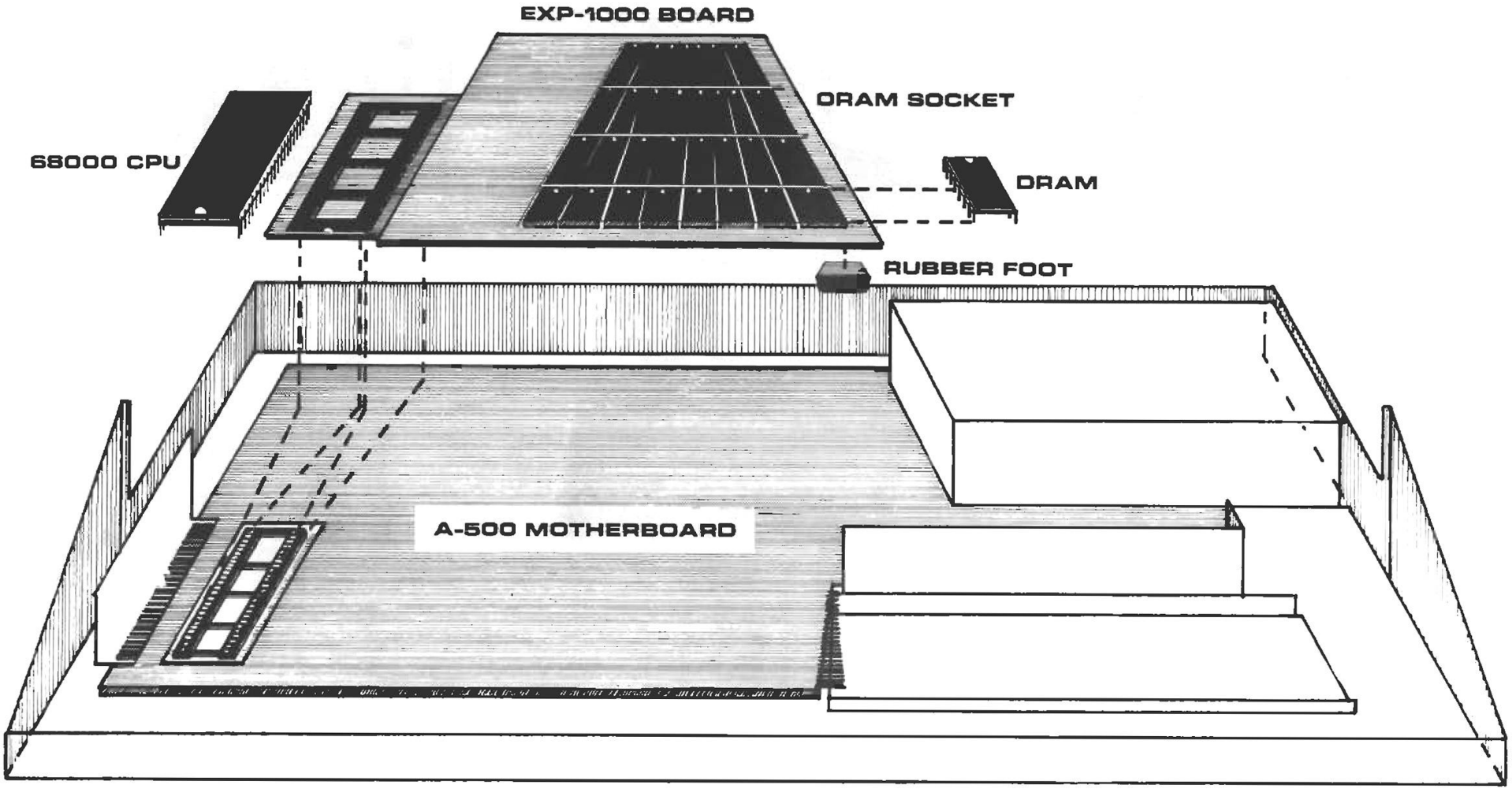
EXP-1000 Memory Expansion Board

Installation Instructions

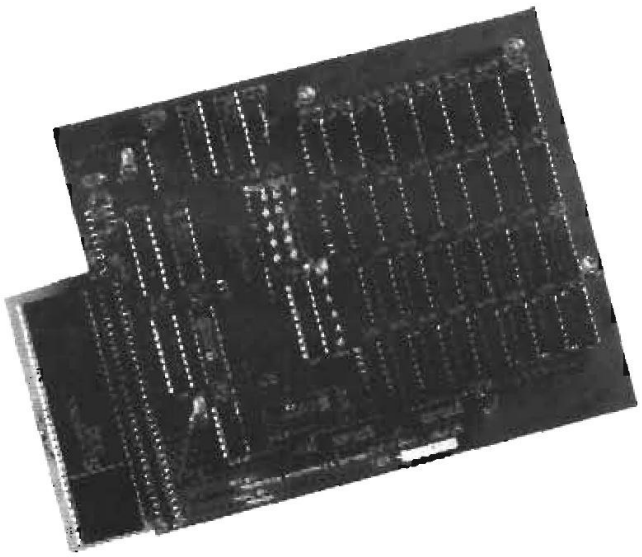


INSTALLATION OVERVIEW

DISCLAIMER

The information contained in this document has been checked and is accurate at the time of printing. However, Progressive Peripherals & Software, Inc. can assume no responsibility for its use and reserves the right to change these specifications without notice.

Your EXP-1000 has been tested and found to be in working order at the time of shipment. In no event will Progressive Peripherals & Software, Inc. be liable for direct, indirect, incidental or consequential damages resulting from the use or misuse of the product described herein.



