

Partition Commander®

Version 8 **User Manual**



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Preface

This User Manual contains all the information you need to safely and quickly install Partition Commander and begin using it to optimize your hard drive.

Each chapter in this manual has a distinct purpose:

Chapter 1 gives you an introduction to Partition Commander, its features and system requirements.

Chapter 2 provides step-by-step instructions for installing the Partition Commander software on your system.

Chapter 3 gives you an overview of the basics of how a hard drive functions, and the fundamental properties of partitioning a hard drive. Concepts and terms described here are important for using Partition Commander.

Chapter 4 describes the features and functions of Partition Wizard, starting with an in-depth walk-through of a typical Partition Wizard operation.

Chapter 5 covers the Start Menu and the BackStep™ Wizard.

Chapter 6 is for users who want to directly control the partitioning process manually in order to create, resize, or delete a partition.

Chapter 7 describes the features and functions of System Commander Personal Edition. System Commander Personal Edition allows you to install and manage multiple operating systems on your hard drive.

Chapter 8 covers useful troubleshooting techniques.

The Appendices offer additional technical information, including contacting technical support (Appendix A), other products from V Communications (Appendix B) and OS and product limitations (Appendix C). Appendix D, ensuring your OS boots, shows how to make a boot diskette for your OS.

Conventions and Icons used throughout 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.

Filenames, for example, BOOT.INI, are noted in ALL CAPS.

OS commands and command lines are indicated by **bold lower case letters**. 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:



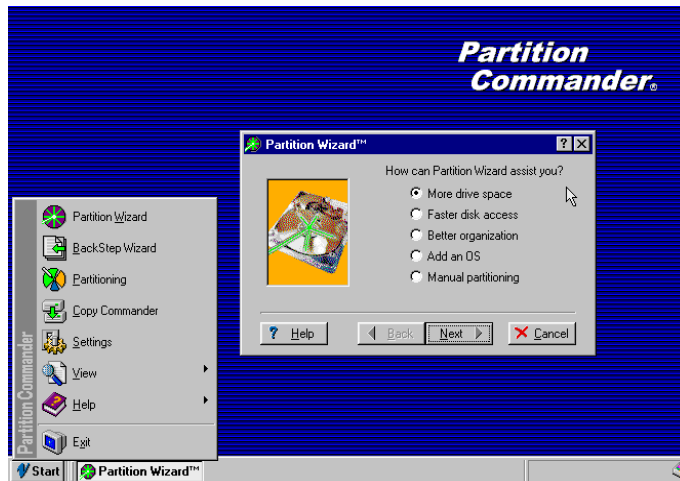
This icon is used identify important information and tips.



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

1: Introduction

With Partition Commander, you can partition your hard drive easily and safely in order to make it more efficient. Partition Commander automates the process, simplifying the choices you must make and providing helpful suggestions along the way.



Key Benefits

Partition Commander provides a number of unique capabilities.

- ✓ The Partition Wizard automatically analyzes your hard drive to determine optimum partitioning schemes, including preparing a primary partition for a new operating system (OS).
- ✓ Partition Commander gives you practical solutions for five major reasons for partitioning your hard drive, including:
 - More drive space
 - Faster disk access
 - Better organization of your files
 - Add an OS

- Manual Partitioning
 - ✓ Allows you to resize, copy, and move partitions.
 - ✓ Allows you to move unused space from one partition to another.
 - ✓ Creates partitions for any OS.
 - ✓ Recaptures unallocated (wasted) space.
 - ✓ Optimizes the size and location of your swap file.
 - ✓ Converts between FAT/FAT32/NTFS to save disk space.
 - ✓ Allows safe deletion of partitions and format undo.
 - ✓ BackStep Wizard™ can undo many automatic and manual partitioning operations.
 - ✓ Creates a safety disk to restart interrupted partitioning operations without data loss (also available on bootable CD).
 - ✓ *Free Bonus:* System Commander Personal Edition SCPE, a starter version of our award-winning System Commander, is provided at no extra charge with Partition Commander. SCPE allows you to install multiple operating systems (OSes) on your system, and choose which one to boot from.
 - ✓ *Free Bonus:* Copy Commander makes it easy to copy an entire drive to another, and optionally expand partitions to fit the new drive.

Technical Highlights

- ☐ Create, delete, move and copy all types of partitions.
- ☐ Resize FAT, FAT32, and NTFS (including XP/2003) partitions.
- ☐ Resize Linux Ext2, Ext3, ReiserFS and swap partitions.
- ☐ Compatible with all file systems including FAT12, FAT16, VFAT, FAT32, NTFS, Linux and UNIX varieties.
- ☐ Install/Uninstall from all Windows or run without installation from CD
- ☐ Works with all hard drive types seen by the BIOS (IDE, most SCSI, etc.). USB and Firewire drives that do not have BIOS support will not be seen.

