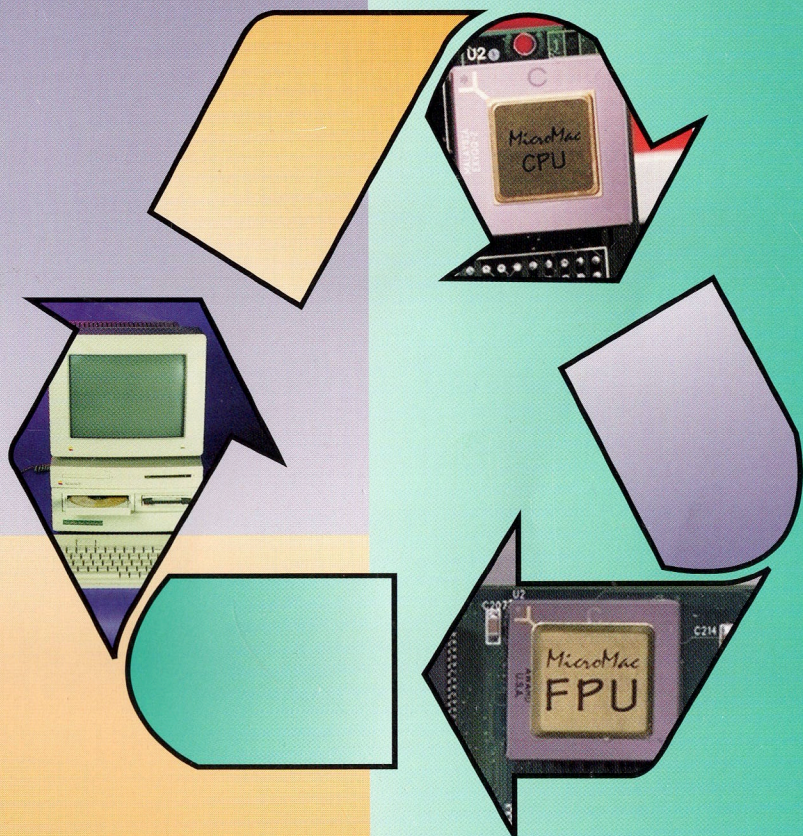


INSTALLATION MANUAL

# MicroMac Technology



Power  
WorkStation



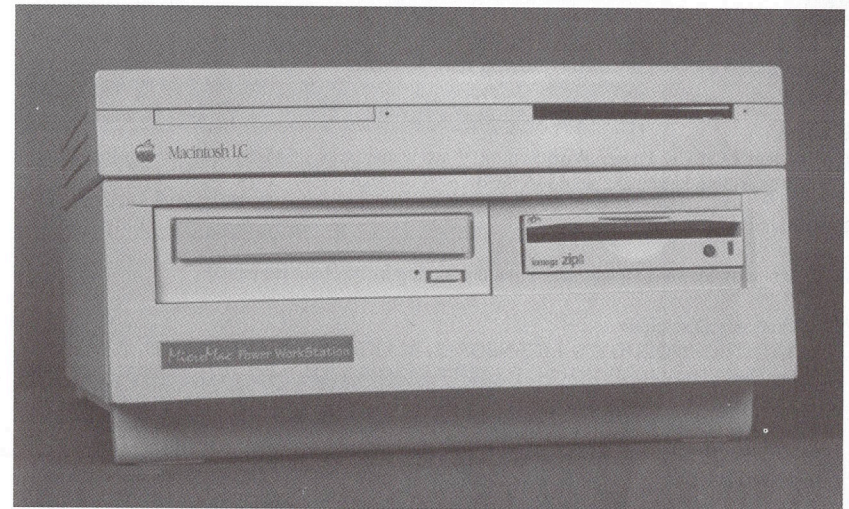
*MicroMac Technology*

# Installation Manual

for the MicroMac LC/LCII Power WorkStation

version 1.1





The MicroMac LC/LCII Power WorkStation  
for the LC, LCII (Performa 400/405/410/430)

## *MicroMac Technology*

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**Acknowledgments**

Manual written by Michael Henderson. Final production by Michael Henderson.

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**MicroMac LC/LCII Power WorkStation**

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Dear Valued Customer,

Congratulations and thank you for purchasing a MicroMac LC/LCII Power WorkStation. Our aim with this product, just like with the other upgrade products from MicroMac Technology, is to help you to protect and leverage the investment that you already have made in your Macintosh computer.

We have paid attention to the little details and used only quality parts throughout so you can get years of service and enjoyment with only a small investment in assembly time. We hope it will make your future Macintosh experience even more enjoyable.

In this business, if you are not constantly improving you are falling behind. We are always looking for new ideas and approaches. If you have feedback, ideas or suggestions about the MicroMac LC/LCII Power WorkStation or this manual, please feel free to contact us.

Sincerely,

A handwritten signature in dark ink, reading "Achim Strupat". The signature is fluid and cursive, with the first name "Achim" and last name "Strupat" clearly distinguishable.

Achim Strupat  
President



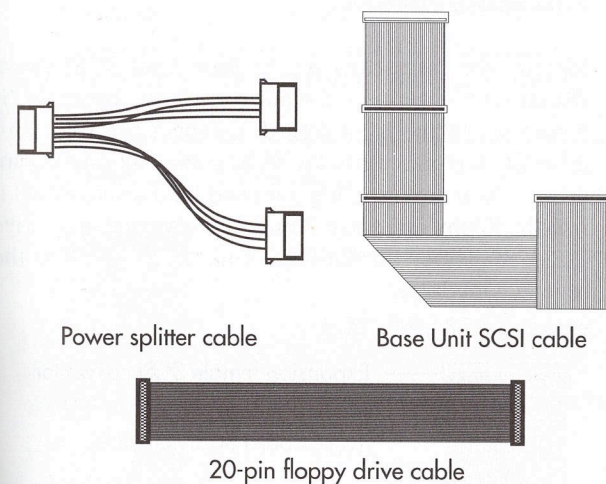
If you are familiar with Macintosh hardware, here is a summary of the installation of your MicroMac LC/LCII Power WorkStation:

## 1. Open your Macintosh

Open your Macintosh by removing the top cover from the computer.

## 2. Install the Base Unit of the Power WorkStation

Unplug the power cable from the back of the hard drive and remove the SCSI cable from the hard drive and logic board. Locate the floppy drive. Unplug and remove the floppy cable from the floppy drive and logic board. Identify the power splitter cable, Base Unit SCSI cable and 20-pin floppy drive cable that came with the workstation. (Refer to Figure 1-1).

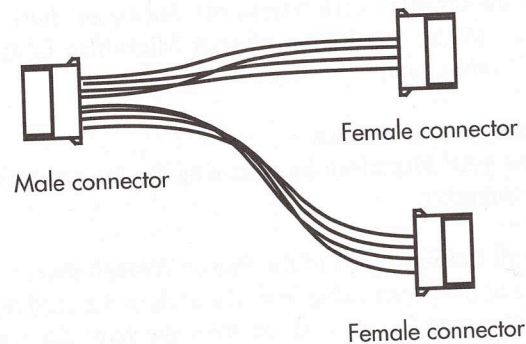


**Figure 1-1:**  
Cables packaged with  
the Base Unit

Identify the connectors on the power splitter cable. (Refer to Figure 1-2). Attach one of the female connectors on the power splitter cable to the 4-pin male power connector on the back of the hard drive. Attach the female connector you removed from the hard drive to the male connector on the power splitter cable.



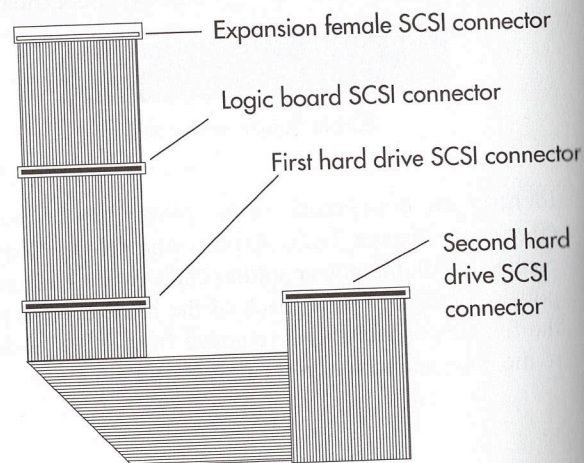
## MicroMac LC/LCII Power WorkStation



**Figure 1-2:**  
Power splitter cable

Attach the floppy drive cable to the logic board. Remove the floppy drive from the floppy drive bay. Remove the metal bracket that surrounds the floppy drive and attach the drive with the original four screws to the chassis extension.

Identify the connectors on the Base Unit SCSI cable. (Refer to Figure 1-3). Connect the logic board SCSI connector to the logic board. Connect the first hard drive SCSI connector to the SCSI connector on the hard drive. If you are installing a second hard drive, install it into the floppy drive bay. Connect the second hard drive SCSI connector on the Base Unit SCSI cable to the second hard drive.



**Figure 1-3:**  
Base Unit SCSI cable

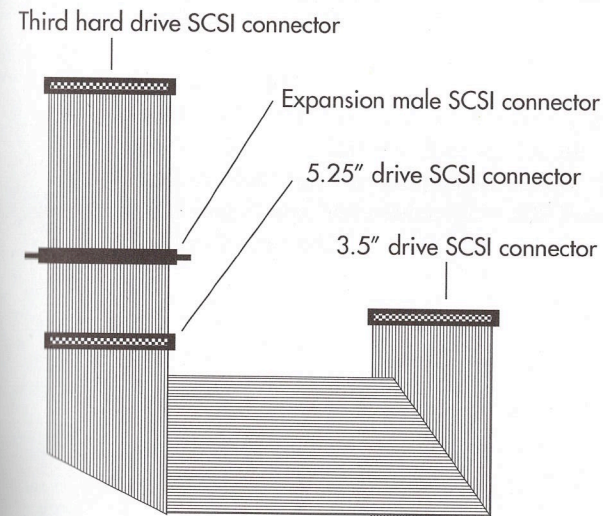
## MicroMac LC/LCII Power WorkStation

Connect the last female connector on the power splitter cable to the 4-pin male connector on the back of the second hard drive. Install the dual-slot PDS adapter into the PDS slot on the logic board. Install the accelerator into bottom slot on the adapter and an optional Ethernet card into the top slot.

### 3. (Optional) Install the Drive Option Upgrade

With the drive option upgrade, install a third hard drive onto the chassis extension. If you are installing a 3.5" and/or 5.25" drive, install them onto their appropriate locations on the metal drive plate. Remove drive covers from the workstation bezel. Install the drive plate into the chassis extension. Identify the connectors on the Drive Option SCSI cable provided with the Drive Option upgrade. (Refer to Figure 1-4). Plug the appropriate connectors into the internal drives on the drive plate.

**Note:** In order to run multiple drives, the Power Option upgrade is required.



**Figure 1-4:**  
Drive Option SCSI cable

### 4. (Optional) Install the Power Option Upgrade

Install the power supply, fan and power distributor into their appropriate locations in the chassis extension.



## MicroMac LC/LCII Power WorkStation

### 5. Close your Macintosh

Install the chassis extension onto the original bottom case. Connect the 20-pin floppy drive cable to the floppy drive. If you installed the Drive Option upgrade, connect the expansion male connector on the Drive Option SCSI cable to the expansion female connector on the Base Unit SCSI cable. Connect all necessary internal drive power cables to the power distributor. Replace the original top case onto the chassis extension.

