# 3 Installing the Mpower 4 plus, System Memory, CPUs, and Peripherals

This section explains how to install the Mpower 4 plus system board, SIMMs, CPUs, and peripherals.

***Warning:***
***Before installing or removing any peripherals or components, make sure you have a clear work space and you adhere to all anti-static precautions described on page 2-1. Micronics recommends only trained technicians operate on the system board. Damage which occurs to the board, while adding or removing peripherals or components, may void the warranty.***

***If problems arise while installing peripherals, contact the computer outlet where you purchased the peripheral or Micronic's Technical Support Department.***

# Installation of the Mpower 4 plus

The installation of the Mpower 4 plus system board depends on the type of case you are using. The Mpower 4 plus is an integrated, low profile LPX system board and should be limited to installation in a low profile chassis.

Prior to installing the Mpower 4 plus, make sure you have a clear work space available and adhere to all anti-static precautions.

If you are unfamiliar with installing a motherboard, it is highly recommended you read the computer user's manual or contact your dealer's technical support department.

## Tools Required

Micronics recommends using the following tools to install the Mpower 4 plus:

- Small Phillips screwdriver.
- Tweezers or a pair of needle-nose pliers.
- Tray (to hold loose screws).

## Equipment Required

Micronics recommends using the following equipment with the Mpower 4 plus for a typical configuration:

- LPX or Low Profile Chassis.
- A high quality power supply capable of providing continuous power within a 5 volt range, plus or minus 5% (eg. 4.75 to 5.25). A power filter may be added for areas with noisy transmission.
- VGA monitor with a 15-pin connector.
- PS/2 or compatible keyboard.
- Eight ohm speaker.
- Standard ribbon cables for internal connections.
- Standard power cord (grounded).
- Heat-sink with cooling fan for each CPU (if needed).

# System Memory

System memory devices, commonly known as SIMMs (Single Inline Memory Modules), are necessary to operate the Mpower 4 plus system board. The Mpower 4 plus has four banks of DRAM, which provide a maximum of 64MB using 1Mx32, 1Mx36, 4Mx32, or 4Mx36 SIMMs.

## Memory Configuration

Table 3-1 lists the possible memory size configurations. The BIOS automatically detects the amount of memory installed.

| Bank 0 | Bank 1 | Bank 2 | Bank 3 | Total |
|---|---|---|---|---|
| 1MB | | | | 1MB |
| 1MB | 1MB | | | 2MB |
| 4MB | | | | 4MB |
| 1MB | 1MB | 4MB | | 6MB |
| 4MB | 4MB | | | 8MB |
| 1MB | 1MB | 4MB | 4MB | 10MB |
| 4MB | 4MB | 4MB | | 12MB |
| 4MB | 4MB | 4MB | 4MB | 16MB |
| 16MB | | | | 16MB |
| 1MB | 1MB | 16MB | | 18MB |
| 4MB | 16MB | | | 20MB |
| 4MB | 4MB | 16MB | | 24MB |
| 16MB | 16MB | | | 32MB |
| 4MB | 16MB | 16MB | | 36MB |
| 4MB | 4MB | 16MB | 16MB | 40MB |
| 16MB | 16MB | 16MB | | 48MB |
| 16MB | 16MB | 16MB | 16MB | 64MB |

**Table 3-1 Memory Configuration**

## Installing the SIMMs

With the SIMMs installed, memory can be increased up to 64MB. To install the SIMMs, first locate the four memory banks on the system board. Start with the bank marked “0”, then work your way up (0, 1, 2, 3).

Perform the following steps to install the SIMMs:

1. Hold the SIMM so that the NOTCHED edge is pointing toward the ISA slots (refer to Figure 2-1).

2. Insert the SIMM at a 45 degree angle.

3. Gently push the SIMM to an upright position until it “snaps” into place (past the release tabs).

The SIMM is ready to operate when it is firmly seated in the socket.

