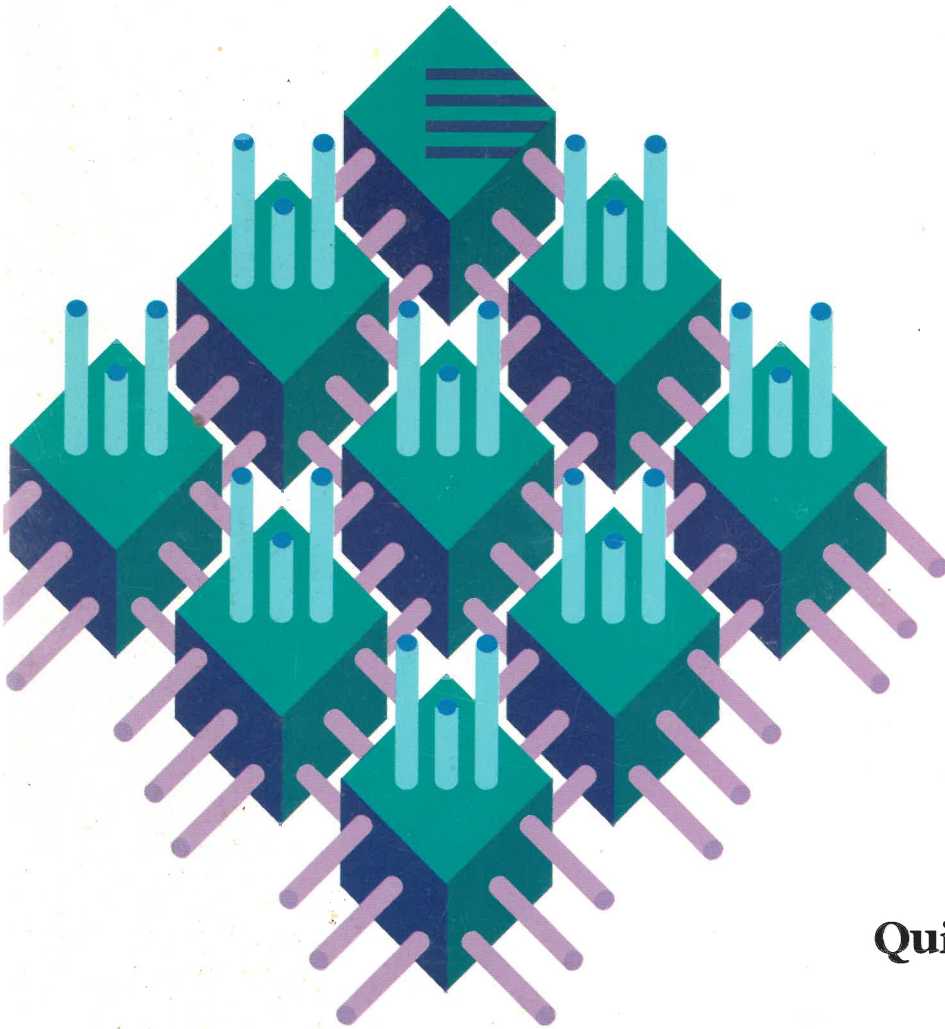
Acculogic

# SIMMply-RAM™
## For the PS/2-16



## Quick Start Guide

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# SIMMply-RAM™
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Acculogic Inc., 13715 Alton Parkway, Irvine, CA 92718
First Edition September 1991 SIMMply-RAM is a trademark of Acculogic Inc.

# Introduction

Your SIMMply-RAM™ for the PS/2-16 lets you add up to 32 MB of memory to your PS/2 Model 50 series or 60 series computer, or any 16-Bit Micro-Channel compatible system. You can use 1-, 2-, 4-, or 8-MB IBM compatible Single In-Line Memory Modules (SIMMs) to add memory to your SIMMply-RAM board. You can mix SIMM types on the same board to add just the right amount of memory for your needs. The 16-bit SIMMply-RAM board is designed to be used in any 16-bit Micro Channel expansion slot.

SIMMply-RAM can be used to add *extended* and/or *expanded* memory to your system.

- *Extended memory* is added to the memory in your system so you can run large operating systems like IBM's Operating System/2™ (OS/2™), Xenix, Novell Netware®, and others that directly access extended memory. Extended memory is also used by MS-DOS 5.0 and Windows 3.0.
- *Expanded memory* works with MS-DOS to break the 640-KB barrier. Expanded or paged memory allows applications to swap memory pages in and out of the 640 KB of base (or conventional) memory. SIMMply-RAM supports the latest version of the Lotus® /Intel® /Microsoft® Expanded Memory Specification (LIM EMS Version 4.0), which provides all you need to run Microsoft Windows, Lotus, and many other applications that use EMS memory.

## SIMMply-RAM Software

The software included with your SIMMply-RAM board automatically configures your system to recognize the added memory. For operating systems other than MS-DOS, the SIMMply-RAM memory is automatically installed as extended memory. For MS-DOS systems, the INSTALL program lets you allocate the added memory as extended and/or expanded memory — any way you choose.

SIMMply-RAM's Productivity Utilities increase and add functionality to your system. The Productivity Utilities, which include RAM disks, a print spooler, and a disk cache, can be run in system memory, extended memory, or expanded memory.

## Using the Manuals

This *Quick Start Guide* is to help you get your hardware and software installed and up and running quickly. It steps you through installing the hardware, configuring the system, and installing the SIMMply-RAM software.