### 6. Connect Power Cables

Connect power cables to the computer and the chassis extension if you installed the Power Option upgrade. Turn on the computer.

### 7. Install Software

Install the MicroMac accelerator and/or Ethernet software as instructed in their user manuals.

### 8. Installation Completed

Congratulations! You have completed the installation of the MicroMac LC/LCII Power WorkStation.

## MicroMac LC/LCII Power WorkStation

Thank you for purchasing a MicroMac LC/LCII Power WorkStation. Your new MicroMac upgrade allows you to:

- **Extended your computer's case**

The MicroMac LC/LCII Power WorkStation extends the chassis of your computer to allow for added room and expansion.

- **Upgrade to a faster CPU**

Depending upon the MicroMac accelerator installed in the workstation, CPU performance increases up to 220%-350%.

- **Speed Up Math Calculations**

An optional FPU adds the benefit of a math co-processor (FPU) to your system. The performance of math calculations increases up to 400%-1000%.

- **Support RAM Doubler and Virtual Memory**

RAM Doubler and Virtual Memory are supported with the MicroMac LC/LCII Power WorkStation. (Some restrictions may apply. Refer to accelerator manual for further information.)

- **Easily user-installable**

The MicroMac LC/LCII Power WorkStation features a straight-forward installation. Simply locate the QuickInstall or Hardware Installation section of this manual and install the MicroMac LC/LCII Power WorkStation as instructed.

## Introduction

### Introduction



## MicroMac LC/LCII Power WorkStation

### Using this Manual

This manual gives you, step-by-step, all the information you need to successfully:

- Install the MicroMac LC/LCII Power WorkStation
- Power up and use your newly increased speed.

### Inventory

As you unpack your new MicroMac LC/LCII Power WorkStation, please take the time to check that you have received the following items:

### Base Unit

MicroMac LC/LCII Power WorkStation (Base Unit)

- Chassis extension
- Dual-slot PDS adapter
- Power splitter cable (4-pin cable with 3 connectors)
- Base Unit SCSI cable (50-pin folded SCSI cable with 4 connectors)
- Floppy cable (20-pin cable with 2 connectors)
- This manual
- MicroMac accelerator
  - MicroMac accelerator Start-up disk
  - Utilities disk
  - MicroMac accelerator Installation Manual

If you purchased one of the following Option Upgrades you should receive:

### Drive Option Upgrade

Drive Option Upgrade:

- Drive Option metal drive plate
- Drive mounting hardware (screws, etc.)
- Drive Option SCSI cable (50-pin folded SCSI cable with 4 connectors)

### Power Option Upgrade

Power Option Upgrade:

- Power supply
- Power distributor
- Fan
- Power supply mounting hardware (screws, nuts, etc.)

### Before you Begin

Please save the original packing materials and box. The original packing materials provide the best protection for your MicroMac LC/LCII Power WorkStation should the need arise to store or ship it again.

## MicroMac LC/LCII Power WorkStation

Installing the MicroMac LC/LCII Power WorkStation is accomplished by following the steps in the following chapters. As you go through this manual, please read each paragraph in its entirety before actually completing the instructions. The area and tools you will need to install the workstation are:

- A flat, non-conductive static-free work area
- An optional anti-static grounding strap (available at most computer stores)
- A philips screwdriver

It is assumed that you are familiar with the internal layout and assembly of your Macintosh. We recommend that you familiarize yourself with this manual and understand the steps necessary to install the MicroMac LC/LCII Power WorkStation. As long as you understand the basic concepts required, the installation will be easy from start to finish.

There are some steps you can perform before you begin the installation of the MicroMac LC/LCII Power WorkStation to make sure you encounter no problems. Please follow these guidelines for a quick and easy installation:

- Test your Macintosh before installing the MicroMac LC/LCII Power WorkStation. If you have not used your Macintosh for a while you may have a booting problem or a software application problem that you have not noticed lately.
- Make certain you are using the latest System software that is compatible with your software applications.
- Do not make too many upgrades at the same time. When you make too many upgrades at once, it makes it difficult to identify exactly what the source of the problem is if you should happen to encounter one.

### System software requirements:

- System 7.1–7.5.x.

### Skills Needed

#### Introduction

### Before you Install

### System Software Requirements



Before you install the MicroMac LC/LCII Power WorkStation and optional workstation upgrades, you should become familiar with the following:

### Pre-Installation Considerations

#### SCSI Considerations

If you have more than one SCSI device (internal or external) connected to your Macintosh, the following rules must be applied to assure for correct peripheral operation:

1. Each peripheral must have a different SCSI address ID between 0 and 6 (SCSI ID 7 is used by the Mac logic board and SCSI ID 0 is usually used by the first internal hard drive). On the back of most external SCSI peripherals is a SCSI number selector or switch with a numerical reader used to set the SCSI ID address. If your device does not have such a switch, you can set the SCSI ID address by installing small black jumpers on the SCSI ID pins on the controller board of the device. Peripherals without a switch usually provide a diagram identifying the location of the ID switching pins. If you do not have this information, Technical Support of your peripheral or drive manufacturer can help you locate the pins and settings by providing you with the necessary information to make the correct configuration settings.
2. SCSI peripherals must be terminated correctly. The first and last device on the SCSI chain must be terminated, otherwise the peripherals will not work correctly. Refer to the installation instructions that came with your peripheral for proper termination settings.



## MicroMac LC/LCII Power WorkStation Overview

### Base Unit

The MicroMac LC/LCII Power WorkStation is configured as a Base Unit with a chassis extension (the metal enclosure that attaches to the original bottom case), a MicroMac accelerator and a dual-slot PDS adapter. The Base Unit allows you to operate three additional hardware upgrade units with the current Macintosh power supply. For example, you may operate a MicroMac accelerator, a second hard drive and an Ethernet card at the same time without the need for an additional power supply.

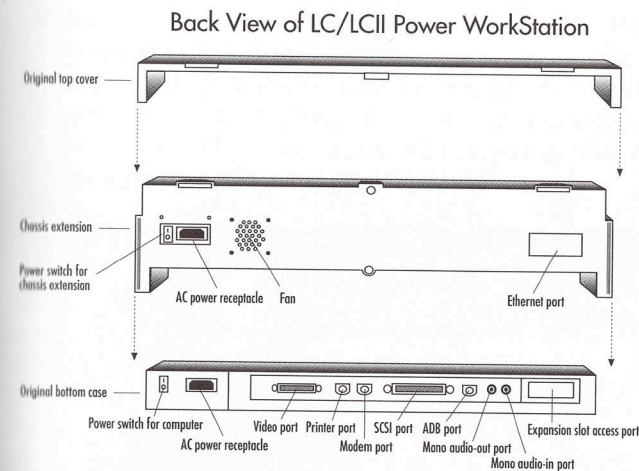
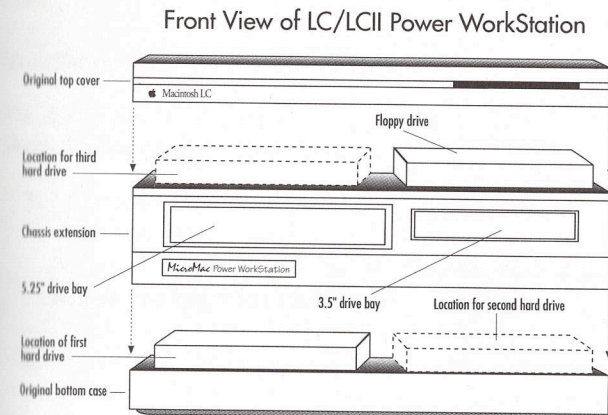
### Drive Option Upgrade

Depending on your system needs, you can configure the MicroMac LC/LCII Power WorkStation with a Drive Option upgrade. The Drive Option allows you to add a 5.25" drive (such as a CD-ROM or Jaz drive) and a 3.5" drive (such as a Zip or Optical drive) to the workstation; however, you are still restricted to operating only three hardware upgrade units with the current Macintosh power supply. For example, a MicroMac accelerator, an internal CD-ROM drive and an Ethernet card.

### Power Option Upgrade

For maximum system expansion, the Power Option upgrades the MicroMac LC/LCII Power WorkStation with an additional power supply to simultaneously operate multiple drives, an accelerator and an Ethernet card.

Figure 3A-1 and 3A-2 illustrate the overall configuration set-up of the MicroMac LC/LCII Power WorkStation.



**Figure 3A-1:**  
Front view of LC/LCII  
Power WorkStation

**Figure 3A-2:**  
Back view of LC/LCII  
Power WorkStation

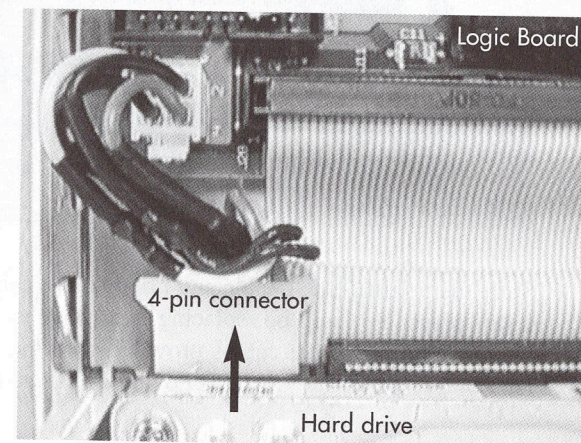


Installing the Base Unit of the MicroMac LC/LCII Power WorkStation involves removing the top cover from your Macintosh computer, installing a second hard drive (if one is to be installed), installing the chassis extension, dual-slot PDS adapter, MicroMac accelerator and optional Ethernet card.

Installation takes approximately 30 minutes.

To install the Base Unit of the MicroMac LC/LCII Power WorkStation please follow these steps:

1. Shut down the computer. If the computer has been on, the metal power supply case inside the computer may be hot. Please wait at least five minutes until it cools before you begin the installation.
2. Situate the computer so that the front of the case is facing you. Press and release the two lid latches and lift the top cover off the computer. If you have an anti-static grounding strap, put it on at this time. (See grounding strap package for instructions.)
3. Locate the hard drive. It is located in a drive bay in the front left corner of the computer's case. On the back of the hard drive is a 4-pin connector for the power cable. Gently unplug the cable from this connector. Leave the other connector of the power cable connected to the logic board.



**Figure 3B-1:**  
Disconnect the hard  
drive power cable

### Base Unit Installation

#### Hardware Installation

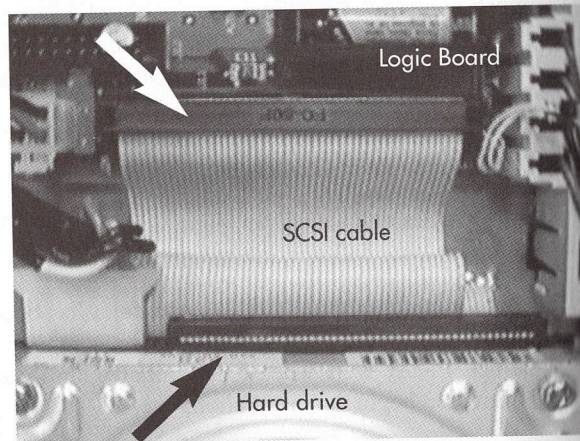
#### Base Unit

### Disconnect the Hard Drive Power Cable



## Disconnect the SCSI Cable from the Hard Drive

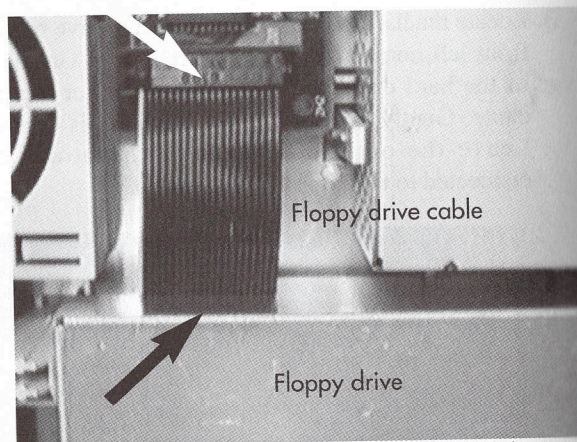
4. Gently unplug the SCSI cable from the back of the hard drive and from the logic board. Set it aside.