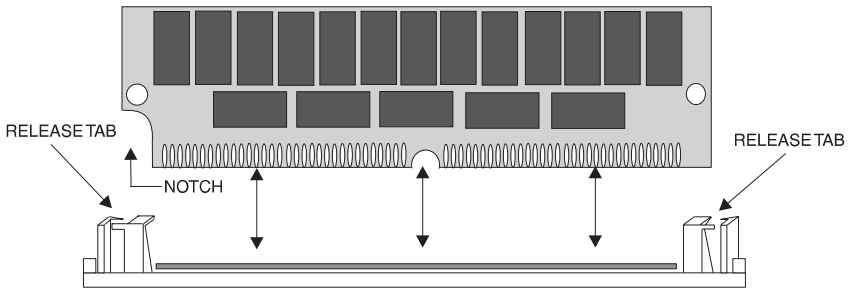


**Figure 3-1 Installing a SIMM**

## Removing SIMMs

Perform the following steps to remove SIMMs, if necessary:

1. With both thumbs (or fingers), press the release tabs away from the socket.

2. With the SIMM free from the release tabs, lift the module up and place in an anti-static bag or package.

# Installing the Upgrade *OverDrive* CPU

The Mpower 4 plus is specifically designed to support the Intel Clock Doubling 486DX2 CPU or the *OverDrive* processor. Perform the following steps to install an upgrade processor:

1. Locate the ZIF socket on the board (Figure 3-2).

2. Lift the lever of the socket.

3. Insert the new processor into the socket. Make sure pin 1 on the CPU lines up with pin 1 on the socket. Refer to Figure 3-2 for pin 1 location.

4. Push the lever down to its original position.

5. Configure the board using the tables in Chapter 2.

The new CPU is now ready to operate. The system board detects the installed CPU after it is inserted and configured.

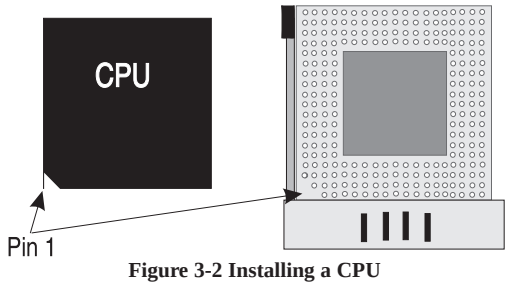


**Figure 3-2 Installing a CPU**

***Warning:***
***If the new processor includes a heat sink or cooling fan, be certain to install the device according to the manufacturer's instructions. Failure to provide adequate cooling of the processor may seriously affect system performance or cause permanent damage.***

# Installing Cache Memory

The Mpower 4 plus supports 8K of four-way associative cache in the microprocessor. Level 2 cache is also available to provide 64K, 128K, or 256K of direct mapped cache.

## 64K of Level 2 Cache

For 64K bytes of level 2 cache, install eight 8Kx8-20ns SRAMs into sockets U56, through U58, U60, and U67 through 70. Install an 8Kx8-20ns SRAM into U34 for Tag RAM and an 8Kx8-20ns SRAM into socket U61 for write-back cache mode. Leave U61 empty for write-through mode. After installing the cache, refer to tables 2-7 and 2-10 for the correct jumper settings.

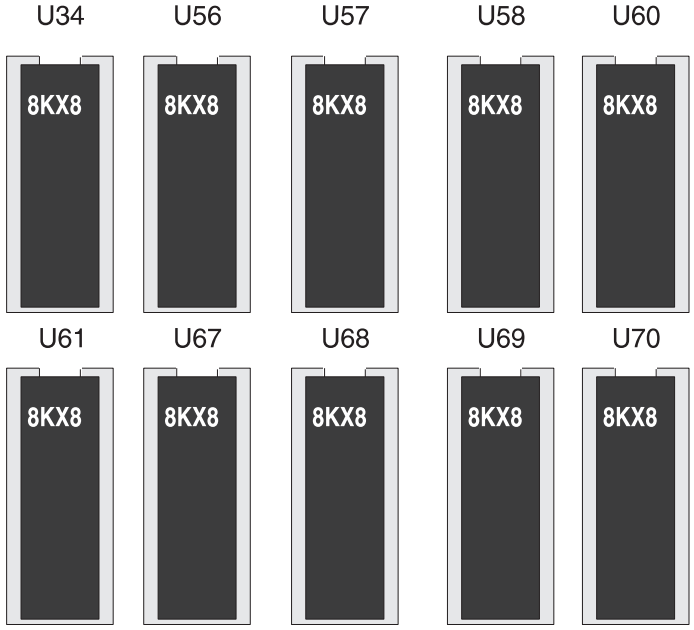


**Figure 3-3 Installing 64K of Level 2 Cache**

*Note:*
*Make sure the notches on SRAMs match the notches on the sockets.*

## 128K of Level 2 Cache

For 128K bytes of level 2 cache, install four 32Kx8-20ns SRAMs into sockets U56 through U58 and U60. Install a 32Kx8-20ns SRAM into U34 for Tag RAM and a 32Kx8-20ns SRAM into socket U61 for write-back mode. Leave U61 empty for write-through mode. After installing the cache, refer to tables 2-7 and 2-10 for the correct jumper settings.

