GS-RAM™

and

GS-RAM Plus™

User's Manual

Æ APPLIED ENGINEERING™

v2.01

Applied Engineering

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GS-RAM™
and
GS-RAM Plus™

User's Manual

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Table of Contents

About This Manual

The GS-RAM allows you to increase the Random Access Memory (RAM) capacity of your Apple IIGS by a maximum of 1.5 megabytes, in increments of 256K. With the GS-RAM Plus, you can expand the computer's memory as much as 6 megabytes, in steps of 1024K (1 megabyte). If someday you discover that you need even more memory, an optional 2 megabyte "piggy-back" expander card can be installed to boost the total memory expansion for the GS-RAM up to 3.5 megabytes and up to 8 megabytes for the GS-RAM Plus! See Chapter 5, "More Memory" for more information.

Chapter 1 will take you quickly through the installation and testing of your GS-RAM or GS-RAM Plus card.

Chapter 2 tells you how to use some of the expanded memory as a RAM disk. This is a great way to increase the access speed to different applications.

Chapter 3 describes the GS-RAM ≡Cache included on your AW 2 Expander disk. The ≡Cache will greatly increase your access speed to most applications. With the ≡Cache installed, you will notice that the time it takes to load a program from an Apple Disk 3.5 drive is greatly decreased--even on the initial load!

Chapter 4 steps you through the installation and use of the AW 2 Expander program. This software will enable you to greatly enhance your AppleWorks program by using the extended memory that the GS-RAM has given your IIGS.

Chapter 5, as mentioned above, helps you to decide what chips you will need to expand the memory of your GS-RAM card. It also explains how to install the chips yourself as well as how to return the card to Applied Engineering for a memory upgrade with no additional charge for the installation and testing.

Applied Engineering Technical Support

If you have a technical question relating to your GS-RAM card that is **not covered in the manual**, please contact the dealer from whom you purchased the card. Most dealers have the knowledge and the resources to answer your question readily. In the event that the dealer cannot answer your question, direct it to Applied Engineering. We have a staff of technicians dedicated to answering specific technical questions about Applied Engineering products and software. Technical Support representatives are available between the hours of 9 AM and 5 PM Central time, Monday through Friday. The Technical Support telephone number is (214)241-6069. Please call only this number for technical support, as our sales office cannot transfer calls to the support lines.

The support representatives are experienced in many of the applications of Applied Engineering products, but in order to provide a quick and effective answer

to your question, they will need to know as much as possible about the hardware and software specifically related to your question. Please provide the technical support representative with the following information:

- The specific Applied Engineering product related to your question. If the question is related to GS-RAM, please provide the revision level, original memory configuration, and current memory configuration of the GS-RAM card.

- The configuration of your computer. (What peripherals are attached?)

- If the question is related to an Applied Engineering expansion card, please provide the revision level, original memory configuration, and current memory configuration of the card.

- The name, version, and publisher of the software package related to your problem.

- The results of any testing or troubleshooting done by you or your dealer.

Most questions can be answered in one telephone conversation, but some may require research by the technical support representative. Please be sure to make a note of the representative's name, just in case you need to call back with any additional information or follow-up on a previous question.

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Remember:
When all else fails, *read the manual!*
...then call Technical Support.

1: Getting Started

This chapter tells you how to install and test the GS-RAM and GS-RAM Plus memory expansion cards. Before you install your memory-expansion card, please be sure to read Setting Up Your Apple IIGS and the Apple IIGS Owner's Guide. You'll need to be particularly familiar with the Control Panel functions as this manual makes frequent reference to the Control Panel menu.

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Installation

⇨ **Turn off the computer.**

Leave the computer plugged in but flip the power switch to the OFF position.

⇨ **Remove the Apple IIGS cover.**

Locate the two latches on either side of the backplate. Push in on the latches while pulling up and back on the lid.

⇨ **Touch the power supply case.**

The case is shown in the illustration below. This will discharge any static electricity that may be on your body. Do not skip this step. **Static electricity can ruin chips on the board and in the computer.**

