

0431

RamFAST/SCSI V1.05

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"We make hard drives RamFAST!"

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Table of Contents

Limited Lifetime Warranty	1
About the RamFAST/SCSI	2
Features	2
General Theory of Operation	2
Setting the DIP Switches	3
Installation	4
Installation - Apple IIs	4
The Built-in RomDISK - A Short Explanation	5
The GS/OS Driver and the Utility Program	5
Using the Utility Program	6
Setting the Switches	7
ProDOS 8 Slot Allocation	8
Drive Status Settings	8
Saving Your Configuration Information	9
Formatting - What kind of drive do I have?	9
Formatting a SASI Drive	11
Formatting a SCSI Drive	12
Partitioning Your Drive	13
Daisy-chained Drives - A special note	15
REFORMAT REQUIRED - What's it mean?	16
Verbose Drive Information	17
Quitting the Program	17
DMA and Other Compatibility Issues	19
DMA Compatibility	19
DOS3.3 Compatibility	19
Trouble Shooting	20
Where to get HELP!	22
Technical Support	22
GENie	22
Warranty Registration	23

Limited Lifetime Warranty

C.V. Technologies warrants this product against defects in materials and workmanship for as long as you, the original consumer purchaser, own it. This warranty applies only should the product fail to function properly under normal use.

During the warranty period, *C.V. Technologies* will repair (or, at its option, replace), at no charge, components that prove to be defective, provided the product is returned (shipping prepaid and properly packed) to *C.V. Technologies*.

Before returning any item you must first obtain an RMA (Return Merchandise Authorization) number. This number must be prominently marked on the outside of the shipping container and on a letter enclosed inside that lists your name, address, and the reason for returning the item. Also, your purchase receipt or other proof of original purchase and the serial number must be provided when requesting warranty service to be performed. This warranty does not apply if the serial number has been removed, defaced, or altered, or if, in the opinion of *C.V. Technologies*, the product has been damaged by accident, misuse, neglect, improper packing or improper modifications.

This warranty is in lieu of all other express warranties, statements, or representations, and unless stated herein, all such warranties, statements, or representations, made by any other person or firm are void.

In the event that this product shall prove defective in workmanship or materials, your sole remedy shall be the repair or remedy as stated in this warranty, and under no circumstances shall *C.V. Technologies* be liable for any loss or damage, direct, incidental, or consequential, arising out of the use of, or inability to use, this product caused by any defect in the product.

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About the RamFAST/SCSI

Congratulations! You have just purchased the ultimate hard drive controller for the Apple II line of computers. The RamFAST/SCSI is the **ONLY** DMA hard drive controller that supports true 1:1 interleave. No other controller in the Apple II market can make that claim. What this means is that you can expect unparalleled speed and performance (2 to 12 times that of other controllers).

Features

- 1mb/second transfer rate
- 256k of dedicated memory
- GS/OS driver included
- Utility/partitioning program included
- Built-in RomDISK, no floppies to mess with!
- Supports up to 8 drives/partitions at a time
- Access to all of them even under ProDOS 8
- Compatible with the Apple IIe and the Apple IIgs
- Even supports the older SASI (pre SCSI) drives
- Easy installation — just plug and go
- Limited lifetime warranty

General Theory of Operation

The RamFAST/SCSI accelerates your hard drive performance by using an on-board processor and state-of-the-art hardware caching techniques, coupled with DMA (Direct Memory Access) to take the burden of disk I/O off of the Apple CPU. All that is necessary is for code on the Apple to tell the RamFAST/SCSI what data it wants and where it wants it put and the RamFAST/SCSI does the rest. And since the RamFAST/SCSI keeps the most recently accessed data in its on-board memory at all times, the data is often available almost immediately.

Even when it is necessary to actually access the disk to get the data, the RamFAST/SCSI gets the data as fast as physically possible. Since the processor on the RamFAST/SCSI runs at 10mHz, it has no problem keeping up with an interleave of 1:1. This allows the RamFAST/SCSI to read an entire track of the drive in one revolution. And what's more, even when writing to the disk the RamFAST/SCSI is able to keep up with this 1:1 interleave.

Setting the DIP Switches

You should read this section before attempting to install your RamFAST/SCSI and make a note of any DIP switches you need to change. Note: All DIP Switches (with the possible exception of Switch #1) are shipped in the OFF position.