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A Special Word about the Amiga 500 Power Supply

Voltage outputs from the power supply normally included with Amiga 500s sold in North America vary widely. Generally, this power supply is not sufficient to fully support the use of peripheral devices with the Amiga 500. Because of this deficiency, the standard Amiga 500 power supply may not be sufficient to fully power your computer when used with the EXP-1000. An insufficient power supply could cause permanent damage to your Amiga and/or EXP-1000.

We **strongly** recommend that you purchase a replacement Amiga 500 power supply (available from most Amiga dealers) capable of outputting +5 Volts at 6 Amps, +12 Volts at 1.1 Amps and -12 Volts at .1 Amps.

INTRODUCTION [Please Read]

About your new EXP-1000

Thank you for purchasing the EXP-1000 RAM Expansion Board for the Amiga 500 computer. The EXP-1000 adds 1 full Megabyte of 'fast' RAM (random access memory) to the existing 512K of RAM which came as part of your Amiga 500. Based upon a unique, patent-pending design, the EXP-1000 is fully auto-configuring and fully transparent. Once installed, you will be able to make full use of the RAM on board your EXP-1000 by simply switching on your computer as usual.

The EXP-1000 is also fully compatible with other 512K memory expansion boards for the Amiga 500 such as the A501 or the EXP-512 (also produced by Progressive Peripherals & Software). Used in conjunction with these expansions, the EXP-1000 brings your Amiga 500 to a full 2 Megabytes of RAM.

The Importance of this Manual

Beginners with some experience working on electronic hardware will find very little difficulty installing the EXP-1000 into the Amiga 500. If you are not experienced at working with computer chips, we recommend that you ask someone with this background to perform this installation for you. Your Amiga dealer would probably be able to do the work for a reasonable price.

Whether or not you install the EXP-1000 yourself, please be aware as you read the manual that neglect of certain cautions or failure to carry out any of the steps correctly **may cause permanent damage to your Amiga 500, to the EXP-1000 or both.**

For this reason, carefully read the section called **Before You Begin.** This part of the manual is especially important because it will familiarize you with the tools you will need and dangers associated with installing your EXP-1000. We also suggest that you read the remainder of the manual so that you know in advance the basic steps involved.

BEFORE YOU BEGIN

Please read this entire section to gain a familiarity with the tools, dangers and vocabulary you will need to know as you install your EXP-1000.

The Contents of this Package

Your EXP-1000 should come with all of the following items. If any one is missing, please contact us at (303) 825-4144.

- **The EXP-1000 1 Megabyte RAM Expansion Board** made of two interconnected parts: a larger main board and much smaller 64-Pin Adapter Board.
- **Pink Styrofoam Pin Protector** attached to the 64-pin adapter board the EXP-1000. Do not remove it until instructed, later in the manual.
- **Rubber Support Foot** with peel-off adhesive will stick to one corner of the EXP-1000.
- **Warranty Card**
- **This Manual**

Please be sure to save the box your EXP-1000 came in. (See the WARRANTY section at the back of this manual for more information.)

Tools You Will Need

There are several tools you will need when installing RAM chips into your EXP-1000 and when installing your EXP-1000 into your Amiga 500. If you do not already have these, you can find them at your local electronics supply store.

- **Chip Installation Tool**
- **Needle Nose Pliers**
- **Blade Screwdriver** (1/4" blade width)
- **T10-size Torx Screwdriver**

Also be sure to work in a well-lit area.

The Danger of Static Electricity

The greatest potential for permanent damage to your Amiga 500 or EXP-1000 comes from static electricity. Even the smallest electrical discharge from you to an exposed computer chip can ruin the microcircuitry inside that chip. For this reason you should do everything possible to avoid static electricity and to ensure that you ground yourself each time you work with electronic parts. To reduce this danger, we suggest the following:

- Do not work on or near carpeting.
- Work at a table over a tiled, linoleum or concrete floor.
- Don't wear clothes which attract static electricity (wool, nylon, polyester, etc.).
- Ground yourself **each** time you are about to pick up any electronic component. The hardware of a kitchen sink or the metal screw on a light switch are acceptable grounds.

Important Terms

There are 3 important terms you will need to know as you install your EXP-1000:

Motherboard The main circuit board inside the Amiga 500, covered with computer chips, resistors, capacitors, etc.

68000 Chip Sometimes called the CPU (Central Processing Unit), this chip is part of your Amiga 500. It has 64 pins and is plugged into its own socket on the Amiga 500 Motherboard.

64-Pin Adapter The small board marked with *PROMIGA 64 PIN ADAPTER* is attached to the EXP-1000. Later, after removing the 68000 Chip from the Motherboard, you will plug it directly into the sockets on the top of this 64-Pin Adapter. The pins on the underside of the 64-Pin Adapter will then plug directly into the 68000 Chip socket on the Motherboard. (See front cover overview).

INSTALLING RAM CHIPS

Your EXP-1000 comes 'unpopulated' (i.e. without any RAM Chips installed). Before using your EXP-1000, you will need to purchase a total of 32 256K DRAM Chips.

Where to purchase 256K DRAM Chips

When shopping for 256K DRAM chips, you may want to begin your search with any of the following suppliers:

- Computer Discount, (303) 825-2943
- Your local Electronic Parts supply house
- Progressive Peripherals & Software, Inc., (303) 825-4144

What Specific Models to Ask For

A number of different firms manufacture 256K DRAMS which would be suitable for use with your EXP-1000. Several of these chips are:

• Hitachi HM50256P-15 • Motorola MCM6256-15 • NEC MPD41256-15
• OKI M41256-15 • Fujitsu MB81256-15

Please note that the "-15" suffix denotes 150 nanosecond chips. More expensive 120 and 110 nanosecond chips are also adequate, even though they don't improve performance.

Step 1. Properly Orienting your DRAM Chips

The orientation of your DRAM Chips is extremely important for your EXP-1000 to function properly. Assuming that you have read the section called **Before You Begin**, remove your EXP-1000 from its plastic bag and set it down in front of you.

