



**Mai Logic**

# **AmigaOne-XE Motherboard User Manual**

**PowerPC™ for Amiga OS4 & Linux**

**April 2003**

**Revision 1.1**

Mai Logic Incorporated & Eyetech Group Ltd

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## Revision History

Revision	Date of Modification	Remark
V 1.0	05-10-2002	Preliminary version
V 1.2	04-10-2003	First revision - AmigaOne-XE version

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## AmigaOne-XE Board Benefits

The main benefits of the AmigaOne-XE boards are

- Support the immediate evaluation of key Articia S features such as AGP in different development platforms powered by PowerPC™ 750 CX, PowerPC™ 750FX, G4 CPUs. The AmigaOne-XE can also support dual PowerPC™ 750 FX or G4 processors CPU module cards up to 133 MHz bus speed running Linux OS, and Amiga OS4 (planned).

## Related Documents

The following documents are useful for reference purposes when using this manual

PCI Local Bus Specification – Revision 2.2

PCI Bus Power Management Interface – Revision 1.1

Articia S Data Book version 1.0.5

Mai Logic or Eyetech may have updated the documentation that was shipped with your board. Please check the Mai logic website: [www.mai.com](http://www.mai.com) for the latest information

## Document Convention

This section explains the document conventions used in this manual

### Typographic Notation

The following typographic conventions are used in this manual

- ***Italic*** type is used for filename or text that user type on a prompt display
- **Times New Roman** type is used for filename or text that appears on a computer display

## 1 Introduction

The AmigaOne-XE board features the Articia S chipset and a 300-pin low profile Meg-Array connector. Using the Meg-Array connector, the AmigaOne-XE can be easily configured to different development platforms powered by PowerPC™ 750CX, PowerPC™ 750FX, or G4 (MPC74xx) CPUs. The AmigaOne-XE can also support dual PowerPC™ 750 FX or MPC7410 processors CPU module cards.

Since the AmigaOne-XE board is built to use standard PC devices, users can purchase low cost and widely available PC devices instead of costly proprietary devices normally needed with PPC architectures.

The AmigaOne-XE provides an ideal platform for developing embedded and networking products.

This manual will address the hardware installation of the AmigaOne-XE board.



## 2 Features

- ❑ Processor Support
  - Support different processor configurations through CPU module card
  - Support 100 and 133 MHz processor bus speed
  - SMP Support
- ❑ CPU Module Card (Meg-Array 300 Connector)
  - Single/Dual PowerPC™ 750 FX (Sahara) processor(s)
  - Single Motorola MPC 7441 / 7451 processor
  - Single/Dual Motorola MPC7410 processor(s)
- ❑ Firmware
  - PPCBoot/U-boot 4Mbit boot ROM
- ❑ Memory system
  - 72-bit SDRAM Data Path addressable up to 2 G-bytes
  - Two 168-pin DIMM slots on board
  - Error check and correction (ECC)
  - Support for registered or non-registered SDRAM DIMM module
- ❑ PCI Bus 0
  - Three 33MHz 32-bit PCI slots on board
- ❑ AGP/PCI Bus 1
  - One 66 MHz AGP slot, fully compliant with AGP specification V2.0
  - One 66 MHz 32-bit PCI slot on PCI bus 1
- ❑ North Bridge
  - Mai Logic Articia S Chipset
  - iMemory™ for run-time memory fault recovery
  - Patented Floating Buffer for smart data traffic management
- ❑ On board devices
  - ATA 100/66/33 IDE controller with two IDE connectors
  - Floppy controller connected to one Floppy connector
  - USB controller connected to 4 USB ports (2 on back panel)
  - 100/10 Ethernet controller with RJ45 port
  - PS/2 Keyboard and mouse ports
  - Two serial ports, one parallel port and one game port
  - AC97 and SoundBlaster compatible audio on board

### 3 CPU Module card

The AmigaOne-XE CPU module card is now available with PPC 750FX and MPC 7410, 7441, 7451 processors. More CPU module cards will be available soon. These CPU modules give the user the flexibility to select their desired CPU performance and characteristics for his needs.

