taking the opportunity to upgrade to an 040 or 060, which mostly have MMU's and FPU's as standard (look for the 68RC0x0 chips).

Can I overclock my CPU?

It definately isn't advisable in the case of the standard 020, as lots of changes will have to be made to the rest of the motherboard timing.

[
[|	|	Inside Facing		Trapdoor Facing		|	|
[
[
[|	|	|	|	Edge Conn for SCSI card	CPU	|	|
[
[
[|	|	Solder, and bugger all	|	|	|	|	|
[|	|	else, essentially	|	|	1	|	|
[|	|	|	|	SIMM Socket	|	|	|
[

CPU: 68060 Jumpers: 1 MapROM (see below)

Manufactured Speeds: 50MHz

FPU Socket Type: Internal '060

No of SIMM Sockets: One (or two with SCSI card)

Total Accessible Memory: 128MB (more with SCSI card)

Autoconfig: Y/N Yes

MMU: Y/N/Sometimes Yes

Real Time Clock: Y/N Yes

Notes:

Configuration

First thing to do with this card is figure out whether or not you wish to use the MapROM feature. For most users, this will be yes. What it does is move the KickStart ROM code into Fast RAM, gaining a small speed increase. Bizzarely, to enable the feature, you leave the jumper *open* to copy the code to RAM.

Memory

Installing SIMMs is the usual easy affair, but note that the card only takes single sided SIMMs, because there simply isn't enough space to fit double sided ones. Either parity or non-parity SIMM modules are useable, with the parity bits being ignored. No reference is made to the more recent EDO memory, so I can't say whether it's useable or not. A word of caution; Ensure that any SIMM you fit complies fully with the PS2 "standard". Failure to do so will probably result in your memory appearing to be half what it should be. A 16MB SIMM appearing to be an 8MB one, for example. I fell foul of this, sad to say. The manual makes no mention of this fact.

Software

Only one item is essential, the 68060.library. Obviously, this goes in SYS:Libs, or wherever your LIBS: assign is. A second program (CPU060) is desirable, for setting/providing information about your CPU that the Commodore CPU command can't. Further software is provided, but isn't required to run the board.

Fitting

If you've never fitted anything into an Amiga 1200's trapdoor expansion


```

[|                                     || |                                     |:J1|]
[|                                     || |                                     |   |]
[|_____||_____||_____||_____||_____||_____||_____||_____||_____||]

```

CPU: 68040 Jumpers: J1, MapROM Jumper off
 Manufactured Speeds: 40 MHz
 FPU: 68882 (on chip)
 MMU: Yes

No of SIMM Sockets: 1 x 72-pin (or 2 with optional SCSI-II kit IV board)
 Total Possible Memory: 64MB (or 192MB with 128MB on SCSI board)

Autoconfig: Yes
 Real Time Clock: Yes

Notes:

Can disable accelerator by holding down '2' on keyboard during reset.
 SIMM has to be single sided 32 or 36 bit, 70 ns or less.
 A Fan is attached to the top of the CPU to keep it cooler, runs VERY hot!
 Cannot be used in an unmodified A1200 because of fan.
 No software supplied just need 68040.library for correct operation.
 SCSI-II kit plugs into DMA expansion bus interface.
 Solid build quality, and tight fit into expansion slot on A1200.
 Upgradable to full Blizzard 1260 (1260 actually printed on circuit board!)

Sysinfo (v3.24) reports 29.94 MIPS, 7.59 Mflops
 (with one 16MB 60 ns SIMM, and MapROM on)

Good value for money considering performance gain.

No real software problems other than CPU caching problems with some games
 and Demos etc. No problems running Linux Version 2.0.28 operating system.

1.92 Apollo 1260 Reference

Apollo 1260 Reference

Reference by: Chris Appleton

```

_____
[|                                     |                                     |]
[|                                     |                                     |]
[|                                     |                                     |]
[|                                     |                                     |]
[|_____||_____||_____||_____||_____||_____||_____||_____||_____||]
[| ,-----,##### || ::: |]
[| |Pwr Conv|###CPU### ||,-----, |]
[| '-----'##### ||_____||]
[|          ##### || |]
[|                                     |                                     |]
[|                                     | []          SIMM Socket          [|] |]
[|                                     | _____ |]
[|_____||_____||_____||_____||_____||_____||_____||_____||_____||]

```

"Pwr Conv" is the power converter board

Total Memory: Upto 32mb on one socket.

Autoconfig: Yes.

MMU: Yes.

Real Time Clock: Yes.

Notes:

Badly designed - Pins from CPU protrude into SIMM space leading to problems with double-sided SIMMs, which bend slightly. Tall SIMMs won't fit as there is a chip just behind the socket. Fits well, has built in fan and heatsink, however Apollo have ground the edge of the fan down to make it fit better, which makes it vibrate as they weren't too careful near the blades. A Pentium fan will fit if installed skewed and is more than enough to keep the chip cool.

If you require SCSI, you have to send the card off as the SCSI controller needs soldering on, as does the extra SIMM socket. With the additional socket, you can have upto 64mb autoconfiguring memory.