Each step in the *Quick Start Guide* is covered in greater detail in the *SIMMply-RAM Reference Manual.* So, if you need a more detailed discussion of one or more steps, just look it up in the *SIMMply-RAM Reference Manual.*

## README FILE

Before you go through the installation steps, check your SIMMply-RAM program diskette for a README file that contains any last minute information about the SIMMply-RAM product. If a README file is not on the diskette, no additional information is needed.

You can display the README file on the screen using the DOS TYPE command. You can print a hardcopy version of it using the DOS PRINT command.

# Hardware Installation

Before you begin installing the SIMMply-RAM board, turn your computer OFF; then ON to be sure that it is solidly configured for operation. No error numbers should be displayed when the system is booted. If error numbers are displayed, refer to the manual you received with your system to correct the problem.

## Adding SIMMs

To add memory to the SIMMply-RAM board, install 1-, 2-, 4-, or 8-MB IBM-compatible SIMMs before you insert the board in the computer. You can add one or more SIMMs to the SIMMply-RAM in any available socket. You can also mix types of SIMMs on the board as long as they are compatible with the SIMMs referenced in Table 1.

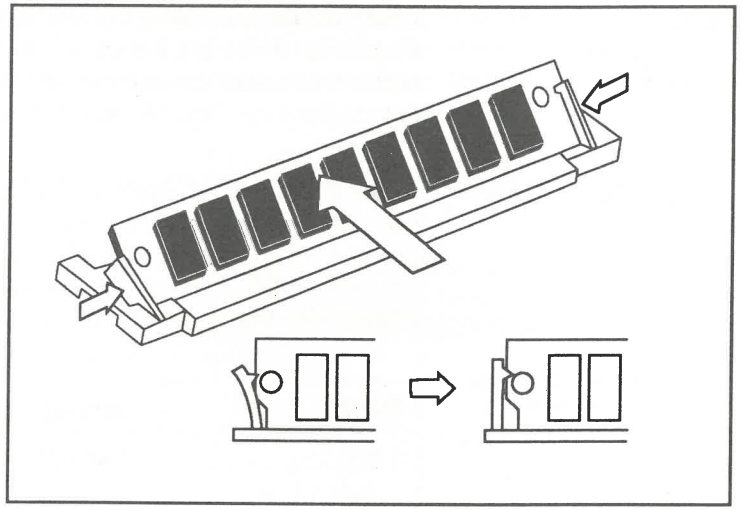
**Table 1. SIMM Part Numbers**

| SIMM | Acculogic PN | IBM PN |
|---|---|---|
| 1 MB | SSP-010 | 450603 |
| 2 MB | SSP-020 | 6450604 or 6450608 |
| 4 MB | SSP-040 | 87F9977 |
| 8 MB | SSP-080 | |

Figure 1 illustrates the correct method of installing a SIMM on the SIMMply-RAM board.

**CAUTION:** To avoid possible damage to the board from static be sure to handle it by the top and bottom edges. Be careful not to touch any of the components on the board.

**Figure 1. Adding a SIMM to the Board**



1. Turn off your system; remove peripherals and cables; and remove the cover of your computer.
2. Follow the instructions in the manual supplied with your computer to insert the SIMMply-RAM board in a free expansion slot. In PS/2 Models 70, 80, and 90, you should install the board in a 16-bit expansion slot.

**CAUTION:** Expansion boards must be aligned straight into the system board connector. Take care to firmly seat the board and ensure it is aligned correctly. Failure to do so may result in damage to the system board.

3. Secure the board by tightening the expansion slot screw on the outside panel.
4. Reassemble the computer.

# System Configuration

Once the SIMMply-RAM is installed in the computer, the system must be configured to include the board and the additional memory. You use the IBM-supplied Reference Diskette and the SIMMply-RAM diskette to configure the system.

**NOTE:** Be sure your IBM Reference Diskette is version 1.03 or higher. Earlier versions of the IBM Reference Diskette do not support adapter description programs required by the SIMMply-RAM software.

The screens used to illustrate the configuration in this section are from Version 1.10 of the IBM Reference Diskette. The screens you observe on your computer may vary slightly.

System configuration consists of two steps:

1. Copying the configuration files from the SIMMply-RAM diskette to your IBM reference diskette.
2. Configuring your SIMMply-RAM board and system.

Follow these steps to copy the configuration files and perform the system configuration.

1. Insert the IBM Reference Diskette once the SIMMply-RAM board is installed in the computer and the computer is reassembled.
2. Turn on the computer.

   The IBM logo screen is displayed.
3. Press **<Enter>**, which will result in the Adapter Configuration Error — 00165 screen being displayed. See Figure 2.
4. Type N, which displays the Main Menu. See Figure 3.

**CAUTION:** You must answer **<N>**, even though you have installed a new adapter. Answering **<N>** allows you to copy the configuration files before configuring your system. If you can answer **<Y>** to this screen, you can configure your system, but your system Reference Diskette will not be to include the SIMMply RAM configuration files.

