

DiskUtil IITM

The complete utility for hard drives.

**Owner's
Manual**

by

FWB, Inc.

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1-1 Preface

Copy protection, its pros and cons, has long been a controversial topic. Valid arguments existing on both sides, the debate continues, and, in the meantime, it is the user who suffers. We have been alarmed at the attitude of many Apple IIGS™ software developers toward copy protection. Most of their schemes require that the user keep the original master disk within reach. This is barely acceptable when working with floppy disks alone, but for those who use RAMdisks or who have made a substantial investment in a hard disk system, the need to insert the master disk each time a copy-protected program is loaded becomes unreasonable. Expensive investments in hard disks and extra memory are, in most cases, made to gain speed and efficiency; the limitations created by copy-protection schemes often severely limit these benefits by forcing users to continue to shuffling floppy disks. With *DiskUtil II* this need to shuffle Master Disks can usually be eliminated!

DiskUtil II was written with the intent of freeing Apple IIGS users from the drudgery of using master disks. In most cases, *DiskUtil II* achieves this goal by actually patching the program disks. Once the software has been patched (and thus no longer copy-protected), programs may then be copied by the click and drag method in the *Finder*™, and, as a result, can easily be copied to other floppies, RAMdisks, ROMdisks, hard disks, etc.

We must stress that the end user has a responsibility to heed the conditions set forth in the software license agreement for each and every software package on which *DiskUtil II* is used. Under federal copyright laws, a backup copy may be made for archival purposes only. Our software is supplied for lawful purposes and may not be used in violation of any federal copyright laws or end user agreements.

1-2 Introduction to *DiskUtil II*™

DiskUtil II is a backup utility that allows users to make backups of protected software which will usually be compatible with hard disks and RAMdisks, in addition to other floppy disks. The copies made using *DiskUtil II* will behave as though they are the actual master disk and will not ask you to insert the original.

To begin, insert *DiskUtil II* in your disk drive and turn on your computer. If you set your disk drive as the startup device, it should automatically load the disk. Consult the owner's manual of your computer if you do not know how to boot up your disk drive.

Because protection schemes change so often, it is necessary to include specific directions in special cases as they arise. This disk based documentation can be found in the README file. If the program you are interested in copying has a README file, read the file with a text editor like *AppleWorks*™, but in any event, always read the Errata file before starting.

The procedure to make uploadable copies from originals consists of three steps: first, making a backup copy of the Master with the **Copy Volumes** option in *DiskUtil II*; second, patching the backup copy with the **Apply Patches** option, and third, uploading the program to the hard disk with the **Copy Files** option. The following sections will describe this procedure in greater detail and will contain the instructions for using each of these applications. In addition, there is an appendix at the end which contains some general background information that may be of interest.

Not all programs are copy protected, so, in general, you should try copying your program by dragging the icon to the desired target before using *DiskUtil II*. In addition, some software packages now include their own hard disk installing systems. If the program you are interested in does not fit in either of these criteria and if *DiskUtil II* does support this program, then consult the patch listing sheet, the "Notes," for the plan of attack.

2-1 Backup Copies on Floppy Disks

The Primary Method...

For backups that do not require master disks, follow this procedure:

1. Check the Patch Disk Notes sheet or open the *Patches* folder on the desktop to see if a patch is available for the program you want to backup. If it is, then continue.
2. Make a backup copy of your master disk onto another floppy disk using the **Copy Volumes** menu option in *DiskUtil II*. Consult section 3-1.A Using Copy Volumes.
3. Use **Apply Patches** to patch this backup copy of the program. Refer to section 3-1.B Using Apply Patches. (Note that certain patched programs will only run from floppies and will either not function or continue to ask for the original if run off a RAMdisk or hard disk. *DiskUtil II* includes a notes sheet that indicates whether or not the patched copy of your program will run on a hard disk/RAMdisk.)
4. This patched backup of your original master disk can now be used as if it were the original. It can also be copied to another floppy disk by any of the normal methods including clicking and dragging.