It is upgradeable to an 060, however it needs to be returned since the processor is not socketed.

1.94 Adding your own Accelerator Reference

How to add your own reference

Depressed because your favourite accelerator isn't in this guide? Don't despair! If you own an accelerator that I haven't featured, and you think you could do the world a service by doing a reference for it, please do!

To make this dead easy, there's a file in the archive called "Accelerator.blank", which is a ascii drawing of both sides of a card. Just sort of fill in where the bits are - the jumpers are the most important - and then fill out the details below, with details of what each jumper does. Add notes if you can. Then email it to me! Don't worry if you can't ascii-draw, I'll clean it up if needed. It's easiest to do it on "overwrite" mode, as well.

For this you get to see your work up on Aminet and in people's homes. You also get your name in the credits*, and of course the good old feeling of inner satisfaction.

* Assuming I don't forget to add you, which happens a lot.

1.95 Drives Index

| _____ |

Drives Index

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- High Density Drives
- Twin Internal Drives
- FAQ

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- 2.5'' vs 3.5''
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- Requirements
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- FAQ

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- IDE Port Buffering
- Interfaces
- (for aftermarket drive interfaces - Catweasel etc)

1.96 Removable Drive Requirements

Removable Drive Requirements

The actual hardware requirements for a removable drive are much the same as the requirements for a CD-Rom Drive, so you should take a look there. Hey, it saves me the bother of pasting it here :)

I'll not dwell too long on the software side of things, but it depends on the drive. For example, an IDE Syquest EZ135 will work out of the box, while the IDE Zip drive needs some kooky software and IDEFix97 to get the eject functions to work. You should ask your retailer for help on specific drives.

1.97 Removable Drive Options

Removable Drive Options

If you're looking at adding a removable drive to your system, there's quite a bewildering range of drives to choose from. You first have to decide which interface you will be using. IDE you already have, but you may want/require a 4-device buffered interface which will add cost. SCSI you may have, otherwise it's usually quite expensive for a controller but it's very fast and low CPU usage. It's really only straight-cut if you already have SCSI.

SCSI Drives

Iomega Zip Drive	Int/Ext	Reasonably fast, rugged media, SCSI address only switchable between 5 and 6.
Syquest EZ135	Int/Ext	Reasonably fragile media, quite fast. No longer in production
Syquest Flyer	Ext	Large storage size (230Mb), fast.

IDE Drives

Iomega Zip Drive	Int IDE	Quite rare, slow writing, problems with disk changing (software fix available).
Iomega Zip Drive	Int ATAPI	Still Rare, uses IDEFix, disk change OK.
Syquest EZ135	Int	Pretty much same as SCSI version.
LS120	Int	Uses floppy-sized media, needs IDEFix to work, can read/write PC HD Disks!

The IDE drives are generally slower, and usually have problems with disk changes because AmigaOS sees them as hard drives, and doesn't expect the contents to change. You may find using IDEFix removes some problems. SCSI drives are generally better supported, and faster.

1.98 Removable Drive Information

Removable Drive Information

A removable drive is basically a storage device (other than floppy and CD-Rom) where the actual storage material is removed, and can be replaced with others.

They work on a number of different systems. Some, like the EZ135, are based on Winchester Disk technology which means they have solid disks inside and floating heads. Others use floppy drive technology (like the Zip), although it is much more precise, and finally there are tape drives, which use a roll of media which it can scan through and write stuff to - much like a C64, only faster :)

The most common use is for backup devices - copying your hard drive onto disk or tape every so often is a must! Other devices are promoted as oversized disks, which can be chopped and changed and things saved to them at random.

There is usually a choice of interfaces. Most are SCSI devices, while for the cheapskates among us (!) some have IDE alternatives. Devices which fit on the parallel port will NOT WORK! Get over it! There is a chance of a multi-port adaptor, but the speed will be awful and it'll take up two ports. Get another

version!

1.99 Removable Drive FAQ

Frequently Asked Questions - Removable Drives

Can I use a Parallel Port Zip/Syquest/Ditto/#? drive on my A1200?

No!

There are hardware incompatibilities. They will not work. Get the SCSI or IDE versions of the drive instead, they are much better anyway.

(A company is reputed to be working on a converter to allow these drives to work, but it will actually take up two ports and thus be slow and clumsy)

Can I read/write removable carts formatted for the PC?

Yup! There are many mountfiles available on Aminet, especially for the Zip drive, which allow use of CrossDOS to read and write PC formatted disks.

1.100 Removable Drive Compatibility

Removable Drive Compatibility

Both SCSI and IDE removables are quite good at one thing - pretending they are hard drives. In fact, some IDE drives go a little too far and won't eject their disks, but more on that later.

The general idea is that you plug them in and then use a HD prepping program to prep a disk. Prepping a disk involves reading the information (no of sectors, unit number, size etc) from a disk, then saving it either onto an RDB (Rigid Disk Block - what the Amiga reads to find out about the drive) or into a mountlist or mountfile (the same, except it's held in devs: on your boot drive). Once this is done, the Amiga can read the disk just like it was a hard drive.