**Figure 2. Error 00165 Screen.**

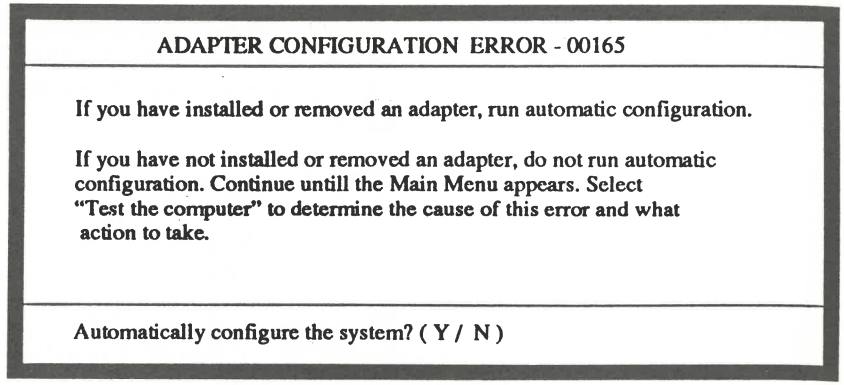
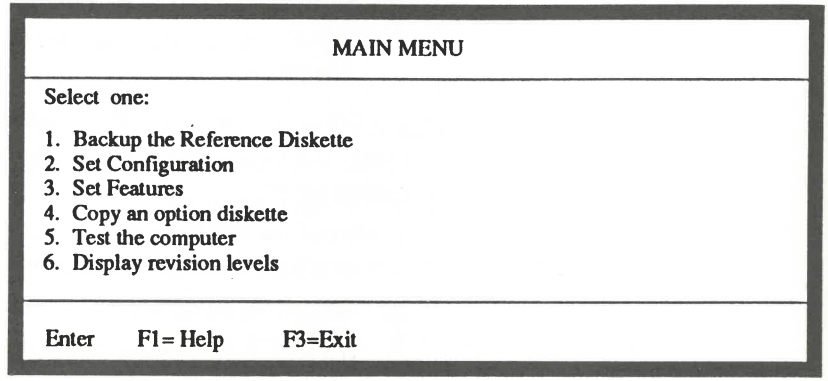
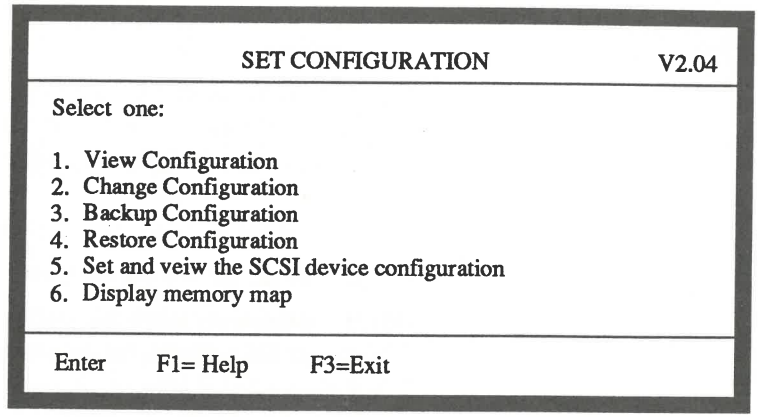



**Figure 3. Main Menu.**




5. Select "Copy an option diskette", which displays a window that asks you to insert the option diskette (the SIMMply-RAM diskette).
6. Insert the SIMMply-RAM diskette. The configuration information is read, and then you are asked to insert the IBM Reference Diskette.
7. Insert the IBM Reference Diskette. Once the configuration information is copied to the diskette, the Main Menu is again displayed.
8. Select "Set Configuration", which causes the configuration to be updated using the information from the SIMMply-RAM diskette. Once the action completes, the Set Configuration screen is displayed. See Figure 4.

**Figure 4. Set Configuration Screen.**

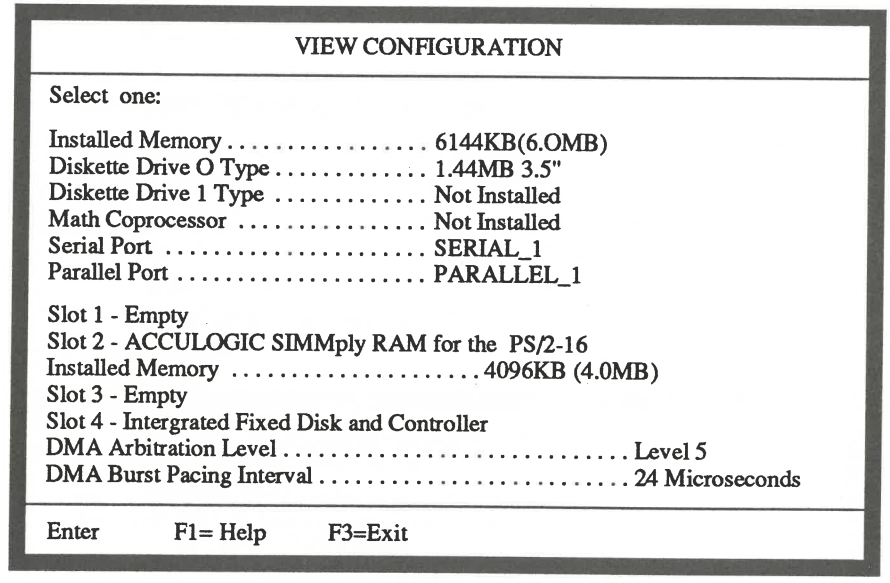



9. Select "View Configuration" to verify that the information about the SIMMply-RAM board is recorded. On the View Configuration screen (Figure 5), look for the following information:

   ACCULOGIC SIMMply RAM for the PS/2-16

   Then verify that the "Installed Memory" corresponds to the amount of added memory you added to your board.

**Figure 5. View configuration Screen.**



10. Press **<F3>** to exit the screen; the Set Configuration screen is then displayed.
11. Press **<F3>**, which causes an Information window to be displayed over the Set Configuration screen. This window explains that you have made configuration changes and must press Enter to restart the computer and activate the changes.
12. Remove the IBM Reference Diskette and then press **<Enter>**.

