Connectix Speed Doubler™ 2

for Macintosh and Power Macintosh

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Connectix Corporation

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1 INSTALLATION

Installing Speed Doubler 2

To Install Speed Doubler 2:

1. Turn on your Macintosh and hold down the Shift key to disable all extensions (such as virus protection). Insert the Speed Doubler 2 floppy disk.

2. Double-click the Speed Doubler 2 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 2 (The usual choice is the one selected since it is the disk you started from).

4. Click the Install button.

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

6. To register Speed Doubler 2 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 Restart or Quit to return to the Finder.

8. Restart your Macintosh.

9. Read the Speed Doubler 2 "Read Me" file on the Speed Doubler 2 installer disk for last minute information that isn't in this manual. The "Read Me" file includes information which may help you in troubleshooting Speed Doubler 2 with your system.

To Temporarily Disable Speed Doubler 2

1. Restart your Macintosh

2. Hold down the Shift key *after* "Welcome to Macintosh" appears until the Speed Doubler 2 icon appears crossed out to disable just Speed Doubler 2.

OR

3. Hold down the Shift key to temporarily disable all extensions when your Macintosh first starts up (*before* the welcome message appears).

To Remove Speed Doubler 2

1. Double-click the Speed Doubler 2 installer icon on the Speed Doubler 2 floppy disk.

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

3. Click Remove.

4. Restart your Macintosh.

2 INTRODUCTION

Welcome to Speed Doubler™ 2

Connectix Speed Doubler™ 2 is the second generation of the award-winning software accelerator for the Macintosh. Unlike processor upgrades, which simply increase the CPU processing rate, Speed Doubler 2 eliminates software performance bottlenecks that are typically responsible for significant slowdowns on your Macintosh. Speed Doubler 2's three primary enhancements provide faster file copying, improved disk performance, and double the performance of Power Mac emulation. You'll notice the improvements every time you use your computer.

Following a brief installation process, Speed Doubler 2 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 2.

The Speed Doubler 2 Components

Speed Doubler 2 consists of one Extension (Speed Doubler 2 Extension) and one control panel (Speed Doubler 2). The Speed Doubler 2 installer will place the Speed Doubler 2 control panel in the Control Panels folder in your System folder, and the Speed Doubler 2 Extension in the Extensions folder in your System folder.

Once Speed Doubler 2 has been installed, the Speed Doubler 2 control panel provides you with a number of settings you can adjust for your specific needs.

System Requirements

Speed Doubler 2 works on all 68030, 68040 and PowerPC Macintosh models. Speed Doubler 2's Faster Emulation feature 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. System 7.5.1 or later is recommended for fastest disk performance.
- 8 MBs of physical RAM memory. 12 MBs of physical RAM memory is recommended to fully use all the Speed Doubler 2 features.
- For fastest network file copying, a Macintosh-based TCP/IP (MacTCP 2.x, Open Transport 1.1 or later) network is required.

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, the original Classic, the original Mac II, and the original Mac LC. Machines that originally had a 68000 CPU and were later upgraded with a 68030 accelerator are not compatible with Speed Doubler 2.

3 HOW SPEED DOUBLER 2 WORKS

Speed Doubler 2 has three main features: faster file copying, faster emulation, and faster disk performance.

Speed Doubler 2's faster file copying

Speed Doubler 2 provides faster performance, more convenience and more features than the Finder. Just copy and delete files as you would normally; Speed Doubler 2 does the rest. Whenever you copy a file in the Finder, Speed Doubler 2 automatically takes over, works in the background and provides extra information about copy progress. Speed Doubler 2 is faster than the Finder, and uses similar techniques when it empties the Trash.

Faster copy features

- 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. You may have as many simultaneous copies in progress as you like.
- Copy progress. Estimated time, elapsed time and total throughput are updated continuously through the copy.
- Smart Replace: Only files that are different are copied from the source to the destination. Speed Doubler 2 examines the files' attributes and if the creation or modification dates are different, or if the sizes differ, it assumes that the files are different and need to be copied.