First, orient your EXP-1000 so that the 64-Pin Adapter is at the lower *left*-hand side of the board and so that the lettering printed on the board is right-side up. Now look closely at your DRAM Chips for a mark at one end of each chip, such as a round or square notch, a small recessed circle, a white dot etc. (**Figure 1**). No matter how this end of each chip looks, **it will be identified in some way.**

IMPORTANT

Once you begin installing these chips, you must **always** orient the marked end toward the top of your EXP-1000.

Step 2. Inserting DRAM Chips

Use a Chip Installer to plug your 32 DRAM Chips into the 32 empty sockets on EXP-1000 board (**Figure** 2).

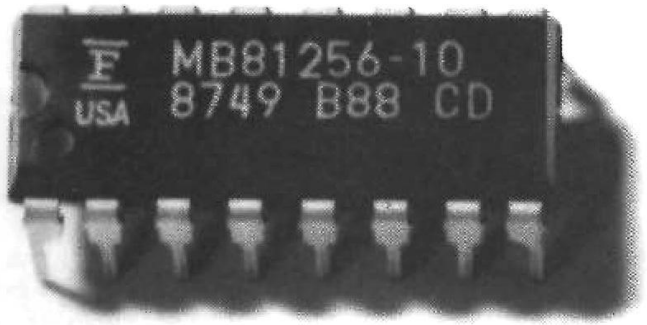

Figure 1

INSTALLING THE EXP-1000

Step 1. Disconnecting Peripherals

Assuming that you have read the section called **Before You Begin**, disconnect the power cable, monitor and all other peripheral devices from your Amiga 500.

Step 2. Opening Your Amiga

Place your Amiga upside down on a table and use a Torx Screwdriver to remove the 6 screws on the bottom of your Amiga, located across the very *front* and *back* edges (**Figure** 3). Do not remove any of the screws in the center of the computer.

Carefully hold the top and bottom shells of your Amiga 500 together and flip the computer right-side-up. Set the computer down with the keyboard facing you. Gently pull *out* and *up* on the sides of the upper shell and separate it from the lower shell, then set the upper shell to one side.

Step 3. Taking out the Keyboard

Look carefully now at your A500. You will see the Keyboard and the Tin Shielding which covers the Amiga 500 Motherboard. You will also see two connections linking the Keyboard to the rest of the computer:

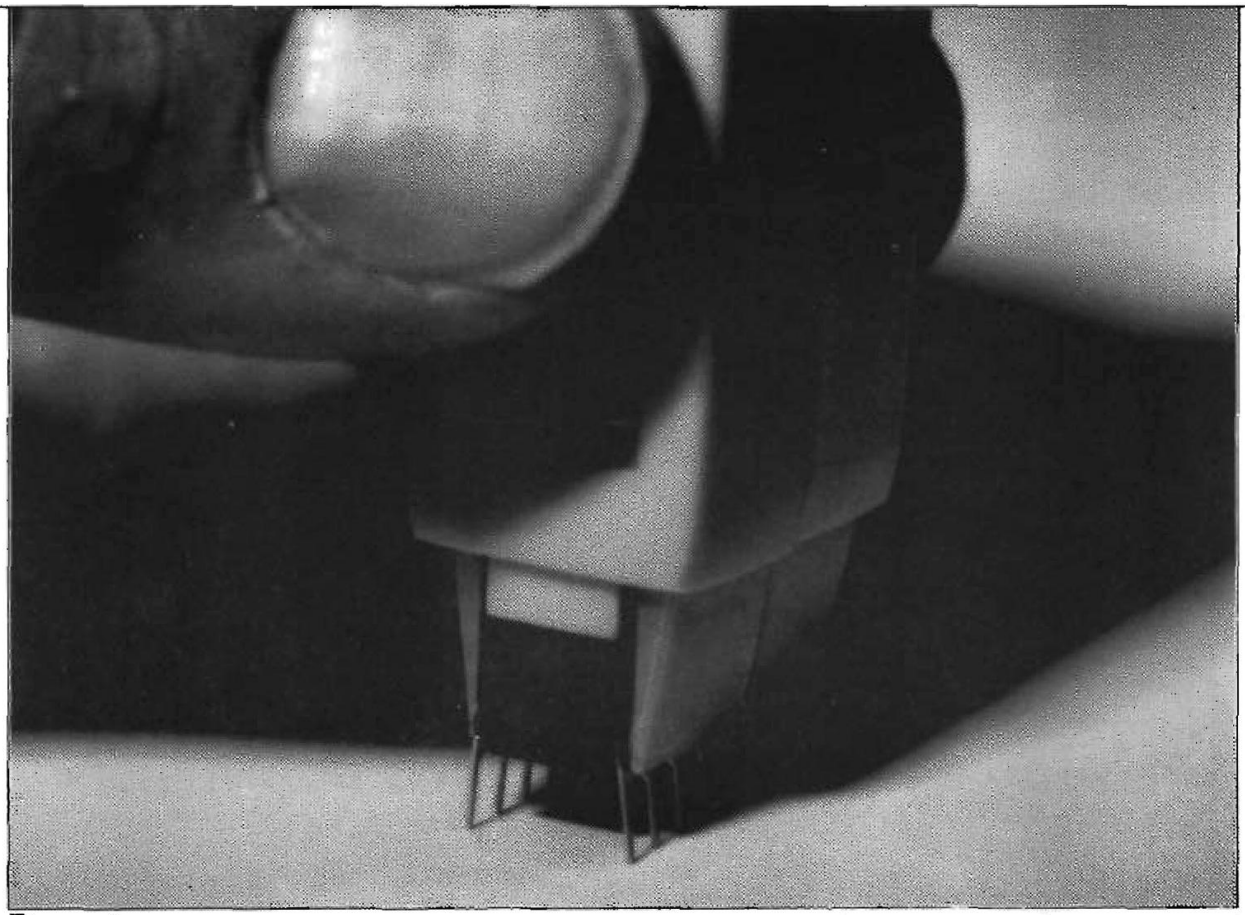

Figure 2.

