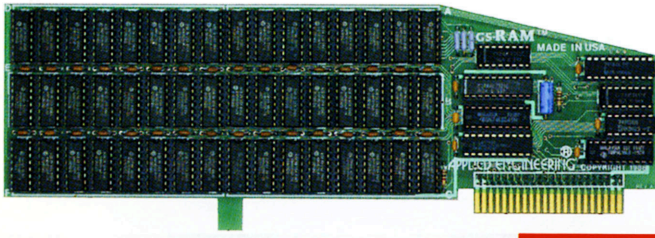
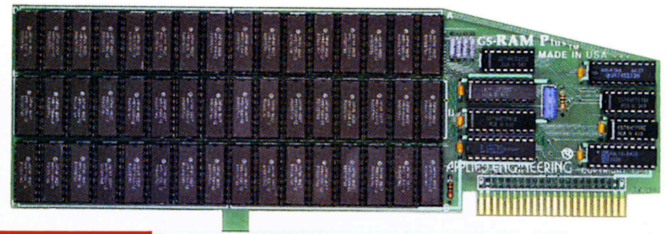


COMPATIBLE WITH IIgs



GS-RAM
Up to 1.5 MEG on one card



GS-RAM Plus
Up to 6 MEG on one card

Now the Fastest Memory Card for IIgs with New Disk-Caching Feature

Remember the 16K cards for the II+ and the 64K cards for the IIe? At the time, that much memory seemed like a lot. But when the owners of these memory cards came to us for more memory, many had to throw away their smaller Apple memory cards or try to sell them. Most of our customers told us that had they known about Applied Engineering's larger memory cards when they bought their Apple, they would have purchased them at the same time.

GS-RAM and GS-RAM Plus are available now, allowing up to 8 MEG of memory expansion. That's 8 times the memory capacity of Apple's card and just look at the benefits that only GS-RAM and GS-RAM Plus have over Apple's card:

- Lower cost
- Has 6 RAM banks (Apple's card has 4)
- Has memory expansion port
- Has ROM expansion port
- No soldered-in RAM chips
- Expandable to 8 MEG
- Expands AppleWorks internal limits
- Built-in Hi-Res self-diagnostic software
- 5 year hassle free warranty (Apple has a 90 day warranty)
- Made in USA

GS-RAM for More AppleWorks Power

Only GS-RAM and GS-RAM Plus eliminate AppleWorks internal memory limits, increasing the maximum number of records available from 6,350 to over 22,000 and only GS-RAM and GS-RAM Plus increase the number of lines permitted in the word processing mode from 7,250 to over 22,000. And only GS-RAM and GS-RAM Plus offer a built-in printer buffer so you can continue using AppleWorks while your printer is printing. GS-RAM and GS-RAM Plus even expand the number of lines in the clipboard from 255 to 2,042 and will auto segment large files so they can be saved on two or more disks. You can even have Pinpoint of Macroworks and your favorite spelling checker in RAM for instant response. GS-RAM and GS-RAM Plus will even display the time and date right on the AppleWorks screen. Nothing comes close to enhancing AppleWorks so much.

Turn Your IIgs into a Giant

Simply plug GS-RAM into the IIgs memory expansion slot and you've got up to 8 megabytes of RAM at your fingertips—all of it instantly and automatically recognized by the IIgs. GS-RAM is compatible with all IIgs software, including AppleWorks.

Grow by Bytes or Megabytes

We offer GS-RAM in two configurations so you can increase your memory 256K at a time (GS-RAM) or a megabyte at a time (GS-RAM Plus). Both offer compatibility, lower cost than other boards, and easy expandability. And both are extremely low in power consumption. A fully expanded GS-RAM operates at only 375 ma, and GS-RAM Plus at only 270 ma (even with 6 megabytes on board!)

GS-RAM—for Normal Memory Requirements

GS-RAM is available with 256K, 512K, 1 MEG or 1.5 MEG of memory already on board. If you don't need the full 1.5 MEG now, you can choose a GS-RAM with less memory and expand it up to 1.5 MEG in the future—or upgrade to GS-RAM Plus for a small charge.

With an optional piggyback card, you can expand GS-RAM even higher than 1.5 MEG! (Other cards are only expandable to 1 MEG.)