- Fast file delete. Emptying the Trash occurs faster than the current Finder.
- Security Erase. All traces of deleted files are removed; files cannot be "undeleted."
- Delete specific items in the Trash. Normally, all items in the Trash are deleted when you choose Empty Trash from the Special menu. With Speed Doubler 2., you can choose which items in the trash should be deleted, and which should be preserved.
- Folder Synchronization: This feature allows two folders to be synchronized. Files and folders that are not present in one of the folders are copied to the other folder. Where files differ, the file with the newer modification date is copied to the other folder. The result is that both folders are identical and have the most recent copies of all files.The copy will not be performed if there is insufficient disk space.
  NOTE: Folders to be synchronized cannot be on the Desktop.
- Audible notification of completion: You can select a sound to be played at the end of a copy operation. This will be played when a copy takes longer than a time defined by the user.
- Automatic deletion of locked files. Speed Doubler 2 gives you the option of automatically deleting locked files, bypassing the warning dialog normally provided by the Finder.
- Verification of Copied Files: You may elect to verify copies to floppies (this is enabled by default), removable drives, or hard drives (each may be set separately). Copies to network volumes cannot be verified.
- Faster Network Copies. When a remote server is mounted, the system uses Appletalk Filing Protocol (AFP) to communicate with that server and to obtain information about files and folders on the mounted volume, and to read and write data to that volume. Unfortunately, AFP is a relatively slow protocol.

– If items are to be copied to or from a server, and Speed Doubler 2 is running on that server, it will attempt to use AppleTalk Data Stream Protocol (ADSP) to receive or transmit data. ADSP is faster than AFP, but AFP is still used to obtain information about the volume or files on the volume.

– If the "Use TCP/IP if Available" option is enabled in the Speed Doubler 2 Control Panel, Speed Doubler 2 will attempt to use TCP/IP, which is an even faster protocol than ADSP. Using TCP/IP for network copying requires an extra 256K of RAM, and requires that MacTCP 2.x or Open Transport 1.1 or later are installed on both systems.

– You may only have 4 simultaneous TCP/IP copies in progress at one time. Subsequent copies will default to ADSP or AFP, depending on the configuration of your Mac and the remote server.

NOTES:

- Speed Doubler 2 does not see copy operations that are initiated through Apple Events, as it does not have the ability to intercept Apple Events directed at the Finder.
- Speed Doubler 2's faster file copying does not work if Apple's At Ease software is enabled.

Speed Doubler 2's faster emulation

Power Mac emulation background

In order for the PowerPC processor to recognize instructions written for the 680x0 processor (non-native instructions), it uses a software emulator to convert 680x0 instructions into PowerPC instructions. A significant portion of the Power Mac system software and numerous applications use 680x0 instructions, thus the emulator's performance is critical to overall Power Mac performance.

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.

For the Power Macintosh 6100, 7100, and 8100, Speed Doubler 2's emulation method delivers double the processing performance as the emulator Apple includes. As a result, all non-native applications and system functions run at Quadra-level speed or faster with Speed Doubler 2 installed. Without Speed Doubler 2, your Power Mac 6100, 7100, or 8100 does not utilize the true speed of the PowerPC processor. Other Power Macintosh systems include Apple's newer dynamic recompilation emulator, but you will still see a performance benefit with Speed Doubler 2's emulator.

Power Mac native applications do not see any performance benefit from Speed Doubler 2's emulation, 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 currently include File Manager, File Sharing and the Finder. Even if you run primarily native applications, non-native system functions are frequently used even while you are working inside a fully native application. All of these non-native functions will benefit from Speed Doubler 2's faster emulation.

How Speed Doubler 2's emulation works

Using this book translation analogy mentioned above, Speed Doubler 2 does the translation of the book all at once. From then on, it reads from the translated book. This method is called Dynamic Recompilation and gives Speed Doubler 2 its performance advantage. Instead of converting each 680x0 instruction to PowerPC whenever it is called, Speed Doubler 2 translates all the instructions dynamically only once. After 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 Doubler 2 compiles it. Translation is faster than compiling, so the first time the instruction is called, Apple's emulator is faster than Speed Doubler 2. However, every time that same instruction is called, the Apple emulator has to translate it again, but Speed Doubler 2 already has

translated it and executes it immediately as a PowerPC instruction. This efficiency of dynamically recompiling instructions from 680x0 to PowerPC gives Speed Doubler 2 its superior performance.

Speed Doubler 2's faster disk performance

Apple disk cache background

Apple's disk cache, which is built into the Macintosh operating system, is a small amount of RAM (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 Doubler 2's cache works

Speed Doubler 2 has an intelligent disk cache system designed to utilize physical RAM to greatly improve data access performance. It automatically replaces the System 7 disk cache and provides critical improvements. It uses intelligent algorithms and techniques to determine which hard drive information to hold for future processor requests. Speed Doubler 2's "read and write ahead" techniques also focus the cache memory to speed up particular functions. These techniques are fully compatible with standard disk caching, so your data is never at risk; you just receive faster performance.