- A braided steel Grounding Strap (connected to the Amiga 500 Disk Drive)
- A bundle of multi-colored wires (connected to the Motherboard through a hole in the Tin Shielding)

First, disconnect the Grounding Strap from the Amiga 500 Disk Drive by simply pulling it away from the drive. You won't need to unscrew anything here.

IMPORTANT

Look closely at the plug that connects the bundled wires to the Motherboard. One end of the plug will be marked in some way to mark Pin 1 of this connection. Write down where this mark is **so that you do not forget this orientation!** The bundle of wires is plugged into the Motherboard in a very specific way, which you will need to remember when you re-assemble your computer. Unplug this bundle of wires from the Motherboard and then remove the keyboard from your Amiga 500. Set your keyboard aside.

Step 4. Removing the Tin Shielding

The Tin Shielding is held down by 4 metal tabs and 4 screws. Use a screwdriver

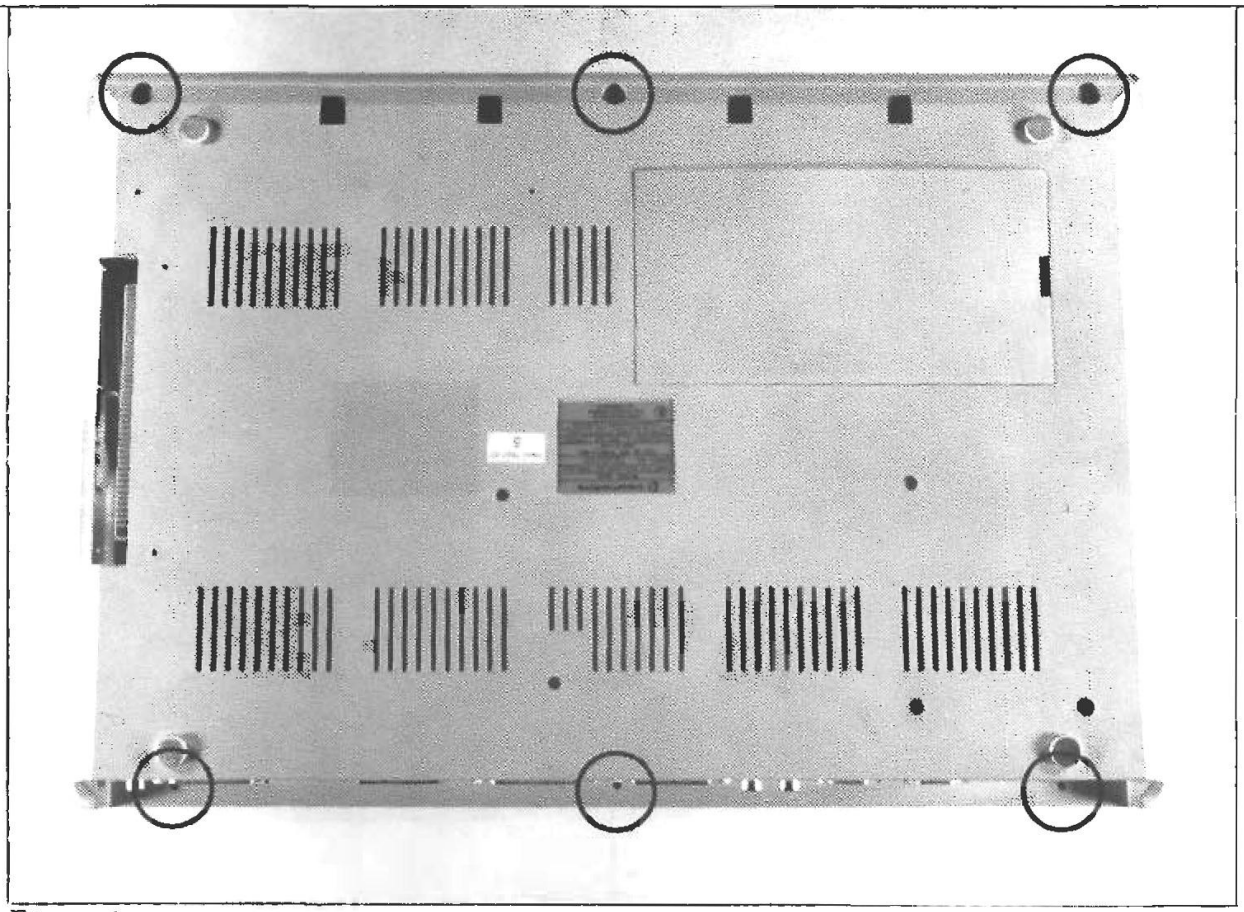

Figure 3

head to bend up the metal tabs. Two of the 4 screws also hold a tin Connector Guard in place. Use the Torx Screwdriver to remove the screws. Remove and set aside the connector guard, shielding and screws.

Step 5. Removing the 68000 Chip

Before continuing, do not forget to properly ground yourself against static electricity. Now that you can see the Motherboard of your Amiga 500, locate the 68000 Chip. It is the largest rectangular chip on the left-hand side and near the front of the Motherboard. It is plugged into its own black 64-pin socket, which sits directly on top of the Amiga 500 Motherboard.

IMPORTANT

> You must take **great** care not to damage the 68000 Chip as you remove it. Be especially careful not to bend any of the pins sticking out of the chip. If you do bend a pin, use a pair of needle nose pliers to carefully straighten the pin. Breaking one of these pins may render the 68000 Chip unusable.