Inside Your IIGS

Power Supply Case

Memory Expansion Slot
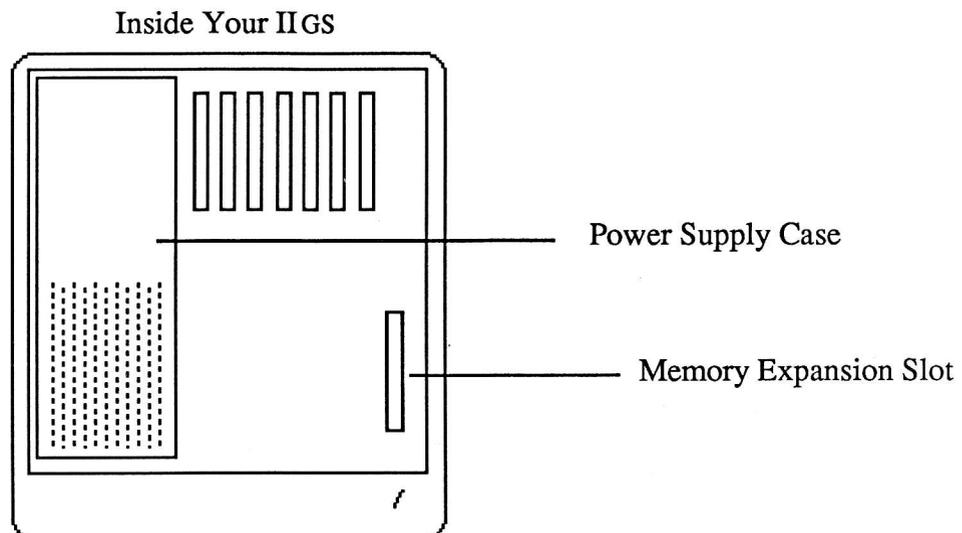
⇨ **Remove the memory-expansion card from its anti-static bag.**

Hold the card by the edges, like a photograph. Do not touch the gold fingers of the card.

➪ **Position the memory expansion card over the Memory Expansion Slot.**

The Memory expansion slot is located in the front right corner of the computer. Hold the card so that the long end of the card is toward the rear of the computer.

➪ **Insert the card.**

Insert the gold edge-connector into the Memory Expansion Slot until it is completely seated. You can wiggle the card gently, back to front, to insure a firm connection.

➪ **Replace the Apple IIGS cover.**

Slid the front of the lid in first, then press on the back edge until it snaps into place.

➪ **Installation is complete!**

➪ **Check the RAM Disk setting to verify correct installation.**

You can verify that the computer recognizes the additional memory by checking the RAM Disk option in the Control Panel menu. First, turn on the computer then select the Classic Desk Accessories menu by pressing ⌘-control-esc. Use the up and down arrow keys to select the Control Panel menu. Select the RAM Disk option and press return. The number next to the Largest Selectable listing tells you the amount of memory that the system now has available.

➪ **Make a copy of the AW 2 Expander disk.**

It is very important to make backup copies of your master disks when possible. The AW 2 Expander disk is not copy protected. You can copy it using the IIGS's Desktop. Simply drag the AW 2 icon to the icon of the destination disk. Or, you can use the "Copy Files" option of your GS utility disk or the "Filer" program included on the AW 2 Expander disk. The drag method seems easiest to many people, but if you prefer, the other methods give you the same end result.

After you copy the disk, store the master in a safe place.

➪ **Test the card.**

Use the GS-RAM Test program from the main menu of your COPY of the AW 2 Expander disk. The test program will run automatically when selected (See warning below). To stop the test, turn the computer off.

> **WARNING:** The GS-RAM test program will erase anything stored in extended memory.

2: The GS-RAM as a RAM Disk

Many of the newer application programs take advantage of the extended memory automatically. However, you may want to use part of the extended memory to emulate a RAM disk. Creating a temporary RAM disk will give you much faster access to some applications (programs which do not automatically take advantage of the increased memory). The following section explains how to create a temporary RAM disk.

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Setting Up a RAM Disk

If you want to set up the GS-RAM as a RAM Disk, run the Control Panel program from the IIGS Desk Accessories Menu (control-Ú-esc). Then select the RAM Disk option.

You must first tell the computer how much of the card's memory you want to set aside for use as a RAM disk. The minimum setting limits the amount of memory that applications can use. The maximum limits how much memory the RAM disk can use. You'll want to leave enough memory open to support the programs that automatically take advantage of the extra memory.

> **NOTE:** If working with an application that uses a version of ProDOS before 1.2, the minimum and maximum RAM disk settings must be equal.

If an application needs more memory than you have allotted, a message to that effect will come up on the screen. You can adjust accordingly by selecting "RAM Disk" from the Control Panel program and <u>decreasing</u> the maximum RAM disk size.

Changing the Control Panel setting will not change the currently established RAM disk. You will have to turn off the power to establish a RAM Disk of a different size.

Remember, powering down will in turn erase what is currently in the temporary RAM disk you have created. Save any data from the RAM Disk that you do not want to erase before powering down. The new settings will take affect upon startup.

