

System **Commander®**

Version 8
User Manual



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Preface

To make it easier to install a new operating system (OS) on your PC, we have included as much information in this manual as is practical. Some of the information is of a technical nature, and we recommend that you read it carefully before you proceed.

This manual is organized into distinct chapters as follows:

Chapter 1 introduces you to System Commander 8.

Chapter 2 covers the quick installation.

Chapter 3 reviews hard drive and partitioning basics. It explains common terminology that might be unfamiliar to you.

Chapters 4 through 6 walk you through a typical OS installation using the OS Wizard. We also show you how to use the custom partitioning option for those times when you may need to make minor adjustments to your partitions.

Chapter 7 is a detailed explanation of the selection menu, and various settings and options available.

Chapter 8 examines the various utilities included with System Commander.

Chapter 9 covers some of the most frequently asked questions. Chapter 10 contains detailed troubleshooting assistance. Chapter 11 deals with recovery from various OS problems. Chapter 12 explains the limitations of different operating systems.

Chapters 13 covers Partition Commander® and Chapter 14 explains Manual Partitioning.

Six appendices provide more technical information on System Commander:

Appendix A lists System Commander specifications, files, upgrade procedures and features. Appendices B and C, cover typical System Commander applications and additional considerations. Appendix D contains information on products from other companies, which work well with or require special handling when using System Commander. Appendix E is an in-depth explanation of some specific OS commands. Appendix F assists with contacting Technical Support and obtaining a Master Password.

In each chapter there are technical highlights and tips. And, of course, some contain warnings and troubleshooting tips that may help you solve an unforeseen problem. In addition, there is a detailed index to point you to the location of whatever topic you wish.

VCOM System Commander 8

The organization of the chapters makes finding information easier for you, and we hope the information contained in this manual will make it easier for you to accomplish your objective by using System Commander.

For additional information:

- The **Online Help** system (press F1) has detailed information on all aspects of the software.
- See the expanding collection of **How To** hints on the Frequently Asked Questions page of the VCOM website at:

http://www.v-com.com/support/intro_SystemCommander.html

Conventions and Icons used in this manual

Step by step instructions follow almost every process or procedure. These steps are noted by their order numerically.

Keystroke commands are noted in **bold** letters. Command key combinations are separated by the "-". This indicates that the noted keys are to be pressed simultaneously. For example, **Alt-S** signifies that you should hold down the **Alt** key while pressing the **S** key.

Bold lower case letters indicates OS commands and command lines. As in, "**copy *.***".

Besides icons noting specific operating systems throughout this manual, the following are used to indicate specific types of information. The applicable information follows each icon in indented paragraph format as shown below:



This icon is used identify important information and tips.



Warning information following this icon may help you avoid a problem.

Latest OS Information/System Commander Versions

Please check our website for the latest information on an OS you plan to install. Our website also provides free minor upgrades to System Commander. The website address is: http://www.v-com.com/support/intro_SystemCommander.html

A Note on Beta OSes

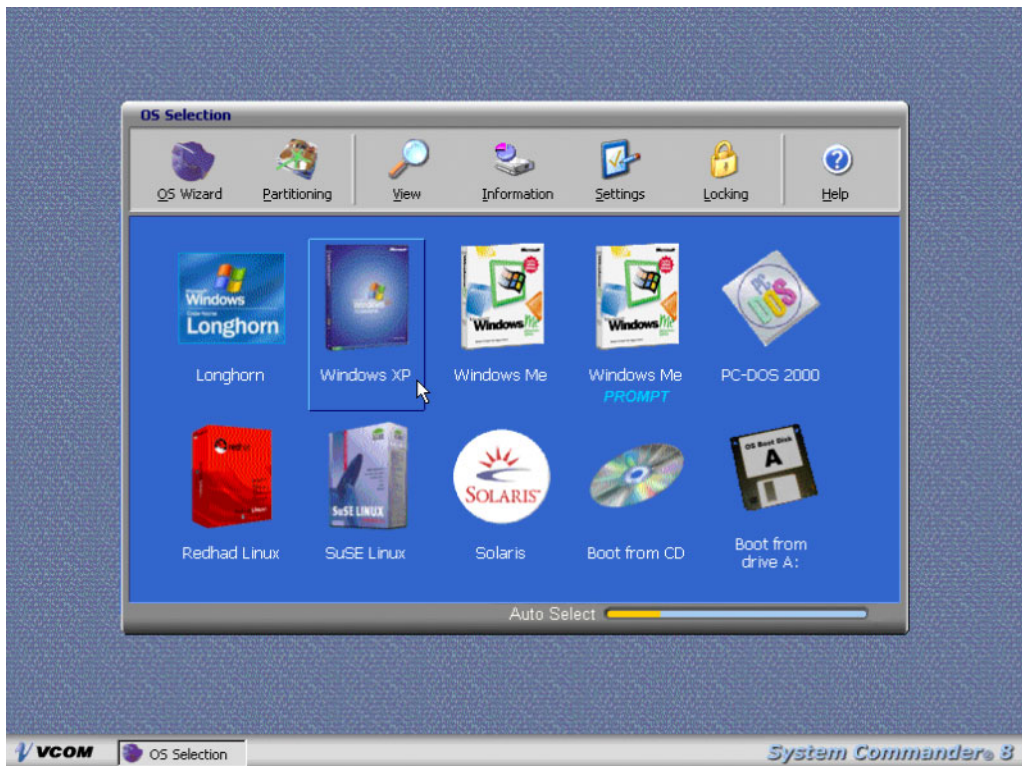
We make every effort to provide support under System Commander for each new release of every operating system, including *beta* releases. There is sometimes a difference in time to market for our product and a *beta* release of a new OS. It is for this reason that it is not always possible to have built-in support for some *betas* under System Commander. If you encounter any problems using a *beta* release of any operating system, we will try our best to provide technical support. We make every effort to incorporate new OSes and *betas* into our product as quickly as possible.

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1: Introduction

Welcome to System Commander

System Commander 8 allows you easy access to multiple operating systems on a single PC. Before any operating system starts, a menu of selections will appear, like the menu shown below.



Simply select the operating system you want, and System Commander takes care of the rest! This makes the migration to a new operating system much easier and less risky, by allowing you to keep your current reliable operating system. It's also easier to evaluate new operating systems such as Windows 2003, Linux, or even beta test versions of new operating systems that may not be stable, such as Longhorn.

Features

System Commander provides a number of unique capabilities:

- OS Wizard determines the best configuration for a new OS and prepares your system for the new OS.
- Management of over 100 different operating systems in primary and logical partitions, the ability to boot from CDs, floppy drives A and B, or through specific master boot records.
- Management of up to 32 different FAT/FAT32 compatible operating systems in a single primary partition, including different DOS versions, Windows 95/98/Me, Windows NT/2000/XP/2003, and OS/2.
- Optional security protection against unauthorized system use prevents hard disk access and booting from floppy disks.
- Automatically saves and maintains system files and critical configuration files for each OS such as CONFIG.SYS, AUTOEXEC.BAT, BOOT.INI, and others.
- Boot sector virus protection checks for infections on every boot with instant replacement of the infected boot sector and system files.

Technical Highlights

- Fully compatible with all Windows including 95/98/Me/NT/2000/XP/2003 and Longhorn, OS/2, Linux, PC UNIXes, NetWare and most other 80x86 compatible OSes.
- Compatible with all DOS types including MS-DOS, PC-DOS, DR-DOS and Open DOS.
- Menu selections offered before any operating system runs.
- After an operating system is selected, System Commander uses no resident memory.
- Makes install and reinstall simple and quick.
- OSes always run at full speed without any performance degradation.

What's New!

System Commander 8 adds a number of new features beyond prior versions. A few of these new features include:

- Selection for booting CDs (requires BIOS support)
- Automatic detection and identification for Windows 2003 and Longhorn
- OS Wizard improvements, including support for Windows 2003 & Longhorn
- Multiple GUIs included with installation
- Improved Check MBR feature to automatically recover from damaged MBR
- Improved auto-hide to protect older Windows versions from being corrupted by new Windows XP/2003
- New Windows "Scout" diagnostics
- Improved installation and updated console
- Improved display speed at boot-time
- SC's boot CD provides a menu selection of options with access to utilities and partitioning
- Dynamic disk booting and ability to install into most single drive dynamic disks

In addition, System Commander 8 includes a fully integrated Partition Commander 8, with the following new features:

- Safely resize Linux Ext3 and ReiserFS partitions
- Safely resize NTFS partitions used in Windows XP and Windows 2003
- Convert FAT to NTFS without Windows (for safety and stability)
- Improved PC Wizard
- Support for resize of huge drives, 200+ GB
- Convert NTFS Dynamic disk to basic NTFS
- Resize clusters in NTFS
- BootFixer™ to automatically correct problems in XP's boot.ini
- Edit volume labels

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2: Quick Installation

The System Commander installation will not affect any OSes you currently have installed. Upon the completion of the installation, your installed OSes will automatically appear on the System Commander OS selection menu. You will also have direct access to Partition Commander. It's that simple!

Basic Installation Requirements

- CD-ROM Drive (not needed for electronic download)
- Either Windows 95/98/Me/NT/2000/XP/2003/Longhorn or DOS installed, or a boot diskette from one of these OSes with access to the CD-ROM drive.
- 20 MB of unused disk space for installation (less for Windows 9x/Me or DOS).
- Partitioning operations requires 32 MB RAM while running. For some operations, such as resize or conversion of very large partitions, significant additional RAM may be necessary.
- If you do not have Windows or DOS installed, then you must have a primary FAT partition on the first drive below 8 GB or a primary FAT32 partition anywhere on the drive.
- Have two 1.44 MB diskettes ready to make the optional utility and restart diskettes. For systems without diskette drives, the System Commander CD is bootable and can be used for directly running Partition Commander and its restart feature, or you can create a bootable CD from the included ISO image.



System Commander will not install to a system that is using a drive overlay such as EZ-Drive or EZ-Bios (both are rarely seen in any system made after 1996) or systems that have GoBack installed. See page 136 for more on GoBack.

Where to Install System Commander

System Commander can install from Windows or DOS, or even a boot diskette with no OSes installed on a system. When you install from Windows 9x/Me or DOS, you will be able to install selected OSes into this same partition using our MultiFAT feature. MultiFAT also allows you to have a prompt choice for Windows 9x/Me, when installed in the same partition as System Commander.



When installing from Windows NT/2000/XP/2003/Longhorn, the MultiFAT feature is not applicable and will not be available.

Whether MultiFAT is available or not, System Commander always supports your ability to have multiple OSes in separate partitions.

Installation

Installing from Windows

Insert the System Commander 8 CD into your CD-ROM drive. In most situations Windows will automatically detect and run the installation.

In the event the installation does not automatically start, run setup from the CD-ROM install directory. To do this, Click on **Start**, **Run**, and enter the drive letter of the CD drive, followed by **install\setup**. Click on OK. The installation will begin.

Installing from DOS

Insert the System Commander 8 CD into your CD-ROM drive. At the prompt, enter the drive letter of the CD drive, followed by **install\scin install** and press Enter. For example, if drive D is the CD drive, enter (in bold): **C:\> d:\install\scin install**

Installing from a boot diskette

You will need a Windows 95/98/Me or DOS boot diskette that has support for your CD-ROM device. Insert the boot diskette into drive A. Restart the system (Shutdown/Restart in Windows or **Ctrl-Alt-Del**) and boot from the diskette. When prompted, select "Boot with CDROM support".

Insert the System Commander 8 CD into your CD-ROM drive. At the prompt, enter the drive letter assigned to the CD drive, followed by **\install\setup** and press Enter. For example, if drive D is the CD drive, enter (in bold):

```
C:\> d:\install\setup
```

Completing the Installation (All Methods)

Once System Commander is installed, you may reboot the system. It will save all of your existing system information. Then you will be presented with a menu of operating system choices. If you wish to change the descriptions, the order in which they appear or other functions, press **Alt-S** for the Settings menu. These options are explained in more detail in Chapter 7.



Keep the System Commander diskettes in a safe place. The utility diskette contains duplicate backup data that may be needed if you later wish to remove System Commander from your system without using the Windows uninstaller. It also holds key disk information to recover from some disk corruption and/or viruses.

Disk Compression Users

System Commander must be installed on a non-compressed drive. It is fully compatible with disk compression on other partitions. We recommend that each new OS be added in its own separate partition.

For installation under Windows NT/2000/XP/2003/Longhorn in NTFS file system, System Commander will install the boot portion in a non-compressed area. No special actions are necessary.

You could have problems with disk compression if you place more than one OS in the same partition, because disk compression software operates differently depending on the OS version and manufacturer. Switching OS versions beneath it might cause problems and may even corrupt the disk. This should be thoroughly tested before assuming all is fine. Some products, like Microsoft's DoubleSpace/DoubleDisk will only work on a single version of DOS or Windows.

At some point you will reboot after the System Commander installation is completed. If you get a "Boot #" message, it often indicates the drive was compressed. See the section "System Fails to Boot Up," under Chapter 10: Troubleshooting, for solutions.

Uninstalling System Commander

System Commander includes a special uninstaller to remove itself from your system, without changing your current partitioning layout. If you wish to only disable System Commander, see the next section. Disable will remove System Commander from the boot up process without affecting System Commander's settings.

You can only uninstall from the OS you originally installed System Commander to.

To uninstall from Windows

Select **Start, Settings, Control Panel** and click on the **Add-Remove programs** icon. Select System Commander 8 in the applications list and select **Remove**.

To uninstall from DOS or a boot diskette (for non-Windows installs)

- 1) At the prompt run SCIN using the drive and path of where it is located. For example: **C:\SC\SCIN**
- 2) At the SCIN main menu, select **Disable/Remove**
- 3) Next select **Remove** to restore the original MBR (without changing your current partitioning) and delete the System Commander files.

Disabling System Commander

You can disable System Commander from the boot up process. This is useful if you no longer want to boot multiple OSes, or if you would like to confirm an OS problem has nothing to do with System Commander. If, at a later time, you wish to reactivate System Commander, use the same process, but select Enable instead of Disable. An Enable will restore all of your OS selections and options.

To disable from Windows

Select Start, Programs, System Commander, and then Console. The Utility Wizard dialog appears. Select Disable/Uninstall System Commander and click on Next. Select Temporarily disable System Commander and click next.

To disable from DOS or a System Commander boot CD/diskette

- 1) At the prompt run SCIN using the drive and path of where it is located. For example: **C:\SC\SCIN**
- 2) At the SCIN main menu, select Disable/Remove.
- 3) Select Disable to restore the original MBR (without changing your current partitioning).

Updates

Periodically VCOM may make minor updates available to System Commander. To check if a new update is available, establish an Internet connection, and go to:

http://www.v-com.com/support/intro_System_Commander.html

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3: Hard Drive and Partitioning Basics

System Commander gives you several powerful tools for partitioning your hard drive. This section provides technical background information about hard drives and partitioning fundamentals that will help you fully understand the features offered by System Commander.

What is a partition?

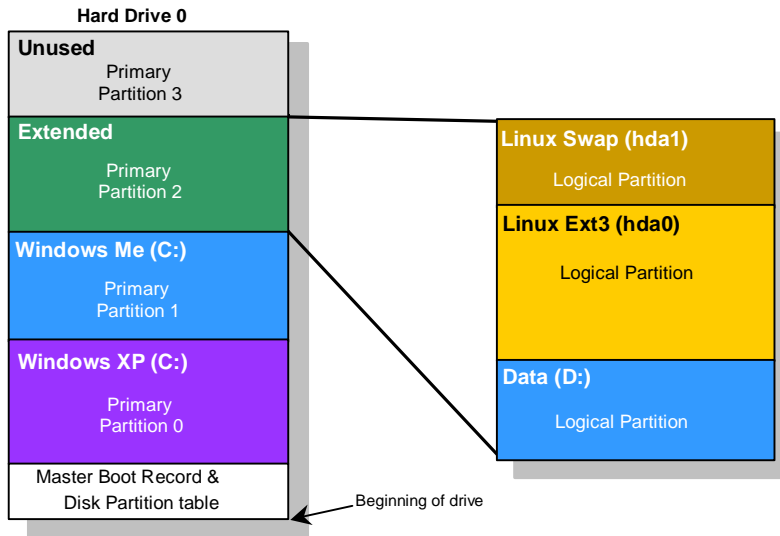
A partition is a basic container for data on your hard drive. Although most hard drives have only one partition, System Commander allows you to divide up a hard drive into several distinct partitions. Each partition occupies a physically separate area of the hard drive and functions almost as if it were an independent hard drive. Because of this, a partition can be given its own name, or *label*, can contain its own operating system and file system, or can simply operate as an additional area for better organization of your files. In Windows, partitions are assigned drive letters such as C, D, E, etc.

Types of Partitions - Partition Terminology

Primary partitions - A hard drive can be divided up into a maximum of four *primary partitions*. The first partition on a hard drive is numbered Partition 0; subsequent primary partitions are Partitions 1, 2, and 3.

Extended and Logical Partitions - In order to provide more than four partitions, a primary partition can be designated as an extended partition. An extended partition can be subdivided into several more sections known as logical partitions. Figure 3-1 shows a partitioning configuration using logical partitions to contain different operating systems.

Figure 3-1. Example of Windows and Linux OSes on a drive



Bootable Partitions

Some partitions can be made bootable, which means that an operating system can be started from that partition. A bootable partition is also known as an *active* partition. A non-bootable partition cannot initialize an operating system. The ability for a partition to be bootable is controlled by the operating system. For example Windows only allows a primary partition to be bootable and will not allow a logical partition to be bootable. In contrast, other operating systems, like Linux, can be installed to allow a logical partition to be bootable.

In order to start up, every PC must contain at least one bootable partition. For example a new Windows system will normally use the first active primary partition (Partition 0) of the first hard drive in the computer (Drive 0). It will be assigned the drive letter C. To run more than one operating system on your PC you will typically want to configure a separate bootable partition for each OS. Partitioning and booting characteristics of several operating systems are discussed in more detail in Appendix C: OS and Product Limitations.

Disk Formatting and Partitions

To understand partitioning and the benefits offered by System Commander, it's helpful to comprehend the structure of a typical hard drive and the formatting process.

Hard Drive Mechanics

A hard drive consists of stacked metallic disks, or platters, that rotate together on a spindle. Read/write heads (one for each side of a platter) are mounted on arms that allow them to move in and out quickly and accurately to reach any part of the surface of each disk. These heads record and read the magnetic charges that represent your data.

For a new hard drive mechanism to become usable it must go through three processes:

- 1) Physical formatting
- 2) Partitioning
- 3) Logical formatting



Warning! Formatting can destroy all data on the drive!

Physical Formatting

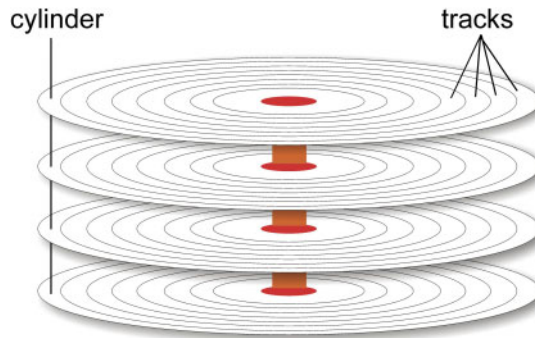
The first stage of formatting is physical, or *low-level formatting*. The hard drive manufacturer performs this operation in their factory. This process creates a magnetic structure on the hard drive platters that allows data to be accurately written and retrieved. Figure 3-2 shows the elements resulting from the physical formatting procedure: tracks, sectors, and cylinders.

Sectors - A sector is the smallest part of the drive that can be addressed. Each sector can hold a defined amount of data, typically 512 bytes (1/2 KB).

Tracks - Tracks are concentric rings onto which data can be written. Each track has a number of sectors. Every disk surface on one drive has the same number of tracks, starting with track 0.

Cylinders - A cylinder consists of all the same-numbered tracks on all platters in the hard drive. For example, in a hard drive that has four platters, there will be eight tracks numbered track 0 (one track 0 on the top surface, and one on the bottom surface of each platter). All of these track 0s form a cylinder 0. Drives today have thousands of cylinders.

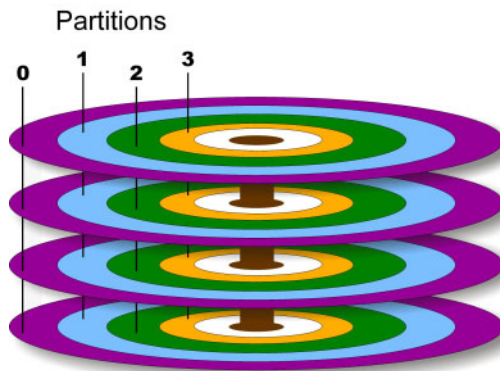
Figure 3-2: Physical Formatting



Partitioning

Following the low-level physical formatting by the drive manufacturer, the hard drive can be divided into one or more partitions. Each partition is assigned a set of contiguous cylinders, so that each partition corresponds to a separate physical area of the hard drive. Figure 3-3 is a simplified drawing of a drive with four partitions.

Figure 3-3: Drive With Four Partitions



The partition process is typically done the first time by the operating system's limited partitioning utility, such as Disk Administrator in Windows XP. Of course System Commander provides a more advanced, safer, and easier set of partitioning functions for adding, deleting, and adjusting partitions on your hard drive.

Logical Formatting

Following partitioning, the disk is given a file structure that allows the disk and the operating system to exchange data. This process is part of logical formatting, and is performed by the operating system software's Format program. System Commander automatically formats Windows, Linux and DOS partitions when you create a new partition. After this, the operating system can be loaded by means of the operating system's installation utility.

Once a partition has been formatted, it is known as a *volume*. When using Windows or DOS operating systems, each partition can correspond to a drive letter, starting with drive C. Each volume (partition) can also be given a name, or *label* that will help you remember what is in that partition.

Linux does not use drive letters, but assigns each volume a name, such as HDA0, HDA1, etc.

Characteristics of File Systems

When partitioning a hard drive, there are three important considerations regarding file systems:

- 1) Compatibility with operating systems
- 2) Maximum partition and cluster size
- 3) Saving space on the hard drive

Note: System Commander automatically takes these constraints into account, and provides graphical displays of these factors so that you don't have to worry about them.

OS and File System Compatibility

Each operating system is designed to function with a particular file system, which is known as its *native file system*. Although some operating systems are compatible with multiple file systems, some are compatible with only one type of file system. Common file systems and OS system compatibility are summarized below and in Table 3-1.

File Allocation Table (FAT) - FAT is the native file system for DOS and Windows. For very small partitions under 32 MB, a version known as FAT12 is used, while larger sizes require FAT16. Although FAT12 uses 12 bits to record drive address, and

VCOM System Commander 8

FAT16 uses a 16-bit drive address. They are very similar file systems and both are generically referred to as FAT.

Virtual FAT (VFAT) - VFAT is a type of FAT file system for Windows 95 and later that supports long filenames. From a partitioning point of view, VFAT and FAT are identical, and System Commander displays them all as FAT partitions.

FAT32 - FAT32 supports 32-bit file records to allow a partition size beyond 2 GB. It can also help reduce wasted space on hard drives.



The FAT32 file system can only be seen by Windows 95 OSR2 and later. Other OSes such as DOS, Windows NT, and the first version of Windows 95 will not see FAT32 partitions. You should also avoid a FAT conversion if your drive is using disk compression, since the compression software may not understand FAT32.

High Performance File System (HPFS) - OS/2 uses HPFS as its native file system. OS/2 also is compatible with FAT. Older versions of NT are also compatible with HPFS.

NT File System (NTFS) - NTFS is the native file system for Windows NT, 2000, XP, 2003 and Longhorn. Windows 95/98/Me, DOS and most other OSes cannot see NTFS file systems. There are also several versions of NTFS, such that Windows NT cannot understand the newer versions of NTFS.

Ext2, Ext3 - Linux file systems. The Ext3 is an enhancement of the older Ext2 file system. Ext3 is a journaling file system, which is much faster for consistency checks than Ext2.

ReiserFS - Another popular Linux journaling file system.

UFS - This is the Unix File System.

Table 3-1: Common OS and File System Compatibility

Operating System	File System
DOS and Windows 3.x	FAT
Windows 95	FAT
Windows 95 OSR2, 98, Me	FAT, FAT32
Windows NT v3 and older	FAT, HPFS, NTFS
Windows NT v4	FAT, NTFS
Windows 2000, XP, 2003, Longhorn	FAT, FAT32, NTFS
Linux (depends on version)	Ext2, Ext3, ReiserFS, Swap
OS/2	FAT, HPFS
Solaris	UFS, NFS, VxFS, QFS, FAT

OS and Partition Size Limitations

The operating system and related file system support different maximum partition sizes. The table below shows how each version of DOS and Windows has increased the maximum partition size.

Table 3-2: OS and Partition Size Limitations

Operating System	File System	Maximum Partition Size
DOS 2.1 and older	FAT12	15 MB
DOS 3.x	FAT12 FAT16	15 MB 16 - 32 MB
DOS 4.0 and higher	FAT16	2 GB
Windows (all)	FAT16	2 GB
Windows 95 OSR2, 98, Me	FAT32	1000+ GB*
Windows NT	HPFS NTFS	8 GB 1000+ GB*
Windows 2000/XP/2003, Longhorn	FAT32 NTFS	1000+ GB* 1000+ GB*

* To access beyond 137 GB requires hardware and BIOS support

Without System Commander, existing disk partitions cannot be changed without deleting the data within the partition. In contrast, Partition Wizard allows you to flexibly resize a partition within its minimum and maximum limits as well as easily move free space from one partition to another.

As drive sizes have grown the operating system, the BIOS and computer hardware have also required changes. For example, IDE drives over 137 GB in size require new

computer hardware and BIOS to work past this limit. These only became available in 2002. System Commander supports large drives (beyond 137 GB) when the computer hardware also supports such drives. Without such support, the disk will be limited to the first 137 GB, and the remainder of the disk will be inaccessible to the system.

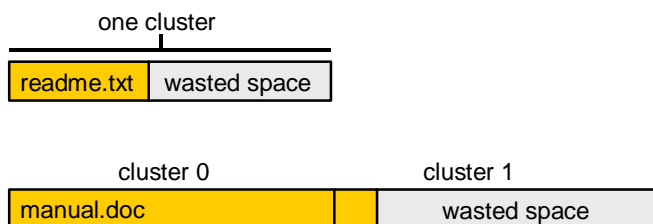
Partition Size and Saving Space

An unfortunate by product of large partitions is the space they waste on your hard drive. System Commander offers you two solutions:

Solution 1: Optimize Partition Size

To better understand this remedy, let's focus on how FAT partitions waste space. FAT file systems divide partitions into groups of sectors called *clusters*. A cluster is the minimum unit that can be used for saving data and more than one file cannot be associated with a cluster. This means that if you save even a very tiny file, it will be allocated an entire cluster, leaving a portion of the cluster unused. A similar situation often occurs when saving files that are larger than a cluster. The last part of the file will require an entire cluster, even if most of the cluster is left empty. Figure 3-4 illustrates this situation.

Figure 3-4: Wasted Space in Clusters



This problem gets worse as partition sizes get larger, as is typical with large hard drives. The reason is that FAT allows a maximum of only 65,536 clusters in a partition. Therefore, as the partition size increases, so does the necessary size of a cluster. For example, a 127 MB partition requires a cluster size of 2 KB, but in a 2 GB partition, the cluster size is 32 KB. This difference has a big effect on file storage efficiency. Saving a small file such as a 500-byte *readme.txt* file wastes about 1.5 KB in a 127 MB partition, and wastes 31.5 KB in a 2 GB partition. With a random distribution of file lengths in a FAT partition, every file saved will waste about 1/2 of a cluster. Simply reducing cluster size and partition size by dividing a hard drive into multiple partitions can help recover a lot of wasted space. As an overview, the table below shows possible waste as related to partition size.

Table 3-3: Possible Waste vs. Partition Size Using FAT16

Partition Size	Size of Cluster	Average Waste per file	Number of files	Average Waste
Up to 128 MB	2K	1K	2,000	2 MB
128 - 256 MB	4K	2K	4,000	8 MB
256 - 512 MB	8K	4K	8,000	32 MB
512 MB - 1 GB	16K	8K	16,000	128 MB
1 GB - 2 GB	32K	16K	32,000	512 MB

Cluster Optimization and Partitioning

The optimum situation occurs when the file sizes in a partition fit efficiently into clusters. For example, large graphic files may fit quite efficiently into a large partition having large clusters. Partition Wizard analyzes your files and suggests the optimum partitioning scheme and cluster size for them.



Optimizing to a very small cluster size may prevent some Windows utilities such as Scandisk and Defrag from running.

Solution 2: Convert from FAT16 to FAT32

If you are running any Windows after the first Windows 95, System Commander allows you the option of saving file space by converting your FAT partitions to FAT32 partitions. Because FAT32 uses 32 bits for recording file drive addresses, it can more efficiently locate the beginnings and endings of files, and allows a smaller cluster size than FAT allows. For example, in a 2 GB partition, FAT uses a 32 KB cluster size. In contrast, FAT32 specifies only a 4 KB cluster size for partitions up to 8 GB. As a result, the FAT32 file system is much more efficient than FAT16 and changing over immediately results in recovered usable disk space. System Commander automatically checks whether you are running a FAT32 compatible Windows that can take advantage of FAT32.

Which Partition Type is Best for Me?

This section will help guide you to the best choice for some of the major OSES you may be using. There is no absolute right or wrong type, but as you can see from earlier in this chapter, you can save space and improve performance with the right choice. Table 3-4 outlines some of the considerations in selection your partition type.

Table 3-4: Windows and File Systems

Windows	File System	Benefits	Disadvantages
95, 98, Me	FAT	<ul style="list-style-type: none"> • Compatible with DOS 	<ul style="list-style-type: none"> • Limited to 2 GB max
95B, 98, Me	FAT32	<ul style="list-style-type: none"> • No real size limits 	<ul style="list-style-type: none"> • DOS & NT cannot see it
NT, 2000, XP, 2003	FAT	<ul style="list-style-type: none"> • Compatible with DOS 	<ul style="list-style-type: none"> • Limited to 2 GB max
2000, XP, 2003	FAT32	<ul style="list-style-type: none"> • No real size limits 	<ul style="list-style-type: none"> • DOS & NT cannot see it
NT, 2000, XP, 2003, Longhorn	NTFS	<ul style="list-style-type: none"> • No real size limits • Higher Security • Improved stability 	<ul style="list-style-type: none"> • 95/98/Me/DOS cannot see it • More difficult to fix if problems occur • NT cannot see XP/2003 NTFS due to version differences

Dynamic Disk

Windows 2000/XP/2003 and Longhorn have the ability to use a new type of partition called a 'Dynamic Disk'. It is a physical disk that contains dynamic volumes created by using Windows 'Disk Management.' Dynamic disks do not use traditional partition tables like primary and logical drives and cannot be accessed by Windows 95/98/Me, Windows NT or DOS operating systems. Consult Microsoft's web site for more about Dynamic disks at www.microsoft.com.

Because dynamic disk does not use a traditional partition table, System Commander can be installed into, but will not resize dynamic disks. System Commander can convert a single drive dynamic disk back to a basic disk that has partitions understood by other OSES (a feature not available in Windows).

NTFS Volume Sets (Fault Tolerance)

Fault Tolerant or 'spanning' partitions combines areas of unallocated space from multiple disks into one logical volume, allowing you to more efficiently use all the space and all drive letters on a multiple-disk system.



You do not want to delete one of the partitions that are spanned. If one of the disks containing a spanned volume fails, the entire volume fails.

You will need to restore the volume back to basic disk in Disk Manager before re-partitioning the drive. Always back up data in a volume set before changing it back to basic.

Linux

Different Linux distributions may offer more than one choice, or require one specific file system. The most common types are shown in Table 3-6.

Table 3-6: Linux File Systems

Linux File System	Benefits	Disadvantages
Ext2	<ul style="list-style-type: none">• Optimized for small drives and small files	<ul style="list-style-type: none">• Older file system, now falling out of favor• Very slow consistency checks
Ext3	<ul style="list-style-type: none">• Journaling File System• Very fast consistency checks• Easy to move from Ext2	<ul style="list-style-type: none">• Journaling is a layer on top of Ext2 (could be a benefit)
ReiserFS	<ul style="list-style-type: none">• Journaling File System• Very fast consistency checks• Efficient for small files• Excellent choice for large partitions	<ul style="list-style-type: none">• Not recommended for partitions under 100 MB

RAIDs

Hardware-based RAID uses an intelligent drive controller and a redundant array of disk drives to protect against data loss in the event of media failure and to improve the performance of read/write operations.

Hardware-based RAID levels 1 through 5 automate redundancy and fault tolerance at the hardware level. All levels (0 through 5) incur no overhead on the system processor. Individual data files are typically spread across more than one disk. It is possible to implement a hardware-based RAID solution that provides your system with seamless, nonstop recovery from media failure.

Depending on the configuration, hardware-based RAID generally provides good performance. It also makes it much easier to manage multiple disks, allowing you to treat an array of disks as one disk. You may even be able to replace a failed drive without shutting down the system.

System Commander installation and the control of multiple OSES are compatible with Hardware RAIDs, but not software emulated RAIDs.

Level 0

This level is also known as disk striping because of its use of a disk file system called a stripe set. Data is divided into blocks and spread in a fixed order among all disks in an array. RAID 0 improves read/write performance by spreading operations across multiple disks, so that operations can be performed independently and simultaneously.

Level 1

This level is also known as disk mirroring because of its use of a disk file system called a mirror set. Disk mirroring provides a redundant, identical copy of a selected disk. All data written to the primary disk is written to the mirror disk. RAID 1 provides fault tolerance and generally improves read performance (but may degrade write performance).

To repartition a Level 1 RAID, you will first need to temporally 'break' the mirror. After the mirror has been 'broken', you can re-partition the drives. Both drives should be partitioned identically. Once partitioning of both drives is complete, you can re-enable the mirror.