    This action reboots the computer and activates the new configuration.

**NOTE:** If you want to use the SIMMply-RAM memory as extended memory, you are finished with the installation and configuration.

If you want to use any part of the SIMMply-RAM memory as expanded memory or to use any of the memory management services, complete the Software Installation instructions in the subsequent section.

# Software Installation

For MS-DOS systems, you must assign a memory type — either expanded or extended — to all or part of the memory you installed. The simple menus of the INSTALL program on the SIMMply-RAM diskette let you install the memory manager software, configure the memory, and install the Productivity Utilities supplied on the diskette. These three utilities set up RAM disks, set up a print spooler, and set up fixed disk caching.

## Running Install

As a result of the INSTALL program, the CONFIG.SYS and AUTOEXEC.BAT files will be changed so the software is loaded whenever you boot the system. Before the installation changes are written to those files, the INSTALL program automatically backs them up (creating CONFIG.BAK and AUTOEXEC.BAK files). In case you need to restore the original files at some point, you can rename those backup files. To run the INSTALL program:

1. Insert the SIMMply-RAM diskette in drive A.
2. Type the following: **A:INSTALL<Enter>**
3. When the copyright screen is displayed, press any key to go to the next screen: the Copy Utilities Screen.

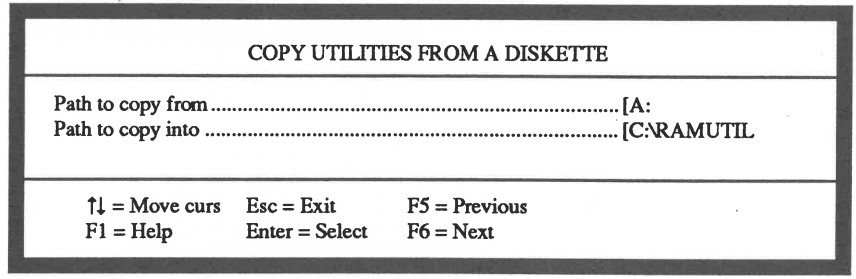
## Copy the Files

The automatic copying of files is set up to copy the SIMMply-RAM software from the A diskette drive to a subdirectory on the C drive. Figure 6 shows the Copy Utilities Screen.

1. If you want to change the path for the source , type the changed path and press **<Enter>**. Otherwise, just press **<Enter>**.
2. If you want to change the path for the destination, type the changed path and press **<Enter>**. Otherwise, just press **<Enter>**.

**NOTE:** The INSTALL program modifies the CONFIG.SYS and AUTOEXEC.BAT files on the boot disk to automatically start the memory manager and utility programs. If those two files are not found on the root directory, they are created by the INSTALL program.

**Figure 6. Copy Utilities Screen.**



## Setup Memory Configuration

The Setup Memory Configuration screen is displayed after the Copy Utilities Screen. Using the fields on this screen, you will allocate memory as extended or expanded.

The Productivity Utilities can use either expanded or extended memory, but system performance is maximized if they are set up in expanded (EMS) memory.

Before you make changes to this screen, read the following sections that explain the standard keyboard controls and conventions that are common throughout the INSTALL program. You need to be aware of these as you use the program.

## Keyboard Controls

On the Setup Memory Configuration Screen and all other screens of the INSTALL program the keyboard controls are listed in a box near the bottom of the screen. Explanations of these keyboard controls are given in Table 2.

**Table 2. Keyboard Controls.**

| Key=Function | Meaning |
|---|---|
| ↑↓ =Move Curs. | Press the up and down arrows to move between the selection fields on the menu screens. |
| F1=Help | Press **<F1>** on any menu screen to see "help" information about the menu selections displayed on that screen. |
| Esc=Exit | Press **<Esc>** to leave a specific menu screen. |
| | When you press **<Esc>** from a submenu (displayed as a result of a Main Menu selection), the Main Menu is again displayed. |
| | When you press **<Esc>** from the Main Menu, the INSTALL program is ended. |
| Enter=Select | To select the choice displayed in the selection field (highlighted box) and move down to the next selection field, press **<Enter>**. |
| F5=Previous | Press **<F5>** in a selection field to display the previous choice. Only certain values are allowed in the fields. Using the **<F5>** and **<F6>** keys, you can display the entire list of choices for any given selection field. |
| F6=Next | Press **<F6>** in a selection field to display the next choice. Only certain values are allowed in the fields. Using the **<F5>** and **<F6>** keys, you can display the entire list of choices for any given selection field. |

## Install Conventions

The following conventions are used throughout the INSTALL program:

- On the screens displayed, the fields that you can change are always enclosed in square brackets **([])**.
- Other entries and the Memory Use Table on the screens cannot be changed. The Memory Use Table automatically changes the memory available and in use whenever you make a configuration choice.
- Once you complete the screen entries and press **<Esc>** to return to the Main Menu, the selection bar is displayed on the next item below the previous one selected.
- To select an item on the Main Menu, move the highlighted selection bar to your choice and press **<Enter>**. A screen for that choice will then be displayed.

## Memory Types

On the various utility screens, you must select the Memory Type in which to install that utility. This field offers the same four choices: None, System, EMS, and Extended. These choices are briefly defined in Table 3.