- 1 **Terminator power** - If this switch is ON then the RamFAST/SCSI will supply terminator power to the SCSI bus. Otherwise the drive is assumed to be supplying it. You should only toggle this switch if the RamFAST/SCSI has problems locating some or all of your drives, or if it is acting erratically.
ON
- 2 **ROM Select** - This switch should be OFF in an Apple IIgs and ON in an Apple IIe. Period.
OFF
- 3 **Machine type** - OFF denotes an Apple IIgs (or an enhanced Apple IIe). ON signifies that you have an unenhanced Apple IIe. If you do have to turn this switch ON, DMA will be approximately 6% slower than it would be otherwise.
OFF
- 4 **DMA Compatibility** - In an Apple IIgs, this switch is turned ON if you have a non-DMA compatible memory card. If this is the case, DMA will only occur to and from the memory on the motherboard and it is important that Switch #5 also be set correctly. In an Apple IIe, this switch completely enables (OFF) or disables (ON) DMA. If you have a CPU accelerator other than the Transwarp III installed in your Apple IIe you will need to turn this switch ON. Note: Turning this switch ON will drop your performance drastically; you might want to try running without the accelerator.
ON
- 5 **GS Motherboard Type** - This switch determines if the motherboard is the older 256k version (switch OFF) or the newer 1meg version (switch ON). If the entire system is DMA compatible (switch 4 is OFF) then this switch is not really used, otherwise it tells the RamFAST/SCSI how much of the Apple IIgs's memory is DMA compatible (128k vs. 1meg). In an Apple IIe this switch is ignored.
OFF
- 6 **RomDISK Disable** - Turn this switch ON and the RomDISK will never show up as a drive and it will also not "pop up" when the saved configuration data does not match the current configuration. The only real reason for disabling the RomDISK here and not in software using the Utility Program is if you plan on turning off all of the drives connected to the RamFAST/SCSI and booting 3.5" or 5.25" disks.
OFF
- 7 **Drive Search Timeout** - Turn this switch ON and the RamFAST/SCSI will only spend 3 seconds (instead of 30) trying to find a drive after powerup. Use this if you want to turn off all of the drives connected to the RamFAST/SCSI and still use your computer (booting 3.5" or 5.25" disks) without having to wait the default 30 seconds.
OFF
- 8 **Reserved** - Must be OFF.
OFF

Installation

- 1 If you are about to connect the RamFAST/SCSI to a drive that contains needed data, we strongly urge you to back it up first. While we do test all cards before they are shipped, things do happen and *C.V. Technologies* can not be held responsible for any loss or damage to the data or the drive, etc.
- 2 Turn off the Apple's power switch. Never insert or remove a card while your computer is turned on. You should, however, leave it plugged in to allow the power supply to absorb any static electricity from your body.
- 3 Remove the cover from the Apple. Consult your owner's manual if you are unsure on how to do this.
- 4 Touch the power supply case in the Apple to discharge any static electricity from your body. Make sure you do this because static can cause a great deal of damage to the computer chips on the card and in your computer.
- 5 Remove the RamFAST/SCSI from its anti-static bag holding it by its edges.
- 6 Set the DIP Switches according to the type of computer and its degree of DMA compatibility. See the previous section, "Setting the DIP Switches".
- 7 Select the slot into which you're going to install the RamFAST/SCSI. Align the card edge of the RamFAST/SCSI with the slot and use the heel of one hand to firmly push the card down into the slot. It should fit snugly.
- 8 Attach the cable from the RamFAST/SCSI to any available opening on the back of your computer. After this, check to make sure that it is still securely connected to the RamFAST/SCSI.
- 9 Connect the drive's cable to the cable at the back of the computer. Replace the cover of the Apple. *Congratulations! The RamFAST/SCSI is now installed.*
- 10 Turn on power to the drive. Turn on your computer. If the RamFAST/SCSI is the boot device the utility program should "pop up." If it does, you should turn to "Using the Utility Program". If you are booting another slot, you should still launch or run the Utility Program so that you can check and save the configuration information.

Installation - Apple IIgs

/C VTECH. ROM

20K

RAMFAST.DRIVER
RAMFAST.SYSTEM

When installing the RamFAST/SCSI into an Apple IIgs, make sure that the control panel setting for the slot it is installed in is set to "Your card." Also, the boot slot should be set to either "Scan" or to the slot that the RamFAST/SCSI is installed in. Lastly, you should copy the file "RamFAST.Driver" off of the RomDISK and into your "System/Drivers" folder as soon as possible (see "RamFAST/SCSI RomDISK - A Short Explanation").

NEVER USE SCSI H.D. DRIVER

The Built-in RomDISK - A Short Explanation

The RamFAST/SCSI contains, within itself, a RomDISK. This RomDISK is used to distribute the files necessary to use the card without having to include an installation disk (they never seem to be around when you need them anyway). This RomDISK will in no way interfere with any other Ram or Rom disks you may have installed in your system. The RamFAST/SCSI treats it just as if there were another partition or drive connected. Whenever the RomDISK is enabled, it will take up one of the 8 available slots in the drive table thus limiting you to 7 other partitions and/or drives.

The GS/OS Driver and the Utility Program

There are two (2) files contained on the RomDISK that are meant to be copied. First, the file "RamFAST.Driver" is a GS/OS device driver. If the RamFAST/SCSI is being installed in an Apple IIgs then you most certainly want to place this file into the "System/Drivers" folder on your hard drive. If it's being installed into an Apple IIe this file can be ignored. The second file, "RamFAST.System" is a Partitioning/Utility Program that is used to partition and format drives and also to adjust and save the configuration information used by the RamFAST/SCSI to control how it works. Unless the RomDISK had been specifically disabled (see "Setting the DIP Switches"), this program will "pop up" of its own accord when any of the following conditions occur:

- The first time you install the card.
- If you change the slot the card is installed in.
- If you add a new drive to the daisy-chain.
- If you change any of the DIP Switch settings.
- After the RomDISK or firmware has been upgraded.