What's New?

Partition Commander 8 includes a number of new features. A few of these new features include:

- Safely resize Linux Ext3 and ReiserFS partitions
- Safely resize NTFS partitions used in Windows XP/2003.
- Convert FAT to NTFS without Windows (for safety and stability)
- Improved PC Wizard
- Detection and identification of XP and 2003
- Now can be installed from all Windows (9x/Me/NT/2000/XP/2003)
- Support for resize of huge drives, 200+ GB
- Convert Dynamic disk to basic (normal) disk
- Optimize NTFS - Defragment MFT (Master File Table) and/or resize clusters
- BootFixer™ to automatically correct startup problems in NT/2000/XP/2003
- Edit volume labels
- Partition Explorer - Look into FAT/FAT32/NTFS partitions to see files, view and edit text files, even if Windows is not running.
- Option for much faster resize and conversions if safety restart is not needed.
- Select partitioning from Windows, Boot-time in SCPE, or from the bootable CD.

Bonus Products

Partition Commander 8 includes two bonus products:

- **System Commander Personal Edition** (SCPE). The new SCPE with PC8 now supports booting from diskettes and through the MBR (for basic Linux LILO and Grub support).
- **Copy Commander™**. Easily copy all the contents from one drive to another. With Auto-resize, the partition sizes are adjusted to fit the new drive, if a different size.

System Commander Personal Edition is an optional component that is installed as part of the Partition Commander. During installation you have the option to not include System Commander. You can also disable System Commander at any time. See Chapter 7 for more details.

Copy Commander is automatically installed with Partition Commander. To access Copy Commander, run Partition Commander and at the main menu, select Cancel, then click on the lower left **Start** button, and select Copy Commander. Chapter 5 explains this in more detail. Use the separate Copy Commander PDF manual for instructions on using Copy Commander.

2: Quick Installation

All installations will offer to make a special bootable restart diskette. This diskette can be used to directly run Partition Commander - no installation is necessary! In addition, Partition Commander can be installed on your hard disk for quick access.

Before installing Partition Commander or using it to alter the partitioning of your hard drive, we recommend 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 Partition 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.

Basic Installation Requirements

- CD-ROM Drive (not needed for electronic download)
- Either Windows 95/98/Me/NT/2000/XP/2003 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)
- Partition Commander requires 16 MB 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 can run Partition Commander directly from the boot CD (no installation) or you can install Partition Commander in a primary FAT partition on the first drive. In this one case, the partition must reside below 8 GB.
- Have two 1.44 MB diskettes ready to make the optional utility and restart diskettes. For systems without diskette drives, the Partition Commander CD is

bootable and can be used for directly running Partition Commander and its restart feature.



Partition 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).

Installation

Installing from Windows

Insert the Partition 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**, then **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 Partition 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 Partition 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)

Follow the on-screen instructions. During the installation procedure you will be asked if you want to enable System Commander Personal Edition (SCPE). You should select Yes if you want to install multiple OSes and be able to select which OS to boot from when you start up your system. If you choose not to enable SCPE now, you can enable it later. If you already own System Commander we suggest you select No because you already have much greater capabilities than are provided in SCPE.

Once Partition Commander is installed, you may reboot the system. If you have enabled System Commander Personal Edition, you will then be presented with a menu of operating system choices. If you wish to change the descriptions, the order, or other functions, press **Alt-S** for the Setup menu. These are explained in more detail in Chapter 5.



Keep the Partition Commander diskettes in a safe place. The utility diskette contains duplicate backup data that may be needed if you later wish to remove Partition 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

Partition Commander is fully compatible with disk compression as long as Partition Commander is installed on the non-compressed drive.

At some point you will reboot after the Partition 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 8: Troubleshooting, for solutions.

Uninstalling Partition Commander

Partition 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 Personal Edition, see the next section. Disable will remove System Commander from the boot up process without affecting Partition Commander.

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

To uninstall from Windows

Select Start, Programs, Partition Commander, and then Uninstall. You can also uninstall from the Add-Remove programs, under settings.

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) Select Remove to restore the original MBR (without changing your current partitioning) and delete the Partition Commander files.

Disabling System Commander Personal Edition

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

To disable from DOS or a boot 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).

3: Hard Drive and Partitioning Basics

Partition 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 Partition Commander.

What is a partition?