**Figure 3B-2:**  
Disconnect and remove the SCSI cable

## Disconnect the Floppy Drive Cable

5. Locate the floppy drive. It is located in a drive bay in the front right corner of the computer's case. Gently unplug the floppy drive cable from the back of the floppy drive and from the logic board.

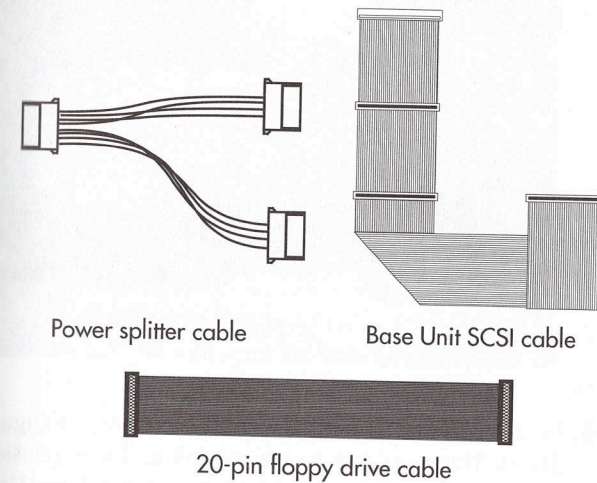


**Figure 3B-3:**  
Disconnect and remove the floppy drive cable

6. Store the original SCSI cable and floppy drive cable in a safe place. You will be replacing them with the new SCSI and floppy drive cables provided with the Base Unit of the MicroMac LC/LCII Power WorkStation.

7. Unpack the contents of the Base Unit box. You will find the following cables:

- Power splitter cable (4-pin cable with 3 connectors)
- Base Unit SCSI cable (50-pin folded SCSI cable with 4 connectors)
- Floppy cable (20-pin cable with 2 connectors)



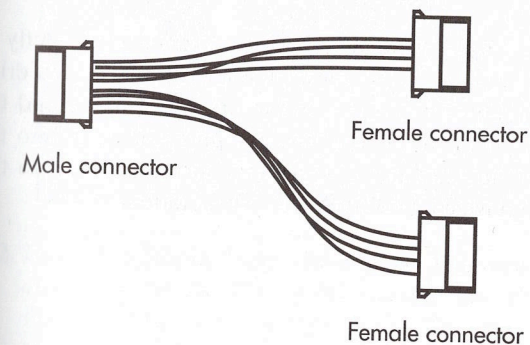
## Unpack Base Unit Cable

Hardware Installation

Base Unit

**Figure 3B-4:**  
Cables packaged with the Base Unit

8. Identify the power splitter cable. It is a 4-pin cable with one male connector and two female connectors. (Refer to Figure 3B-5).

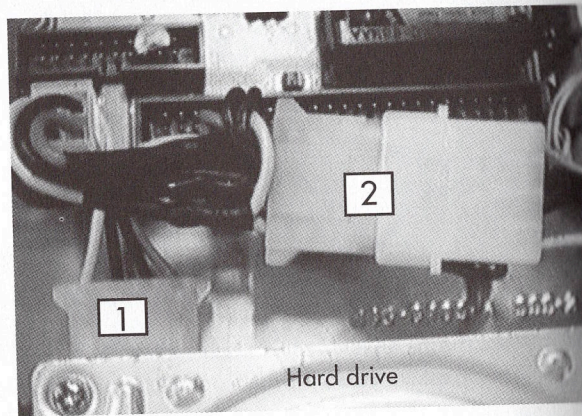


**Figure 3B-5:**  
Power splitter cable



## Install Power Splitter Cable

9. Install the power splitter cable. Plug one of the female connectors on the power splitter cable into the 4-pin male power connector on the back of the hard drive [1]. Plug the female connector that you unplugged earlier from the hard drive into the male connector on the power splitter cable [2].

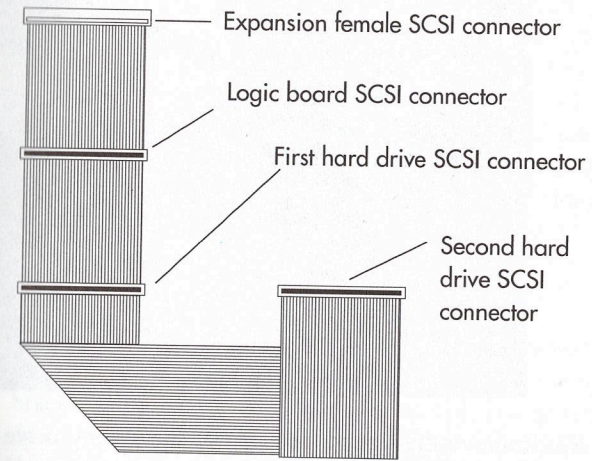


**Figure 3B-6:**  
Install the power splitter cable

## Identify Base Unit SCSI Cable

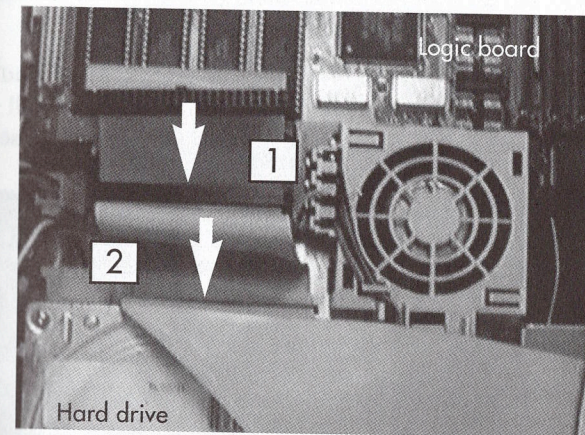
10. Identify the Base Unit SCSI cable. (Refer to Figure 3B-7). There are four connectors on it. The expansion female connector is used to connect the Base Unit SCSI cable to the Drive Option SCSI cable. This one way connection is a nice feature. It allows you to easily disconnect the chassis extension of the workstation from the bottom case of the computer by simply disconnecting the Base Unit SCSI cable from the Drive Option SCSI cable.

The logic board SCSI connector connects directly to the logic board of the computer. The first hard drive connector connects to the first hard drive and the second hard drive connector plugs directly into the second hard drive you may optionally add to the MicroMac LC/LCII Power WorkStation.



**Figure 3B-7:**  
Base Unit SCSI cable

11. Install the Base Unit SCSI cable. Gently plug the logic board SCSI connector into the SCSI connector on the logic board [1]. Plug the first hard drive SCSI connector into the hard drive [2].



**Figure 3B-8:**  
Install the Base Unit SCSI cable

12. Install the 20-pin floppy drive cable. Plug one female connector on the floppy drive cable into the male floppy connector on the logic board. The other female connector on the cable will be connected to the floppy drive in a later step.

Hardware  
Installation

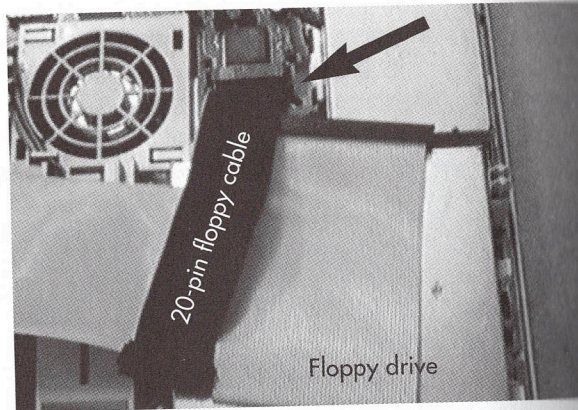
Base Unit

## Install Base Unit SCSI Cable

**Figure 3B-8:**  
Install the Base Unit SCSI cable

## Install Floppy Drive Cable





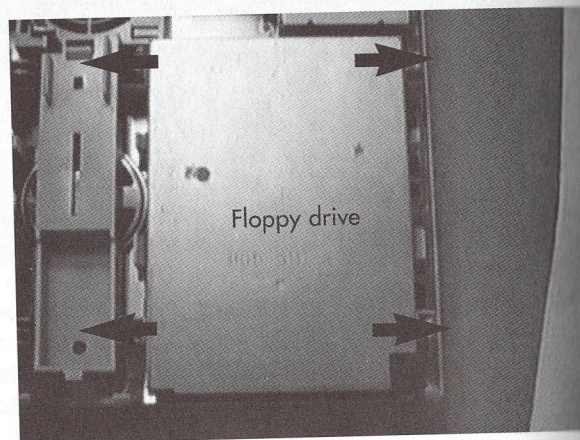
**Figure 3B-9:**  
Install the floppy drive  
cable onto the logic  
board

## Remove Floppy Drive

- Remove the floppy drive from the floppy drive bay and from the metal bracket that encloses the drive. First, pull back the latches on each side of the floppy drive bracket to release it from its mounting. Remove the drive and set it aside.

On the original LC, the floppy drive is fastened rather securely, with two latches on each side. Pull back on the latches on the inner side, angle the loose side of the drive upward, then pull open the outer latches, and it should release easily.

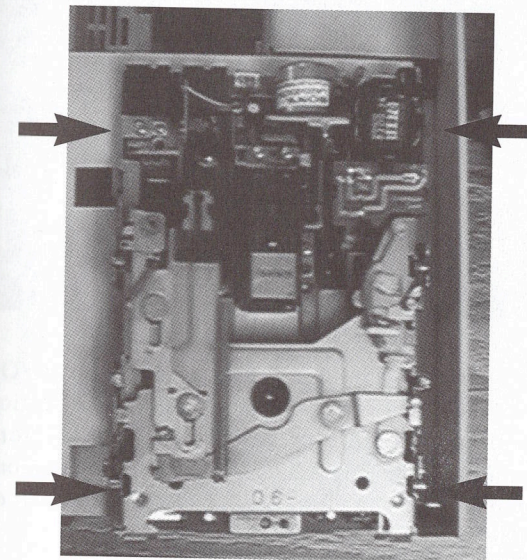
More recent models, such as the LCII and the Performas, use only one latch on each side. Pull both back and slide the drive forward slightly to release it.



**Figure 3B-10:**  
Remove the floppy drive  
from the drive bay

- Once the floppy drive is removed from the floppy drive bay, remove the metal bracket that encloses the floppy drive. This is required so the floppy drive installs correctly onto the chassis extension. To remove the metal bracket, carefully unscrew the four screws that attach it to the floppy drive. Set the four screws aside. Pack and store the metal bracket along with the original SCSI and floppy cables in a safe place.

- Install the floppy drive onto the chassis extension with the same four screws that originally secured the metal bracket to the drive. Make certain the disk slot on the drive is facing towards the front of the workstation. Align the screw holes on the shelf and the drive, and insert the screws. Tighten all four screws.