Level 5

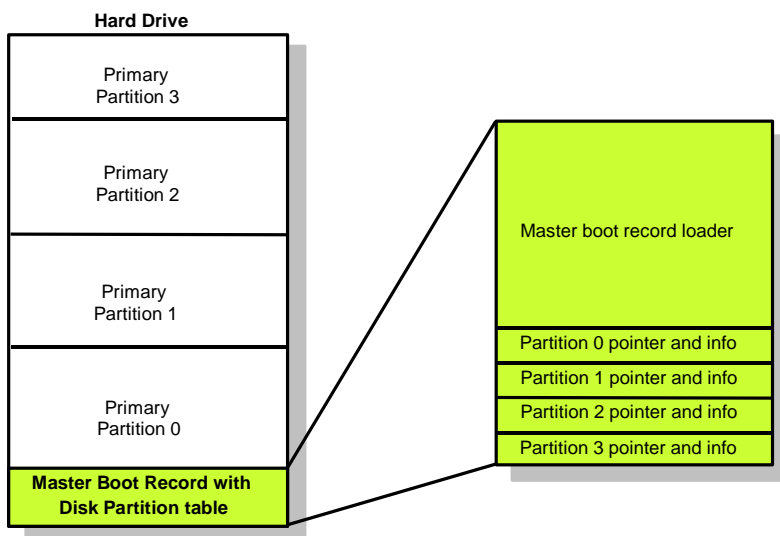
Also known as striping with parity, this level is the most popular strategy for new designs. RAID 5 stripes the data in large blocks across the disks in an array. It differs in that it writes the parity across all the disks. Data redundancy is provided by the parity information. The data and parity information are arranged on the disk array so that the two are always on different disks.

System Commander cannot repartition a Level 5 RAID because it is a combination of level 0 and 1 together. You cannot 'break' it without losing data.

Partitioning and Booting Information

The hard drive keeps track of its partitioning structure and its booting information on hard drive 0, the first hard drive in your system. Figure 3-5 shows a basic hard drive organization, including the Master Boot Record (MBR) and Disk Partition Table.

Figure 3-5. Master Boot Record and Partition Table



Master Boot Record (MBR)

The MBR is contained in the first sector of the hard disk. (Cylinder 0, Head 0, Sector 1) It specifies which operating system will start up the system. When System Commander is used to install multiple operating systems, it replaces the original boot record with its own MBR to control the boot process and allow you the choice of how to boot the system. The old MBR is automatically saved to provide an uninstall option.

Disk Partition Table

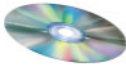
The Disk Partition Table is a hidden part of the hard drive that specifies how the hard drive is partitioned. Under Windows 95/98/Me, the FDISK utility can be used to view and change some partition information. Under Windows NT/2000/XP/2003 and Longhorn the Disk Administrator can also perform limited partitioning tasks.

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System Commander provides a much more flexible and easy-to-use set of tools for working with partitions. Unlike FDISK and Disk Administrator, System Commander allows automatic or manual partitioning, including resize, copy and move without the loss of data.

4: OS Wizard – Preparing for a New OS Installation

Before installing other operating systems, we recommend that you:



Back up your system! Extensive changes will be made to your hard disk as you add new operating systems or use this product.



Have a bootable CD or diskette for your current OS. The System Commander installation will offer to do this for you if you are running under Windows 95/98/Me or DOS. See Appendix D for instructions for other OSes.

Installing System Commander is very easy, and takes only a few minutes. Installing a new operating system can take a little longer, but that's controlled by the operating system. System Commander works with OSes that are installed prior to System Commander as well as OSes installed after System Commander.

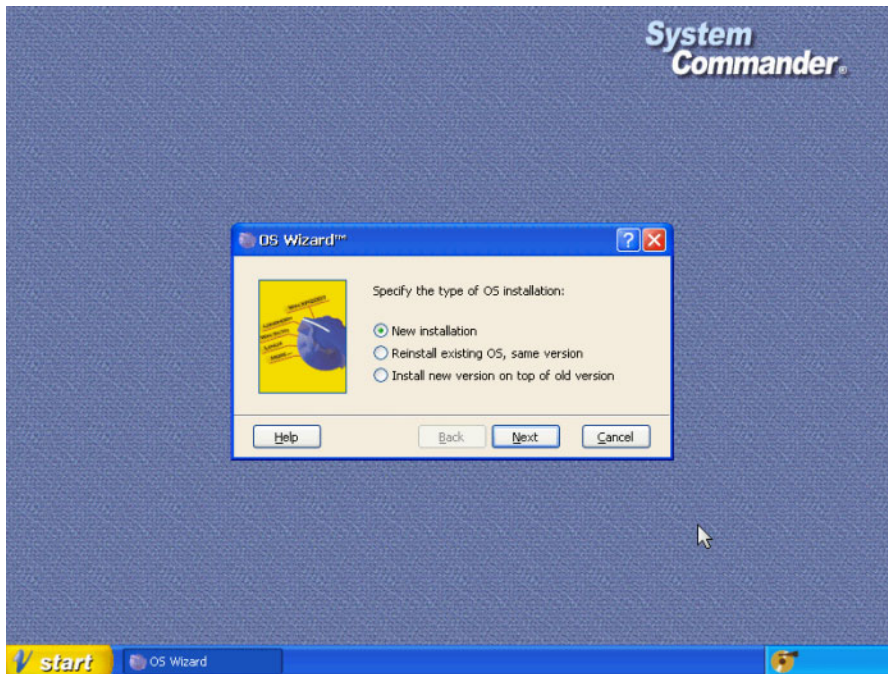
A Typical OS Wizard Session

It's time to actually use the OS Wizard to prepare your computer for a new operating system!

Restart your computer and wait for the System Commander OS Selection menu to appear. Once it appears, do not select an OS; rather press **Alt-O** to launch the OS Wizard.

When the OS Wizard launches, it first analyzes your system. During this analysis, it is determining how many hard drives you have, how each drive is set up and what OSes are installed.

Once this is complete, you will be presented with a series of dialog boxes that will ask you to make a selection and then press or click on the Next button to continue.



In a moment, we will walk you through the OS Wizard for both a Windows XP upgrade and a Linux installation.

You will notice a start button on the bottom of the menu. If you cancel the OS Wizard dialog, you can select other options from the start menu.

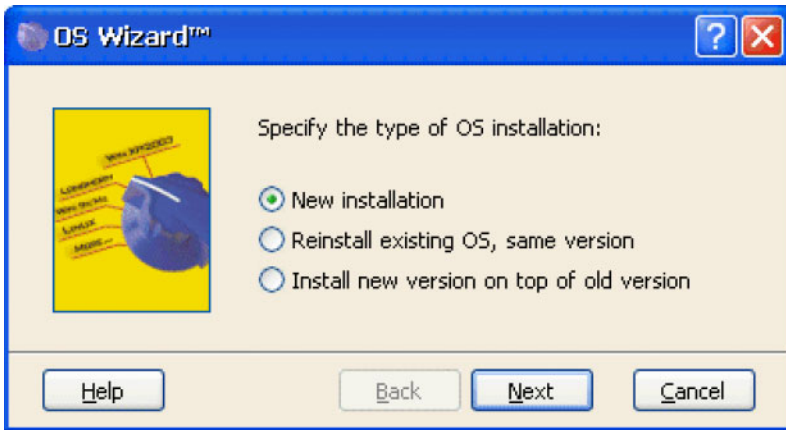
These appear as:



The start menu allows you to re-run the OS Wizard, undo operations with the Backstep Wizard, perform manual or automatic partitioning, change settings, view files, and get basic help. Other than the OS Wizard, each selection is described in detail in the following two chapters.

Using the OS Wizard to add Windows XP

With the first OS Wizard screen, you are asked three questions.



We will assume you are installing a new OS. Select the default option, *New Installation*, and press **Next**. Select the category of OS you wish to install:

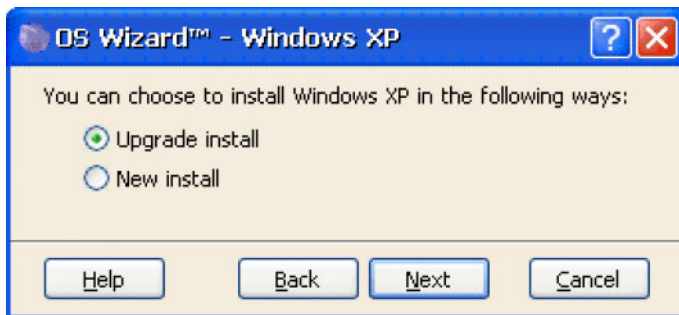


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For all Windows types, select the default option *Windows* and press **Next**.



Select Windows XP and press **Next**.



OS Wizard informs you that Windows XP is shipped in two different editions and it needs to know which edition you are installing. If you are not sure about a specific edition, click on the Help button for a complete explanation of each edition.

Let's assume you have an upgrade edition. Select *Upgrade* and press **Next**



You are given the choice of installing Windows XP together with your existing OSes or isolated by itself. When installing Windows XP on top of an existing Windows NT/2000 system, it will **OVERWRITE** the existing NT/2000 and you will no longer have it available as an OS choice.

Most users prefer to install each OS isolated by itself so all existing OSes will still be available. This also makes it very easy to remove the newly added OS at a later time using System Commander's Backstep Wizard.

Select *Isolated by itself* and press **Next**. At this point, OS Wizard takes all your choices and determines the best location and space needed to make room for the new OS. When a valid solution is found, the action plan is presented:



Typical Wrap up

If this plan is what you would like, press **Next** and the disk will be prepared for the new Windows XP installation. This may take a few minutes or longer depending on the space available and if any areas of the disk need to be copied, moved or resized.

Once the OS Wizard is finished, you will be presented with final instructions on how to begin the Windows XP installation.



These instructions are also in the OS Wizard QuickGuide manual. It's often handy to print these instructions in advance so you have them on hand during an OS installation. To do this from Windows, select **Start**, **Programs**, then **System Commander**. Cancel the wizard if it appears, and select from the top menu, **Help**, then **OS Wizard QuickGuide**.

Once you press **Ok** on the final instructions dialog, the OS Wizard will restart your computer so that you may start the Windows XP installation.

That's all there is to it! All the steps to prepare your system are performed for you automatically.

Size and Drive Overrides

On the Action plan screen, you have the option of changing the space, and depending on the OS you are installing and other factors, you may be able to change the drive used for the new OS. If you make any changes, OS Wizard will re-check that there is enough space on the selected drive for the OS.

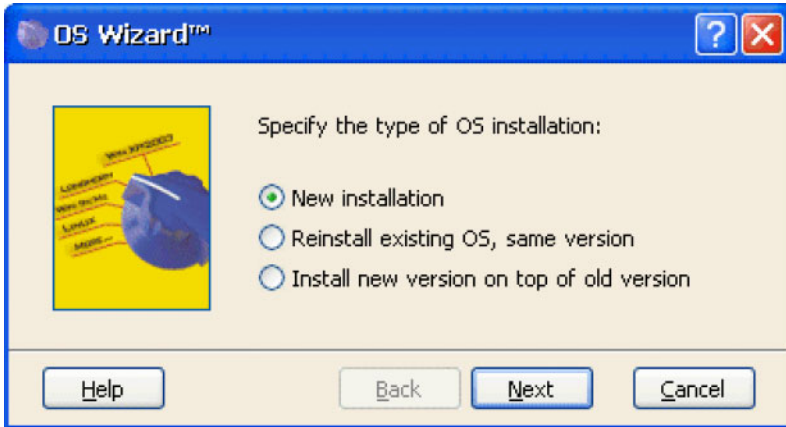
No Solutions

On some systems, OS Wizard's analysis may show that the new OS cannot be installed. The most common reason is not enough disk space. For example, the Windows XP requires over 1.5 GB of space to install. If OS Wizard is unable to obtain enough space for this, you will be notified that there is no solution.

If you are loading a number of OSes on the same system, the choices you selected and/or the OSes own internal restrictions may also prevent a solution.

Using the OS Wizard to add Linux

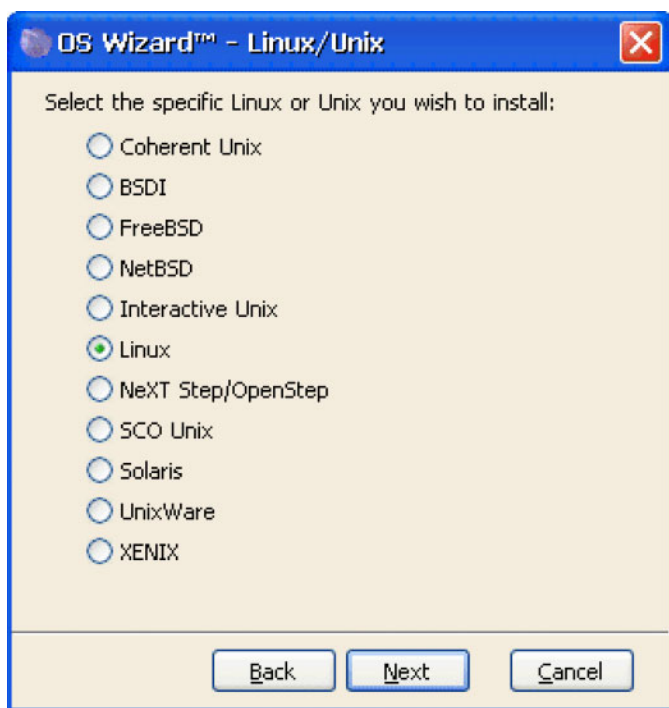
Like our prior example, with the first OS Wizard screen, you are asked three questions.



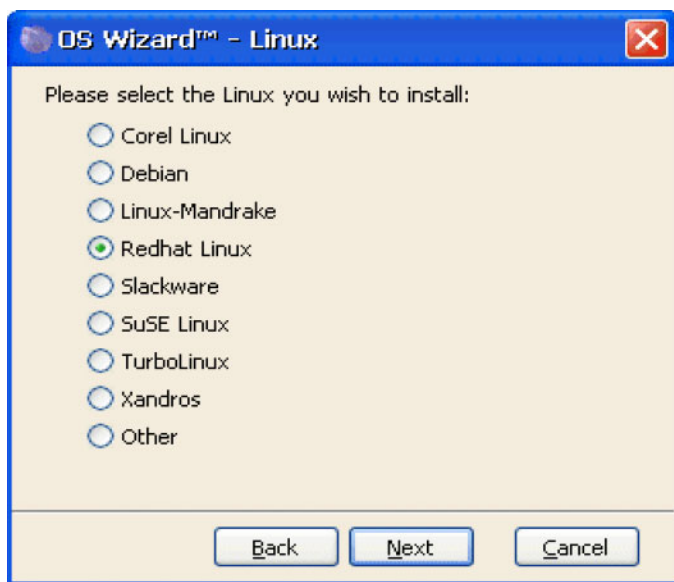
Select the default, *New Installation* option, and press **Next**. You can then select the category of the OS you wish to install:



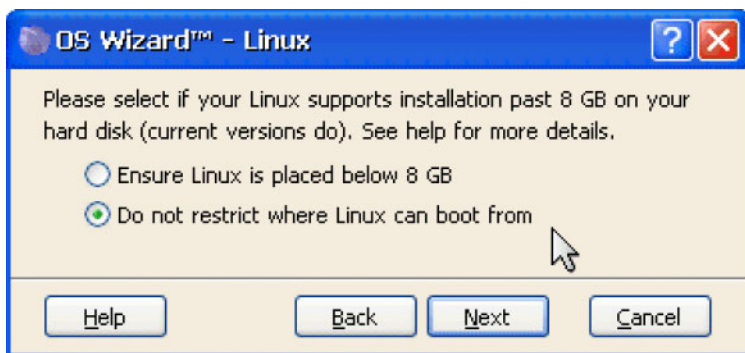
Select the *Linux/Unix* category and press **Next**.



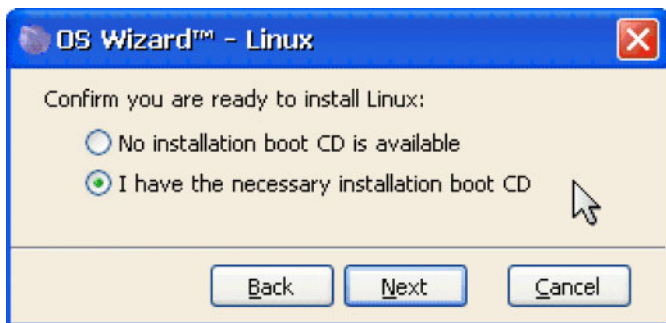
Select *Linux* and press **Next**.



Select your specific Linux type. If it does not appear on the menu, select *Other*. Press **Next**.



If you are using an old Linux version that was made before 2003, the OS may not work unless it is restricted to below 8 GB. All new versions support operation from anywhere on the disk. Choose where to place Linux and select **Next**.



Choose to install with or without boot CD.

As a requirement to install many Linuxes, you will need to have the Linux boot CD made from the Linux distribution before proceeding. If you do not have a boot CD, the OS Wizard will advise you to make it before continuing. Assuming you have a bootable Linux CD, select the second option, and press **Next**.

At this point, OS Wizard takes your choices and determines the best location and space needed to make room for your new Linux.



Tip: Linux and several other Unix OSes require a separate swap partition that is used for temporary data. OS Wizard will automatically create this area for you as part of the total space required.

At this point, when a valid solution is found, the action plan is presented:



Typical Wrap up

If this plan is what you would like, press **Next** and the disk will be prepared for the new Linux installation. This may take a few minutes depending on the space available and if any areas of the disk need to be copied, moved or resized.

Once OS Wizard is finished, you will be presented with final instructions on how to begin your Linux installation.

Once you press **Ok**, OS Wizard will restart your computer so that you may begin your new Linux installation. That's all there is to it! All the steps to prepare your system have been performed for you automatically.

Size and Drive Overrides

On the Action plan screen, you have the option of changing the drive, space and Swap partition sizes for Linux. In most situations, a swap partition size of 64 MB will be the best choice. If you make any changes to the default values, OS Wizard will re-check that there is enough space on the selected drive to install Linux.

No Solutions

On some systems, OS Wizard's analysis may show that Linux (or another OS) cannot be installed. The most common reason is not enough disk space.

If you are loading a number of OSes on the same system, the choices you selected and/or the OSes own internal restrictions may also prevent a solution.

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5: OS Wizard Start Menu

In addition to using the OS Wizard to automatically prepare your system for a new OS, you can manually change your partitions, undo partitioning operations, and other choices.

See the prior chapter for starting the OS Wizard, after which you can access these features from the start menu. If you are in the OS Wizard dialog, first press **Cancel**. When you click on **Start**, the following menu appears:



You can then select your desired action:

OS Wizard - Prepare your system for a new OS installation. See the prior chapter for complete details.

Partition Wizard™ - Handles automated partitioning tasks. See chapter 13 for more details.

BackStep Wizard - Undo previous OS Wizard and manual partitioning operations. This is described in the next section.

Partitioning - Manually perform partition operations such as, create, resize, delete, move, copy and other operations. See chapter 14 for more details.

Settings - Change the way the OS Wizard operates (defaults, and video resolution). These are described in chapter 14.

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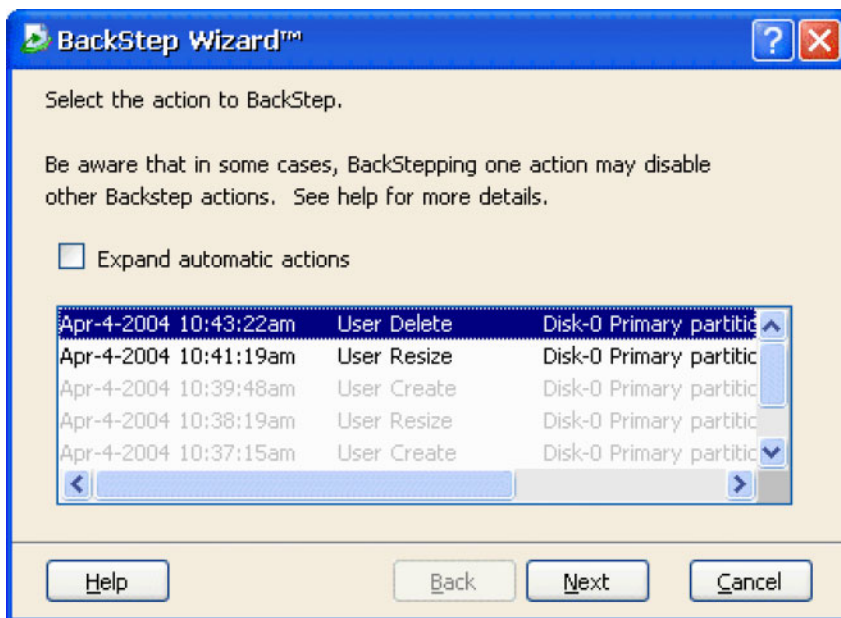
View - View various configuration files such as AUTOEXEC.BAT and CONFIG.SYS. You can also use the Partition Explorer to look at the directories and files. Clicking on a text file opens the viewer/editor for that file.

Help - On-line help about using the OS Wizard.

Exit - Close and reboot the system.

BackStep™ Wizard

The BackStep Wizard allows you to undo previous automatic and manual partitioning operations. When selected, you will see the BackStep Wizard dialog.



A list of prior automatic and manual operations appears, showing the date and time of each operation. The first line shows an OS Wizard operation for Linux. Grayed out lines are operations that can no longer be Backstepped.

Select the operations you wish to undo and the BackStep Wizard will perform the inverse functions necessary to return to a prior partitioning layout. If you wish to view all the individual steps of OS Wizard operations, check the "Expand automatic actions" box.



Warning: If automatic or manual 'create' partition steps were performed, the undo action will **DELETE** the partition and any data within the partition.

Depending upon the number of prior operations and other factors, it may not be possible to perform a BackStep, or some portions of the BackStep may be unavailable. Some of the situations for unavailable BackStep operations include:

- A deleted partition cannot be recovered if a new partition is created in the same area, or if another partition is moved or copied into any area of the deleted partition.
- A partition resized larger cannot be "un-resized" if new data was added to the partition such that the minimum resize is now larger than the original partition size.
- If partitioning was performed by something other than System Commander, such as the use of Windows FDISK, it may prevent some or all BackStep operations.

In general, if you use the OS Wizard to prepare your system for a new isolated OS, you can usually BackStep to remove the OS and restore the partitioning to its prior state.

BackStep operations are not saved on the BackStep list of actions, so once you perform a BackStep, you cannot undo that specific BackStep operation.

If you boot from the restart diskette or the System Commander CD, it will not be possible to save Backstep information.

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6: Common OS Installations & Issues

This chapter covers specific common installations, and some of the special steps we recommend when installing other operating systems like Windows 95/98/Me, Windows NT/2000/XP/2003, Longhorn, Linux, UNIX or NetWare. The easiest way to prepare for these OS installations is to use the OS Wizard described in chapter 4. This chapter explains alternative ways to manually accomplish OS installations.

The chapter wraps up with special limitations, and methods for speeding up the boot process.

The following list is a quick page index for different OSes:

Windows NT/2000/XP/2003 & Longhorn	51
Windows 95/98/Me	56
Linux	65
UNIX	65
NetWare	68
DOS	70



Important: Before attempting to install *any* operating system, please consult chapter 12, ***OS and Product Limitations*** to make sure that you are aware of any limitations imposed by your particular OS. Specifically, be aware that Windows and DOS **will not boot** from any partition other than a primary on the first physical drive. You **cannot** install the boot portion of Windows or DOS into an extended partition or to the second or third hard disk. If you attempt this and call for technical support when you encounter problems, our support technicians will tell you that it is impossible or unreliable. System Commander **cannot** overcome limitations of the operating system.

Windows NT to Longhorn Configurations

In this section only, we refer to any Windows NT/2000/XP/2003 and Longhorn as "Windows". Other Windows such as Windows 95/98/Me will be explicitly named.



Windows can be installed in three (3) different ways. The most common installation places each Windows you install into its own separate primary partition. You can also put multiple Windows into a single partition FAT or FAT32 partition that is managed by System Commander's MultiFAT feature, or place multiple Windows into a single partition that is controlled by the Windows OS Loader, selected from System Commander.

If you want to use NT, it must be either a shared FAT partition (which limits you to 2 GB), or place NT in its own FAT or NTFS partition. Windows 2000 and later have the nasty habit of updating the NTFS type to be incompatible with NT, so you must always hide a NT NTFS partition from other OSes (and System Commander will do this for you).

Windows Installed prior to System Commander with OS Loader

When Windows installs in the same partition with an older Windows, it installs the OS Loader to select between these Windows. In this situation, System Commander will bring up OS Loader like an operating system.

If your older OS was Windows 95/98/Me or DOS, the following instructions will separate this into two (2) System Commander menu selections. One to boot Windows 95/98/Me/DOS directly and another to boot the other Windows choice, if you do not have both selections on the System Commander selection menu. The current System Commander "OS Loader" choice will become a Windows only choice.

To create a separate non-NT/2000/XP/2003 choice on the System Commander selection menu, boot from a Win 95/98/Me/DOS diskette (with the same version and vendor as your current OS). At the prompt run the SYS program to reload the hidden files:

```
A:\> SYS C:
```

Once complete, remove the boot diskette and reboot again. This time System Commander will save the OS hidden system files and other key files such as AUTOEXEC.BAT and CONFIG.SYS. Once at the prompt, reboot again to verify you now have both the old and new Windows menu choices.

Next, make the newer Windows selection bring up the OS Loader with its choices. Select NT/2000/XP/2003. Once Windows is running, click on Start, Program Settings

and then select the Control Panel. Next, click on the System icon within the Control Panel. For Windows XP/2003 click on the Advanced tab, and then click on Settings under Setup and Recovery. Choose the desired default OS (typically leave it as-is) and change the *Time to display list of operating systems* to zero.

Windows Installed prior to System Commander – Stand Alone

In the case of Windows completely self-contained in a single partition (i.e., no DOS or Windows 95/98/Me existed when the new Windows was installed), the new Windows choice will usually appear on the System Commander menu without further action. If you are missing any Windows choice, at the System Commander OS selection menu, select **Alt-S** Settings, and then select the *Order, add, and remove menu*. Select **Alt-A** (Add), and then **P** for Partition. Toggle the desired Windows partition(s) to be bootable with **Alt-T**.

Windows Installed prior to System Commander - Adding DOS

DOS must be installed into a FAT16 primary partition. If Windows is currently installed into the FAT16 primary, then DOS can be added into this partition, otherwise a new Primary FAT16 partition must be created. To add DOS into the Windows partition after System Commander has been installed, boot from the first DOS installation disk. This will take you into the DOS setup program. In some cases you will receive a message indicating that DOS will not install because it detects another OS already on your machine. Should this occur, exit the setup program. At the A:> prompt, type **SYS C:**. After you receive the message "System Transferred", type **SETUP** to launch the DOS installation again. This time it will be *recommended* that you exit the setup, but you will be given the option to continue. You may safely continue the installation at this point. After the installation of DOS has been completed, you will be prompted to reboot the machine. Upon reboot, System Commander will prompt you that a possible new operating system has been detected. Save this choice, as it will be your new DOS installation.

Note: With NT v4, it is possible to create a primary FAT partition larger than 2047 MB. Other Oses, such as DOS and Windows 95/98/Me, will not recognize standard FAT partitions greater than 2047MB.

Installing Windows after System Commander

After System Commander is installed and the existing OS information is saved by System Commander (i.e., you have rebooted once), make sure your last boot was to either the DOS or Windows 95/98/Me that exists in the same partition in which System Commander has been installed (the MultiFAT partition). Do not proceed if the last choice was OS/2. Proceed to install your new Windows per its instructions.

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As part of the Windows installation the system will be rebooted. At this point the Windows installation is not complete. System Commander will detect the new OS and ask you if you wish to save it. Select **Save**, and if you desire, change the description. At this point the Windows installation will proceed as if System Commander was never present.

If you have problems with the Windows installation (i.e., system incompatibilities, disk problems, etc.) and you later attempt to reinstall Windows, upon Windows requiring a reboot, the OS selection menu will appear. Be sure to select the same Windows selection so no files are changed and the Windows installation will continue normally.

Once Windows has completed the installation, issue a system shutdown (**Ctrl-Alt-Del** will display the shutdown option). Upon reboot, System Commander will now present your new Windows as another menu choice.

Getting Rid of OS Loader Messages

When you are using System Commander in a FAT/FAT32 primary partition along with multiple Windows, you may not need the OS Loader selection choice menu to appear. For example, the OS Loader provides a choice for Windows Me and Windows XP, but System Commander can already go directly to Windows Me. You can set Windows XP to be the default OS Loader choice for a faster boot.

To hide the OS Loader, select Windows from the OS selection menu to bring up the Windows OS loader with both new and old Windows choices. Select the new Windows. Once Windows is running, click on Start, Program Settings and then select the Control Panel. Next, click on the System icon within the Control Panel. Pick the new Windows as the startup operating system, and change the settings for "Show List for" to zero. This will skip Windows's extra questions at Boot time, since you will be selecting Windows directly from the System Commander Menu.

Non-bootable Windows selection on the Selection Menu

When Windows is installed with the Windows's OS Loader (i.e., a MultiFAT partition exists during the Windows installation), you might get an unnecessary Windows choice on the System Commander menu that fails to boot. This is a second partition where the non-booting portion of Windows resides. In this situation, Windows actually starts it's booting from some hidden files in the MultiFAT partition, and then continues on from another partition.

To remove the selection from the menu, press **Alt-S** (Settings), and select the *Order, add, or removal menu*. Highlight the unnecessary Windows choice, and press **Alt-R** (Remove). Be careful not to remove your real Windows selection, which resides on the same drive and partition as your other OS choices.

Creating Multiple Windows Configurations

System Commander can manage different configuration selections for Windows and copy files between subdirectories. It is often useful to have different sets of .INI files. You might have one set for a network, another for a laptop's docking station, and yet another while on the road with a laptop. Multiple configurations are only supported when Windows boots through the MultiFAT partition, and Windows is using the FAT or FAT32 file system.

To duplicate the choice, boot into System Commander and press **Alt-S** (Settings) at the OS selection menu. Select *Order add and remove menu* and highlight the Windows choice. Next select **Alt-A** (Add), and then select **D** for Duplicate. A duplicate choice is created. Escape from the menu, and press **Alt-S** (Settings) again. Then select the *File management menu*. In this menu you can specify additional files to copy, such as a specific .INI file.

Multiple Windows OSes

System Commander can manage multiple versions of Windows in separate partitions with a common boot partition. The Windows installer will ask which drive you wish to install it. If you do not select drive C, it will use drive C as the boot partition and install the rest in the specified drive. As you add additional versions of Windows to the system, each installation will alter the BOOT.INI file on drive C to include the added Windows. This results in having a list of Windows choices in Windows OS loader appearing after you select Windows from System Commander.

If you wish to split this list of Windows into individual selections on the System Commander OS selection menu, simply follow the process described in the prior section "Creating Multiple Windows Configurations". Each instance of BOOT.INI can be edited to default to the desired selection.

Special Protection for Windows

System Commander will automatically save and maintain the BOOT.INI, NTLDR and NTDETECT.COM files, critical to Windows operation. During the installation of some OSes, these files are purposely destroyed to disable Windows. Later, when the Windows selection is made in System Commander, it detects the missing files and automatically restores them from System Commander's previously saved images.

Limitations from OS

- Windows can be installed in a primary or logical partition on any accessible drive. If installed into a logical partition, Windows's boot code must reside in a primary

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FAT/FAT32 or NTFS partition within the first 2 gigabytes on the first physical hard drive. (NT is FAT or NTFS only)

- The partition can be FAT, FAT32 or NTFS. Windows NT does not support FAT32, but NT versions 3 and older do support HPFS.
- Long filenames supported.
- Windows NT v4.0 cannot be booted from it's own partition past 2 gigabytes unless its boot code resides in a primary FAT16 partition within the first 2 gigabytes on the first physical hard drive.

Windows 95/98/Me Configurations

System Commander is fully compatible with all Windows variants. Normally Windows 95/98/Me is installed (at least the bootup portion) in the C drive, a primary partition. The Windows 95/98/Me installation provides an option to install the non-boot portion of Windows on any drive.

Installing Windows 95/98/Me after System Commander

Windows 95/98/Me installation has a few of quirks, which will change and delete a number of important files if installed on top of an existing OS, and will erase System Commander's master boot record. The following tips will guide you through a successful Windows 95/98/Me installation.

Often the easiest method is to install Windows by itself in it's own primary partition. You can also install Windows into the same partition where you installed System Commander (FAT/FAT32) and use the MultiFAT feature to manage the different OSes.

When you install Windows 95/98/Me in the same partition with a previous version of Windows, the Windows installation forces you to make one of these, less than desirable, choices:

1. You can leave all your applications working with the old Windows, but none will work with your new Windows 95/98/Me installation.
2. Migrate all your applications to the new Windows 95/98/Me installation, which means they will no longer work under your old Windows.
3. Leave or migrate applications, and then reinstall every application in unique directories for the other Windows.

Keep in mind that even if you attempt to install Windows 95/98/Me in any drive other than C, Windows 95/98/Me will always add and remove many files on drive C, and the migration problems are still present.

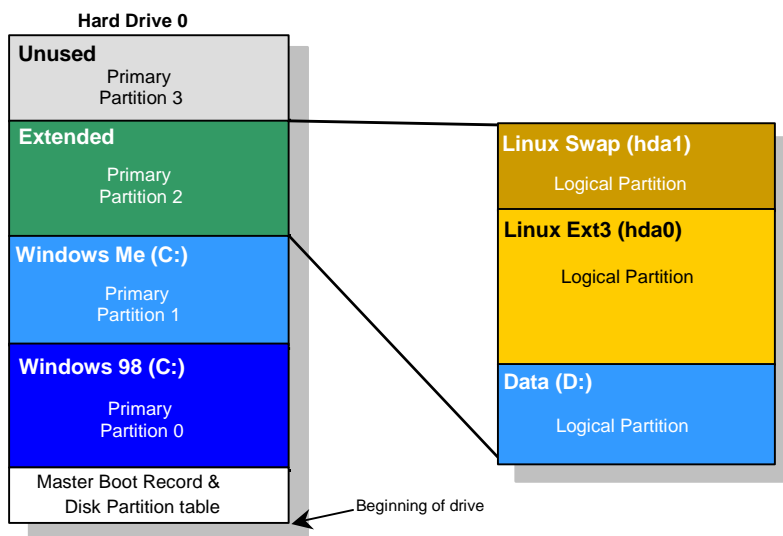
To both keep your old Windows and also have your new Windows 95/98/Me migrate all the applications, we recommend you create a separate duplicate partition of your current Windows, and then install the new Windows 95/98/Me in this separate duplicate partition. You can then safely migrate the duplicate applications, since you still have your original applications on another primary partition.

