Connectix

Accelerate
your Mac
with just
one click

SPEED
DOUBLER

SPEED DOUBLER

FOR MACINTOSH

*Accelerate Your Mac with
Just One Click*

Connectix

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Connectix Speed Doubler™ is the first software accelerator for the
Macintosh. Unlike processor upgrades, which increase the CPU
processing rate, Speed Doubler eliminates performance bottlenecks that
are typically responsible for significant slowdowns on your Macintosh.
Speed Doubler's three primary enhancements provide double the
performance of Power Mac emulation, faster data access and faster
Finder copy and delete. You'll notice the performance improvements
every time you use your computer.

Following a brief installation process, Speed Doubler works
automatically every time you use your Mac. It is fully compatible with
the complete range of Macintosh application software and hardware.
Upgrade your Mac to a higher level of performance with Speed Doubler.

The Speed Doubler Extensions

Speed Copy   **Speed Access**   **Speed Emulator**

Speed Doubler works on all 68030, 68040 and PowerPC Macintosh models currently being produced, and most older Macintoshes that use these processors. The Speed Emulator extension only works on PowerPC equipped Macintosh systems.

To use Speed Doubler, you must have the following:

- A Macintosh equipped with a 68030, 68040 or any PowerPC processor. Examples include all Power Mac, Centris and Quadra models, all PowerBooks and Duos except for the Model 100, all models in the Macintosh II family, except the original (see below), and all Performas.

- System 7.0 or later, including System 7.5.

- 8 MBs of physical RAM memory.

❖ Note: Speed Doubler is fully compatible with Connectix RAM Doubler.

Speed Doubler cannot be used on a few older Macs because they use the 68000 or 68020 microprocessor: PowerBook 100, Mac 128, Mac 512, Mac Plus, SE, original Classic and original LC (see below for an exception). Machines that originally had a 68000 CPU and were later upgraded with a 68030 accelerator are *not* compatible with Speed Doubler.

Speed Doubler can work on the original Macintosh LC if it has an accelerator installed.

Speed Doubler can work on the original Mac II, which uses the 68020 microprocessor, if a 68030 or 68040 accelerator is installed. You may use a 68851 PMMU chip instead of an accelerator.

TO INSTALL SPEED DOUBLER

1. Turn on your Macintosh and hold down the **Shift** key to disable all extensions (such as virus protection). Insert the Speed Doubler floppy disk.

2. Double-click the Speed Doubler installer icon to begin the installation process.

3. Use the pop-up menu to tell the installer on which disk volume you want to install Speed Doubler. The logical choice is usually the one selected since it is the disk you started from.

4. Click the **Install** button.

Connectix Speed Doubler

Volume to install onto: [Macintosh HD ▼]

You are about to install (or remove) Speed Doubler into the System Folder on the selected volume.

Click on 'Install' to use this version, 'Remove' to remove any version, or 'Cancel' to return to the Finder.

[Install] [Remove] [Cancel]

5. Fill in the personalization dialog box that appears. Click the OK button when finished.

```
┌─────────────────────────────────────────────┐
│  Please personalize your copy of Speed Doubler │
│  ─────────────────────────────────────────   │
│  Your Name:    [                          ]   │
│                                               │
│  Organization: [                          ]   │
│                                               │
│            ( Cancel )    [   OK   ]           │
└─────────────────────────────────────────────┘
```

6. To register Speed Doubler electronically (by modem or fax), complete the electronic registration form and follow the instructions to transmit the registration information to Connectix. If you are unable to transmit the registration electronically, you may print the information and fax it, or send in the postage-paid registration card.

7. When you see a message saying installation was successful, click **OK** to return to the Finder.

8. Restart your Macintosh.

9. Read the Speed Doubler "Read Me" file on the Speed Doubler installer disk for last minute information that isn't in this manual.

TO TEMPORARILY DISABLE SPEED DOUBLER

To temporarily disable Speed Doubler, restart your Mac and

1. Hold down the **Shift** key *after* "Welcome to Macintosh" appears to disable just the Speed Doubler extensions.

   Or,

2. Hold down the **Shift** key to temporarily disable all extensions when your Macintosh first starts up.

TO REMOVE SPEED DOUBLER

1. Double-click the Speed Doubler installer icon on the Speed Doubler floppy disk.

2. Use the pop-up box to tell the installer from which disk volume you want to remove Speed Doubler.

3. Click the **Remove** button.

4. Restart your Macintosh.

Connectix Speed Doubler automatically improves critical areas of Mac performance. There are no adjustments necessary. Your Mac is always faster with Speed Doubler installed, primarily in these three areas:

1. Power Mac emulation: running 680x0 software and general system functions on a PowerPC processor

2. Disk access: reading and writing of data to and from the hard disk

3. Finder copy and delete: copying files and emptying the trash

The following section outlines the performance benefit of each feature of Speed Doubler. Understanding how each feature works helps you get the performance benefit of each Speed Doubler feature.