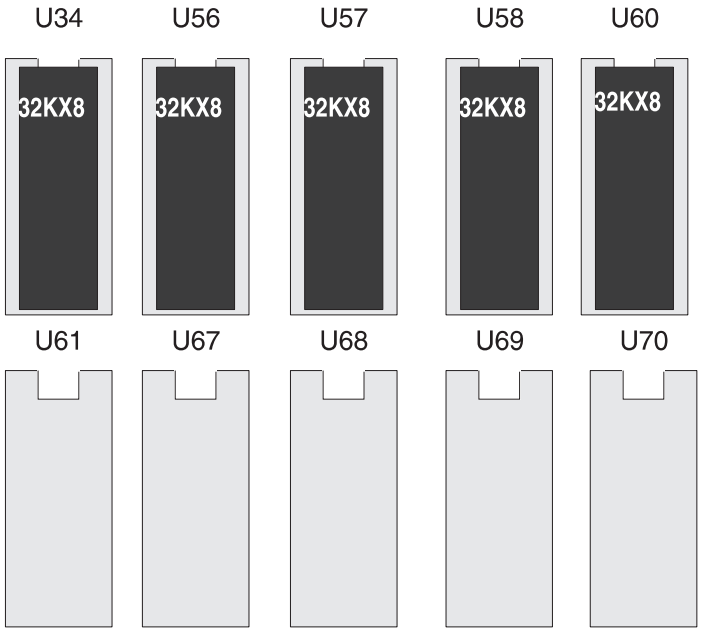


**Figure 3-4 Installing 128K of Level 2 Cache**

*Note:*
*Make sure the notches on SRAMs match the notches on the sockets.*

## 256K of Level 2 Cache

For 256K bytes of level 2 cache, install eight 32Kx8-20ns SRAMs into sockets U56 through U58, U60, and U67 through U70. Install a 32Kx8-20ns SRAM into U34 for Tag RAM and a 32Kx8-20ns SRAM into socket U61 for write-back mode. Leave U61 empty for write-through mode. After installing the level 2 cache, refer to tables 2-7 and 2-10 for the correct jumper settings.

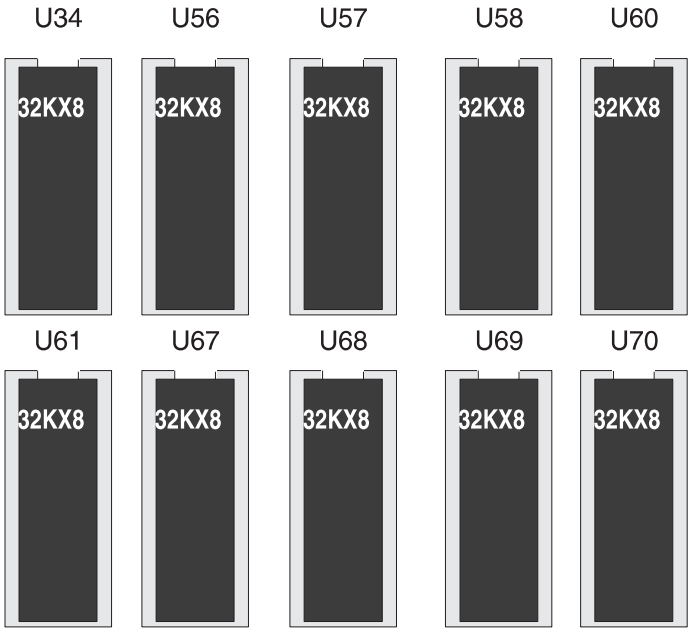


**Figure 3-5 Installing 256K of Level 2 Cache**

*Note:*
*Make sure the notches on SRAMs match the notches on the sockets.*

# Installing Video Memory

The Mpower 4 plus has 1MB of video memory installed on-board. An additional 1MB of memory can be installed to provide faster video performance. For the additional 1MB of video memory, install two 256K x 16-60ns video memory chips into locations U310 and U311.