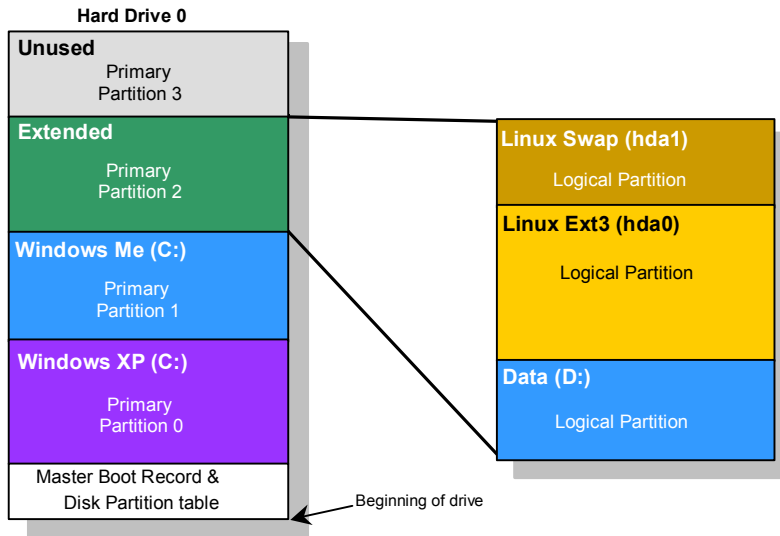
A partition is a basic container for data on your hard drive. Although most hard drives have only one partition, Partition Commander allows you to divide up a hard drive into several distinct partitions. Each partition occupies a physically separate area of the hard drive and functions almost as if it 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. An even more comprehensive set of tools for installing multiple operating systems on your hard drive is found in the full version of System Commander (see Appendix B).

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 Partition 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

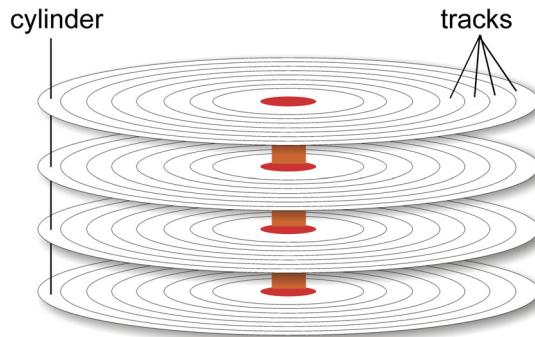
The first stage of formatting is physical, or *low-level formatting*. The hard drive manufacturer performs this operation in their factory. This process creates a magnetic structure on the hard drive platters that allows data to be accurately written and retrieved. Figure 3-2 shows the elements resulting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

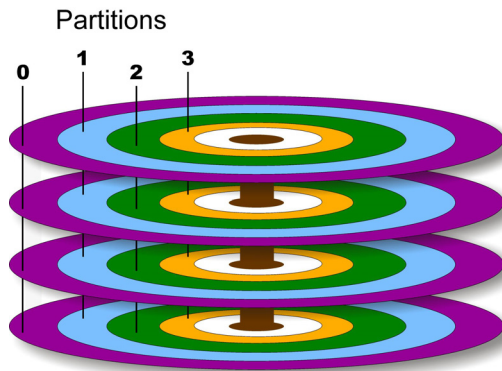
Figure 3-2: Physical Formatting



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 Partition 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. Partition 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: Partition 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 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 95/98/Me/2000/XP to support long filenames. From a partitioning point of view, VFAT and FAT are identical, and Partition 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, and 2003. 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	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	8 GB
	NTFS	1000+ GB*
Windows 2000/XP/2003	FAT32	1000+ GB*
	NTFS	1000+ GB*

* To access beyond 137 GB requires hardware and BIOS support

Without Partition 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. Partition 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.

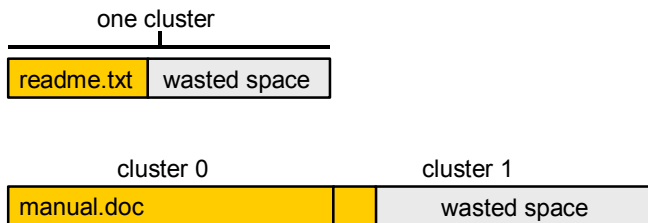
Partition Size and Saving Space

An unfortunate by product of large partitions is the space they waste on your hard drive. Partition 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, Partition 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. Partition 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	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 do to version differences

Windows 2000/XP/2003 also offer the ability to convert a normal drive (any format) to a Dynamic disk. While they offer no way to go back, Partition Commander can convert a Dynamic disk back to a normal (or basic) disk. Windows does not allow laptops and older computers to use Dynamic disk. You also cannot boot to a Dynamic disk. Consult Microsoft's web site for more about Dynamic disks.

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.