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Addressing the GS-RAM Disk

Some applications may ask you to identify your RAM disk by slot and drive number.

SLOT: The GS identifies your mock RAM disk in <u>slot 5</u> just as it recognizes a 3.5" drive as being in slot 5.

DRIVE: The drive number will depend on what you decide to use as your startup device. Drive 1 can be either the RAM disk or a 3.5" drive. Choose one or the other using the "Slots" heading under the Control Panel Program.

-- First, make sure slot 5 is set to "Smart Port."

-- If you want the computer to boot your RAM disk at startup, select "RAM Disk" next to the "Startup Slot" heading. The GS will recognize the RAM disk at, S5,D1 and the 3.5" drive will be S5,D2.

-- If you want the computer to boot your 3.5" drive at startup, enter "5" (or "Scan") under the "Startup Slot" heading. The GS will recognize the 3.5" drive at S5,D1 and the RAM disk will be S5,D2.

-- A second 3.5" drive will be S2,D1. The following chart may help you to understand:

Boot "Slot 5"	Boot "RAM Disk"
S5,D1 ---- 3.5" drive S5,D2 ---- RAM disk S2,D1 ---- 3.5" drive	S5,D1 ---- RAM disk S5,D2 ---- 3.5" drive S2,D1 ---- 3.5" drive

NOTE: If using ProDOS® 1.1.1, your second 3.5" drive (S2,D1) will not be recognized. This early ProDOS version allows only two devices per slot. See your authorized Apple dealer to upgrade your applications which use ProDOS 1.1.1.

Using the GS-RAM Disk

Now you are ready to use the RAM disk you have created. Think of it as a regular disk. You can format it then save or copy documents or applications onto it.

> *Remember:* **The RAM disk is only a disk as long as the power is on. The information it contains is lost when the power is turned off (unless you have saved that information to a disk or disks).**

FORMATTING

You need to format the RAM disk only if you plan to use it as your startup device. The disk will be automatically formatted at startup for saving and copying. So, if you plan only to save to and copy to the disk, you don't need to worry about formatting. If, however, you plan to use the RAM disk as a startup device, format the disk just as you would a regular disk. Format for either ProDOS, Pascal or Applied Engineering's CP/AM (5.1.1 or later) depending upon the operating system of the application(s) you intend to store on the RAM disk. Here are a few ways to format for the different systems:

- Format for Apple Pascal 1.3 by X-ecuting the "Formatter" program on your pascal disk. (Refer to Apple Pacsal documentation for more information on formating for Pascal.)

- Format for ProDOS using the "Format" option on your IIGS System disk or IIGS System Utilities. Or, you may find it easier to use the Desktop's "Format Disk" option under the "Special" menu.

- To format for CP/AM versions 5.1.1 and following, refer to the formatting instructions in the CP/AM manual.

Do not try to format the disk for DOS 3.3. The 3.3 applications were designed for use with 5.25" disks and will not work with the RAM disk, or 3.5" drives.

You can give the RAM disk any name that the operating system will allow.

COPYING

You can copy programs to the RAM disk with the "Copy Files" option on your utility disk. You may prefer to use the Desktop menu to make direct copies of ProDOS applications by dragging the application's icon to your RAM disk's icon.

SAVING

You can save documents onto the RAM disk just as you do on a regular disk. But be sure to ***save the contents of your RAM disk on a regular formatted disk before you turn off the power.*** You will most likely want to save to a regular disk *during* use to keep documents from being lost due to power surges, power loses and other frustrating occurrences.

3: GS-RAM *≡Cache*

Those of you who want to know what the *≡Cache*™ is and does, read, "About the *≡Cache*," at the end of this chapter. Those of you who want to install it right away, here's how...

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Requirements

To use the GS-RAM *≡Cache*, you must have the following:

↳ A GS-RAM™ card installed in the IIGS's Memory Expansion Slot

↳ An Apple 3.5 Drive.

> **NOTE:** The cache supports only the Apple Disk 3.5™ drives (platinum). It will not cache the Apple II Uni-Disk™ 3.5 drives (white) nor will it cache 5.25 drives or lhard disks.

> **Important:** You must set Slot 5 in the Control Panel menu to the Smart Port setting.

↳ A COPY of the AW 2 Expander disk, version 2.1 or later.

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Installing the *≡Cache*

It is easy to install the GS-RAM *≡Cache*. You simply:

↳ **Boot your COPY of the AW 2 Expander disk** (version 2.1 or later),

↳ **Select AE Cache** from the AW 2 Expander main menu or load the file, AECACHE.SYSTEM.