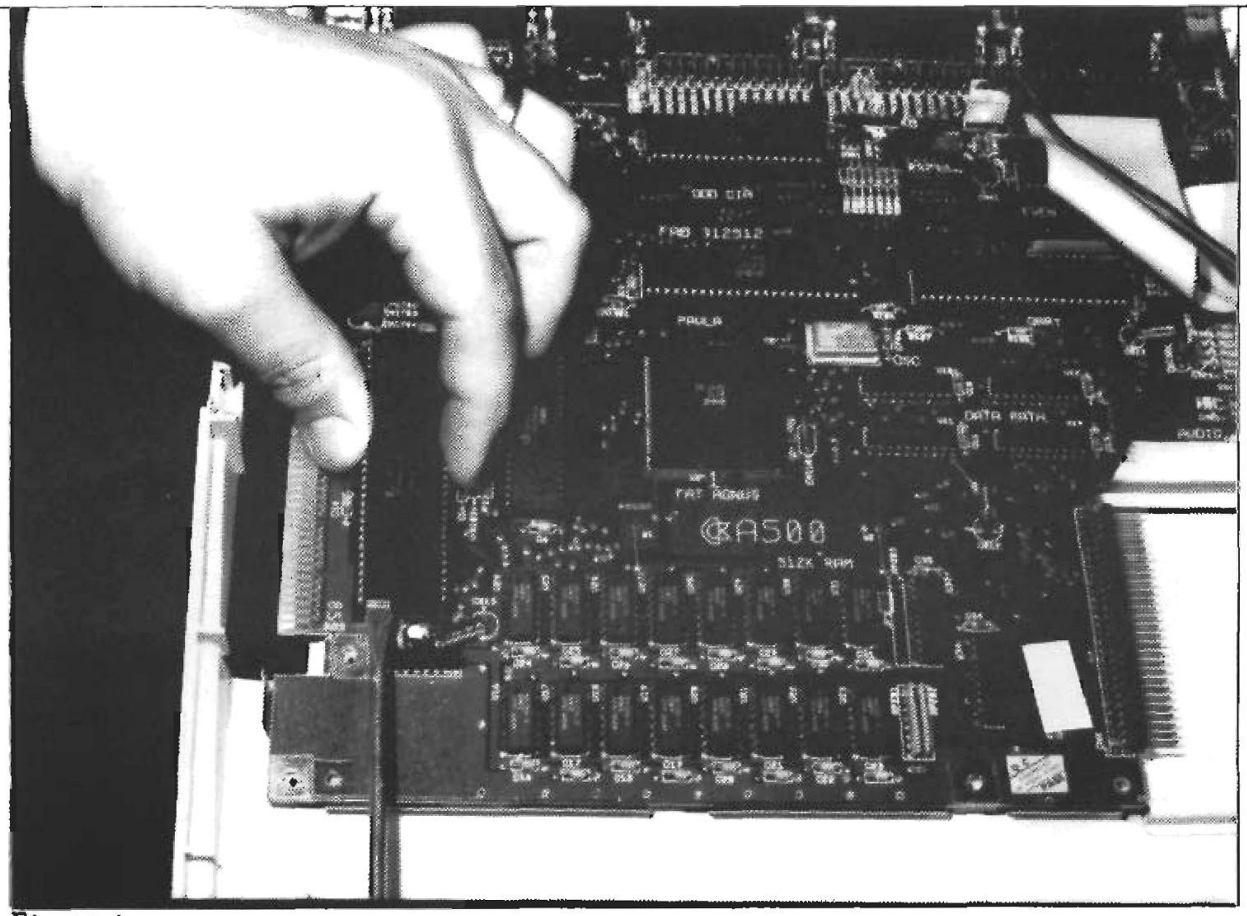

Figure 4

To remove the 68000 Chip from your Amiga 500, use a small flathead screwdriver to carefully lift the chip out of its black 64-pin socket. First slide the screwdriver between one end of the 68000 Chip and its 64-pin socket. Pry it up only **slightly**. Next slide the screwdriver under the opposite end and pry **that** end of the chip up slightly. Alternate from one end to the other in this manner until the 68000 Chip is free. (**Figure 4**). Set the 68000 Chip to one side in a safe, static free place.

Step 6. Attaching the Rubber Support Foot

The Rubber Support Foot which came with your EXP-1000 attaches to the bottom of the EXP-1000, beneath the lower right-hand corner. (The 64-Pin Adapter is already attached at the lower *left*-hand corner of the EXP-1000.) Peel the paper backing from the Rubber Support Foot and stick it on so that the sides of the foot are flush with the edge of the EXP-1000 (**Figure 5**).

Step 7. Plugging the 68000 Chip into the EXP-1000

Look carefully at the 68000 Chip again and locate a small rounded notch at one end. On some 68000 Chips, this end of the chip is marked in some other way (with a white dot, a squared notch, etc.). No matter how this end of the 68000 Chip looks,