USING SPEED EMULATOR

What is Speed Emulator?

Speed Emulator is an ultra-fast 680x0 emulator for the Power Mac. Speed Emulator processes all 680x0 instructions from the System software and applications twice as fast as Apple's standard emulator.

In order for the PowerPC processor to recognize instructions written for the 680x0 processor (non-native instructions), it uses a software emulator to convert the 680x0 instructions into PowerPC instructions. With a significant portion of the Power Mac system software and numerous applications using 680x0 instructions, the emulator's performance is critical to overall Power Mac performance. Speed Emulator's emulation method delivers double the processing performance as Apple's standard emulator. As a result, all non-native applications and system functions run at Quadra-level speed, or faster, with Speed Emulator installed. Without Speed Doubler, your Power Mac does not utilize the true speed of the PowerPC processor.

Using Speed Emulator

There are no adjustments necessary to get the performance advantage of Speed Emulator. Every emulated application and system function processes faster, twice as fast as the standard Power Mac emulator. Just work as you would normally—Speed Emulator speeds non-native applications and system functions automatically.

Speed Emulator provides the greatest benefit for processor performance. A processor intensive task looks like the computer is

"thinking." There is not any disk or network activity, just a delay or status bar as the processor calculates. Processor intensive tasks include screen redraws, graphics renderings, and any situation where the processor must perform calculations. Most graphics applications, games and spreadsheets are very processor intensive.

It is important to note that Power Mac native applications do not see any performance benefit from Speed Emulator since they are already taking full advantage of the fast PowerPC processor. However, a significant portion of Power Mac system software is non-native (using 680x0 instructions). These system functions include File Manager, File Sharing and the Finder, among others. Even if you run primarily native applications, non-native system functions are frequently used even while you are working inside a fully native application. Speed Doubler gives all non-native system instructions its double speed performance benefit. The trade-off for this tremendous performance benefit is RAM—Speed Emulator uses approximately 800K of RAM memory for its caching of instructions.

USING SPEED ACCESS

What is Speed Access?

Speed Access is an intelligent disk cache system that replaces the System 7 disk cache and speeds disk access. Speed Access is faster than the standard System 7 disk cache by effectively using more RAM and intelligent algorithms (see Disk Cache Background, p.16).

Whenever your software needs access to the hard drive, Speed Access is at work speeding up the read/write process by storing frequently used hard drive data in RAM. Since the processor can access data quicker from RAM than from a hard drive, disk access performance improves and there is less hard drive activity. Speed Access speeds database sorts and searches, speeds document saves and accelerates the data transfer rate within your system. The end result is your Macintosh becomes more responsive and there is less time waiting for the hard drive.

Using Speed Access

Speed Access automatically sets the size of the cache during installation. The size of the cache, based upon the amount of physical RAM installed, is optimized by Speed Access for general performance improvement. Speed Access is designed to cache average size documents and other data while reducing the frequency of hard drive accesses. Also, if you have only 8 MB of RAM, Speed Access leaves enough RAM available to open multiple applications. Remember, the RAM allocated to the cache is not available for applications to use.

Speed Access automatically uses the amount of RAM allocated in the "Cache Size" setting in the Memory control panel to speed disk access. In general, Speed Access is always faster than the standard System 7 disk cache. And unlike previous versions of System 7, when more RAM is allocated to the disk cache, Speed Access is optimized to improve performance by "caching" additional disk data.

Speed Access always provides faster disk access performance. If you typically use large documents or databases and have plenty of extra memory available, you can increase the cache size for a greater benefit. The recommended amount for large documents or databases is enough memory to store the single largest document you use. For example, if you are frequently using a 6 MB database file, Speed Access can store (or "cache") the entire document if there is 6 MB of memory allocated to the cache. With the entire database in memory, you can sort and search at RAM speed, rather than hard drive speed, and significantly improve performance. If you have extra RAM available that is typically not in use or allocated to applications, you can adjust the cache setting higher to reallocate this unused RAM. With more memory, Speed Access stores more information and increases the disk access performance benefit.

There is one simple rule to follow if you choose to increase the size of the cache: *The memory you allocate to the cache is not available for applications to use.*

In our 6 MB database example, if the cache was set to 6 MB on an 8 MB configuration, this would leave only 2 MB remaining for the system and any application to load. You should only allocate *extra* memory you have available to the cache and leave enough memory remaining for your applications to load. If you find that you do not have enough memory to load the applications you need, simply reduce the size of the cache.

❖ **Note:** To adjust the size of the cache in the Memory control panel, use the arrows to increase or decrease the amount of RAM. You must restart for changes in cache size to take effect.

USING SPEED COPY

What is Speed Copy

Speed Copy provides faster performance, more convenience and more features than the Finder. Just copy and delete files as you would normally; Speed Copy does the rest. Whenever you copy a file in the Finder, Speed Copy automatically takes over the copy process, works in the background and provides extra information about copy progress. You'll instantly notice that Speed Copy is faster than the Finder. In addition, Speed Eraser, a component of Speed Copy uses similar techniques to speed the "Empty Trash" process.