SCSI drives are better at being removable because it's easier to handle. Custom software can handle IDE drives being removed, but this isn't always available. An example is the IDE Zip disk, where you have to swap the disks then power down and back up again to get it to totally re-read the disk. Failure to do this results in the IDE bus acting funny. New software attempts to fix this, but on my system at least just does nothing to help.

1.101 Installing 3.5inch Drives

Installing 3.5" Drives

The art of installing a 3.5" hard drive in an A1200 has got considerably easier

in the past few years. New drive technology means the drive are now very slim. But here are the typical sizes you will come across:

- A "Full height" drives - generally 30mm tall, give or take.
- B "Low Profile" or "Slim" - these are generally 25mm tall.
- C "Super Slim" or "Ultra Slim" - typically less than 20mm tall.

Firstly, it will be quite hard to install a full height drive. It'll involve a lot of hacking but it can be done. The steps below are sometimes separated into sub-steps - in this case A refers to Full-height, B refers to Low Profile and C refers to Super Slim - just choose the one that applies to your drive.

- 1 You need to find a cable. The A1200 header is a 44-pin high density DIL, otherwise found on PC laptops. The 3.5" drive connector is 40-way regular density DIL. All the cable does is go from the high density to the regular density connectors on a 1-1 basis - the extra four pins on the motherboard are for power and can be left unconnected. Various types are available, from a straight cable to ones with little bits of PCB in the middle. Get whatever you can.
 - 2 You also need a power cable, this replaces the floppy power cable (currently a short small4 -> small4) with a longer cable with a "spur" off it to power the hard drive. The HD will have a larger connector on it. You can often find this cable and the one described above in a kit from Amiga dealers.
 - 3 Open up the 1200 and locate the IDE header. It's up near the RF Modulator, on the left hand side of the motherboard. Now earth yourself before touching the 1200. A good way is either to touch a central heating pipe, or plug your 1200 in and switch it OFF at the plug - this will connect the whole sheild to the mains earth. You need to take the keyboard off, BTW - slide up the collar on the ribbon plug, slide the ribbon out then remove the keyboard by pulling it towards the rear of the machine.
 - 4 Sit the drive in the machine. It'll shove upto the left hand edge, and probably wedge nicely against the PCMCIA slot. Cover the metal rails in insulating tape, and again make sure it sits steadily and securely. The cables will be on the right hand side of the drive.
 - 5 A You'll need to junk the sheilding for this. Remove the floppy drive (take the cables out, then there are two screws under the case and one at the front), the undo all the little metal tabs. Pull the sheilding off. You might get away with cutting the sheilding, cut a hole out where the drive will sit.
B Follow A or C, depending on how high your drive is.
C Lucky you, your drive will sit on top of the sheilding. Cover all the sheilding in that area with insulating tape, not over all the holes though. Make sure all the metal is covered! Then place the drive on, to make sure it'll be secure. You'll probably have to use sticky pads or something to stop it slipping.
 - 5 Plug your data cable in, making sure the red stripe is the same end as pin 1 (which is marked on the motherboard). Lay it flat, going towards the floppy drive. Plug the power cable in. Then mount your hard drive where you decided it would go. Now replace the keyboard and the top part of the case. If the case goes on completely, with no bulging, feel very happy. If it bulges, you need to sit the drive lower down - cut or remove the sheilding if you haven't
-

already done so, and/or cut the strengthening lugs out the inside of the top of the case.

- 6 Disassemble again. If you haven't already done so, securely mount the drive so it won't slip. Make sure the metal rails are covered with tape, and if you've still got it the sheilding is too. Plug the cable into the drive (remembering the red line is pin 1) and plug the power in too. Route the cables safely - don't kink the data cable.
- 7 Reassemble. The floppy drive must go back in if you've taken it out, and then the keyboard. Slide it in, then route the very fragile ribbon cable over the HD cables, back round into the connector. Slide the collar up, stick it in then push the collar back down again. Then put the case lid back on and screw it together.
- 8 Well, since this is the hardware guide the rest is upto you. Here's a clue - it involves HDToolbox or RDPrep to prep the drive. Then you're done!

1.102 Hard Drive Information

Hard Drive Information

Hard Drives really are indispensible. I really don't see how anyone can survive without one... having to boot Workbench from floppy is like Chinese water torture.

The A1200 from factory was designed to take a 2.5" hard drive. These are more commonly found in PC notebooks, and were also sold for Atari Falcons. All A1200's had a small cradle, mounted near the IDE port, to take a drive safely and keep it level. Only the 1200's shipped from Commodore with a standard drive (A1200HD machines) came with a cable and WB3 Install disks, though.

It's now more popular to stick a 3.5" drive in. These used to require the installer to cut or remove the metal RF sheilding, and to make a cable to convert the A1200 44-pin high-density connector to the 3.5" drive's 40-pin connector. New advances with drives mean it's now possible to leave the shield in, and the drive still won't hit the keyboard - these are typically sold as "super-low profile", "ultra-low profile" or "super-slim" drives, and are less than an inch high.

