

Plain Vanilla Hard Drive  
Formatting and Partitioning Utility  
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Instruction Manual  
Version 1.01

#### Shareware

The Plain Vanilla Hard Disk Utility is sophisticated and powerful. It is designed to let you format and partition hard drives connected to an Apple SCSI card in any Apple IIe, or 64K Apple II Plus. It WILL NOT work in an Apple IIgs. It is distributed as shareware. Please try it for 2 weeks and pass it around to others. If you care to continue using it, please send \$5 to the author:

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If not, please destroy your copy or give it someone else. Please copy this disk and give it to others for demonstration. Thank you for sending your payment. You will receive a letter of thanks from me and information on updated versions if any occur. Your honesty will allow me to distribute future programs in this same low-cost way.

#### Requirements

This program needs an Apple II Plus, Apple IIe, or slotted clone. In other words, it should work on any slotted Apple II or clone that is capable of running ProDOS except an Apple IIgs. Also required is an Apple II SCSI Card with the Revision C ROM. There are a few different SCSI cards on the market today, but this program will only work with those which are 100% compatible with the Apple card. (And I don't know if any or which ones are.) Also required is a SCSI hard drive which is able to be connected to the Apple SCSI Card. I've tested it on my Seagate ST277N and ST225N units but it should work fine on any standard SCSI drive.

ProDOS 8 (preferably a later version), BASIC.SYSTEM, and the boot code found on block 0 of any bootable ProDOS disk are also required. This program was made for Apple IIe and II Plus owners to low-level format, set up to 4 partitions, and ProDOS-format a hard drive in one easy step without restarting the system. Partitions may be of any size from 1 meg to 32 megs. You can even set partitions to fractions of a meg as small as eighths. If you own an IIgs and need to set up a hard drive,

you should use ADU, the Advanced Disk Utility which is supplied with the GS/OS System Disk.

## Background

In April of 1989, Ken Buchholz helped me put together my hard drive system using the Seagate ST277N, Apple SCSI Card, and a case-and-cable set from Tulin called the Apple Hive. To perform the low-level format we used a program called HACKER by Joe Jaworski. Next, HDSCPARTITION which is on the disk that comes with the Apple II SCSI Card was used to create 2 partitions. I had to disconnect my hard drive from my //e at that point and hunt up a //gs to use ADU to set 2 partitions of around 32 megs. The utility which comes with the Apple II SCSI Card for setting partitions only allows partitions of up to 20 megs. Finally, I used Copy II Plus to ProDOS-format the drive. I decided to try to write a program for //e (ProDOS 8) users which could do the whole job.

My sources of information were the Apple II SCSI Card Technical Reference Manual, an article by Tom Weishaar in Open-Apple about Smartports called "How to keep from getting pregnant," the Seagate SCSI Interface Manual, Llew Roberts of the Apple II Developer Technical Support Team, and Tim Grams who knows more about SCSI stuff than anyone else I could find. Tim's programs for use with SCSI tape drives are available through Ken's bbs in Washington, New Jersey, The Washington Towne Crier, (201-689-3649, 300/1200/2400, 24 hrs.) a well known clearing house for plain vanilla SCSI information.

## Getting Started

This program comes with a machine language module called VERIFY which includes several ancillary routines that support the BASIC program, VANILLA. Add the files PRODOS and BASIC.SYSTEM to the disk with VANILLA on it and rename VANILLA to STARTUP to make the disk self-booting. Experimenters will enjoy fiddling with another program I've included called SMARTPORT. This is an extension of Tom Weishaar's program as found in his above mentioned article. I've tried to make it work like the ProDOS Exerciser, published with the ProDOS 8 Technical Reference Manual by Apple and Addison Wesley. You will probably get more out of SMARTPORT if you have a copy of the Apple II SCSI Card Technical Reference Manual at hand.

## Using the Program

### Start Screen Options

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1. Format/partition a drive - This program is a one-trick pony. This is what it came to do.
2. Quit to ProDOS - In case you're all done AND you're using a program selector.
3. Quit to BASIC - In case you want to use the monitor or my SMARTPORT program to snoop around in memory or whatever.

### Format and Partition a Drive

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When you see this title on the screen, the program is scanning the slots for Apple II SCSI Cards. If it finds any, it displays the card's slot

number, and the unit number, ID string, and capacity in megs of each hard drive connected to each card.

Select Slot, Unit, and Interleave  
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You have some input here...

Slot: - Type the slot number of the card that has the drive you want to format.

Unit: - Type the unit number displayed in the above section.

Enter Interleave: (default=5) - Press <Return> for the default or type any other interleave value you want to use and press <Return>. I'm afraid I can't help you much here, except to say that I always use 5, as advised to by Ken Buchholz and which works very nicely on my system so far,

and that the Seagate SCSI Interface Manual states (somewhat confusingly to me):

Interleave: requests that the logical blocks be related in a specific fashion to the physical blocks to facilitate speed matching. An interleave value of zero requests that the Target (your hard drive) use its default interleave--one to one. An interleave value of one requests that consecutive logical blocks be placed in physical consecutive order.

All valid interleave values, including one to one, are supported. Valid interleave values are from zero to sectors/track minus one. i.e., for 34 sectors/track, the valid interleave values are from zero to 33.

One way to find the best interleave might be to format with interleave 5, set 2 smallish partitions, copy a meg of files to the first one, then copy the files from the first to the second partition, while timing the event. Repeat these steps with interleave 10, then 15, then 20, then narrow it down to the quickest interleave value between these grosser intervals. There's a program available from GENIE called DISK.TEST which was made to do the job with ProDOS 8-running Apples. Give me a call when you come up with the best value.