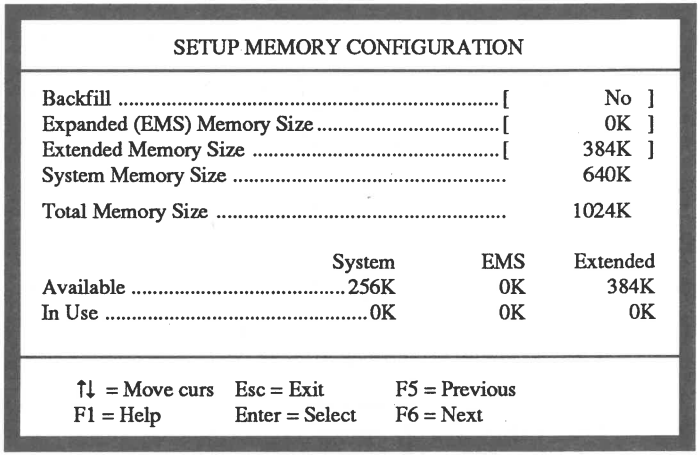
**Table 3. Memory Type Choices.**

| Choice | Meaning |
|---|---|
| None | Selecting None causes the utility NOT to be installed. This choice is the default for the utility screens. |
| System | Selecting System causes the utility to be installed in available system memory (within the 640 KB DOS limit). |
| EMS | Selecting EMS causes the utility to be installed in the available expanded (paged) memory. To install the utilities in EMS memory, you must allocate all or some of the added memory to that type on the Setup Memory Configuration Screen. |
| Extended | Selecting Extended causes the utility to be installed in the available extended memory. To install the utility in extended memory, enter the amount to be allocated on the Setup Memory Configuration Screen. |

## Allocate Memory

Use the Keyboard Controls to enter your selections for the first three fields on the Setup Memory Configuration Screen, which are the ones you can change. (See Figure 7.) Those fields as well as the fields you cannot change are described in the following paragraphs. Once you complete your changes, press **<Esc>** to return to the Setup RAM Disks choice on the Main Menu.

**Figure 7. Setup Memory Configuration Screen.**




## Backfill

Select the default "No" or press **<F6>** to change the field to "Yes".

If you select "Yes", the memory on the system board is disabled. In that case, paged (EMS) memory is used as system memory.

Enabling backfill allows certain EMS applications to be run out of EMS memory. Applications such as DESQview that support multitasking are compatible with this memory setup. DO NOT choose "Yes" unless you are using an application that specifically uses this choice.

Enabling Backfill causes you to lose use all memory on your system board.

## Expanded (EMS) Memory Size

Use **<F5>** and **<F6>** to go through the allowed values for expanded memory until you reach the amount you want to select.

The Memory Use Table at the bottom of the screen shows the amount of available expanded memory.

### Extended Memory Size

Use **<F5>** and **<F6>** to go through the allowed values for extended memory until you reach the amount you want to select.

This category shows 384 KB of extended memory as the minimum because the memory above the 640 KB limit on the system board is automatically allocated as extended. Any amount above 384 KB that you select will be allocated out of the memory you added using the SIMMply-RAM board.

You should only allocate extended memory above the 384 KB shown if you use an application that specifically requires extended memory.

The Memory Use Table at the bottom of the screen shows the amount of available expanded memory.

### System Memory Size

This entry reflects 640 KB as the base memory in the system.

If you enable Backfill, this entry shows the system memory to be allocated out of expanded (EMS) memory.

### Total Memory Size

This entry reflects the amount of installed, usable memory in the computer. It includes the system board memory and the added memory (expanded and extended).

If you enable Backfill, the amount shown decreases by the amount of memory on your system board because the memory on the system board is disabled.

### Memory Use Table

The Memory Use Table appears near the bottom of each screen. This table shows each type of memory and gives the amounts "available" and "in use" for each.

As you make choices to allocate memory and to install the utilities in a certain type of memory, the numbers in this table are automatically updated.

## The Main Menu

Once you press **<Esc>** from the Setup Memory Configuration Screen, the Main Menu of the program is displayed, listing five choices. (See Figure 8.) The Setup RAM Disks choice is highlighted. The choices give you the option of installing RAM disks, the print spooler, disk caching, and of saving the new installation. You can decide which utilities to install.

**NOTE:** The first time you run INSTALL, the Setup Memory Configuration is automatically selected after the Copy Utilities Screen before the Main Menu is displayed. If you use INSTALL later to change something, the Main Menu is displayed after the Copy Utilities Screen.