## Remove Floppy Drive Metal Bracket

Hardware  
Installation

Base Unit

## Install Floppy Drive onto Chassis Extension

**Figure 3B-11:**  
Install floppy drive  
onto chassis extension

- If you are planning **not** to install a second hard drive or the Drive Option and/or Power Option upgrade into the Base Unit, skip to step 20.

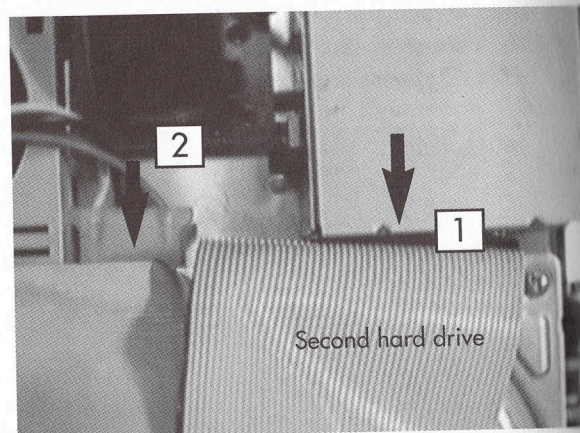
## If You Are Not Installing a Second Hard Drive or the Drive Option and/or Power Option Upgrades



## MicroMac LC/LCII Power WorkStation

### If You Are Installing a Second Hard Drive

17. If you are installing a second hard drive, install it into the original floppy drive bay from which you removed the floppy drive. A hard drive installed in this location may require mounting brackets. If you do not have the necessary mounting hardware, please contact MicroMac Technology.
18. After the second hard drive is installed, connect the second hard drive SCSI connector on the Drive Option SCSI cable to the back of the drive [1]. Then, connect the last female connector on the power splitter cable to the 4-pin male connector on the back of the second hard drive [2].



**Figure 3B-12:**  
Connect SCSI and  
power splitter cables  
to second hard drive

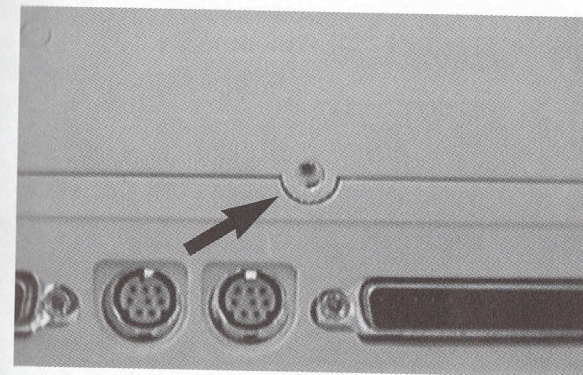
### If You Are Installing the Drive Option and/or Power Option Upgrades

19. If you are installing the Drive and/or Power Option upgrade please refer to their appropriate sections in this manual for further instructions. After you complete the upgrade(s), return to this section and continue at step 20 to complete the installation of the Base Unit.

**Note:** If you wish to run multiple drives in the MicroMac LC/LCII Power WorkStation, you need the Power Option upgrade. The power supply of the Base Unit can only accommodate the addition of one extra drive, such as a second hard drive, CD-ROM drive or a Zip drive.

## MicroMac LC/LCII Power WorkStation

20. Install the chassis extension of the workstation onto the original bottom case of the computer. First, gently align the chassis with the front of the computer, then slowly lower it down until it rests evenly on the base of the computer. Make certain the lower back of the chassis extension with the circular tab fits snugly into the circular insert of the bottom case.



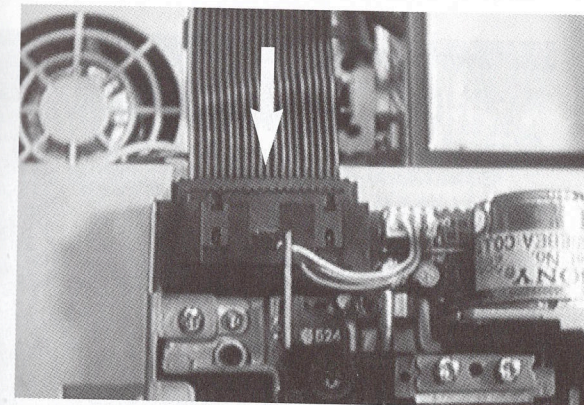
### Install the Chassis Extension

Hardware  
Installation

Base Unit

**Figure 3B-13:**  
Attach chassis  
extension to the  
original bottom case

21. Locate the 20-pin floppy drive cable you connected earlier to the logic board. Connect the other female connector to the back of the male connector of the floppy drive.



**Figure 3B-14:**  
Connect 20-pin floppy  
drive cable to  
floppy drive

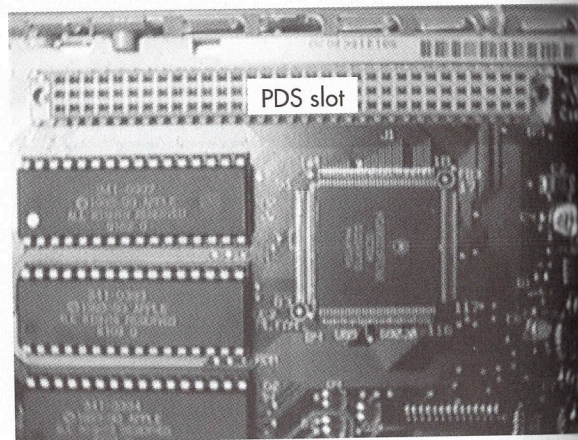
### Connect Floppy Drive Cable to Floppy Drive



## MicroMac LC/LCII Power WorkStation

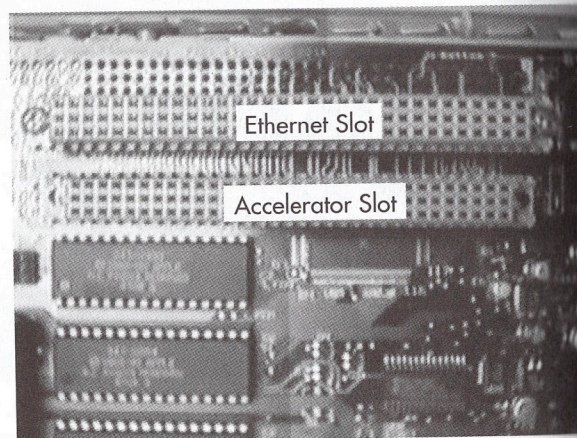
### Install Dual-Slot Adapter

22. Locate the dual-slot PDS adapter and MicroMac accelerator from the packing material.
23. Install the dual-slot PDS adapter into the PDS slot on the logic board.



**Figure 3B-15:**  
Location of PDS slot  
on logic board

On the dual-slot PDS adapter there are two connectors. Typically, the lower connector is used for the accelerator card and the top connector is used for the Ethernet card.



**Figure 3B-16:**  
Location of Ethernet  
slot and accelerator  
slot on the dual-slot  
PDS adapter

## MicroMac LC/LCII Power WorkStation

24. Install the MicroMac accelerator into the lower connector.
25. If you are installing an Ethernet card, install it into the top connector on the dual-slot PDS adapter.
26. Replace the original top cover onto the chassis extension of the MicroMac LC/LCII Power WorkStation. Make certain the two lid latches fit snugly onto the chassis extension.
27. Connect the power cable to the AC power receptacle and turn on the computer.
28. Install the necessary software. Please read the software installation section of the MicroMac accelerator manual for installing accelerator software. If you installed an Ethernet card, follow the instructions supplied by the manufacturer of the Ethernet card.
29. Congratulations! You have completed the Base Unit installation of the MicroMac LC/LCII Power WorkStation.

### Install MicroMac Accelerator

### Install Ethernet Card

Hardware  
Installation

Base Unit

### Install Software



Installing the Drive Option upgrade of the MicroMac LC/LCII Power WorkStation involves setting appropriate SCSI IDs, installing the additional drives onto the Drive Option drive plate, installing the drive plate into the chassis extension and plugging in appropriate SCSI and power cables. The Drive Option upgrade allows you to add a 3.5" drive (such as a Zip or Optical drive), a 5.25" drive (such as a CD-ROM or Jaz drive) and a third hard drive to the MicroMac LC/LCII Power WorkStation.

Installation takes approximately 30 minutes.

To install the Drive Option upgrade of the MicroMac LC/LCII Power WorkStation please follow these steps:

1. Unpack the contents of the Drive Option upgrade and locate the following items:
  - Drive Option metal drive plate
  - Drive mounting hardware (screws, etc.)
  - Drive Option SCSI cable (50-pin folded SCSI cable with four connectors)
2. Locate the chassis extension of the MicroMac LC/LCII Power WorkStation and set it on it's side. It should not be connected to the bottom case nor should the top cover be attached to it.
3. Proceed to install the drives into their appropriate locations on the metal drive plate.

---

**Note:** Make certain to set the SCSI ID addresses of the drives to their correct settings, otherwise they will not properly work. Refer to the section entitled "SCSI Considerations" on page 3A-1 for further information on setting SCSI ID addresses.

---

4. If you are installing a third hard drive, mount it on the very top of the chassis extension, left of the floppy drive.

### Drive Option Upgrade Installation

#### Hardware Installation

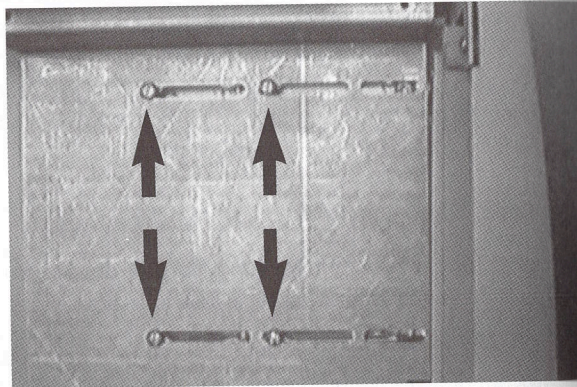
#### Drive Option

### Locate Chassis Extension

### Install Third Hard Drive



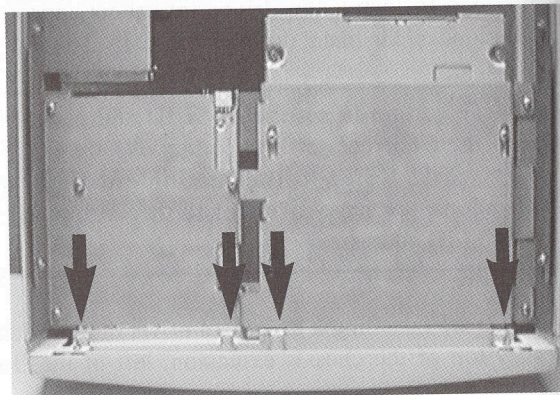
Mount the optional third hard drive into place by screwing the hard drive screws into the drive slots on the chassis extension.



**Figure 3C-1:**  
Location of drive slots  
for optional third  
hard drive

5. Gently turn the chassis extension upside down. The floppy drive (and third hard drive, if you installed one) will be resting on the surface of your work area. Be careful as you work so you do not damage these drives.

6. Prior to installing a 3.5" and/or 5.25" drive, remove the 3.5" and/or 5.25" drive cover from the bezel of the workstation by unscrewing the two screws from the inside of the chassis extension.