GS-RAM Plus—for Growing by Leaps and Bounds

GS-RAM Plus is the first Apple memory card to use 1 MEG RAM chips on the main board. It's available with 1 to 6 MEG on board. If you don't need the whole 6 MEG now, you can buy a GS-RAM Plus with less memory and easily expand it in the future.

GS-RAM Plus can be expanded up to 8 MEG with an optional piggyback card.

Easy Expansion

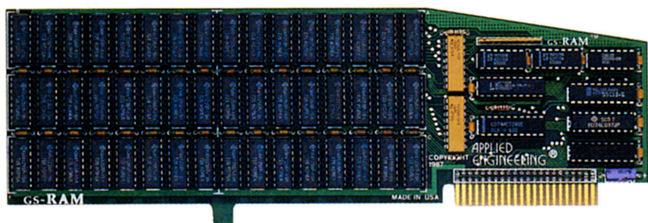
Both GS-RAM and GS-RAM Plus use standard RAM chips that are readily available and just plug right in. So unlike other cards, you'll find expanding your GS-RAM or GS-RAM Plus easy, convenient and very economical. And with our optional ROM expansion module you can even increase the IIgs's ROM space and all in just one slot.

GS-RAM with 256K	\$169
GS-RAM with 512K	\$219
GS-RAM with 1 MEG	\$299
GS-RAM with 1.5 MEG	\$379
GS-RAM Plus with 1 MEG	\$459
GS-RAM Plus with 2 MEG	\$759
GS-RAM Plus with 3 MEG	\$1059
GS-RAM Plus with 4 MEG	\$1359
GS-RAM Plus with 5 MEG	\$1659
GS-RAM Plus with 6 MEG	\$1959
2 MEG RAM/ROM Piggyback	CALL



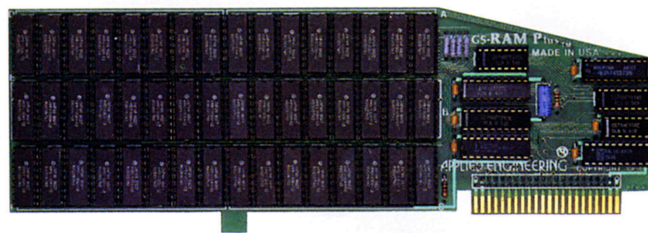
and C.O.D. 214/241-6060

Compatible with IIGS



GS-RAM

Up to 1.5 MEG on one card



GS-RAM Plus

Up to 6 MEG on one card

Now expand the IIGS RAM and ROM with up to 8 MEG of "Instant On" memory with the all new GS-RAM!

GS-RAM Has an All New Design

A design that delivers higher performance including increased speed, greater expandability, and improved software.

More Sophisticated, Yet Easier to Use

GS-RAM works with all IIGS software. In fact *any* program that runs on Apple's smaller memory card runs on the GS-RAM. But with GS-RAM you can have more memory, improved performance, and almost unlimited expansion capabilities. We've designed the new GS-RAM to be easier to use too—you don't have to adjust the size of your RAM disk every time you use a DMA device. No other RAM card with more than 4 banks of memory installed can make the same claim.

More than Just Hardware

Each GS-RAM and GS-RAM Plus includes the most powerful set of IIGS software enhancements available anywhere. In fact, our nearest competitor offers only a fraction of the invaluable programs that we include with each GS-RAM card. This software includes the most powerful disk-caching program available, the GS-RAM Cache. The Cache will make most of your applications run up to *7 times faster*. Also included is a diagnostic utility that lets you test your GS-RAM by graphically showing the location of any bad or improperly installed RAM chips. And for AppleWorks users, we give you our exclusive Expander program that dramatically enhances both the capabilities and speed of AppleWorks.

Making AppleWorks Even Better

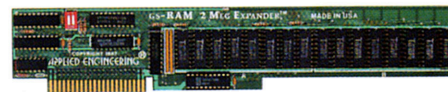
Applied Engineering's Expander program eliminates AppleWorks 2.0 internal

memory limits allowing it to recognize up to 8 megabytes of Desktop workspace, and increasing the limits from only 7,250 lines to 22,600 lines in the word processor and from 6,350 records to 22,600 records in the database. The Expander allows all of AppleWorks, including print functions, to automatically load into RAM. The clipboard size will increase from 255 to 2,042 lines maximum. GS-RAM will automatically segment larger files so you can save them onto multiple floppies. And GS-RAM provides a built-in printer buffer that allows you to continue working in AppleWorks while your printer is still processing text. You can even load Pinpoint or MacroWorks and your favorite spelling checker into RAM for instant response.