Whenever your software needs access to the hard drive, Speed Doubler 2 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 Doubler 2 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.

Speed Doubler 2 optimizes the size of the cache based upon the amount of physical RAM you have installed. For optimal performance, you should usually set the size of the cache to 1/16th of the total RAM you have installed on your system. Speed Doubler 2's cache will not become active unless the cache is at least 128 K in size.

If you 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 Doubler 2 can store 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 not in use or allocated to applications, you should assign more memory to the cache. With more memory, Speed Doubler 2 stores more information and increases the disk access performance benefit.

Remember that memory allocated to the cache cannot be used to load applications. If you find that you do not have enough memory to load the applications you need, simply reduce the size of the cache. If you are consistently encountering low-memory conditions, Connectix RAM Doubler 2 could be the solution to your problems. With RAM Doubler 2, you can expand your RAM without buying expensive memory chips. For more information about RAM Doubler 2 and other Connectix products, see Chapter 6.

Speed Doubler 2's disk cache is most effective when used with slower drive mechanisms, especially removable drives. Speed Doubler 2's cache will *not* work with volumes greater than 4 GB, and will be automatically disabled if any hard drive partition exceeds 4 GB in size.

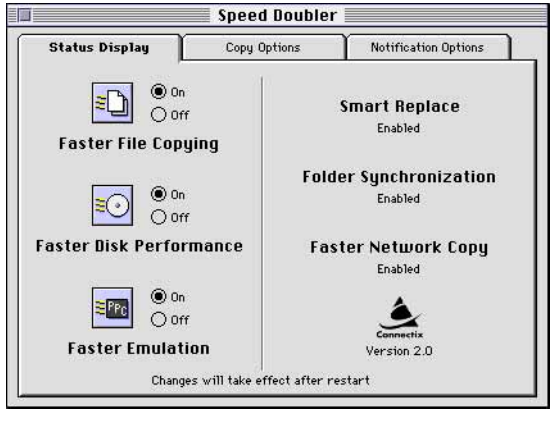
4 SPEED DOUBLER 2'S CONTROL PANEL

Within the Speed Doubler 2 control panel, there are three tabs: Status Display, Copy Options, and Notification Options.

Status Display tab

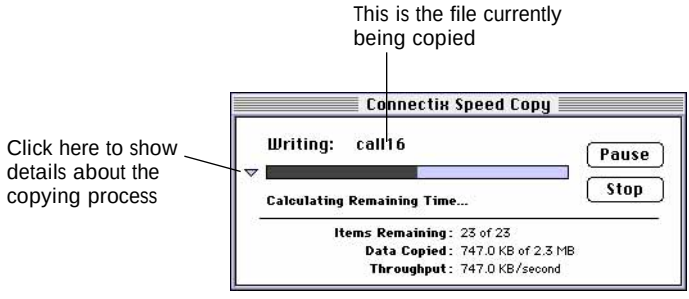
In the Status Display tab, you can turn on and off Speed Doubler 2's three main features: Faster File Copying, Faster Disk Performance, and Faster Emulation. The right section of the Status Display tab also shows the current settings for file copying. To change settings for file copying, use the Copy Options tab.

You must restart your computer for changes to take effect.

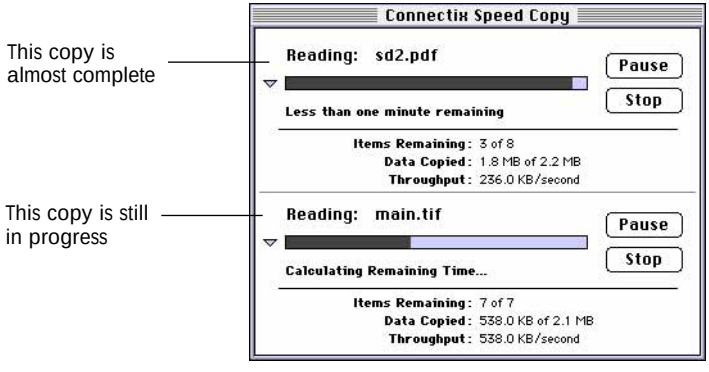


Turning on Faster File Copying

Click On to activate Speed Doubler 2's faster file-copying features. See page 1 for more information about copying features. You will be able to copy in the background, and to have up to three copy sessions active at the same time. An example of Speed Doubler 2's copy dialog is shown on the next page.