Speed Copy features include:

- Fast Finder copy. Copies run faster than the current Finder.
- Background copy. Copies take place in the background, allowing you to complete other tasks during longer copies.
- Copy multiple files to multiple destinations. Up to 3 copies can run simultaneously.
- Copy progress. Estimated time, elapsed time and total throughput are updated continuously through the copy.
- Speed Replace. Replaces only files that have changed to save time.
- Fast file delete. Deletes occur faster than the current Finder.
- Security Erase. All traces of the files are removed; files cannot be "undeleted."
- Delete locked items without asking
- Delete specific items in the Trash

Using Speed Copy

To use Speed Copy, just copy files as you would normally. Speed Copy takes over the Finder copy process automatically and provides a faster copy. In addition to fast performance, Speed Copy also introduces four new features: background copying, copy statistics, speed replace and multiple copies.

Using Background Copy

Just copy files as you would normally. Notice a new dialog box titled "Speed Copy" that replaces the normal Finder copy dialog.

```
════ Speed Copy ═══════
 Items remaining to be copied:   2518
 Writing:    "Icon"
▷ ▮▮▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯       [ Stop ]
```
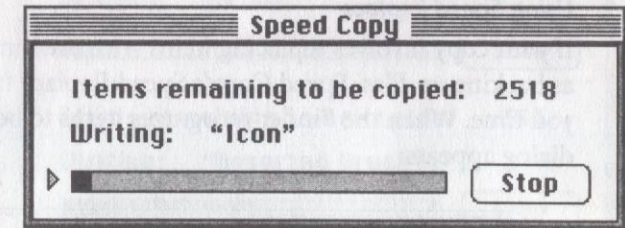
After starting the copy, move the mouse and select another open application or the Finder. You can continue other work while the copy is in progress. You can also start another copy (up to 3 copies simultaneously, see Multiple Copies). When the copy is completed the Speed Copy dialog disappears.

The background copy feature is especially useful if you have a large copy or need to make copies to multiple destinations. Speed Copy completes the copy automatically and allows you to continue working.

Using Additional Copy Statistics

During the copy process, you can obtain further copy performance statistics by clicking on the triangle on the left side of the status bar. This extends the Speed Copy dialog box and reveals additional information: bytes copied, elapsed time and estimated remaining time.

```
════ Speed Copy ═══════
 Items remaining to be copied:       30
 Writing:    Mail
▽ ▮▮▮▮▮▮▮▮▮▯▯▯▯▯▯▯▯▯▯▯       [ Stop ]
 Bytes copied:         546.6K of 1.5 MB
 Elapsed time:                  0:00:20
 Estimated remaining time:      0:00:38
```
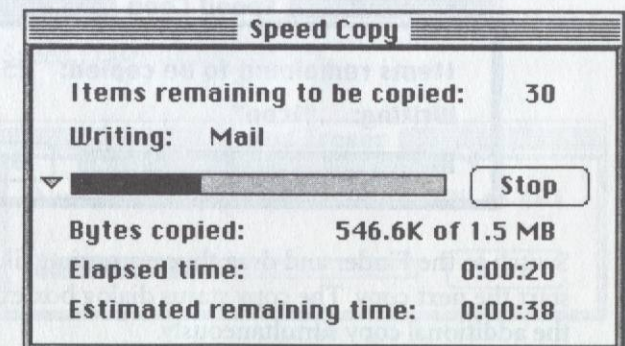
This information allows you to gauge the progress of your copy. Click on the triangle at any time during the copy to show or hide the additional copy statistics.

Using Speed Replace

If your copy involves replacing items with the same name, such as backing up files, Speed Copy's Speed Replace function saves you time. When the Finder recognizes items to be replaced, this dialog appears:

```
┌─────────────────────────────────────────────┐
│   ⚠    An item named "FileMapping" already   │
│        exists in this location. Do you want to│
│        replace it with the one you're moving? │
│                                               │
│   [ Speed Replace ]  [ Cancel ]    [  OK  ]   │
└─────────────────────────────────────────────┘
```
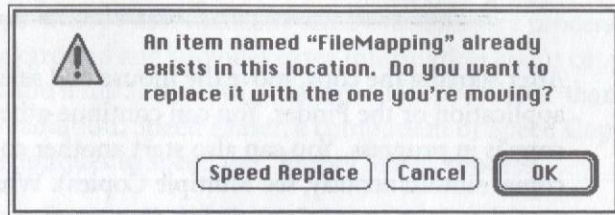
If you select **Speed Replace** only the items that have a different modified date are replaced, thus saving time and resulting in a faster copy. If you select **OK**, the Finder replaces all the contents, even if nothing has changed. Select **Cancel** if you are not certain you want to replace any items.