It's also possible to have two hard drives, set as master and slave. Although Commodore never allowed for this in the design (the 2.5" drive meant to go in is always the only drive on it's chain - they are hardwired to master), with at least one 3.5" drive and careful cable-making it is possible, although any 2.5" drives present need to be master.

IDE Buffering is a confused matter - many people seem that it is not needed with two devices, but there are slight risks to your CPU when using two devices on the IDE port. I cannot stress how small these risks are... probably less than the risk of you being hit by a thunderbolt. But still, the buffered ports take the risk away, and usually allow you to operate another two devices as well. And most now come with some software bonus, like IDEFix or AtapiPnP.

1.103 Hard Drive FAQ

Frequently Asked Questions - Hard Drives

OK, I've got this internal SCSI hard drive, and.....

Wait right up there. Are you sure? It's very rare for a SCSI drive to be internal, you know. What's more likely is that you're using an IDE drive, which the A1200 controls with `scsi.device`, hence the confusion.

Can I bung a 3.5" drive in my A1200?

Yeah, sure. It won't fit as well as a 2.5" drive, but it'll work. You need a power cable which splits the floppy power into two, and a 44-40 way IDE cable. Many dealers sell these two in kits. You also need the thinnest drive possible, the thinner the better. See my Installation Guide for details.

My drive isn't recognised on powerup, but if I reset it will boot.

You have a common problem - your drive isn't spinning up fast enough to be ready by the time the Amiga wants to boot. So it ignores it and looks for a floppy instead. The cheapest fix is just to do a reset, it won't hurt at all. A more expensive fix is to upgrade to OS3.1, which has a waaay longer timeout.

My Drive isn't recognised after I reset, but it is on a cold power-on boot.

You have another common problem, but one that is dying out. What happens is that on a reset, the Amiga pulls pin 1 of the IDE cable (Reset) low. Most drives ignore this, but some older ones will actually take this as a signal to spin down and shut off. All you have to do is locate line 1 on the IDE cable (it's the one nearest the front edge of the motherboard, not always red!) and cut it. Tape the ends back. Really. It won't hurt it to have this cut, even if you change the drive later on.

What's a MaxTransfer Rate?

Thwack. It isn't a rate, it's a size.

MaxTransfer is the largest block of data that can be transferred from the drive's on-board cache to the Amiga memory. It is set when you prep the drive in HDToolbox or RDPRep. It should be just slightly less than the cache on the drive - check your drives specs for this (it is usually 64k, 128k or 256k).

I get corruption of data when transferring stuff to/from my hard drive.

Say hello to Mr MaxTransfer Problem. Basically what's happening is you have your MaxTransfer set to high, so the drive is trying to fit (say) 128k of data into 64k of cache. The Amiga just can't pull it out fast enough, so bits get lost. To fix it, see the next bit.

How do I set the MaxTransfer correctly.

For new drives, you can safely use a MaxTransfer size of 0x0001FE00. For older drives, a figure of 0x0000FFFF or maybe 0x0000FE00 may be more suitable. To test it, copy a file where corruption will be easily noticeable, but make it large - say over 128k. Good filetypes are IFF pictures, IFF sounds and ASCII text.

1.104 2.5inch VS 3.5inch Drives

2.5" Drives vs 3.5" Drives

Many of you will have had to decide between a 2.5" drive and a 3.5" drive sometime. It's a difficult decision, but here's what each has to offer;

2.5"

- + No bulging cases common with large 3.5" drives¹
- + "Safe" - A1200 was designed to safely run one
- + Fits safely in custom-designed cradle
- + Don't need a larger power supply
- + No need to trail power cables from floppy port
- + No need to pay lots for a hacked cable

3.5"

- + Cheaper²
- + Faster³
- + Everywhere sells them

So, in conclusion, a 3.5" drive is ideal for people who want most bang for their money, and don't care if it isn't meant to go in. For those worried about power, space or heat limitations then a 2.5" drive is ideal.

Notes:

¹ Newer ultra-slim 3.5" drives also fit well, but still slope

² Based on single retailers selling both drives - for example, taken from August 1997 magazine, £230 gets you either 1.8gb 2.5" or 2.5gb 3.5"

³ According to respected people who have used both.

1.105 Twin Internal Drives

Twin Internal Drives

With big-box Amigas, it's fairly simple to add another drive to the internal chain, for whatever reason you may have. Not so with the A1200, for the chain only supports a single device. No amount of wire-twisting and jumper-jumpering will help you. Extra drives, up until recently, had to be added via the external port, which is sometimes a pain for tower systems.

All you can hope to do is get hold of a device like the Catweasel or the

DiskPlus, and that will let you add two drives. It also supports high-density, which is a complete bonus. Sorry, but no cheap hack on this one.

1.106 Internal Floppy Drive Information

Internal Floppy Drive Information

The A1200 was fitted with the standard Amiga 880k double-density double-sided drive. The most common (for the older, more common Commodore-produced machines) is the Panasonic, which is generally reliable.