If Nothing Works ...

If you encounter a program for which *DiskUtil II* cannot make a backup, please let us know. If no patches are available, we may ask you to send in your original for evaluation.

2-2 Copying to a RAMdisk or Hard Disk

RAMdisks and hard disks have the same patching requirements, and anything uploadable to a RAMdisk or hard disk will always be copyable to other floppies.

Step-by-Step Procedure

1. Check the Patch Disk Notes sheet or open the *Patches* folder on the desktop to see if a patch is available for the program you want to backup. If it is, then continue.
2. Make a backup copy of your master disk onto another floppy disk using the **Copy Volumes** menu option in *DiskUtil II*. Consult section 3-1.A Using Copy Volumes.
3. Use **Apply Patches** to patch this backup copy of the program. Refer to section 3-1.B Using Apply Patches. *DiskUtil II* includes a notes sheet that indicates whether or not the patched copy of your program will run on a hard disk or RAMdisk since certain patches are only floppy compatible.
4. The backup copy on the floppy disk is no longer copy-protected and can now be transferred to your RAMdisk or hard disk.

The **Copy Files** option (refer to section 3-1.C) in *DiskUtil II* may be used to copy files to a RAMdisk or hard disk volume if either is online. As an alternative, you can move the files to your RAMdisk or hard disk by dragging the icons of the files you need from the patched disk onto the RAMdisk boot disk or onto your hard disk, respectively. (Be sure to copy all necessary files to your hard disk, including the program itself and all its support files including system resource files.)

3-1 Using *DiskUtil II*

DiskUtil II performs three functions: it makes backup copies of disks, patches disks, and transfers files from a disk to another storage device. The next three sections will describe in detail how to perform these operations with the three options under the **Utilities** pull-down menu in *DiskUtil II*, and the two subsequent sections will describe additional features of *DiskUtil II*.

3-1.A Using Copy Volumes

The **Copy Volumes** option is used to make a backup copy of the disk you wish to patch and transfer, and is selected from the **Utilities** pull-down menu. **Copy Volumes** supports most disk drive configurations and will utilize dual disk drives.

Have a **preformatted** destination disk ready, and insert the disk to be copied into the source disk drive. Select the **Copy Volumes** option, and *DiskUtil II* will then prompt for the original disk. Select the volume to be copied by pressing the **Drive** button. Every time you press this button, the name of the current volume, in the upper left corner of the dialog box, will change. When the desired volume is selected, hit the **OK** button. The disk will now be read into memory. *DiskUtil II* fully utilizes any available memory. If not enough memory is available for a full disk, it will prompt the user to swap disks. After the disk is read in, you will be prompted for the destination volume. If you have one disk drive, eject the disk in the drive and insert the formatted destination disk and click on the **OK** button. If you have two disk drives, simply insert the formatted destination disk into your other disk drive and click on the **Drive** button until your other disk drive is selected.

If only one disk drive is available, *DiskUtil II* will automatically prompt for the disk swaps.

Note that the copy made is a sector copy and does not contain the weird formatting present on the original, thus it will usually not function correctly without patching. You may also use any sector copier that ignores disk errors to produce a backup for patching.

3-1.B Using Apply Patches

Patching is the most important function *DiskUtil II* performs. This operation involves modifying the specific information on the disk to allow for greater functionality of program in general.

The **Apply Patches** option is used to patch floppy copy prepared by the **Copy Volumes** option, and is also found under the **Utilities** pull-down menu.

When this option is selected, *DiskUtil II* will prompt for the patch file to use. Select by double-clicking the one corresponding to the program you are patching. *DiskUtil II* will then prompt for the volume to be patched. Insert the disk to be patched, click on the **Drive** button until it is the selected disk, and click on **OK** to start the patching. Once started, the patching process will begin automatically and will usually take 5-10 seconds. In any event, once the copy is patched, this backup can be copied by normal means and can be moved over to other storage devices with the **Copy Files** option, also under the **Utilities** menu. Consult the Notes sheet for compatibility with hard disks and RAMdisks.