Grow by Kilobytes or Megabytes

We offer GS-RAM in two configurations so you can increase your memory 256K at a time (GS-RAM) or a megabyte at a time (GS-RAM Plus). Both are IIGS compatible and both come with our powerful enhancement software. GS-RAM can hold up to 1.5 MEG of 256K chips and GS-RAM Plus can hold up to 6 MEG using 1 MEG chips. And since both use standard RAM chips (not high-priced SIMM's), you'll find expanding your GS-RAM or GS-RAM Plus easy, convenient, and very economical. For further expansion, you can plug a 2 MEG "piggyback" card into the GS-RAM's expansion port for up to 3.5 MEG of total capacity. Or up to a whopping 8 MEG on GS-RAM Plus. If GS-RAM owners outgrow 3.5 MEG, they can easily upgrade to GS-RAM Plus for a nominal charge.

GS 2 MEG Expander



- Expands GS-RAM and GS-RAM Plus
- Up to 8 MEG total memory
- Can be used as stand-alone memory
- DMA compatible

GS-RAM's Got It ALL!

- 6 RAM banks (most cards have 4)
- Memory expansion port
- Ultra-fast disk caching on ProDOS 8 AND ProDOS 16
- Expands AppleWorks internal limits
- Includes hi-res self test software
- No soldered-in RAM chips
- Expandable to 8 MEG with 2 MEG Expander
- No configuration blocks to set
- DMA compatible to 4 MEG
- RamKeeper back-up option allows permanent storage of programs & data
- 5 year warranty — parts and labor
- Proudly made in the U.S.A.

GS-RAM with 256K	\$219
GS-RAM with 512K	\$339
GS-RAM with 1 MEG	\$579
GS-RAM with 1.5 MEG	\$819
GS-RAM with 2.5 to 3.5 MEG	CALL
GS-RAM Plus with 1 MEG	\$639
GS-RAM Plus with 2 MEG	\$1139
GS-RAM Plus with 3 to 8 MEG	CALL
RamKeeper Option	\$179



and C.O.D. 214/241-6060

GS - R A M TM A N D G S - R A M P L U S TM

Applied Engineering's IIGS memory cards, the GS-RAMTM and GS-RAM PlusTM are the ONLY large capacity IIGS memory cards that are fully DMA compatible. Others are either totally non-compatible or compatible only in certain specific configurations.

That difference in a memory card is critical. Here's why: DMA (Direct Memory Access) tremendously speeds up computer operations by bypassing the microprocessor. All addressing and

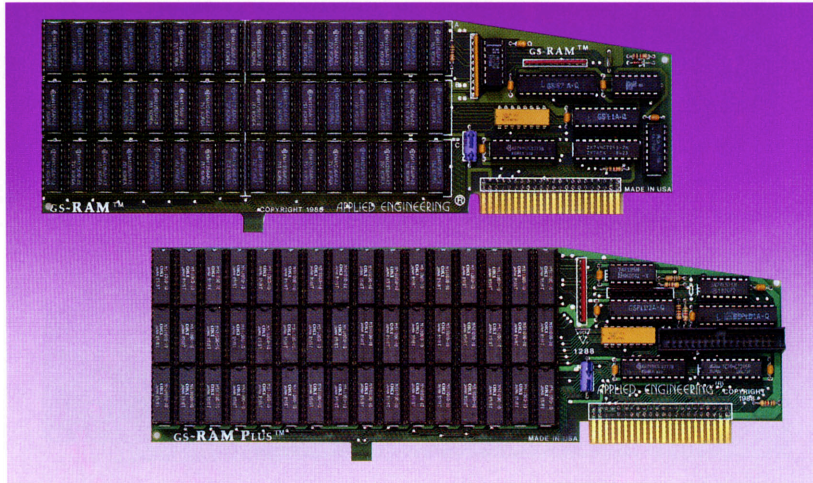
gram that dramatically enhances the capabilities and speed of AppleWorks. The Expander eliminates disk access time by allowing all of AppleWorks, including print functions, to automatically load into RAM. You can even load Pinpoint or the TimeOut Series into RAM for instant response.