To continue working, click outside the dialog to return to the Finder. To start another copy session, simply drag the new set of files to their destination. Here is an example of two simultaneous copies:



When a copy session is done, it will disappear from the Speed Copy dialog. In the example above, the session at the top is almost complete. When it is done, the dialog will only display information about the remaining copy session.

Turning on Faster Emulation

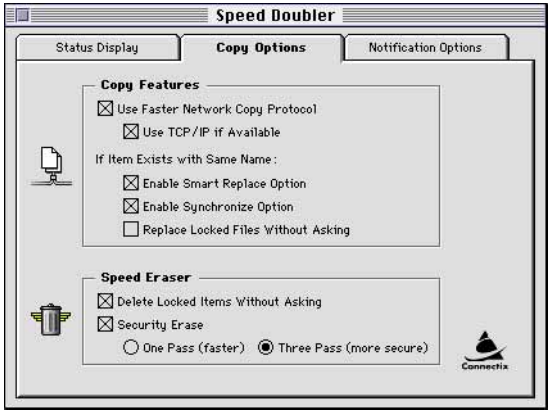
A significant portion of Power Mac system software is non-native (using 680x0 instructions). These functions currently include the File Manager, File Sharing and the Finder. Click On to activate Speed Doubler 2's fast emulation to speed up these functions. See page 3-3 for more information.

Turning on Faster Disk Performance

Click On to activate Speed Doubler 2's intelligent disk cache and get improved disk performance. See page 4 for more information about the disk cache.

Copy Options tab

Use the Copy Options tab to control how files are copied and deleted.



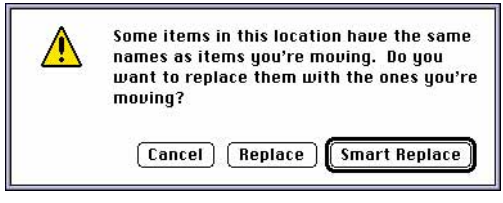
Using Faster File Copying

Faster Network Copying

For faster network copying, select Use Faster Network Protocol. If Mac TCP 2.x or later or Open Transport 1.1 or later are present on both systems, you can also select Use TCP/IP if Available for the fastest possible network file copying.

Using Smart Replace

Click Enable Smart Replace Option to activate Speed Doubler 2's Smart Replace option. This will copy only those files that are different. That means that if a file is the same in both the source and destination folders, it will not be copied. You will see the following dialog when Speed Doubler 2 finds files with the same name:



Synchronizing Folders while copying

Click Enable Synchronize Option to make sure that two folders contain the latest versions of each file, and have identical contents. If Speed Doubler 2 determines that the versions of a file are different in the source and destination folders, it will copy the newest version to the folder that does not have it. As a result, both folders will have the same, and newest, version of each file.

Replacing locked files automatically

Click Replace Locked Files Without Asking if you want to automatically replace files that have been locked. If you do not check this box, you will be prompted for confirmation before Speed Doubler 2 will replace a locked file.

Using Speed Eraser

Speed Doubler 2's Speed Eraser automatically takes over the "Empty Trash" command from the Special menu in the Finder to deliver faster file deletion and additional options.

Deleting files in the background

Speed Eraser operates in the background, so there is no need to wait for it to finish emptying the trash. Click outside of the Speed Eraser dialog box to move to another application or switch to the Finder.

Speed Eraser has several options for erasing files:

Deleting Locked items automatically

Normally a locked file cannot be deleted. To automatically delete locked items, clickDelete Locked Items Without Asking. If you do not check this box, you will be prompted for confirmation before Speed Doubler 2 will delete a locked file. If you lock files to prevent them from being deleted, it is a good idea to leave this option unchecked. You will then receive the standard alert from the Finder if you attempt to delete a locked file.

NOTE: You cannot erase a file which is in use, even if this option is checked.

Using Security Erase

To securely erase a file, click Security Erase

– Choose **One Pass** for faster performance. Speed Doubler 2 will then write a single pass of 0s and 1s over the area formerly occupied by deleted files. Normally, this area is not changed when you erase file, and the information in it can be easily recovered.