During the patching process, *DiskUtil II* looks for specific strings to replace, and if it does not locate them, it will give you a "No matches found" error. If you encounter this error, check to insure that the patch selected corresponds to the correct program and version number. Patches look for specific errors, and newer versions of a program will not have the same errors as older ones; as a result, patches are not interchangeable with different versions. Contact FWB, Inc. to determine the origin of this error if it persists, and, if necessary, to check whether an update that contains the patch for your version is available. Note that whenever this error is encountered, *DiskUtil II* aborts from patching and leaves the copy in an altered state.

3-1.C Using Copy Files

The **Copy Files** option is used to move files from a one disk to another storage device. This device can be another floppy disk, RAMdisk, ROMdisk, or a hard drive.

When this option is selected, *DiskUtil II* will prompt for the source file. Insert the source disk into the drive and click on **Drive** until it is the selected disk. Select the file to be copied by double clicking on it. Once it has been selected, it will be read in and you will be prompted for the destination volume. Select the destination by clicking on the **Drive** button until it is the selected volume and then click on the **OK** button.

The destination volume can be another floppy disk, a RAMdisk, a ROMdisk or hard disk volume (be sure it's mounted before you choose **Copy Files**). Always make certain that you have enough space in your destination volume before starting. An error message will appear if *DiskUtil II* encounters any errors in the transfer process. The **Copy Files** option copies files one at a time. (Note that transferring files patched by *DiskUtil II* can also be performed by clicking and dragging in the *Finder*.) When transferring files to another volume, be sure to copy all the program's files including data files and system resource files. Some programs might include files within folders, be sure to maintain the folder/subdirectory structure on your destination volume.

3-1.D *DiskUtil II* Menu Items

The following section explains all pull-down options available from within *DiskUtil II*.

"Apple" Menu options:

About DiskUtil II™: Shows information about *DiskUtil II* – such as the version number.

About Upgrades: Displays information on upgrading.

Disclaimer: Presents an important disclaimer on program usage.

Quit: Quits the program.

Utilities Menu options: (As outlined in the previous three sections.)

Copy Volumes...: Duplicates a volume.

Apply Patches...: Performs the patching operation on a floppy disk.

Copy files...: Moves the files from a volume onto another volume.

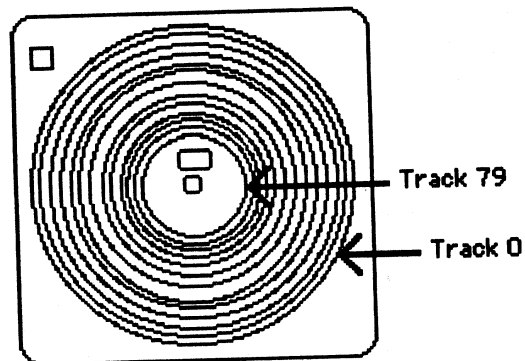
Disk Operations options:

Format...: Formats a disk. Be sure to have a **formatted** disk in the drive before selecting this option. It is used to select the volume to be formatted.

Other menu option might exist or be unselectable. These will give you a sense of what future versions of this program will contain.

A-1 Apple IIGS™ Disk Structure

The Apple IIGS uses 3.5" floppy diskettes that are divided into 80 concentric tracks with track zero at the outside and track seventy-nine nearest the center.



Inside a 3.5" Floppy Disk

Each track is divided into sectors. The number of sectors per track is variable, depending on its location on the disk. Since the outer tracks are longer, they contain more sectors than the smaller inside tracks. Each sector can store 512 bytes of information.

Sectors are often referred to as blocks. A single-sided disk is divided into 800 blocks, each containing 512 bytes (400K bytes total). A file consists of a bunch of sectors that may be spread throughout the disk. For example, on one disk the directory file may fill 12 sectors (6,000 or 6K bytes) and be found in blocks 4-15 on that disk. Looking at those blocks with a disk-editing program will show you the coded information that is contained in that file.