The program will display a summary of the condition(s) which caused it to become active and then run normally from that point on. Read "Using the Utility Program" for more information.

DO NOT COPY THE APPLE GS.OS SCSI.HD.DRIVER
SCSI.MANAGER
FROM PROSEL
DEV. NUMBER ON MAIN BOARD

Using the Utility Program

When you run the Utility Program (or it “pops up”, which will be treated as the same thing from here on out) the first thing you should see is a screen something like the one below:

RamFAST Utility Program						
Current device ID	7	+-----+-----+-----+-----+-----+-----+-----+				
Device size (in blocks)	\$0284D8					
Blocks used	\$028000	RamFAST/SCSI V1.0				
Blocks available	\$0004B8					
Machine type	IIgs	Copyright 1990				
DMA Compatible	Yes	C.V.Technologies				
Motherboard type (GS only)	256k					
Rom Disk	Enabled	"We make hard drives RamFAST!"				
Drive search timeout	Long					
Switch #8	Off					
Slot allocation priority	S4 S1 S2	+-----+-----+-----+-----+-----+-----+-----+				
Part#	Active	Locked	Lookahead	Size (Scale: \$1000)	Name	
1	Yes	No	12k	32.000mb \$010000	UNTITLED1	
2	Yes	No	12k	32.000mb \$010000	UNTITLED2	
3	Yes	No	12k	10.000mb \$005000	UNTITLED3	
4	Yes	No	12k	6.000mb \$003000	UNTITLED4	

The Utility Program

It is possible that the first thing you see will be a message telling you that the stored configuration data is missing or wrong. In this case you should read the message and make sure that what it's saying is indeed true and then press “RETURN.” You should then see the copyright message unless you have just upgraded the RomDISK or firmware on your card. If this is the case you will see one more screen telling you that your RomDISK may have been reenabled to allow you to copy off the newest versions of the GS/OS driver and the Utility Program. If you press “RETURN” again you will finally see the copyright message.

If you see the message “**Can't locate RamFAST card in system!**” instead of the copyright notice then the program has failed to locate the RamFAST/SCSI card in the system. If you are running on an Apple IIgs, check to make sure that the control panel setting for the slot that the RamFAST/SCSI is installed in is set to “Your card”. If you can find no reason for this message to have appeared turn to the section “**Where to Get HELP!**”.

The entries for “Current Device ID”, “Device size (in blocks)”, “Blocks used”, and “Blocks available” will almost certainly not be the values shown. These values are (in order): The SCSI ID of the current drive, The total number of blocks available on the drive, The number of blocks currently allocated to partitions or overhead, and lastly The number of blocks currently available for expansion of existing partitions or creation of new partitions.

The entries at the bottom of the screen are any partitions that were found on the drive. For more details on what the column headings mean read the sections **“Drive Status Settings”** and **“Partitioning Your Drive”**.

You will notice that many of the numbers displayed are prefixed with a **“\$”**. What this means is that the number in question is in hexadecimal notation (base 16 instead of base 10). Base 16 numbers go up in powers of 16 in the same way that base 10 numbers go up in powers of 10. For example: $245 = 2 \times 10^2 + 4 \times 10^1 + 5 \times 10^0$ where as $\$245 = 2 \times 16^2 + 4 \times 16^1 + 5 \times 16^0 = 2 \times 256 + 4 \times 16 + 5 \times 1 = 583$. For more information on hexadecimal notation, read the owner's manual that came with your computer.

There should be one (1) highlighted entry. This is the current entry. You can use the **“ARROW”** keys to move this highlight bar from entry to entry on the screen. For information on how to change a particular entry, refer to the section that covers that entry in more detail. Also, throughout this tutorial you will see commands displayed in the following format: **@-key(function)**. What this means is that you should hold down the **“OPEN-APPLE”** key at the same time as another **“key”** to execute that command.

When you first install the RamFAST/SCSI, you will probably want to follow these steps:

- 1 Backup all data that may be on any drives connected to the RamFAST/SCSI.
- 2 Format all drives - see **“Formatting - What kind of drive do I have?”**.
- 3 Partition the drives - see **“Partitioning Your Drive”**.
- 4 Set and save the configuration data - see the next four (4) sections.
- 5 Restore any data that was backed up.

Setting the Switches

On the left-hand side of the screen are six (6) entries corresponding to DIP Switches #3 through #8. Note: #7 and #8 are here for display purposes only; they can not be modified in any way except by the explicit setting of the DIP Switches on the card. The other four (4), however, can be set and changed here just as if you had set the DIP Switches themselves. To demonstrate this, use the arrow keys to move the highlight bar onto the entry labeled **“RomDISK”**. Press the **“SPACE”** bar. Notice that the entry now says **“Disabled.”** The **“SPACE”** bar can be used to toggle the value of any of these Switches. Remember, this is just practice. You should be sure to copy the files off of the RomDISK before actually disabling it.