> While loading, the program will display the Æ startup screen accompanied by the message:

> INSTALLING....

at the bottom of the screen.

If the program does not find a properly installed GS-RAM card it will print the following message to the monitor:

```
REQUIRES AN APPLIED ENGINEERING GS-RAM
IN IIGS MEMORY EXPANSION SLOT
```

NOTE: Booting ProDOS 16 will reinitialize the system. Therefore, if you want to boot ProDOS 16 and use it with the cache, you must cold boot ProDOS 16 (by pressing "*control-*-reset*" or by powering your computer down and then back up) <u>before</u> installing the cache. Warm booting ProDOS 16 (e.g. pr#5) with the cache installed will cause unpredictable results.

Once the ≡*Cache* is installed, it will automatically increase your productivity. All you need to do is decide how large you want the ≡*Cache* to be.

⇨ **Access the IIGS Classic Desk Accessories Menu** (*control-*-esc*). Notice the new option--AE Cache.

```
┌────────────────────────────────────┐
│ Desk Accessories               ████ │
│ ──────────────                      │
│                                     │
│   Control Panel                     │
│   Alternate Display Mode            │
│   AE Cache                          │
│   Quit                              │
│                                     │
│                                     │
│                                     │
│                                     │
│                                     │
│                                     │
│                                     │
│                                     │
│                                     │
│                                     │
│                                     │
│                                     │
│   Select: ↓ ↑            Open: ↵    │
└────────────────────────────────────┘
```
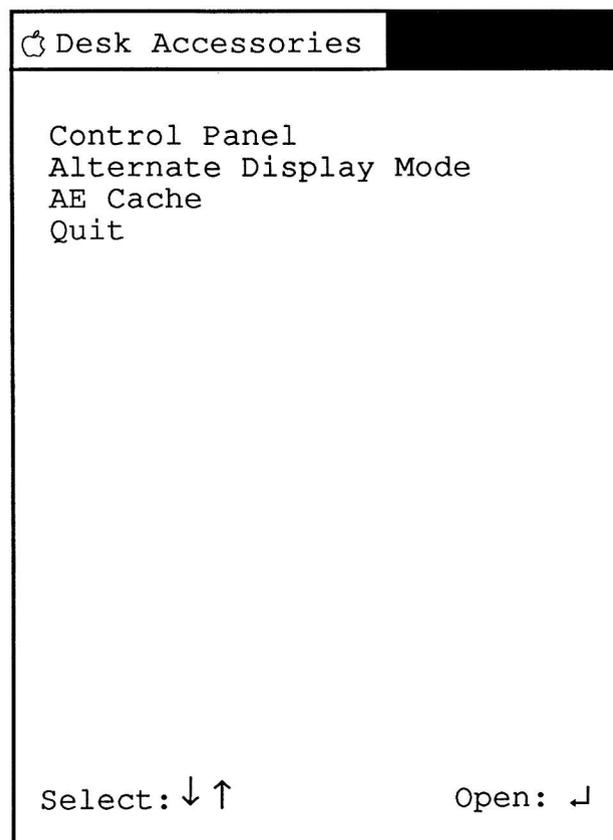
⇨ **Select the new option** using the arrow keys and return. You will see the following screen:

```
┌─────────────────────────────────────────────────┐
│                                                   │
│              RAM Cache   V__                      │
│                                                   │
│                                                   │
│          RAM Buffer Size:          ___K           │
│                                                   │
│                                                   │
│          Current Size:             ___K           │
│                                                   │
│          GS-RAM Size               ___K           │
│                                                   │
│                                                   │
│                                                   │
│          Select ←→    Cancel:Esc   Save:↵         │
│                                                   │
└─────────────────────────────────────────────────┘
```

⇨ **Change the size of the RAM buffer** to the size you want by pressing the right and left arrow keys to increase and decrease. You do not have to power your computer down and back up to change the size of the cache like you do when you change the size of a regular RAM disk. Simply select the size you want then press return. If you access the AE CACHE option again, you will see that your new setting has taken effect.

Note About Setting the RAM Buffer Size

The GS-RAM Size: heading displays the entire amount of memory on the GS-RAM card. If another program or utility is using some of the extended memory, the RAM Buffer will not be able to use all of the memory indicated by the GS-RAM Size. But it can use the free memory available at that time for a RAM buffer. If you request more memory than is free at the time, the ≡*Cache* will use as much free memory as is available. The ≡*Cache* will not automatically fulfill your size request once the memory becomes free. If a program frees any memory, you can use that memory as a RAM buffer by resetting the RAM Buffer Size in the AE Cache option in the Desk Accessories menu.