Using Multiple Copies

Speed Copy allows up to 3 copies to occur simultaneously. To perform multiple copies, start the first copy process as you would normally.

```
┌══════════════ Speed Copy ══════════════┐
│                                         │
│   Items remaining to be copied:  2518   │
│   Writing:   "Icon"                     │
│                                         │
│  ▷ ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓      [ Stop ]   │
└─────────────────────────────────────────┘
```

Switch to the Finder and drag the appropriate files or folders to start the next copy. The copy status dialog box expands to show the additional copy simultaneously.

```
┌══════════════ Speed Copy ══════════════┐
│                                         │
│   Items remaining to be copied:  2396   │
│   Writing:   "Icon"                     │
│                                         │
│  ▷ ▓▓▓▓▓▓░░░░░░░░░░░░░░░░     [ Stop ]   │
│ ·······································  │
│   Items remaining to be copied:  303    │
│   Writing:   "Assorted Brushes"         │
│                                         │
│  ▷ ▓▓▓▓▓▓▓▓▓▓▓▓░░░░░░░░░      [ Stop ]   │
└─────────────────────────────────────────┘
```
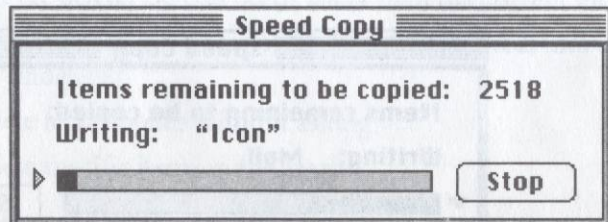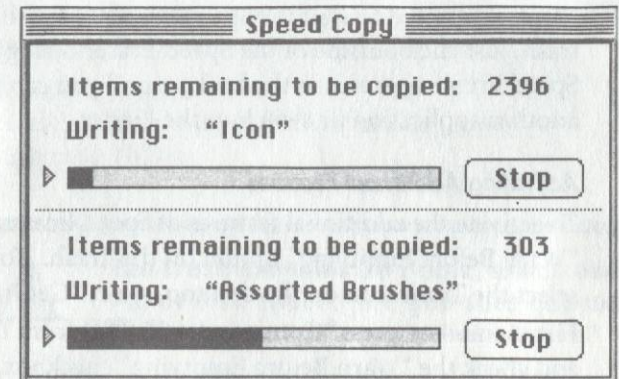
To see additional copy statistics for any of the copies in progress, click on the triangle to the left of the status bar.

Each copy progresses independently. As soon as a copy is complete, its status disappears from the dialog box until all copies have completed.

Using Speed Eraser

To use Speed Eraser drag files to the Trash as you would normally. Speed Eraser takes over the Empty Trash process automatically and provides a faster delete. In addition to fast performance, Speed Eraser also introduces four new features: background delete, security delete, delete locked items and selective delete.

Background Delete

Speed Eraser automatically takes over the "Empty Trash" command from the Special menu in the Finder to deliver faster file delete and additional features. When Empty Trash is selected, the Speed Eraser dialog appears.

```
┌══════════════ Speed Eraser ══════════════┐
│                                           │
│   Number of items deleted:    200 of 481  │
│                                           │
│   ▓▓▓▓▓▓▓▓▓▓▓▓░░░░░░░░░░       [ Stop ]    │
└───────────────────────────────────────────┘
```
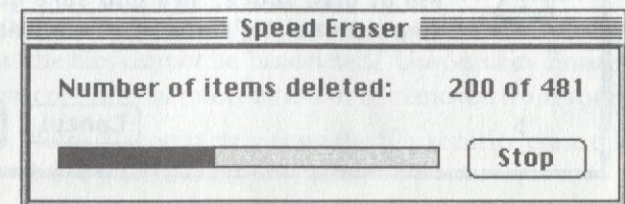
There is no need to wait for Speed Eraser to finish emptying the trash, just click outside of the Speed Eraser dialog box. Since Speed Eraser operates in the background you can move to another application or switch to the Finder.