ProDOS 8 Slot Allocation

Below the switches is a section labeled "Slot Allocation Priority." Followed by a list of three (3) slot designations. These three slots are where the RamFAST/SCSI will map extra partitions when running ProDOS 8 applications. You can change them in one of two ways: you can type a number from 1-7 and the current entry will be set to that slot or you can press the "SPACE" bar which will increment the slot number by 1. For example, let's make the leftmost slot the current entry, then let's press the "6" key, the "4" key, and the "2" key. Given the same four (4) partitions we had above and a RamFAST/SCSI installed in slot #7, this would yield the following setup for the drives:

Part#	Location under ProDOS	
1	S7,D1	/UNTITLED1
2	S7,D2	/UNTITLED2
3	S6,D1	/UNTITLED3
4	S6,D2	/UNTITLED4
RomDISK	S4,D1	/RamFAST.ROM

Notice that if the RomDISK is enabled, it will end up as the last drive in the list.

IMPORTANT NOTE! Do NOT set the first Slot Allocation to the slot that the card is installed in or you may encounter unpredictable results. That slot is always assigned the first two (2) partitions. This is taken care of internally and can not be adjusted!

Drive Status Settings

The bottom half of the screen is devoted to the partitions on the current drive. The columns labeled "Active", "Locked", and "Lookahead" are part of the RamFAST/SCSI's configuration data. "Active" is used to mark a partition as Offline if it is set to "No." "Locked" is used to mark a partition as write-protected if it is set to "Yes." And finally, "Lookahead" is the amount of data that the RamFAST/SCSI will read beyond the end of the current request in hopes of already having the data for the next request ready immediately. The default setting of 12k is sufficient for almost applications; however, if you wish to experiment you can set the value anywhere from 0k - 60k. "Active" and "Locked" are both toggled by making the entry you want to change the current entry and pressing the "SPACE" bar. "Lookahead" is changed by making it the current entry and pressing the "SPACE" bar also. This will increment the "Lookahead" by 4k (with 60k wrapping around to 0k). In general, a small "Lookahead" is better when you do a lot of random accesses to your drive and a large "Lookahead" is better if you typically load a large amount of contiguous data into memory to work with there. Again, if you're not sure, the default value of 12k is fine for most all applications. To get some practice, let's make the "Active" entry for Part #3 the current entry and press the "SPACE" bar. The entry should have toggled from "Yes" to "No." Now let's do the same thing to the "Locked" entry for Part #4. That one should have toggled from "No" to "Yes". Lastly, let's make the "Lookahead" entry for Part #4 the current entry and press the "SPACE" bar six (6) times. The entry should have gone up in 4k increments, ending up at "36k".

Saving Your Configuration Information

Before saving your configuration, make sure that everything is the way you want it and not just the way the practice session told you to set it. After you've changed the Switches, Slot Allocation, and Drive Status Settings to the values you want, it's time to save them. To do this just execute the @-S(Save) command. This will save the configuration information on physical block zero (0) of each drive connected to the RamFAST/SCSI. Note: on a partitioned drive this block is not used for anything so it doesn't hurt to store the RamFAST/SCSI's configuration data here. Looking back at the example system we've been working with all along, the screen would now look like this:

```

                                RamFAST Utility Program
Current device ID              7          +-----+
Device size (in blocks)       $0284D8    | Command key summary      ? for help |
Blocks used                   $028000    |                               |
Blocks available              $0004B8    | @-A  Add a partition        |
                                | @-D  Delete current partition    |
Machine type                  IIgs        | @-F  Format drive           |
DMA Compatible                Yes         | @-N  Next drive in chain    |
Motherboard type (GS only)    256k        | @-P  Write partitioning     |
Rom Disk                      Disabled    | @-Q  Quit program           |
Drive search timeout          Long        | @-S  Save current configuration |
Switch #8                    Off          | @-V  Verbose drive information |
Slot allocation priority      S6 S4 S2    +-----+

Part#   Active   Locked   Lookahead   Size (Scale: $1000)   Name
  1     Yes     No       12k         32.000mb $010000    UNTITLED1
  2     Yes     No       12k         32.000mb $010000    UNTITLED2
  3     No      No       12k         10.000mb $005000    UNTITLED3
  4     Yes     Yes      36k          6.000mb $003000    UNTITLED4
```

Modified Configuration

Formatting - What kind of drive do I have?

All SCSI drives on the market today are true SCSI; however, there are a substantial number of drives out there that were produced before the SCSI standard was finally settled upon. These drives are known as SASI drives. They only implement a subset of SCSI's commands and they have an optimum interleave of 4:1 instead of the 1:1 supported by the newer SCSI drives.

To determine the type of drive you have, execute the @-V(Verbose) command. If you get the message "Not supported by current drive" then that drive is a SASI drive; otherwise, it's a SCSI drive (even if the information doesn't make any sense).