This powerful software:

- Allows AppleWorks to recognize up to 8 MEG on the desktop

- GS-RAM Plus expands from 1 MEG to 6 MEG
- GS ExpanderTM adds up to 2 MEG to either card
- Full DMA compatibility in *any* configuration
- 5-year warranty - parts and labor
- 6 RAM banks (most cards have only 4)
- Piggyback memory expansion port
- Ultra-fast disk caching on ProDOS 8 *and* ProDOS 16
- Free graphic Super Hi-Res diagnostic software
- Free AppleWorks Enhancement software
- No soldered-in RAM chips
- Accepts GS Expander for additional 2 MEG
- No configuration blocks to set
- RamKeeper option available for permanent storage
- Proudly made in the U.S.A.

Now expand the IIGS with up to 8 MEG of "Instant On" memory with GS-RAM Plus and RamKeeper.



GS-RAM
Up to 1.5 MEG on one card

GS-RAM Plus
Up to 6 MEG on one card

control logic is contained on our cards, enabling a DMA device to bypass the microprocessor and go straight to the heart of things...the computer's memory.

AE's full DMA compatibility means GS-RAM and GS-RAM Plus run all GS software, support all *current and future* DMA peripherals, and don't require you to adjust the size of your RAMdisk everytime you use a DMA device...something every other large capacity memory card requires you to do.

Software.

Both GS-RAM and GS-RAM Plus come complete with Applied Engineering's own powerful enhancement software.

Disk caching software is included, tremendously speeding up the computer's access to the 3.5 Drive and running most applications up to *seven times faster*.

Super Hi-Res diagnostic utility software is also included free. It graphically shows the location of bad or improperly installed chips and even tests for CAS before RAS chips.

Your free software also includes AE's exclusive AppleWorks Expander pro-

- Increases word processor lines from 7,250 to 22,500
- Increase database records from 6,350 to 22,500
- Increases clipboard capacity from 255 lines to 2,042
- Automatically loads AppleWorks (including print functions) into RAM
- Automatically segments files for saving large files on multiple floppies
- Provides a built-in print buffer

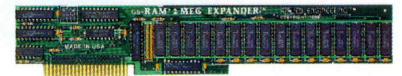
RamKeeper option.

Coupled with Applied Engineering's RamKeeper, your GS-RAM or GS-RAM Plus actually gives you an internal "electronic hard disk" with an instant-on Finder and emergency power backup. RamKeeper even supports an Apple IIGS memory card (and most others) alone or in combination with one of our cards. See the RamKeeper page in this catalog for more details on how this \$189 wonder gives your IIGS all the speed and power it was meant to have.

Compare our features:

- GS-RAM expands from 256K to 1.5 MEG

GS-RAM with ZeroK	\$139
GS-RAM with 256K	\$249
GS-RAM with 512K	\$399
GS-RAM with 1 MEG	\$699
GS-RAM with 1.5 MEG	\$999
GS-RAM Plus with ZeroMEG	\$169
GS-RAM Plus with 1 MEG	\$699
GS-RAM Plus with 2 MEG	\$1249
GS-RAM Plus with 3-8 MEG	CALL
GS-Expander with 1-2 MEG	CALL
RamKeeper option	\$189



IIGS

Comparison Between RamWorks™, RamFactor™, GS-RAM Plus™ and GS-RAM Ultra™

Many of the features and benefits of RamWorks III™, RamFactor™, GS-RAM™, GS-RAM Plus™ and GS-RAM Ultra™ are the same; however, there are differences that we would like to point out so that you can make the best choice.

Most importantly, RamWorks III is specially designed for the Apple IIe

while GS-RAM, GS-RAM Plus and GS-RAM Ultra are specially designed for the Apple IIGS. These three cards will not work on a II+, Franklin or Laser. That leaves RamFactor as the source of most of the confusion, since it is compatible with the IIe, II+, IIGS, Franklin, Laser 128 and most compatibles.

For the most powerful AppleWorks enhancements, stick with RamWorks III for the IIe and GS-RAM, GS-RAM Plus or GS-RAM Ultra (the major difference is capacity) for the IIGS. For other applications, RamFactor reduces disk access time and storage and can be battery backed-up. See the accompanying chart for further comparison.