Activating Additional Features

To activate the additional features of Speed Eraser, select the "Warn Before Emptying" option on the Trash. To activate: select the Trash icon on the desktop, select "Get Info" from the File menu—or press "Command + I" (⌘I) from the keyboard—and check the "Warn Before Emptying" checkbox.

```
┌─────────────────────────────────────────┐
│ ▓▓░│▓▓▓▓▓▓▓ Trash Info ▓▓▓▓▓▓▓           │
├─────────────────────────────────────────┤
│                                          │
│      ┌─┐                                 │
│      │ │   Trash                         │
│      └─┘                                 │
│                                          │
│   Where : On the desktop                 │
│                                          │
│   Contents : The Trash is empty.         │
│                                          │
│                                          │
│                                          │
│   Modified : Mon, Mar 20, 1995, 4:36 PM  │
│                                          │
│   ☒ Warn before emptying                 │
└─────────────────────────────────────────┘
```
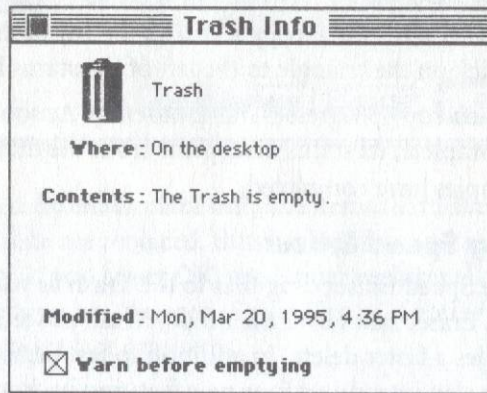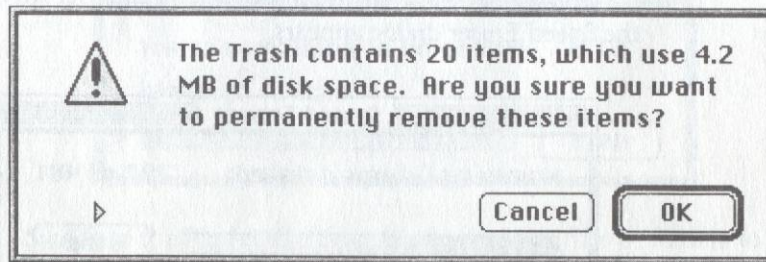
With the warning activated, whenever emptying the trash you receive additional empty trash information and options from Speed Eraser. Notice the triangle in the lower left corner. Click on the triangle to display additional Speed Eraser features.

```
┌───────────────────────────────────────────────┐
│                                                │
│    ⚠    The Trash contains 20 items, which use │
│    /!\  4.2 MB of disk space. Are you sure you │
│         want to permanently remove these items?│
│                                                │
│    ▷               ┌──────────┐  ┌──────────┐  │
│                    │  Cancel  │  │    OK    │  │
│                    └──────────┘  └──────────┘  │
└───────────────────────────────────────────────┘
```

Clicking on this triangle will reveal, or hide, these additional features:

*   Security Erase
*   Delete Locked Items (without asking), and
*   Selective Delete.

```
┌─────────────────────────────────────────────────┐
│  ⚠    The Trash contains 20 items, which use 4.2  │
│ /!\   MB of disk space. Are you sure you want     │
│       to permanently remove these items?          │
│                                                   │
│  ▽                    ┌──────────┐ ┌──────────┐   │
│                       │  Cancel  │ │    OK    │   │
│ ─────────────────────└──────────┘ └──────────┘── │
│                 ┌──────────────┐                  │
│                 │ 🗑 Trash  ▼  │                  │
│                 └──────────────┘                  │
│  ┌──────────────────────────────────────────┐ ▲  │
│  │ 🗑 ▪ About the Apple Extras Folder     │ ║  │
│  │ 🗑 ▫ About Virtual Memory              │ ║  │
│  │ 🗑 ▪ Acrobat Reader 2.0                │ ║  │
│  │ 🗑 ▪ Apple Extras                      │ ║  │
│  │ 🗑 ▪ Apple Video Player                │ ║  │
│  │ 🗑 ◆ Graphing Calculator               │ ▼  │
│  └──────────────────────────────────────────┘    │
│  ☐ Security Erase                                 │
│  ☒ Delete locked items without asking             │
└─────────────────────────────────────────────────┘
```
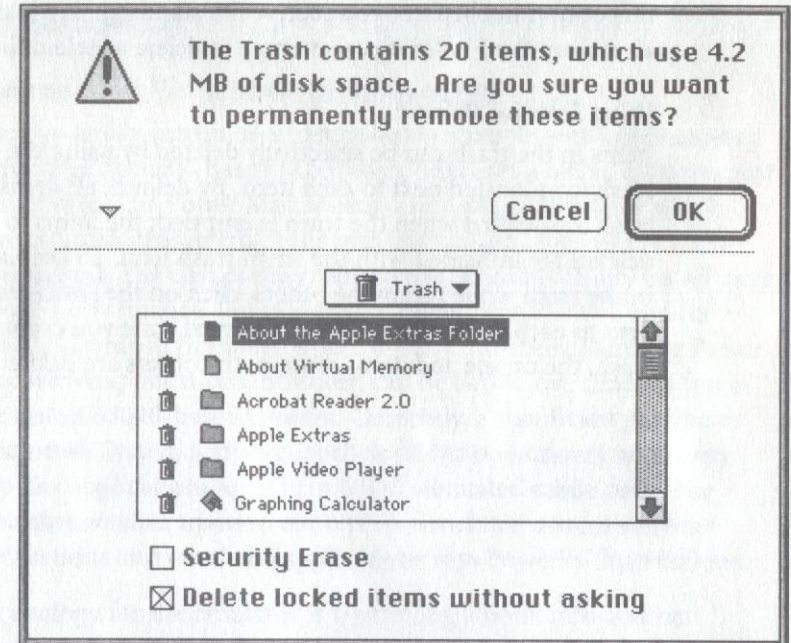
Using Security Erase

Security Erase permanently erases the files in the trash so that they cannot be "undeleted". Typically when the Finder empties the Trash, only the file name is removed from the list of disk files. The file's data remains on the drive until it is written over. Security Erase takes extra steps to clear the data from the drive so that the files cannot be "undeleted." Use Security Erase when you have confidential information to be removed from your drive.