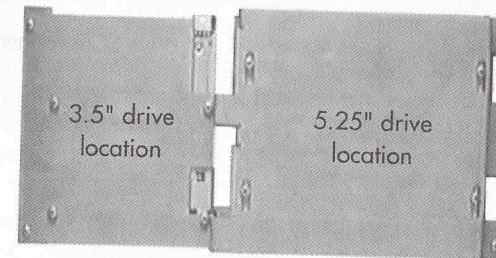
**Figure 3C-2:**  
Location of screws in  
drive bay covers

3.5" and 5.25" drive cover locations

7. Mount the drive(s) in the appropriate bay location on the metal drive plate.

8. A 3.5" drive (such as a Zip or Optical drive) mounts into the smaller bay (which measures about 4") on the drive plate. Mount it into place by screwing in the four screws from the bottom of the metal drive plate.

9. A 5.25" drive (such as a CD-ROM) mounts into the larger bay (which measures about 6") on the drive plate. Mount it into place by screwing in the four screws from the bottom of the metal drive plate.



**3.5" Drive Bay**

**5.25" Drive Bay**

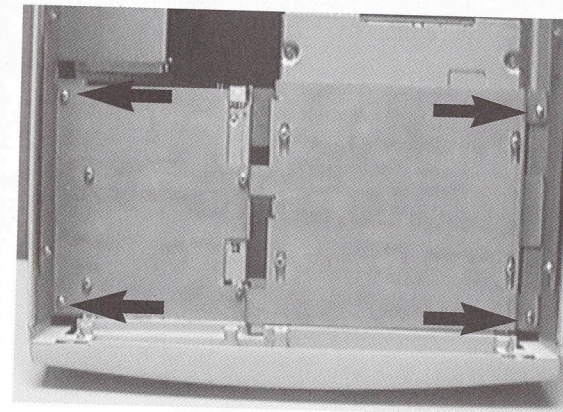
Hardware  
Installation

Drive Option

**Figure 3C-3:**  
5.25" and 3.5" drive  
locations on metal  
drive plate

10. Install the drive plate into the chassis extension. Guide it gently up and in until it sits flush with the front of the bezel. You should see the drive(s) fit snug in it's drive bay location in the front bezel.

11. Fasten the drive plate to the chassis extension with the four screws supplied with the Drive Option upgrade.



**Install Drive Plate into  
Chassis Extension**

**Figure 3C-4:**  
Attach drive plate to  
chassis extension



## Identify Drive Option SCSI Cable

- Identify the Drive Option SCSI cable. (Refer to Figure 3C-5). There are four connectors on it. The third hard drive SCSI connector connects a third hard drive, the expansion male connector connects the Drive Option SCSI cable to the Base Unit SCSI cable, the 5.25" drive SCSI connector connects a CD-ROM or Jaz drive and the 3.5" drive SCSI connector connects a Zip or Optical drive.

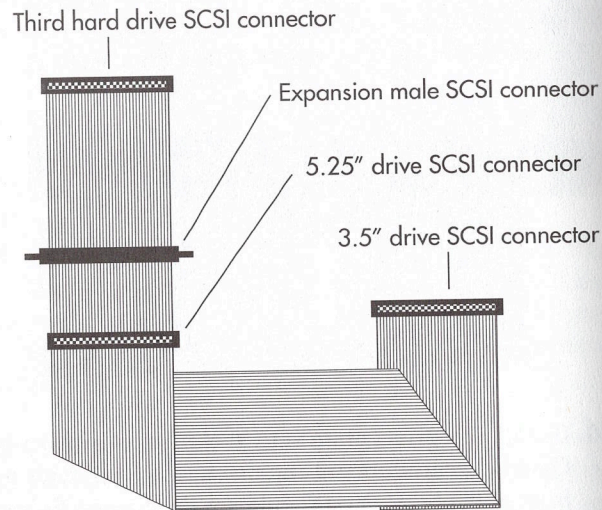


Figure 3C-5:  
Drive Option SCSI cable

## Install Drive Option SCSI Cable

- Install the Drive Option SCSI cable. If a 5.25" drive is installed, connect it to the 5.25" drive connector on the cable [1]. If a 3.5" drive is installed, connect it to the 3.5" drive connector on the SCSI cable [2].

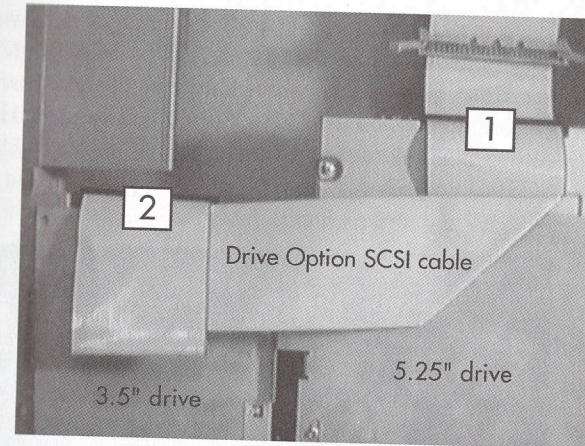


Figure 3C-6:  
Install Drive Option SCSI cable

Hardware  
Installation

Drive Option

- To double check your progress, the Drive Option metal drive plate should now be firmly screwed in the chassis extension and the Drive Option SCSI cable should be attached to the 5.25" and/or 3.5" drive(s).
- Turn the chassis extension upright. The floppy drive and third hard drive (if you installed one) should be facing upwards.
- If you installed a third hard drive, connect the third hard drive SCSI connector on the Drive Option SCSI cable to the back of the third hard drive.

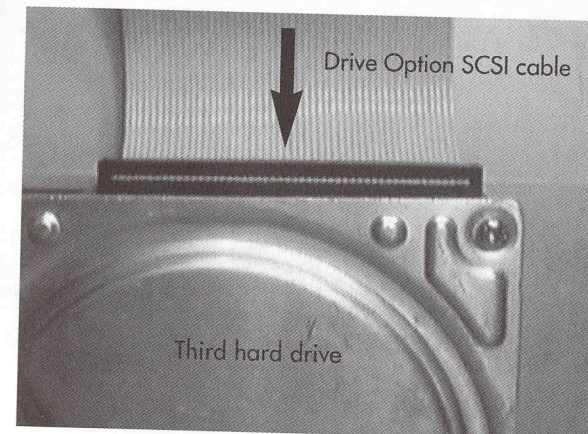


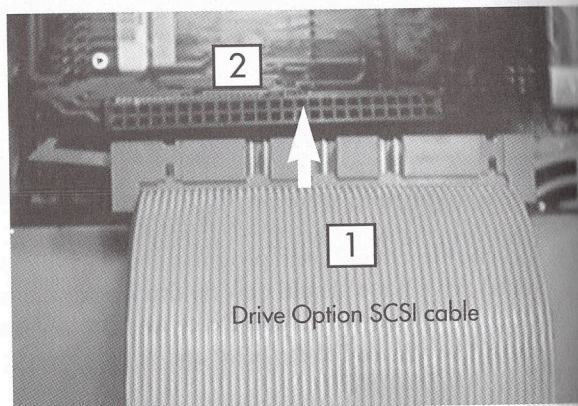
Figure 3C-7:  
Connect third hard drive SCSI connector to third hard drive



## MicroMac LC/LCII Power WorkStation

### Connect Drive Option SCSI Cable to Base Unit SCSI Cable

17. Once the Drive Option upgrade is configured to your requirements, connect the Drive Option SCSI cable to the Base Unit SCSI cable. Connect the expansion male connector on the Drive Option SCSI cable [1] to the expansion female connector on the Base Unit SCSI cable [2].



**Figure 3C-8:**  
Connect Drive Option  
SCSI cable to Base  
Unit SCSI cable

18. Congratulations! You have completed the Drive Option installation of the MicroMac LC/LCII Power WorkStation. If you plan to install the Power Option upgrade, proceed to the next section. If you are finishing the installation of the Base Unit then refer to the section entitled "Install the Chassis Extension" on page 3B-9.

## MicroMac LC/LCII Power WorkStation

Installing the Power Option upgrade of the MicroMac LC/LCII Power WorkStation involves installing the second power supply, auxiliary fan and power cables of the internal drives to the power distributor. The Power Option upgrades the MicroMac LC/LCII Power WorkStation with an additional power supply to simultaneously operate multiple drives, an accelerator and an Ethernet card.

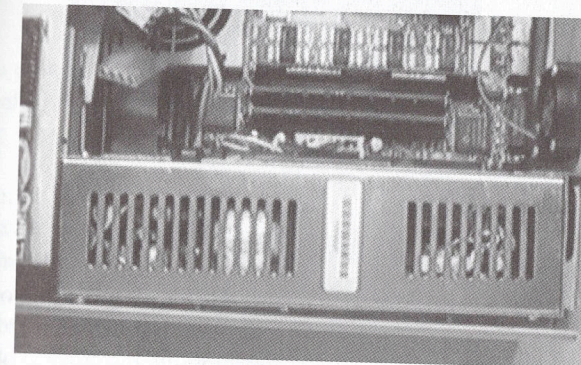
Installation takes approximately 15 minutes.

To install the Power Option upgrade of the MicroMac LC/LCII Power WorkStation please follow these steps:

1. Unpack the contents of the Power Option upgrade and locate the following items:

- Power supply
- Auxiliary fan
- Power distributor
- Power Option mounting hardware (screws, nuts, etc.)
- Power Option power supply cable

2. Install the power supply into the chassis extension. The power supply installs into the right rear location of the chassis extension. You may have to also remove a panel that covers the AC power receptacle port in the back of the chassis extension case.



**Figure 3D-1:**  
Power Option power  
supply installed in  
chassis extension

### Power Option Upgrade Installation

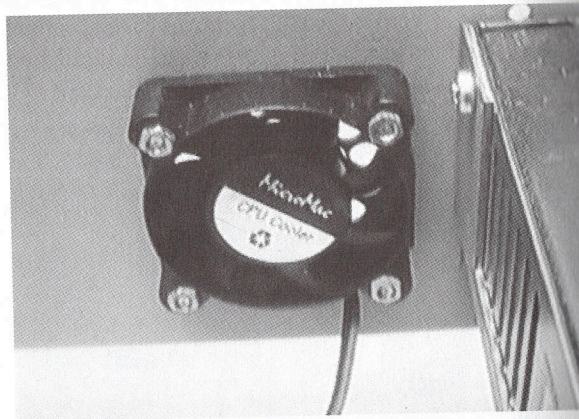
#### Hardware Installation

#### Power Option



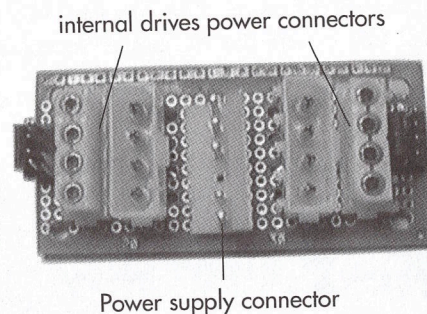
## MicroMac LC/LCII Power WorkStation

3. Install the fan inside the chassis extension over the circular vent holes by screwing the fan in place with the 4 nuts provided with the Power Option upgrade.



**Figure 3D-2**  
Power Option fan  
installed in chassis  
extension

4. Install the power distributor. Hook the power distributor to the power supply. Install the power cables from the internal drives (CD-ROM, Zip and third hard drive) to the connectors on the power distributor.



**Figure 3D-3:**  
Power distributor  
board

5. Install the Power Option power supply cable.
6. Congratulations! You have completed the Power Option installation of the MicroMac LC/LCII Power WorkStation. If you are finishing the installation of the Base Unit then refer to the section entitled "Install the Chassis Extension" on page 3B-9.