One common drive layout, which many users like, appears in figure 7-1.

In this layout, when you boot into partition 0, you can run Windows 98 on drive C. Drive D is on the logical partition, which contains application data. Partition 1 can either be hidden or will appear as drive E at your option.

When you boot partition 1, Windows Me will appear as drive C, and drive D is the same logical partition as appears when booting Windows 98. Partition 0 is either hidden or you can elect to have it appear as drive E.

Figure 7-1. Windows 98 and Windows Me in separate partitions.



This table summarizes the different 95/98/Me installations:

Old Windows	Actions to take
Does not exist	Install new Windows anywhere (no issues).
No longer wanted	Install new Windows on top of old Windows (applications are transferred to new Windows).
Want it to be available	Install new Windows in a new subdirectory (applications will need to be reinstalled under new Windows to use them).
Want it to be available	Install new Windows in a separate primary partition using the Risk Free Windows approach (applications will work under both new and old Windows).

Risk Free Windows 95/98/Me Installation (Separate Partitions)

This is the safest approach to installing Windows 95/98/Me. It keeps Windows 95/98/Me completely isolated from your existing OSes, and avoids having to load all your applications again. On some systems, this approach may require repartitioning, so one of the other alternative installations may be preferred.

Starting Assumptions and Requirements

- You have an **upgrade** release of Windows 95/98/Me.
- An older Windows is installed and working on drive C: (this approach requires Windows on drive C:).
- System Commander has been installed and booted at least once (this saves the old Windows configuration).
- Your first drive has unallocated disk space approximately the size of your current Windows partition or larger.

What to do if all drive space is allocated?

For the risk free process, it is necessary to create another partition on your first drive. This can only be done when unallocated disk space is available. Often systems are pre-configured with all of the disk space already allocated.

To free up allocated disk space, it is necessary to delete one or more partitions, and then re-create smaller partition(s) to make available disk space. Remember to back up your data before deleting the partition, since all of the data will be destroyed. You

might also consider changing the size of a partition, without deleting the data within the partition using the OS Wizard.

Optional Extended Partition(s)

It does not matter if you wish to create extended (logical) partitions now or later for additional OSES or for data and applications. Logical (FAT/FAT32) partitions will change your drive lettering, since they appear after the C: drive.

Risk Free Installation Steps

1 Create a partition copy of the old Windows partition on the first drive.

Use Partition Commander (select Partitioning at boot time) to copy the partition. Remember that both partitions must reside on the first drive.

2 Make the new partition appear as an OS selection and temporarily hide the old Windows partition from the new Windows 95/98/Me installer.

Normally it will appear automatically. If the new partition does not appear on the OS selection menu, press **Alt-S** (Settings), and select the *Order add and remove menu*. Press **Alt-A** (Add), and then press **P** for partition. Highlight the new partition, and press **Alt-T** to toggle the boot status to YES. Press Esc three (3) times to return to the OS selection menu.

Press **Alt-S** (Settings), and select the *Specific OS options menu*. Use **PgUp** and **PgDn** to switch to the new primary partition. Select the option *Partitions Visible* by pressing Enter, and hide the other primary partition. Return to the OS selection menu, and select the new primary partition. It should boot up just like your original Windows.

3 Install Windows 95/98/Me!

Now run the Windows 95/98/Me installation program. At some point it will ask if you wish to install Windows 95/98/Me on top of your old Windows (i.e., typically to the **C:\WINDOWS** directory). Keep this directory name. By installing Windows 95/98/Me on top of the duplicate copy of Windows, all of the applications are automatically transferred to Windows 95/98/Me. This avoids having to load every application again! Remember that you still have your original set of Windows files and applications in the other partition hidden from Windows 95/98/Me.

During the Windows 95/98/Me installation, you may get several messages about OS/2 and/or NT indicating that they will no longer work. You can safely ignore these warnings.

4 Restore System Commander.

When the Windows 95/98/Me installation is complete and working, you will find that after a reboot, System Commander fails to appear. Windows 95/98/Me erases the System Commander master boot record.

In most cases System Commander will automatically recover on the next boot cycle. During the next boot up, System Commander will appear and save the new Windows 95/98/Me information. All of your prior options and selections will not be affected. If System Commander fails to appear, run C:\CHECKMBR.EXE from Windows or boot from the System Commander CD or diskette 1 and select Enable System Commander.

Multiple Windows 95/98/Me installations in the same partition

This type of installation for Windows 95/98/Me is strongly discouraged as it may result in an unstable installation. Windows 95/98/Me installation writes additional subdirectories outside of the Windows subdirectory without prompting and without giving you the option to rename (for example, the Program Files subdirectory). Since Windows 95/98/Me cannot effectively share this subdirectory with other installations, multiple versions of 95/98/Me in the same partition can be very unstable. In addition, Windows 95/98/Me virtual memory will cause swapfile overlaps, which means that you will not be able to use virtual memory in one of the installs of Windows 95/98/Me. We encourage you to install multiple versions and languages of Windows 95/98/Me into separate primary partitions.

Other Windows 95/98/Me Issues

Windows Plus (Microsoft Plus) can Destroy other OSes!

Microsoft offers a separate package of utilities, icons, and wallpaper for Windows 95/98/Me. One of these utilities is the compression software called DriveSpace. This utility can compress your FAT partition and all OSes installed on that partition. In most cases, these OSes will no longer work. A reboot may present a "Boot" error message and hang the system.

If you get into this weird situation, boot from the System Commander CD or diskette 1. Run SCIN and select "Disable".

You may be able to run Windows 95/98/Me, but the other OSes are not likely to be recoverable. A full installation of System Commander will get System Commander running again, but the other OSes must be loaded again. Remember that System Commander **MUST** be installed on the non-compressed drive, which will no longer be drive C.

In general, with Windows Plus, NEVER select the option to install everything. If you want other DOS versions, Windows NT/2000/XP/2003 or Longhorn, you should not compress the C drive using DriveSpace.

Windows 95/98/Me and Novell NetWare 4.x/5.x

If you are using Novell NetWare, the installation of Windows 95/98/Me into the FAT partition may alter the STARTNET.BAT file under the \NWCLIENT subdirectory. The network may no longer work under DOS in this case. If you encounter this problem, it is fairly easy to correct, since Windows 95/98/Me is nice enough to make a backup copy of the DOS version as STARTNET.--- in the \NWCLIENT directory.

System Commander can be used to swap the appropriate STARTNET files between DOS and Windows 95/98/Me. To set this up, you will keep two separate copies of the STARTNET file. System Commander is then instructed to copy the appropriate STARTNET file when switching between OSes. The following example assumes the Windows 98 files that System Commander copies (like CONFIG.SYS) are in the directory \SC\WIN98, and the DOS files are in the directory \SC\MSDOS6.22 (use the directories that match your system).

Perform the following copies:

```
C:\> copy \nwclient\startnet.bat \sc\win98\startnet.bat
```

```
C:\> copy \nwclient\startnet.--- \sc\msdos6.22\startnet.bat
```

Next, reboot the system, and highlight the Windows 98 menu choice, and press **Alt-S** (Settings), and select the *File management menu*. Move down to an empty slot, and add the following entry (+ or - toggles the settings):

Action	Update	Source	Target
COPY	PROMPT	C:\SC\WIN98\STARTNET.BAT	C:\NWCLIENT\

Press **PgUp** or **PgDn** to change to your DOS choice. Add the following entry:

Action	Update	Source	Target
COPY	PROMPT	C:\SC\MSDOS6.22\STARTNET.BAT	C:\NWCLIENT\

Now NetWare should work properly from both DOS and Windows 95/98/ Me. Try out DOS and Windows 95/98/Me to be sure it works. If your first OS selection causes System Commander to prompt whether or not you wish to update STARTNET.BAT,

specify **Skip** to avoid overwriting the file this very first time. After that, it is acceptable to update the file.

Windows 95/98/Me MSDOS.SYS File

Unlike old DOS, Windows 95/98/Me stores textual configuration information in the MSDOS.SYS file. This file may be updated by users, Windows 95/98/Me itself, and installation programs. With DOS installations, System Commander detects any changes to MSDOS.SYS as a possible new operating system. With Windows 95/98/Me, System Commander saves and maintains the MSDOS.SYS file in the Windows 95/98/Me save directory. As changes are made, the saved MSDOS.SYS file is automatically updated on the next reboot.

Creating Multiple Windows 95/98/Me Configurations

One handy feature of System Commander is the ability to provide multiple selections for the same OS (i.e., Windows 95/98/Me) and copy files between subdirectories. It is often useful to have a different set of .INI files and/or MSDOS.SYS. You might have one set for a network, another for a laptop's docking station, and yet another while on the road with a laptop.

To duplicate a Windows 95/98/Me choice, after booting into Windows 95/98/Me, reboot, and press **Alt-S** (Settings) at the OS selection menu. Select *Order, add and remove menu* and highlight the Windows 95/98/Me choice. Next select **Alt-A** (Add), and then select **D** for Duplicate. A duplicate choice is created. Escape from the menu, and press **Alt-S** (Settings) again and select the *File management menu*. In this menu you can specify additional files to copy, such as a specific .INI file.

Once the duplicate is made, return to the OS selection menu and select the new duplicate choice. When Windows 95/98/Me boots up, edit files to take your specific actions (like MSDOS.SYS, CONFIG.SYS and/or AUTOEXEC.BAT).

Exiting Windows 95/98/Me

When shutting down Windows 95/98/Me, the shutdown menu provides a number of alternatives. We suggest you select the option *Restart the computer*. This will always go to the System Commander menu, where you can select any OS you want. Other shutdown options will not affect System Commander, but they will not bring up the System Commander OS selection menu.



Warning: In most cases, it is better not to use the Windows 95/98/Me *Restart the computer in MS-DOS mode* option. Using this option may load an old set of configuration files. It is better to reboot and select a true DOS from the System Commander menu.

Limitations from OS

- The Windows 95/98/Me boot up portion (approximately 4 MB of Disk Data) must be installed in a primary FAT or FAT32 partition on the first drive, while the balance can go on any primary or logical partition on any drive. The minimum size of this boot partition should be 20 MB or larger.
- Long filenames can only be seen by Windows 95 OSR2, Windows 98/Me/NT/2000/XP/2003 and Longhorn. The first version of Windows 95 and DOS do not support long filenames.
- Long filenames can be lost if a DOS file utility such as DEFRAG, SCANDISK, or an old version of Norton Disk Doctor is run which does not understand long filenames.
- Use of the optional FAT32 partition type is fully compatible with System Commander, but DOS, Windows 95A and Windows NT cannot access a FAT32 partition.
- Windows 95/98/Me becomes unstable with more than 512 MB of RAM. Search Microsoft's knowledgebase for instructions to limit Windows to using 512 MB when more memory is available.

OS/2 Configurations



OS/2 and Other OSES in Separate Partitions

If OS/2 is already installed, System Commander should already show OS/2 as a boot selection after a reboot. In addition, a selection for OS/2's Boot Manager may appear. In some installations, OS/2's installation incorrectly marks other non-bootable partitions as being bootable, so you may see other choices on the menu that should be removed.

If OS/2 does not appear as a selection, press **Alt-S** (Settings), and select the *Order, add and remove menu*. Press **Alt-A** (Add), and then select **Partition**. Move the highlight bar to the OS/2 partition and press **Alt-T** (Toggle) to set the bootable status to **YES**. Press Escape three (3) times to return to the selection menu.

Once you verify the OS/2 partition boots properly from System Commander, you can remove any bogus entries and remove Boot Manager if desired. To remove a menu choice, from the OS selection menu, press **Alt-S** (Settings). Select the *Order add and remove menu*. Highlight the choice to remove, and press **Alt-R**.

If you are installing OS/2 now, OS/2 requires Boot Manager to install OS/2 in a separate primary or logical partition. The OS/2 installation will handle this for you. Once OS/2 is fully installed, Boot Manager is no longer needed, and the partition can be reused or deleted.

If you do not have any free space to install Boot Manager (it requires a primary partition on your first drive), OS Wizard can be used to change the size of an existing partition, on the first drive, without deleting data.

Limitations from OS

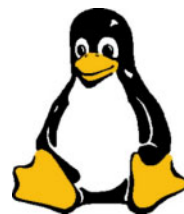
- OS/2 can be installed in primary or logical partitions on any accessible drive.
- Boot Manager must be installed in a primary partition on the first drive to install OS/2 (It can be discarded after OS/2 is installed).
- Only one (1) OS/2 configuration is allowed for the one installation (see next section for multiple configurations).
- The partition can be FAT16 or HPFS for higher performance, but does not support FAT32 nor NTFS.
- OS/2's long filenames can only be seen by OS/2

Displaying OS/2 Configuration Help

You can view help information from the File management menu or from the Order menu by pressing **Alt-O** for OS/2 multiple configurations.

LINUX Configurations

System Commander is fully compatible with Linux. The GRUB or LILO boot loader will be installed as part the Linux installation. For most new distributions, you will use GRUB, as it allows you to install to any place on the drive. For small drives and/or older distributions, LILO is the best choice.



If using LILO, we recommend having LILO's target location set to the root superblock. This option is typically selected from within Linux while installing Linux. For the fastest and easiest boot, we suggest only making LILO boot Linux and no other OS.

To install LILO into the root superblock on an existing partition, modify the LILO configuration file (typically `/etc/lilo.conf`) so that the **boot=** line refers to your Linux root partition, and not your first hard disk (i.e. **boot=/dev/hda5** instead of **boot=/dev/hda**).

After editing the LILO.conf file, you must run the LILO program (typically `/SBIN/LILO`).



Technical Information: If you are having problems with installing LILO into the root superblock, we recommend an alternate approach that has System Commander launch the Linux MBR. In this case, install LILO into the MBR. System Commander will automatically detect this and handle it. To have System Commander manually load an MBR is explained in detail in Appendix C.

If you use a Linux swap partition (partition id 82), in rare instances it may appear on the main menu as a potential OS to boot. It is not bootable. To remove the UNIX-82 selection from the OS selection menu, press **Alt-S** (Settings), and select the *Order, add, and remove menu*. Highlight the swap partition and press **Alt-R** (Remove). This removes the selection from the menu (but has no effect to the swap partition).

UNIX Configurations

Although System Commander can boot from any partition on any drive, most UNIX variants require installation on drive 0. If your UNIX allows installation on other drives, System Commander can boot it. Linux, Solaris and Free BSD all allow booting from any disk.

Some UNIX installations may overwrite System Commander's master boot record. For example, running SCO UNIX's FDISK will cause this minor problem. When the master boot record is changed, a reboot will not bring up System Commander, but will run SCO instead. To correct this, boot from the System Commander CD or utility disk and select Enable System Commander. Now when you reboot, System Commander will appear. No loss of information occurs from this quirk in SCO UNIX. System Commander also supports selection from multiple UNIX operating systems installed on one system. When a specific UNIX is selected, the other UNIX partitions on the same drive are automatically hidden to avoid conflicts. To override this feature, use the *Setup* menu, selecting *Specific OS options menu*.

System Commander also makes any FAT partitions accessible to UNIX. Again, this feature can be overridden using the *Specific OS options menu*.

The following subsections cover issues related to specific UNIX implementations.

Solaris

Solaris can be installed on any drive. The Solaris installation instructions indicate that you must use a special Solaris boot diskette if you elect to install on any drive other than the first.



Warning: Avoid using the Solaris "Automatic" installation, as it usually erases all existing partitions on the drive!

System Commander will boot Solaris from any IDE disk without using the Solaris boot diskette. We recommend an *Interactive* installation. Please refer to the following link for installation instructions:

www.v-com.com/support/sup_osin.html

Install Solaris as if a boot diskette was going to be used. When the installation is complete, you can boot directly to Solaris from System Commander. On some SCSI controllers, it may not be possible for System Commander to properly launch Solaris from any drive other than the first drive.

Old Solaris and Drives greater than 1 GB

Solaris 2.4 and older do not allow drive translation (or often referred to as an option for drives greater than 1 GB). This means older Solaris versions must be installed on the disk below cylinder 1024 (1 GB). Solaris v7 and later do not have this limitation.

Solaris and Linux on the same System

The Linux swap partition and Solaris both use the same partition id, 82. When using a Linux swap partition and Solaris partitions in the same system, it is necessary to prevent Solaris from accessing the Linux swap partition and Linux from accessing the Solaris partition.

System Commander normally handles this automatically. To perform these actions yourself, at the OS Selection Menu press **Alt-S** (Settings) then select *Specific OS options*, and set the *primary partitions visible* option for each OS selection. With Solaris selected, make the Linux swap partition hidden. With Linux selected (id 81 or 83), make Solaris partition hidden.

SCO OpenServer and SCO UnixWare

Most operating systems expect to see a single partition bootable, with all other primary partitions marked as non-bootable. SCO OpenServer and UnixWare require all of its partitions be marked as bootable, even if the partition is not truly bootable. Bootable status is often referred to as the “active partition” by partitioning software like FDISK.

When System Commander is first installed, it will automatically set an option for UNIX partitions to make all identical partitions active. If you install SCO OpenServer or UnixWare *after* System Commander was installed, you may need to set this option manually.

To change the handling of the bootable/active status across partitions, first highlight the UNIX choice on the OS selection menu and press **Alt-S** (Settings). Select *Specific OS options menu*. Set the option *Bootable/ active status across partitions* to OVERRIDE ON. All other operating systems, including other UNIX variants, should use the default setting of AUTO.

SCO UNIX System V, v5.03 and older, must be installed within the first 500 MB of the first physical hard drive.

Although rare, if you get a boot error message from UNIX, see the troubleshooting section for UNIX.

FreeBSD

FreeBSD normally installs its own boot loader program into the MBR. When installing FreeBSD, use its boot loader to verify that the FreeBSD installation is working properly, then boot from the System Commander CD or utility diskette 1 and select Enable System Commander. Then reboot into the System Commander menu. System Commander will automatically detect the FreeBSD installation, and add it to the OS Selection menu.



NetWare Configurations

Novell's NetWare versions 3 and later use DOS to start, and then takes over the system using its own partition. System Commander can create separate boot choices for each NetWare you install. In essence, a duplicate DOS choice is made so NetWare starts with its unique CONFIG and AUTOEXEC files and a separate set of files for DOS. To split a single DOS/NetWare selection into two separate selections, press **Alt-S** (Settings) and select the *Order add and remove menu*. Highlight the current DOS choice, and press **Alt-A** (Add), followed by **D** (Duplicate). You can now enter the name and new subdirectory for the duplicate menu selection. When complete, exit to the new "Duplicate" DOS choice. Update the AUTOEXEC.BAT file to go directly to NetWare.



NetWare version 2.x does not boot through the DOS partition, but has its own bootable partition. System Commander will boot directly into a NetWare version 2.x partition.

Installing NetWare after System Commander

To install NetWare version 3.x, 4.x or version 5.x after System Commander is installed, you must follow these steps:

1. Your hard disk must be partitioned such that the space you want to allocate to NetWare is unpartitioned. The NetWare installation procedure will create the NetWare partition in this space.
2. From the System Commander OS Selection menu, press **Alt-S** (Settings) and duplicate the current DOS choice from the *Order Add and Remove menu* (see the start of the NetWare Installations for complete duplicate instructions). This new duplicate will become the NetWare choice, so enter an appropriate description. Exit to the selection menu, and select the NetWare choice. DOS will come up at this point.

3. Install NetWare. NetWare will grab the undefined area of the disk and make it a NetWare partition for its use.

Multiple NetWare OSes on one system

System Commander lets you manage multiple versions of NetWare on the same system. Because the NetWare installation makes many automatic assumptions, the following is a “real world” example of how to have multiple versions of NetWare on one system. To our knowledge it is otherwise impossible to do this without System Commander.

This example case uses an 800 MB drive. Upon completion, DOS will have a 100 MB partition, NetWare v3 will get a 300 MB partition, and NetWare v4 will get a 400 MB partition. These sizes are completely arbitrary, and you should select sizes appropriate for your needs. The steps to accomplish this are:

1. Using DOS FDISK, partition the disk for one DOS 100 MB partition, and one Extended partition of 400 MB. Leave the last 300 MB undefined, as NetWare v3 will use this. Install DOS, without using the extended partition (don't bother to format it, since it will be deleted later). Then install System Commander.
2. Reboot once to save the DOS files. This first selection will always be used for DOS. Select the DOS choice and verify that it boots up properly.
3. Reboot again to the System Commander OS selection menu. Press **Alt-S** (Settings) and duplicate the current DOS choice from the *Order, Add and Remove menu* (see the start of the NetWare Installations for complete duplicate instructions). This new duplicate will become the NetWare v3 choice, so enter an appropriate description. Exit to the selection menu, and select the NetWare v3 choice. DOS will come up at this point.
4. Install NetWare v3. NetWare will grab the 300 MB undefined area of the disk and make it a NetWare partition for its use.
5. Using FDISK again, delete the extended DOS partition (400 MB). Reboot and press **Alt-S** to go into Settings for the NetWare v3 choice. Select *Specific OS options menu*. On the line *Primary partition visible on drive 0*, verify that one partition named (NET WARE) is set to YES. Also jot the partition number down for later use, as you will need to remember this is the v3 NetWare partition.
6. Return to the OS selection menu and highlight (but don't select) the DOS choice. Press **Alt-S** (Settings) and duplicate the current DOS choice from the *Order, Add and Remove menu* (see the start of the NetWare Installations for complete duplicate instructions). This new duplicate will become the NetWare v4 choice, so enter an appropriate description.

VCOM System Commander 8

7. Next, return to the Setup menu, and select *Specific OS options menu*. On the line *Primary partition visible on drive 0*, change the one partition named NET WARE to "hidden". This will prevent the NetWare v4 installation from seeing the NetWare v3 partition.
8. Exit to the selection menu, and select NetWare v4. DOS will again come up at this point.
9. Install NetWare v4. NetWare will grab the 400 MB undefined area of the disk and make it a NetWare partition for its use.
10. Reboot to the selection menu, and highlight the NetWare v3 choice. Press **Alt-S** (Settings) and select the *Specific OS options menu*. On the line *Primary partitions visible on drive 0*, set the v4 NetWare partition to "hidden". This is not the same NetWare partition you had in step 5 earlier.
11. At this point you are done! If you did not elect to have NetWare change your AUTOEXEC/CONFIG set of files you may wish to do so now.

Limitations from OS

- NetWare versions 3 and later must be installed in a primary partition on any accessible drive.
- Older versions of NetWare will automatically take all free (unallocated) disk space on the selected drive. Some of the latest versions now allow you to specify how much space to use.

DOS Configurations

Multiple DOS Versions and Vendors



System Commander provides the ability to have multiple versions and vendors of DOS on the same system. This means you can have DOS from Microsoft, IBM, or Caldera, and even different versions on the same system. The different DOSes all reside in the same disk partition, so all your programs and data files are accessible regardless of the currently active DOS.

When System Commander is installed, it creates a hidden file SCDOS.SYS. This file holds information about each OS, including several hidden system files for each DOS loaded. If you delete this file, you will be unable to access any DOS operating system other than the one currently active.

Limitations from OS

- The bootable DOS portion must reside in a primary FAT partition on the first drive.
- Unable to access FAT32 and NTFS partitions.

Special DOS Issues

Most DOS utilities are version dependent and will not work if a different DOS version is operating. To overcome this issue, System Commander will automatically copy key files from a subdirectory to the root directory. In most cases this will include COMMAND.COM, CONFIG.SYS, and AUTOEXEC.BAT. The CONFIG.SYS and AUTOEXEC.BAT files should be customized for the specific DOS version. For example, the path statement in the AUTOEXEC.BAT file must point to the system directory for the related version of DOS. If the system files were loaded into a directory \PCDOS7, then a portion of the AUTOEXEC.BAT path statement would appear as:

```
PATH = C:\PCDOS7;
```

You may already use a SHELL statement in CONFIG.SYS or a COMSPEC variable in AUTOEXEC.BAT to point to the directory where COMMAND.COM resides. Be aware that many programs that “shell-out” do not follow the path, but expect COMMAND.COM to be in the root directory. For this reason, System Commander copies the file COMMAND.COM into the root directory when a new DOS is selected.

CONFIG.SYS Issues

Some commands in CONFIG.SYS are unique to specific DOS versions and will generate an error message if they are run from a different DOS version. In addition, some device drivers are specific to a version of DOS and may not function with older or newer DOS versions. Make sure the SHELL points to the correct COMMAND.COM and is in the proper form for the specific DOS version. Some of the more recent command differences are shown below. A blank indicates the command is not supported.

Supported in DOS Versions

CONFIG Command	DR 6.0	Caldera 7.0	MS-DOS			PC-DOS		
			3/4	5.0	6.x	3/4	5.0	6/7
chain	✓	✓						
cls	✓	✓						
cpos		✓	✓					
devicehigh				✓	✓		✓	✓
devicehi		✓						
dos		✓		✓	✓		✓	✓
echo	✓	✓						
exit	✓	✓						
gosub	✓	✓						
goto	✓	✓						
hibuffers	✓							
hidevice	✓	✓						
hidos		✓						
hiinstall		✓						
history	✓							
include					✓			✓
menucolor					✓			✓
menudefault					✓			✓
menuitem					✓			✓
numloc					✓			✓
rem	✓	✓		✓	✓		✓	✓
return	✓	✓						
set	✓	✓						
shell	✓	✓	✓	✓	✓	✓	✓	✓
submenu					✓			✓
switch	✓	✓						
switches				✓	✓			✓
timeout	✓	✓						

AUTOEXEC.BAT Issues

Some commands in AUTOEXEC.BAT are unique to specific DOS versions and will generate an error message if they run from a different DOS version. Specifically check your path statement carefully, as it usually will point to the system subdirectory, which will be different for each version. If you use a COMSPEC statement, also check that it points to COMMAND.COM for this operating system. Recent differences are shown below. A blank indicates the command is not supported.

Supported in DOS Versions

CONFIG Command	DR 6.0	Caldera 7.0	MS-DOS			PC-DOS		
			3/4	5.0	6.x	3/4	5.0	6/7
choice	✓	✓			✓			✓
comspec	✓	✓	✓	✓	✓	✓	✓	✓
gosub	✓	✓						
path	✓	✓	✓	✓	✓	✓	✓	✓
yes	✓	✓						
return	✓	✓						
switch	✓	✓						
switch	✓	✓						

Multiple Primary DOS Partitions

Use the OS Wizard or use manual partitioning from the OS Wizard to create multiple primary partitions. DOS by itself (and DOS's FDISK) will NEVER create such a configuration. If additional drives are necessary, FDISK will only allow one primary DOS partition, but makes no restrictions on the number of DOS logical partitions given enough disk space.

System Commander is designed to work on systems with multiple DOS partitions. One common configuration, made possible with System Commander, is DOS/Windows 3.1 in one primary partition and Windows XP in another primary partition.



Warning: DOS BUG: We have seen a minor bug in all versions of DOS that can affect some configurations. With two primary FAT partitions, and an extended partition (on any drive) that has the last logical drive as non-FAT, DOS cannot see the other primary partition. This DOS bug does not occur when no extended partition exists, or if the last logical partition in the extended partition is FAT.

Multiple Selections for One DOS

In some situations, more than one OS selection choice is desired for a single version of DOS. In these cases, a different CONFIG.SYS and AUTOEXEC.BAT file are desired for each DOS selection.

To create an additional entry on the System Commander OS selection menu, from the OS selection menu, press **Alt-S** (Settings), and select the *Order add and remove menu*. Highlight the selection you wish to duplicate (which must be in the FAT partition where System Commander resides), and press **Alt-A** (Add). Press **D** to duplicate the choice. You will be prompted for a description and new subdirectory to use.

Return to the OS selection menu and select this new choice. At the DOS prompt, remember to update your CONFIG.SYS and AUTOEXEC.BAT files to reflect any changes you wish on this duplicate set.

Windows 3.x and DOS as separate selections

Throughout this manual, we talk very little about Windows 3.1 because it is not an operating system by itself. It always requires DOS to be running first, and operates like an application program from DOS (a real complex application). It is not possible for System Commander to detect Windows 3.x as a separate selection automatically, but it is easy to set up two choices on the menu for DOS and Windows 3.x.

If you do not have DOS installed, you must install DOS before you can install Windows 3.x. Once DOS is installed, boot into DOS from System Commander, and install Windows. DO NOT use the same directory name (i.e. C:\WINDOWS) if you previously have Windows 95/98/Me installed in that directory. Also, DO NOT allow 3.x. to search for installed Windows Applications: if it sees Windows Applications it will destroy or corrupt them.

Once you have DOS and Windows 3.x installed and working, you can duplicate your single DOS selection on System Commander's menu. Boot into System Commander and highlight the DOS choice (but do not select it). Press **Alt-S** (Settings), and select the choice *Order add and remove menu*. Press **Alt-A** (Add), then press **D** to duplicate the choice. You will be prompted for a description to use. You might use a description like "Windows 3.x". When complete, return to the main selection menu (press Escape twice), and go into the new Windows 3.x choice.

Assuming this only goes to a DOS prompt, edit the AUTOEXEC.BAT file in the C: root directory. Add the line at the end of this file:

WIN

This automatically launches Windows at the completion of DOS processing the AUTOEXEC.BAT file.

If your Window 3.x selection from System Commander already boots directly into Windows, reboot and try the DOS selection. If the DOS selection also goes into Windows 3.x, edit the AUTOEXEC.BAT file in the C root directory. One line in the file will launch windows, typically just the word WIN. Remove this line so the DOS selection will not launch Windows automatically.

DOS/V (Japanese version of DOS)

DOS/V versions can be easily installed along with other versions of DOS in the same partition.

DOS/V's installation will erase System Commander's master boot record. This is not a serious problem. When the DOS/V installation completes, a reboot will skip System Commander and simply run DOS/V. To correct this, at the DOS prompt, switch to the System Commander directory. Next run SCIN, and select *Enable/Update* from the main menu. Now when you reboot, System Commander will save DOS/V along with all prior saved OSes. No loss of information occurs by DOS/V's quirk.

If you plan to install multiple versions or vendors of DOS/V, you will need to address other DOS/V files in the root directory. For example, DOS/V usually places several font files in the root. These are usually version specific, and must be handled to avoid overlap with the next installed DOS/V. Those files referenced from CONFIG.SYS can be moved to a unique directory and the CONFIG.SYS updated to point to the new location. Other files may need to be copied by System Commander before a specific DOS/V is launched. Specify those files to be copied using the Settings option (Alt-S), under the selection *File management menu*. On older versions of DOS/V there are usually many files to copy. Even though System Commander has only eight (8) file copy slots, you can use wildcards to copy many more files. For example, the file name *.FNT would copy every file with the extension .FNT.

Limitations from OS

- DOS/V must be installed in a primary FAT partition on the first drive.

Limitations

Boot Drive

Most PC based operating systems are written in a manner that assumes they will be installed and booted from drive C: (also referred as hard drive 0). System Commander cannot overcome this limitation. However, if the operating system allows it, System Commander can boot it from another drive. OS/2 versions 2.x, Warp and Linux allow installation and booting from any drive and even allow booting from a logical drive in an extended partition. Solaris and FreeBSD also allow booting from any drive's primary partition.

Be aware that Windows solves this problem by actually booting through files in a primary partition on drive 0, even if you tell it to install somewhere else. Therefore, System Commander simply treats Windows like another OS in a partition.

System Commander File Location

System Commander can be installed in a primary FAT, FAT32 or NTFS partition on drive C (also referred to as hard drive 0). The partition does not need to be the first partition on the disk. System Commander will install SYSCMDR.SYS, SCDOS.SYS, CHECKMBR.EXE and a few other files into the root directory as hidden system files. These files control the operation of System Commander, and must remain in the root directory. The active status of partitions as set by FDISK and the use of DEFRAG programs do not affect System Commander's operation.

Other files reside in the \SC directory on the root. If this directory is renamed or removed, a number of features such as the OS Wizard will no longer function.

Disk Compression

All System Commander files must be installed on the non-compressed boot drive. Remember that System Commander runs before any Windows/DOS or decompression software runs. This includes hidden disk compression methods used by DriveSpace, DoubleSpace, Stacker and DoubleDisk. If you are using multiple operating systems in the FAT partition, you would be wise to avoid disk compression altogether. Although not an issue with System Commander itself, different versions of DOS, Windows 95/98/Me, NT/2000/XP/2003 and Longhorn may be incompatible with disk compression software. Be aware, you are on your own if you attempt to use disk compression software!

Anti-Virus Software

System Commander must modify the Master Boot Record. In addition, it will swap out the MultiFAT boot record when different OSes are selected that are installed in the same partition. Some older Anti-Virus packages complain about both of these changes with a possible note about a possible boot sector virus or operating system change.

This is normal if you just installed System Commander or just changed operating systems. Instruct the virus-detection software that the operating system has changed, and it will save the new information without altering the boot sector.

If you have not changed the selected operating system and the virus-detect software all of a sudden pops up with a warning about the boot sector, you should be concerned that a virus may have attached itself to the boot sector.

One way to correct this is to simply reboot the system. System Commander will detect the change and ask if a new operating system was installed. If no OS was just installed, select **B** for Bypass. This forces System Commander to overwrite the boot sector AND hidden system files with new non-infected copies.

This should remove the virus from the system files, but other executables may be affected. Run your virus checking software to clean up other files that may be infected.