Capability	RamWorks® III	RamFactor™	GS-RAM™ GS-RAM Plus™ GS-RAM Ultra™
Computer compatibility	Apple IIe	Apple II+, IIe, IIGS and compatibles	Apple IIGS
Maximum memory on main card	1 Megabyte	1 Megabyte	1.5 MEG GS-RAM 6 MEG GS-RAM Plus 4 MEG GS-RAM Ultra
Expander cards (for expansion beyond main card)	512K, 2 MEG	RamFactor 4 MEG, "Y" connector for 2 RamFactors	2 MEG RAM
Compatible slot	Auxiliary slot	Slots 1-7 except 3	Memory expansion
RAM disk	Disk based	EPROM/disk based	IIGS Control Panel
Software standard	Yes	Yes	Yes
Battery back-up	No	Yes	No on main board*
AppleWorks compatibility	All versions	Versions 1.3, 2.0, 2.1 and 3.0	Versions 2.0, 2.1 and 3.0
Maximum number of records in database in AppleWorks	22,500	22,500	22,500
Maximum number of lines in word processor in AppleWorks	22,500	22,500	22,500
Lines in WP and DB clipboard in AppleWorks	2,042	2,042	2,042
Autoload AppleWorks	Yes	Yes	Yes
Displays time on screen with ProDOS clock	Yes	Yes	Yes
Auto-segments large files	Yes	Yes	Yes
AppleWorks printer buffer	Yes	No	Yes
Fully socketed and user upgradeable	Yes	Yes	Yes
16 bit option (65C816)	Yes	No	N/A
Memory chip types for expansion	64Kx1 256Kx1	256Kx1	256Kx1 GS-RAM 1 MEGx1 GS-RAM Plus 256Kx4 GS-RAM Ultra

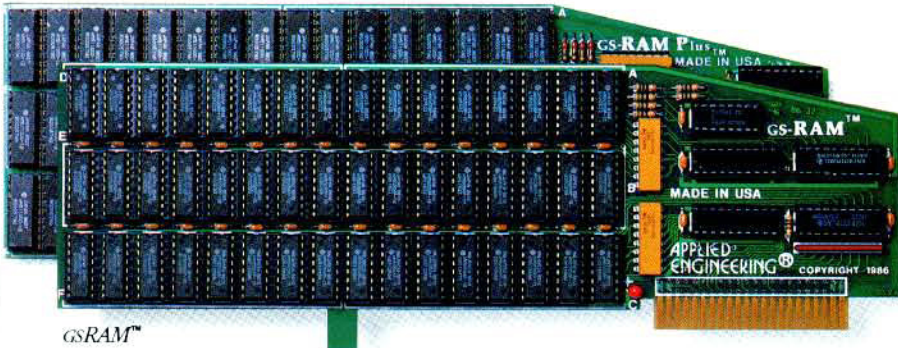
Comparisons made using AppleWorks 2.1, however, similar performance is obtained using older AppleWorks versions with RamWorks.

*RamKeeper provides the GS-RAM, GS-RAM Plus and GS-RAM Ultra with battery back-up.

Insist on GSRAM™ When You Buy Your IIGS™

Expand the IIGS RAM and ROM with the GSRAM or GSRAM Plus
with ROM Pak. Available now with 256K to 8 MEG!

GSRAM Plus™



GSRAM™

Remember the 16K cards for the II+ and the 64K cards for the IIe? At the time, that much memory seemed like a lot. But when the owners of these memory cards came to us for more memory, many had to throw away their smaller Apple memory cards or try to sell them. Most of our customers told us that had they known about Applied Engineering's larger memory cards when they bought their Apple, they would have purchased them at the same time.

