

AX-RAM FOUR

INSTALLATION MANUAL

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INTRODUCTION

AX-RAM FOUR is a very flexible addition to your Amiga 500. It is capable of providing up to 4 Meg of additional memory, 2 Meg of which can be Chip RAM. AX-RAM can be tailored to suit your system depending upon your memory requirements. It will operate with either the 1Meg or 2Meg Agnus for 1Meg or 2Meg of Chip RAM respectively. The battery backed clock will ensure that your Amiga is always aware of the current date and time.

Installation is straight-forward but does require the use of a soldering iron. Installation for operation with the 1Meg Agnus is the easier. If you are not familiar with soldering, we recommend that you seek the services of a person with technical experience. Your computer dealer should be able to assist if necessary.

To install AX-RAM follow the directions carefully. Installation comprises several steps: determining the configuration that best suits your needs; configuring the AX-RAM boards and Amiga 500; and then installing AX-RAM in the Amiga.

AMIGA 500 CONFIGURATION

AX-RAM requires an Amiga 500 (Revision 6), which is fitted with the Kickstart 1.3 ROM and 1 or 2 Meg Agnus. Older Amigas with Kickstart 1.2 and/or the 0.5Meg Agnus can be upgraded (refer to page 11).

If your Amiga 500 has already been upgraded to 1.0 MByte of Chip RAM, then the extra 0.5 MByte must be removed or disabled.

EQUIPMENT SUPPLIED WITH AX-RAM FOUR

The following parts have been included:

- AX-RAM FOUR main board with 0 to 4.0 Mbyte of RAM
- GR-2 Gary adaptor board
- a 3 wire lead
- a 2 wire lead
- a 1 wire lead
- switch and lead
- support disk
- installation manual

TOOLS REQUIRED FOR INSTALLATION

For AX-RAM FOUR installation the following tools will be needed:

- medium Phillips head screwdriver
- small flat blade screwdriver
- small Allen key or Torx screwdriver
- sharp hobby knife
- soldering iron

CHOOSING THE RIGHT CONFIGURATION

The flow chart on pages 6 and 7 shows the options available and steps necessary to install AX-RAM. The options vary according to the Agnus used and the amount of memory installed and its use. The bottom block of each path shows the the total amount of memory available and its type. There are seven different configurations possible, five for the 2M Agnus and two for the 1M Agnus.

Follow the flow chart through each diamond shaped decision box to decide which configurations are available to you. The following information will assist you:

AGNUS

You must have either the 1Meg or 2Meg Agnus in your Amiga. The standard Revision 6 Amiga 500 has the 1Meg Agnus (part No 8372A) installed and is capable of operating with a maximum of 1Meg of Chip RAM. The 2Meg Agnus (part No 8372B) is capable of operating with up to 2Meg of Chip RAM and may be installed into any Amiga 500. Be warned that upgrading the Agnus requires the use of a PLCC chip remover to avoid damage to the socket.

The Revision 5 Amiga 500 was fitted with a 0.5Meg Agnus (8371), but can be upgraded. Refer to page 11 for more details.

Chip RAM

Chip RAM is controlled by AGNUS and is available to both the 68000 processor and the video and sound chips. It is automatically configured into the system by Kickstart when power is turned on.

Exec Configured Fast RAM

This memory is available only to the 68000 procsssor. As for Chip RAM, it is configured into the system when power is turned on.

AddMem Configured Fast RAM

Unlike Chip and Exec configured RAM, AddMem RAM is not available unless a small program, AddMem, is run. AddMem simply tells the operating system that the memory is available for use. Normally you would place the AddMem command in the Startup-Sequence on your boot disk. If you have an external memory expansion board for your Amiga, you may find that the AX-RAM AddMem RAM and the expansion RAM are at the same address and conflict. If this is the case, then select the AX-RAM configuration with the AddMem RAM disabled, (Configuration 1).

AMIGA 0.5Meg

If you are using 2Meg of Chip RAM then the 0.5Meg of internal Amiga RAM will be used either as Fast RAM or AddMem RAM depending on the amount of memory installed. To use the Amiga memory, some tracks on the Amiga computer must be cut. Users of the 1Meg Agnus will not have to cut tracks. If you do not wish to cut tracks, then use configurations 1,2,5,6 or 7.