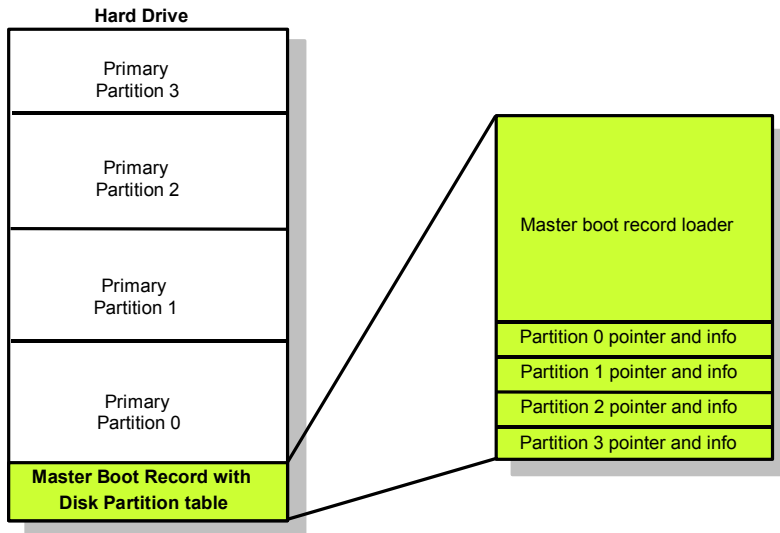
Table 3-6: Linux File Systems

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

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 Personal Edition 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 the partition information. Under Windows NT/2000/XP/2003 the Disk Administrator can also perform limited partitioning.

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

4: Using Partition Wizard



About 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 Partition Wizard. These options are described later in the chapter. Manual partitioning is described in more detail in Chapter 5.

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 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.

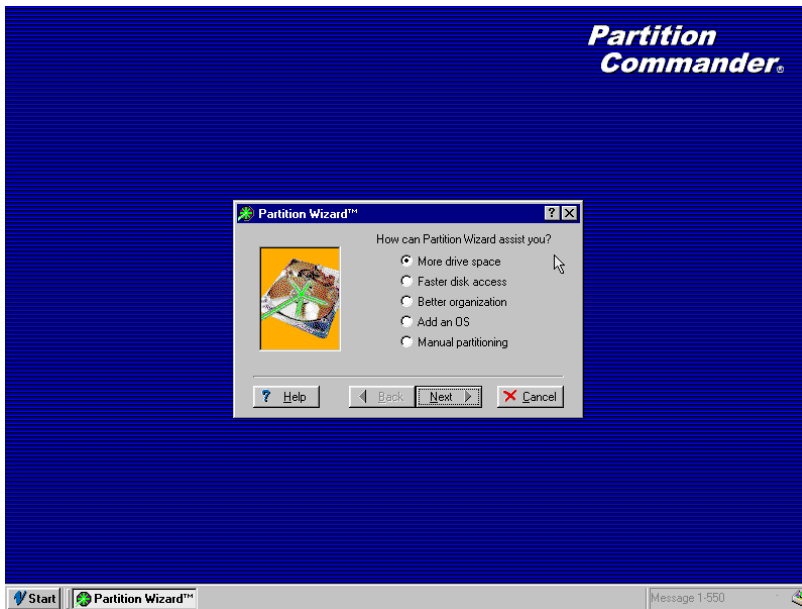
Starting Partition Wizard

There are three easy ways to run Partition Commander:

- 1) From Windows, double-click the Partition Commander icon on the desktop, or select Start, Programs, Partition Commander, then select Partition Wizard. A dialog will appear to confirm to shutdown Windows so Partition Commander can safely run. Partition Commander does this to ensure Windows multi-tasking nature cannot harm the drive contents during important partitioning operations.
- 2) If System Commander Personal Edition is enabled, when the system first starts up, or after a restart, you can select **Partitioning** (Alt-P) from the OS selection menu.
- 3) You can also boot from the Partition 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.

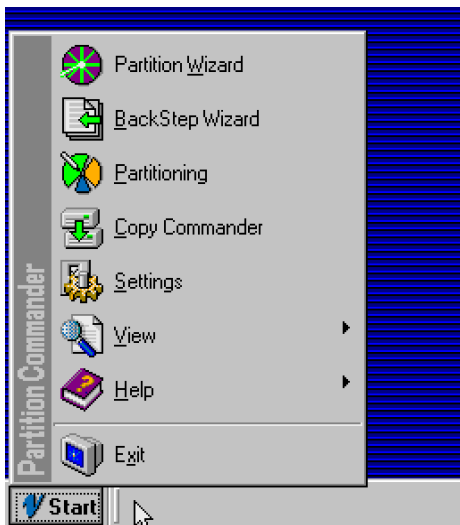
Once this is completed, you will see the Partition Wizard main menu as shown on the next page.



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.