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Removing the ≡*Cache*

To remove the ≡*Cache* from the system, cold boot your computer by doing either of the following:

⇨ Press and hold down the *control* and open apple (⌘) keys while pressing and releasing the reset key.

⇨ Power down--turn off the computer, then power up--turn it back on.

After you cold boot, access the Desk Accessories menu and note that the AE Cache option is gone.

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About the ≡*Cache*

Part of the reason the GS-RAM ≡*Cache* is so incredibly fast at retrieving information is that it reads a whole track every time it accesses the disk drive instead of reading individual blocks. This method, called, "track caching," makes even the initial read much faster--up to twice as fast as a system without a cache. All subsequent calls are sped up even more because the system does not have to access the disk drive every time you request information. In fact, subsequent accesses are often faster than accesses from a RAM disk!

The ≡*Cache* installs itself onto the smartport and will operate with ProDOS 8, ProDOS 16, Apple Pascal 1.3, and Æ's PC program for CP/AM.

The GS-RAM ≡*Cache* uses some of the expanded memory for itself plus the amount of memory you allocate to it.

When the cache program reads a track, it stores the entire track in the track buffer and stores the block(s) containing the requested information in another buffer, the cache buffer. You can set the cache buffer to the size you want, depending upon the memory size of your GS-RAM card and how much of that memory you have allotted for use as a RAM disk. When the cache buffer becomes full, it will make room for the most recently requested data by replacing the blocks that have been stored in the buffer the longest without being accessed.
The track buffer is not variable; it is large enough to hold one track (6K) and cannot be changed.

When you call for information, the system first looks in the cache buffer. If the information is there, it reads it with speed comparable to (often even faster than) reads from RAM disks and internal hard disks. If it doesn't find the information in the cache buffer, it checks the track buffer. This takes very little more time than reading from the cache buffer because the system is still not required to read the disk drive.

If the information is not in the track buffer, the system will then go back out to the disk drive, find the information and read the entire track to the track buffer. This new track replaces the track currently held in the track buffer.

While this method actually goes through more steps than a non-cached system to get information that is not stored in the buffer, the actual time it takes the system to check the cache buffer and track buffer is insignificant.

Note About Copy Protected Programs

Some copy protected programs have a disk accessing function of their own and will not use the cache. However, most programs will use the cache with no problem.

4: AW 2 Expander Instructions

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About the AW 2 Expander

The AW 2 Expander is an accessory program designed to compliment Applied Engineering memory expansion products. It modifies the AppleWorks™ program to recognize and utilize the additional memory provided by these products. Also contained on the AW 2 Expander disk are several test programs you can run to verify the operation of your GS-RAM card.

When used with the GS-RAM or GS-RAM Plus, the AW 2 Expander program will enhance AppleWorks USA version 2.0, German 1.4, and French 1.4. The AW 2 Expander program is very different from the Super AppleWorks Desktop Expander program. The Super AppleWorks Desktop Expander will only enhance AppleWorks versions 1.0 through 1.3 which are not designed to be used with the IIGS.

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Before You Even Think of Modifying AppleWorks...

If you are familiar with AppleWorks, you will probably be tempted to use the AW 2 Expander without reading these instructions. Resist the temptation. Or at least read the following.

- AW 2 Expander does not support AppleWorks versions 1.0 through 1.3.

- These instructions assume that you already know how to use AppleWorks. The AW 2 Expander program uses the same screen displays and keyboard input routines ("user interface") as the AppleWorks program. If you need a quick review, read Throughout AppleWorks in your Using AppleWorks manual.

- There is an AppleWorks Word-Processor file on the AW 2 Expander disk entitled "**READ.ME.**" Please do so. This document will contain information about any recent changes to the software or updates to the documentation.

- Apply the AW 2 Expander modifications only to **unmodified BACKUP copies** of your AppleWorks startup and program disks. Modifications required by other programs should be done after executing the AW 2 Expander enhancements.

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AppleWorks Modification Instructions

This is how to use the AW 2 Expander to modify the AppleWorks disks:

1. First, make copies of your original AppleWorks disks. "Filer ," provided on the AW 2 Expander disk, or the copy program on your System Utilities disk should be used for this purpose.

2. Boot the AW 2 Expander disk in your startup drive.

3. Select option 1 - "Execute AppleWorks Enhancements."

4. The Applied Engineering AW 2 Expander copyright screen will then appear. After reading each of the screens, press the space bar to continue.