I have one 1200 with a Citizen drive and another with a Panasonic drive, both work fine. The Citizen was sourced from a Cumana External drive, but operates well internally. I believe some machines had Chinon drives.

Note that you can't just take any old external drive apart and use the drive internally. In particular, the popular AmiTek drives uses Sony mechanisms, with some cunning logic to make it work - it won't work if you just put it on the 34-way plug.

1.107 High Density Drives

High Density Drives

While the 880k floppy drive we know and love was revolutionary in the A500's time, it was already kinda long in the tooth by the time the A1200 arrived. In these days of hard, compact disk and removable drives it may not be so important, but a lot of you will find some need for a High Density Drive.

The A1200, as with all Amigas, has problems with high-density drives. Because there is twice as much data packed on, the drives normally read twice as much data. But the disk drive handling logic in Amigas cannot handle this, so Amiga drives have to be special. The usual method to get around this, and the one used by Commodore for the A4000, is to slow the disk rotation speed when an HD disk is inserted. It halves it, from 300RPM to 150RPM, and the data is read at the same speed as a DD drive.

So what options are there?

Complete Internal Drives

There are a couple of internal high-density drives available for use in an A1200. They both work on the same principles - to slow the drive speed for HD disks. However, there may be many dealers rebadging these and selling them, so you have a good chance of finding one. One dealer is MicroniK, who sell a drive suitable for their Infinitiv tower system. But, they also work on the desktop A1200 as they fit into the standard drive bay.

Complete External Drives

There is slightly better choice here, but again a lot of dealers are selling rebadged versions of other drives. The first is the Power Computing drive, which has been around for a while now. It uses a software patch, without

which it can only read DD disks, but apparently works well, if a little unreliably with the patch. This drive has been rebadged by GVP at some point. Also available is the 4-Square drive, which is a slightly hacked Dell Notebook drive. As such it's design is very compact, barely bigger than three stacked disks. This is also sold as a Brian Fowler Computers drive, and needs no software patch to work.

Kits to add PC drives

There are a couple of ways to add your own PC drive to your A1200, for different ports so it doesn't matter if your IDE port is already overflowing with goodies.

The Catweasel - This device sits on the IDE port and provides a standard interface for PC HD floppy drives, as well as providing access to other formats such as C64 disks. It allows PC HD access at full speed and can support >1 drive.

The DiskPlus - This comes in two flavours, one is a Catweasel type IDE port floppy interface (might even be a rebadged Catweasel), the other fits onto the suddenly popular A1200 Clock header. Unfortunately no other details were available, but both are available from Eyeteck

1.108 Floppy Drive FAQ

Frequently Asked Questions - Floppy Drives

Can I use an PC High-Density drive on my A1200?

Sort of. If you're talking just plugging it straight in, then no. However, adaptors exist to connect them, most notably the Catweasel. This costs around £60 and will allow drives of many formats to be used.

If you want to use HD disks, then alternatives are the external HD drives such as the Four-Square and the PowerXL, or Blittersoft's internal and external HD drives.

Can I use PC Double-Density drives on my A1200?

Again, sort of. They are not pin-for-pin compatible, as Escom proved with their little excursion. However, they can be made to work, typically the main setback is the swapping of the CHNG line from 34 (Amiga) to 2 (PC). Devices such as Eyeteck's EZ-DF0 will happily convert floppies for you, as will the CatWeasel.

Can I read an Amiga disk on a PC?

Nope. It's a hardware problem and it will remain unfixed for ever.

If you want to transfer stuff, as usual we have to go to their standards and use CrossDOS to format 720K PC disks (or 1.44Mb if you have a HD drive).

1.109 External Floppy Drive Information

External Floppy Drive Information

Many manufacturers made external drives for the Amiga range, and indeed any Amiga external drive will work, including the new high-density drives.

These consist of a drive mech, which is often Amiga-specific, and an adaptor board which converts the 23-way External Drive output into the 34-way data and 4-way power inputs. The drives have enable switches on the back, and if you don't require the drive it can be disabled to save memory - usually between 30kb and 50kb per drive. Also, some A1010 (The original Commodore external drive) had the power passthrough connections left unsoldered to "protect" A500 users from blowing their power supplies.

Cumana drives are generally reliable, as they use a high quality Citizen mechanism. Drive are also available with built-in virus protection (which stops writes to track 0) and the highly dubious Synchro disk copier - "Can Copy Any DD Disk". Also look out for Amitek drives, which use Sony internals as these have a very long life, as well as features like Virus Protection, which disables track 0 accesses..

The 1200, as with all other Amiga models can handle upto 4 drives, one internally and 3 externally via "daisy chaining". You should be careful not to exceed the limit of your power supply when adding more drives.

1.110 Escom Internal Drive Problems

Floppy Problems with Escom Machines

When Escom re-released the A1200, they couldn't track down the drives used in the original Commodore machines. So, being the mega-global-super-corp they were, they skimped and bought a job load of PC drives instead :))

They usually work fine, except when you run a program which looks for the DSKRDY signal. These are usually demos, and sometimes games. Very rarely will a utility fail. What happens is the program looks for this signal to know that the disk is ready for reading. This signal isn't there, so the program just waits. And waits.