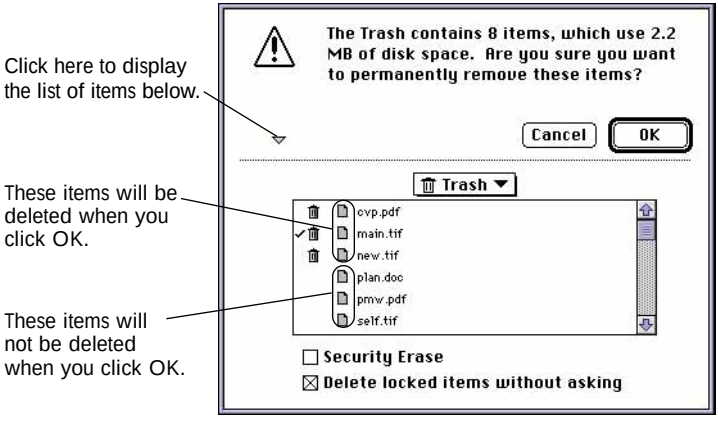
– Choose **Three Passes** for better security. Speed Doubler 2 will then write three passes of 0s and 1s over the area formerly occupied by deleted files. This provides much better security, but may take very much longer than a single pass, depending on the size of the file that you are erasing.

Selectively deleting items in the Trash

To selectively delete one or more items in the trash:

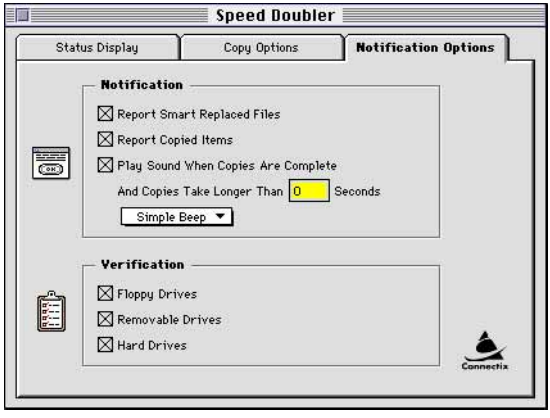
1. Select the Trash icon and press Command-I or choose Get Info from the File menu.
2. In the dialog that appears, check the Warn before emptying box.

3. The next time you choose Empty Trash from the Special menu, the following dialog will appear (the cursor will appear as a checkmark). Items with a small trash can next to their name will be deleted.



4. To preserve an item, click to remove the trash can next to its name. Click OK to empty the trash and delete the items you have selected.

Notification Options tab



Notification options

- To see a report when Speed Doubler 2 uses Smart Replace to replace files, click Report Smart Replaced Files.
- To see a report for copied items, click Report Copied Items.
- To have Speed Doubler 2 play a sound when copying is done, click Play Sound When Copies are Complete. Select the sound from the menu. You can also choose to have Speed Doubler 2 play a sound when copies take longer than the interval you set in the And Copies Take Longer Than box.

Verification options

Select whether you wish Speed Doubler 2 to verify copies made to floppy drives, hard drives, or removable drives. By default, the Finder only verifies data that it copies to floppy drives. We recommend that you do not turn this feature off in Speed Doubler 2. You can also activate verification for your hard drive and for removable drives. You may choose any or all of these verification options.

5 FREQUENTLY ASKED QUESTIONS

Q *On my Power Mac, I'm not seeing much performance improvement. How do I get the most out of Speed Doubler 2's emulation?*

A Speed Doubler 2 provides the largest performance improvement for non-native software running on a Power Mac. Aspects of non-native software that are processor intensive, such as calculations and renderings, will receive the most noticeable improvement. Some examples of processor intensive functions include: a Summary Calculation in FileMaker Pro, a recalculation in Excel 4.0 (non-native), a scroll in Word 5.1 (non-native).

Q *How do I get the most disk access performance with Speed Doubler 2?*

A Try increasing the amount of memory allocated to the disk cache if you have extra memory available. Speed Doubler 2 speeds access time by caching frequently used data in RAM. With more RAM available for the cache, Speed Doubler 2 can store more data in RAM and 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 Doubler 2's emulator benefit floating point math intensive functions?*

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

Q *I use CD-ROM caching software. Will this affect Speed Doubler 2?*

A Yes. You should disable one or the other, if you do not have enough RAM available. The advantage of Speed Doubler 2 is that it has a wider benefit, including CD-ROM performance.

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 time to complete or are an important part of your work and time each function. As you make improvements to your system (like installing Speed Doubler 2!), use the timed functions to gauge each improvement. Another method is to use a benchmark utility. These utilities use standardized tests specific for different aspects of performance,

such as math, disk, processor and video. Some benchmark utilities are posted on commercial on-line services: Speedometer™ 4.0–shareware by Scott Berfield (sberfield@aol.com), Symantec Norton Utilities System Info, and MacBench™ 3.0 by Ziff-Davis Publishing Company L.P. (CompuServe: GO ZDBENCH).