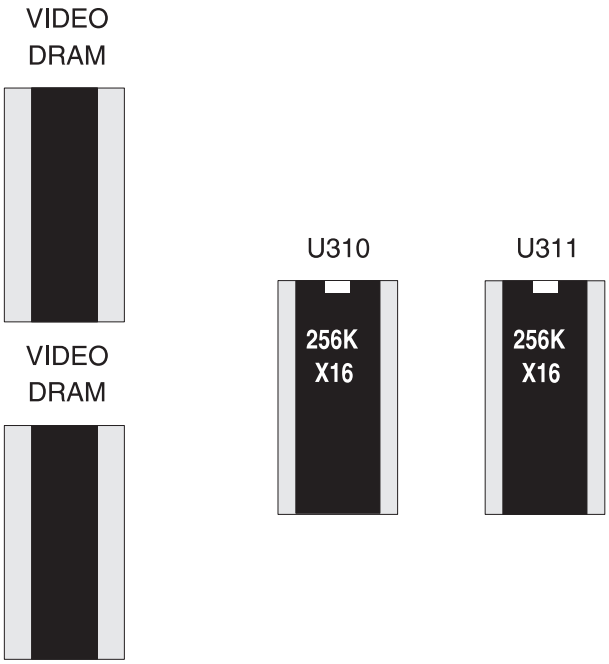


**Figure 3-6 Installing Video Memory**

*Note:*
*Make sure the notches on the video memory match the notches on the sockets.*

# Installing a VL-Bus Riser Card

The Mpower 4 plus may include a riser card if the board is installed in a chassis. If the system board is not installed in a chassis, perform the following steps to install the riser card:

1. Locate the unused VL-Bus slot and ISA slot (refer to Figure 2-1).

2. Make sure no peripherals are installed on the riser card.

3. Insert the card with the bottom edge level. **Never insert the card at an angle.**

4. Holding the card at the center of the top edge, gently push straight in. Do not force the card. If it does not fit, take it out and try again.

5. Make sure the card is fully inserted.

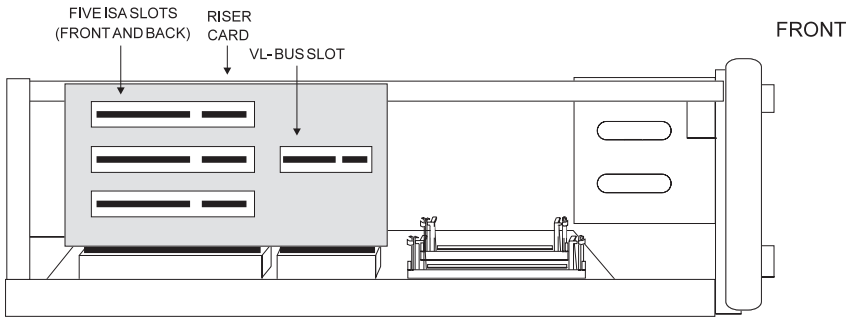


**Figure 3-7 Inserting a VL-Bus Riser Card**

# Installing a VL-Bus Card

Micronics VL-Bus slot accommodates most VESA-approved Local Bus cards. The VL-Bus video card is installed onto the riser. Perform the following steps to install a VL-Bus Card

1. Power off the computer system and remove the computer cover.

2. Choose an unused VL-Bus slot on the riser card.

3. Insert the card with the bottom edge level. **Never insert the card at an angle.**

4. Holding the card at the center of the top edge, gently push the card straight down. Do not force the card in place. If it does not fit, take it out and try again.

5. Make sure the card is fully inserted.

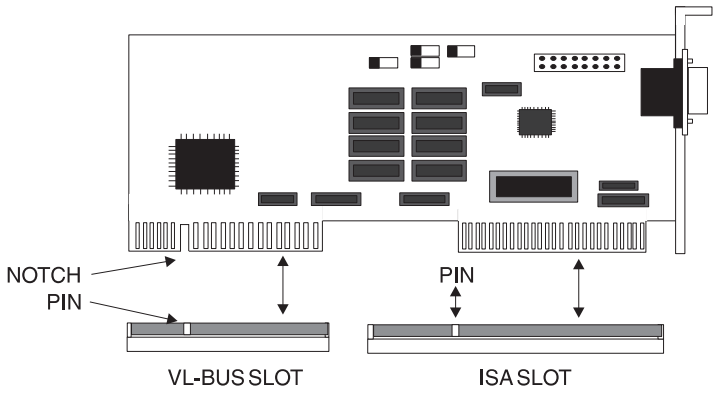


**Figure 3-2 Inserting a VESA Local Bus Card**

*Note:*
*Always refer to the computer user guide for additional instructions concerning installation. Make sure the VESA Local Bus card is configured to accommodate the computer.*