There is a hardware hack to fix this problem, which was also recognised by Escom and fixed - later Escom machines aren't affected. For an aftermarket fix (seeing as asking Escom to fix it will be a little hard...), there's a file on Aminet which describes how to build a little hardware adaptor which "re-creates" the DSKRDY signal.

1.111 CD-Rom Drive Requirements

CD-Rom Drive Requirements

The first thing you need for a CD-Rom drive is some sort of controller. You should have already decided which type is for you (see Options), so you know exactly what you're letting yourself into.

IDE Drives

The IDE port on the A1200 is perfectly capable of driving a CD-Rom drive with the right software. However, Commodore did connect this port directly to the CPU and a few retailers will have you believe that the world will end if you don't use a buffer in there somewhere. Well, specifically if you don't use their buffer :). Anyway, there is a extremely small risk that connecting two devices to the IDE port can fry your CPU - I know of a single case of this happening, in all the time I've been researching this document. So, a buffer will prevent this from happening, and usually let you control four devices off one port (2 channels of 2 devices). So you need to add an extra 40-pin port to your existing cable somehow. Exactly how depends on what HD you have already, if you've got a buffered interface or not etc, but it's just connected on the same cable as your HD. Simple. Then use the software described below.

SCSI Drives

Unless you already have a SCSI controller, you'll need one now. I'm not going into which one is best, but there are many kinds - PCMCIA, IDE port translators, accelerator mounted ones... Once you have this, it's a case of getting the cable, setting up the controller and drive and using the software supplied with the controller to mount it.

ATAPI Software

To use an IDE drive you'll need some appropriate software, since support for them isn't built into OS3.0*. There are some demos of drivers on Aminet - do a search for "atapi" in disk/cdrom, but the best ones are probably IDEFix97 (disk/misc) which is a kind of patch for the IDE controller, or AtapiPNP which is purely for CD-Rom drives. Both are demos which will timeout with varying degrees of nag requestors.

* I know Amiga International have been working on ATAPI drivers and have been released in a beta, and I know OS3.1 has better CD support, but I don't know whether OS3.1 actually has ATAPI support. Get the software just in case :)

1.112 CD-ROM Drive Options

CD-ROM Drive Options Available

Up until quite recently the only feasible way to add a CD-Rom drive to an Amiga A1200 was to buy a custom unit, which usually plugged into the PCMCIA port.

These were made by Archos (Zappo in the UK) and consisted of an IDE drive, most commonly a Mitsumi and an interface. The same principle is applied to the brand new Amiga Technologies Q-Drive.

The times, they are-a-changing however. With the prices of bare SCSI units dropping weekly, many 1200 owners are turning to them. A SCSI interface is required, the most popular being the Squirrel which slots into the PCMCIA slot. Any SCSI adaptor will work however, including the Dataflyer which sits on the IDE port, and the range available to fit on Expansion boards.

They haven't stopped changing yet. Suddenly IDE drives are as cheap as muck - a double speed drive can now be picked up for the same price as a cable used to connect it. PC owners are to "thank", since that's where IDE CD-Rom drives are most commonly found. After getting hold of a special cable, it's a simple job of plugging the drive in and running a custom driver, a demo of which is available on Aminet. Cheap and easy, but they can never hope to match the speed of SCSI devices. As a rule single speed drives reach 150kb/s maximum, double speed drives 300kb/s, quad speeds 600kb/s and so on. However, as with all rules it can be broken, usually by very early drives which can fail to get anywhere near the speed and take these figures with the pinch of salt you normally reserve for transfer rates. Other factors affecting the transfer rates are the size of file transferred, and the seek speed between parts of the file.

Type	Interface	Notes
Custom Unit	PCMCIA	Very expensive, but simple to install
SCSI	Squirrel	Easy to install, quite fast, cheap.
SCSI	Surf Squirrel	Fast, can autoboot, easy to install.
SCSI	Dataflyer	Only as fast as IDE, but more expensive
SCSI	Via Accelerator	Depends on accelerator. Usually expensive.
IDE	Internal IDE	Cheap and quick, but sometimes problematic software.
IDE	Via PCMCIA	Reasonably quick, but what's the point?

1.113 CD-Rom Drive Information

CD-ROM Drive Information

CD-Drives are now beginning to take off in a big way. In fact, they are like Hard Drives were a few years back - viewed as fast, huge amounts of storage and very useful. But now they are as cheap as old muck, can you afford not to be without one?

Most Amiga mags now have a cover-mount CD of some kind. Couple these monthly gems with the whole of Aminet, then add the huge collections of software, pictures, music, samples etc from the likes of Epic, Weird Science et al. Oh, and there's the CD-only software now, such as PPaint7, Wordworth Office, Big Red Adventure.... get the piccie?