5. You will now be prompted to remove the AW 2 Expander disk and insert a COPY of the AppleWorks STARTUP disk in drive one. Be sure the WRITE PROTECT tab has been removed from the disk. As prompted at the bottom of the display screen, press the space bar to continue or the escape key to go back to the main menu.

   The AW 2 Expander program expects to find the AppleWorks STARTUP file, "APLWORKS.SYSTEM," on the disk in drive one. If, at this point, the program displays the following message:

   ```
   Cannot find correct file
   Please enter the prefix of the AppleWorks program
   ?
   ```

   Enter the complete ProDOS prefix of the AppleWorks STARTUP disk. Be sure to include any (/) slashes for subdirectories. An example ProDOS prefix of an AppleWorks subdirectory on a Profile hard disk (with a volume directory name of /PROFILE) might be:

   ```
   /PROFILE/APPLEWORKS
   ```

6. The program will then give you a list of the modifications that it will make to your AppleWorks disk(s) and ask you if you want to continue. If you want to go ahead and make these modifications to your AppleWorks disk(s), hit the "Y" key. If you do not want to make these modifications, hit the "N" key to return to the main menu.

7. After the STARTUP disk has been successfully modified, you may be prompted to remove it from the disk drive and insert a COPY (write enabled) of the AppleWorks PROGRAM disk. The volume directory name of this disk must be the same as the STARTUP disk. Press the space bar to continue.

8. When the modification to the AppleWorks PROGRAM disk has been completed, the program will prompt for a key press to quit. Press the space bar and the modified AppleWorks can then be booted in the normal manner.

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Setting the AppleWorks Enhancement Options

Boot the AppleWorks startup disk just like you normally would. (Notice that the AppleWorks version number near the lower right corner of the startup screen now has an "A" tagged onto its end (Ex: 2.0A). If it does not have an "A: appended to the version number, it has not been modified correctly.

When the startup disk has finished loading, remove the startup disk and insert the program disk, but DO NOT press return. Press the ESCape key instead. If you are booting AppleWorks from a UniDisk 3.5 or a hard disk, press the ESC key when you are prompted with: "Press the Space Bar to continue."

> **Note:** It is not necessary to access the Getting Started options menu each time you boot AppleWorks. The Getting Started menu is only used to set the enhanced AppleWorks options.

The current enhancement-options configuration will be read from the parameter file (SEG.PR) on the AppleWorks program disk and displayed in the Getting Started option menu. The configuration shown contains the default settings. These default settings remain in effect until you change them and save the new configuration back to the AppleWorks program disk.

> **Note:** Options 1 and 3 apply to RamWorks and Z-RAM only and are noted with the symbol (RW). Option 4 applies to the GS only and is marked with a (GS).

The Getting Started options menu:

```
File: None                 GETTING STARTED
===============================================================================

     ┌─────────────────────┐
     │  Getting Started  └───────────────────────────────────────────┐
     │                                                                │
     │   1. Maximum Records/Lines(RW)          12,000                 │
     │   2. Preload AppleWorks onto Memory         On                 │
     │   3. Printer Buffer(RW)                    Off                 │
     │   4. Buffer Size(GS)                       0 K                 │
     │   5. Reserved RamFactor Size (RF)          0 K                 │
     │   6. Time Display                          Off                 │
     │                                                                │
     │   7. Save Configuration                                        │
     │   8. Continue with AppleWorks                                  │
     │                                                                │
     │                                                                │
     └────────────────────────────────────────────────────────────────┘


─────────────────────────────────────────────────────────────────
Type number, or use arrows, then press Return      1113K Avail.
```

Use the Up Arrow and Down Arrow keys to highlight the option you want. Use the Return key to select a highlighted option. For more information on the options, refer to the section entitled About the New Features. When you have made the desired changes, save the new configuration back to the AppleWorks program disk by selecting menu option 5, "Save Configuration."

Choose option 7 to continue booting the AppleWorks program. If you didn't save your new configuration, the new one will be in effect only until you quit the AppleWorks program. The next time you boot AppleWorks, the previous (saved) configuration will be used.

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About the New Features

The following paragraphs describe the new features of the enhanced AppleWorks and the instructions for using them. Please read this section very thoroughly.

More Word-Processor Lines and Data Base Records

With sufficient memory, the maximum number of Word Processor lines available with the unenhanced AppleWorks 2.0 is limited to 7,250; the maximum number of data base records is 6,350. The enhanced version expands the maximum number to just over 22,600 apiece.

With your GS-RAM or GS-RAM Plus, the enhanced AppleWorks automatically sets the number of lines and records to the maximum (22,600).