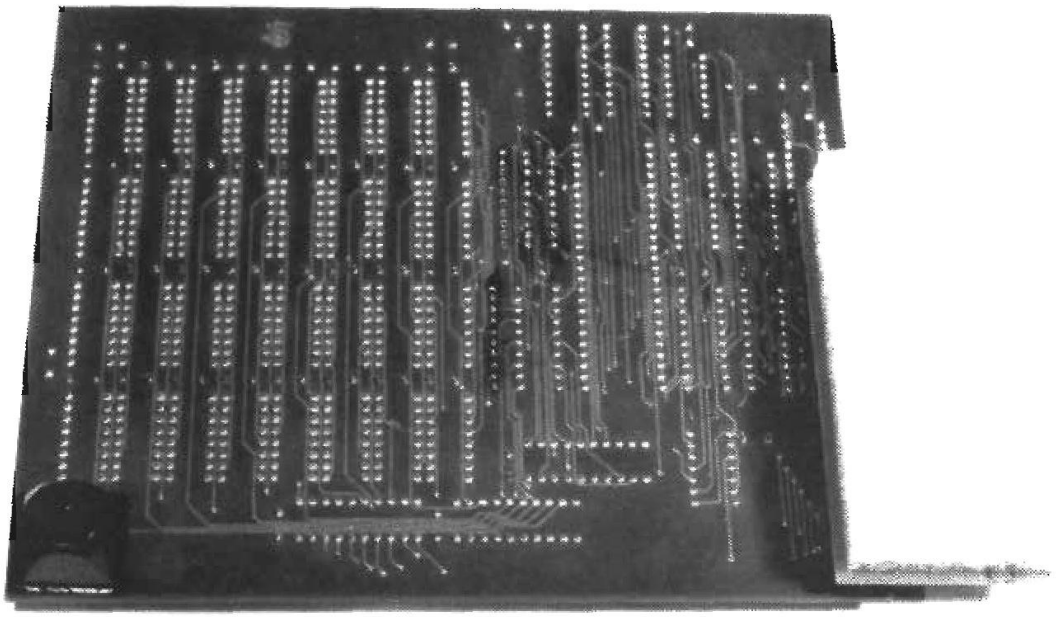

Figure 5

it will be identified in some way.

Now look closely at the 64-Pin Adapter of your EXP-1000 and find the letters **U1** (printed in white at one end of the 64-pin adapter). Just above the letters U1 is a white line with a rounded notch. (**Figure 6**). Align the marked end of the 68000 Chip with the notch drawn on the 64-Pin Adapter.

VERY IMPORTANT

Use extreme care at this point. Be certain that all of the pins on the 68000 Chip are straight and that they match perfectly with all of the sockets on the 64-Pin adapter. We suggest that you align the 68000 Chip with the row of sockets closest to the EXP-1000 board **first**, and then with the outer row of sockets (**Figure 6**).

After lining everything up, gently press the 68000 Chip into the socket on the 64-Pin Adapter (**Figure 7**). Look closely at the connection from all angles to be sure that all of the pins have gone into the 64-Pin Adapter. Check to see that each pin is properly seated in a socket and straight.

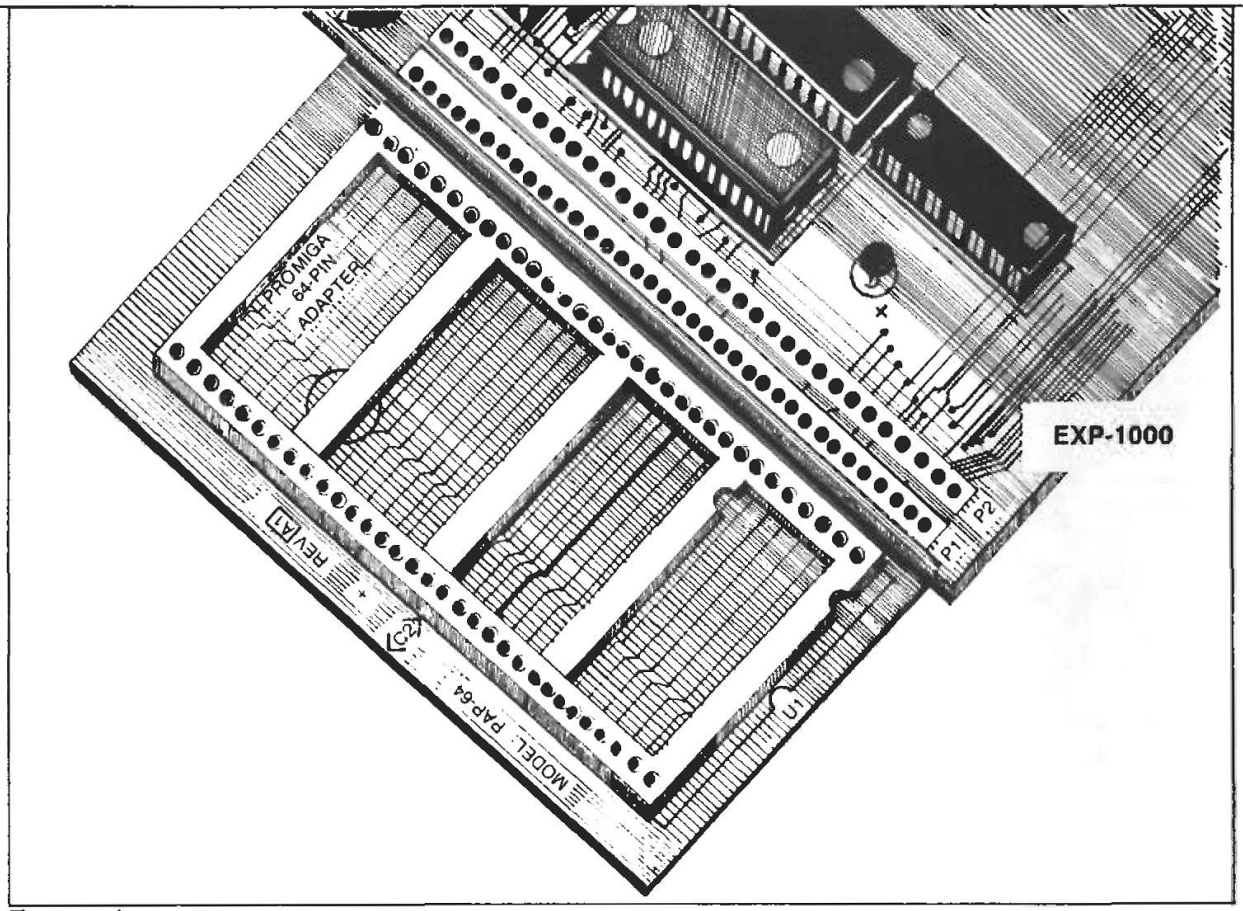

Figure 6

Step 8. Installing the EXP-1000 into the A500

Remove the Pink Styrofoam Pin Protector and inspect the pins on the bottom of the 64-Pin Adapter. Carefully straighten any pins that are not straight. Now locate the black 64-pin socket on the Motherboard where the 68000 Chip used to be. This is where the EXP-1000 will connect to your Amiga 500. Be sure that any of the capacitors attached to the Motherboard will not get in the way of your EXP-1000 as you install it. Bend these over if necessary. Align the EXP-1000 so that both rows of the pins sticking down from the 64-Pin Adapter line up perfectly with all of the sockets on the Motherboard.