So, how much will it cost? The answer to that is "How much can you afford?" The options are explained in another section, but the cheapest option is probably an IDE drive, a bit of shareware software and a cable. Typically the

drive will be minimum of £30 for a double speed, the cable perhaps £15 - quite a cheap option! If you're a flash git, how about a fast SCSI drive, maybe a 24x one, slapped onto a accelerator SCSI port - this may set you back around £300 or more - there's really something for everyone.

The drive needs a driver to be readable. For an IDE drive this is probably one of the shareware atapi devices, from Aminet - there are a few different versions including the complicated-but-comprehensive IDEFix97. For a SCSI drive it's usually down to the actual SCSI controller driver, such as "apolloscsi.device", which can cope with all kinds of drives.

If you're getting a IDE drive, it's imperative that it's an ATAPI compliant drive. A lot are, some don't quite make the grade and some just totally aren't. It will usually state whether it is - on the manual, the model label (the bit with all the warnings on) or on the driver disks. A good rule of thumb is to ask people what they have - typically if one model is, others from the same manufacturer will be. Good drives to go for are Mitsumi's (4x or higher), any Sony, Wearnes or Aztech. Another popular drives is the Hitachi CDR7730, I had one and a lot of Amiga dealers sell it.

1.114 CD_Rom Drive FAQ

Frequently Asked Questions - CD-Rom Drives

Can I use PC IDE CD-Rom drives on my A1200?

Possibly. There are drivers available (such as AtapiPNP and IDEFix97) which allow use of a true IDE-ATAPI drive, however you have to make a careful choice of drive, it has to be fully ATAPI compliant. Most will say somewhere, a lot are (such as Mitsumi, Sony and Wearnes drives), some are nearly (Vertos drives - steer clear!) and some are nowhere near.

You just need the drivers (Aminet disk/cdrom or disk/misc) and a cable - all drives will need a 40-pin connection, and you can just get a longer cable from your hard drive. This brings in it's own problems such as data transfer problems on long cables and buffering worries, but it works.

What alternatives are there?

Good old SCSI! Using a Squirrel (Surfing or otherwise), a DataFlyer+ or other SCSI controller, any SCSI drive can be connected and will work. For this you need a driver such as AmiCDFS (Aminet) and the appropriate cabling/SCSI Software/jumper settings/termination.

Also, there are plenty of ready made drives from retailers, which underneath are actually IDE or SCSI, but are just plug-and-play and you don't need to get your screwdriver out :)

1.115 Obtaining New A1200's

Obtaining New A1200's

Please note this information was correct at the time of writing, but due to Sod's Law it isn't at the time of reading :)

Amiga International, well Gateway 2000, bought a lot of A1200's when they obtained the Amiga rights from whoever owned them previously. They were all complete and ready to go, and indeed a few retailers now sell them, incidentally at a much lower price than Escom ever did.

In addition to this, many retailers have taken the initiative and are starting to sell specced-up A1200's. A local retailer to me has ones available with Ram expansions, bigger hard drives all the way up to the top-of-the-range 34Mb 060 model.

Finally, there now exist pre-built Tower A1200's, from MicroniK, named the A1300, the A1400 and the A1500. These have varying specs, mostly relating to the supplied Zorro spec and full details are available in the Tower/PreBuilt section.

1.116 The Keyboard Matrix

The Keyboard Matrix

This applies to the GB keyboard, but on each row the keys are listed left-to-right, so you know which key replaces it on other keyboards - for example the blank keys on GB.

One notable change from earlier keyboards, which does not lie in the matrix as such, is the lack of multiple-key rollover. This annoys most users - speed typists have to keep their speed down, and most annoyingly games have to have silly keys to avoid the fact that two keys on the same row cannot be pressed together.

Layout:

Row	Key	Connects	Pins	|	Row	Key	Connects	Pins
Top	Esc		7 to 15	|	2nd	<Shift>		12 to 30
	F1	7 to 17	|			<Blank Key>	3 to 15	
	F2	7 to 18	|			Z	3 to 16	
	F3	7 to 19	|			X	3 to 17	
	F4	7 to 20	|			C	3 to 18	
	F5	7 to 21	|			V	3 to 19	
	F6	7 to 23	|			B	3 to 20	
	F7	7 to 25	|			N	3 to 21	
	F8	7 to 26	|			M	3 to 22	
	F9	7 to 27	|			,	3 to 23	
	F10	7 to 28	|			.	3 to 24	
5th	'		5 to 15	|		/		3 to 25
	1	5 to 16	|			<Shift>	6 to 30	
	2	5 to 17	|	Btm		<L Alt>	13 to 30	
	3	5 to 18	|			<L Amiga>	14 to 30	