Clipboard Expansion

The standard AppleWorks clipboard (2.0) is limited to only 250 lines of information. The enhanced AppleWorks clipboard expansion increases the clipboard size for the Word Processor and data base functions to 2,042 lines. Only clipboard activities within and originating from the Spreadsheet function remain limited to 250 lines.

Printer Buffer Option

The Apple IIGS has a built-in print buffer which can be activated from the Apple IIGS Control-Panel menu. You may select the "On" setting from the Printer Buffer option but the buffer will be functional only if you have selected it from the Control Panel option. If you would like to know more about the internal printer buffer, please refer to your Apple IIGS Owner's Guide.

Buffer Size Option

The Buffer-Size option of the Getting Started option menu affects the size of only the Apple IIGS' internal printer buffer.

> **Important:** If any amount of memory is allocated to the Buffer Size option, the printer buffer setting is shown to be "On." However, it will not actually be on if not selected from the Control Panel menu.

The Buffer-Size option of the enhanced AppleWorks Getting Started option menu lets you allocate the amount of Apple IIGS memory space (up to 64K) to be used for the print buffer. With the Apple IIGS print buffer ON and the Getting Started Buffer Size option set to 0 K, the actual buffer size will be determined by the amount of memory (2K or less) that the Apple IIGS memory manager can allocate.

Time Display/Data Base Time-Stamp Option

This option will read the output of the Apple IIGS internal clock and replace the "Open-Apple-? for Help" message in the bottom line of the AppleWorks screen with a current date and time display. This option also allows the AppleWorks user to enter the current date or time into a data base category by typing the @ character as the only entry in that category. The category name must contain either the word DATE or the word TIME but should not contain both. For example, you should not use this feature in a category named, "Date and Time."

> **NOTE:** To use the internal clock of the Apple IIGS, the enhanced AppleWorks must be run under ProDOS 8 or 16, not ProDOS 1.1.1. (See your Apple dealer for ProDOS upgrades.)

The Getting Started options menu allows 12 hour or 24 hour time and date display. How the date is displayed on the screen is affected by the time display option selected.

The 12-hour (USA format) option displays the date as Month/Day/Year.

The 24-hour (French, German, and military format) option displays the date as Day/Month/Year.

Multiple-Disk Save

Data storage problems arise when the size of a file on the Desktop exceeds the amount of storage space on the data disk. A standard floppy disk can store only 135K of AppleWorks data. Using the modified AppleWorks, Desktop files larger than the available disk space will be segmented, or "split" and saved in sections to two or more disks. The following paragraphs explain how to use this feature to save and load segmented Desktop files.

This seems to be a good time to remind you of Murphy's Law:

Whatever can go wrong will go wrong.

Back up your Desktop files! A power failure will wipe out anything currently on the Desktop! It's always a good idea to have backup copies of your working data disks, especially if you have large amounts of data stored on them.

Saving Multiple Files to Disk

When saving a Desktop file which is larger than the data disk space available, the enhanced AppleWorks will prompt the user with the following message:

Segmented Desktop File...
Please insert NEXT disk with SAME VOLUME NAME

Note: If a previous version of the file already exists on the disk, AppleWorks will first ask you if you wish to delete the old file.

Remove the data disk from the current disk drive and replace it with the next data disk. All segments of a given segmented Desktop file MUST be saved on data disks having the same volume (disk) name as the primary (first) data disk. On subsequent data disks, each appended file segment (sequential) will be automatically deleted before saving a new segment.

If you discover that you don't have enough formatted blank disks with the same volume name, don't panic! Press *esc* then space to continue. Just use the AppleWorks Disk Formatter utility under the "Other Activities" menu before you begin to save your file.

Adding Multiple Disk Files to the Desktop

When adding multiple-disk or segmented files to the Desktop, the file MUST be loaded from the data disks in the same sequence as it was saved. AppleWorks will prompt the user to insert the NEXT data disk(s) until the file is completely loaded.

If you list the files on disks that contain segmented files you'll notice that the first segment has the filename that you gave it. The next segment (on the NEXT disk) will have a ".2" appended to the end of your filename. The next disk in the sequence will have a ".3" appended to the filename and so on. In this way, AppleWorks helps the user keep track of the segmented Desktop file sequence. You'll probably want to label your data disks in such a way that you too can keep track of the proper sequence. You may segment up to 9 disks (".9) in this manner.