## MicroMac LC/LCII Power WorkStation

### Symptom:

**No start-up chime and/or screen remains black.**

### Explanation:

The MicroMac LC/LCII Power WorkStation is installed incorrectly. Please consult the following list of possible causes and remedies to isolate a particular installation problem.

### Possible Cause:

Improper installation of the dual-slot PDS adapter, MicroMac accelerator and/or Ethernet card

No power supplied to your Mac or chassis extension

Speakers not connected

No power to logic board

Floppy or hard drive(s) not connected properly

Other information

### Remedy:

Make certain the dual-slot PDS adapter is firmly seated in the PDS slot on the logic board. Also check to make sure the MicroMac accelerator and/or Ethernet card are firmly seated in their slots on the adapter.

Verify and correct the status of the power strip, power cable(s) and power switch(s). Check for fan and hard drive noise to verify that the Macintosh is powered on.

Check for audible (floppy or hard drive noise) or visual (screen booting signs)

Check power cables on logic board and/or power distributor board if the Power Option upgrade is installed.

Check power connection to floppy drive and/or hard drive(s).

Check the MicroMac accelerator manual for further troubleshooting hints or our Web site for the latest technical support information.

## Troubleshooting Guide

## Appendix A



## Glossary

<b>Apple Menu</b>	The menu indicated by the Apple symbol (🍏) from which you choose desk accessories and items from the Apple Menu Folder.
<b>Application</b>	A program that performs a specific task such as graphics, word processing, database management or accounting.
<b>Cache</b>	Pronounced 'cash'. Memory that acts like RAM, but faster. The computer stores its most frequently used instructions in cache.
<b>Control Panel</b>	A small program that allows you to adjust the Mac's operating features (such as desktop patterns, speaker volume or networking options).
<b>CPU</b>	Central Processing Unit. The "brains" of the computer that does most of the intensive operating calculations.
<b>Dialog Box</b>	A box that contains a message informing or requesting for information.
<b>Extension</b>	A file that expands the Mac's System software capabilities.
<b>FPU</b>	Floating Point Unit. A chip that takes over many of the operations of SANE and retrieves instructions straight from an application rather than having the CPU do all the work.
<b>Icon</b>	A graphical representation of a file or an application on the screen.
<b>INIT</b>	A small patching program that adds additional features to your operating system.
<b>KB</b>	Kilobyte (1024 bytes). An amount of memory that can express a text line of 1024 characters, or roughly half a typed page.
<b>MB</b>	Megabyte (1,048,576 bytes). An amount of memory equal to 1024K, or roughly 175,000 typed words.
<b>Menu</b>	A list of commands that appear when you select a menu title with the mouse pointer. To select a command, you drag through the menu, highlight a command and release the mouse button.

## Appendix B



## MicroMac LC/LCII Power WorkStation

<b>PDS</b>	Processor Direct Slot. An expansion slot available on some Macintosh computers, such as the Macintosh LC, for add-on cards.
<b>RAM</b>	Random Access Memory. Expandable memory where the Mac's operating system and applications are stored during power on, but will be lost at shut down.
<b>ROM</b>	Read Only Memory. Non-erasable memory with the Mac's basic operating code (such as Quickdraw).
<b>SANE</b>	Standard Apple Numerical Environment. Software routines for numeric operations (=, -, *, /...). Many operations performed by SANE can be taken over by a FPU.
<b>SCSI</b>	Small Computer System Interface (pronounced 'skuzzy'). An industry standard for a parallel bus interface.
<b>SIMM</b>	Single In-Line Memory Module. Memory add-ons to expand RAM.
<b>Trash</b>	An icon into which you put files to be deleted. You can also eject a disk by dragging it to the trash.
<b>Window</b>	An area that displays information (icons or files) on the desktop. You can move, resize, open and close a window as well as manipulate its contents while it is displayed.

## MicroMac LC/LCII Power WorkStation

-0, 1, 2, 3, 4, 5, 6, 7, 8, 9-

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3.5" drive SCSI connector	3C-1, 3C-4
4-pin male power connector	1-1, 1-3, 3B-1, 3B-4, 3B-8
5.25" drive	1-3, 3A-2, 3C-2-5
5.25" drive SCSI connector	3C-1, 3C-4

-A-

AC power receptacle	3B-11, 3D-1
accelerator	1-3-4, 2-1-2, 3A-2, 3B-1, 3B-10-11, 3D-1, A-1
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-B-

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Base Unit SCSI cable	1-1-2, 1-4, 2-2, 3B-3-5, 3C-4, 3C-6

-C-

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## MicroMac LC/LCII Power WorkStation

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workstation bezel

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-X-

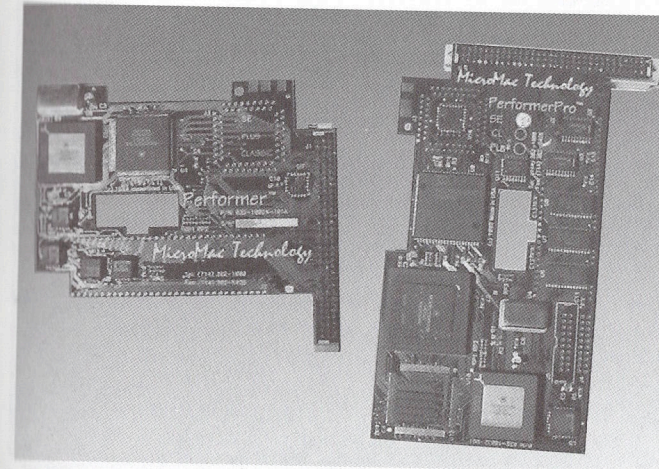
-Y-

-Z-

Zip drive

3A-2, 3B-8, 3C-1, 3C-3, 3D-2

## MicroMac Technology



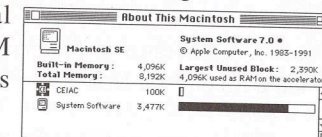
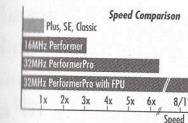
**MicroMac  
Performer &  
PerformerPro  
Accelerator**

For the Plus, SE & Classic:  
The MicroMac Performer & PerformerPro Accelerator

### Plenty of Speed for Your older Macintosh

The MicroMac Performer/PerformerPro accelerator line replaces the relatively low processing speed of the 7.8MHz 16-bit 68000 processor of the Macintosh Plus, SE or Classic with the high performance speed of a 32-bit 68030 processor. The accelerator is available in two speeds: the 16MHz Performer which boosts system performance up to 300% and the 32MHz PerformerPro with 64KB cache which boosts system performance up to 600%. Both accelerators accept an optional FPU (25MHz for the Performer and 32MHz for the PerformerPro) which increases math calculation speeds for spreadsheets and graphic programs up to 800%/1200% respectively.

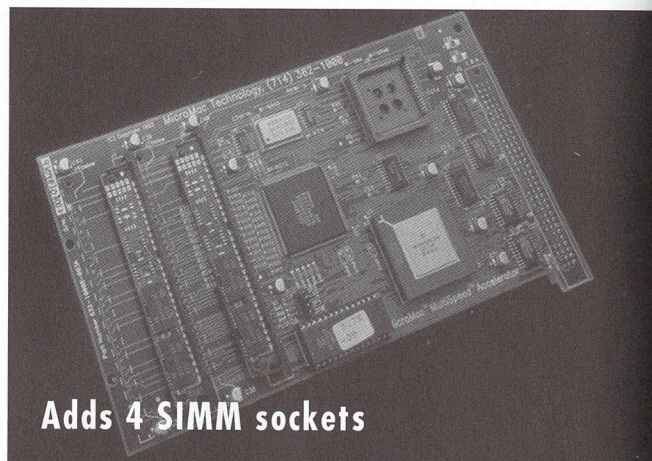
The Performer accelerator also allows you to go beyond 4MB of RAM by using Connectix's Compact Virtual Memory management software. With Compact Virtual, you can increase your total memory up to 16MB of RAM by utilizing your hard drive as Virtual Memory.





## MicroMac MultiSpeed Accelerator

# MicroMac Technology



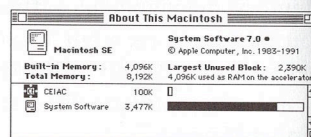
Adds 4 SIMM sockets

For the Plus, SE & Classic:  
The MicroMac MultiSpeed Accelerator

### Professional Power Computing

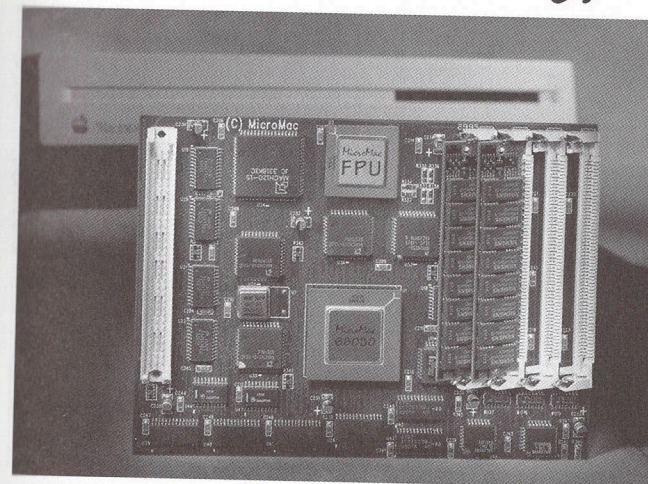
With today's CPU intensive and memory hungry applications, one can never have enough power or memory. With the MicroMac MultiSpeed accelerator, you can upgrade your Macintosh Plus, SE or Classic for the '90s and enjoy the benefits of increased application performance and accessing the Internet/World Wide Web. The MicroMac MultiSpeed accelerator combines the advantages of a powerful 32MHz 68030 processor with optional FPU, boosting CPU speeds up to 900% and math calculations up to 1200%.

Super fast performance is achieved by employing 60ns DRAMs in the four accelerator SIMM slots. Connectix's Compact Virtual 3.0.2 (required if you want to go beyond 4MB) combines your existing memory on the logic board with the memory on the accelerator for a total of 8MB or 20MB (16MB System memory and 4MB fast RAM disk). A Macintosh Plus, SE or Classic with the Multi-Speed accelerator is faster than a Macintosh IIfx.



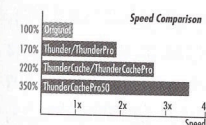
# MicroMac Technology

## MicroMac Thunder Series Accelerator

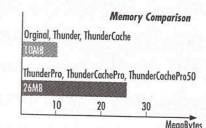


For the LC, LCII (Performa 400/405/410/430) & Color Classic:  
The MicroMac Thunder Series Accelerator

### Blazing Speed and Performance!



The MicroMac Thunder series line of accelerators offer the best hardware upgrade for your Macintosh LC, LCII Performa (400/405/410/430) or Color Classic. The plug and play power of the 32MHz 68030 **Thunder** accelerator with 16MHz 68881 FPU speeds up your Macintosh by 170% and math calculations up to 400%. With the 32MHz 68030 **ThunderCache** accelerator, your Macintosh's speed is increased up to 220% by utilizing a 32KB ultra-fast cache memory. If you add the optional 32MHz 68882 FPU, you boost the performance of such programs as spreadsheets and graphic rendering applications up to 700%.