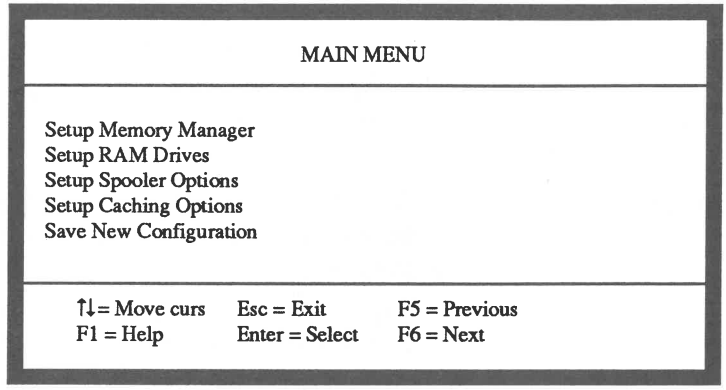



**Figure 8. INSTALL Main Menu.**

## Setup RAM Drives

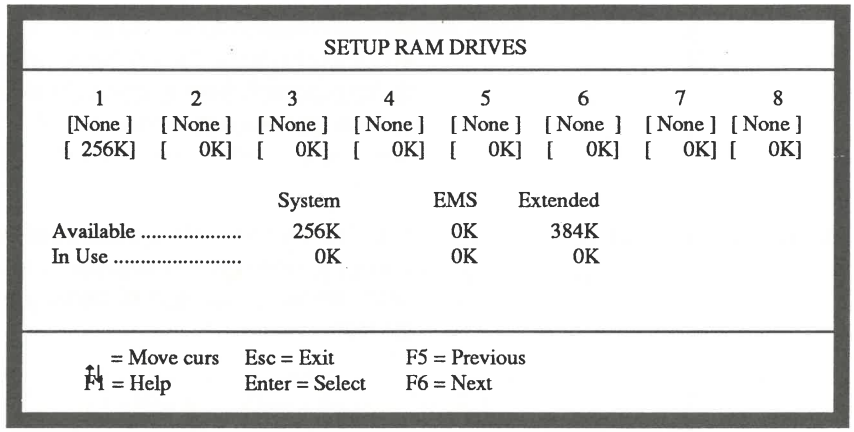
A RAM drive is a simulation of a disk drive in memory. You can use the RAM drive for storage. However, any information stored in a RAM drive is lost when the computer is powered off, rebooted, or experiences a power irregularity. Creating a RAM drive offers you a couple of benefits:

- You can use a RAM drive to facilitate copying files between diskette drives if you only have one diskette drive in your system. This disk acts as a temporary, working drive.
- Because accesses to the RAM drive are made to memory, they are faster than accesses to a physical drive. You can store programs or data on the RAM disk in order to speed up performance while you are using them. Just remember that any disruption of power causes the information stored in the RAM drive to be removed.

## Installing a RAM Drive

Press **<Enter>** on the Setup RAM Drives choice on the Main Menu to select it and display the screen shown in Figure 9.

**Figure 9. Setup RAM Drives Screen.**




You can set up 0 to 8 RAM drives. The default choices are "None" and "0K" for the selection fields for the eight possible RAM drives. If you press **<Esc>** without changing these defaults, no RAM drive is configured.

Each possible RAM drive offers two fields for you to specify in order to create the disk. These fields are explained in the following paragraphs.

Once you complete the selections, press **<Esc>** to return to the Setup Spooler Options choice on the Main Menu.

### Memory Type (1st field)

The Memory Type field immediately below the RAM drive number is the field for selecting the type of memory to allocate for that RAM drive.

Use **<F5>** and **<F6>** to go through the memory choices — None, System, EMS, Extended.

Choosing "None" disables the RAM disk and allocates no memory.

Because expanded (EMS) memory is faster than extended memory, you should create RAM disks from EMS memory unless an application you plan to use in the RAM disk specifically requires extended memory.

### Size of RAM Disk (2nd field)

The Size field below the Memory Type field allows you to choose the size of the RAM disk.

When "None" is chosen as the Memory Type, 0K is allocated. Once you select a Memory Type, the size changes to 128 KB.

Use **<F5>** and **<F6>** to go through the choices until you find the amount you want to allocate.

You should choose the size based on how you plan to use the disk. If you plan to run programs from it, check the memory required for the program and allocate that amount. A good rule of thumb is to set the size to be the same as a floppy size — for example, 720 KB (the same size as a 3.5" floppy diskette).

### Memory Use Table

The Memory Use Table appears near the bottom of each screen. You cannot change it. However, it is automatically updated when you allocate memory for a utility, showing each type of memory and the amounts "Available" and "In Use" for them.

## Setup Spooler Options

A print spooler is a designated buffer of memory that stores print jobs while your printer is busy printing. It can store several print jobs, sending one after the other as the printer finishes the previous job.

A spooler offers you a couple of advantages:

- You no longer need to wait for a printer to finish before going to the next task. So you save time. A print spooler is an especially useful tool with Desk Top Publishing applications.
- You can control or manipulate the jobs to be printed. For example, if you mistakenly send a print job you can remove it before it prints.
- You can define certain formatting capabilities through the Control Panel options to change the printer setup during operation.

## Installing the Print Spooler

Press **<Enter>** on the Setup Spooler Options choice on the Main Menu to select it and display the screen shown in Figure 10.

**Figure 10. Setup Spooler Options Screen.**

```
                    SETUP SPOOLER OPTIONS

Buffer Memory Type ..................[   None ]
Buffer Memory Size ..................[     0K ]
Printer Output Port .................[   LPT1 ]

                      System      EMS      Extended
Available .....         256K       0K          256K
In Use ........           0K       0K          128K

↑↓ = Move curs   Esc = Exit        F5 = Previous
F1 = Help        Enter = Select    F6 = Next
```

If you do not want to install a print spooler, press **<Esc>** to return to the Main Menu before you change the selection fields.

To create a spooler, select entries for the Buffer Memory Type, Buffer Memory Size, and Printer Output fields. These fields are described in the following paragraphs. After you complete the selections, press **<Esc>** to return to the Setup Caching Options choice on the Main Menu.

### Buffer Memory Type

The default selection for this field is "None".

Use **<F5>** and **<F6>** to go through the memory types (System, EMS, and Extended) to the one you want to select.

Because expanded (EMS) memory is faster than extended memory, it is recommended that you create the print spooler from EMS memory.

### Buffer Memory Size

The default selection for this field is "0K" until you select a memory type. When you specify a memory type, the default of "128K" is displayed for this field.