Special Partitioning Software (Disk Spanning)

In very rare situations, special software can make multiple disk drives appear as one very large drive. This is called disk spanning. The ability to span disks is not supported with the operating system's utilities, but requires special software and drivers.

If your system is set up with disk spanning, where multiple drives appear as one drive, do not use System Commander.

Some drives can divide themselves into two smaller drives. This hardware approach is not related to disk spanning and works fine with System Commander.

Speeding Up the Boot Process

There are a number of ways to dramatically speed up the booting process. The following tips can help speed the time it takes from when you press **Ctrl-Alt-Del** to when the System Commander OS selection menu appears.

BIOS Options

Some system BIOSes have options to speed up the booting process. Since there is no standard between vendors you will have to examine your specific setup program and menus to see if any provided options are similar to those described below. Setup is typically activated immediately after a reboot. Often a short description is presented, such as "Press **Del** for Setup". Older machines sometimes use special key combinations, such as **F1**, **Ctrl-Alt-Esc**, **Ctrl-Alt-Ins**, or **Ctrl-Alt-S**. Some laptops access setup by holding down the **Esc** key during bootup.

Some PC vendors do not offer any setup options that will help performance. At the other end of the spectrum, vendors like AMI and Phoenix often provide extensive options. Some OEMs who license BIOSes may remove some or all performance options in an attempt to reduce confusion to non-technical users or help reduce potential customer support.

Memory Test

Some BIOSes provide an option to skip the detailed test of all the memory in the system. This test can take a number of seconds depending on the system speed and amount of memory to be tested. Disabling this option will eliminate most of this delay. On most AMI BIOSes, this option appears under Advanced CMOS setup as *Above 1 MB Memory Test*.

Floppy Drive Seek

This option bypasses a seek operation during boot up. It is rarely necessary, since the first diskette drive access will perform the seek anyway. When disabled, it shaves 1 to 5 seconds off the boot process. On most AMI BIOSes, this option appears under Advanced CMOS setup as *Floppy Drive Seek At Boot*.

System Boot Up Sequence

Normally the BIOS attempts to boot from the CD drive, then the diskette drive. Upon failure, it then boots from the hard disk. This wastes another few seconds in the boot

up process. By selecting a boot sequence first using the hard drive, and only using the CD or diskette if the hard disk fails to boot, another 2 to 10 seconds are eliminated out of the boot up process. On most AMI BIOSes, this option appears under Advanced CMOS setup as *System Boot Up Sequence*.

To still allow booting from a diskette, we suggest adding the "Boot from A:" option as one of the OS selections if it does not already appear. To do this, press **Alt-S** (Settings), and select *Order add and remove menu*. Press **Alt- A** (Add) and press **R** (Removable), and then select diskette A.

Hard Disk Selection

Although difficult to change at this point, the hard disk and controller often have the biggest effect on the time required to boot.

Hard Disk Controllers

Older SCSI controllers often waste 20 to 60 seconds during the boot up process for initialization and checking for nonexistent SCSI devices. IDE controllers require no significant initialization time.

Disk Drives

A less significant factor is the performance of the disk drive. The faster the access time, the faster the boot process can proceed. System Commander will also appear faster if the SYSCMNDR.SYS and SCDOS.SYS files appear near the start of the disk and are not fragmented. Use a disk defragmentation program to minimize the load times for System Commander and operating system files.

Speeding Up DOS boots

In addition to using the tips from the prior section, the following suggestions can help speed up the DOS boot process.

In general, each item in your CONFIG.SYS and AUTOEXEC.BAT file, such as device drivers and TSRs slow the boot process. You might want to review these files to see if any unnecessary programs can be removed.

You can also add the line inside the CONFIG.SYS file for MS or PC-DOS version 6 or later:

```
SWITCHES=/F
```

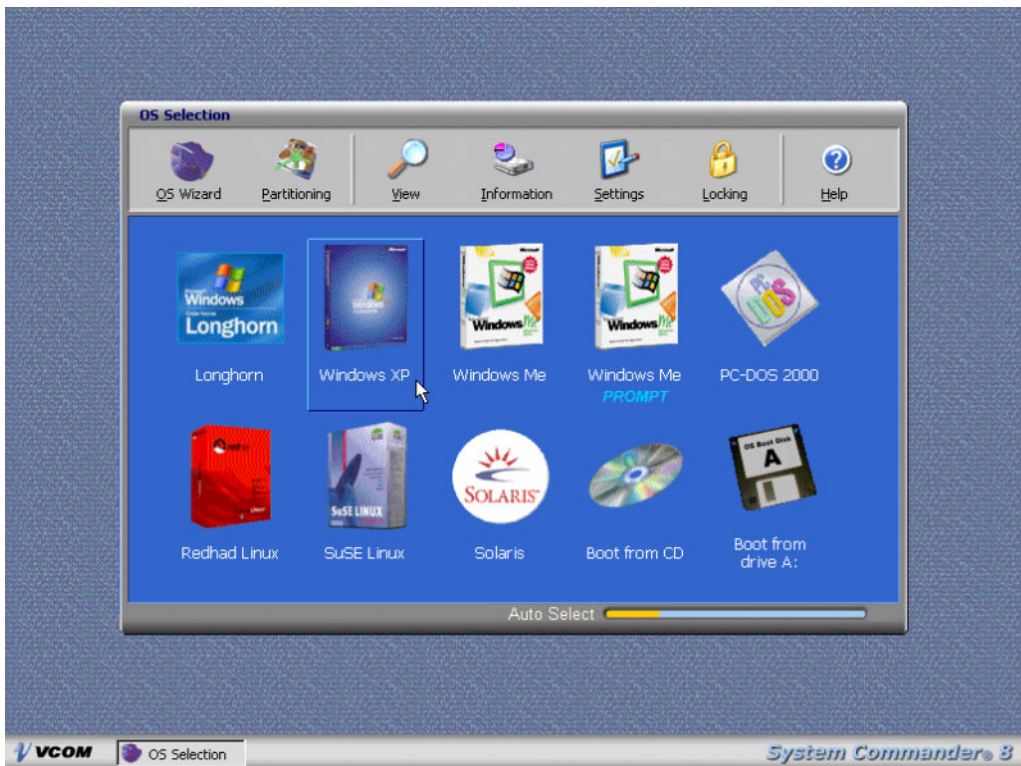
This eliminates a 2 second wait for detection of several bypass keys, such as F5, or F8.

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7: System Commander OS Options

Menu Options

When the System Commander option screen appears after a re-boot, it shows all of the operating system choices. The menu might appear as:



You can make a selection by highlighting an OS selection and then pressing Enter, or clicking the left mouse button. To select a System Commander option from its menu bar, mouse over the selection and left-click or hold the Alt key down and press the desired underlined letter. For example, press **Alt-S** for Settings.

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Functions available include:

OS Wizard Automatically prepares your system for a new operating system installation. Manual options are available to create and resize partitions (press **Alt-O**).

Partitioning Use the Partition Wizard to perform various automatic or manual partitioning tasks (press **Alt-P**). See Chapter 13 for complete details.

View Toggle different views of the OS selections. (press **Alt-V**).

When extra information is shown, the drive and partition numbers are also shown. An "e" appears after the partition number if the partition is an extended partition handling one or more logical partitions. An "m" appears after the partition number if the selection is an MBR file load. Other letters may appear after the number; consult the online help (press **Alt-H** or **F1**) for more information.



Tip: With some operating systems, the OEM name is cryptic or misleading. Do not rely on it. See Inaccurate OEM names on page 128 for more information.

Information Shows primary and logical partition information for the drives on your system (press **Alt-I**). While viewing disk information, move the highlighted selection bar to see detailed information about each partition and see the drive letter assignments for the selection. Sub-functions of the Information screen include:

Help for help about this screen (press **Alt-H**).

Empties to see empty partitions (press **Alt-E**)

View to toggle the type of information (press **Alt-V**)

Settings Use this menu for setting timeout options, adding and removing OS selections, passwords, descriptions, icons and many other features. See Settings, later in this chapter for complete details (for Settings, press **Alt-S**).

Locking Toggle the Locking security option as locked or unlocked (press **Alt-L**).

This option will only appear when passwords are enabled, and the option *Allow to turn security on/ off?* is set to YES.

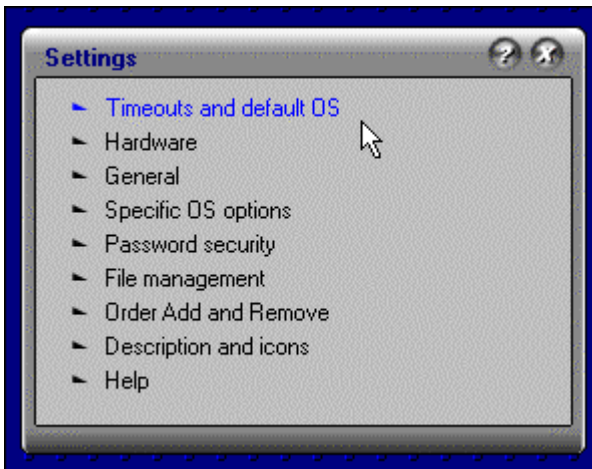
This option is handy when you would like password security active in some situations and inactive in other situations. For example, a laptop

used in the office might not need password security, yet when traveling, the laptop could have password security active.

- Help** Display help about System Commander or turn off Tips. (press **Alt-H** or **F1**).
- Color** This option lets you change the OS selection color style (press **Alt-C**). Color options are only available when graphics is off and 3D style is selected.
- Back** This minor option does not appear on the menu. It allows you to view the background screen prior to System Commander appearing (press **Alt-B**).

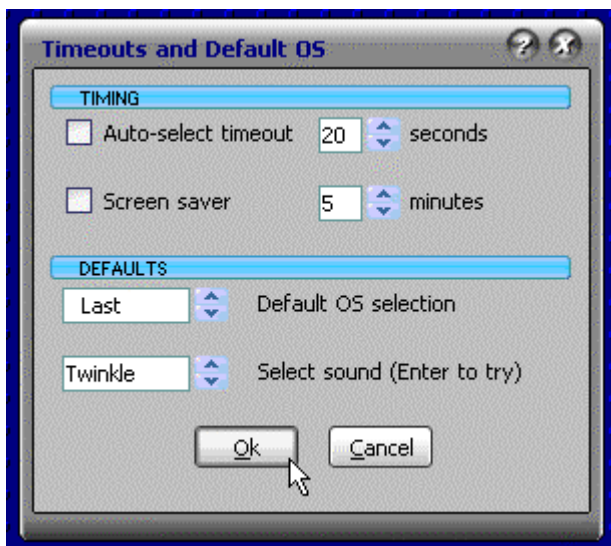
Settings Menu

The settings menu is accessed from the OS selection menu by left clicking on Settings or pressing **Alt-S**. Use Settings to select from a number of System Commander options and features. The settings menu appears below.



Timeouts and Default OS Menu

This menu provides options to set the timeout delay, default OS, and screen saver options. The Timeouts and Default OS menu appears as



Auto-select timeout - This indicates if you wish to have System Commander automatically make a selection after a preset time. Set the number of seconds you wish to wait before the default OS selection is made.

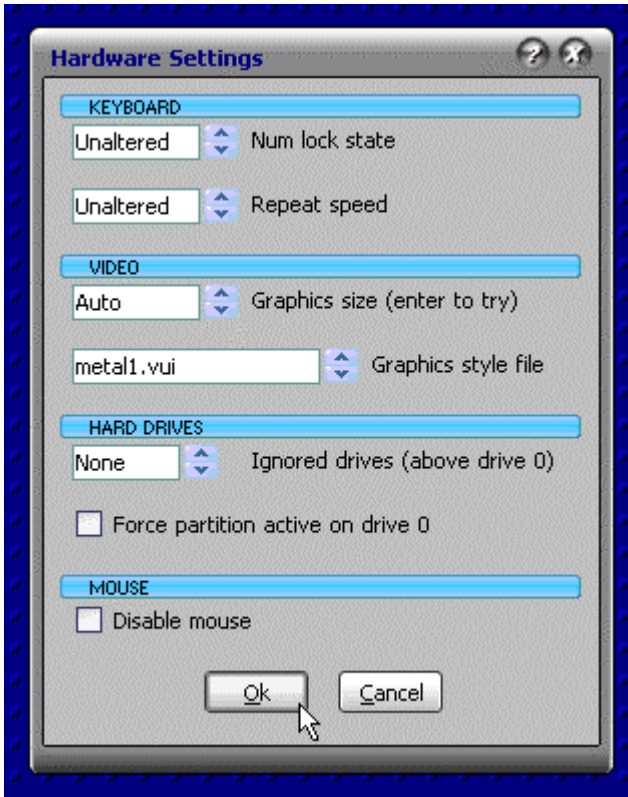
Screen saver - Specify screen saver option and the number seconds of to wait before activating the screen saver. In graphics, the screen will go blank when activated. Press any key or the mouse to restore the screen.

Default OS selection - Specify the default operating system after a reboot. Select Last to remember the last selection made. Choices A to Z represent the OS choices shown in the detailed View mode (i.e. A for the first OS choice, B for the second OS choice, etc.).

Select Sound - Select QUIET or any of fifteen different sounds. When System Commander boots up, it issues the selected sound. Press Enter to hear the current selected sound.

Hardware Settings Menu

Use this menu to change keyboard, video, drive or mouse settings. This menu appears as:



Keyboard Functions

Num lock state - Specify the num lock state after you make an OS selection as Unaltered, On or Off. This is useful to override the BIOS default choice.

Repeat speed - Specify how fast the keyboard repeats a held key as Unaltered, Fast or Fastest. This is useful to speed the up keyboard operations.

Video Functions

System Commander provides both graphics and text modes. Graphics are only available with video cards that correctly implement the VESA standard, as most do. Text modes are available on all systems.

Graphics size - Set to Off for text mode. For graphics, use Auto or a specific resolution for your system. Auto will default to 800x600 resolution if available or 640x480 when not available. When Auto is selected on most LCD laptops, the resolution will be set to the actual LCD resolution.

Support for a higher graphic resolution will depend on your video card and monitor. Some video cards only support up to 800x600 (including some new ones). These cards are typically designed for Windows. They only support higher video modes through a Windows device driver, which is not usable when System Commander runs.

Graphic style file - Select an available graphic user interface file to control the visual look and feel. Metal1.vui is the default choice, but you can choose from a number of different styles. Some styles require at least 800x600 resolution and are not available at 640x480 resolution.



When in text mode only, the following options are available to improve the text mode visual appearance:

Text style options - Select from various visual styles, from ordinary text, to several improved text mode styles (2D and 3D). These text styles also have an option to allow European characters (EURO).

Laptop style override - Most laptops have a single fixed resolution. Laptop style overrides can often make System Commander's text look better. For 640x480 screens, we recommend using the option 8x16. For higher resolution screens, you might try the 9x19 selection. For non-laptops, the "NO" option is best.

Stretched display - Many newer laptops will stretch and distort lower resolutions to fit the fixed LCD display. While this will fill the entire display area, it results in very poorly formed characters and distorted graphics. This option is used to turn off stretching (not available on all laptops). Four options are available - Unaltered: makes no changes, No: turns off stretching, Yes: activates stretching, and Auto turns off stretching while in System Commander, but turns it back on at exit. This option only affects flat panel displays like LCDs.

Hard disk functions

Ignore drives - Specify drives to be completely ignored. This is useful for drives, which do not function properly without special device drivers. For example, some obsolete hard cards are read-only until a device driver is loaded.

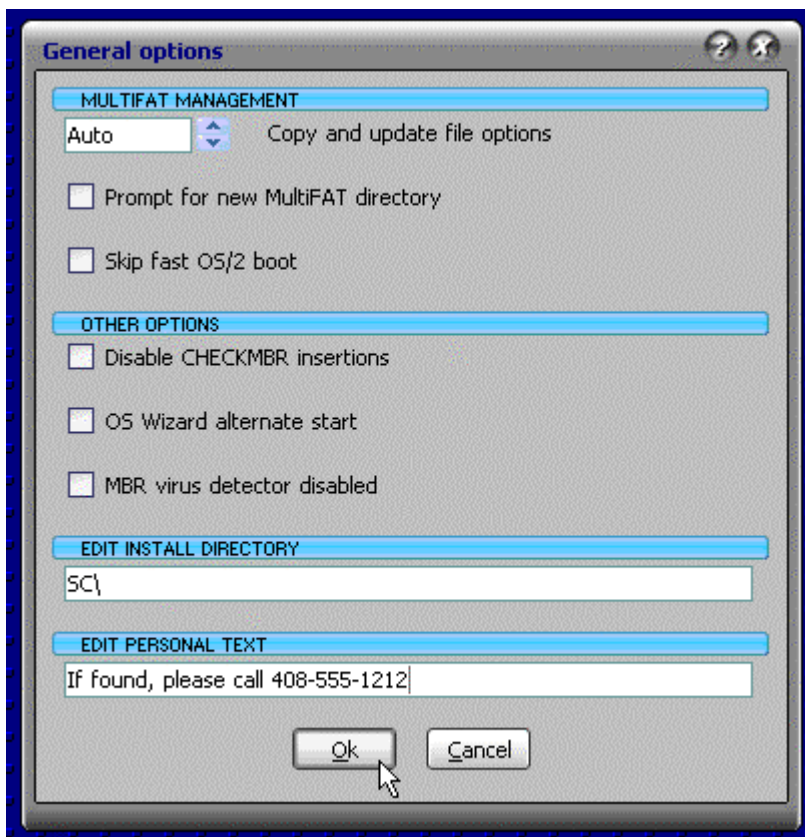
Force partition active on drive 0 - Depending on the OS choice and the OS drive location, it may be normal to have no partitions marked active on the first drive. In very rare cases, the system BIOS detects this as a fault and prevents normal bootup. This option can be set to insure at least one partition is active on the first drive. If you do not get any BIOS error messages, do not set this option.

Mouse

Disable mouse - By default, System Commander supports most mouse devices. This includes serial mice, bus mice, and those that use a PS/2 port (motherboard). If you do not use a mouse, you can save about 500 milliseconds during the boot process by turning off the mouse detector. USB mice are only supported when the BIOS offers legacy mouse support.

General Options Menu

This menu provides options not specific to a selected OS. If System Commander is installed into NTFS or FAT32 virtual mode, a number of options are not applicable and will not appear.



General options affect overall operation. Options include:

Copy and update file options - The file management system is set up to copy and maintain a number of files for each OS in the MultiFAT partition. Some changes are prompted, while others happen automatically. Normal operation occurs when the "Auto" option is set.

To help debug file management issues, this option can be set to "Prompt all". This forces a prompt for every file copy. You can elect to proceed with the copy or bypass it. The prompt also shows the source and target of each file copy.

Hidden system files (like IO.SYS) and any file deletions you include on the file management menu are handled normally and are never prompted.

When a different OS in the MultiFAT partition is selected, hidden files and configuration files are copied. The normal operation will skip a file if the name, date, time and file size are all identical. Select "Always copy" to force a copy, even if the files appear identical.

Use the option "Prompt©" if you want both the Prompt All option and the Always copy option active.

Prompt for new MultiFAT directory - Not selected is the default. In this state, when a new operating system is detected at boot time, the system files like AUTOEXEC.BAT and CONFIG.SYS are stored in a subdirectory under the **\SC** subdirectory. Set this option to have System Commander prompt you for a directory name when a new OS is saved rather than automatically doing so.

Skip fast OS/2 boot - The default state is off. In this state, System Commander will emulate OS/2's dual boot operation when OS/2 is installed in the MultiFAT partition. This is a faster way to switch between Windows/ DOS and OS/2. With the option set, System Commander will not swap CONFIG and AUTOEXEC files with those in the \OS2 directory. This option might be used when multiple OS/2 configurations are desired in the MultiFAT partition and the files to be copied are explicitly specified in the file management menu.

Disable CHECKMBR insertions - The CHECKMBR program is normally inserted into the AUTOEXEC.BAT file. CHECKMBR verifies that System Commander's MBR has not been destroyed by a new OS installation and corrects the condition if necessary. CHECKMBR is not a TSR.

OS Wizard alternate start - If the OS Wizard stops with the message "OS Wizard is analyzing your system...", try setting this option to use an alternate startup method. Normally this option is automatically set as needed.

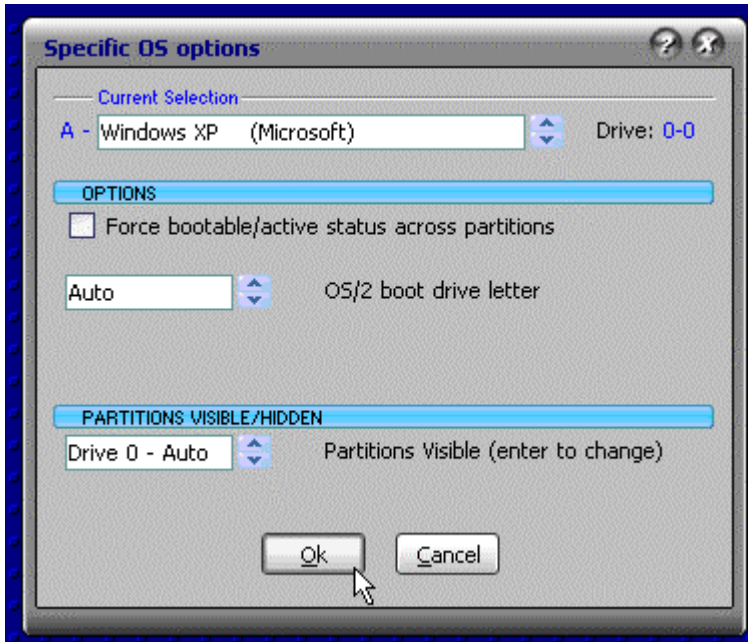
MBR virus detector disabled - Normally System Commander will perform a virus check during every boot. The detector does not look for any specific virus, but catches system changes that help hide a virus and allow it to multiply and infect files. If a possible virus is detected, a special warning screen appears. This screen has additional information and help to determine if a virus has infected the system, and allows you to remove the virus. This option can be used to disable this feature.

Edit Install directory - Specify the directory where key System Commander files reside for OS Wizard. In addition, when saving files for a new OS, this is the parent directory where the files are stored. **C:\SC** is the installation default. The directory must reside on the C drive and must be only one subdirectory deep, and it must already have all of the necessary System Commander files.

Edit personal text - Edit your personal text. This text appears on the About screen. You may wish to include your phone number and/or driver's license as identification. This can help in the recovery of your computer if it is lost or stolen. This information is even accessible when a password is required at bootup.

Specific OS Options Menu

This menu controls options specific to each OS selection. The menu appears as:



Specific OS options only affect the current operating system selection shown. In text mode only (not shown), use **PgUp** and **PgDn** to change the current selection. If you change the current selection, any changes made are saved as if you had pressed Ok. Options are normally left set at Auto, the default setting.

Force bootable/active status across partitions - Most operating systems expect to see a single partition bootable, with all other primary partitions marked as non-bootable. This is the default state with Auto selected. When this option is toggled to override on, every primary partition which matches the selected partition type, is marked as bootable. The only OSes that require this unusual situation are SCO Unix System V and Novell's UnixWare. Other operating systems such as DOS, Windows, OS/2, NetWare, and other Unix variants should leave this option at Auto.

OS/2 boot drive letter - With Auto, the drive letter is automatically assigned for your OS/2 selection based on the position of OS/2 relative to other partitions. This option can override the automatic selection with a specific drive letter. The option has no effect on a non-OS/2 selection or OS/2 in the MultiFAT partition.

Windows 9x/Me boot style (not shown) - Windows can boot either to a normal graphics interface, or as an option, a DOS like prompt. With this option you can choose to use the default as set by the MSDOS.SYS file with the selection Unaltered. Two overrides, Graphics and Prompt, let you specify how Windows will boot up. This option is only available for Windows 9x/Me boot selections that reside in the MultiFAT. If you installed System Commander into NTFS or from Windows 2000/XP/2003 or Longhorn, MultiFAT is set off, and this option is not available.

You can easily have two menu choices for the same Windows, one that goes to graphics, and other that goes to a prompt. If this is not already set, go to Settings, Order Add and Remove, and press **Alt-A** (Add). Select Duplicate. If using Windows 9x, select *Same directory*, or if Windows Me select *Different directory*. This will make a new OS selection, but uses all the same files as the source duplicate. With Windows 9x, any future changes to configuration files are reflected in both selections, since they share the same files. Windows Me always destroys the configuration files in graphics mode, so we need to save the files separately.

Warm Reboot when CD selected (not shown) – When the selected choice is a CD boot, this option appears. If checked, when a CD boot choice is selected, an immediate warm reboot is issued. The BIOS will then look at the CD drive and boot the CD in the drive. This option is intended for older BIOSes that improperly implemented the CD boot specifications. These older BIOSes can only access the CD as a boot device if the CD is in the drive during the BIOS initialization process. You might check to see if the BIOS manufacture has an update available which corrects this deficiency.

Partitions visible - Normally, only one primary partition on each drive is active and visible at a time. System Commander provides automatic control over accessing partitions depending on the selection made and the type of file system. You can override automatic operation (Auto) and force a specific partition to be hidden or visible. Use help for additional information.

Password Security Menu

The password security menu allows you to set a wide variety of security features to limit access and protect your system. The use of security features is completely optional.



Tip: Although System Commander provides a high level of security; someone with sufficient technical knowledge, access, time and equipment can break through any computer security system. The best possible system security prevents physical access to your system in the first place!

Security Basics

When access is required through the password security system, the user enters the appropriate user name and password. The passwords are case sensitive, but the user names are not. This means the password ABC123 is not the same password as AbC123.



Tip: A special user in every system is Administrator. The administrator always has access to all features and OS selections. The administrator can also set up other users and rights for each user. The initial password for the administrator is *password*. We strongly recommend you change this to your own private password and record the new password in case you later forget it. Should you lose or forget your password, V Communications can provide an emergency master password unique to your copy of System Commander. **This service is not free, so DO NOT LOSE your password!** See Appendix F for more details on getting a master password.

Password Prompting

The default operation asks for a user name and related password before the OS selection menu appears. A valid user name and password must be entered to proceed. Once validated, the user is granted all privileges that were defined by the administrator.

To allow anyone limited access to your system, where no password is required, the AutoLogin feature is used. A special user name called **AutoLogin** is created. If desired, the AutoLogin user profile can assign specific OS choices and prevent setup access. When the system boots up, no password is requested, but the user is limited to the choices you granted.

This feature is useful for test systems where controlled access to some features is desired. It can also be used where a system reboot (such as caused by a power failure) will allow the system to boot to the desired choice automatically without requiring a password.

When using the AutoLogin feature, you might want to set a fixed timeout and/or a default OS choice that is not changeable by any user. These are made under the Settings menu, under the *Timeouts and Default OS* menu. The timeout value and default OS value is saved for each user.

To make changes to these values, you must

1. Login as an administrator.
2. Go to the AutoLogin user profile.
3. Set the option *Settings Menu Allowed* to YES.
4. Exit and make an OS selection.
5. Reboot the machine.
6. Enter the *Settings Menu*.
7. Set the desired settings under the *Timeouts and default OS Menu*.

To prevent the user from making changes or accessing setup, exit to the main OS selection menu and press **Alt-L** to specify a new user. Log in as the administrator. Go to the AutoLogin user profile and set the option *Settings menu allowed* to NO.

Access Protection

The Access Protection feature prevents any kind of access to your system. When activated, it prevents both diskette drives from operating, and locks out all hard disks from use (other than System Commander). The password must be correctly entered to turn off access protection during any login.

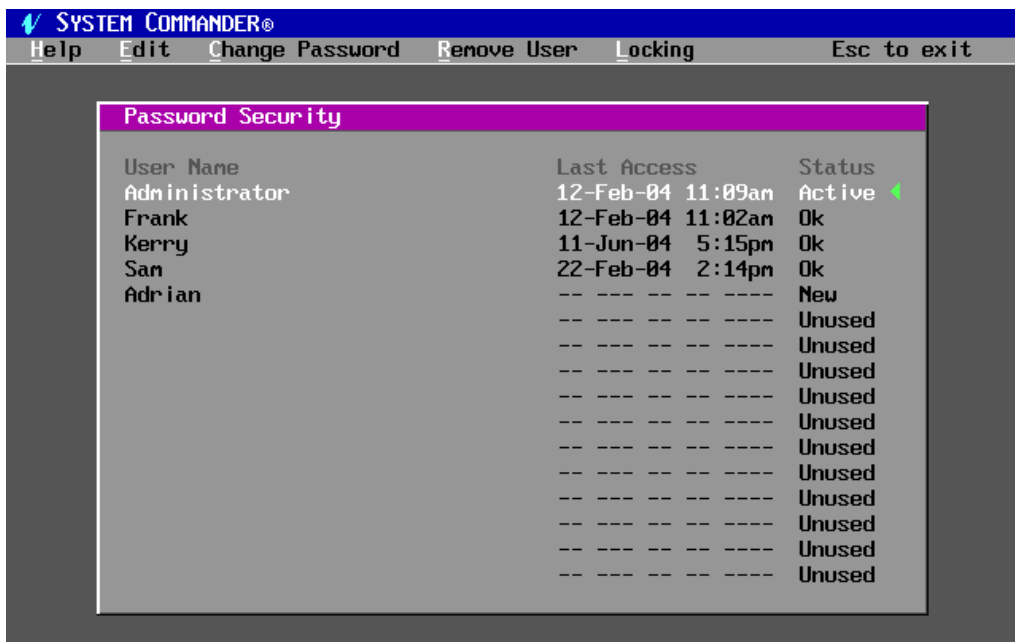
To activate access protection, have a password set within the password security menu. From any OS, reboot to System Commander. When you are prompted for the login, select Shutdown (**Alt-S**). Access protection will be set and you will be prompted to turn off the system.

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If access protection is not active, it is automatically activated after four (4) failed attempts to login.

System Administration

When selecting the password security menu, the following selections appear when you are the administrator, or if passwords are disabled. This screen shows you all the current users and the last time the user accessed the system.



The status column shows one of the following states:

Active	The user currently logged in
OK	The user is a valid user
New	A user who has never logged in
Expired	The user is no longer allowed access
Unused	An available slot for a new user

From this menu, you can issue the following commands:

Help	Get additional help (Alt-H)
------	--------------------------------------

Chapter 7: System Commander OS Options

Edit	Edit the user profile information on the highlighted line (Alt-E or Enter)
Change Password	Specify a new password for the highlighted user (Alt-C)
Remove User	The user information is deleted (Alt-R)
Locking On/Off	Activate or deactivate the password security system (Alt-L)

When editing the user profile, a new screen appears:

User Profile	
User login name	Frank
Last access	12-Feb-04 11:02am
User expires	--- -- --
Password does not expire	--- -- --
Password change allowed	YES
Setting menu allowed	YES
System administrator privileges	YES
Allowed to turn security on/off	YES
Force password change at next login	NO
Minimum password length	5
O/S access menu	

From this screen the following options are available:

User login name - Enter the user name. Each user has a unique password. This allows different layers of control for different users of this computer.

Names can be up to 32 characters long and can include spaces and most symbols. User names are not case sensitive.

Two special user names are available. The user name Administrator is reserved for administrative functions and cannot be changed. The user name AutoLogin is reserved for the AutoLogin feature.

Last Access - This is an information only line. It shows the date and time the system was last accessed by this user.

User expires - Set the optional date and time when this specific user can no longer access the system. If this field is left blank, no user expiration date is set. For instance, for year 2006 enter a two-digit year 06.

Password expires - Set the optional number of days that the user can use a single password. After the number of days goes by with the same password, upon the next access of this user, the user is prompted to change the password.

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Password change allowed - When set to YES, the user is allowed to change the related password. When set to NO, the user is prevented from changing the password.

Settings menu allowed - When set to YES, the user is allowed to enter the settings menu.

System administrator privileges - The user can access these screens to add, remove and change user security information. When this option is set to NO, the user cannot access the password security menus, but may be allowed to change the one password associated with the user.

Allowed to turn security on/off? - This option, when set to YES and a password is used, allows you to instantly toggle the password on and off from the main OS selection menu. This is handy for a single laptop user, who may not want to bother with a password while at work or at home, but needs password protection when out on the road.

Force password change at next login - Once this user logs in, the user will be prompted to enter a new password.

Minimum Password Length - This is the minimum number of characters required in a new password for this user.

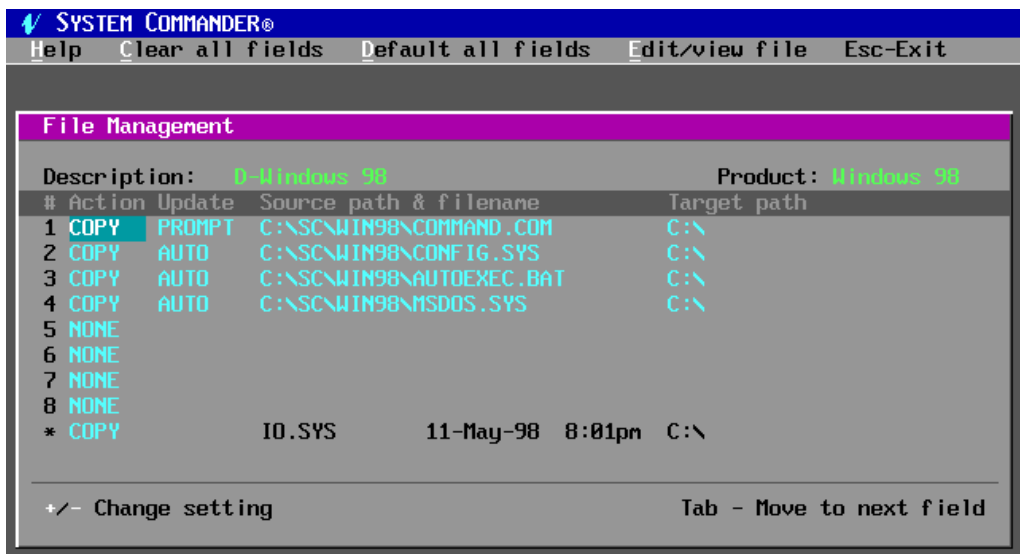
Operating System access menu – You can select which operating systems are accessible by the user. Any user that has System Administrator privileges will always have access to all OSes. When a user logs on that does not have access to a specific OS selection, the selection is shown in gray.