❖   **Note:** To completely erase the file, security erase takes longer than a standard empty trash.

Using Delete Locked Items

Select "Delete locked items without asking" to automatically delete any locked item in the trash. Normally a locked file cannot be deleted; the Finder alerts you when there is a locked file in the trash. If you typically lock files to prevent them from being deleted, it is a good idea to leave this option unchecked. With this option unchecked, you receive the standard "file locked" alert from the Finder if you attempt to delete a locked file.

Using Selective Delete

Items in the trash can be selectively deleted by using the small trash icon located next to each item. By default, all items in the trash are deleted when the trash is emptied; the items to be deleted are indicated with the small trash icon. To keep an item in the trash while removing others, click on the small trash icon next to each item to unselect it. The next time you empty the trash, the unselected items remain, the others are deleted.

Now that you know what Speed Doubler does for your Mac's speed, and why it focuses on certain aspects of performance, you are ready to learn how Speed Doubler works its speed magic. This section describes, in detail, the techniques used by Speed Doubler. Use this information to advance your understanding of Speed Doubler and get the most out of your Mac's speed.

SPEED EMULATOR

Power Mac Emulation Background

The Power Macintosh, in order to be compatible with applications written for the 68K-based Macintosh, emulates a 680x0 environment in software. The Power Mac system uses a 680x0 emulator which converts all 680x0 instructions into instructions the PowerPC can understand. The cost of maintaining 680x0 compatibility on a Power Mac is performance. For instance, a Power Mac 6100/60 runs at about Macintosh IIci speed under 680x0 emulation. Running Power Mac native applications, however, can be two to five times as fast as the fastest 68040-based Quadra. Currently, a significant portion of Macintosh System software (such as all file operations) and many popular applications are still in 680x0 emulated mode only. The emulator is relied upon to convert the emulated system software instructions and emulated applications into PowerPC instructions.

An analogy for the emulator is translating a book into another language. Imagine you have a book written in a foreign language and you have a language translation dictionary. To read the book, you look up a word in the dictionary, go to the next word, look it up, and so on. The emulator is like the language translation dictionary. It reads a 68K instruction, converts it to a PowerPC instruction, reads the next instruction, converts it, and so on. This process is effective but very time consuming.

How Speed Emulator Works

Using this same book translation analogy, Speed Emulator does the translation of the book all at once from the start. From then on, it reads from the translated book. The method used is called Dynamic Recompilation and gives Speed Emulator its performance advantage. Instead of converting each 680x0 instruction to PowerPC whenever it is called, Speed Emulator translates all the instructions dynamically

and only one time. Once each instruction is translated, it does not need to be translated again. Future calls of that particular 680x0 instruction are already in faster PowerPC mode.

In terms of performance, the first time a particular 680x0 instruction needs to be compiled to PowerPC, Apple's emulator translates the instruction, while Speed Emulator compiles it. Translation is faster than compiling, so the first time the instruction is called, Apple's emulator is faster than Speed Emulator. However, every time that same instruction is called, the Apple emulator has to translate it again, but Speed Emulator already has translated it and executes it immediately as a PowerPC instruction. This efficiency of dynamically recompiling instructions from 680x0 to PowerPC gives Speed Emulator its superior performance.

SPEED ACCESS

Apple Disk Cache Background

Apple's disk cache, which is built into the Macintosh operating system, is a small amount of RAM memory (adjusted through the Memory control panel—typically 256K or greater) used to improve data access speed. The disk cache acts as a buffer between the hard drive and application memory, storing frequently used information from the hard drive. Since RAM access time is hundreds of times faster than any other storage medium (hard drive, CD-ROM and so on), the information stored in the cache can be accessed quicker by the processor than from the storage devices.

When the processor requests data from the hard drive, it goes through the disk cache first. If the cache has the requested data, it transfers it directly to the processor at physical RAM speed. If the cache does not have the data, it passes the data request on to the hard drive. Once the requested data has been acquired from the hard drive, the cache stores the data from the hard drive in its memory and transfers the requested data to the processor. Thus, for each subsequent data request, the cache receives new data and the process continues. This disk cache technique, while a functional part of the Macintosh operating system, is limited by its rudimentary methods.

It has not been significantly optimized to use more RAM and data access continues to be a bottleneck for faster and faster processors.

How Speed Access Works

Speed Access is an intelligent disk cache system designed to utilize physical RAM to greatly improve data access performance. Speed Access automatically replaces the current disk cache and provides critical improvements. Speed Access uses intelligent algorithms and techniques to determine which hard drive information to hold for future processor requests. Speed Access techniques focus the cache memory to speed up particular functions, such as data writes. Through the combination of using more memory and intelligently managing data, Speed Access improves data access performance and provides a greater benefit than the standard System 7 disk cache.

