GsRAM™
and
GsRAM Plus™

Installation
Guide

Æ APPLIED ENGINEERING

v1.0

Introduction

This guide tells you how to install and test the GSRAM and GSRAM Plus memory expansion cards and how to add more memory as your needs grow. Before you install your memory-expansion card, please be sure to read *Setting Up Your Apple IIGS* and the *Apple IIGS Owner's Guide*.

The GSRAM 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 GSRAM 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 GSRAM up to 3.5 megabytes and up to 8 megabytes for the GSRAM Plus! By the way, an upgrade from the GSRAM to a GSRAM Plus is available at a small charge.

Installation

Installing the GSRAM or GSRAM Plus is easy. Here's how:

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

- Remove the Apple IIGS cover.

- Discharge any static electricity that may be on your body or clothing by touching the metal case of the computer's power supply.

- Remove the memory-expansion card from its anti-static bag. Do not touch the gold edge-connector.

- Position the memory expansion card over the Memory Expansion Slot, with the long end of the card toward the rear of the computer.

- Gently, but firmly, insert the gold edge-connector into the Memory Expansion Slot until it is completely seated.

- Replace the Apple IIGS cover. Installation is complete.

GSRAM Test

Boot the enclosed GSRAM Test Program disk. The test program will run automatically. To stop the test, turn the computer off.

> WARNING: The GSRAM Test Program is a destructive memory test. It will erase anything stored in extended memory.

Using the Extended Memory

Many of the newer application programs take advantage of the extended memory automatically. Appendix A of the *Apple IIGS Owner's Guide* explains how to use the Control Panel Program to designate some of the extra memory on the memory expansion card for use as a RAM disk.

Access Memory (DRAM) chips. GSRAM Plus uses 1024K x 1 DRAM chips. Both the 256K and 1 megabyte chips must have a speed specification of 150 nanoseconds and must support the "$\overline{CAS}$ before $\overline{RAS}$" method of memory refresh.

You may be able to find memory chips with the proper specifications at some computer or electronics-parts stores. Or you can purchase them from Applied Engineering, probably at a lower price. Since Applied Engineering receives bulk-quantity discounts on purchases of memory chips, they can 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.") 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.

Recommended memory chips:

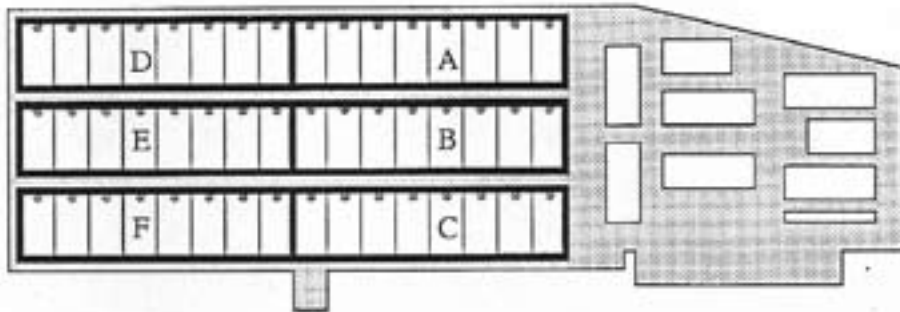| GSRAM		GSRAM Plus	
Hitachi	HM50256-15	Hitachi	HM511000-15
Mitsubishi	M5M4256P-15	Toshiba	TC511000-15
Fujitsu	MB81256-15		
OKI	MSM41256A-15AS/RS		

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. block A, block B, block C...). Refer to the illustration at the top of the next page.

- 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. See illustration.

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

- Be careful. Applying power to a chip that has been installed incorrectly can ruin the chip.

Note: You may return your GSRAM or GSRAM Plus to Applied Engineering for a memory upgrade with no additional charge for the installation or testing. Call Applied Engineering Technical Support for the latest memory-chip prices and shipping instructions. (All materials returned to Applied Engineering must have a Return Material Authorization number.) The Technical Support telephone number is (214) 241-6069.

GSRAM and GSRAM Plus memory-block configuration:

Applied Engineering Technical Support

If you have a technical question relating to your GSRAM card, 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, Applied Engineering has 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 GSRAM, please provide the revision level, original memory configuration, and current memory configuration of the GSRAM card.

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

* 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.