Carefully push the EXP-1000 down and into place on the Amiga 500 Motherboard (**Figure 8**).

Step 9. Test the System

Now that your installation is complete, check to see that the EXP-1000 is working properly. Reconnect the monitor and power supply, being careful not to touch any of the components inside your Amiga. You will not need to reconnect your keyboard or mouse.

Put your Workbench disk in drive DF0: and switch your system on. Wait for the

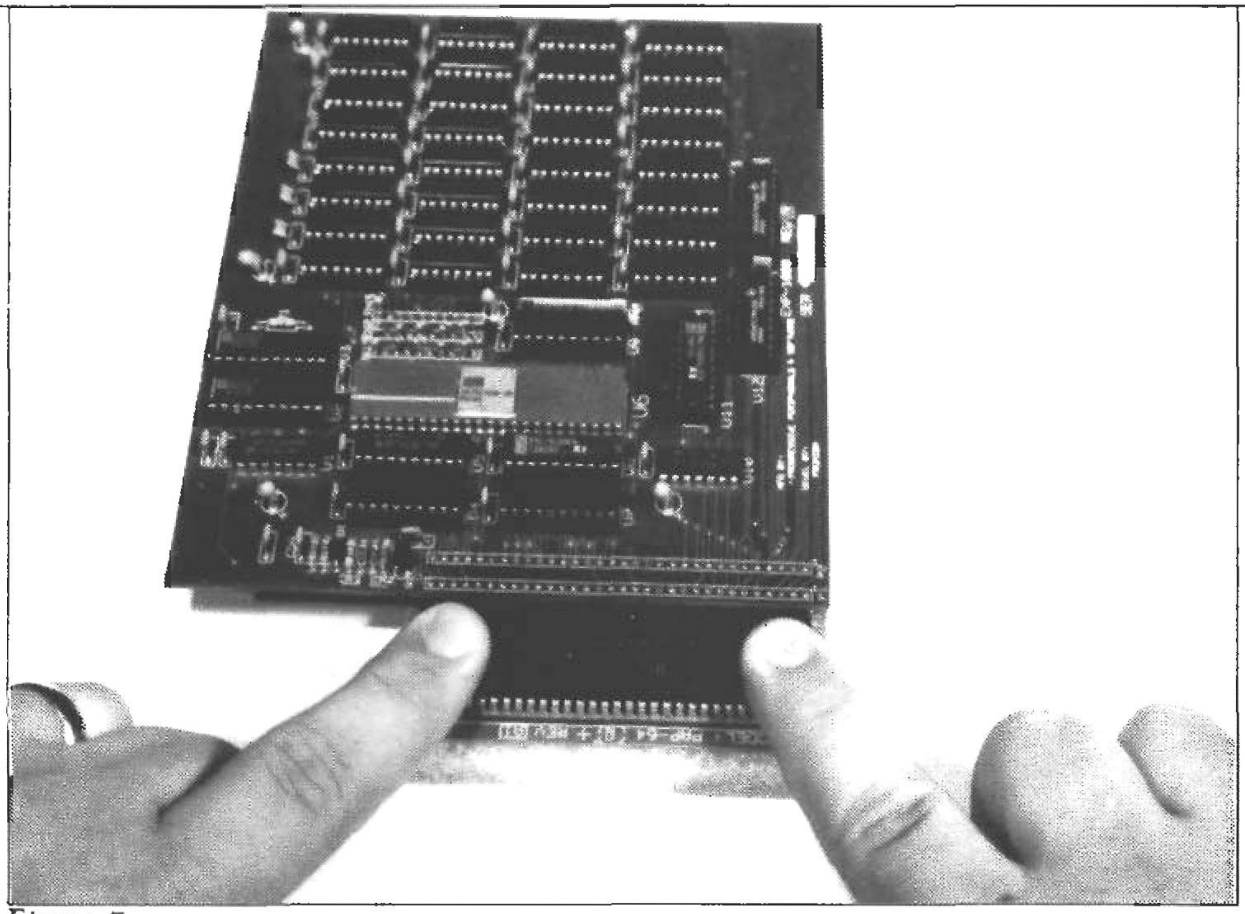

Figure 7

Workbench screen to appear and look at the menu bar for the amount of memory available. If you do not have a 512K memory expansion installed, your RAM should be in the 1300000 to 1500000 bytes range. If you do have a 512K expansion board installed, then your RAM should show approximately 1700000 to 2000000 bytes available. If your system works properly at this point, disconnect the monitor and power cable, and move on to **Step 10.** However, if this test does not work, turn off your system, disconnect the power supply and check for the following:

- Be sure that the 256K DRAMS are all properly aligned and firmly in place.
- Be sure that the 68000 Chip is plugged in fully and that all of the pins are plugged in to the 64-Pin Adapter.
- Be sure that the underside of the 64-Pin Adapter is firmly connected to the Motherboard.