INSTALLATION

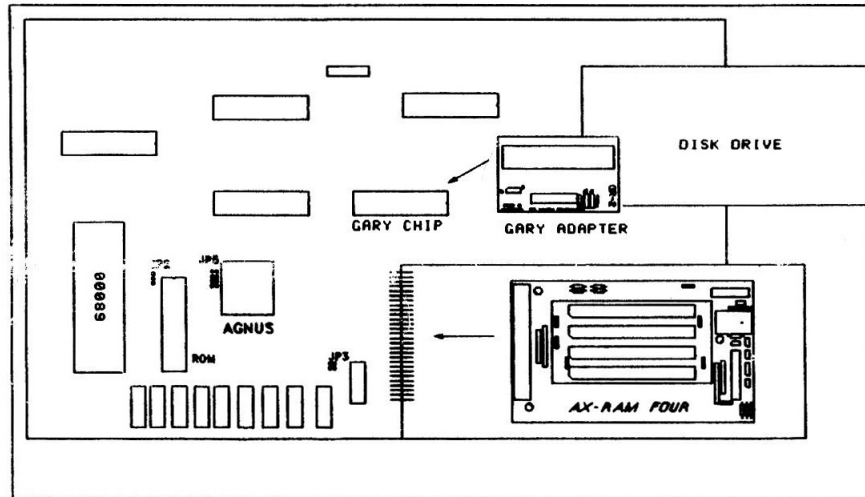
Having determined the configuration to use, installation consists of setting jumpers on the AX-RAM and GR-2 boards, changing the Amiga jumpers as required and plugging in the boards. The individual changes necessary for each configuration are shown by the flow chart on pages 6 and 7. The following sections give the installation sequence and more detail on configuration change.

OPENING THE AMIGA

This section details opening the Amiga case in preparation for configuring the Amiga and installing AX-RAM.

- * Turn off power to the Amiga and disconnect all cables.
- * Remove the six screws from the bottom of the Amiga. Note that one screw is beneath the warranty seal. Removing this seal will void any warranty on the Amiga.
- * Turn the computer the right way up and carefully remove the top cover which is a 'click' fit.
- * Now disconnect the keyboard plug from the Amiga main board, noting its orientation (normally with the black wire to the left) and remove the keyboard.
- * It is necessary to remove the metal shield which is held in place by two screws on either side of the expansion connector, two screws on the front edge and four metal tabs. Remove the screw and carefully bend the tabs vertical. The shield can now be removed.

The following diagram shows the location of the Amiga jumpers and major chips.



CONFIGURING AX-RAM

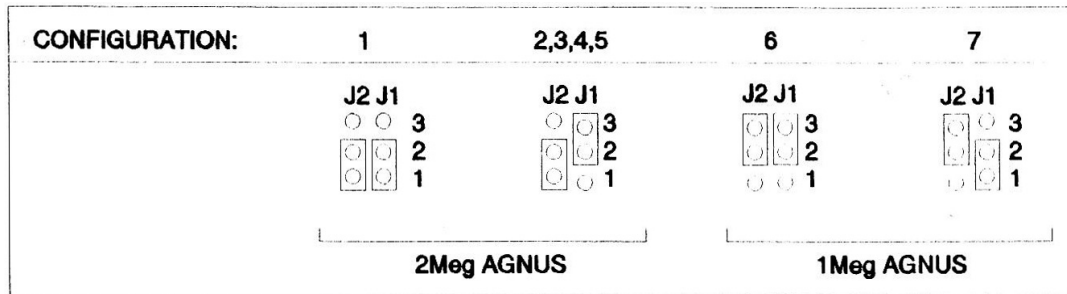
This section prepares AX-RAM FOUR and GR-2 for installation. There are two jumpers on each of the AX-RAM boards that need setting. The settings are shown below:

AX-RAM FOUR Memory Board:

Configuration	1	2	3	4	5	6	7
JP2	ON	ON	ON	ON	ON	OFF	OFF
JP3	ON	ON	ON	OFF	OFF	ON	OFF

JP2 selects 1M or 2M Agnus operation.
 JP3 selects 2M or 4M of memory installed.

GR-2 Adaptor Board:



J1 enables Addmem operation.

J2 selects 1M or 2M Agnus operation.

Memory Chip Installation

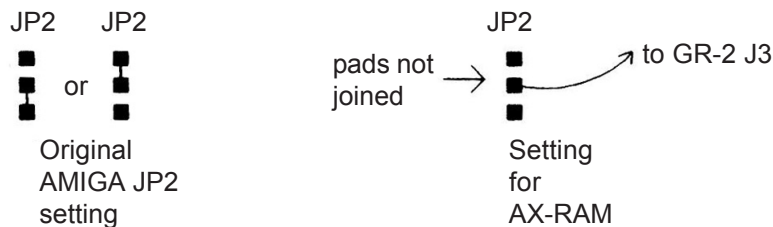
AX-RAM uses 1Mx8 80 or 100ns SIMMs. The memory modules can only be inserted one way and are a click in fit to the socket. For 2M installation, place the memory modules in the first and third positions, U3 and U5. Be careful to avoid static damage to the memory.