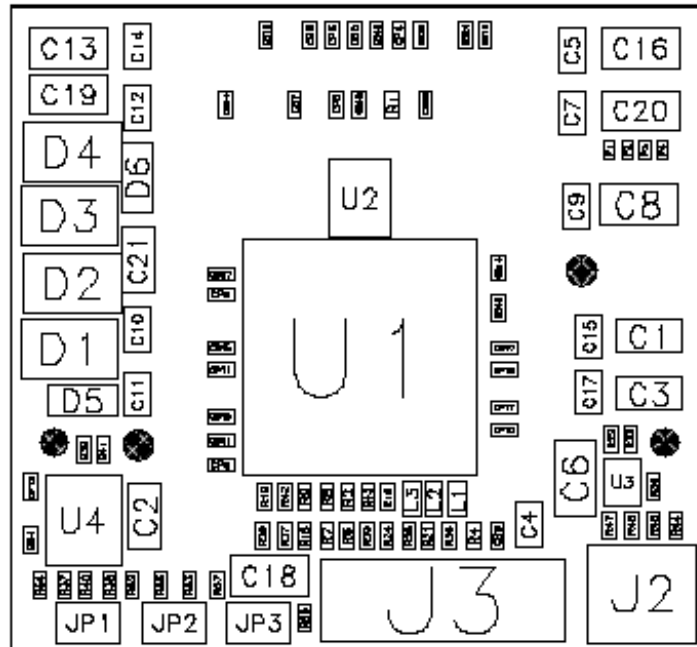


Figure 3-1 CPU Module Card

**U1:** Processor (PPC750FX or MPC7410, MPC7440, MPC7451) \*\*

\*\* More CPU module cards with different CPU types will be available soon.

**J2:** Assigned for the synthesizer clock speed ratio

**J3:** JTAG connector

**JP1, JP2, and JP3:** PLL Configuration for PowerPC 750FX\*\*

\*\* More detail setting information; please refer to PPC 750FX data book. For MPC74XX this jumper can be ignored