4	5 to 19	|	<Space>	3 to 27
5	5 to 20	|	<R Amiga>	10 to 30
6	5 to 21	|	<R Alt>	8 to 30
7	5 to 22	|		
8	5 to 23	|	Numberpad	
9	5 to 24	|		
0	5 to 25		Top 	2 to 28
-	5 to 26	|	<Help>	7 to 29
=	5 to 27	|	(	7 to 16
\	5 to 28	|	)	7 to 22
<BS>	3 to 28	|	/	7 to 24
4th <Tab>	1 to 15	|	*	4 to 15
Q	1 to 16	|	4th 7	4 to 25
W	1 to 17	|	8	4 to 21
E	1 to 18	|	9	4 to 17
R	1 to 19	|	-	4 to 29
T	1 to 20	|	3rd <U Csr>	5 to 29
Y	1 to 21	|	4	4 to 26
U	1 to 22	|	5	4 to 22
I	1 to 23	|	6	4 to 18
O	1 to 24	|	+	4 to 16
P	1 to 25	|	2nd <L Csr>	1 to 29
[	1 to 26	|	<D Csr>	3 to 29
]	1 to 27	|	<R Csr>	2 to 29
<Return>	1 to 28	|	1	4 to 27
3rd <Ctrl>	11 to 30	|	2	4 to 23
<Caps Lock>	2 to 15	|	3	4 to 19
A	2 to 16	|	<Enter>	4 to 24
S	2 to 17	|	Btm 0	4 to 28
D	2 to 18	|	.	4 to 20
F	2 to 19	|		
G	2 to 20	|		
H	2 to 21	|		
J	2 to 22	|		
K	2 to 23	|		
L	2 to 24	|		
;	2 to 25	|		
#	2 to 26	|		
<Blank Key>	2 to 27	|		

1.117 Miscellaneous Index

Miscellaneous Index

What is the Clock Header?
 ~The~Keyboard~Matrix~Pinouts~
 PPC Cards (probably out of date now!)
 New A1200 Availability
 Upgrading to Kickstart 3.1

Also, see the Complete Pinouts for this header.

1.120 Upgrading to Kickstart 3.1

Upgrading to Kickstart 3.1

Operating System upgrades are available for the A1200. These come as two ROMs to go on the motherboard, the system disks (Workbench 3.1) and the manuals.

It is possible, however, to run Workbench 3.1 on a Kickstart 3.0 machine. This apparently "works", although it crashes sometimes. Not really worth it, since the actual kickstart chips have just had a price cut.

The upgrade is advised if you are serious about using Zorro cards with your Amiga, since some of the newer GFX and controller cards like to have the bugfixes available in 3.1. It also makes datatypes slightly better. Contact your retailer to see if they can supply it - not all will be able to. Note that owners of Amiga Technologies, Amiga International and MicroniK A1200's have no need to upgrade as those machines feature OS3.1 already.

One last thing... at the time of writing, it had just been revealed that work was underway on OS3.5. This will apparently need OS3.1 Kickstart Chips installed.

1.121 PPC Information

PPC Accelerator Information

Before I start, this information is liable to be quite out of date, with the speed the computer news business works. But it may be of interest.

Phase 5, creators of the Blizzard range of A1200 Accelerators, are (as I speak) preparing to ship PPC accelerators for the A1200. These will be called the BlizzardPPC or Blizzard603e cards, and will feature:

Blizzard 603e: Motorola PPC 603e CPU @ 150MHz, 175MHz or 200MHz
Socket for compulsory 68030 companion CPU
2 SIMM sockets
BVision GFX Card Socket
SCSI-II Interface

Blizzard 603e+: Motorola PPC 603e+ CPU @ 175MHz, 200MHz or 250MHz.
Socket for compulsory 68040 or 68060 companion CPU.
2 SIMM sockets
BVision GFX Card Socket
SCSI-II Interface

The BVision (or BlizzardVivion) card is kinda special - it's a tweaked version

of the CyberVisionPPC card, which fits onto the CyberStorm A4000 boards. It's a very fast, very cool and very nice graphics card, and it uses the same Permedia chipset as the CyberVision. Who needs Zorro for GFX cards? Wheyhey!

1.122 Retailer Listing

Eyetech Group

Eyetech Group have a wide range of drives and interfaces, and seem to know what they are talking about! Their prices are a little high, but they offer good telephone support (from personal experience).

Eyetech Group	Telephone	01642 713185
The Old Bank		07000 4 AMIGA
12 West Green		
Stokesley	email	eyetech@cix.co.uk
North Yorkshire	url	www.eyetech.co.uk/~eyetech
TS9 5BB		
UK		

1.123 Retailer Listing

Blittersoft

Blittersoft are perhaps the biggest retailer of tower equipment - from the MicroniK Infinitiv systems and pre-built towers to the various components for DIY towers. They also sell the complete range of Phase5 accelerators.

Blittersoft	Telephone	01908 261466 (sales)
6 Drakes Mews		01908 261477 (tech)
Crownhill Industry		
Milton Keynes	email	sales@blittersoft.com
MK8 0ER	url	www.blittersoft.com
UK		

1.124 Retailer Listing

HiSoft Systems

Hisoft are a major retailer of items such as the Surf Squirrel, Squirrel and a multitude of drives.

Hisoft Systems Telephone 01525 718181
The Old School Fax 01525 713716
Greenfield
Bedfordshire email sales@hisoft.co.uk
MK45 5DE url www.hisoft.co.uk

1.125 Index

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