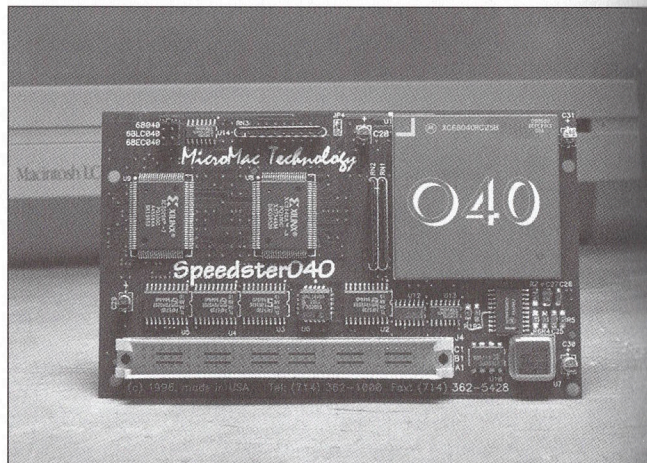


With the 32MHz 68030 **ThunderPro** or **ThunderCachePro** accelerators you break the 10MB barrier by loading the onboard SIMM slots with 1, 2 or 4MB SIMMs. And, for the ultimate in performance, the ThunderCachePro is also available at 50MHz for a 350% speed increase. Both the ThunderPro and ThunderCachePro are available with optional FPU.



# MicroMac Technology

## MicroMac Speedster040 Accelerator



For the LC & LCII (Performa 400/405/410/430):  
The MicroMac Speedster040 Accelerator

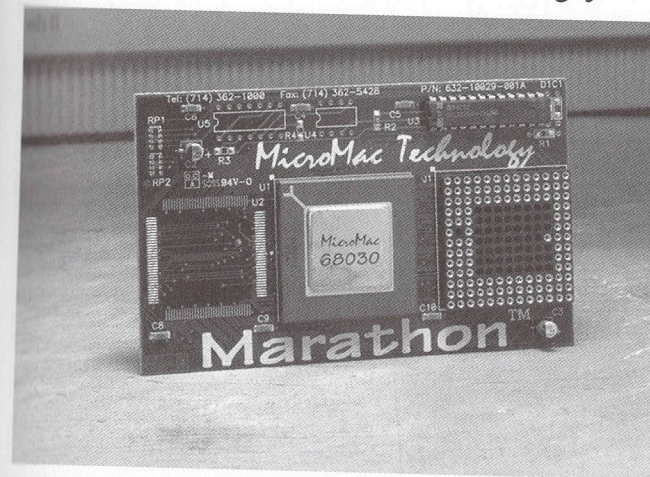
### Blazing '040 Performance

Today's software requires top-level performance from your Macintosh LC and LCII (Performa 400/405/410/430). With the MicroMac Speedster040 accelerator you receive 68040 power to perform a wide variety of tasks at an efficient pace. If you work extensively with QuarkXPress, Photoshop, Illustrator, Microsoft Word, Excel or accessing the Internet/World Wide Web then the Speedster040 is the accelerator specifically designed for your needs.

You receive all the benefits and power of 68040 software. With the 50MHz Speedster040 you will notice a speed boost of up to four times, outpacing the PowerPC 6100/7100/8100 in '040 emulation mode while running 68040 based applications. Better yet, the Speedster040 supports your older 68030 software as well. A few clicks of the mouse in the Speedster040 Control Panel and the accelerator is set to "downshift" to 68030 mode for your 68030 applications and utilities. With the Speedster040 you get the power you need today with the best upgrade value for your Macintosh LC and LCII (Performa 4xx).

# MicroMac Technology

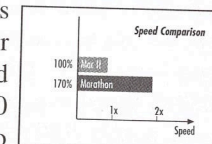
## MicroMac Marathon Accelerator



For the Macintosh II:  
The MicroMac Marathon Accelerator

### Economical Processing Power

The MicroMac Marathon accelerator is an economically priced accelerator for the Macintosh II. The increased speed of the Marathon's 32MHz 68030 processor runs your Macintosh II up to 170% faster. The enhanced speed makes working with large word processing and database files extraordinary easy. With the optional 16MHz 68882 FPU upgrade you can replace the slow 68881 FPU and increase the performance of math intensive work, such as spreadsheets, up to 200%.



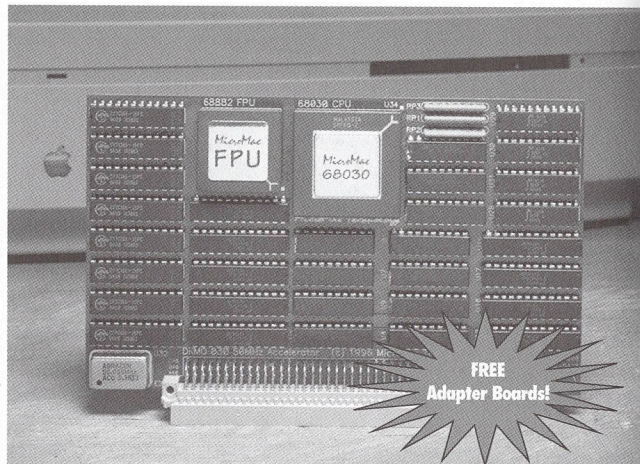
With the Marathon accelerator you can take advantage of the 68030's PMMU (Paged Memory Management Unit) and address more than 8MB of physical RAM or utilize Virtual Memory software such as RAM Doubler.

The Marathon accelerator installs easily into the CPU socket on the logic board. Simply unplug the 68020 processor from the CPU socket and install the Marathon accelerator in its place.



# MicroMac Technology

## MicroMac DiiMO 030 Accelerator



For the Mac II, IIfx, IIsi, IICx, IILx, IIVx, SE/30 & LCIII:  
The MicroMac DiiMO 030 Accelerator

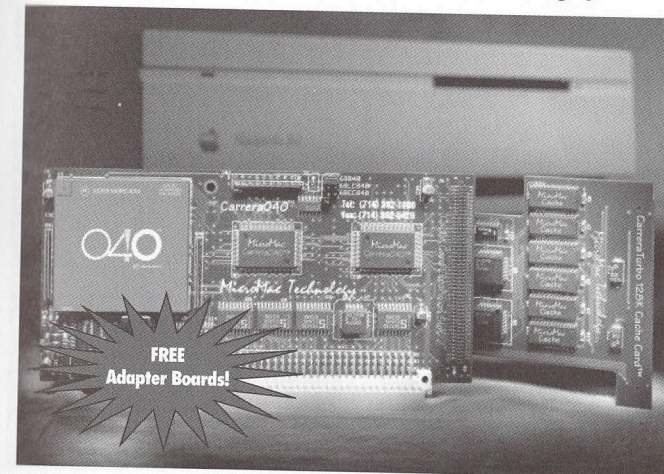
### *Raw 50MHz Horse Power!!*

The MicroMac DiiMO 030 accelerator offers exceptional speed, performance and value for your Macintosh computer. Once installed in your machine, it will give you 68040 speed and performance comparable to a Quadra 605 or Centris 650. The DiiMO 030 achieves its 68040 equivalent power and performance by employing a 64KB static RAM cache (which serves as a very high speed storage area for frequently used data) and Zero-wait state technology (which allows the CPU to perform operations without delays) to a fast 50MHz 68030 processor.

The DiiMO 030 accelerator is compatible with all standard software (such as System 7.5 and RAM Doubler) and hardware and is user-installable in minutes. The accelerator for the Macintosh IIfx (IIVx, IIVI, Performa 600) and LCIII plugs directly into the Processor Direct Slot (PDS) on the logic board. For the Macintosh IIsi and SE/30, the DiiMO 030 installs with an adapter board that plugs directly into the expansion slot. The DiiMO 030 for the Macintosh II, IICx and IILx installs with an adapter board that plugs into the CPU socket. The necessary adapter boards are included at no extra cost.

# MicroMac Technology

## MicroMac Carrera040 Accelerator



For the IIfx, IIsi, IICx & IILx:  
Carrera040 Accelerator & CarreraTurbo 128KB Cache Card

### *Quadra Speed and Power!!*

Just plug in the 66MHz or 80MHz Carrera040 accelerator and instantly get blazing performance from your Macintosh IIfx, IIsi, IICx or IILx. It's the smartest, fastest and most economical way to get a hot new Macintosh without buying a new one. And, it's hundreds of dollars less than comparable accelerators. With the 80MHz Carrera040 accelerator you notice the benefits and power of a 68040 CPU right away: screen redraws up to 7.3 times faster in Illustrator, Freehand, PageMaker and QuarkXPress; blazing special effects 4.9 times faster in Photoshop; lightning fast recalculations up to 8 times faster in Microsoft Excel; and screen scrolls 5.2 times faster in Microsoft Word.

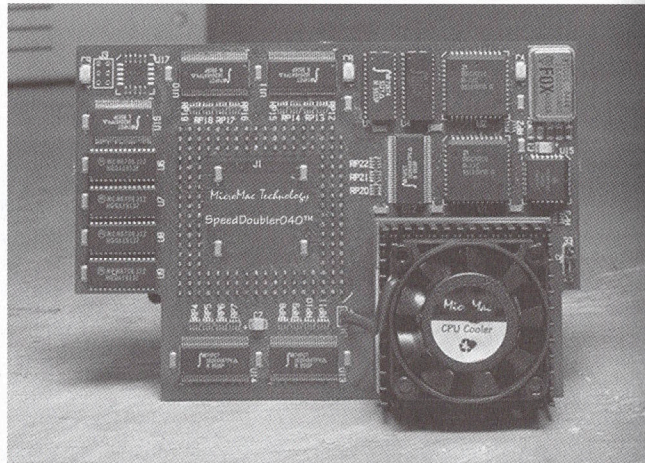
For added performance, purchase the CarreraTurbo 128KB Cache card. With the added benefits of cache, the performance of your Carrera040 accelerator increases by an additional 25%. The CarreraTurbo 128KB Cache card plugs directly onto the Carrera040 accelerator.

With the Carrera040 accelerator and CarreraTurbo 128KB Cache card, you will get the power you need today with the best upgrade value for your '030 Macintosh.



# MicroMac Technology

## MicroMac SpeedDoubler040 Accelerator



For the Quadra 700 & 900:  
The MicroMac SpeedDoubler040 Accelerator

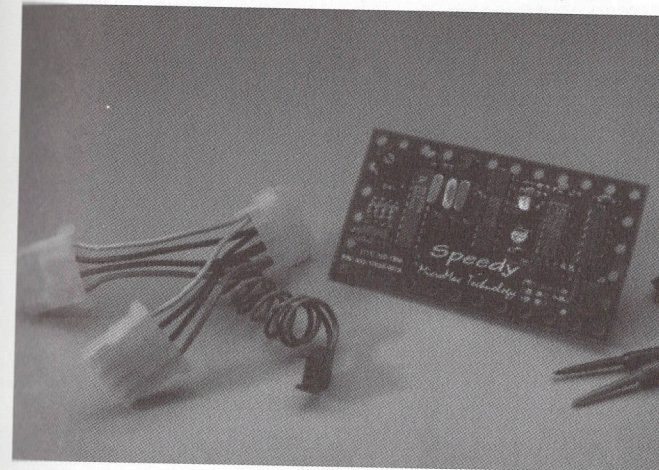
### Maximize Your Creative Time

The SpeedDoubler040 is the ultimate accelerator in speeding up your Quadra 700 or 900. The unsurpassed quality of the SpeedDoubler040 is ideal for such demanding tasks as extensive database management, word processing, multimedia and accessing the Internet/World Wide Web. With a 68040 processor running at 100MHz, 128KB cache and Zero-wait state technology, the SpeedDoubler040 is faster than a Power PC 6100/7100/8100 while running 68040 software in emulation mode. The FPU version of the SpeedDoubler040 boosts the performance of desktop publishing and 3D rendering programs that utilize an FPU. The performance of tasks as simple as recalculating a spreadsheet or as sophisticated as rendering a three dimensional object will increase up to 200%.