File Management Menu

This secondary menu provides options specific to the currently selected MultiFAT. If the current selection is not a MultiFAT choice (i.e., not an OS in the FAT partition where System Commander is installed), the next MultiFAT entry is selected. If the MultiFAT is inactive, the file management menu is not available.

When a new OS is installed, System Commander will automatically manage files, such as CONFIG.SYS, AUTOEXEC.BAT, COMMAND.COM as well as hidden files. These files are shown on the file management menu.

The file management menu will appear similar to:



You can add, remove or change entries. For example, under Windows 95/98, some users do not have an AUTOEXEC.BAT file, and may wish to delete CONFIG.SYS, since it is only used to process AUTOEXEC.BAT. In this case, AUTOEXEC.BAT and CONFIG.SYS could be set to none.

To move to different entries, use the following keys:

TAB - Move to the next field

Shift-Tab - Move to the prior field

Up or Down - Move up or down

To select a different MultiFAT entry, use **PgUp** or **PgDn**.

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For the first eight entries, you can specify the following actions (while in the action or update columns, use + or - to change).

NONE	Take no action for this entry
DELETE	Delete the target file
RENAME	Change the file name in the directory specified. When the OS is selected, the file is renamed from the source filename to the target filename (the paths must be the same). When a different OS selection is made, the target filename is renamed to the source filename.
RESTOR	Restore the filename or directory to the specified name. This is similar to RENAME, but it only renames from the source to the target. It will proceed without an error if the specified file or directory does not exist or cannot be renamed.
COPY	Copy the specified file from one directory to another. Wildcards (the * character) are allowed in the source filename to copy up to 128 files in one entry. If the target subdirectory does not exist, it is created.

When COPY is selected, you can specify 3 update options, using + or -, which have the following effects:

NO	No updates, just perform a copy.
PROMPT	Normal copy, but when switching between OS selections, if the target file is newer than the source file, you are prompted to update the older file.
AUTO	Normal copy, but no prompting occurs if the target file is newer than the source file. The older file is updated.
IGNORE	Same as "Prompt" except if the file does not exist, no warnings or errors occur. This is used when a file might exist, such as the NTBOOTDD.SYS file under NT/2000/XP.

Other File management options:

Clear-All - Set all actions to NONE, except for the hidden file entries, which remain unaffected (**Alt-C**).

Defaults - Reset all entries to the System Commander defaults. You will be asked for a source subdirectory to use, but it does not need to exist at this time (**Alt-D**).

Normally spaces are not allowed in a filename. OS/2 in the DOS partition uses two file names with spaces for extended attributes. These filenames are "EA DATA. SF" and

“WP ROOT. SF”. If you need to enter a space in a filename, while holding the Alt key down, press 127 on the numeric keypad.

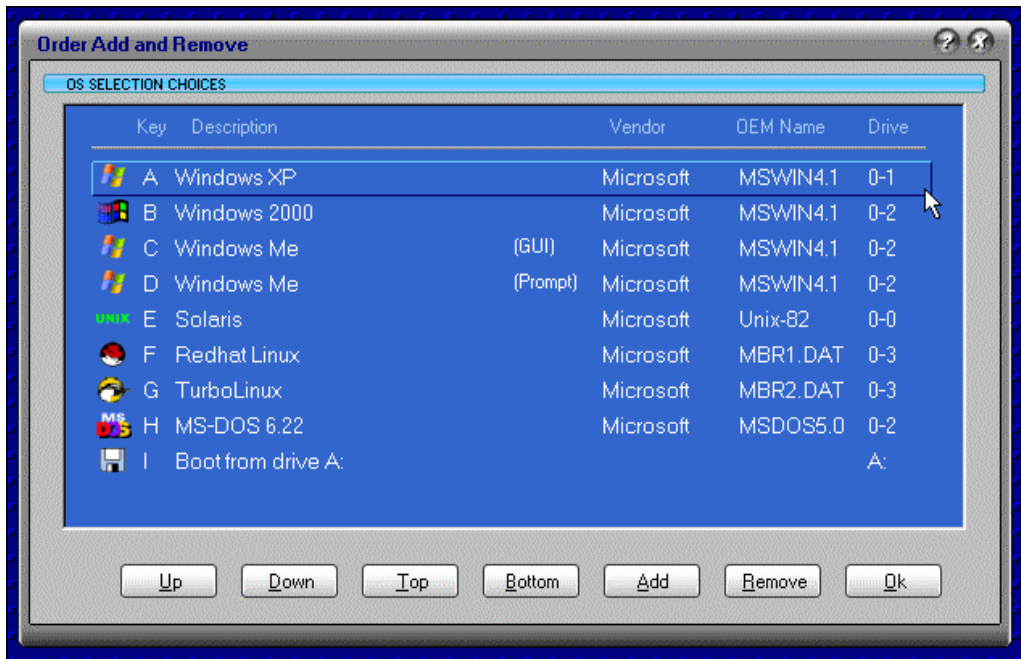


Tip: To help troubleshoot file copy problems, see the option *Copy and update files*, in the General Menu, earlier in this section.

Alt-O - Display detailed help on setting up multiple configurations for OS/2.

Order Add and Remove Menu

Use this menu to change the order of selections, and to add or remove selections. The order menu is similar to the OS selection View:



Changing the order of OS selections

Move a highlighted selection up, down, or to the top or bottom. Upon exit of this menu, the new order will appear on your OS selection menu.

Adding a new selection to the menu

Press **Add (Alt-A)** to add a new selection to the menu. You can choose between adding a duplicate of the current MultiFAT selection (if the highlighted selection is a MultiFAT), a primary or logical partition, a master boot record (MBR), or add a selection to boot from removable media such as a CD or diskette drive A or B.

When adding a primary or logical partition, you will be presented with a list of all partitions. Move to the desired partition, and press **Alt-T** to toggle the bootable status to Yes.

For the rare case of MBR boots, press **Add (Alt-A)** at the Order, add and remove menu, and select MBR (see page 168 for more information).

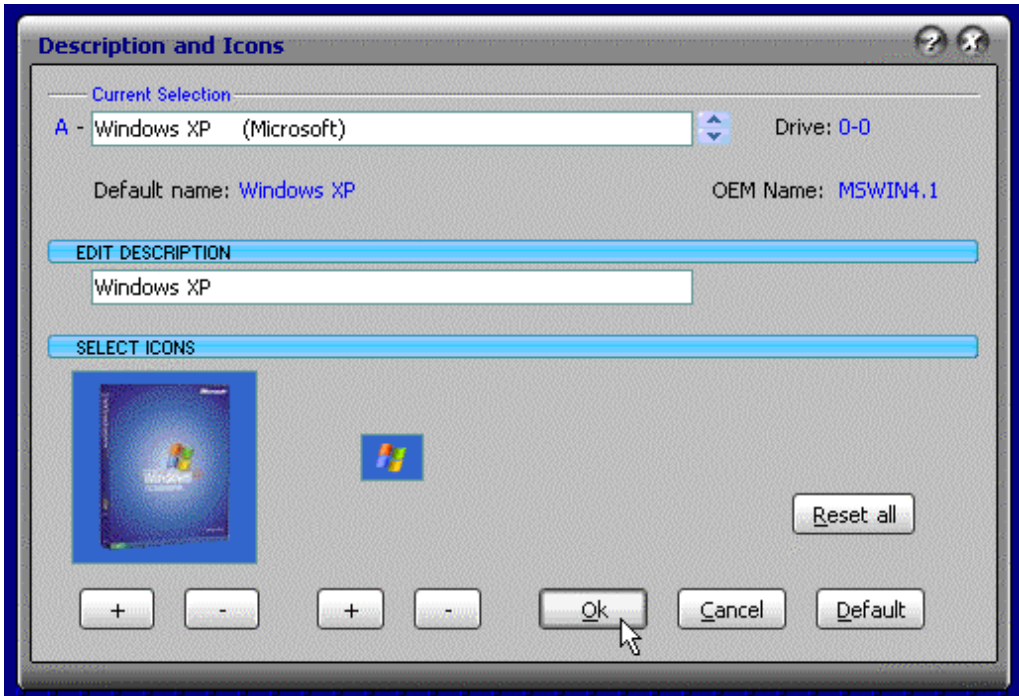
To add a boot from CD option, select **Add (Alt-A)**. Select the choice **Removable**. Next choose **CD**. If your system BIOS supports controlled CD booting, the option will be added. Some system BIOSes do not include this feature, and additional instructions will be provided on how you may be able to have a CD boot selection. We've found that a few systems incorrectly implemented CD boot support, and when a CD boot choice is selected, it may boot a different device than expected. You might check to see if the manufacture has an updated BIOS to correct this issue.

Removing a selection from the menu

Press **Remove (Alt-R)** to remove the highlighted entry. At the removal confirmation question, select **OK**.

Description and Icons Menu

Use this menu to change OS descriptions, icons, or reset all descriptions to default names. The menu appears as:



Description and Icons only affect the current operating system selection shown. In text mode only (not shown), use **PgUp** and **PgDn** to change the current selection. If you change the current selection, any changes made are saved as if you had pressed Ok.

Changing the Description

You can edit the description, or select **Default** to restore the description to the default name shown in the current selection area. In graphics mode only, use of an open parenthesis "(" will blank any remaining text in the description when shown on other menus.

Icon Control

Select the icon you would like associated with the current OS. In Graphics you have two icons to set, and in text mode, a single icon.

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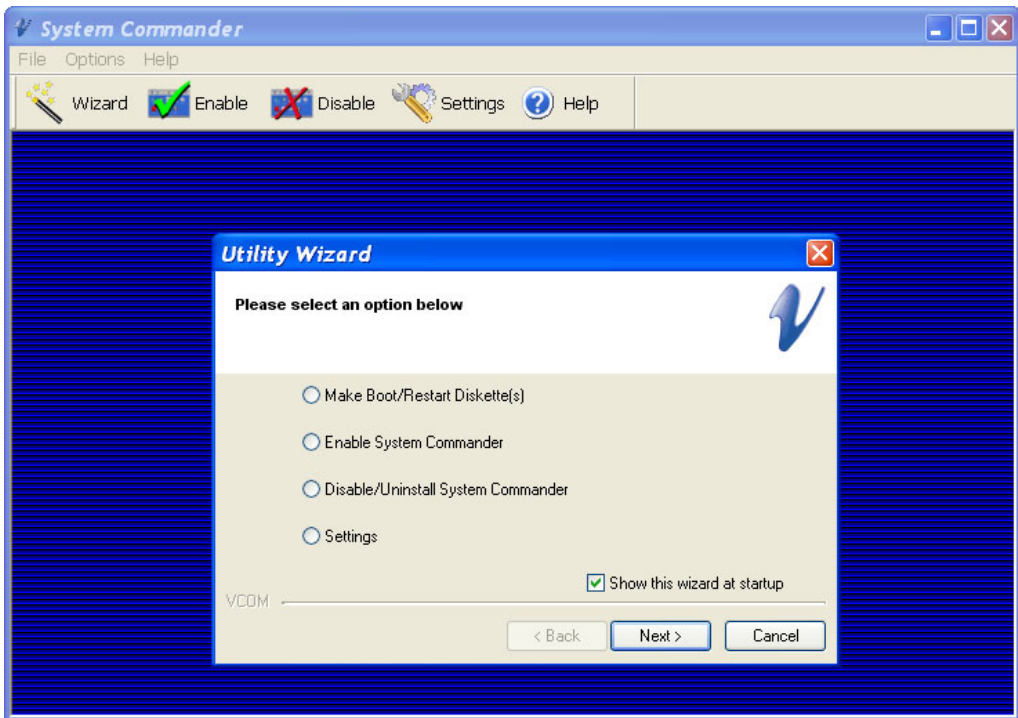
Reset All - Use this option to reset every OS description and icon to our standard defaults. A confirmation is required before performing this reset.

8: Utility Programs

Windows Utilities Console

The Windows Utilities Console lets you enable, disable, control settings, create boot diskettes, and access the manual and more. The Utility Console is available when System Commander is installed under any Windows.

To start the Console program, click on *Start*, *Programs*, then *System Commander*. The console appears with the Utility Wizard:



If you prefer not to start with the Utility wizard, uncheck the option “Show this wizard at startup”.

Utility Wizard

Select one of the desired options as follows:

Make Boot/Restart Diskettes - Use this option to build the System Commander Utility diskette 1 and/or the System Commander Restart diskette 2. These are the same diskettes that you would normally create during the installation. For retail versions, these programs are also available from the System Commander boot CD. If you install a new update of System Commander, a new set of diskettes should be made, and the old ones discarded.

Enable System Commander - Select the Enable option to update the boot records needed to run System Commander. All prior System Commander user options and settings are unaffected.

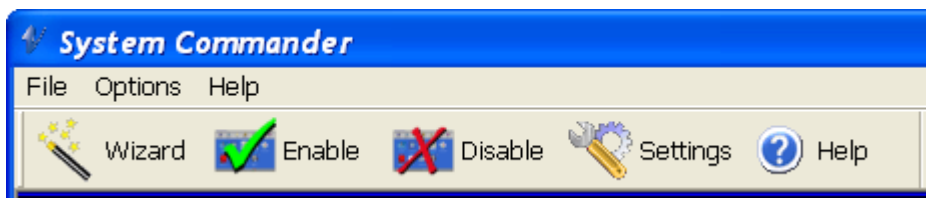
Disable or Uninstall System Commander – This option will temporarily disable or uninstall System Commander. The following menu provides the options to disable or remove. Disable will restore the original master boot record, which was saved when System Commander was installed. You can later use the Enable option to restore full System Commander operation. Uninstall disables and removes System Commander files.

At this point, System Commander is no longer in the bootup loop, and the OS you last booted from will boot directly. After a disable or uninstall you can boot from a Windows boot diskette and run Windows FDISK to specify a different active primary partition to boot from.

Settings – Change key hardware or general settings in System Commander. These are the same settings that are accessible from the OS selection menu at boot time.

Menu and Toolbar Functions

You can also access all wizard settings and more from the menu and toolbar.



For example you can Enable or Disable System Commander right from the toolbar.

From the menu bar, functions available include:

File

Enable System Commander

Disable/Uninstall System Commander

Exit

Options

Make Boot/Restart Diskettes – The restart diskette is used to complete an operation in the event of a power-failure or reset during a critical partitioning operation.

Make Boot/Restart CD – This instructs you on making a System Commander bootable/restart CD from our ISO image. A CD burner and burner software that supports ISO images are required.

Hardware Settings

General Settings

Special – Used to extract or insert files into the virtual System Commander partition

SCOUT Diagnostic – Get information for technical support.

Utility Wizard

Help

Manual – View the pdf manual.

OS Wizard Quickguide – Instructions for each specific OS after the OS Wizard completes preparations for the new OS.

Check for updates – See if any updates are available.

VCOM on the Web - Link to our home page on the web at:

www.v-com.com/intro.html

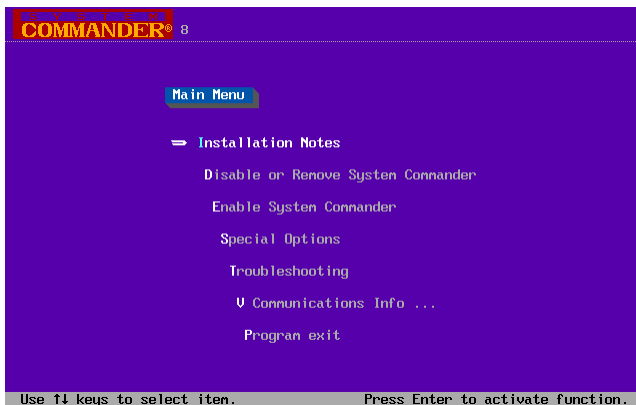
About

DOS Utilities

Several programs are also available which run in a Windows 95/98/Me DOS box, from DOS, or can be accessed from the System Commander Boot CD and Utility disk 1. If you are using Windows, we recommend using the previously described Windows Utilities instead.

Using SCIN - Installation & Configuration

To read the latest installation notes and change the configuration of System Commander, run **SCIN** from the System Commander directory.



It provides seven options:

Installation Notes - View important notes about System Commander and any new notes not in this manual.

Disable or Remove System Commander - To temporarily disable or uninstall System Commander, select this option. From the submenu, select disable or remove. Disable will restore the original master boot record, which was saved when System Commander was installed. You can later use the Enable option in SCIN to restore full System Commander operation. Remove performs a disable and removes the System Commander files.

At this point, System Commander is no longer in the bootup loop, and the OS you last booted from will boot directly. After a disable or remove you can run Windows FDISK to specify a different active primary partition to boot from.

Enable System Commander - Select the sub-menu Enable option to update the master boot record. All prior System Commander user options and settings are unaffected.

Special Options - These provide less frequently used options. The next section details these options.

Troubleshooting - Use this section to get detailed solutions to problems. It also contains details on common questions and answers.

V Communications Info - See more about V Communications. This option also presents System Commander information such as the version and serial number.

Program Exit - Return to a prompt.

Special Options

The following menu choices are available under Special options:

Make Utility Diskettes

Use this option to make the utility and restart diskettes. The utility diskette holds various System Commander utilities such as SCIN.EXE, SCOUT.EXE, CHECKMBR.EXE and SCDISK.EXE. It also holds duplicates of important data files for the uninstall option, such as the saved MBR.

The restart diskette allows continuation of an interrupted partitioning operation, such as the OS Wizard or partition resize operations, should a power failure or reset occur during these critical operations. If you have the bootable System Commander CD, it includes all the utility programs and partitioning restart programs, so additional diskettes are not normally necessary.

Change MultiFAT option

The MultiFAT feature allows having multiple OSes in the FAT partition. This feature automatically defaults on when installed from Windows 95/98/Me or DOS, but can be overridden from this option. If you only need one FAT/FAT32 based OS, and do not plan to add Windows, Longhorn, OS/2 or DOS in the MultiFAT partition, you can safely turn this option off. There is no real benefit to having the MultiFAT option set off.

Specify non-compressed boot drive

If you are using disk compression, including DoubleDisk, DoubleSpace, Stacker, or SuperStor, the **non-compressed disk must be identified** so System Commander can properly install its files. The non-compressed drive is rarely C. Often the drive has

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only a few files and holds one very large hidden file representing the compressed disk.

Alter the current boot record serial number

This option is used if you need to create two (2) or more System Commander menu choices for the identical operating system. This option simply changes the boot record serial number so that the boot record appears different to System Commander.

When the system reboots, System Commander detects the change and asks if you wish to save the new OS. Saving the new OS adds a second entry for essentially the same OS. In most cases, we recommend using the duplicate feature built into System Commander. At the OS selection menu, press **Alt-S** (Settings), and select the *Order add and remove menu*. Highlight the desired selection, and press **Alt-A** (Add). Then press **D** for Duplicate.

Restore DOS boot record

System Commander provides this disk recovery feature should a virus, system crash, or program defect destroy the current DOS boot record. Often this extremely serious fault cannot be corrected with most hard disk tools available today.

This option is only used when a "Boot" error number 2, 3, 4, or 5 occurs, indicating there may be a defective DOS boot record. In this situation, even booting from a DOS diskette does not provide access to the C: drive.

This option only functions when run from the utility diskette you made during the System Commander installation.

Diagnostic Checks

Three (3) diagnostics are available to validate the partition tables, check the DOS boot record information, and check for proper access to key System Commander files from the BIOS. Each check will indicate if the test passed (validated), show any warnings, or show if the test failed.

Any failures indicate potential problems that may prevent System Commander from operating properly. Warnings are less serious in nature, and will not usually affect System Commander operation. Press **Alt-H** or **F1** for additional help and explanations of error messages.

Transfer System (Advanced SYS)

This option replaces the limited DOS and Windows 95/98 SYS command. It transfers the bootable OS from a diskette in drive A to hard drive C. It supports all DOS versions 4.0 to 7.0 from Microsoft, IBM, Caldera and Novell, as well as Windows 95/98.

Unlike the SYS Command, the Transfer System option has the following features:

- Fixes a bug in all DOS versions that prevent DOS from booting past the 2 GB boundary on the hard drive.
- Corrects a number of limitations in the SYS command, including dealing with non-system files in the first two directory entries.
- Provides an option to perform selective portions of the system transfer.
- Extensive progress reports and error detection with explanations.
- Detects a damaged MSDOS.SYS file on a Windows 95/98 boot diskette and creates a new valid MSDOS.SYS file (Windows 95/98 boot disks created by Windows 95/98 usually have a bad MSDOS.SYS file).
- If no AUTOEXEC.BAT or CONFIG.SYS exists, an option is provided to create generic ones.
- It works when SYS fails!

SCIN Command Line Options

The installation and information program SCIN has a number of options to control the screen colors and display. Options are normally set automatically, but in unusual cases, can be overridden. These options are memorized the first time used, and are not required again.

color	standard colors
mono	monochrome colors
lcd	monochrome for LCD screens
grey	grey scale colors, for VGA greyscale monitors
-v	prevent VGA fonts and custom colors
+v	allow VGA fonts and custom colors (default)

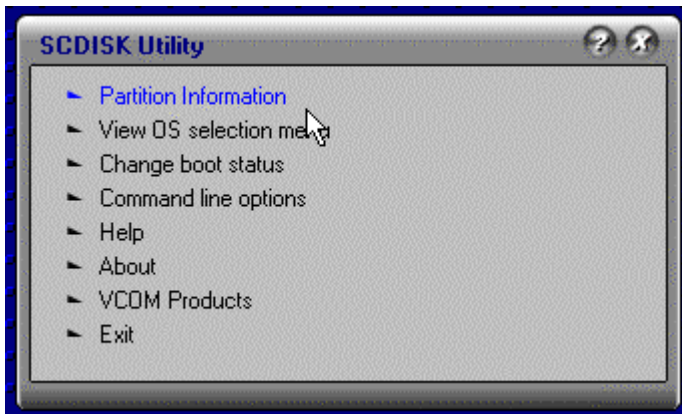
For example, to change to mono, without VGA fonts, enter: C:\SC > **scin mono -v**

Using SCDISK

The SCDISK utility allows you to examine disk information, view the current OS selections, preset some System Commander boot options, and preset the bootable partition for special OS installations. To use SCDISK, at a prompt, run:

```
C:\SC\ > scdisk
```

A menu of choices appears:



Use the Up and Down arrow keys to move to a choice, and press Enter to select. Press **Alt-H** to see help information. Press Escape to exit back to DOS.

Partition Information

Shows primary and logical partition information for the drives in your system. While viewing disk information, use the up and down arrow keys to move the highlighted selection bar and see detailed information about each partition and see the drive letter assignments for the selection. Subfunctions for partition information include:

Help for detailed explanations about this screen (**F1**).

Empties to toggle inclusion of empty partitions (**Alt-E**).

Detail to toggle the type of detailed information. Toggle between details about the highlighted partition and information about the highlighted drive (**Alt-D**).

View to show the contents of the currently selected boot record or sectors on the drive. For the boot records, you can select content or hex views.

In most cases, the primary partition's boot status is the internal System Commander boot status. This is shown with an asterisk following the boot status. If the SYSCMNDR.SYS file does not exist or is not readable, the boot status from the partition is shown.

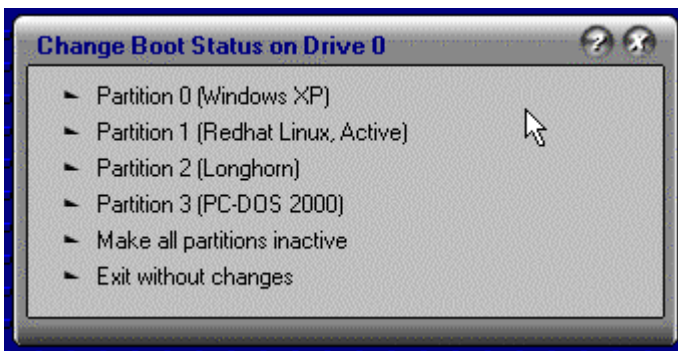
View OS Selection Menu

The OS selection menu shows available current OS selections. Although you can scroll through the available choices, you cannot make a choice from this menu. You can toggle the View information using **Alt-V** while at this screen. To save the screen to a file, press **Ctrl-PrtScn**. It may take 5-10 seconds to capture the screen.

Change Boot Status for OS Install

In some situations it is necessary to define one specific partition as bootable for the installation of certain operating systems, and hide all other partitions on that drive. With this option you can specify a specific partition on any disk as bootable, or specify all partitions on a disk as inactive (non-bootable) if required. The bootable status information is not used by System Commander and has no effect on System Commander's operation or which operating systems are truly bootable.

When selected the choices appear:



Select the desired option.

When changing the boot status for one of the primary partitions, all other primary partitions are hidden (except for extended and logical partitions). When booting from an OS installation CD or diskette, only the selected bootable partition will be visible. This protects your other partitions from inadvertent alteration.

When booting from the hard disk through System Commander, the hidden status is ignored. System Commander will function normally, and clear the hidden partition information.

Command Line Options

This shows command line options available for SCDISK. All command line options are case insensitive. Some of the command line options you may find useful include:

A to Z	Set the next default OS selection to the specified letter A to Z.
Boot	Issue a warm boot after all the command line options are examined. This is not intended for use inside Windows.
Dlimitn	Limit System Commander to the drive number specified and all drives with a lower number. For example, on a 3 drive system, the option "Dlimit1" will only look at the first drive for possible OS selections. The 2nd and 3rd drives are ignored.
No_Font	Turn off graphic option on the boot time portion of System Commander.
Timeout	Turn on the timeout at bootup feature, and set the timeout period to five seconds.
Wait	Turn off the timeout feature, so System Commander will wait for a user-entered selection.

As an example of using command line options, the following line will set the default OS to selection "E", turn the timeout feature on with a 5 second wait, and initiate a warm reboot.

```
C:\SC > scdisk e timeout boot
```

About

This shows information about System Commander, including the version and serial number.

9: Common Questions and Answers

1 How should I partition my disk?

Wow, this is a complex question, but we'll try to give you a few guidelines! First we assume you know that removing a partition will erase all the data in the partition. You should always have a complete backup of important data.

Make a list of the OSes you want to install now, and a list of OSes you may want to install in the near future. Include on the list the space you want to allocate for each OS, the number of partitions you wish to use for each OS, and any limitations you may need to follow. Limitations might include items like the OS must be on the first drive, or must be in a primary partition. See Chapter 12, "OS and Product Limitations" for more detailed information.

With the list of OSes, you assign each OS to a partition and drive, based on the space you have available and the limitations. Keep in mind each drive has a limit of four (4) primary partitions. The use of any logical partitions (one or more) on a drive takes away one (and only one) primary partition on that drive.

Your plan, at your option, can also place up to 32 different FAT compatible OSes into the single MultiFAT primary partition on the first drive. This might include different versions of Windows 95/98/Me, OS/2 or DOS. Refer to Chapter 6 on each of these OSes for additional details on each OS.

If you plan to install OS/2 anywhere other than the primary partition on the first drive, you must leave one (1) partition free for OS/2's Boot Manager (it must be 1 MB or larger). It is required by OS/2 during its installation. Once the OS/2 installation is complete, you can reuse the partition for another OS.

You can use System Commander's built in partitioning with OS Wizard (recommended) or it's manual partitioning option. You can also use the utility program that comes with your OS to handle the actual partitioning. For example, Windows 95/98/Me, DOS, OS/2, and others have a utility called FDISK. The FDISK program allows you to create and delete partitions. Refer to your operating system manual for detailed instructions on using the partitioning utility that comes with it.

2 A new OS installation failed, and I think System Commander is the cause!

We hope this is never the case, but there is an easy way to confirm the problem is not System Commander. In Windows, run the System Commander console (from Start, Programs, System Commander) and disable System Commander. For non-Windows situations, you can boot from the System Commander CD or diskette 1 and run the SCIN program and select Disable. This puts back the original master boot record, so System Commander will no longer be active. The partition table is not changed, so partition changes after you installed System Commander are preserved.

Now install the new OS. In most cases we expect the same problem will occur, and you may need to contact the OS manufacturer to resolve the problem. Once the problem is resolved, and the OS is working, simply run the System Commander Console (in Windows) and enable System Commander. You can also do this from the System Commander Boot CD or diskette 1, and run SCIN to select Enable. This restores System Commander with all your prior OS selections.

A disable does not delete our configuration files, so a later enable brings back System Commander with all your prior OS selections and options.

3 At boot time, the product name is wrong. Can this be corrected?

Yes. Go to settings and select "Descriptions and Icons".

We would like to hear about any product names that appear wrong. It might indicate a new version of an OS we have not seen before, or is caused by some other issue. While we can't promise an immediate correction, we will try to ensure future versions correctly identify the OS.

4 At boot time, the OEM name is wrong on some screens. Can this be corrected?

In all cases, except for UNIX OSes, the OS vendor specifies the OEM name. It is typically the identification string in the partition boot record. For more about inaccurate OEM names, see page 128.

5 How do I get rid of an OS selection from the menu?

At boot time, select Settings, and select the Order add and remove menu. Highlight the OS you wish to remove from the menu and click on Remove. Next select OK to confirm the removal. This does not affect contents of the related partition.

6 What are the advantages of using System Commander over other products like OS/2's Boot Manager or OS Loader?

The key benefit is the ability of System Commander to boot many OSes that are impossible to boot through other boot managers. In addition System Commander provides the following unique advantages:

- Supports over 100 OSes on a single system.
- Supports multiple FAT compatible OSes in a single partition, including OS/2, Windows 95/98/Me and multiple DOS versions.
- Includes both automatic and manual partitioning tools.
- System Commander can manage multiple configurations of a single OS in the FAT partition. This includes different configurations of OS/2, Windows 95/98/Me and DOS.
- All setup options, menu descriptions and features are accessible at boot time. There is no need to boot into an OS just to make changes.
- System Commander does not require repartitioning to install, nor a separate partition for itself.
- You can view and edit configuration files before the OS runs.

Some of the other significant built in features include a partition viewer, ability to hide partitions from an OS selection, passwords, automatic file management, automatic OS detection, boot from CD or diskette drives A or B, and complete help at boot time.

7 Why must some OSes only be installed on the first drive?

This is a limitation within the OS itself. The early startup code begins by booting from the first drive, regardless of where the OS actually resides. In these cases, even if you were to somehow able to get the OS on a second or third drive, System Commander could attempt to boot the OS, but the OS will quickly hang. The OS erroneously attempts to read data from the first drive rather than the drive where it actually resides.

The OSes that we've seen so far that allow installation on any drive include OS/2, Free BSD, Linux and Solaris. In rare cases, an OS could be installed on the first drive, and then moved to another drive position (i.e., drive jumper changes). QNX is one such OS, when the QNX configuration file is updated to point to the new disk position. Other OSes like DOS, Windows 95/98/Me, and most UNIX variants not already mentioned, must be installed on the first drive.

Windows has the option to install most (but not all) of its files into any partition on any drive. When Windows (older versions) installs, it asks which drive and path Windows

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should be installed to. Regardless of what drive you specify, Windows will always place about 4 MB of boot up files on the first disk (in a primary partition).

8 How do I hide a partition from an OS selection?

System Commander allows you to hide primary partitions from a selected OS. System Commander will never let you hide the partition you are booting into, or extended partitions.

To specify which partitions are accessible and which are hidden, at the OS selection menu, select Settings. Select the Specific OS options menu. This menu allows you to indicate which primary partitions should be accessible for each drive. Move down to the desired line Primary partitions visible on drive n and press Enter. A new menu will show the partition status for each of the four primary partitions. Partitions are marked as visible, hidden or no access. Partitions that have a status that cannot be changed are grayed out.

9 How can I create a second selection for the same Windows 95/98/Me/ DOS (or any other OS)?

You can create a duplicate of an OS selection at boot time, if the OS is installed into the MultiFAT partition, by selecting Alt-S (Settings) and then the Order add and remove menu. Highlight the choice you wish to duplicate, and press Alt-A (Add). Press D for (Duplicate), to create a second choice. This will automatically copy the necessary startup files from the highlighted selection to the new selection's subdirectory. You can then edit the new startup files as desired. When System Commander is installed from Windows NT/2000/XP/2003 or Longhorn, MultiFAT features are not available.

10 Will I have any problems with GoBack, EZ-Drive, Drive-Pro, or Disk Manager with System Commander?

Currently GoBack, Drive-Pro and Disk Manager are not compatible with System Commander or most non-Windows operating systems. These products all change the partition to a non-standard format. This also means you cannot use any partitioning tools (System Commander or other manufacturers) on a system that has these products installed.

The latest versions of EZ-Drive (v9 or later) are compatible with System Commander.

For more on GoBack, see page 136.

10: Troubleshooting

This chapter is intended to give you answers to the most common problems that might arise. If you do not see your problem detailed in this chapter, check "Answers" on our web site. To go to our support web site:

www.v-com.com/support/intro_SystemCommander.html

Depending on the nature of the problem, one of the following sections should help guide you to a solution. Start with the section that seems most appropriate.

Problems without messages	117
Messages from System Commander at bootup	119
Messages from NT/2000/XP/2003 or Longhorn	122
Messages from Windows 95/98/Me	123
Messages from a Linux OS	123
Messages from DOS	125
Inaccurate OEM names	128

Problems Without Messages

New OS installer complains about seeing a bootable OS

In this case, the operating system sees another operating system as bootable. To correct this, just run the SCDISK program from the System Commander directory (typically c:\sc), select *Change boot status*, and select the option *Make all partitions inactive*.

System Commander Fails to detect new DOS installation

Although rare, if the newly installed DOS has a boot record identical to a prior installed DOS and the hidden system files have the same date and time, System Commander may not offer the choice to save the new DOS. In this case, do not make a new selection from the System Commander menu, but use the default choice to avoid System Commander overwriting the new DOS information. At the DOS prompt, run

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SCIN from the System Commander directory, and select *Special options*. Then select *Alter Current Boot Record Serial Number*. Select YES, and then exit SCIN. Reboot, and System Commander should detect and save the new DOS.