## 4 AmigaOne-XE Board Layout

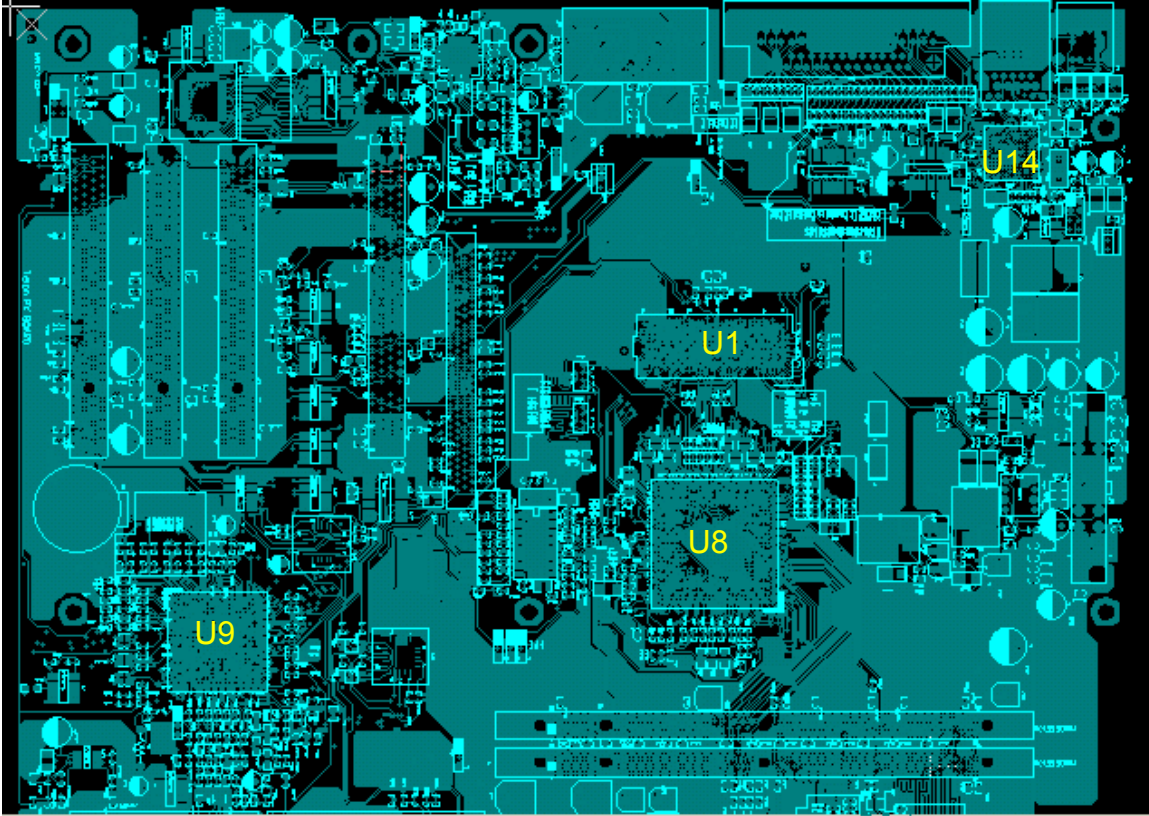


Figure 4-1 AmigaOne-XE Board Layout

### Major On-board Components:

The component numbers below refer to the AmigaOne board layout shown in figure 4-1

**U1** – 300-pin Mega-Array connector

**U8** – North Bridge: Mai Logic Articia S

**U9** – South Bridge: VIA VT82C686B

**U14** – 10/100 Ethernet Controller: 3COM 3C920



## 4.1 Back Panel Connectors

The keyboard, mouse, USB1~2, COM1~2, parallel, ethernet (RJ45), game and audio ports are all in the standard ATX positions on the back panel.

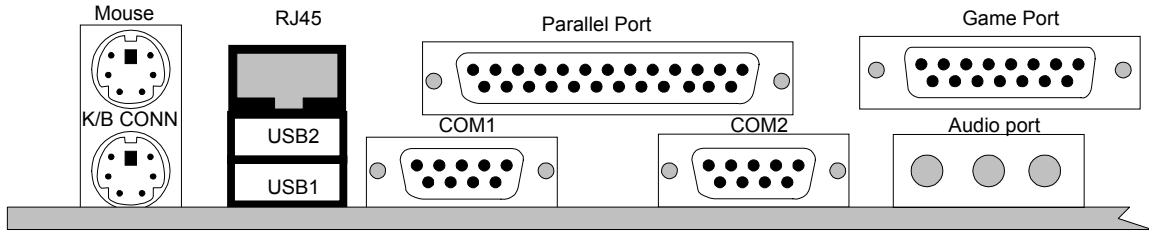


Figure 4-2 AmigaOne Back Panel Connector Layout

## 4.2 Hard Disk, Floppy and add-in card Connectors

The floppy disk drive connector, IDE hard disk connectors and PCI and AGP slots on board are shown in Figure 4.3.

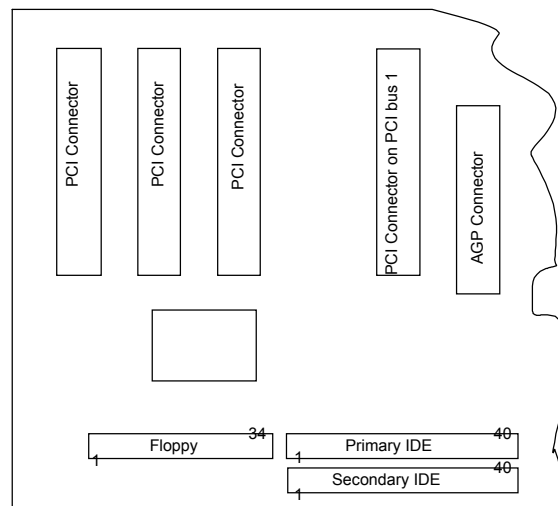
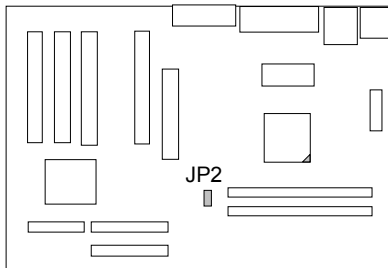