GSRAM and GSRAM Plus are available now, allowing up to 8 MEG of memory expansion. That's 8 times the memory capacity of Apple's card and just look at the benefits that only GSRAM and GSRAM Plus have over Apple's card:

- Lower cost
- Has 6 RAM banks (Apple's card has 4)
- Has memory expansion port
- Has ROM expansion port
- No configuration blocks to set
- No soldered in RAM chips
- Expandable to 8 MEG
- Expands AppleWorks internal limits
- Built-in Hi-Res self-diagnostic software
- 5 year hassle free warranty (Apple has a 90 day warranty)
- Made in USA

GSRAM for More AppleWorks Power

Only GSRAM and GSRAM Plus eliminate AppleWorks internal memory limits, increasing the maximum number of records available from 6,000 to over 25,000 and only GSRAM and GSRAM Plus increase the number of lines permitted in the word processing mode from 6,000 to over 15,000. And only GSRAM and GSRAM Plus offer a built-in printer buffer so you can continue using Appleworks while your printer is printing. GSRAM and GSRAM Plus even expand the number of lines in the clipboard from 255 to 2047 and will auto segment large files so they can be saved on two or more disks. You can

even have Pinpoint or Macroworks and your favorite spelling checker in RAM for instant response. GSRAM and GSRAM Plus will even display the time and date right on the AppleWorks screen. Nothing comes close to enhancing AppleWorks so much.

Turn Your IIGs into a Giant

Simply plug GSRAM into the IIGs memory expansion slot and you've got up to 8 megabytes of RAM at your fingertips—all of it instantly and automatically recognized by the IIGs. GSRAM is compatible with all IIGs software, including AppleWorks, as well as BASIC®, ProDos, DOS 3.3, PASCAL®, "C" and CP/M®.

Grow by Bytes or Megabytes

We offer GSRAM in two configurations so you can increase your memory 256K at a time (GSRAM) or a megabyte at a time (GSRAM Plus). Both offer full compatibility, lower cost than other boards, and easy expandability. And both are extremely low in power consumption. A fully expanded GSRAM operates at only 375 ma, and GSRAM Plus at only 270 ma (even with 6 megabytes on board!)

GSRAM—for Normal Memory Requirements

GSRAM is available with 256K, 512K, 1 MEG or 1.5 MEG of memory already on board. If you don't need the full 1.5 MEG now, you can choose a GSRAM with less memory and expand it up to 1.5 MEG in the future—or upgrade to GSRAM Plus for a small charge.



Steve Wozniak, the creator
of Apple Computer

"In quality, performance, compatibility, expandability and support, Applied Engineering's GSRAM and GSRAM Plus are number one."

With an optional piggyback card, you can expand GSRAM even higher than 1.5 MEG! (Other cards are only expandable to 1 MEG.)

GSRAM Plus—for Growing by Leaps and Bounds

GSRAM Plus is the first Apple memory card to use 1 MEG RAM chips on the main board. It's available with 1 to 6 MEG on board. If you don't need the whole 6 MEG now, you can buy a GSRAM Plus with less memory and easily expand it in the future.

GSRAM Plus can be expanded up to 8 MEG with an optional piggyback card.

Easy Expansion

Both GSRAM and GSRAM Plus use standard RAM chips that are readily available and just plug right in. So unlike other cards, you'll find expanding your GSRAM or GSRAM Plus easy, convenient and very economical. And with our optional ROM expansion module you can even increase the IIGs's ROM space and all in just one slot.

Quality and Support of the Industry Leader

Applied Engineering is the largest supplier of Apple peripherals in the world. We invented the first large RAM cards for the Apple. With a 5-year "no-hassle" warranty and outstanding technical support, you can be sure GSRAM and GSRAM Plus will deliver the performance you're looking for—or return them within 15 days for a full refund.

GSRAM with 256K	\$169
GSRAM with 512K	\$219
GSRAM with 1 MEG	\$299
GSRAM with 1.5 MEG	\$379
GSRAM with 2-8 MEG	CALL
GSRAM PLUS with 1 MEG	\$459
GSRAM PLUS with 2 MEG	\$759
GSRAM PLUS with 3-8 MEG	CALL

Order today!

See your dealer or call Applied Engineering today, 9 a.m. to 11 p.m. 7 days. Or send check or money order to Applied Engineering. MasterCard, VISA and C.O.D. welcome. Texas residents add 6¼% sales tax. Add \$10.00 outside U.S.A.

AE APPLIED ENGINEERING™

The Apple enhancement experts.

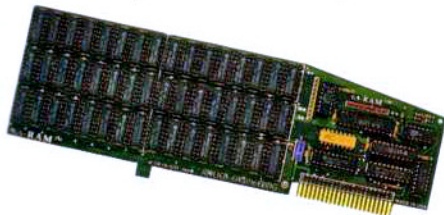
(214) 241-6060

P.O. Box 798, Carrollton, TX 75006

Three good reasons to buy a memory card from Applied Engineering.