System Commander Menu does not appear after reboot

This might occur if a newly installed OS overwrites System Commander's master boot record. Boot from the System Commander CD or utility diskette 1, and select *Enable System Commander*.

When the process is completed, remove the CD/diskette and reboot. System Commander will appear and save the new OS information. All of your prior options and selections will not be affected.

System Commander appears twice to get into a selection

Some versions of QEMM will force the system to reboot twice, or multiple times when performing optimization. Select the same choice until QEMM is satisfied. There may be options in QEMM to prevent this behavior.

Colors have problem or screen unreadable

If this occurs with the SCDISK utility, use the command line option **-V** (for example, C:\>**scdisk -V**).

If this occurs at boot time with System Commander, select Settings, and select the *Hardware settings menu*. Change the option *Graphics size* to **off**. Refer to page 86 for more information. An alternative way to set this option is in Windows to run the System Commander console and select settings and change the graphic size option there. From DOS, use the SCDISK utility with the following switch: C:\SC\> **scdisk no_font**

Disk Compression Software

Disk compression software such as DoubleSpace, Stacker and SuperStor compress the disk and may change the drive lettering. System Commander is fully compatible, but it **must** be installed in the non-compressed portion of the disk. This is necessary, since it is impossible to read any files from the compressed portion until the compression software driver is running. Consult your compression software manual to find where the non-compressed software resides.

In general, we do not recommend that you use any disk compression if you plan to install multiple OSes into a single partition (the MultiFAT). Non-DOS operating systems generally do not work with disk compression systems. Older versions of DOS may also have problems, and might cause data loss.

Messages from System Commander at Bootup

Boot error: Y-ZZ

Boot WX

Cause: Seeing one of these two error messages indicates a problem in starting up the system or reading the disk drive. The letters W, X, Y and Z represent an error character or number to identify the source of the problem. Note that there are two sets of codes and possible solutions depend on which error message appears.

Codes for the message **Boot error: Y-ZZ** are as follows:

Y code	Issue
0	MBR Checksum failure
1	Read error, FAT32 cluster chain
2	Read error, NTFS file system
3	Read error, NTFS file system OR the SYSCMNDR.SYS file is too fragmented - a defrag of the NTFS partition is required.
4	Read error, NTFS file system root
5	Read error, NTFS file system OR the SYSCMNDR.SYS file is too fragmented - a defrag of the NTFS partition is required.
9	Invalid boot record and/or corrupted
@	No FAT32/NTFS primary partition found, so unable locate System Commander.
A	FAT32 found only, no System Commander
B	NTFS found only, no System Commander
C	FAT32/NTFS both found, but no System Commander
E	SYSCMNDR.SYS found in FAT32 but not in virtual mode, no NTFS found
G	SYSCMNDR.SYS found in FAT32 but not in virtual mode, NTFS found
J	SYSCMNDR.SYS found in NTFS but not in virtual mode, no FAT32 found
K	SYSCMNDR.SYS found in NTFS but not in virtual mode, FAT32 found
O	SYSCMNDR.SYS found in both FAT32/NTFS, but not in virtual mode

The ZZ portion is the disk error code and is generally not important.

Action: The codes given help identify the source of the problem. In most cases you will be given the option to boot into one of the four primary partitions on the first drive. Several combinations we've seen on occasion include:

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Boot C-zz (where **z** is any character).

Boot 3-zz (where **z** is any character).

The most likely cause is having the System Commander SYSCMNDR.SYS file become badly fragmented. Boot into the OS where System Commander was installed, and perform a full defragmentation. After this is performed once, it is very unlikely to occur again. The file is static to Windows and does not shrink or grow.

For **Boot WX** style messages:

W code	Issue
0	Disk error reading the master boot record.
1	No FAT partition found on drive 0.
2, 3, 4, 5	FAT partition found, but unable to locate SYSCMNDR.SYS file in root directory, or a disk error occurred reading the file, or the partition is not 512 bytes per sector (the DOS/Windows standard).
A	Disk error reading FAT.
B	Disk error reading SYSCMNDR.SYS.
C	Defective cluster encountered.
F	Could not find SYSCMNDR.SYS file in the root directory, or a bad cluster area was encountered (FAT-32 only).
G	Problem reading the SYSCMNDR.SYS file (FAT-32 only).
H	Contents of SYSCMNDR.SYS file are wrong (FAT-32 only).

The second "X" character indicates the error code returned from the hard disk BIOS. It may indicate the hard disk or controller has some type of problem, or may indicate bad partition information on the disk.

Action: The codes given help identify the source of the problem. In most cases you will be given the option to boot into one of the four primary partitions on the first drive. Several combinations we've seen on occasion include:

Boot 0x. (where **x** is any character) This could indicate a bug in the BIOS of the hard drive controller or main system BIOS.

Boot 2> or Boot 3>. This error indicates that the file SYSCMNDR.SYS could not be found in any primary partition on the first drive. To fix this, boot from a DOS or Windows 95/98/Me startup diskette and at the prompt, type FDISK /MBR. This will have no effect on partitions, but simply installs the generic MBR boot loader. Once your OS is running, you will need to perform a full installation of System Commander.

System fails to boot up (no messages)

Cause: If you have FAT partitions you have created on the first drive, but have not formatted them yet, this condition may occur. It can also occur if the product is installed into a compressed drive. For these cases or if for some unexplained reason the system fails to boot up properly, the following instructions will restore the original master boot record.

Action: First check if System Commander's safe mode is working. When you first see any BIOS messages on screen at the start of the bootup, press and hold the Alt key down. If System Commander is running, it will present the "Safe mode" screen. This turns off a few functions that in rare situations could be incompatible with your system. If this works, you are done!

If this fails, boot the system from the System Commander CD or utility diskette 1. Run SCIN and select *Disable or Remove System Commander*. Then select *Temporarily Disable*. Exit and reboot normally. At this point System Commander is removed from the boot-up sequence.



Disable only replaces the master boot record. It does not change the current partition information. There is no problem performing a Disable, even if you had changed the partition information after System Commander was installed. The original master boot record information is saved in a hidden read-only file BOOT.DAT on both the hard disk and the utility diskette.

If this still does not correct the problem, boot from a Windows or DOS boot diskette and at the prompt, type **FDISK /MBR** to insert a generic MBR loader. It will not affect your partitions. If the Windows FDISK program is not available, you can also run the System Commander utility **CHECKMBR /MBR** from the System Commander boot CD or utility diskette 1 to do the same thing.

If you are still having problems getting into an OS, check that the desired OS partition is Active/Bootable. You can set this from System Commander by running System Commander directly from the CD, going to Manual Partitioning. Click on the desired partition and from the menu-bar select *Advanced*. Click on the *Set Bootable* option.

Possible Defective Boot Record

Cause: When this message appears after a non-FAT boot selection is made, the selected OS does not have a boot record, or uses a nonstandard format. If you selected (B) to boot anyway and the OS works, we would like to hear from you. It appears the OS you are using does not follow any prior standard.

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If the OS fails to boot, it indicates the OS has not properly built the boot record or other critical files are missing from the partition. It may also indicate the OS does not allow booting from the selected partition, and it should be removed from the OS selection menu.

Action: To remove a selection, select **Settings** from the OS selection menu, and move to the *Order add and remove menu*. Select the OS partition to remove, and click on **Remove**.

Some operating systems may boot through the FAT partition, even though the OS is in a separate partition. NT/2000/XP/2003 and Longhorn are prime examples of this, when they not installed to a single NTFS primary partition.

Messages From NT/2000/XP/2003 and Longhorn

Fatal System Error

Missing File <winnt root> \system32\ntoskrnl.exe

Windows [XP] could not start because of....

Cause: If the OS partition is not accessible, then one of these OS error messages may appear: "The Session Manager Initialization system process terminated" or with NT 3.5 "Windows NT could not start because of the following file is missing or corrupt.". Windows XP's messages are often more confusing talking about ARC firmware configuration problem or disk hardware configuration problem.

This can be caused by a new partition being created by another OS or the deletion of a partition before Windows so that it displaces the Windows partition number up or down.

Action: This usually indicates the hidden file BOOT.INI has the wrong partition to find the OS. This critical file resides in the root directory. System Commander's BootFixer™ can automatically repair the BOOT.INI file. At the System Commander OS selection menu, select Partitioning (it can also be run directly from our CD if desired). At the Partition Wizard screen, select Manual Partitioning. Then click on the menu choice *Advanced*, and then *BootFixer*. It will automatically check and correct all BOOT.INI files it finds. Exit and try again to boot into the OS.

For Windows XP and later, you may want to try and use its Recovery Console. It can often fix some OS problems. To do this, boot from the Windows XP CD, and when you see the option for Manual Repair, select it (press **R**).

If these prior solutions do not correct the problem, you may want to copy a new set of boot files from the Windows CD, usually under the \i386 folder. Copy "ntldr", "ntdetect.com" and "ntbootdd.sys" (if you use SCSI hard drives) onto the C:\ root. You may have to change the attributes of the files on the hard drive before a copy is allowed, since these files normally are in read-only, system, hidden. The prompt

command to change attributes is: **attrib -r -s -h c:\filename.**, where *filename* is the file you wish to overwrite.

Messages From Windows 95/98/Me

Warning SU-0012 (OS/2 or NT/2000/XP will no longer work)

Cause: If an OS/2 or NT/2000/XP/2003 partition is present, this message will appear during the Windows 95/98/Me installation.

Action: No action is necessary. System Commander protects both OS/2 and NT/2000/XP/2003 from Windows 95/98/Me.

Warning SU-0015 (NT/2000/XP/2003 will no longer work)

Cause: If NT/2000/XP/2003 was installed prior to Windows 95/98/Me, this message will appear during the Windows 95/98/Me installation.

Action: No action is necessary. System Commander protects NT/2000/XP/2003 from Windows 95/98/Me.

Warning SU-0016 (OS/2 will no longer work)

Cause: If OS/2 was installed prior to Windows 95/98/Me, this message will appear during the Windows 95/98/Me installation.

Action: No action is necessary. System Commander protects OS/2 from Windows 95/98/Me.

Windows 95/98/Me fails to appear, and drops into a Windows DOS prompt.

Cause: This occurs when Windows has some problem during the boot up process.

Action: Check the contents of the MSDOS.SYS text file. This appears in the root directory as a hidden system file. To see hidden files, at the Windows 95/98/Me DOS prompt, try:

```
C:\> dir /ah
```

To access the file, change the attributes:

```
C:\> attrib -h -r -s msdos.sys
```

The MSDOS.SYS file is typically about 1500 bytes. If the file is missing, set to zero length, or has been replaced with the older DOS MSDOS.SYS executable (10 KB or larger), Windows 95/98/Me will not start. Correct the file if damaged or missing. If the file is completely lost, we have included a generic MSDOS.SYS file for Windows

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95/98/Me on the System Commander installation disk. It is under the filename MSDOS.BAK and is a hidden file. Be sure to edit the entries in this file for the drives and path as appropriate for your system.

If the MSDOS.SYS file is Windows 95/98/Me (i.e., about 1500 bytes), check that a line appears "BootGUI=1" under "[options]". Without this line, or if the value is set to zero, Windows 95/98/Me will go directly to a Windows prompt without going into the graphical portion of Windows.

You also might try pressing F8 immediately after you select Windows 95/98/Me from System Commander. This will issue a menu of options, such as safe mode, and a logging mode. The Windows 95/98/Me manuals and online readme files should have other suggestions and recommendations, and explain the use of these options.

Incorrect version of DBLSPACE.BIN

Cause: If DOS 6.x was installed on top of Windows 95/98/Me, DOS will install an old version of DBLSPACE.BIN.

Action: If you are not using disk compression, we recommend renaming or removing DBLSPACE.BIN. It is not needed nor used if disk compression is off. The file appears in the C:\ root directory as a hidden system file.

Messages From a Linux OS

Linux fails to boot

Cause: Depending on the original installation method, the LILO or GRUB MBR may have been removed by another OS installation/operation or the configuration information may need updating to the current drive configuration.

Unlike Windows, Linux distributions have a boot up process that is far less tolerant. Installation using the superblob (one option Linux provides) is the most stable and tolerant approach, but if an MBR method was used, it cannot be easily changed now.

Action: First we strongly recommend checking the FAQs and/or support for your specific Linux distribution or Linux loader (Grub or LILO). They may have updated information and/or other options.

Many Linux vendors are recommending reinstalling the Linux from the CDs and being sure to select "Upgrade". Unfortunately, this may not always save user data, accounts, or installed applications. To find out what may be saved in the upgrade process, check with your Linux vendor.

Messages From DOS

Can't Access drive C: Invalid Drive/Media Type

Cause: When booting from a diskette, the C: drive has “disappeared” and/or is invalid with either of these messages. Attempting to boot from the hard disk just generates the System Commander error message “**Boot 1x**”. Proceed with this solution only if BOTH these conditions occur.

CMOS memory loss or an incorrect drive type specified in setup may cause the problem. The DOS boot record being altered or erased, possibly due to a virus or application program defect can also cause this problem.

Users of Novell DOS 7 and OpenDOS are limited to one primary FAT partition. You must hide any other primary partitions.

Action: If you suspect CMOS loss or the wrong drive type was set in the BIOS setup program, attempt to correct this first and try rebooting from the hard disk.



WARNING! Do not alter the BIOS setup unless you are absolutely sure of what you are doing!

You may need to contact service personnel for your computer if you are unfamiliar with using setup and/or the proper disk types for your system.

If you conclude that the DOS boot sector has been damaged, System Commander has a built in feature to replace the DOS boot record. Boot from the System Commander utility diskette 1. System Commander saved the DOS boot record here when you installed System Commander.



WARNING! Do not proceed if the System Commander utility disk was created in another system! The saved DOS boot record is rarely the same from system to system. Also do not replace the old DOS boot record if you have resized this partition, since it will no longer be valid. Replacement of the wrong DOS boot record will likely cause strange unrecoverable problems, and may even affect other non-DOS partitions.

From the diskette, run SCIN, select *Special options*, and then select *Restore DOS Boot record*.

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Once the operation is complete, remove the diskette and reboot. Assuming no other damage occurred, System Commander's OS selection menu should appear. In this special case, we recommend not selecting the default choice, but another DOS choice if available. This will force System Commander to replace the boot record and hidden files in case these were also damaged.

Can't Find COMMAND.COM Invalid COMMAND.COM Wrong COMMAND.COM version

Cause: Most likely the COMMAND.COM file is the wrong version for the current OS booted. This will occur under several situations, as explained below.

Action: It is usually necessary to use your OS boot CD/diskette at this point so the problem can be resolved.

First, the CONFIG.SYS file for this version of Windows 95/98/Me or DOS should have a SHELL statement that points to the COMMAND.COM for this version. If you are unfamiliar with the SHELL statement, this critical line in CONFIG.SYS instructs where COMMAND.COM resides. For example, in DOS 6, the default SHELL statement might appear as:

```
SHELL=C:\DOS\COMMAND.COM C:\DOS /P
```

Normally you would have created a unique subdirectory for each operating system, such as "MSDOS6.2". In this case, the SHELL statement must be changed when booting MS-DOS 6.2 to point to the directory where COMMAND.COM resides for MS-DOS version 6.2. This new SHELL line might appear as:

```
SHELL=C:\SC\MSDOS6.2\COMMAND.COM C:\MSDOS6.2 /P
```

You might have other options or use a different subdirectory instead of "MSDOS6.2" shown. In any case, the drive and path should always point to the subdirectory for COMMAND.COM related to the DOS version selected.

Also check if the AUTOEXEC.BAT file has a COMSPEC statement, which must also point to the COMMAND.COM for this version. You do not need COMSPEC if the CONFIG.SYS file has a SHELL statement.

Verify that System Commander was properly set up to copy the unique version of COMMAND.COM into the root directory. Some programs ignore the path and assume COMMAND.COM is in the root directory.

To have System Commander automatically copy COMMAND.COM into the root directory, select **Settings** from the OS selection menu, and select the *File management menu*. Verify the files and subdirectories are correct.

The files to copy will not be copied if the last boot was the same OS. This means you may need to select another OS in the FAT partition, and then reboot and select the desired OS.

These error messages will also appear if the wrong version of COMMAND.COM resides in the unique subdirectory you made for the DOS having the problem. To correct this, copy the correct COMMAND.COM version for the selected DOS from the diskette into the unique subdirectory.

Incorrect DOS Version

Cause: A device driver or TSR was run that does not match the current DOS version. This is usually due to an incorrect directory specification or path statement.

Action: First you must determine which driver or TSR causes this message. If it is occurring in the CONFIG.SYS file, check to see which drivers are loading before and after the message appears. Unfortunately, many device drivers do not display anything when they run. Newer DOS versions allow a step-by-step confirmation of each CONFIG statement by pressing F8 when the phrase "Starting MS/PC-DOS..." appears on screen.

You might also look in the CONFIG.SYS file for each DEVICE= line, verify the path for the device driver is correct, and it points to the subdirectory where the current OS files reside. If the problem is occurring in AUTOEXEC.BAT, you can remove the statement ECHO OFF, and reboot to see which is the offending line. Once the problem line is found, change the subdirectory to point to the current DOS directory.

Additional notes about getting the CONFIG.SYS and AUTOEXEC.BAT files setup properly are reviewed in the section on *Special DOS Issues* starting at page 71.

Your Current Operating System on drive C is not DOS

Cause: This message might appear while attempting to load a new operating system from a special update version of the DOS OS. The update version of some older DOS versions does not correctly detect DOS or will not accept a system with a newer version of DOS than the one attempting to be loaded.

Action: There is no way around this limitation of the update version. You will need to load DOS from a non-update version of DOS. If you have a bootable system diskette (which is not provided with the update version) you boot from it, create a unique directory, and copy all the desired files from the diskette to this directory. In addition, you need to run the SYS program from the diskette. At the DOS prompt, run:

```
A:> sys c:
```

This will transfer the system to the C: drive. Remember to update CONFIG.SYS and AUTOEXEC.BAT files. Reboot to have System Commander save the new OS.

Inaccurate OEM Names

In several places, System Commander will display the OEM vendor name from the boot record. Often the vendor has left a misleading name in a newer version of the product. For example the OEM name for Microsoft Windows 2000 (FAT and FAT-32) is MSDOS5.0. The following table shows some of the more common names for different operating systems.

Operating System	OEM Name
DR-DOS 5.0 (Digital Research)	BM 3.3
DR-DOS 6.0 (Digital Research)	IBM 3.3
DR-DOS 7.0 (Caldera)	DRDOS 7
MS-DOS 3.3 (Microsoft)	MSDOS3.3
MS-DOS 5.0 (Microsoft)	MSDOS5.0
MS-DOS 6.0 (Microsoft)	MSDOS5.0
MS-DOS 6.2 (Microsoft)	MSDOS5.0
MS-DOS 6.22 (Microsoft)	MSDOS5.0
Novell DOS 7.0 (Novell)	NWDOS7.0
OS/2 Boot Manager (IBM)	BOOT MGR
OS/2 v1.x in DOS partition (IBM)	IBM 10.0
OS/2 v2 to 4 in DOS partition (IBM)	IBM 20.0
OS/2 v2 to 4 in HPFS partition (IBM)	OS2 20.0
Open DOS (Caldera)	NWDOS 7.0
PC-DOS 3.3 (IBM)	IBM 3.3
PC-DOS 4.0 (IBM)	IBM 4.0
PC-DOS 5.0 (IBM)	IBM 5.0
PC-DOS 6.1 (IBM)	IBM 6.0
PC-DOS 6.3 (IBM)	IBM 6.0
PC-DOS 7.0 (IBM)	IBM 7.0
PTS-DOS	PARAGON
ROM DOS 5.0 (Datalight)	DLDOS5.0
ROM DOS 6.0 (Datalight)	DLDOS6.0
UNIX (most vendors)	UNIX-xx
Windows NT Dual Boot (Microsoft)	MSDOS5.0
Windows NT in NTFS partition	NTFS
Windows 95	MSWIN4.0
Windows 95 (1996 SR2, SR2.5)	MSWIN4.1
Windows 98	MSWIN4.1
Windows 2000 (FAT, FAT 32)	MSDOS5.0
Windows 2000 in NTFS partition	NTFS
Windows XP (FAT, FAT 32)	MSWIN4.1
Windows XP in NTFS partition	NTFS
Windows 2003 in NTFS partition	NTFS

When Windows 95/98/Me installs, it changes all boot records on all FAT type primary and logical partitions. While this does not normally affect any OS already installed, the partition may be seen incorrectly as Windows 95/98/Me, with an OEM boot name MSWIN4.0 or MSWIN 4.1.

11: OS Recovery Techniques

If a working OS no longer boots due to a virus, disk crash, or other errors that corrupted or destroyed key system files, the following suggestions can help in the recovery of some OSes. The OS manufacturer may have additional suggestions and notes.

As a starting point, we suggest booting into the OS selection that fails. This will ensure System Commander has loaded any files specific to the OS, and made the selected partition active (bootable). In addition, if changes are made to correct the problem, the changes are automatically updated to the related choice after the next reboot through System Commander.

Once the boot selection is made, then boot directly from a boot CD or diskette that matches the OS (do **not** boot through System Commander's boot from A: option). If the OS boot disk is not available, in some cases a Windows 95/98/Me or DOS boot disk can be used to examine potential problems and files.

Windows NT/2000/XP/2003/Longhorn Recovery

Most Windows installations place a custom boot record that will load the file NTLDR. A weird quirk of the Windows installation is that the old boot record OEM name (like MSDOS5.0) will copy into the Windows boot record.

These three (3) additional files are critical to the boot process:

NTLDR	This is the Loader file that actually launches Windows.
NTDETECT.COM	This program is run by NTLDR to detect Windows' presence.
BOOT.INI	A text configuration file for NTLDR.

Windows XP/2003 and Longhorn

Boot the machine from the OS installation CD. At the Setup screen you will be given the option of repairing the current Windows installation.

Windows NT v4.0, Windows 2000

Under Windows, to correct the problem, boot the machine into the NT/2000 Setup Program (usually by using the three or four boot disks you made during the initial installation of NT/2000). At the Setup screen you will be given the option of repairing the current NT/2000 installation. Choose this option and insert the NT/2000 Emergency Repair disk into the machine when prompted.

Windows NT v3.5 or v3.51

Basic Windows NT boot problems are very easy to correct. Reboot directly from the NT emergency repair diskette, and follow the instructions. In most cases no other diskettes or CDs are necessary.

If you did not make an NT emergency repair diskette, the NT installation diskette can be used as an Alternative. In this case, reboot from the diskette. You will be prompted to either perform an NT installation or an emergency repair.

Windows 95/98/Me Recovery

In addition to the boot record, there are five (5) files that must be in place for Windows 95/98/Me to get to a DOS/Win95/98/Me prompt. These files reside in the C:\ root directory, and include:

IO.SYS	This 200 KB+ file is the first Win95/98/Me program to start after the boot record runs.
MSDOS.SYS	This text configuration file can be edited, and is normally about 1500 bytes long, but never 10 KB or larger.
COMMAND.COM	DOS commands are processed through COMMAND.COM and should have a file date of 1995 or later.
CONFIG.SYS	This is similar to a DOS CONFIG.SYS file. Some device drivers and the shell statement will point to the Windows 95/98/Me subdirectory.
AUTOEXEC.BAT	This is similar to a DOS AUTOEXEC.BAT file. One portion of the PATH statement should point to the Windows 95/98/Me COMMAND subdirectory and not to the old DOS directory.

Each of these files should be examined to determine which file(s) are damaged or incorrect. The text files, CONFIG.SYS and AUTOEXEC.BAT, can be corrected by editing in desired changes. Some valid Windows 95/98/Me configurations have zero length CONFIG.SYS and AUTOEXEC.BAT files. They are not always necessary for Windows 95/98/Me.

If the wrong MSDOS.SYS file appears, first search the drive for another possible instance of the file. System Commander usually saves a copy in the Windows directory (\SC\WIN95 or \SC\WIN95.A). If no valid copy can be found, you can use the hidden MSDOS.BAK file from the System Commander CD or utility diskette 1, as a starting point. Comments are included in the file. It may be necessary to edit some lines to match your configuration.

If the IO.SYS or COMMAND.COM files are suspect, you can get a copy from the Windows 95/98/Me boot diskette (IO.SYS is a hidden system file). Since System Commander saves the boot record in its own file, it is unlikely to be damaged unless the Windows 95/98/Me selection was removed from the System Commander selection menu.

To reload the boot record, it is necessary to first save the Windows 95/98/Me MSDOS.SYS file in the hard disk root directory. The SYS command that will be used in a moment to load the boot record will overwrite the real MSDOS.SYS file with a useless 6-byte file. To do this:

```
C:\> attrib -h -s -r msdos.sys
```

```
C:\> copy msdos.sys msdos.tmp
```

Insert the Windows 95/98/Me boot diskette that was created when you installed Windows 95/98/Me. Shutdown Windows 95/98/Me (i.e., Restart the computer). Once the diskette boots up, it should leave you at a prompt on drive A, where you can run the SYS program. After the system is transferred, restore the correct MSDOS.SYS file by issuing the following commands:

```
A:\> sys c:
```

```
A:\> c:
```

```
C:\> attrib -h -s -r msdos.sys
```

```
C:\> copy msdos.tmp msdos.sys
```

After all the files are properly restored, remove the boot diskette, and reboot through System Commander to save the new files and configurations.

DOS Recovery

DOS has five (5) files critical to its operation and a boot record. These files reside in the C:\ root directory, and include:

IO.SYS or IBMBIO.COM	This is the file first run by the DOS record. It contains the DOS initialization code and key parts of DOS. It is a hidden system file, and often (but not always) has a file creation time that matches the version.
MSDOS.SYS or IBMDOS.COM	This contains the balance of the resident parts of DOS. It is a hidden system file, and often (but not always) has a file creation time that matches the version.
COMMAND.COM	This program is used to process the DOS command line (it does not stay resident).
CONFIG.SYS	This is the standard configuration file for DOS. See page 72 for specific issues about this file.
AUTOEXEC.BAT	Additional TSRs and commands run from AUTOEXEC.BAT. See page 73 for specific issues about this file.

To load a new copy of the two hidden files and the boot record, boot from a diskette that has the identical version of DOS. At the DOS prompt run:

A:\> **sys c:**

The SYS program, with DOS 5 and later, will also insert a new copy of COMMAND.COM. For older DOS versions, the COMMAND.COM file must be copied from the diskette manually.



Warning! If you made your DOS boot diskette after NT/2000/XP was installed, the DOS boot disk will have an NT/2000/XP boot record and not the standard DOS boot record! Use a real DOS boot diskette in this case. After all the files are properly restored, reboot through System Commander to save the new files and configuration.

12: OS and Product Limitations

Each operating system has its own quirks and limitations. We have included a few of the major limitations we have seen. To our knowledge at the time of this writing, there is no way to overcome these limitations.

As well, there are certain products with which are not compatible with System Commander. Those are detailed here including suggestions or workarounds where available.

In all cases, the OS or product vendor has the final word on what their product can and cannot do. If you see anything in this chapter that you question please contact the vendor for absolute verification.

OS Limitations

Limitations of Windows NT/2000/XP/2003 and Longhorn

1. NTFS file format can only be seen from Windows NT/2000/XP/2003 and Longhorn. Other OSes like Windows 95/98/Me and DOS cannot see a partition with the NTFS file format.
2. NT/2000/XP/2003 and Longhorn must boot from a primary partition on the first drive. Most of the non-boot portion can be located on any partition or drive.
3. Only Windows 2000/XP/2003 and Longhorn (not NT) can see FAT32 partitions.
4. If using a dynamic disk (an option defaulted off in 2000/XP/2003 and Longhorn), some partitioning features will not be available for that drive. Windows 95/98/Me/NT cannot see dynamic drives.

Additional Limitations of Windows NT

Windows NT cannot access the NTFS type used in Windows 2000/XP/2003 and Longhorn. The later OSes use a newer version of NTFS.

Limitations of Windows 95/98/Me

1. Windows 95/98/Me must be installed onto the first physical hard drive in a primary partition. It is possible to install the start up files into a primary partition with the remainder of the program files in an extended partition or even on the second physical hard drive.
2. Windows 95/98/Me cannot access NTFS partitions.
3. Windows 95/98/Me must be installed in the first 64 GB of a drive.
4. Windows 95/98/Me is unstable if more than 512 MB of RAM is present.

Additional Limitations of Windows 95

5. Windows 95A cannot see a FAT32 partition. The later variant called Windows 95B added FAT32 support.
6. Windows 95 will not normally install and/or is unstable in a system with a processor greater than 350 MHz.

Limitations of DOS

1. DOS must be installed into a primary partition on the first physical drive (also called the master drive) within the first 2 GB. DOS installed into either a second hard drive or an extended/logical partition will not boot.
2. When your system has more than one primary FAT partition, the inactive primary partitions may not be visible. This DOS bug will occur when either:
 - a. An extended partition exists without any logical drives defined.
 - b. The extended partition has no FAT logical partitions defined.
3. Novell DOS 7 and OpenDOS have a bug that will stop DOS from running if more than one primary FAT partition is visible. To correct this bug, hide all primary partitions except its own partition.

Limitations of other OSes

Linux, Solaris, SCO UNIX, NextStep, and other UNIX variants use their own unique file formats, which are typically not visible to any other OS.

Unix OSes need to be in the first 8 GB of the drive.

If installing both Solaris and Linux on the same drive, Solaris needs to be hidden from Linux. Linux will think the Solaris partition is the Linux swap and corrupt it. You can use System Commander's Settings option *OS specific options* for your Linux to hide the Solaris partition from Linux.

As of this writing, Linspire (formally Lindows) automatically erases the MBR on every boot cycle, preventing any boot manager from working. The team at Lindows is working on a new version of Linspire that expects to correct this issue. It should be released in the summer of 2004.

Product Limitations

Dynamic Disk

Windows 2000/XP/2003 and Longhorn have the ability to utilize 'Dynamic Disk.' Microsoft defines Dynamic disk as, "A physical disk that contains dynamic volumes created by using 'Disk Management.' Dynamic disks do not use traditional partition tables like primary and extended partitions (logical drives); therefore, dynamic disks cannot be accessed by Windows 95/98/Me, Windows NT or DOS operating systems."

Because dynamic disk does not use a traditional partition table, Partition Commander and System Commander cannot resize dynamic disks. Partition Commander, unlike Windows, can convert a dynamic disk back to a basic disk that has partitions understood by other OSes. See page 158 for details. System Commander 8 adds the new abilities to install and boot from a Dynamic disk.

Anti-Virus Software (SystemSuite, Trend, Norton, McAfee, etc.)

Virus detection programs scan the MBR for viruses. If they see anything out of the ordinary, they try to repair it. In rare cases, these programs may see System Commander as a virus, and should you choose to repair the MBR, you will wipe out System Commander. If this should happen, Enable/Update System Commander to restore the System Commander MBR using the System Commander console utility in Windows.

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In no case should you choose to repair the MBR if System Commander has been installed. System Commander monitors the boot record, and will tell you if we detect any changes, which could indicate a virus. Most of these virus detection programs will allow you to manually disable MBR virus detection.

Disk Compression Software (DriveSpace, DoubleSpace)

Because of the inability to correctly diagnose any problems you could encounter with compression, we cannot provide assistance to users of System Commander with compressed drives.

Drive compression is quite outdated. The purchase price of extremely large hard drives continues to fall every year. In terms of man-hours spent getting compression set up and stable, simply purchasing a larger drive is worth considering.

Disk compression software does not understand FAT32 conversions, so users of disk compression software must not perform this conversion.

Norton Disk Lock

Disk Lock is a security package that runs from the MBR. If you are using Disk Lock, System Commander will not install. You can still run Partition Commander from the System Commander CD.

GoBack

Our testing with GoBack has shown that it is not compatible with any partitioning or boot management products including both Partition Commander and System Commander. If GoBack is installed prior to System Commander, it will not let System Commander install. If System Commander is installed prior to GoBack, System Commander is disabled.

The reason for these problems is that GoBack partly resides in the MBR, where boot management products must reside. While System Commander has a special MBR boot feature that solves this obstacle, GoBack also alters the FAT and FAT32 partitions into custom non-FAT partitions. These partitioning alterations also prevent partitioning operations, such as resize.

If you would like to have boot management and the ability to partition your drives, you will need to remove GoBack.

13: Partition Commander

All of the Partition Commander features are included with System Commander, and no additional installation is required. Partition Commander provides both automatic and manual means to safely prepare and modify your hard disk. This chapter explains the Partition Wizard, the automatic way to accomplish your goals.

Using the Partition Wizard

Partition Wizard automates much of the software configuration process to make it easy, safe, and quick. You will see graphical displays that illustrate the status of your hard drive, your progress through the process, and the choices you can make. Partition Wizard analyzes your hard drive and makes suggestions about the best way to optimize your hard drive configuration. Partition Wizard options are organized around the five most common practical reasons for partitioning a hard drive:

- More drive space
- Faster disk access
- Better organization
- Add an OS
- Manual Partitioning

Each of these choices leads to several practical strategies offered to you by the Partition Wizard. These options are described later in the chapter. Manual partitioning is described in more detail in Chapter 14.

A Typical Partition Wizard Session

It's time to actually use the Partition Wizard to prepare your computer for better organization! As an example of how to use the Partition Wizard, we will go through the strategy Organize OS, Applications and Data. This is one of the options under Better Organization. Other Partition Wizard options and how to use them are described later in this chapter.

Organize OS, Applications and Data

A popular way to organize your hard drive is to put your operating systems, application programs, and data in separate partitions. By organizing your drive in this way, you will make your backups easier. In addition, when you upgrade an application or operating system, the data files are kept safely out of the way.