No matter which kind of drive you have, after the format command all of the available blocks on the drive will be allocated to one big partition. The display would then look like this after formatting our example drive:

```

                                RamFAST Utility Program

Current device ID          7          +-----+
Device size (in blocks)    $0284D8    | Command key summary      ? for help |
Blocks used                $0284D8    |                               |
Blocks available           $000000    | @-A  Add a partition        |
                               | @-D  Delete current partition |
Machine type               IIgs       | @-F  Format drive          |
DMA Compatible             Yes        | @-N  Next drive in chain   |
Motherboard type (GS only) 256k      | @-P  Write partitioning    |
Rom Disk                   Disabled   | @-Q  Quit program          |
Drive search timeout       Long       | @-S  Save current configuration |
Switch #8                  Off        | @-V  Verbose drive information |
Slot allocation priority    S6 S4 S2  +-----+

Part#  Active  Locked  Lookahead  Size (Scale: $1000)  Name
  1      Yes    No      12k        80.500mb $0284B8  UNTITLED1

```

Partitions after a format command

Since the Apple operating systems can't use all of a partition that's larger than 32 megabytes, if your drive is larger than this you should then proceed to the section entitled "**Partitioning Your Drive**" and break this large partition up into a number of smaller ones after the format command completes. Otherwise you can execute the **@-P(Partition)** command immediately to write the partition to the drive (see "**Partitioning Your Drive**" for more information).

Please note that after a format, ALL data on the drive will be gone, including any configuration data you may have saved using the **@-S(Save)** command. Make sure you have backed up any data you wish to save **BEFORE** executing the format command. You can back it up to another hard drive or onto floppies, but it can't be stressed enough that once you execute the format command there's no turning back; the data's gone. Now turn to the section on formatting the type of drive you have and follow the instructions there to do the format. After that, you should execute a **@-S(Save)** command to resave the current configuration data to the drive.

Formatting a SASI Drive

To format a SASI drive, first enter the **@-F(Format)** command. You should then see a warning and a question asking whether you are about to format a SASI drive. Answer with "Y" or "RETURN." You are then asked if the drive is a Sider D2. This is because there is an extra step involved in formatting one of these drives. Answer the question "Y" or "N" depending on whether your drive IS a Sider D2 or not. If it is, you will see the message "A Sider D2 takes 1 hour to format!" This is the extra step. To reformat a Sider D2, the stepper motor inside the drive must be exercised for a whole hour before issuing the actual format command to the drive. Regardless of whether or not your drive is a Sider D2, you will now get a final chance to abort the format if you've changed your mind. If you answer "Y" or "RETURN" to the question "Do you really wish to format ;Y/n;?" the drive will then start formatting. It is now too late to change your mind; the data is gone. Below is a sample screen showing the messages and prompts as they would appear on your screen. Please note that depending on your answers to some of the questions, you may or may not see all of them actually displayed.

```

                                RamFAST Utility Program

Current device ID          7          +-----+
Device size (in blocks)    $0284D8    | Formatting will erase any data that |
Blocks used                $028000    | may be on the drive!                |
Blocks available           $0004B8    |                                     |
                                | Is the current drive a SASI <Y/n>?      |
Machine type              IIgs        | Is it a D2 <Y/n>?                    |
DMA Compatible            Yes         |                                     |
Motherboard type (GS only) 256k      | A Sider D2 takes 1 hour to format!  |
Rom Disk                  Disabled    | Do you really wish to format <Y/n>? |
Drive search timeout       Long      |                                     |
Switch #8                 Off        |               Formatting...          |
Slot allocation priority    S6 S4 S2  +-----+

Part#   Active   Locked   Lookahead   Size (Scale: $1000)   Name

```

Formatting a SASI drive

Formatting a SCSI Drive

To format a SCSI drive, first enter the @-F(Format) command. You should then see a warning and a question asking whether you are about to format a SASI drive. Answer with "N." You will then be asked to enter a value for interleave (0-9). Unless you know otherwise, you should enter a value of "1" in response to this prompt. If you answer "0", this tells the drive to format itself to what it thinks is its best interleave value; however, some drives seem to have a low self-esteem and format themselves 2:1 or worse when they really can handle 1:1. This is why, under normal circumstances, you should just answer with a "1." You will now get a final chance to abort the format if you've changed your mind. If you answer "Y" or "RETURN" to the question "Do you really wish to format?" the drive will then start formatting. It is now too late to change your mind; the data is gone. Below is a sample screen showing the messages and prompts as they would appear on your screen.

```

                                RamFAST Utility Program

Current device ID      7      +-----+
Device size (in blocks) $0284D8 | Formatting will erase any data that |
Blocks used            $028000 | may be on the drive!                |
Blocks available       $0004B8 |                                     |
                                | Enter a value for interleave (0-9): |
Machine type          IIgs    |                                     |
DMA Compatible        Yes     |                                     |
Motherboard type (GS only) 256k |                                     |
Rom Disk              Disabled | Do you really wish to format <Y/n>? |
Drive search timeout   Long   |                                     |
Switch #8             Off     |           Formatting...              |
Slot allocation priority S6 S4 S2 +-----+

Part#   Active   Locked   Lookahead   Size (Scale: $1000)   Name

```

Formatting a SCSI drive

Partitioning Your Drive

This section covers partitioning your drive. It is VERY important to partition your drive if it is not or never has been partitioned. Failing to do so may cause unpredictable results. The following commands are available to help you partition your drive just the way you want:

@-A(Add) - Adds a partition to the bottom of the list.