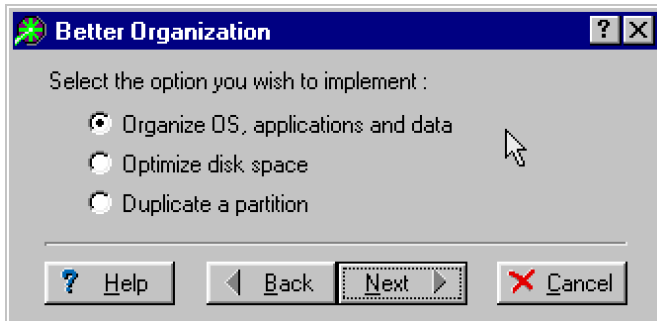
These appear as:



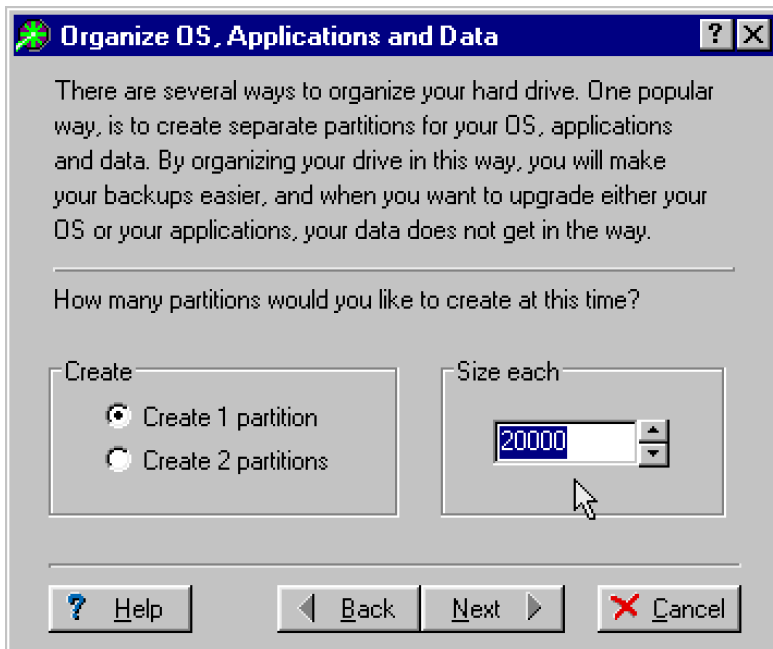
The start menu allows you to re-run the Partition Wizard, undo operations with the BackStep Wizard, perform manual partitioning, run Copy Commander, change settings, view files, and get basic help. Each selection is described in detail in this and the following chapter.

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.




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, 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.

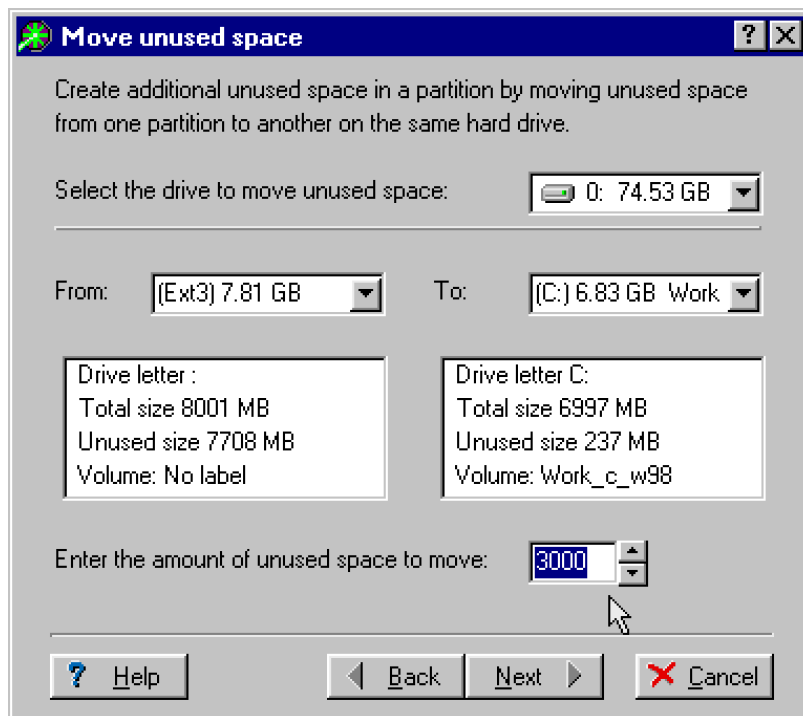
Select the desired partition size by using the up/down arrows in the Size box. Press Next to create the partition.

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.