Reconnect power and test the system again. **If your system still does not work properly, contact our Technical Support department (303) 825-4144.**

Step 10. Replace the Tin Shielding over the Motherboard

Use the Torx Screwdriver to replace the 4 screws holding the Tin Shielding and

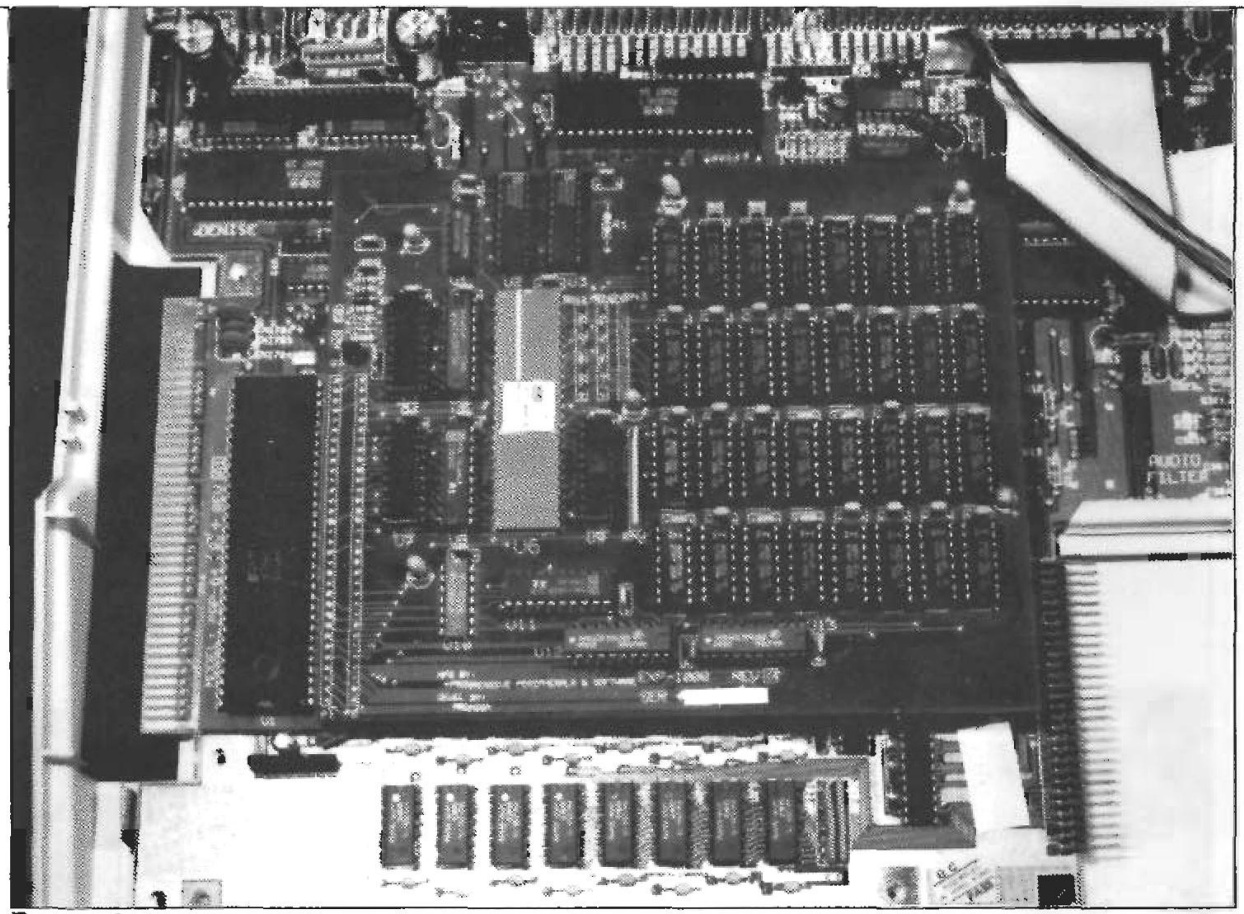

Figure 8

the small Tin Connector Guard. Also don't forget to bend the 4 metal tabs back into place.

Step 11. Replace the Keyboard

IMPORTANT:

Re-install the keyboard correctly: Be sure to fit the front edge of the keyboard securely under the 4 plastic tabs at the very front of the lower shell (Figure 9).

Step 12. Reconnect the Grounding Strap

Reconnect the braided steel Grounding Strap (coming from the right-hand side of the keyboard) to the blade attached to the Amiga 500 Disk Drive.

Step 13. Reconnect the Bundled Wires

The bundle of colored wires coming out of the Keyboard has a plug at the end of it, which you will have to reconnect to the Motherboard through the square hole in the center of the Tin Shielding. Slide the plug over the row of pins sticking up

Figure 9

from the Motherboard. If necessary, use a pair of Needle Nose Pliers to push the plug securely into place.

IMPORTANT:

Be sure to reconnect the bundled wires in the same orientation as you found them (see Step 3). Make sure that all of the sockets in the plug slide over all of the pins sticking up from the Motherboard (**Figure 10**).

Step 14. Replace the top Shell

Align the upper lid of your Amiga 500 with the keyboard, lights, etc. and snap it back into place. Next, hold the top and bottom shells together and turn the entire computer over. Use the Torx Screwdriver to replace the 3 screws at the front and 3 screws at the rear of the computer.

Step 15. Reconnect all Peripherals

Hook your Amiga 500 to your power supply, monitor cable and any other peripheral devices. You are now finished with the installation of your EXP-1000. When you switch

Figure 10

on your A500, start up your system as normal.

WARRANTY

Progressive Peripherals & Software, Inc., warrants the EXP-1000 against defects in material or workmanship for a period of 90 days from the date of purchase. Please return the enclosed warranty card to Progressive Peripherals & Software, Inc. as soon as possible. Warranty cards must be registered within one month of purchase in order to validate any warranty-related repairs For warranty repair service, call or write to Progressive Peripherals & Software, Inc. to obtain a Return Merchandise Authorization (RMA) number. Send your EXP-1000 to Progressive Peripherals & Software, Inc. *in its original packaging and write your RMA number on the outside of the package.*