CONFIGURING THE AMIGA 500

The following notes describe the changes which are indicated by the flow chart on pages 6 and 7. Be sure to do only those changes indicated in the flow chart for the configuration that you have chosen. Most of the changes refer to solder jumpers, which are pads connected by thin tracks or solder bridges. These need to be cut with a sharp knife as shown.

Cut Amiga JP2 and Connect Single Wire

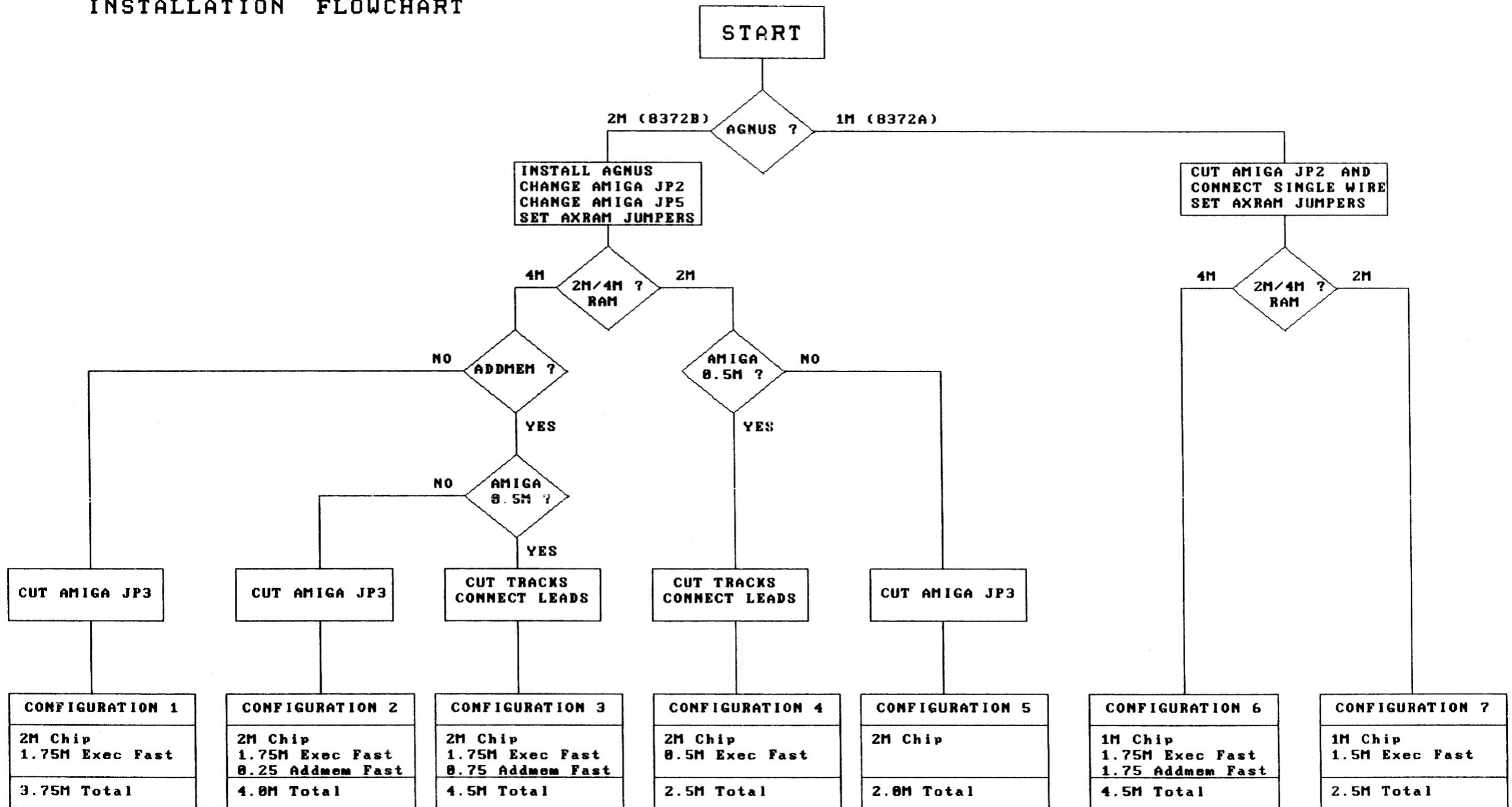
For 1Meg Agnus operation, JP2 on the Amiga must be cut and the single wire connected between the centre pad of JP2 and J3 on the GR-2 board. This is illustrated below:



Install Agnus

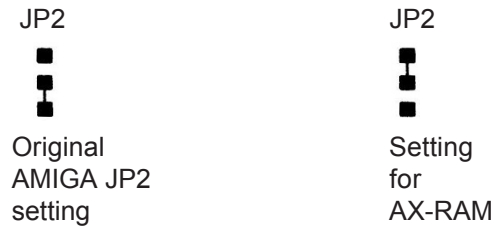
Upgrading to the new 2Meg Agnus involves removing the old 1Meg Agnus and installing the new one. This is a simple operation but requires the use of a PLCC chip removing tool to prevent damage to the Agnus socket. The Agnus chips are also static sensitive, so take the necessary precautions such as using a static control workbench.

INSTALLATION FLOWCHART



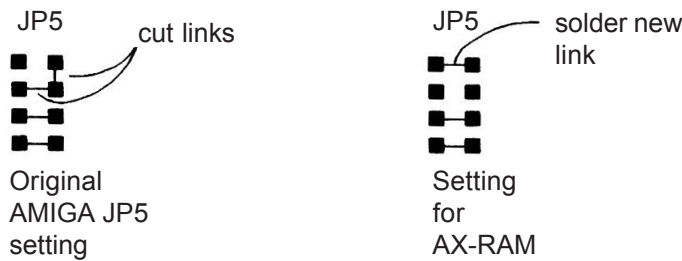
Change Amiga JP2

For the 2Meg Agnus, JP2 on the Amiga needs to be cut and reconnected as shown below. Be careful when cutting the thin track connecting the bottom two pins, to avoid damage to other tracks.



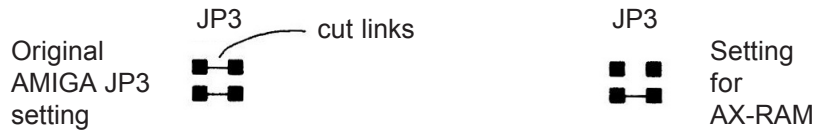
Change Amiga JP5

For the 2Meg Agnus, JP5 on the Amiga must also be cut and reconnected as shown below. Be sure to cut both connections.



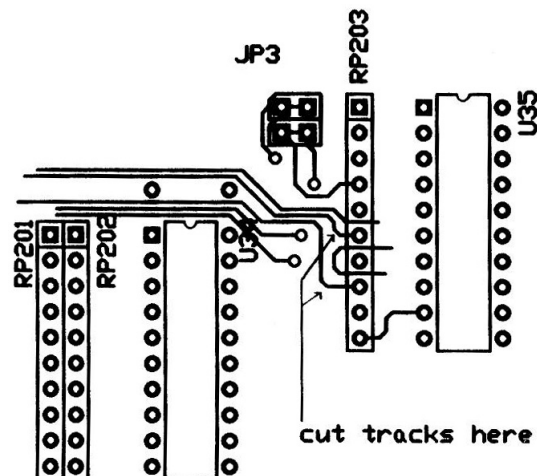
Cut Amiga JP3

For the 2Meg Agnus, JP3 on the Amiga must be cut if the on-board Amiga 0.5Meg RAM is to be disabled. This illustrated below:

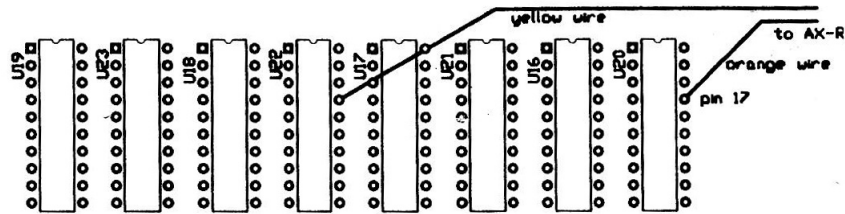


Cut Tracks and Connect Leads

To utilise the on-board Amiga 0.5Meg of RAM, when you have 2Meg of Chip RAM, two tracks must be cut and two wires soldered on. The tracks to cut are shown below. Be very careful to avoid damage to any other tracks. Cut the tracks only sufficiently enough to break continuity.