The screenshot shows the 'Move unused space' dialog box. The title bar is blue with a green arrow icon and the text 'Move unused space'. The main area has a light gray background. At the top, it says 'Create additional unused space in a partition by moving unused space from one partition to another on the same hard drive.' Below this is a dropdown menu for 'Select the drive to move unused space:' showing '0: 74.53 GB'. Underneath are two columns. The left column is for the 'From' partition, showing '(Ext3) 7.81 GB' in a dropdown. Below it is a box with details: 'Drive letter:', 'Total size 8001 MB', 'Unused size 7708 MB', and 'Volume: No label'. The right column is for the 'To' partition, showing '(C:) 6.83 GB Work' in a dropdown. Below it is a box with details: 'Drive letter C:', 'Total size 6997 MB', 'Unused size 237 MB', and 'Volume: Work_c_w98'. At the bottom, there is a label 'Enter the amount of unused space to move:' followed by a text box containing '3000' and a spinner control. At the very bottom are three buttons: '? Help', '< Back', and 'Next >', and a 'Cancel' button with a red X icon.

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.

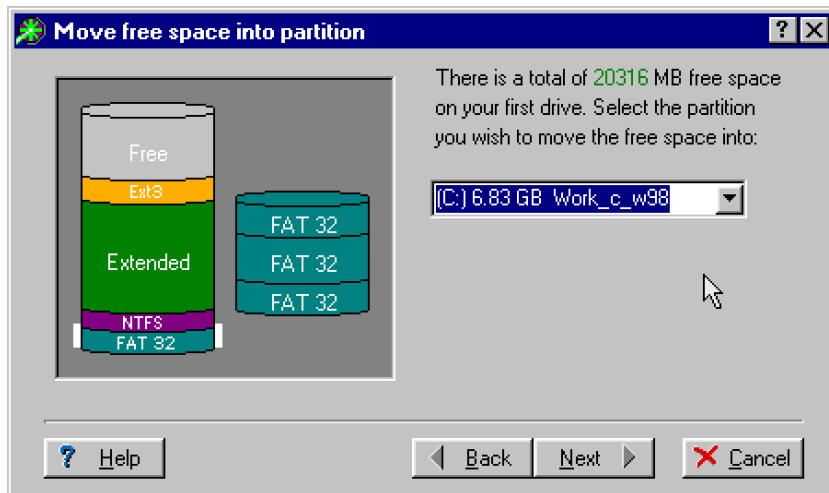
To start this process, select it in the More Drive Space dialog box, then press Next.

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.

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:



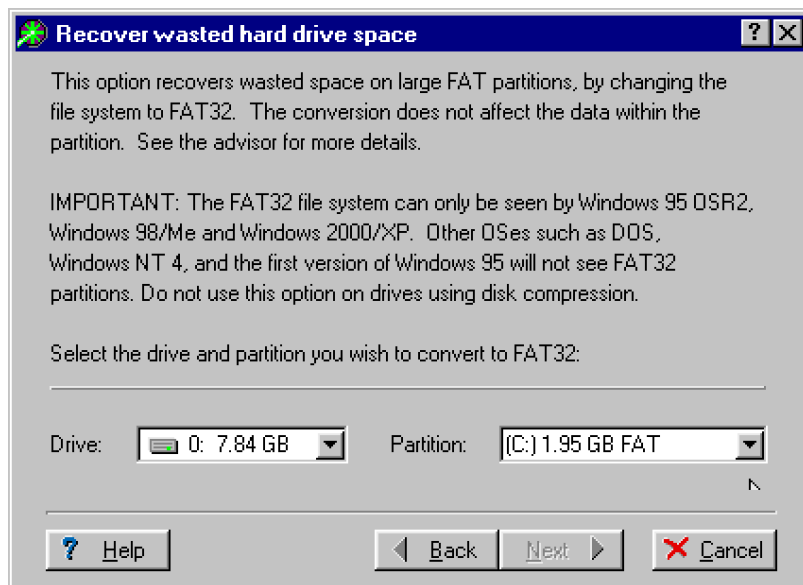
Using the down arrow in the text window, select the partition to which you want to add free space, or click on a partition in the window. Press Next to continue.

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 swapfile 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 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.

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

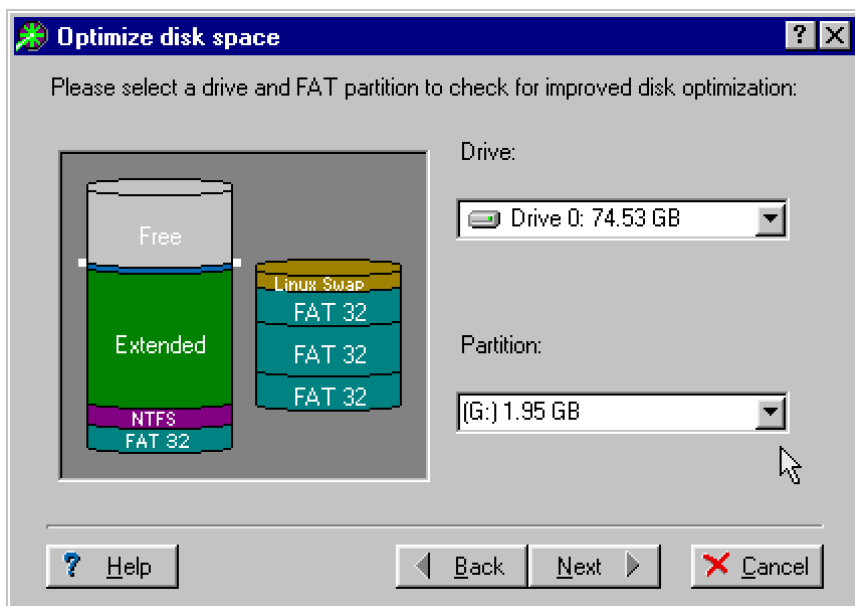
Organize OS, Applications and Data.