Double-sided disks contain 1600 blocks. The blocks are arranged on alternate sides of the disks to achieve the greatest possible access speed.

A-2 Copy Protection Information

This section has been included in the manual to provide some background information on copy-protection schemes used on Apple IIGS™ programs. It contains some general information on the different levels of copy protection that may be of interest to Apple IIGS users.

Level 1

The first method of copying disks, or copying files between disks, was to drag them from one disk to another in the *Finder*™. The first level of copy protection uses an invisible file on the Master Disk to keep it from being copied successfully by this method. Because this file is invisible and cannot be duplicated in the *Finder*™, it will not exist on the backup disk. The program then checks for this invisible file and will not run without it, so it will then ask for the master disk, which contains the invisible file. Copying the program to a RAMdisk or a hard disk results in the same request to insert the master disk when the application is opened.

Level 2

The next level of copy protection uses "flags" in certain files to prevent their being copied or moved. The flag labels the given file with the information that it cannot be moved or copied, and trying to move it or copy it usually results in an error message that says it cannot be done.

Level 3

The third level of copy protection utilizes a "bad" sector on the disk that is either erased, unformatted or altered from normal form. A disk-copy program will try to read and write this sector as if it were normal, sometimes generating an error message, sometimes not. If the program checks for the existence of the bad sector on the backup disk and doesn't find it, it will ask you for the master disk before it will run. Many weird sectors have been generated on the Macintosh™.

Level 4

Some of the newer methods in copy protection involve disk-timing schemes. In one such scheme, sometimes called nibble counting, a flag bit is inserted on a track, and then a specific number of bytes are written. The program checks to make sure that the correct number of bytes pass by before the flag bit appears

with a bit-copy program shows no errors, yet the backup copy usually will not run, or will request insertion of the Master Disk. Track synchronization is another disk-timing scheme. It involves writing tracks on the disk in a specific pattern. After the first track is written, the disk drive head is immediately stepped to the next track and more information is written. This synchronization can occur throughout the disk and is often teamed with nibble counting to make the scheme more complicated.

Yet another technique uses special disks with laser holes in them. The program attempts to write information to the sector with the hole, and if there is no media there, an error results that allows the program to run. If the program is copied onto a normal disk there is no laser hole (thus no error) and the program cannot run.

Protection Schemes of the Future

Because the disk controller in the Apple IIGS is similar to the one that is used in the Apple //™ series, the protection schemes designed for those computers are now being used on the GS. Some of the schemes of the future could make more use of modified address and data markers. There could be new timing schemes and special encoding of tracks with less data or different encoding algorithms. Memory protection could utilize encrypted code, self-modifying code, checksums and possibly ROM checks. Future protection schemes will continue to utilize the older protection schemes in various combinations with the new ones. The merry-go-around of disk protection/unprotection will continue forever; there is no way a scheme could be implemented and prevent 100% of users from tampering with it. What is done by a human can eventually be undone, all it takes is time.

A-3 Update Information

Updates to the Program Disk

Registered owners can update their program disk if a newer version is available for \$15. These updates will consist of updated parameters for new versions of programs that are already on the disk, as well as any updates to any of the application programs. Return the original *DiskUtil II* disk with \$10 to receive an update. Major upgrades may cost more, but will contain major revisions in most of the software. Registered owners will be notified only on major upgrades.

Technical Support Offer

We also make a special offer of technical support. If you encounter a new program that you'd like *DiskUtil II* to support, please let us know. Call our technical support line at (415) 474-8055 to tell us what program(s) you'd like to have patched. We cannot guarantee that we can find parameters for every program, but we'll do our best! We won't, however, find parameters for programs that have a bulletproof installation/removal procedure.

New Product Ideas

FWB, Inc. is committed to develop programs directed towards performance without compromise, hence our main focus on utility products. If you have ideas for helpful products that you'd like to see developed, or if you have a program you'd like to market, please let us know.

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