@-D(Delete) - Deletes the current partition.

@-P(Partition) - Write the partition data to the drive.

@-UpArrow(Increment) - Increases the size of the current partition.

@-DownArrow(Decrement) - Decreases the size of the current partition.

@-LeftArrow(IncScale) - Increment the "Scale" factor (explained below).

@-RightArrow(DecScale) - Decrement the "Scale" factor (explained below).

"Scale" factor is the 4-digit hexadecimal number at the top of the Size column. This number dictates the amount that **@-UpArrow(Increment)** and **@-DownArrow(Decrement)** commands will affect the size of the current partition by. The easiest way to understand this is to try some examples. Assuming we've just formatted our example drive, let's make the one big partition the current entry. Now let's execute the **@-D(Delete)** command. We now have no partitions and all of the space on our drive (minus a little for overhead) is available. Next, let's execute the **@-A(Add)** command twice in a row. You'll see two (2) partitions at the bottom of the screen now and each of them has a size equal to the "Scale" factor. Now, let's use the "ARROW" keys to make size entry of the first partition the current entry. By executing **@-UpArrow(Increment)** a number of times you can see that each time the size is incremented, it goes up by an amount equal to the "Scale" factor. When the size of the drive reaches "32.000mb" stop since that's the largest partition that the Apple operating systems can currently handle. Now move down to the second partition and increment its size until it's "16.000mb."

Now let's change the "Scale." Execute the @-RightArrow(DecScale) command one time and notice that the "Scale" entry has changed from "\$1000" to "\$0100." Now execute the @-A(Add) command and notice that the size of this partition is same as the NEW "Scale" factor. If we now move over and make size the current entry and execute the @-UpArrow(Increment) command a couple of times we get a screen that looks something like this:

```

                                RamFAST Utility Program

Current device ID          7          +-----+
Device size (in blocks)    $0284D8    | Command key summary      ? for help |
Blocks used                $018320    |                               |
Blocks available           $0101B8    | @-A  Add a partition        |
                               | @-D  Delete current partition |
Machine type               IIgs       | @-F  Format drive           |
DMA Compatible             Yes        | @-N  Next drive in chain    |
Motherboard type (GS only) 256k      | @-P  Write partitioning     |
Rom Disk                   Disabled   | @-Q  Quit program           |
Drive search timeout       Long       | @-S  Save current configuration |
Switch #8                  Off        | @-V  Verbose drive information |
Slot allocation priority    S6 S4 S2  +-----+

Part#  Active  Locked  Lookahead  Size (Scale: $0100)  Name
  1      Yes    No      12k        32.000mb $010000  UNTITLED1
  2      Yes    No      12k        16.000mb $008000  UNTITLED2
  3      Yes    No      12k         0.375mb $000300  UNTITLED3

```

Example of adding/modifying partitions

The last thing to do now is to change the names to something more meaningful than "UNTITLED1", etc. To change the name of a partition, make the name the current entry and press the "DELETE" key or the "SPACE" bar. This will clear the field and allow you to type in the name of your choice. Not having much imagination at the time of the morning this was written, let's name our example partitions "HD1", "HD2", and "HD3." So our final product would look something like this:

```

                                RamFAST Utility Program

Current device ID          7          +-----+
Device size (in blocks)    $0284D8    | Command key summary      ? for help |
Blocks used                $018320    |                               |
Blocks available           $0101B8    | @-A  Add a partition        |
                               | @-D  Delete current partition |
Machine type              IIgs        | @-F  Format drive           |
DMA Compatible             Yes        | @-N  Next drive in chain    |
Motherboard type (GS only) 256k      | @-P  Write partitioning     |
Rom Disk                   Disabled   | @-Q  Quit program           |
Drive search timeout       Long       | @-S  Save current configuration |
Switch #8                 Off        | @-V  Verbose drive information |
Slot allocation priority    S6 S4 S2  +-----+

Part#  Active  Locked  Lookahead  Size (Scale: $0100)  Name
  1      Yes   No      12k        32.000mb $010000  HD1
  2      Yes   No      12k        16.000mb $008000  HD2
  3      Yes   No      12k         0.375mb $000300  HD3

```

Example of changing partition names

The only thing left to do now is to write the partitions to the drive. First, make sure that anything that was on that drive is backed up because once you write the new partitioning any data that may have been on that drive will be lost. As long as that is taken care of you should now execute the @-P(Partition) command and the RamFAST/SCSI will write the partitions to your drive and do a high-level format of each of the partitions. What the "high-level format" does is put a valid ProDOS directory onto each of the partitions so that they are now completely ready to use.

Daisy-chained Drives - A special note

If you have connected more than one drive to the RamFAST/SCSI, you must take care that none of them have duplicate SCSI ID numbers. If you are not sure of the ID of a drive, you can connect it to the RamFAST/SCSI all by itself and run the Utility Program. You will see that drive's ID displayed in the "Current device ID" entry. Check the owner's manual that came with your drive for information on changing the drive's ID. You might want to note at this time that the RamFAST/SCSI searches for drives starting with SCSI ID#7 and works its way down to SCSI ID#0. This isn't backward. It's the way it's supposed to be done. You just might want to keep this in mind as you're setting the ID's of your drives.