Q: *On my Power Mac, I'm not seeing much performance improvement. How do I get the most out of Speed Emulator?*

A: Speed Doubler provides the largest performance improvement for non-native software running on a Power Mac. Any applications, games, utilities, etc. that are 680x0 based will process twice as fast with Speed Doubler installed. And aspects of the non-native software that are processor intensive, such as calculations and renderings, will receive the most noticeable improvement in speed. Some examples of processor intensive functions include: a Summary Calculation in FileMaker Pro, a recalculation in Excel 4.0 (non-native), a gaussian blur filter in Photoshop 2.5.1 (non-native). Typically these type of functions take the longest to complete and they will receive the greatest benefit with Speed Doubler installed.

Q: *How do I get the most disk access performance with Speed Access?*

A: Try increasing the amount of memory allocated to the disk cache (see pages 6-7) if you have extra memory available. Speed Access speeds access time by caching frequently used data in RAM. With more RAM available for the cache, Speed Access can store more data in RAM and greatly reduce the amount of disk accesses. The goal of the disk cache is to access the data you need at RAM speed, rather than disk speed. When adjusting cache size, however, remember that memory allocated to the cache will not be available for applications.

Q: *Does Speed Emulator benefit floating point math intensive functions?*

A: No. The best solution for math performance is to use native software.

Q: *I use a CD-ROM caching software. Will this affect Speed Access?*

A: No. You should have no problems between Speed Access and any other caching software. If you have enough RAM, you could use both at the same time. However, if you do not have enough RAM available, you should disable one or the other. The advantage of Speed Access is it has a wider benefit, and it helps CD-ROM access speed as well.

Q: *How do I benchmark my performance?*

A: The simplest, and perhaps most meaningful way, is to use a stopwatch. Choose some functions that take a long time to complete or are an important part of your work. Then, time each function. As you make improvements to your system (like installing Speed Doubler!), you can use these functions to gauge each improvement.

Another way is to use a benchmark utility. These utilities use standardized tests specific for different aspects of performance, such as math, disk, processor and video. Numerous benchmark utilities are posted on commercial online services, the Internet and World Wide Web. Some examples of benchmark utilities include: Speedometer™ 4.0–shareware by Scott Berfield (sberfield@aol.com), Symantec Norton Utilities System Info, and MacBench™ 2.0 by Ziff-Davis Publishing Company L.P. (CompuServe: GO ZDBENCH).

Q: *How does Speed Doubler affect native Photoshop or other native applications?*

A: Disk accesses and non-native system instructions are faster in native applications with Speed Doubler installed. Thus, disk intensive activities in native applications, such as saving a large file or sorting a database, are faster with Speed Access installed.

Even in native applications, non-native system instructions are frequently used, such as File Manager. All non-native instructions receive the double speed benefit of Speed Emulator.

Q: *Will Speed Doubler make my Mac run hotter or void my Apple warranty in any way?*

A: No to both questions. Speed Doubler does its magic entirely in software and does not alter your hardware in any fashion.

Q: *I have a new Power Mac 9500 that has Apple's new, faster emulator built-in. Is Speed Doubler's emulator even faster and can I use it on my new configuration?*

A: Speed Emulator is faster than the new Power Mac emulator by 30% to 100%, depending upon the function. Speed Emulator automatically overrides the new emulator, so there are no adjustments necessary.

Q: *I own Connectix RAM Doubler and it works so effectively that I really can't live without it on my Mac. Is Speed Doubler compatible with RAM Doubler?*

A: Absolutely! Speed Doubler complements RAM Doubler perfectly. Use both to increase your productivity and performance!

In addition, Speed Doubler is compatible with the full range of Macintosh application software.

In the unlikely event that you have a problem related to Speed Doubler, please read this section.

CONTACTING CONNECTIX SUPPORT

If you have questions or problems with Speed Doubler, you may contact us by telephone, by fax or via electronic mail. However, please try the following first:

1. **Read this manual.** It may only take a few moments to get the answers you need. Also, check the "Read Me" file on the Speed Doubler diskette for the latest information on known problems and solutions.

2. Write down the events that lead to the problem. Have you changed anything in your computer recently?

Have the following available when you contact Technical Support:

- Registration number—on the Registration Card
- Speed Doubler version number—on the Speed Doubler Installer
- Mac model—located in "About This Macintosh…"
- Apple System software version—in "About This Macintosh…"
- How much physical RAM installed—in "About This Macintosh…"

Connectix Technical Support can be contacted at the following addresses:

Online Service	Mail Address	Forum Location
AppleLink	CONNECTIX.TS	Third Parties, A-C
America On-Line	Connectix	Keyword = Connectix
CompuServe	75300, 1546	Go MACAVEN, Section 8
eWorld	RAM Doubler	Shortcut = Connectix
Internet	support@connectix.com	
FAX	415.571.5195	
Phone	415.571.5100 or 800.950.5880	

CONTACTING CONNECTIX SALES

Contact Connectix Sales for more information about Speed Doubler volume sales (site license, 50-user, and 10-user packs) or other Connectix products.