Print-File Cache

One small file (SEG.PR) on the AppleWorks program disk contains special configuration information about such things as your printer information, standard location of your data disk, and enhancement options. The unmodified version of AppleWorks leaves this information on the program disk and is not preloaded along with the program overlays. When AppleWorks needs information from this file it prompts you to reinsert the AppleWorks program disk. The enhanced version of AppleWorks loads this file into memory at startup and eliminates the need for the program disk (until overlays are bumped from memory). Only when you change the contents of this file does the enhanced AppleWorks prompt you to insert the program disk.

5: Adding More Memory

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Choices

Your GS-RAM can contain up to 1.5 megabytes using 256K RAM chips; GS-RAM Plus, up to 6 megabytes using 1 Meg RAM chips. Memory on both cards is organized into six blocks, designated blocks A, B, C, D, E, and F, shown in the illustration at the top of the next page. Each block consists of <u>eight</u> memory chips. You must add these chips in groups of eight, filling the blocks in order, A-F.

Selection of the proper memory chips for the GS-RAM and GS-RAM Plus can be a little tricky. There are several chip manufacturers and many different types and specifications of RAM chips available. GS-RAM requires 256K x 1 Dynamic Random Access Memory (DRAM) chips. GS-RAM Plus uses 1024K x 1 DRAM chips. Both the 256K and 1 megabyte chips must have a speed specification of 150 nanoseconds or less (for example, -15, -12, -10) and must support the "CAS before RAS" method of memory refresh.

You may be able to find memory chips with the proper specifications at some computer or electronics-parts stores. But we recommend that you purchase them from Applied Engineering. Applied Engineering receives bulk-quantity discounts on purchases of memory chips and can often offer them for less. Applied Engineering uses only the highest-quality memory chips and warrants them for a full 5 years. (Most electronics-parts vendors sell their chips "as-is.") We will not warrant chips purchased from other vendors. When you get ready for more memory, give Applied Engineering a call. You'll be assured of getting the right chips at the right price.

Approved manufacturers and chips are:

| <u>GS-RAM</u>		<u>GS-RAM Plus</u>	
Hitachi	HM50256-15	Hitachi	HM511000-15
Mitsubishi	M5M4256P-15		HM511001-15
Fujitsu	MB81256-15	Toshiba	TC511000-15
OKI	MSM41256A-15AS/RS		TC511001-15
Intel	P21256-15		
Samsung	KM41256-15		
Micron Technologies	MT1259-15		
Toshiba	TMM41257-15		

Installing the Chips

There is nothing complicated about installing RAM chips onto the memory expansion cards. Just follow these basic guidelines:

- Fill the memory blocks in alphabetical order (i.e. fill block A, then block B, then block C...). Refer to the illustration on the next page.

GS-RAM and GS-RAM Plus memory-block configuration:
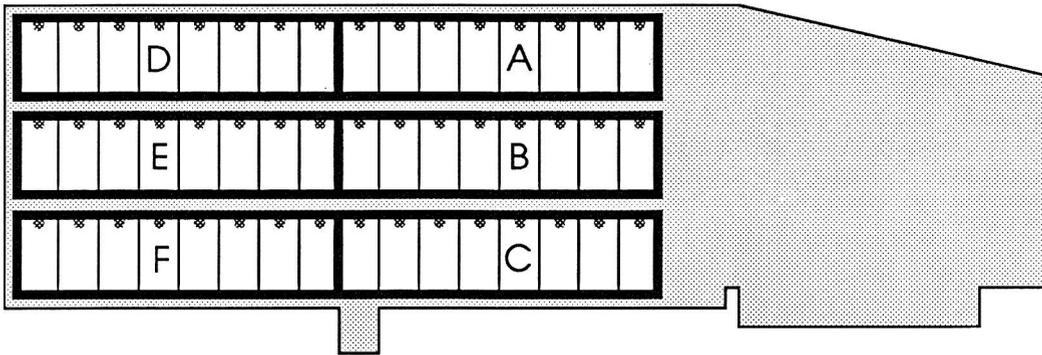
- Handle the RAM chips carefully. Avoid bending the pins excessively. (Some bending may be necessary.)

- Make sure the notch (or dot, on some chips) is pointing UP, away from the gold edge-connector on the bottom of the card. <u>See illustration below</u>.

- Press down firmly on each chip to ensure that it is fully seated in its socket. Check closely for bent pins.

    Warning: Applying power to a chip that has been installed incorrectly can ruin the chip. Be sure to double check the orientation notch.

Reminder: You may return your GS-RAM or GS-RAM Plus card to Applied Engineering for a memory upgrade with no additional charge for the installation or testing. Call the Applied Engineering sales office for the latest memory-chip prices and shipping instructions. The sales office telephone number is (214) 241-6060.