Once you have that taken care of there is one extra command that comes in very handy, the @-N(Next) command. This command searches for the next drive in the chain and displays the partitioning information contained on it. You can continue to execute the @-N(Next) command as many times as you wish; you will eventually wrap around and return to the original drive.

REFORMAT REQUIRED - What's it mean?

With some older drives it is possible that you will see a message on the screen like the one below:

```

                                RamFAST Utility Program

Current device ID          7          +-----+
Device size (in blocks)    REFORMAT  | Command key summary      ? for help |
Blocks used                REQUIRED   |                               |
Blocks available          FIRST!!!  |                               |
                             | @-A  Add a partition                |
                             | @-D  Delete current partition        |
Machine type              IIgs      | @-F  Format drive                |
DMA Compatible            Yes       | @-N  Next drive in chain        |
Motherboard type (GS only) 256k     | @-P  Write partitioning         |
Rom Disk                  Disabled  | @-Q  Quit program              |
Drive search timeout       Long     | @-S  Save current configuration |
Switch #8                 Off      | @-V  Verbose drive information |
Slot allocation priority   S6 S4 S2 +-----+

```

```

Part#   Active   Locked   Lookahead   Size (Scale: $1000)   Name

```

Drive with an illegal block size

What that "REFORMAT REQUIRED FIRST!!!" message means is that the size of the physical blocks on the current drive is not 512 bytes. This means that you will have to backup any data on the drive (using the original controller) first. Then, you must reformat the drive with the RamFAST/SCSI which will set the block size to the correct value. Finally, you can now restore the backed up data to the drive. You will only be required to do this once, but you must do it before you will be allowed to create any partitions on that drive or indeed have any access at all to it.

Verbose Drive Information

The **@-V(Verbose)** command is used to get a more detailed listing of information about the current drive. This command is not supported by SASI drives and you will see the message “**Not supported by current drive**” if you execute this command. If this command is supported you should see some or all of the following information:

- Device name (i.e. SEAGATE ST251N-1)
- Serial number
- Cylinders - this is the actual number of cylinders on the drive
- Heads - this is the actual number of heads on the drive
- Sectors/Track - this is the number of physical sectors on a single track
- Current interleave - this is the currently formatted interleave of the drive

If the “Current interleave” is anything other than 1:1 we suggest that you backup all of the data on the drive and reformat it with an interleave of 1:1. This will dramatically improve your performance.

Quitting the Program

Quitting is pretty much self-explanatory, especially if you launched the program from GS/OS, ProDOS, or some other program launcher. If that is the case, and you haven’t modified the partitioning of the drives in any way, then the program just executes a ProDOS \$QUIT call and this returns you to where ever you launched it from.

If, however, the program “popped up” or you modified the partitioning in any way, you will see the message “ProDOS not loaded” and you will be asked whether to boot the RamFAST/SCSI or another slot. If you press “Y” or “RETURN” then the RamFAST/SCSI will attempt to boot. If you press “N”, you will then be prompted for the slot number you wish to boot (1-7). In any case, your screen should look something like the one below:

RamFAST Utility Program

```

Current device ID          7          +-----+
Device size (in blocks)    $0284D8  |
Blocks used                $018120  |         ProDOS not loaded
Blocks available           $0103B8  |
                                |
Machine type               IIgs      | To boot RamFAST type <Y> or <RETURN>
DMA Compatible             Yes       | To choose another slot type <N>
Motherboard type (GS only) 256k     |
Rom Disk                   Disabled  |
Drive search timeout       Long     |
Switch #8                  Off      |
Slot allocation priority    S6 S4 S2 +-----+

```

Part#	Active	Locked	Lookahead	Size (Scale: \$0100)	Name
1	Yes	No	12k	32.000mb \$010000	HD1
2	Yes	No	12k	16.000mb \$008000	HD2
3	Yes	No	12k	0.375mb \$000300	HD3

Quitting when ProDOS wasn't loaded or partitioning was modified

DMA and Other Compatibility Issues

DMA Compatibility

The following is a short list of products and whether or not they are DMA compatible:

Product	Made By	DMA Compatible?
All Apple Products	Apple Computer, Inc.	Yes
GS Juice	Ingenuity Inc.	Yes
RamPack 4GS	Orange Micro	No
RamKeeper	Applied Engineering	Yes (with 1 card)*
RamKeeper	Applied Engineering	No (with 2 cards)
GS-Ram	Applied Engineering	Yes (Rev E or later)
GS-Ram Plus	Applied Engineering	Yes (on lower 4mb)
GS-Ram Ultra	Applied Engineering	Yes
RamWorks	Applied Engineering	Yes
Transwarp-GS	Applied Engineering	Yes
Transwarp	Applied Engineering	No
Transwarp II	Applied Engineering	No
Zip Chip	Zip Technologies	No
Rocket Chip	Bits and Pieces	No

* For the RamKeeper to be DMA compatible with even one card, the card itself must be DMA compatible.