Q *How are native applications affected by Speed Doubler 2?*

A Even in native applications, non-native system instructions are frequently used, such as File Manager when saving a file. All non-native instructions receive the double speed benefit of Speed Emulator. Disk intensive activities in native applications, such as saving a large file or sorting a database, are faster with Speed Doubler 2.

Q *Is Speed Doubler 2 compatible with clock chip upgrades? Or will it make my Mac run hotter or void my Apple warranty in any way?*

A Speed Doubler 2 works with any clock chip accelerator and provides improvements that no accelerator can—making it a great complement to any accelerator upgrade. Speed Doubler 2 does not alter your hardware in any fashion.

Q *I have a new Power Mac 9500/8500/7500/7200 that has Apple's new, faster emulator built-in. Is Speed Emulator compatible and faster?*

A Speed Doubler 2's emulation is faster than the new Power Mac emulator by 30% to 100%, depending upon the function. Speed Doubler 2's emulator automatically overrides the new emulator, so there are no adjustments necessary.

Q *Is Speed Doubler 2 compatible with Connectix RAM Doubler?*

A Absolutely! Speed Doubler 2 complements RAM Doubler perfectly. Use both to increase your productivity and performance! In addition, Speed Doubler 2 is compatible with the full range of Macintosh application software.

Q *My hard drive formatting software has disk caching. Should I turn other disk caching software off if I use Speed Doubler 2?*

A Yes. Speed Doubler 2 supersedes all other hard disk caching software, so you should disable other caching software or use its smallest setting. There are no compatibility issues, but an extra layer of disk caching is likely to degrade performance rather than improve it.

Q *Is Speed Doubler 2 compatible with the Level 2 cache on my Power Mac?*

A Speed Doubler 2 is fully compatible with any Level 2 cache. A Level 2 cache is a Processor cache; any instructions sent to the main CPU (Power PC) are stored in this ultra fast cache in case they are requested again. Having a Level 2 cache increases PowerMac performance between 10% and 30%, and also benefits Speed Doubler 2 because it benefits your entire Mac. Speed Doubler 2 has an intelligent Disk cache, storing frequently used information in RAM to minimize hard drive access. This complements any Level 2 cache.

6 SUPPORT AND SALES

In the unlikely event that you have a problem with Connectix Speed Doubler 2, please read this section first.

Contacting Connectix Support

If you have questions or problems with Connectix Speed Doubler 2, contact us by telephone, by fax, or through electronic mail. But first, try the following:

1. Read this manual. It may only take a few moments to get the answers you need. Also, check the "ReadMe" file. This has 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
- Software version number — in the Speed Doubler 2 control panel
- Amount of physical RAM installed — located in "About This Macintosh…"
- Cache setting — in the Memory control panel.
- Macintosh model — located in "About This Macintosh…"
- Apple System software version — in "About This Macintosh…"

If you have an electronic mail address, you can subscribe to the Speed Double 2 List Server to receive electronic mail with the current information about Speed Doubler 2, which includes automatic notification of new updaters.

To subscribe, either send mail to majordomo@connectix.com with “subscribe speed-doubler list” in the body of the message or subscribe on the web at http://www.connectix.com/mail.speed.html

Connectix Technical Support can be contacted at the following on-line services:

On-line Service	Mail Address	Forum Location
■ America OnLine	Connectix	Keyword = Connectix
■ CompuServe	75300, 1546	Go CONNECTIX

You can also contact us on the World Wide Web, or by e-mail, fax, or phone:

- WWW: http://www.connectix.com
- E-mail: sdsupp@connectix.com
- Fax: 415-571-5195
- Phone: 415-571-5100 or 800-839-3632

Contacting Connectix Sales

Contact Connectix Sales for more information about other Connectix products.

- Internet: sales@connectix.com
- Fax: 415-571-0850
- Fax-back system: 800-571-7558 (for current product information)
- Phone: 800-950-5880 or 415-571-5100 (Sales only)

Contacting Connectix Support in Europe

Country	Telephone Number
Germany	0130-823887 (toll-free)
France	0800-917943 (toll-free)
Britain	0800-966199 (toll-free)
Holland	20-5814384

For all other European countries, dial +31-20-5814385. This number is in Holland, however information will be provided in English.

European Addresses

Mailing: SEI, Attn: Connectix, Orlyplein 85, 1043 DS Amsterdam, The Netherlands

FAX: Fax questions to: +31-20 581 4380

Internet: For e-mail use the internet address: CONNECTX@NL.SYKES.COM

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