If you do not want to use the default size, press **<F5>** and **<F6>** to go through the possible sizes. A rule of thumb to help you determine the size for the spooler is that a text page requires 4 KB and a graphics page requires 256 KB to 1 MB.

If you normally send large documents or graphics to the printer, you should allocate a fairly large spooler.

### Printer Output Port

This selection field determines to which printer port — LPT1 through LPT3 or COM1 through COM4 — the data stored in the spooler is to be output. The default is LPT1.

The defailt input port is LPT1. You set up your applications to send print jobs to LPT1 if you want them buffered by the print spooler.

If your printer is connected to the serial port of your computer, change the selection to the correct COM port. When you select a COM port,, the default communications setup for the serial port is displayed below the field. This setup is for 150 bps, None, and 0-bits with 0 stop bit.

If you need to change the communications setup for the COM port, move to these fieldsand use **<F5>** and **<F6>** to view and select the various COM port options.

## Setup Caching Options

The *disk caching* program buffers disk reads or reads and writes in a memory buffer. With read caching, any random sectors accessed are read into the cache. If two or more sequential sectors are accessed, those sectors plus sectors to the end of the track are read into the cache. Any subsequent reads to that track are thus completed faster because the stored sectors rather than the physical disk are accessed.

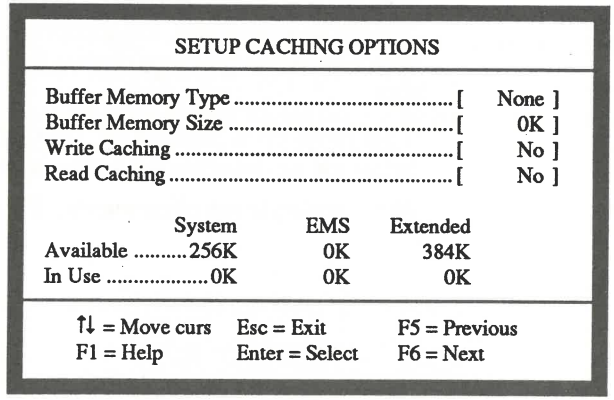
Write caching stores the write data in memory until the disk is free to be accessed, like a print spooler. By default, read caching is enabled so that writes take place immediately. If write caching is also enabled, data written to the cache is saved and then written when the computer is not busy doing disk I/O. Enabling write caching significantly improves speed. However, with write caching enabled, an unstable computer environment may cause write data stored in the cache to be lost.

The main benefit in using disk caching is the improvement in fixed-disk performance especially for "disk-bound" applications like databases. Because the reads are accessed from the memory, the speed of executing them in concert with the fixed disk is enhanced.

## Installing Disk Caching

Press **<Enter>** on the Setup Caching Options choice on the Main Menu to select it and display the Set Caching Options Screen shown in Figure 11.

**Figure 11. Setup Caching Options Screen.**




If you do not want to install disk caching, press **<Esc>** to return to the Main Menu before you change the selection fields.

To install disk caching, select the Buffer Memory Type, Buffer Memory Size, and Write Caching fields, which are described in the following paragrahs; then press **<Esc>**.

### Buffer Memory Type

The default selection for this field is "None".

Use **<F5>** and **<F6>** to go through the memory types (System, EMS, and Extended) to the one you want to select.

Because expanded (EMS) memory is faster than extended memory, it is recommended that you allocate the disk cache from EMS memory.

### Buffer Memory Size

The default selection for this field is "0K" until you select a memory type. When you specify a memory type, the default of "64K" is displayed for this field.

If you do not want to use the default size, press **<F5>** and **<F6>** to go through the possible sizes.

The recommended size for a disk cache is 384 KB or greater depending on the application. If you are using a large fixed disk (30+ MB) or have multiple subdisks defined, a larger disk cache is recommended.

Refer to the table at the bottom of the screen for the amount of memory available.

### Write Caching

The default selection for this field is "No". Read caching is always enabled ("Yes") when a memory type is specified.

Change the field to "Yes" to enable write caching. When write caching is enabled, data written to cache are stored until the computer is not busy doing disk I/O. In some cases, the application may write several times to the same sector (stored in the cache) before that sector is actually written to the physical disk.

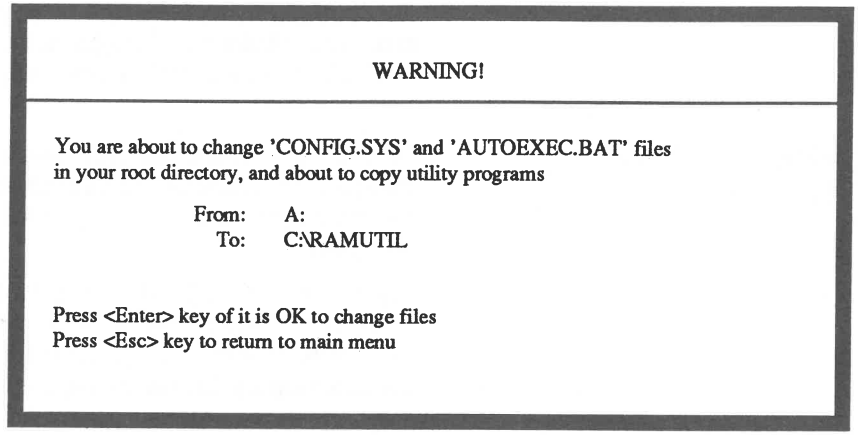
If the computer is powered off, rebooted, or experiences a power irregularity before the stored writes are written to the physical disk, the data is lost.