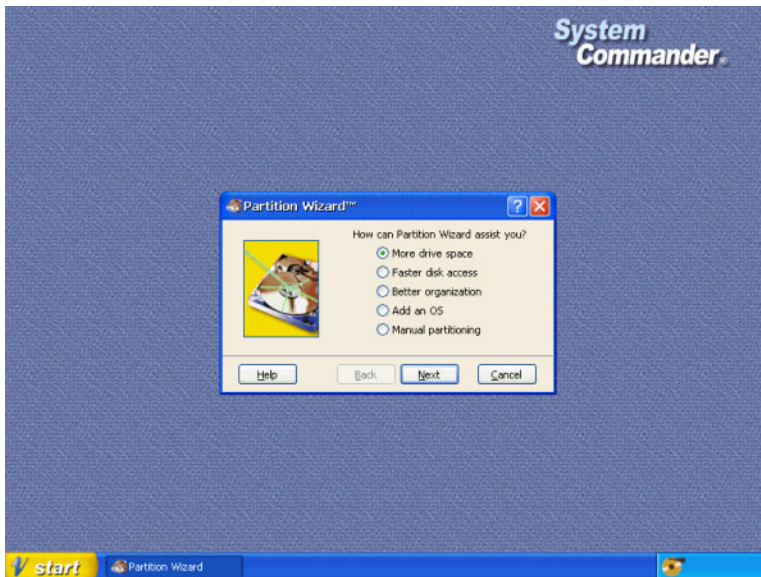
Partition Wizard analyzes the selected hard drive and partitions. The size of these partitions is automatically adjusted based on free disk space (not already allocated to partitions) and the proportion of used space in existing partitions. Up to two new partitions can be made at a time.

Starting Partition Wizard

There are two easy ways to run start the Partition Wizard:

- 1) When the system first starts up, or after a restart, you can select **Partitioning** (Alt-P) from the OS selection menu.
- 2) You can also boot from the System Commander CD or diskette 2 to fully run Partition Commander.

When Partition Commander is launched, it first analyzes your system. During this analysis, it determines how many hard drives you have, how each drive is set up and what OSes are installed. This will only take a few seconds.



Once this is completed, you will see the Partition Wizard main menu as shown on the prior page.

In a moment, we will walk you through the Partition Wizard for better organization.

You will notice a start button on the bottom of the menu. If you cancel the Partition Wizard dialog, you can select other options from the start menu.

These appear as:



The start menu allows you to re-run the Partition Wizard, OS Wizard, undo operations with the BackStep Wizard, perform manual partitioning, change settings, view files, and get basic help. Each selection is described in detail in this and the following chapter.

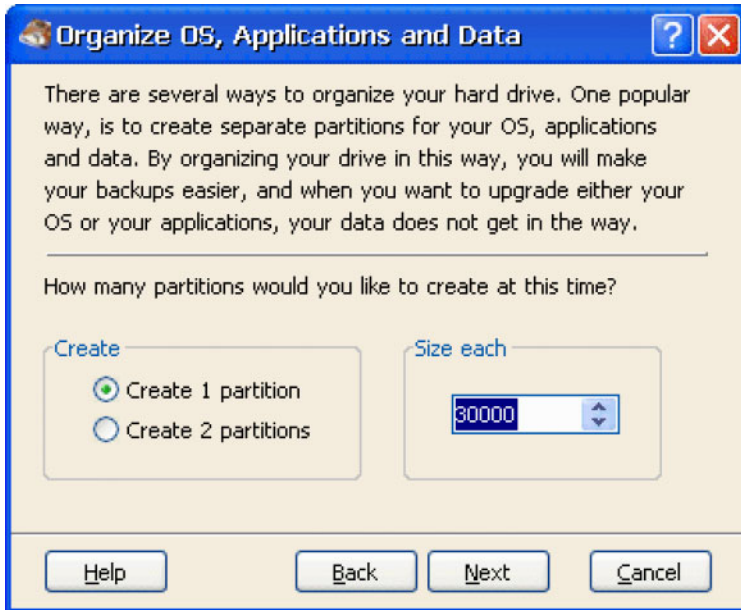
OK, we are ready to walk through the Partition Wizard for better organization!

At the Partition Wizard main menu, select Better Organization. The Better Organization dialog box opens.



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Select Organize OS, Applications and Data. The Organize OS, Applications and Data dialog box opens.



Click a radio button to create one or two partitions. The Size each box shows a recommended partition size based on the analysis of your hard drive. You may use the up/down arrows (spin button) to select another size, or enter a different value in the box. At this point you are ready to create your new partition. If you do not wish to do this now, press Back or Cancel.

Press Next to continue. A progress window opens, displaying the status of the creation process. Upon completion, a dialog box shows the drive letter assignment and label of the new partition.



Drive letter assignments are controlled by the operating system, not by Partition Commander.

If you have chosen to create two partitions, a second Partition create screen will appear. Upon completion, a dialog box shows the drive letter assignment and label. Press Next to continue.



Press the Finish button to complete the process.

Using Partition Wizard

The following sections describe each of the Partition Wizard options available to you and how to implement them.

More Drive Space

Partition Wizard provides four options for creating more space on your hard drive. This applies to all OSes like Windows 95/98/Me/NT/2000/XP/2003, DOS, Linux, and a few others. These options are shown in the More Drive Space dialog box and are listed below.

- Create more storage space
- Move unused space from one partition to another
- Search for free space
- Recover wasted hard drive space

For all of these options, the Partition Wizard analyzes your hard drive, searching for two types of space: free space and unused space.

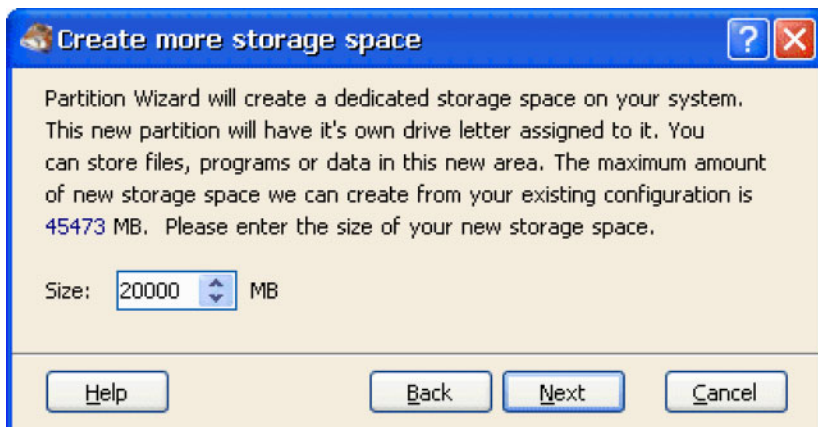
Free space is space on the hard drive that has not been assigned to a partition, and is therefore inaccessible for data storage.

Unused space refers to space within a partition that has not yet been used to store files.

Create More Storage Space

Partition Wizard analyzes your hard drive for both free and unused space and allows you to create a new partition for more storage space. Your OS will see this partition as a new drive letter.

Start this process by selecting it from the More Drive Space dialog box, then press Next. The Create More Storage Space dialog box opens.



The Size box shows the recommended partition size, based on an analysis of your hard drive. Selecting the maximum size will shrink an existing partition until it is almost full, and is not usually recommended.

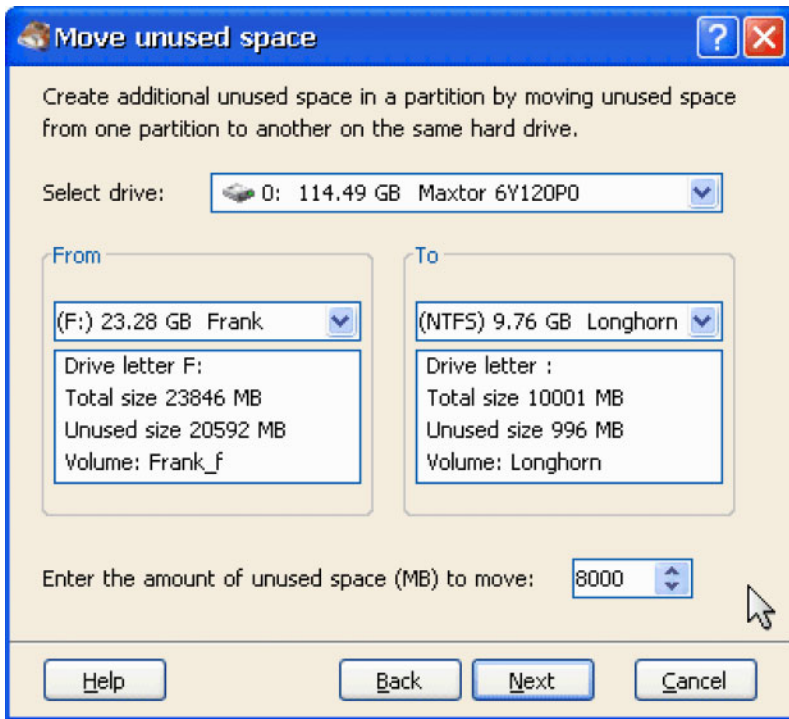
Select the desired partition size by using the up/down arrows in the Size box. Press Next to create the partition.

A progress screen appears, displaying the process. Upon completion, a Partition Wizard Finished dialog box opens. Press Finish when done.

Move Unused Space from One Partition to Another

This strategy allows you to move unused space in one partition to another partition on the same physical drive. Partition Wizard automatically moves the unused space and resizes the partitions.

Start this process by selecting it from the More Drive Space dialog box, then press Next. The Move Unused Space dialog box opens.



In this dialog box, select the drive within which you want to move unused space. Select the partition containing the extra unused space in the *From* box. Select the partition to which you want to add space in the *To* box.

Enter the amount of free space you want to move or use the up/down arrows to select an amount. Press Next to implement your choices.

A progress screen appears, displaying the process. Upon completion, a Partition Wizard Finished dialog box opens. Press Finish when done.

Search for Free Space

Partition Wizard searches your hard drive to find space that has not been put into a partition. It then allows you to add it to an existing partition or create a new partition for it.

To start this process, select it in the More Drive Space dialog box, then press Next.

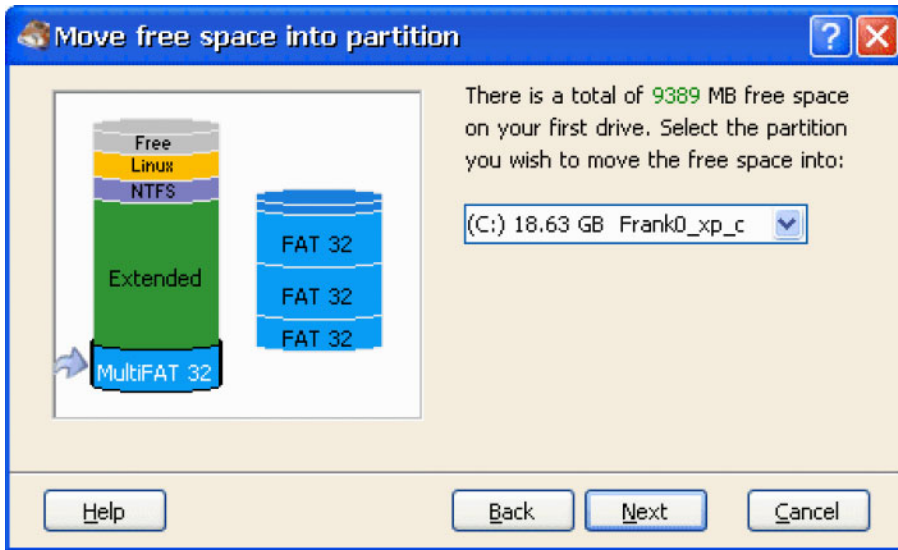
The Search for Free Space dialog box will open showing on which drive(s) the Partition Wizard found free space. Select the drive to operate on, and click a radio button to indicate whether you wish to allocate the space to a new partition or to select a partition to add the free space to.

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If you choose to add a partition, you will be notified that by proceeding you may change the drive letter assignments on your system. Press Next to proceed.

A progress screen appears, displaying the process. Upon completion, a Partition Wizard Finished dialog box opens. Press Finish when done.

If you choose to add the space to an existing partition, a dialog box opens showing the existing partitions, as shown below:



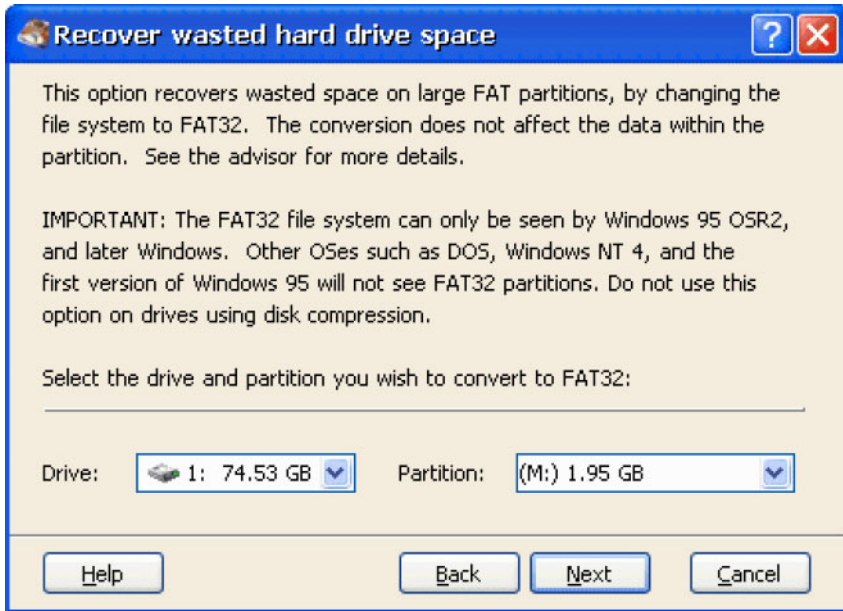
Using the down arrow in the text window, select the partition to which you want to add free space, or click on a partition in the window. Press Next to continue.

A progress screen appears, displaying the process. Upon completion, a Partition Wizard Finished dialog box opens. Press Finish when done.

Recover Wasted Hard Drive Space

If your system is using the FAT file system, converting to FAT32 can recover a significant amount of wasted drive space. This is because FAT32 is a more efficient file system. Partition Wizard determines if your system is using a FAT32 compatible OS (Windows 95 OSR2/98/Me/2000/XP/2003) and if you can benefit from converting to the FAT32 file system. If you are already running FAT32, or are running Windows NT or the first release of Windows 95, this option will not be available to you.

To start this process, select it in the More Drive Space dialog box, then press Next. The Recover Wasted Hard Drive Space dialog box opens.



Select the drive and partition you wish to convert to FAT32 by using the down arrow in the Drive box and the Partition box. Press Next to continue.

A progress screen appears, displaying the process. Upon completion, a Partition Wizard Finished dialog box opens. Press Finish when done.

Faster Disk Access - Create a Partition for Swapfiles

One way to enhance the speed of your system while running Windows 95/98/Me is to place the swap file in a partition by itself. This forces Windows to use the swap file more efficiently than it currently does. In addition, placing it in its own partition makes it easier for Windows to find the file. We do not recommend creating a separate swap file under Windows NT/2000/XP/2003, since it is very easy for the OS to become unstable in a number of situations.

Windows uses the swap file on the hard drive to hold data for which there is not enough room in RAM. When manipulating large files or using complex applications, reads and writes to the swap file can be numerous. Optimizing this function can significantly improve system performance on many systems.

After using the Partition Wizard to create the partition, you will have to start Windows and change the default location of swap file to the new partition. Simple instructions for doing this are provided by Partition Wizard and are repeated in the section below.

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To begin creating a partition for swap files, select Faster disk access from the Partition Wizard main menu. The Faster Disk Access dialog box opens, showing the recommended partition size. Press Next to continue.

A progress screen appears, followed by another dialog box, which shows the drive letter assigned to the new partition. Click a radio button to select the type of OS you are using and press Next to continue. Simple instructions appear describing how to reassign the swap file location in Windows.

Upon completion, a Partition Wizard Finished dialog box opens. Press Finish when done.

Setting the Swap File in Windows 95/98/Me

- 1) Click on Start, Settings, Control Panel, and System. Select the Performance tab, then Virtual Memory.
- 2) Click on "Let me specify my own virtual memory settings."
- 3) Enter the swap drive letter of the new partition (as was shown in the Finish box).

If you are uncertain which drive letter matches your new partition, as each drive is selected, the available space will be shown. The correct drive selection will have available space approximately the size of your new partition.

- 4) The minimum and maximum values can be left at the defaults.
- 5) Select OK. At "Confirm Virtual Memory" select YES. It is safe to ignore the Windows warning message.
- 6) The change will take effect when you next reboot Windows.

Better Organization

Partition Wizard provides three options to help you better organize your data storage:

- Organize OS, Applications and Data
- Optimize Disk Space
- Duplicate a Partition

Organize OS, Applications and Data

This option is described in the Typical Wizard section starting on the second page of this chapter.

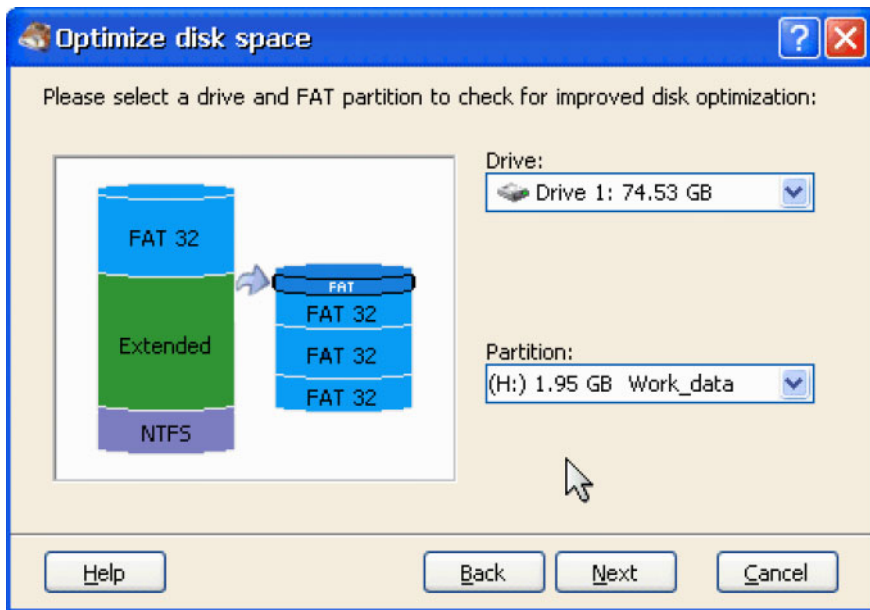
Optimize Disk Space

A large cluster size can cause wasted space on your hard drive because even small files are allocated an entire cluster. This Partition Wizard option analyzes your drive and OS, and if possible, allows you to convert inefficient FAT partitions to FAT32 partitions. If you are already using the FAT32 file system, the Wizard determines if altering the cluster size can attain further space savings.



Tip: Optimization was very important when small drives such as those 20 GB and smaller were common. With today's large drives and use of NTFS and to a lesser extent FAT32, the need and benefits of optimization are minimal if even possible and often not worth the bother.

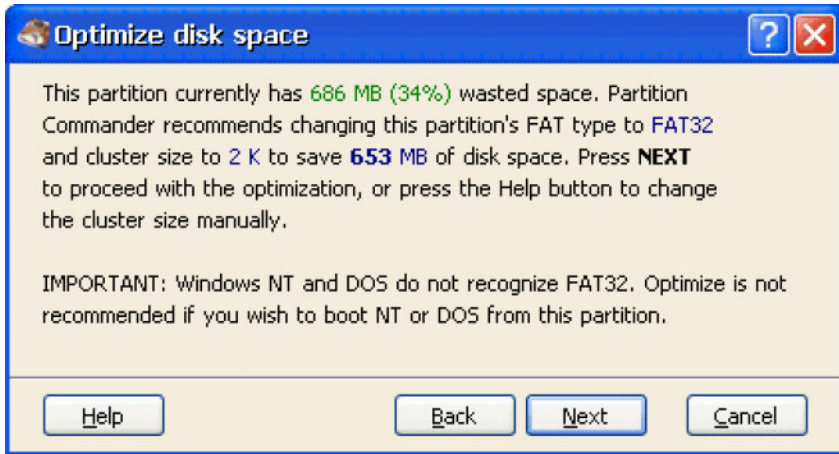
Start this process by selecting it from the Better Organization dialog box, and then press Next. The Optimize Disk Space dialog box opens.



Select the drive to optimize in the Drive box.

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Select the partition to optimize in the Partition box or by clicking on a FAT or FAT32 partition in the window. Press Next to continue. Partition Wizard analyzes your hard drive, shows you the progress, and displays the Optimize Disk Space dialog box if optimization is possible.

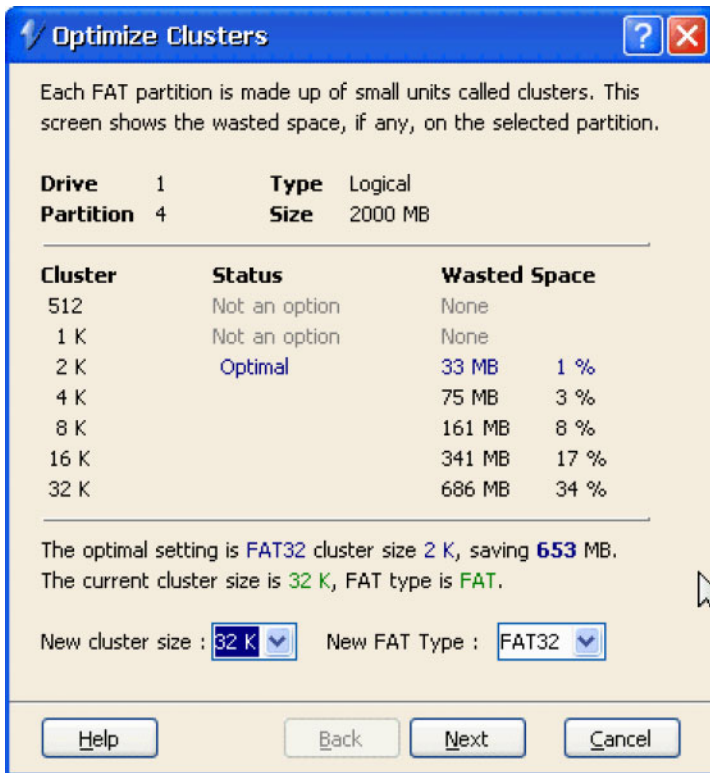


This dialog box shows the amount of wasted space and a recommendation of how to recapture it. Press Next to proceed with the optimization.

If no optimization is possible, you will be advised of this and can press Back to select another partition to optimize, or select Help to do manual changes. You will see the Optimize Clusters dialog box shown on the next page.

If you wish to change the cluster size manually, press the Help button.

If you choose to do manual changes, The Optimize Clusters dialog box opens. You can see what the results would be with different FAT types and cluster sizes.



The center of this dialog shows the amount of wasted disk space for each possible cluster size if this FAT partition were converted to FAT32.

In the lower section, the optimal settings appear in blue and the current configuration parameters for the selected partition are in green. Normally you would select the optimum parameters in the two list boxes at the bottom of the screen.

The New cluster size box contains the minimum and maximum cluster size available. Select one using the up/down arrows or enter a value.



Some older Windows utilities such as Scandisk and Defrag may not be compatible with the smallest cluster sizes. No harm will occur, but these utilities will not run.

The New FAT Type box contains the possible file systems (FAT or FAT32). Select one using the down arrow on the drop-down menu.

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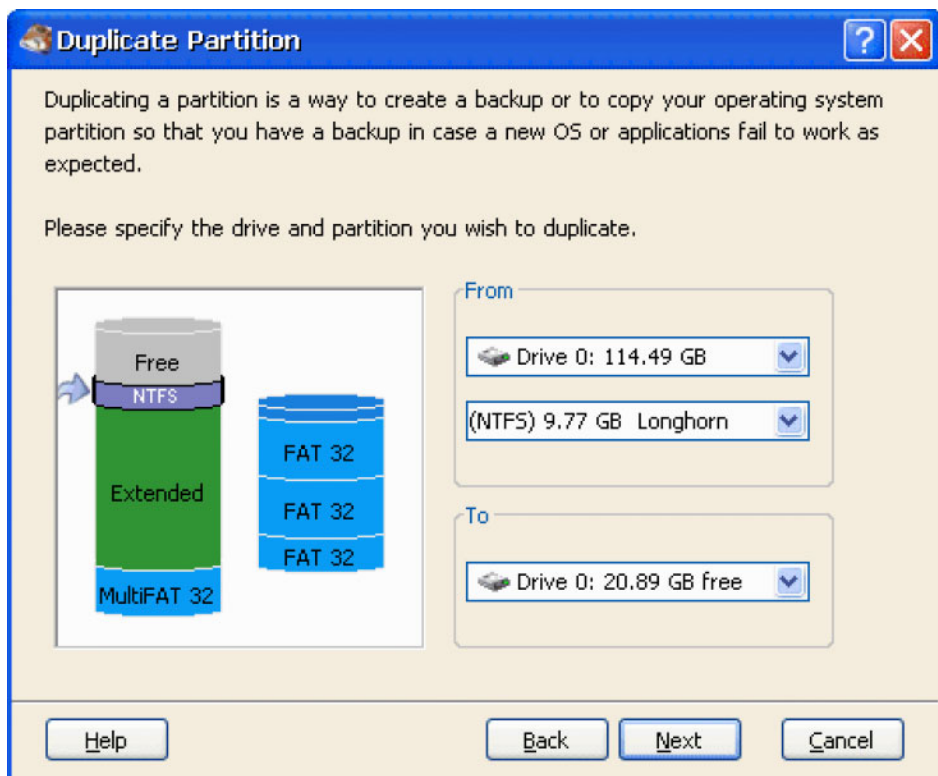
Press Next to change the cluster size and FAT type. A progress window appears, displaying the process. Upon completion, a Partition Wizard finished dialog box appears. Press Finish when done.

If you wish to optimize a NTFS partition (which is rarely needed), go to Manual Partitioning, select the desired NTFS partition, and click on Tools, Optimize.

Duplicate a Partition

Duplicating a partition is one way to create a backup of your system's OS, applications, or data. This can be very useful in case a newly installed application or OS does not work well. This strategy allows you to make a copy of a partition into available free space on the same physical disk or on a separate disk.

Start this process by selecting it from the Better Organization dialog box, and then press Next. The Duplicate Partition dialog box opens.



Indicate the drive location of the partition to copy in the From box.

Indicate the partition you want to copy in the Partition box or by clicking on a partition in the window. Click the Down arrow to see your choices.

Indicate the drive in which the copy will be located in the To box. Press Next to implement your choices.

A progress screen appears, displaying the process. Upon completion, a Partition Wizard Finished dialog box opens. Press Finish when done.



There must be a contiguous block of free (unallocated) space to contain the duplicate partition. If there is not enough room, you will have to free up space either by reducing the size of a partition or deleting a partition you no longer need. Partition Wizard will advise you if this is the case.

Add an OS

This runs the OS Wizard, described in chapter 4.

Manual Partitioning

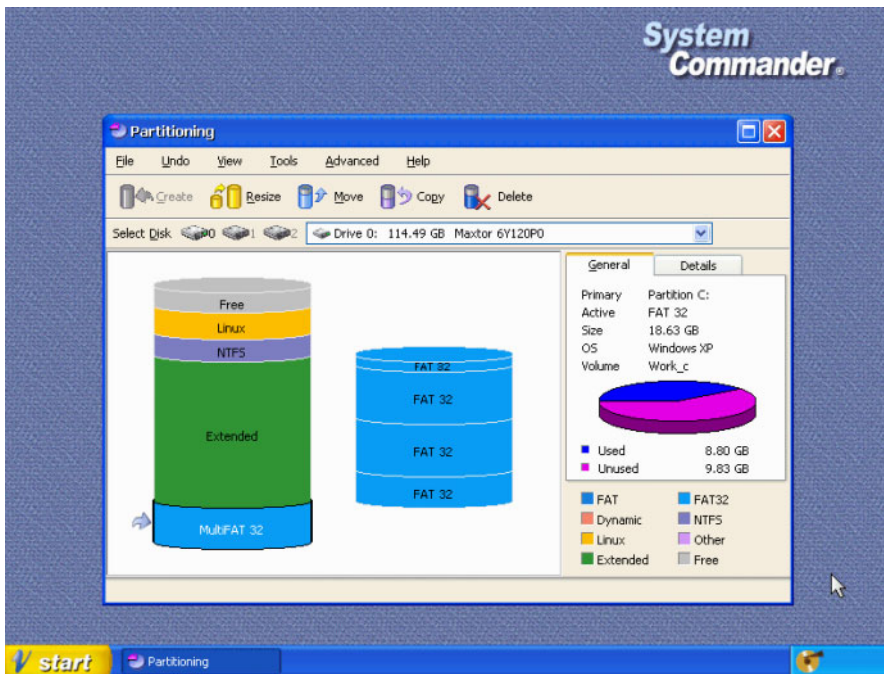
This option is described in detail in the next chapter. The Manual Partitioning option allows you to directly control various partitioning processes. It is also useful for seeing a graphical display of the partitions on your drive. To return to the Partition Wizard menu from the Manual Partition dialog box, click the File menu then Partition Wizard.

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14: Manual Partitioning

There may be times when you will want to create, delete, resize, optimize, format, move, copy, or validate a partition manually. For example, you may wish to add a new partition for data, to provide more room on a second partition, or delete a partition that is no longer useful to you.

To begin this process, at the first Partition Wizard screen, select *Manual Partitioning*. This brings up the Manual Partitioning dialog shown below.



This dialog always opens showing the first physical drive, labeled as Drive 0, in the graphical display. In the lower right is the legend for the colors used to indicate the type of file system installed in the partition. Both FAT12 and FAT16 partitions are displayed simply as FAT. On the right, an information panel has two tabs. The General tab shows the selected drive information and the details tab shows additional technical information for the drive. In the left graphic area, you will see the entire drive divided into partitions, with primary partitions all on the left, and logical partitions, if any, shown on the right. The logical partitions are contained inside of the Extended partition.

To select a partition, click on the desired partition in the graphical display. An arrow appears to the left of the selected partition.

To change drives, select the drive from the drive drop-down box. You can also quick select one of the first three drives by clicking on the buttons labeled, "0," "1," and "2."

Menu Bar Items

Across the top of the dialog box, there are six menu items: File, Undo, View, Tools, Advanced, and Help.

File	<p>Contains the submenus:</p> <p>Open lets you browse files on the selected partition.</p> <p>Close Window clears the window.</p>
Undo	<p>Reverses the Delete and Format commands.</p> <p>Undo Delete restores the last partition deleted.</p> <p>Undo Format restores the selected FAT/FAT32 partition that was previously formatted. Once data is written into a formatted partition, you cannot unformat it.</p> <p>BackStep Wizard will undo OS Wizard or manual partitioning. See Chapter 5 for complete details.</p>
View	<p>Allows you to quickly view and edit text files such as BOOT.INI or AUTOEXEC.BAT.</p> <p>Partition Explorer to view and edit files in FAT/FAT32 or NTFS partitions.</p> <p>Refresh to repaint the view on screen.</p>
Tools	<p>Provides various submenu commands for changing a partition as listed below.</p> <p>Create builds a new partition and is described below.</p> <p>Resize changes the size of an existing partition and is described below.</p> <p>Delete allows you to delete the selected partition. This function is described below.</p>



Warning: Once a partition is deleted, other later operations may make the data unrecoverable. Be sure to backup important data in a safe location.

Format prepares the partition for data.

Move allows you to move a partition on the same drive.

Copy allows you to copy a partition to free space on the same drive or a different drive.

Optimize to change the cluster size on FAT/FAT32 or NTFS partitions.

Change Volume Label to alter the volume label for the selected partition.

Validate checks boot sectors, directory structure, file allocation table, and checks file validity (FAT/FAT32/NTFS).

Advanced Contains menus for viewing log files and for advanced file type conversions. These are described later in this chapter.

Help Shows help information.

Buttons

On the top toolbar are five useful buttons that perform the same functions as the menu choices described in the previous section. Some buttons may be grayed out when the function is not appropriate for the selected partition.

Create Builds a new partition as described below.

Resize Changes the size of a partition as described below.

Move Allows you to move a partition into free space on the same physical drive.

Copy Allows you to copy a partition into free space on either the same drive or a different drive.

Delete Remove the selected partition from the drive. There are two confirmations before anything is done to the drive.

Help View help information.

Create Partition

To create a partition on the drive, you must first have free space available. Free space, in this instance, is space on the hard drive that has not been put into a partition. This is not the same thing as unused space within an existing partition!

Free space is identified by the word Free in the drive diagram. Click on this area, and an arrow appears to the left of the selection. Click on the Create button and a dialog box opens indicating the maximum size allowed. Specify the size of the partition you wish to create. The application automatically double checks to make sure that you have not entered an invalid value. The partition cannot be made any larger than the maximum size indicated.

You may also enable a surface scan, which will check for errors in the partition area. You can create a label for the partition. In addition, the Custom Partition Type checkbox allows you to select a specific file system for the partition.

Normally, FAT is automatically selected for Windows and DOS partitions, and FAT32 is chosen for Windows partitions over 2 GB. See page 29 for information on picking the right Windows or Linux partition type for you.

Once you have entered the information necessary, press Next and the partition will be created and formatted.

Resize Partition

The Resize partition function does exactly what its name implies. It will either shrink or expand the selected partition, based on your choice.

The Resize partition function uses our revolutionary technology to resize your existing partition while safely preserving your data.



When you are resizing a partition, the partition may not be made smaller than the actual data contained in it, or larger than the size of the physical drive. For example, if you have a 20 GB partition that contains 10 GB of data, then the smallest that you can make that partition will be 10 GB. If the hard drive has 30 GB capacity, the 20 GB partition cannot be expanded to more than 30 GB - the total size of the drive.

Don't worry about double-checking yourself; Partition Commander takes care of verification for you. It is mentioned here for information only.

To start the resize process, select a partition to resize. Next press the Resize button or select the Tools menu, then Resize.

The Resize Partition dialog box shows you the adjustment range, in megabytes, for the selected partition. You may either enter a number between the minimum and maximum, or you can use the spin button (the up/down arrow control to the right of the field) to have them shown for you.