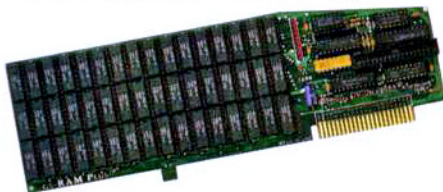
Applied Engineering makes three different memory cards for the IIGs because every IIGs owner is different. Each card was designed to suit specific needs:

1. **GS-RAM™** Start with as little as 256K of memory and grow in affordable 256K increments to 1.5 MEG (an amount that once sounded large, but is now considered a moderate amount of memory expansion.) Incorporates 256K x 1 chips.



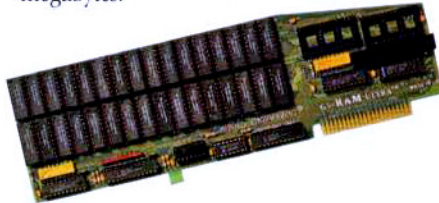
GS-RAM w/256K	\$219
1 MEG	\$639
1.5 MEG	\$919

2. **GS-RAM Plus™** Expands from 1 to 6 MEG in 1 MEG increments. Originally designed for power-users requiring a great deal of internal memory, this card has recently found favor with many moderate users. MEG-sized jumps in memory have now become practical for many users because of the enormous memory requirements of today's software titles. Incorporates 1 MEG x 1 chips.



GS-RAM Plus w/1 MEG	\$599
2 MEG	\$1049
3-6 MEG	CALL

3. **GS-RAM Ultra™** AE's newest memory card incorporates a new chip - the 256K x 4, which has four times the density of 256K x 1 chips. GS-RAM Ultra offers incremental expansion like the GS-RAM and ultimate size like the GS-RAM Plus. It's expandable from 256K to 4 MEG in 256K increments, so you can start small and still grow to a massive 4 megabytes.



GS-RAM Ultra 256K	\$239
512K	\$399
768K-4 MEG	CALL

We've also added ROM sockets to the GS-RAM Ultra. ROM sockets allow hardware-based applications to be loaded permanently into EPROMs...an increasingly important feature when application become available from Applied Engineering and others.

Consider your needs.

Need a moderate amount of memory? **GS-RAM** lets you start small and takes you up to 1.5 MEG. Need lots of memory right away? **GS-RAM Plus** is your best bet. Want to start small and leave open the possibility of a huge internal memory? **GS-RAM Ultra** is your card. And our **GS Expander™** piggyback card adds up to 2 MEG to any of the three cards. Call AE for prices.

Trade in your Apple card.

We even offer a trade-in credit for your Apple IIGs memory card, so you can switch to an AE card with more features and greater capacity. Still have questions? Call us, we'll be happy to discuss your particular applications.

DMA compatibility.

All three of our GS memory cards are fully DMA compatible (and they're the ONLY large-format cards that are), so they not only run all GS software, they also support *current and future* DMA peripherals.

Installation couldn't be easier, the cards just plug in. And all three cards feature Applied Engineering's meticulous craftsmanship, along with our 5-year warranty, our 15-day money-back guarantee* and our American-made pride.

Still more:

Each of our GS memory cards comes with many other exclusive features, *disk caching* that tremendously speeds up many programs, including AppleWorks, by virtually eliminating disk access. Our *diagnostic utility* feature graphically detects the presence of bad or improperly installed chips and tests for CAS before RAS chips. And our *AppleWorks enhancement* package dramatically increases AppleWorks' word processor lines (from 7,250 to 22,500), database records (from 6,350 to 22,500), clipboard capacity (from 255 lines to 2,042) and more.

Order today!

To order or for more information, see your dealer or call (214) 241-6060 today, 9 am to 11 pm 7 days. Or send check or money order to Applied Engineering. MasterCard, VISA and C.O.D. welcome. Texas residents add 7% sales tax. Add \$10 outside U.S.A.

AE APPLIED ENGINEERING®

The Apple enhancement experts.

A Division of AE Research Corporation.

(214) 241-6060

P.O. Box 5100, Carrollton, TX 75011

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*When purchased from Applied Engineering or thru a participating dealer.