The twin lead labelled 'L2' should now be soldered to pin 17 of the empty IC positions for U20 and U22 as shown below. The lead will be plugged into P2 of the AX-RAM memory board.



INSTALLING AX-RAM

This section describes plugging the AX-RAM FOUR and GR-2 boards into the Amiga.

- * Locate the Gary chip, note its orientation, and remove by carefully levering with a screw driver from each side. Be careful not to bend the pins or damage the main board. The Gary chip should be handled only by the ends; avoid touching the pins.
- * Now plug the GR-2 board into the Amiga with the three pin connector to the front. The Gary chip should then be plugged into the GR-2 facing the same way as it was before removal.
- * If you are using the 1Meg Agnus, then connect the single wire from JP2 on the Amiga to J3 on the GR-2.
- * Plug the AX-RAM board into the expansion slot of the Amiga.
- * **CAUTION:** The card should be inserted with the component side facing up, the edge connector should be carefully aligned with the mating pins within the Amiga. Ensure the AX-RAM is fully inserted.
- * Connect the GR-2 to the AX-RAM with the three wire cable supplied. The plugs must be inserted with the white dot facing up.
- * If you are using 2Meg of Chip RAM and the internal 0.5Meg RAM then connect the two wire lead previously soldered to pin 17 of ICs 20 and 22, to P2 on AX-RAM FOUR. The white dot must be to the left.
- * If you are installing the disable switch, then follow the instructions on Page 10.
- * Test the computer for correct operation.
- * Now reassemble the Amiga in the reverse order to disassembly. Be careful not to damage the cable between the GR-2 and the AX-RAM. When connecting the keyboard ensure that the connector is plugged in the correct way around.

SOFTWARE INSTALLATION

Installation of the AddMem program to your boot disks, if necessary, is covered by instructions on the floppy disk provided.

USING THE CLOCK/CALENDER

The battery-backed clock supplied on the AX-RAM can be easily set using the CLI commands: 'Date' and 'SetClock' as follows:

1. The date and time must first be set using 'Date'. Open a shell from the Workbench and enter the date and time in the following format:

Date DD-*MMM*-YY HH:MM:SS

eg. Date 12-Sep-90 11:45:00

2. Use Setclock to save the date/time to the AX-RAM clock. Enter the command as:

Setclock save

3. To read the date/time from the clock, enter the command:

Setclock load

'Setclock load' should be added to the Startup-Sequence script file on your boot disks (it may already be there), so that the correct date/time will be loaded from the clock. Refer to the Amiga 500 instruction manual for full details.

MEMORY DISABLE SWITCH

The disable switch will disable the AX-RAM memory to reduce the total available memory to 512k.

The switch is installed simply by connecting the switch cable to JP1 on the AX-RAM FOUR memory card with the dot facing up. If you are using the 2Meg Agnus, then connect the free wire from the switch to J3 on the GR-2 board. 1Meg Agnus users do not connect this wire, but be sure that it cannot connect with any metal part of the Amiga board.

AX-RAM MEMORY MAP

		CONFIGURATION						
		1	2	3	4	5	6	7
D80000 - DBFFFF	0.25Meg Exec	█	█	█			█	
D00000 - D7FFFF	0.5Meg Exec	█	█				█	█
C80000 - CFFFFF	0.5Meg Exec							█
C00000 - C7FFFF	0.5Meg Exec				█			█
9C0000 - 9FFFFF	0.25Meg AddMem		█	█			█	
900000 - 97FFFF	0.5Meg AddMem						█	
880000 - 8FFFFF	0.5Meg AddMem						█	
800000 - 87FFFF	0.5Meg AddMem			█			█	
100000 - 1FFFFF	1.0Meg Chip	█	█	█	█	█	█	
080000 - 0FFFFF	0.5Meg Chip						█	█
000000 - 07FFFF	0.5Meg Chip	█	█	█	█	█	█	█

Revision 5 Amiga 500 - AX-RAM FOUR installation.

Revision 5 Amigas (and some Revision 6s) were fitted with the original 0.5Meg Agnus (part No. 8371). To use AX-RAM FOUR, your Amiga must have the 1Meg or 2Meg Agnus. Revision 5 Amigas can be easily upgraded to the 1Meg Agnus and then follow the guidelines for configurations 6 or 7. Upgrading to the 2Meg Agnus is more difficult because circuit board tracks need to be cut and altered. S.E. Watts Electronics can arrange the upgrade.