If your memory card or CPU accelerator is not listed, go ahead and try it. If it doesn't work, follow the installation instructions for a non-DMA compatible machine for the moment and then call Technical Support. They may be able to offer another solution.

DOS3.3 Compatibility

DOS3.3 is not directly supported by the RamFAST/SCSI. To use it you must use a program along the lines of DOS-MASTER, by Glen Bredon. Such a program allows DOS3.3 to run using virtual drives on ProDOS devices.

Trouble Shooting

The first thing to do if you have a problem is check to make sure that all of the cables are plugged in securely, that the power is turned on to all of your drives and your computer, and that the DIP Switches are set correctly for your type of computer. If everything seems to be setup and connected correctly, scan through this list of problems and see if any of them match your situation. If so, try any possible solutions and see if they help. If that doesn't work, turn to "**Where to get HELP!**"

Problem - Hangs on powerup.

Possible Cause - The card may still be looking for drives.

Possible Solution - Wait 30 seconds and see if it does anything.

Problem - Powers up and displays a message like "RAMFAST FATAL ERROR CODE = ".

Possible Cause - The card has failed its powerup diagnostics.

Possible Solution - Proceed to "**Where to get HELP!**" and report what code was displayed.

Problem - Doesn't find one or more of your drives.

Possible Cause - You may have more than one drive set to the same SCSI ID.

Possible Solution - If you have more than one drive, make sure you have read about SCSI ID's in "Daisy-chained drives - A special note."

Problem - Doesn't find one or more of your drives.

Possible Cause - The drive may not be supplying terminator power to the SCSI bus.

Possible Solution - Try changing the setting of DIP Switch #1.

Problem - Doesn't find one or more of your drives.

Possible Cause - The drive or drives may not be completely powered up when the Ram-FAST/SCSI goes out searching for drives.

Possible Solution - Try powering up all of your drives first and waiting about 20 seconds before turning on the power to your computer.

Problem - Works fine for a while but then it starts to act erratically.

Possible Cause - You are probably over-stressing your power supply.

Possible Solution - Try getting a fan or a more powerful power supply.

Problem - Your IIGs with Transwarp-GS powers up fine but proceeds to crash into the monitor (displays a list of registers with their values and has a "*" prompt).

Possible Cause - When Applied Engineering made the transition from 7mHz to 6.25mHz on their Transwarps they introduced a bug.

Possible Solution - Check to see if there is a part labeled TWGS-2A installed on your Transwarp. If there is you will need to contact Æ to obtain a replacement (TWGS-2B). At the time of this printing, the upgrade was free of charge.

Problem - Your IIGs with Transwarp-GS acts erratically once in a while.

Possible Cause - The setting labeled AppleTalk/IRQ in the Transwarp-GS control panel may be OFF.

Possible Solution - Switch AppleTalk/IRQ ON.

Problem - Won't boot in your IIGs.

Possible Cause - The control panel setting for the slot in which the card is installed may not be set to "Your card".

Possible Solution - Make sure that the control panel setting is set to "Your card".

Problem - Won't boot in your IIGs.

Possible Cause - The control panel setting for boot slot may be set to something other than "Scan" or the slot the RamFAST/SCSI is installed in.

Possible Solution - Make sure that the control panel boot slot setting is set to "Scan" or to the slot the card is installed in.

Problem - Won't boot in your IIE.

Possible Cause - Your IIE might be unenhanced. Unenhanced IIE's do not recognize Smartport devices (the RamFAST/SCSI is a Smartport device) as bootable.

Possible Solution - Contact your local Apple dealer and upgrade your IIE to an enhanced IIE or type PR#slot to boot after power-up.

Problem - Can't access all of your partitions under ProDOS 8.

Possible Cause - The partitions are getting mapped to a slot that already has a block device installed in it.

Possible Solution - Reread "ProDOS 8 Slot Allocation" and make sure the slots you have selected do not have other block devices installed in them.

Where to get HELP!

Technical Support

C.V. Technologies
9431 Saddlebrook Lane Suite #2C
Miamisburg, Oh 45342

(513) 435-5743

If the "Trouble Shooting" section didn't help here are some general guidelines you may want to try to narrow down the problem before calling Technical Support:

- 1 Try removing the other cards in your system one at a time until you find the card that is causing the problem. If the card doesn't work by the time you try it by itself then call Technical Support.
- 2 Once you've found the culprit card, try re-inserting any other cards back into your computer and make sure that the RamFAST/SCSI still works. If it doesn't work again, try combinations of cards to see which cards work together and which ones don't or call Technical Support.
- 3 Once you've found out which cards work together and which ones don't you should give Technical Support a call.

Technical support is available from 9am-5pm Eastern Standard Time, Monday through Friday (excluding holidays). Please have the following information ready when calling:

- 1 Serial Number of your RamFAST/SCSI card.
- 2 Which type of Apple (IIe or IIgs) you have.
- 3 A list of any other cards which are installed in it.
- 4 Any results you may have obtained from the general guidelines above.

GEnie

Help can also be obtained through the General Electric Network for Information Exchange (GEnie) online service. You can send questions through email to CV.TECH or post messages or questions in the *C.V. Technologies* category in the Apple II Roundtable.