Figure 4-3 hard disk, floppy, and add-in card connectors layout

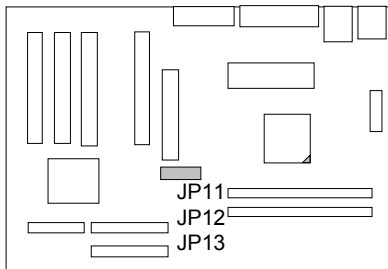
## 4.3 Jumper and Switch Settings on The AmigaOne-XE Board

### 4.3.1 Jumpers and their default settings



**JP2:** Normal, GC mode select (2-3)

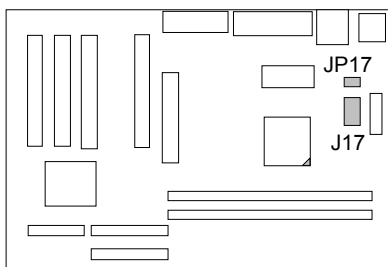
GC Mode	Normal Mode
1-2	2-3



**JP11, JP12, JP13:**

Set the system clock configuration.

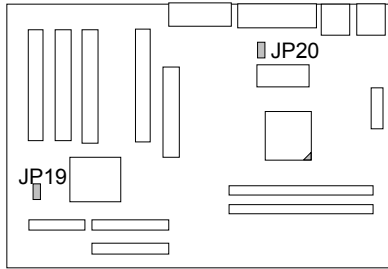
JP11	JP12	JP13	Host (MHz)	AGP (MHz)	PCI (MHz)	USB (MHz)	REF. (MHz)
2-3	2-3	2-3	Hi-z	Hi-z	Hi-z	Hi-z	Hi-z
2-3	2-1	2-3	100	66.67	33.33	Hi-z	14.318
2-1	2-1	2-3	100	66.67	33.33	48	14.318
2-3	2-1	2-1	133	66.67	33.33	Off	14.318
2-1	2-1	2-1	133	66.67	33.33	48	14.318



**J17, JP17:** Core voltage switch

This dip switch is for adjusting the core voltage for the CPU. The following table lists typical setting for MPC7451 (1.59v) and the PPC750FX (1.44v) cores.

1	2	3	4	JP17	Vcc_Core	
on	off	on	off	short	1.59	7451(G4)
off	on	off	off	short	1.44	750FX(G3)