Partition resize is only available with the major file systems such as: FAT, FAT32, NTFS, Linux Ext2, Ext3, ReiserFS and Linux Swap.

Copy Partition

You can copy a partition to free space onto any drive where it will fit. If you are copying a Windows OS partition to a secondary partition, please note that due to the limitation of Windows, it will not boot from anywhere but the primary drive.

After a partition copy has been preformed. The partition will be hidden to preserve drive letter assignments. To unhide the partition, select it and on the menu bar select *Advanced* and click on *Unhide*.

Delete Partition

There is no button provided for the delete partition command. To use this, select the partition that you wish to delete, and then go to the menu bar and select Tools and then Delete.

At this point, a dialog box appears with bold warnings and other information about the partition, such as its size and volume label.



Warning: Once a partition is deleted, all data in the partition is no longer accessible. Make sure important data is backed up in another location!

To actually perform the delete, you must enter the volume label exactly as it is displayed and then press Next.

If the label names do not match, you will receive an error message and no change will be made to the partition.

Optimize

If you select a FAT or FAT32 partition, the Optimize function will analyze the files in the partition to determine if a different compatible file system or a change in cluster size will save space. You can then have Partition Commander perform the optimization or look at the results of other choices available.

For NTFS partitions, you will be presented with two options - Defragment MFT or Optimize. The Defragment MFT option will check if the Master File Table is fragmented or not. If it is fragmented it will offer to defragment it. This will help keep your system running at peak performance. Selecting the Optimize option allows you to select a cluster size from 512 to 4K.



Tip: If Windows was used to convert a partition from FAT32 to NTFS, it normally uses a 512-byte cluster size. Many users have reported dramatic speed improvements by going to a higher cluster size such as 4K.

Using the Advanced Tools

Under the Advanced menu, there are several choices:

Set /Toggle active/bootable Assigns bootable active status to a single partition.

Hide Hides an unhidden partition.

Unhide Unhides a hidden partition.

Conversion This option allows you to convert a partition from one file type to another, for example, from FAT16 to FAT32 and vice versa. Select the partition that you wish to convert, and then select this option.

If the selected partition is NTFS, it is converted to FAT32 or FAT. Only Windows 2000/XP/2003 can access FAT32. **Do not convert an NTFS partition in older NT versions, if you wish to continue to use NT**, since NT does not understand FAT32.

If the selected partition is a Dynamic Disk, you can convert it back to a normal "basic" disk.

BootFixer™ This feature examines every BOOT.INI file in FAT/FAT32 and NTFS partitions and fix any problems with the drive numbering within this file. BootFixer automatically runs after any partitioning

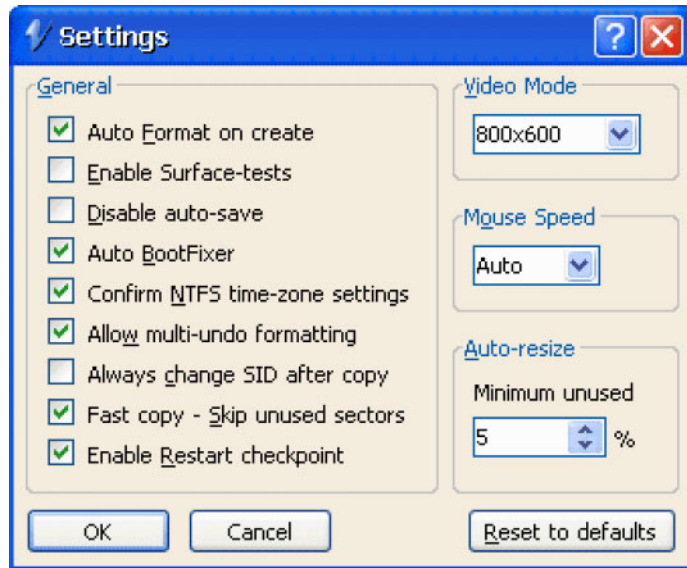
operation to ensure the Boot.ini files are constructed correctly for any changes that may have taken place.

Change SID

Update the security identifier for the selected partition, all partitions on a drive, or all drives and partitions. A unique SID is required in every partition by Windows NT/2000/XP/2003 and Longhorn. If you perform a partition copy, the SID should be updated.

Settings

The dialog appears:



Description for each setting:

Auto Format on create automatically formats newly created partitions.

Enable Surface-tests performs error checking on a partition. It is similar to the ScanDisk program in Windows.

Disable auto-save makes these option settings apply only to the current session - they are not saved.

Auto BootFixer when enabled will automatically correct BOOT.INI problems after any partitioning operation. As you move or copy partitions, BootFixer will update the BOOT.INI to keep your Windows NT/2000/XP/2003 booting properly.

Confirm NTFS time-zone settings will ask you about the local settings each time this information is used, such as converting from NTFS to FAT or back. If the local settings do not match your

OS, file date/times and filenames may change during the conversion!

Allow multi-undo formatting saves the information about undoing formatting for the BackStep Wizard. This adds a small amount to time to the formatting process, but also makes it reversible with the BackStep Wizard.

Always change SID after copy will update the NT/2000/XP/2003 SID (Security Identifier) after a copy operation. This insures the copy does not have the same SID as the original.

Fast copy - Skip unused sectors will speed copy operations by skipping those sectors that are unused.

Enable Restart checkpoint is the safest way for resize and conversion operations to recover in the event of a power failure or system reset in the middle of a critical partitioning operation. We strongly recommend keeping this option enabled. If you are working on a partition or system where the data is not important, disabling this feature will speed up these operations.



If you disable the Restart Checkpoint, and a power failure or reset occurs during some partitioning operations, your data within that partition may be lost and unrecoverable!

Video Mode provides screen resolution options.

Mouse Speed adjusts how mouse movement appears on-screen.

Auto-resize specifies the minimum percentage of unused space to be retained in a partition when resizing using Partition Wizard.

Reset to defaults returns the settings to default values.

View log

As the name implies, this allows you to view the partition action log. This is included mostly to assist Technical Support.

Appendix A: About System Commander

Interrupts and Memory

System Commander is non-resident and uses no memory once a menu selection is made. System Commander does not intercept any interrupts nor is any part of System Commander active while an operating system is running. System Commander is only active for the brief time the operating system selection menu appears on screen. This means that, once selected, System Commander cannot affect the way an operating system is working.

Specifications

Handles over 100 x86 compatible operating systems, split as 32 OSES in the MultiFAT partition, up to 16 OSES in logical partitions, and up to 56 OSES in primary partitions across fourteen drives (additional drives are ignored, but usable by operating systems).

- Ability to boot other Master Boot Records.
- Works with all standard display adapters.
- Requires 640KB RAM minimum, but zero bytes remain resident after a selection is made. OS Wizard requires 32 MB while it is running. Resize operations may require additional RAM for large partitions.
- Works with all standard drive types, IDE, EIDE, SCSI, ESDI and others made available by the BIOS. Most USB and Firewire drives are not supported by the BIOS and will not be seen by System Commander.

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Summary of significant System Commander files

File name	Description
CHECKMBR.EXE	Determines if the System Commander MBR has been erased, and if so, restores it. This program is not a TSR and displays nothing in normal operation.
CONSOLE.EXE	The Console can enable and disable System Commander from Windows and performs other utility functions in Windows.
MSDOS.BAK	Generic MSDOS.SYS file for Windows 95/98/Me.
SCBOOT.DAT	System Commander's data file
SCDISK.EXE	Program to view partition information and to temporarily mark partitions bootable or non-bootable. Also used to preset some System Commander options.
SCIN.EXE	Utility to enable, disable and run diagnostics.
SCNOTES.TXT	Text only version of installation notes.
SCOSW_x.x	Files for the OS Wizard
SCOUT.EXE	Writes diagnostic information to a file SCOUT.TXT
SYSCMNDR.SYS	Boot executable - This is NOT a device driver and is only used during the operating system selection process. It is installed in the root directory as a hidden system file.
SETUP.EXE	Installs System Commander.
WINMBR.EXE	Determines if the System Commander MBR has been erased, and if so, restores it. This program is not resident and displays nothing in normal operation.

Files Created by System Commander

File name	Description
BOOT.DAT	The original master boot sectors are saved during the first time installation, both on the hard disk and on the utility diskette. It is used when uninstalling System Commander and should not be deleted.
DOSBOOT.DAT	The DOS boot sector before System Commander is installed. It is only saved on the utility diskette as part of System

	Commander's special recovery feature. The file should not be deleted.
EBOOT.DAT	The original partition boot sectors are saved during the first time installation, both on the hard disk and on the utility diskette. It is used when uninstalling System Commander and should not be deleted.
SCDOS.SYS	This file is created by System Commander to hold OS hidden system files like IO.SYS and MSDOS.SYS for DOS. SCDOS is also marked as a hidden system file. It may change in size as new operating systems are added to the FAT/FAT32 partition.
SCOSW.LOG	Log of various operations
SCTEMP.BAT	Temporary file (not important to operation)
VDATA.SAV	Settings information is saved in this file.

Screen Captures

Since System Commander runs at boot time, it's often not possible to perform a screen capture at that point. A number of screen shots are provided on the CD in the press folder and on our web site at: www.v-com.com/news/news_imges.html.

We've also included the ability to make screen captures from within the program itself.

OS selection menu capture

It is best to run the SCDISK program from a Windows 95/98/Me or DOS prompt. At the prompt, type:

```
C:\> \sc\scdisk
```

Select the option *View OS Selection menu*. After pressing Ok at the explanation dialog, the OS selection menu appears. You can move to different choices and toggle the Info option, but if you make a selection, you will simply return to SCDISK. No OS selections can be made from this menu.

When the OS selection menu appears, press **Ctrl-PrtScn** or **Ctrl-Backspace** to capture the screen. It may take a few seconds. When complete, the screen capture file name appears in the taskbar. Press any key to clear the filename information. The screen is captured to a file in the same directory you run scdisk. The file format is SCREEN00.BMP where the digits 00 increment automatically. It will not overwrite prior screen captures.

OS Wizard and Partition Wizard captures

When run from the hard disk (i.e. select OS Wizard or Partition Wizard from the OS selection menu), you can capture screens to the hard disk. Press **Ctrl-PrtScn** or **Ctrl-Backspace** to save the current screen. The captured screen is saved to the installation directory in the file name format SCREEN00.BMP. The last two digits will automatically increment for each new screen capture. Each session will start at 00, so if you made files from a previous session, they will be overwritten. When you make a screen capture, there is no feedback other than brief activity of the disk drive.

If System Commander was installed using it's virtual mode (typically under NTFS or Windows XP), it will be necessary to use the console to retrieve the screen capture files, using the Extract function, under Options, Special. See the Windows console on page 103 for more details on getting running the console and the extract function.

For example, to get a screen capture file, in the extract dialog, use the drop-down source to show all the files and locate the SCREENxx.BMP file you wish to retrieve. Select a destination anywhere on your system and click on Ok.

Upgrading from a previous version

To upgrade from a prior version of System Commander, install the new System Commander as though it were a first time install. You should install System Commander in the same partition and subdirectory as the original installation. After the files are copied, you will be presented with an option to transfer all menu names and other options to the new installation. Select "Use Prior Settings" to do this.

If you have OS selections that boot from a logical partition, in a few rare cases the new installation may not transfer the OS selection description. In these cases, System Commander will automatically assign a name based on the operating system name.

System Commander normally assumes the MultiFAT feature is always on. If you had the option off before, it is automatically set on during the new installation. When installing to a NTFS partition or from Windows NT/2000/XP/2003 or Longhorn, MultiFAT is disabled.

System Commander 8 uses a visual interface file for your chosen style, such as metal1 or xblue. The VUI design has changed since version 7, and version 7 VUI files are not compatible with System Commander 8.

Appendix B: Applications

As a result of booting multiple operating systems, System Commander also serves the following applications:

Games

System Commander will allow you to keep your DOS games while still migrating up to Windows 95/98/Me. Conversely, if you already have Windows 95/98/Me, you can keep your 95/98/Me games and add games that run under your DOS installation.

Another feature of System Commander will allow you to create different DOS configurations for games designed to run under DOS. Rather than create the dreaded boot disk for every game you have, you can use the System Commander boot menu to manage DOS boots designed specifically for the game you wish to run. See the section "Multiple Selections for One DOS" on page 74.

Development

Rather than having multiple machines, each running a different OS under which you are developing, you can use System Commander to boot all of them on the same machine. This allows you to develop applications either across multiple platforms or for an individual platform while cutting costs for expensive hardware.

QA/Testing

After you have developed your applications, it is often necessary to run them through rigorous testing using multiple OS installations or software scenarios. With System Commander you can either boot multiple Oses or boot the same OS with different startup configurations. This will allow you to test your application on the same machine, again cutting expensive hardware costs.

OS Migration

First came DOS, then Windows 9x, Linux, and more. Today XP is the most common Windows variant with new versions such as Longhorn and Blackcomb in the works. Operating systems are being developed and revamped at an ever-increasing rate. Unfortunately, it is often a difficult decision to migrate to these new and improved

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OSes. System Commander will allow you to continue to run your preferred operating systems while testing out new OSes.

Multi-Lingual OSes

System Commander allows those who are multilingual to use the language variants of operating systems with which they are comfortable. Work requires that you use English Windows 95/98/Me, but you grew up programming Japanese? Use System Commander to get back and forth between what you need and what you want!

Training

System Commander can be used to cut hardware costs for training facilities by allowing you to boot the operating system you need. If your developers are using Windows 2000/XP while your support staff is using Windows 95/98/Me, it can sometimes be difficult to arrange training. With System Commander, you can install the OSes you need onto the same machine reducing costs and space in training facilities.

Sales Demonstrations

Field salespeople will love System Commander. It unburdens them from carrying two or even three laptops to demonstrate their products on. If your firm develops applications across multiple platforms, you can use System Commander to install all of these OSes on a single laptop that your field salespeople can use for demonstrations.

Help Desks and Technical Support groups

Does your support organization support a product that runs under multiple operating systems? If so, you can use System Commander to boot different OSes on the same machine. This will enable the support engineer to easily replicate the circumstances the user is experiencing.

Password Security

System Commander provides advanced multi-user password security for a PC while using no resident memory and with zero degradation to application speed or performance.

Appendix C: Additional Considerations

Making a partition Bootable or Active

In rare situations, an OS might require an active or bootable partition before installation. You can use Partition Commander to set the bootable status. Simply reboot to the System Commander OS selection screen and select **Partitioning**. Then from the Partition Wizard, select **Manual partitioning**. Select the desired drive and partition and check in the right information pane if it is bootable or not. To change the state, from the menu bar, pick **Advanced**, then **Set/Toggle active/bootable**.

As an alternative, you could use the SCDISK utility provided with System Commander. To do this, at the prompt (Windows 95/98/Me only), run SCDISK. Select the option Change boot status for OS install. This allows you to set the partition for the new operating system to be bootable. Be aware the SCDISK utility will also hide all other non-bootable partitions when you boot directly from a boot diskette (without going through System Commander). The hiding process is automatically cleared when System Commander boots up.

Never Delete other OSes

If during the installation of your OS, the installation program asks if you wish to delete an older OS, select NO unless you truly wish to delete the old OS. In addition, when installing an OS into the MultiFAT partition, do not install the OS on top of (in the same directory as) the old operating system! Instruct the new OS to use a new directory.

Making a new OS selection appear

Once the OS is installed, simply reboot, and the new choice should appear on the System Commander OS selection menu. In some cases, the OS selection might not appear. To add an OS selection to the menu, select Settings, and select the *Order add and remove* menu. Press Add, and then select Partition. You can then toggle the bootable status for the OS you just added to Yes.

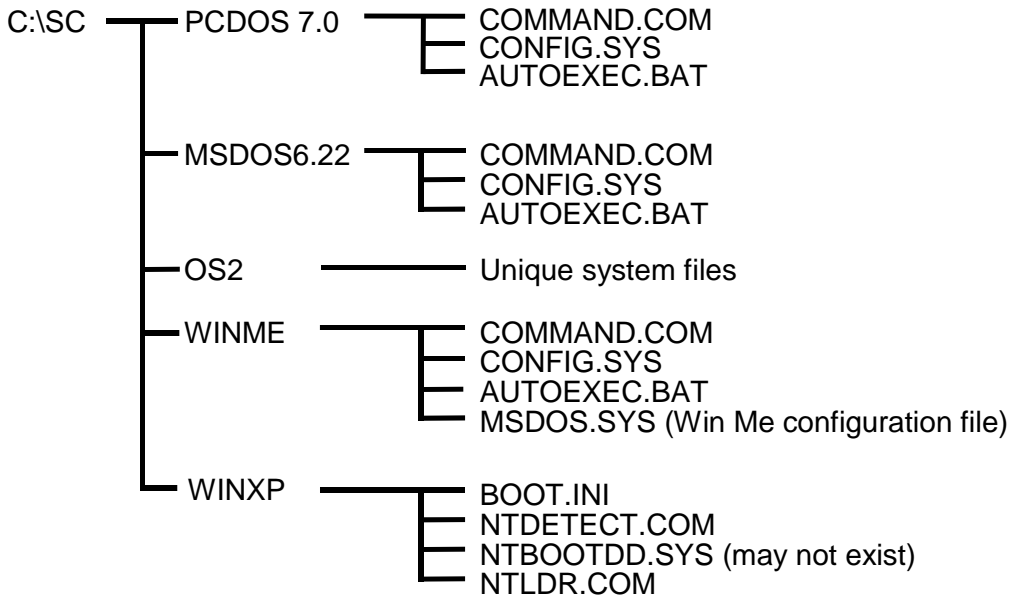
Although rare, some new OS installations destroy System Commander's master boot record during installation. For example, Windows 95/98/Me and Japanese DOS/V version 6 do this. In these cases, System Commander will not run after rebooting the system. This is not a critical problem, and is easily solved. At a DOS/Windows prompt,

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switch to the System Commander directory and run SCIN and select Enable. You can also perform this action directly from Windows 95/98/Me. In this case, run the Windows System Commander console program and select Enable. Exit and shutdown windows (reboot). Now System Commander will come up normally.

Multiple OSes In MultiFAT partition Summary

After loading four OSes, the directory structure might appear as shown below. You can use any directory names you wish, but using the vendor and version as part of the name is helpful in keeping everything straight.



As the various files, like CONFIG.SYS and AUTOEXEC.BAT are changed in the root directory, System Commander will automatically update the saved images in the appropriate subdirectories.

Hidden system files, like IO.SYS and MSDOS.SYS, are saved and managed in the System Commander SCDOS.SYS file. Windows 95/98/Me's MSDOS.SYS is saved as a separate configuration file, to allow System Commander to automatically update this file if changed.

Special Case - Booting through the MBR

In very rare cases, an operating system fails to follow the PC architecture standard and requires its own Master Boot Record (MBR) to boot properly. The only two cases we've encountered are the SOS operating system, and Linux's optional LILO and Grub MBR installations. When Linux is installed with a partition boot (called a superblock in Linux terminology), it will not need this MBR file feature. Many Linux installations do not provide a choice and automatically insert a LILO or Grub MBR.

Automatic MBR Booting

When System Commander is installed in a FAT or FAT32 partition (not NTFS), it's CHECKMBR program will detect a new MBR and save the LILO or Grub MBR in a special filename (MBR_LILO.DAT or MBR_GRUB.DAT). When System Commander boots and sees either of these MBR files in the root, it will automatically add the new boot choice to the menu.

Manual MBR Booting

To setup the MBR boot selection manually, you will need a binary file image of the MBR. If the OSes MBR was installed prior to System Commander, we will have saved the MBR in the file BOOT.DAT in the subdirectory where you installed System Commander (C:\SC is the default). Changes to the MBR after System Commander is installed are saved to MBR_BOOT.DAT. Copy the MBR file into the root directory. It is wise to rename the file so you are aware what it is. For example the Linux MBR could be renamed **LINUX.MBR**.

To add a new OS selection that loads the MBR file, reboot into System Commander. Select **Settings**, and select the *Order add and remove* menu. Click on **Add**, and then select **MBR**. The next three dialog boxes will appear in sequence:

MBR Filename - Enter the filename of the MBR file. The file does not need to exist yet, as it only needs to exist when you select it from the OS selection menu. A subdirectory is not allowed, as the file you supply will be on the root directory of the C drive (non-compressed).

MBR Partition Option - A portion of the MBR normally holds the partition table. When System Commander loads the MBR into memory, it can transfer the current partition information to the MBR in memory, so that the data is current with the drive layout. Select OK to allow the transfer. Select Bypass if you want to leave the MBR in memory untouched. If you are unsure which option to use, try OK first. If this fails to boot up properly, you can remove the MBR choice and then add it back, changing this option to Bypass.

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MBR Active Partition Option - This specifies which partition should be associated with the MBR. For example, if you use the Linux MBR, then you must enter the drive and partition where Linux resides (not the swap partition). You can also elect to make no partition bootable by making the field blank. Press Alt-I to see the location of every partition.

Once these three questions are answered, the new MBR choice will appear on the menu. You can have up to four different MBR boot choices on the menu. If needed, you can control access to different partitions for each MBR choice from the Local special options menu.

If a drive and partition were specified, these will appear on all System Commander menus that show the drive and partition. A small "m" will appear after the partition number. For example, 0-2m, indicates that partition 2 on the first drive (0) will be made active/bootable when the MBR choice is made.

Appendix D: Ensuring your OS boots!

It's always smart to have a known good boot CD or diskette for your OS. This can often get you out of a jam, should the OS crash or have other problems that prevent it from running normally. Some of the more recent OS releases include a boot CD, which can often be used in place of a boot diskette. Typically retail versions of Windows Me, 2000, XP, and 2003 include the ability to boot from the CD. Most Windows OEM versions that come with a new PC only allow installation and may not be useful in the event of a problem. Many Linux distributions also include the ability to boot from the CD.

If you are unsure what you have, it may be worth a quick test to see what happens when you boot from the CD. If it only provides an option to install, cancel the install, and it may leave you at a point where other utilities can be used at a command prompt. Remove the CD and reboot (press **Ctrl-Alt-Del**).

Windows NT/2000/XP/2003

Surprisingly, Microsoft left out the ability to create a startup disk, but it is relatively easy to do if you are somewhat familiar with using command prompts.

In Windows, select Start, Run, then type in **cmd**, and press Enter. This will open up the command prompt window.

- 1) Place a diskette in drive A. Type **Format A:** at the command prompt. This is necessary even if the diskette is pre-formatted, as the Format in NT/2000/XP/2003 installs a different boot record than the one used by Windows 9x/Me or DOS. Do not skip this step.

Type **Exit** to leave the cmd mode.

- 2) Copy the following hidden system files from the C: root onto the diskette (you can see hidden system files in explorer by clicking on Tools, Folder options, click on the View tab, then click on the option in Advanced settings to *Show hidden files and folders*. Also un-check the option to *Hide protected operating system files*):

ntldr
ntdetect.com
boot.ini
ntbootdd.sys (only if present, needed for SCSI disks only)

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- 3) You may want to edit the copy of the BOOT.INI text file that you copied onto the diskette (do not edit the one on the hard disk!). It controls which partition holds the OS and will be booted, along with other options.
- 4) You should boot from the diskette to confirm that is working as expected. It will be slow, but eventually you will be asked to log into Windows.

Windows 95/98/Me

Method 1: Use System Commander's Diskette Builder

Click on Start, Programs, System Commander, then Diskette Builder. At a minimum, make the utility diskette, which will be a bootable diskette with your OS along with other useful system files.

Method 2: Use Windows 98/Me (not available in Windows 95)

In the Control Panel, click on **Add/Remove Programs** (to get to the Control Panel, click on Start, Settings, Control panel). Next click on the **Startup Disk** Tab. Click on **Create Disk**. Follow the instructions.

Linux

Your Linux distribution should have specific instructions on making a set of boot diskettes and/or information indicating if the CD is a bootable type. Even more important than Windows, you should always maintain a means to boot into Linux from a diskette or CD. Linux tends to be sensitive to some system changes that will cause it to fail to boot up from the hard disk. Most of these issues can be easily solved, but only if there is a means to boot up from a CD or diskette set. Your Linux distribution will also have troubleshooting tips for correcting boot up problems, usually related to LILO or GRUB (the most common Linux boot loaders).

DOS

Switch to the C:\SC directory and run **scin.exe**. Select Special options, Make Utility diskettes, and select to make the Utility diskette. In addition to making the diskette bootable, SCIN will copy a number of useful DOS command utilities.

Appendix E: Common OS Commands

This section describes common commands available in Windows 95/98/Me and DOS that are often used in the installation, setup and maintenance of FAT operating systems. Your Windows 95/98/Me and DOS manuals should provide greater detail about these commands.

ATTRIB

The attribute command changes the file attributes. In most cases one of the following two commands are used:

To make the MSDOS.SYS hidden file visible, non read-only, and non-system (which allows you to delete or copy the file):

```
C:\> attrib -h -r -s msdos.sys
```

To make the IO.SYS file hidden, read-only, and system:

```
C:\> attrib +h +r +s io.sys
```

FDISK

Although System Commander has far more advanced partitioning control, through OS Wizard, DOS and Windows 95/98/Me provide limited partitioning control with FDISK. The FDISK utility allows you to display current partitions and add or remove partitions on multiple hard disks. Keep in mind that when you delete a partition all of the data within the partition is lost and is not recoverable. Make a backup of important data and programs before deleting a partition.

If the partition you wish to remove is the partition you installed System Commander in, be sure to disable System Commander before deleting the partition.

To run the FDISK utility, at the DOS/Windows 95/98/Me prompt:

```
C:\> fdisk
```

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FDISK provides the following options:

- 1 - Create a DOS partition or Logical DOS drive.
- 2 - Set active partition.
- 3 - Delete partition or Logical DOS drive.
- 4 - Display partition information.
- 5 - Change drive.

Keep in mind that you can only create a partition when unused disk space is available. If no space is available, FDISK cannot create a new partition. If you need to create more than one primary partition on a single drive, you must use Partition Commander. Chapter 14 explains manual partitioning using Partition Commander.

FDISK can only create FAT partitions. These are suitable for DOS, Windows 95/98/Me, OS/2 or NT. It cannot create special partition types for UNIXes, NetWare, OS/2's HPFS type, nor NT's NTFS type. Version 6 and later FDISK can delete any type partition (i.e. DOS as well as non-DOS). Older FDISK versions can only delete DOS partitions.

A partition cannot be booted unless it is active. If System Commander is already installed, you do not need to be concerned with the active status, since System Commander automatically handles this. If System Commander is not installed, be sure to make the partition you wish to first boot to as *active*.

After the creation of a partition it is necessary to format the partition. See the next section for instructions using the format command.

FORMAT

This prepares a new disk partition for use and creates a boot record for the partition. A format will erase the data in the partition and makes the partition ready to accept files. When accessing a new partition from DOS that has not been formatted, the error message appears ***Invalid media type***.

To format a partition, the format command is issued with the drive letter. The ***/S*** option will also load a set of minimal start up files from the boot diskette so the partition (if active) will boot. To format drive E and load the system into drive E, the following command is issued:

```
A:\> format e: /s
```

SYS

To issue the SYS command from a boot diskette to place the system onto the C: drive, the command is issued:

A:\> **sys c:**

It is not necessary to boot from the diskette drive before issuing the SYS command. After the SYS command completes, it returns the notice "System Transferred".



Technical Information: The SYS command loads the operating system startup files onto the specified drive. For MS-DOS and Windows 95/98/Me, this includes IO.SYS and MSDOS.SYS. Versions 5 or later of the SYS command will also copy the COMMAND.COM file to the target disk. With PC-DOS, OpenDOS, Novell DOS, and DR-DOS, the SYS command loads the files IBMIO.COM and IBMDOS.COM.

The SYS command has a number of annoying quirks that may prevent it from working. We would recommend you use System Commander's *Transfer System* option instead. This is run from **SCIN**, under the *Special options* menu (see page 106).

If the SYS command detects a newer version of the OS already installed, it may complain and do nothing. In this case, delete the files on the target disk root directory, IO.SYS and MSDOS.SYS (or if PC-DOS or Novell DOS, delete the files IBMIO.COM and IBMDOS.COM). Remember that the files are usually hidden read-only files, and the attributes must be changed before deletion.

If the SYS command returns the confusing message "Write failure, diskette Unusable", it means the target partition has not been formatted.

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Appendix F: Technical Support

We hope that you will never encounter problems with System Commander. However, the reality is things may come up that are not covered in this manual and you may need technical assistance.

We strongly encourage you to check the manual's troubleshooting chapter 10 and check out our latest support information on our web site at:

www.v-com.com/support/intro_SystemCommander.html

Complementary Technical Support

Should you find yourself at a loss and need to contact us directly, we will do our best to assist you. Our web site has additional information and you can send questions via our web site directly to our support engineers.

Before you contact technical support, please have your product version number. In addition, we will need to know the exact nature of the problem and what you have done to attempt to remedy it.

Our technical support hours are normally Monday through Friday 9 am to 5 pm Pacific Standard Time. We are closed for most major holidays, and on Thursdays from 12 noon to 2 pm for group training. Complementary technical support is on a first come, first serve basis.

Please use the link above to get FAQ information and email support. To contract us by phone, call us at 408-965-4018.

Getting a Master Password

If you lose or forget your password, V Communications can provide a onetime use master password that will let you gain access to your system. Before calling V Communications, you should be at the password request box. We will need information presented in the About box (**Alt-A**).

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In addition, please have your credit card ready. There is a nominal fee for this service. If you do not have a credit card, call for the current cost of this service. V Communications requires prepayment for this service.

When you call V Communications, we will collect key information from you. After the call we will verify your ownership. Upon verification, we will call you back and provide the master password for your copy of System Commander.

This master password will only work on your single copy of System Commander and is valid only for one boot time. We strongly recommend you go directly to the password menu and set a new password.

After you select an OS, the master password is changed. Should you lose your password again, a new master password will be required.

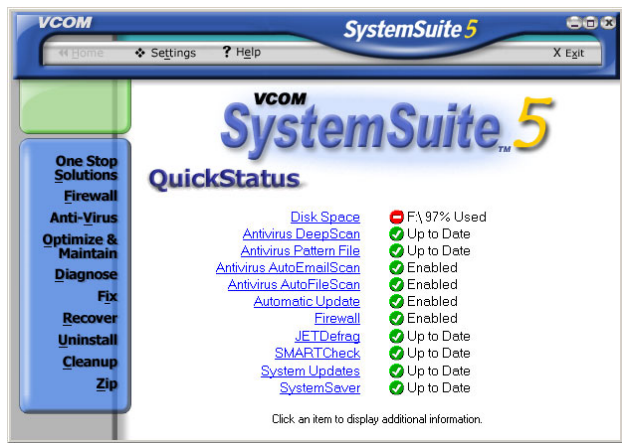
Appendix G: VCOM Products

VCOM makes a number of great products that can save you time and effort! Check out the latest information or order on-line from our web site at **www.v-com.com**

SystemSuite™

A comprehensive collection of essential PC utilities designed to maintain and protect your computer. SystemSuite improves system performance, protects your system against viruses and from hackers, diagnoses and fixes problems, recovers lost data, and much, more!

SystemSuite's award-winning design makes all these utility features accessible from one easy-to-use interface that eliminates the need to buy and install each package.



PowerDesk® Pro

A powerful file manager that offers more features and functionality than the limited file manager offered in Windows or other file management software. It completely replaces Windows® Explorer, giving users a wide array of tools to search, edit, delete, move, sort, view and copy files, including those found on digital cameras and MP3 music players.

More products from VCOM!

iEasySite™

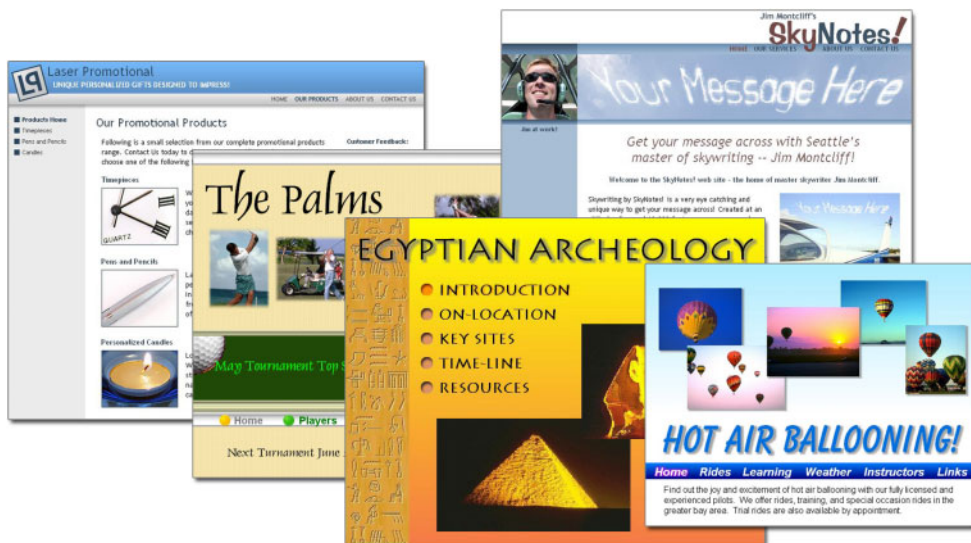
Host your web site at iEasySite.com. iEasySite is the recommended hosting partner for Web Easy. It's easy to get started - once your web site is completed, click on 'Publish' from the Web Easy menu. You'll have your account open and live within minutes!

Media Easy™

Media Easy is the ultimate tool for managing digital media, including photos, MP3 files and video. Click on a folder to view thumbnails of all the files. Advanced search features allow you to find the image you want quickly and easily. Media Easy also offers special software to maximize your photo print quality, convert between different image formats, and even create an instant photo web site!

Web Easy Professional™

The most powerful, easy-to-use web design tool available! Web Easy Professional delivers dynamic Web sites that, up to this point, only the pros were able to create. Web Easy Professional comes with an extensive library of templates, graphics, animated GIFs, photographs, forms, objects, sounds and more. Creating custom web sites with advanced features is now as simple as drag-and-drop.



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