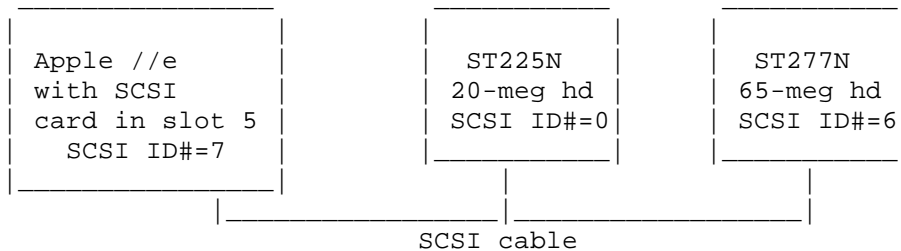
Anyway, after selecting slot, unit, and interleave, you have two chances to bail out before low-level formatting begins. This will erase and prepare the drive for use with an Apple?I disk operating system, like ProDOS. Please be sure that this erasing is what you intend for the hard drive selected. I will not be held responsible if you erase all your programs and data by mistake. Be patient, it takes a few minutes.

When low-level formatting is done, you will be asked if you want to verify the drive. My verification routine takes hours, is very exhausting and complete, and checks each of the thousands of blocks on the newly-formatted drive for errors. My advice is to verify the drive once, the first time you format it, and periodically, say every couple of years, depending on how much use it gets. If any defects are found, from 1 to 383 defective blocks will be "reassigned." This means that a new home will be found for this numbered area on the disk surface, not far from the original location. Refer to the Seagate manual for more information. If 384 or more defective blocks are found, something is wrong and you should start over. In testing this program, I must have formatted my drives 50 or 100 times. Once, I had to reformat the ST277N four times before it would verify correctly.

## Setting Partitions

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When this title appears, everything is ready for you to input the number and size of the partitions you want. You must set at least one partition. There doesn't seem to be any inherent limit to the number of partitions a drive can have. However, each partition will be "seen" by ProDOS as a disk mounted in a drive, connected to a slot. Under ProDOS 8, you are ordinarily limited to two of these per slot. With the SCSI card in slot 5, you may have two seen in slot 5, and two more in slot 2, for a total of four. With the SCSI card in any other slot, you are limited to just two partitions seen in that slot. My program limits you to two partitions for a card in any slot except slot 5, in which case you may set up to four partitions, even if you already have another hard drive unit with valid partitions on it! In the case of multiple units per SCSI card, partitions of hard drive units will be available to ProDOS (able to be "seen") depending on the SCSI ID number of the unit. The higher the SCSI ID number, the higher the priority and potential availability of the partitions of that unit. Sound complicated? Maybe a diagram of my system would help:



Note that the SCSI card itself has a SCSI ID number of 7. The ST277N, of the two drives, has the higher SCSI ID number. Because of this, if I have 1 partition on this drive, it appears as slot 5, drive 1 and any partitions on the other drive appear as slot 5, drive 2, then the next (if there is another) would be slot 2, drive 1, then the next partition (again, if one exists) on the ST225N would be slot 2, drive 2.

If there were 2 partitions on the ST277N, they would be slot 5, drive 1 and slot 5, drive 2. Then, only two partitions could be seen on the other drive: slot 2, drive 1 and slot 2, drive 2. Partitions with less priority may disappear and reappear as the situation in higher priority units changes.

SCSI ID number is set on my Seagate drives using the jumper blocks provided on the drive. Refer to your drive's manual for more information.

Size of the partitions is specified in megs. (1 meg = 2,048 blocks) Of course, you will not be allowed to set partitions totaling more space than the drive's capacity as displayed. Each must be at least 1 meg long, none may be more than 32 megs. By the way, a 32-meg partition is actually one block shy of 32 megs. Fractions of a meg are allowed in your partition size specifications, but only to eighths of megs. (E.g., 10.125) Where X is any whole number of allowable megs, any of the following may be used as long as the total is within the capacity of the drive:

X	X.125
X.25	X.375

X.5                   X.625  
X.75                   X.875

Creating the partitions takes about a minute. Then you will be ready for...

#### ProDOS Formatting

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Now the program is ready to place an empty directory, volume bit map, and even the ProDOS bootstrap loader on the new partitions. A ProDOS online call is issued, ALL the drives are polled, and the program looks for and then displays the slot and drive numbers of the new partitions.

Now, I'm not a licensed developer, so I can't just give you the ProDOS bootstrap loader. This is the little program found on most ProDOS disks that gets ProDOS going or says, "UNABLE TO LOAD PRODOS" when you try to boot a data disk. My program just copies the bootstrap loader from a disk you have onto any of your new partitions which happen to be drive 1, making them bootable. This is why it's asking you to put a ProDOS disk in a drive?.

You have to name the new partitions. All ProDOS volumes have names. The names must start with a letter, contain only letters, numbers, or periods, and may be up to only 15 characters long. The little volume name editor will make sure you don't break any of these rules. Additionally, it converts letters to upper case and lets you use the back space and <Delete> keys in case you goof. Press <Return> when each name looks right.

That's it. If you decide to send me the shareware fee, let me know how you made out with the program. I'm especially interested to know which computer and hard drives you have.

If you call GENie, you can message me there. My address is:

JOHN.THOMAS