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

Optimize Disk Space

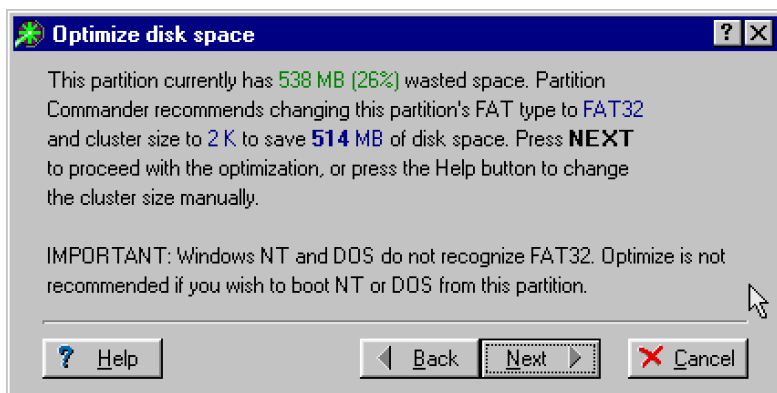
A large cluster size can cause wasted space on your hard drive because even small files are allocated an entire cluster. This Partition Wizard option analyzes your drive and OS, and if possible, allows you to convert inefficient FAT partitions to FAT32 partitions. If you are already using the FAT32 file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

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.

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.

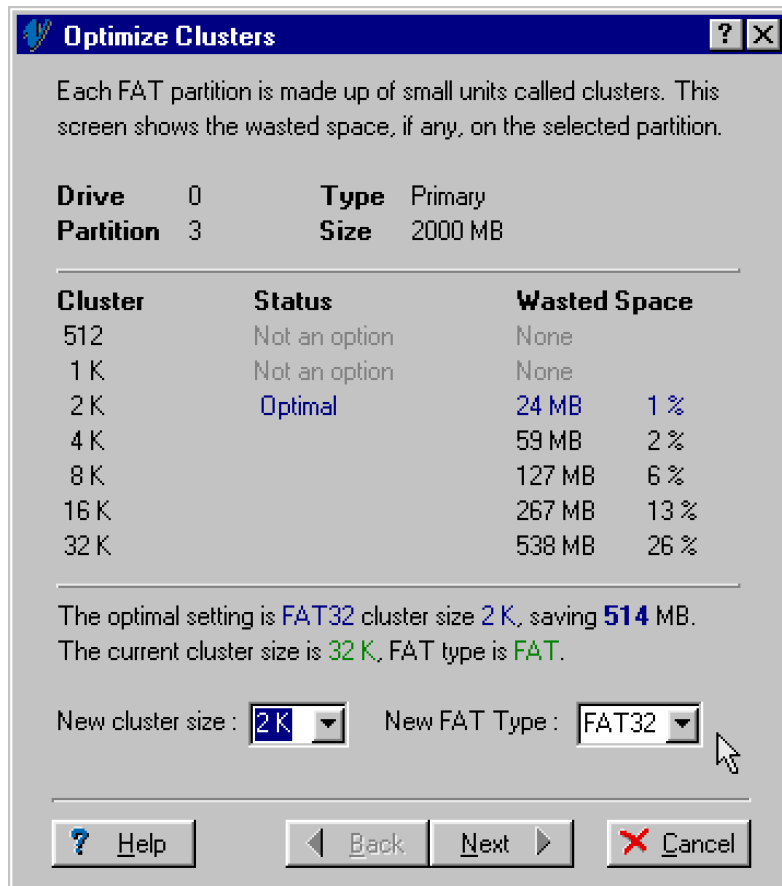


This dialog box shows the amount of wasted space and a recommendation of how to recapture it. Press Next to proceed with the optimization.

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 cluster size manually, press the Help button to proceed to change cluster size manually.

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 dialog box titled "Optimize Clusters" contains the following information:

Each FAT partition is made up of small units called clusters. This screen shows the wasted space, if any, on the selected partition.