Write caching is not recommended if the possibility of power problems exists.

## Save New Configuration

Press **<Enter>** on the Save New Configuration choice on the Main Menu to select it, displaying the "WARNING" Screen shown in Figure 12.

**Figure 12. WARNING Screen.**




Complete the INSTALL program by pressing **<Enter>**. The configuration changes that you've chosen are made. Saving the configuration causes the CONFIG.SYS and AUTOEXEC.BAT files to be updated with the appropriate command lines to start the EMS Memory Manager and any utilities installed.

If you do not want to save your configuration settings, press **<Esc>** to return to the Main Menu. Go back to the selections you want to change and do so. Then select "Save New Configuration" when you are ready.

Once you save the configuration, the software installation is complete.

# Using the Software

To begin using the SIMMply-RAM software, remove the SIMMply-RAM diskette and reboot the system to cause the EMS Memory Manager and the utilities to be loaded and started.

After you use the software for a while, you may decide to make changes to the memory configuration or setups for the utilities . You can go through the INSTALL program to make those changes.

## Using the Memory Manager

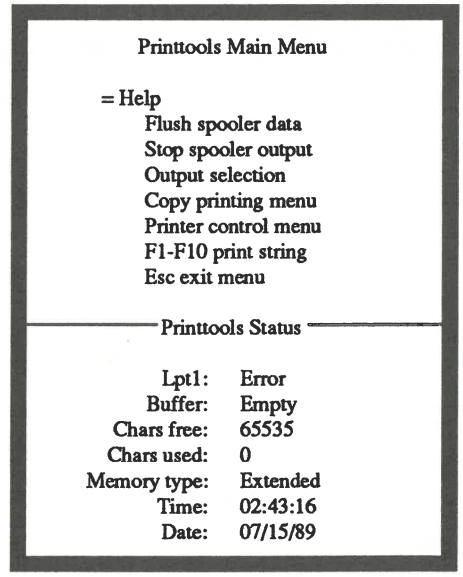
For most applications that use expanded memory, you can simply start using the application. However, some applications may require that you configure or set up the application software for EMS use. Refer to the manual supplied with your software.

In a few cases, specific parameters for the EMS Memory Manager may need to changed to meet a unique technical need. If so, you will need to manually install the specific memory manager software using a command line format. Details of the command line installation are given in the *Reference Manual.*

## Using the Print Spooler

Once all the utilities are installed and the system prompt is displayed or you're running an application, you can press a "hot-key" to "pop-up" the Control Panel for the print spooler. Pressing **<ALT><PrtScr>** will display the print spooler Control Panel shown in Figure 13.

**Figure 13: Print Spooler Control Panel**



The Control Panel lets you control the print spooler and check the status of the print jobs.

On the Printtools Main Menu, use the arrow keys to move to your choice and press **<Enter>** to select the function or menu. Table 4 lists the Printtools Main Menu functions and menus. You can use the key or key combination listed to access that selection when the menu is displayed.

Table 4: Printtools Main Menu Functions

| Key | Function | Meaning |
|---|---|---|
| <Alt><H> | Help | Lists the help window describing the functions. |
| <Alt><F> | Flush | Removes all data from the spooler and cancels any copies that are active. |
| <Alt><S> | Stop | Pauses spooler output to the printer until the Resume command is issued. |
| <Alt><R> | Resume | Resumes spooler output to the printer after a Stop command has been issued. |
| <Alt><O> | Output Selection | Lets you select the output device. |
| <Alt><C> | Copy Printing | Displays the Copy Printing Menu, which offers commands to set up printing of multiple copies. |
| <Alt><P> | Printer Control | Lets you assign strings of control data to the function keys **<F1>** thru **<F10>**. |
| <F1> - <F10> | | Executes the control string assigned to the function key pressed. |
| <Esc> | Exit | Exits the Printtools Main Menu. |

When you access the Copy Printing Menu (**<Alt><C>**) from the Printtools Main Menu, the following functions are available:

- **Help:** Displays help information for copy printing.
- **Start of Copy:** Lets you mark the beginning of copy that is to be printed multiple times.
- **End of Copy:** Lets you mark the end of copy that is to be printed multiple times.
- **Number of Copies:** Lets you set the number of copies to print of the marked copy.
- **Cancel Copies:** Cancels the multiple copies set for printing.

The Control Panel also displays the following status information:

- The name and status of the output device
- The status of the buffer (full, empty, printing, and so forth)
- The numbers of characters free (or space unused) in the buffer
- The numbers of characters used (the space occupied) in the buffer
- The type of memory allocated for the buffer
- The current time and date

The Reference Manual provides a more detailed explanation of the various print spooler controls as well as instructions for manually installing the print spooler using a DOS command line.

## Using the Disk Cache

Once disk caching is installed, you can execute several commands from DOS during operation to change the way the cache works. The cache is controlled by entering simple commands from the DOS prompt.For example, the command to turn the cache function OFF is as follows:

C>**CACHE OFF<Enter>**

Each command begins with the word CACHE and is followed by the option. The commands are listed below:

- **CACHE LIMIT:** Switches the cache size limit ON and OFF. If ON, only reads (and writes, if enabled) of less than one track in size are cached. IF OFF, all reads (and writes, if enabled) are cached regardless of size.
- **CACHE STATUS:** Displays the current status of the cache.
- **CACHE ON:** Turns caching ON.
- **CACHE OFF:** Turns caching OFF.
- **CACHE FLUSH:** Causes all sectors that have been changes to be written to the disk.

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