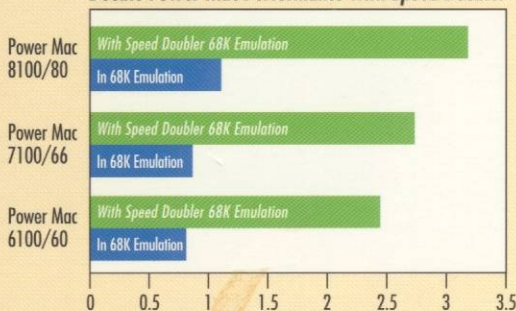|	
Internet	sales@connectix.com
FAX	415.571.5195
Phone	800.950.5880 or 415.571.5100

Connectix

2655 Campus Drive • San Mateo • CA • 94403-2520
800.950.5880 • 415.571.5100 • FAX 415.571.5195
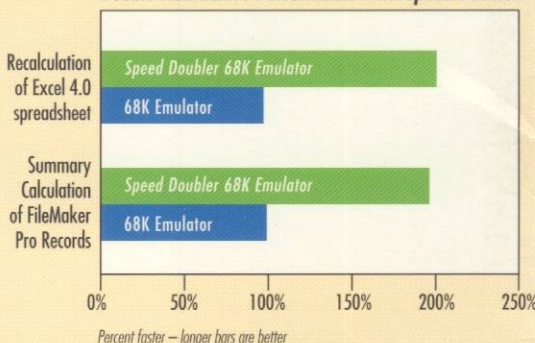email: support@connectix.com

SPEED DOUBLER

Get double the performance in Power Mac emulation, faster disk access on all Macs, and speed up Finder functions with Speed Doubler. Installation takes just seconds and Speed Doubler works automatically. Take your performance to a higher level with Speed Doubler.

Double Power Mac Performance with Speed Doubler

Power Mac 8100/80	With Speed Doubler 68K Emulation / In 68K Emulation
Power Mac 7100/66	With Speed Doubler 68K Emulation / In 68K Emulation
Power Mac 6100/60	With Speed Doubler 68K Emulation / In 68K Emulation

0   0.5   1   1.5   2   2.5   3   3.5

Speedometer 4.0 Processor Benchmark Average in 68K Mode — longer bars are better
1.0 = Quadra 605   2.25 = Quadra 840 AV

Double Non-native Performance with Speed Doubler

Recalculation of Excel 4.0 spreadsheet	Speed Doubler 68K Emulator / 68K Emulator
Summary Calculation of FileMaker Pro Records	Speed Doubler 68K Emulator / 68K Emulator

0%   50%   100%   150%   200%   250%

Percent faster — longer bars are better

Doubles Speed of 680x0 Emulation for Power Macs

With Speed Doubler's emulator, all non-native software and system functions process twice as fast as the standard Power Mac emulator. For example, a Word 5.1 (non-native) document scrolls in 30 seconds with Speed Doubler, 60 seconds without.
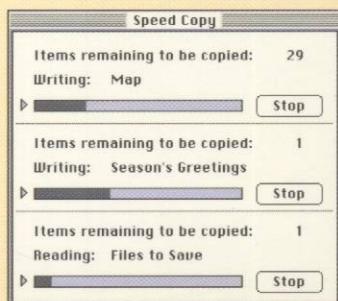
Speeds Disk Access on All Macs

Speed Doubler speeds disk access by up to 40% by replacing the System 7 disk cache with an ultra fast "read and write ahead" algorithms for better performance. Faster disk performance means faster performance in disk intensive functions, like sorting and searching FileMaker Pro documents.

Improved Finder Functions on All Macs

Copy and delete files without delay. Speed Doubler is faster than the Finder, works in the background and supports multiple copies simultaneously.

Additional Features

- Installs in just seconds and works automatically.
- Complements any processor or RAM upgrade. Speed Doubler improves aspects of performance that are not affected by a faster processor; and having more RAM available increases the disk access speed benefit.

1011-400-002

Speed Copy

Items remaining to be copied: 29
Writing: Map
▶ [   ] Stop

Items remaining to be copied: 1
Writing: Season's Greetings
▶ [   ] Stop

Items remaining to be copied: 1
Reading: Files to Save
▶ [   ] Stop

With Speed Doubler, all these copies run in the background, simultaneously, and faster than the Finder.

Requirements

- Macintosh equipped with a PowerPC, 68040, or 68030 processor.
- 8MB of physical RAM required. Compatible with Connectix RAM Doubler.
- System 7 or later.
- ▲ Not compatible with Mac Plus, Mac SE, original Classic, or PowerBook 100.

Connectix provides toll-free technical support and a 30-day money back guarantee for all its products.

Connectix

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