**JP19:** Interrupt mode select (2-3)

2-3 PowerPC/MIPS

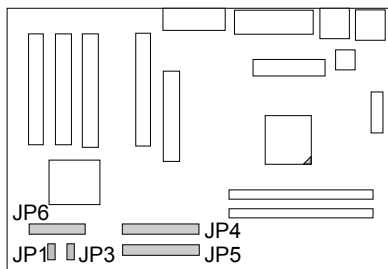
1-2 x86

**JP20:** CPU mode select (2-3)

2-3 PowerPC/MIPS

1-2 x86

### 4.3.2 Connectors and Switches

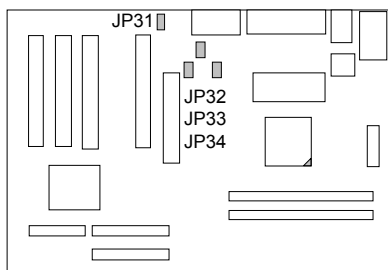


**JP1:** Power-on switch

**JP3:** IDE Hard Disk LED

**JP4, JP5:** Primary and Secondary IDE connectors

**JP6:** Floppy connector

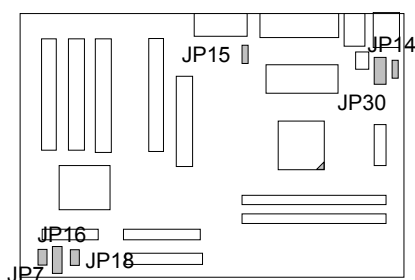


**JP31:** SPDIF Out

**JP32:** Headphone Out

**JP33:** Aux In

**JP34:** CD In

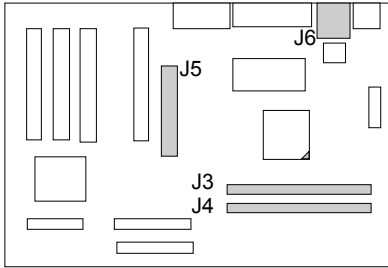


**JP14, JP15:** CPU cooling fan connectors.

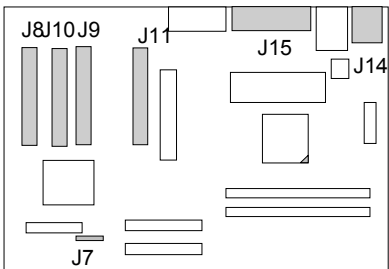
**JP16:** Internal speaker connector

**JP18:** Reset

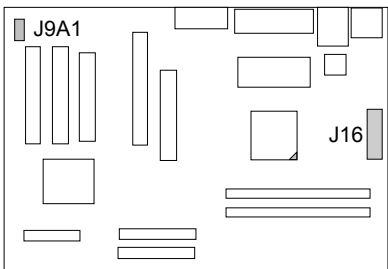
**JP7, JP30:** Reserved



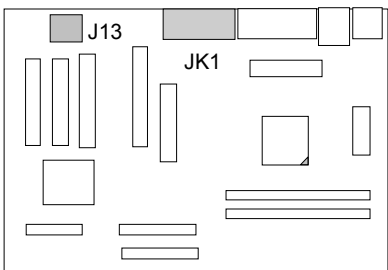
- J3, J4:** SDRAM DIMM Slots
- J5:** Universal AGP Slot
- J6:** USB/RJ45 Connector



- J7:** Infrared Connector
- J8, J9, J10:** Universal PCI slots
- J11:** Universal PCI Slot on PCI Bus 1
- J14:** PS/2 Key Board/Mouse connector
- J15:** Parallel and serial port connector



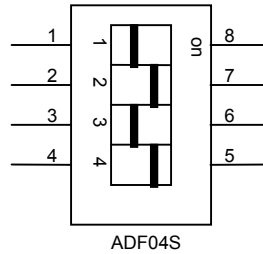
- J9A1:** Header for USB 3 and 4
- J16:** ATX power connector



- JK1:** Audio and game port
- J13:** ROM socket

## 5 Appendix

### I. J1, J17 Switch



### II. CS-5155 Power Range for Articia S Switch Setting

1	2	3	4	JP17	VCC_CORE (V)
Off	Off	Off	Off	Short	1.34
On	Off	Off	Off	Short	1.39
Off	On	Off	Off	Short	1.44
On	On	Off	Off	Short	1.49
Off	Off	On	Off	Short	1.54
On	Off	On	Off	Short	1.59
Off	On	On	Off	Short	1.64
On	On	On	Off	Short	1.69
Off	Off	Off	On	Short	1.74
On	Off	Off	On	Short	1.79
Off	On	Off	On	Short	1.84
On	On	Off	On	Short	1.89
Off	Off	On	On	Short	1.94
On	Off	On	On	Short	1.99
Off	On	On	On	Short	2.04
On	On	On	On	Short	2.09
Off	Off	Off	Off	Open	1.244
On	Off	Off	Off	Open	2.14

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>JP17</b>	<b>VCC_CORE (V)</b>
Off	On	Off	Off	Open	2.24
On	On	Off	Off	Open	2.34
Off	Off	On	Off	Open	2.44
On	Off	On	Off	Open	2.54
Off	On	Off	On	Open	2.64
On	On	On	Off	Open	2.74
Off	Off	Off	On	Open	2.84
On	Off	Off	On	Open	2.94
Off	On	Off	On	Open	3.04
On	On	Off	On	Open	3.14
Off	Off	On	On	Open	3.24
On	Off	On	On	Open	3.34
Off	On	On	On	Open	3.44
On	On	On	On	Open	3.54