With its unique slot-free design the SpeedDoubler040 does not occupy any NuBus slots on your Quadra's logic board, thus allowing for added expandability. Simply unplug the 68040 processor from the CPU socket on the logic board of your Quadra 700 or 900 and insert the SpeedDoubler in its place.

# MicroMac Technology

## MicroMac Speedy Accelerator



For the IIsi, IIfx, Centris 610/650, Quadra & PowerPC:  
The MicroMac Speedy Accelerator

### Almost 100 Speedy Frequencies

The MicroMac Speedy accelerator offers the best price/performance of any variable speed CPU clock accelerator on the market. The Speedy clock accelerator replaces the fixed frequency clock oscillator of your Macintosh or PowerPC logic board with a Variable Frequency Oscillator (VFO). The increased speed of your new CPU clock runs your Macintosh or PowerPC between 115% and 150% of your original Macintosh's speed, allowing you to perform many routine tasks much faster.



With its unique frequency thumb wheel dial, you can fine tune the Speedy to your specific hardware and software environment. This feature allows you to adjust your Macintosh's CPU between a wide range of frequencies unlike other clip on crystal oscillators on the market today that are set for only one frequency.

The Speedy accelerator comes with all the necessary connectors to fit the supported Macintoshes and best of all, no soldering is required!



# MicroMac Technology

## MicroMac Mach10 Jet Accelerator



For the IIsi, Centris 610/650, Quadra and PowerPC:  
The Mach10 Jet Accelerator



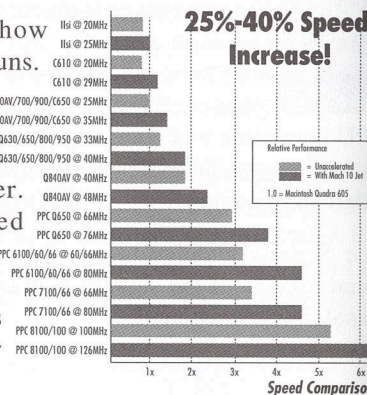
<sup>1/2</sup> Review in MacUser UK  
(3/31/95, Vol. 11 No. 7)

The Mach10 Jet is a simple "Plug-and-Play" accelerator for a wide variety of Macintosh computers that mounts on the clock chip inside your computer. It consists of a mounting clip (the Mach10 Jet itself) and an interchangeable clock chip. Also supplied is a fan and/or heatsink if your Macintosh requires extra cooling. The Mach10 Jet does not require any NuBus or PCI slots. Since it is a hardware solution that requires no external software, it is totally compatible with all Macintosh software.

You will be amazed how fast your Macintosh runs.

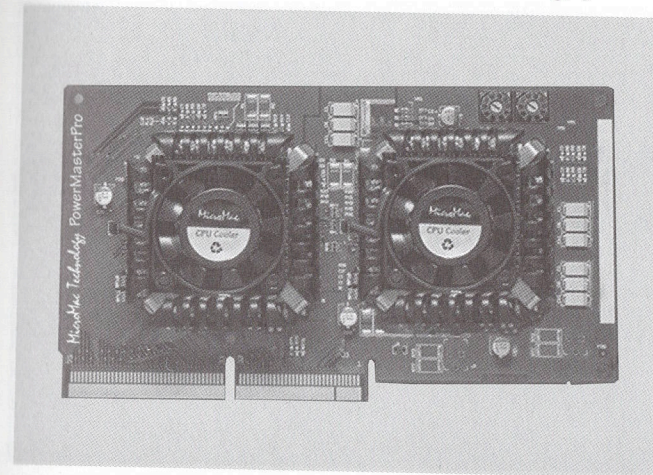
The bootup sequence is quick, windows fly open and applications run faster.

You will notice speed increases in all CPU intensive tasks, screen redraws and scrolls. Its just like owning a new Macintosh!



# MicroMac Technology

## MicroMac PowerMasterPro



For the PPC 73/75/76/85/86/95/9600 & most Mac clones:  
The MicroMac PowerMaster Accelerator

*World's Only Single 604e CPU Card  
Upgradable to Dual CPU Processing!*

The MicroMac PowerMasterPro accelerator introduces a revolutionary concept: Upgradability of the 604e processors on the accelerator card as your needs grow.

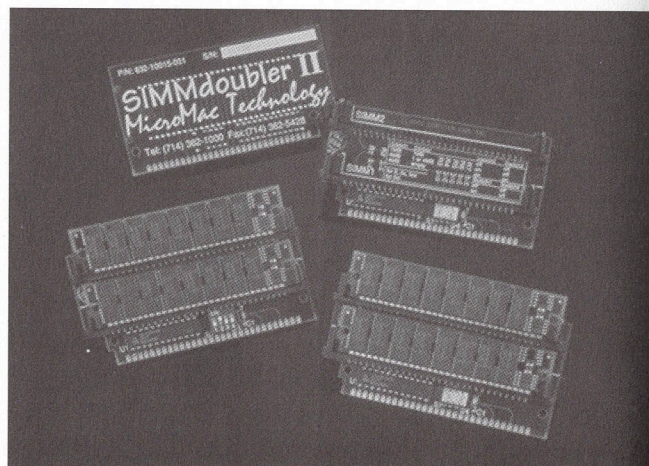
Instead of having the processor chip soldered onto the accelerator card, the PowerMasterPro accelerator employs a small user-installable plug-in board, called a granddaughter card, with a 604e processor. The PowerMasterPro allows you to install one or two granddaughter cards with 604e processors. The accelerator plugs into the Processor Card Slot on the logic board.

The clock generation circuitry of the PowerMasterPro produces a bus frequency from 40MHz to 70MHz, easily user-selectable in 1MHz steps through the adjustable speed thumbwheels on the board. This bus frequency is common to both processors. Each processor, however, can run at user-selectable, individual speed settings. For example, today you can start with a PowerMasterPro with one 250MHz processor and later add a second processor running at 350MHz, bringing the speed for dual processing applications to 600MHz!



# MicroMac Technology

## MicroMac SIMMdoubler II



For the Mac II, IIfx, IIsi, IICx, IIX, IIVx (IIVI, Performa 600) & IIfx:  
The MicroMac SIMMdoubler II

### Double Your Memory

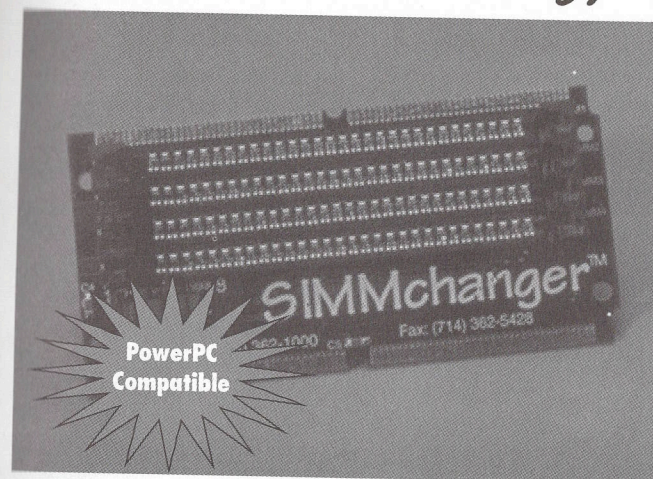
The MicroMac SIMMdoubler II consists of four boards. Each SIMMdoubler board plugs into one SIMM socket of your Macintosh logic board and provides two SIMM sockets. This effectively doubles your SIMM capacity and is the most cost effective solution to add physical memory to your existing DRAM.

#### SIMMdoubler II Benefits:

- **Increase your memory up to 64MB**  
Works with standard 1MB, 2MB, 4MB SIMMS.
- **Reuse your existing SIMMs**  
The SIMMdoubler II adds additional SIMM slots so you can use your existing memory.
- **Costly ROM exchange not required**  
Owners of the Macintosh II no longer need a ROM exchange to go beyond 8MB of memory.
- **Customize your memory configuration**  
The SIMMdoubler II allows you to build 2MB, 3MB, 4MB, 5MB and 8MB SIMMs by combining 1MB, 2MB and 4MB SIMMs in various configurations.
- Easy 10-minute installation.

# MicroMac Technology

## MicroMac SIMMchanger



For the Mac LCIII, Centris 610/650, Quadra 605/610/650 &  
PowerPC 6100/7100 (without internal CD ROM):  
The MicroMac SIMMchanger

### Re-use Your SIMMs

The MicroMac SIMMchanger converts your existing 8-bit 30-pin SIMMs into one 32-bit 72-pin SIMM for use in the new Macintosh Centris, Quadra and PowerPC models.

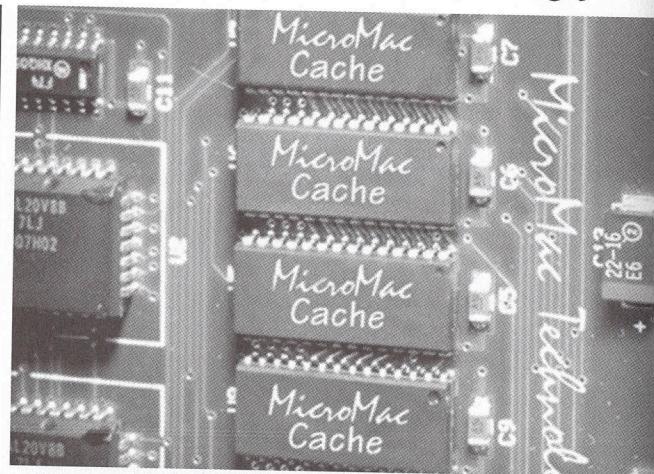
#### SIMMchanger Benefits:

- **Re-use your existing SIMMs**  
Save by converting SIMMs that you may have from your older Macintosh such as a Macintosh II series or Plus, SE or Classic.
- **Perfect upgrade for the Quadra or PowerPC**  
The SIMMchanger is compatible with a wide range of Macintosh computers, including the PowerPC 6100 and 7100 (without internal CD ROM).
- **Easy 10-minute installation**  
As easy as adding SIMMs. Just populate the SIMMchanger with four 30-pin SIMMs, set the configuration jumpers and plug the SIMMchanger into the 72-pin SIMM socket of the logic board of your Macintosh or PowerPC. Its that easy!



# MicroMac Technology

## MicroMac Cache Cards



For Select Macintosh II Series and Quadras:  
MicroMac Cache Cards

### *High-Performance Cache*

MicroMac Cache cards are economical for every type of CPU intensive processing: from home finances and business productivity applications to graphic programs and games. With a MicroMac Cache card you speed up many operations on your Macintosh, such as CPU throughput, accessing frequently used data, performing complex image filtering and effects and spell checking documents. Cache is used to store frequently used information and data so the next time you perform a task, the computer retrieves the information from the quick, high performance cache instead of the computer's RAM where information is processed at a slower rate.

The Slot-Free Cache cards install into the CPU socket on logic board of your Macintosh. You simply remove the processor, insert the Cache card into the CPU socket and replace the processor into the socket connector on the Cache card.

The PDS Cache cards install into the Processor Direct Slot (PDS) on the logic board of your Macintosh.



## MicroMac Technology

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