Drive	0	Type	Primary
Partition	3	Size	2000 MB

Cluster	Status	Wasted Space
512	Not an option	None
1 K	Not an option	None
2 K	Optimal	24 MB 1 %
4 K		59 MB 2 %
8 K		127 MB 6 %
16 K		267 MB 13 %
32 K		538 MB 26 %

The optimal setting is FAT32 cluster size 2 K, saving 514 MB.
The current cluster size is 32 K, FAT type is FAT.

New cluster size : New FAT Type :

Buttons: Help, Back, Next, Cancel

This dialog box shows you the current configuration parameters for that partition in green text, along with the current wasted space. At the bottom, the recommended configuration is indicated in blue text. Select the optimum parameters, or those of your choice 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.

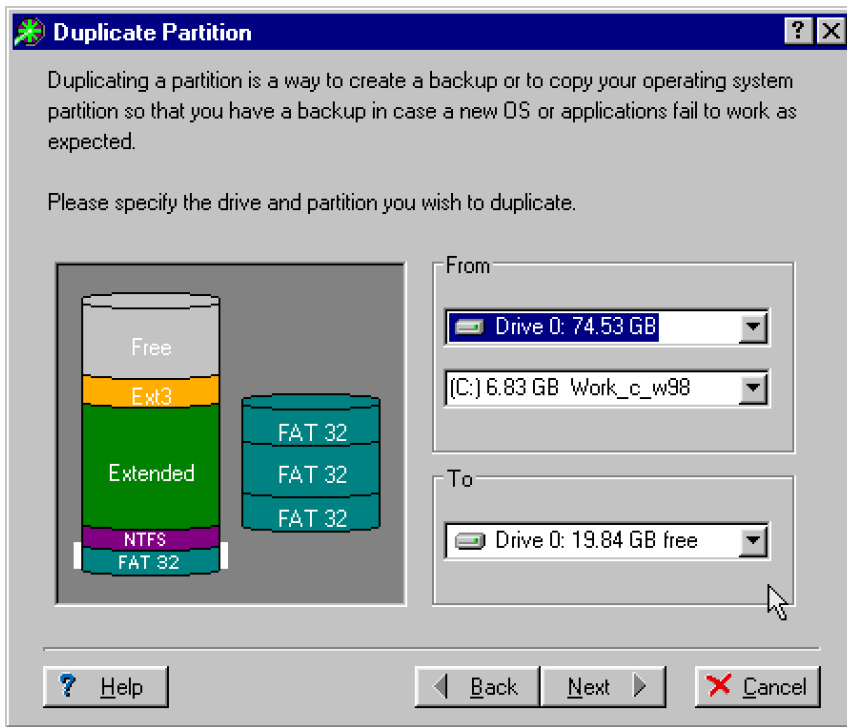
Press Next to change the cluster size and FAT type. A progress window appears, displaying the process. Upon completion, a Partition Wizard finished dialog box appears. Press Finish when done.

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.

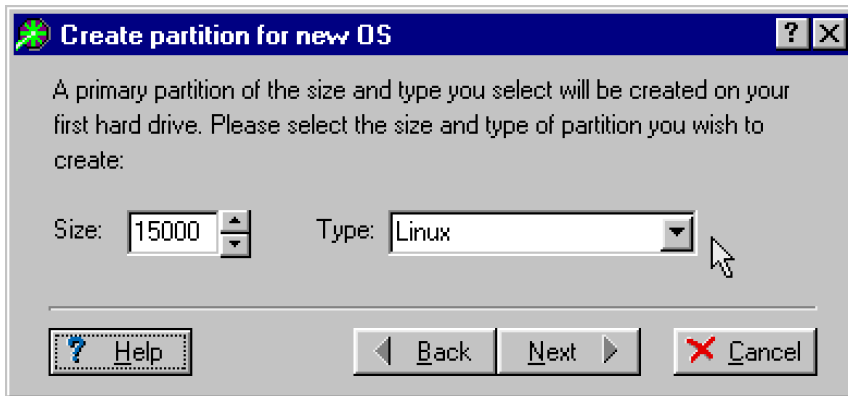


There must be a contiguous block of free (unallocated) space to contain the duplicate partition. If there is not enough room, you will have to free up space either by reducing the size of a partition or deleting a partition you no longer need. Partition Wizard will advise you if this is the case.

Add an OS

This option creates a new primary partition on your first hard drive where you can install a new OS. It also makes the new partition active (bootable). You must know the minimum space needed for the new OS.

To begin creating a new partition, select Add an OS from the Partition Wizard main menu. The Create Partition for a New OS dialog box opens. Press Next to continue. The create dialog box opens:



The Size box shows the range of possible sizes for the partition. Enter a number or use the up/down arrows to select a size.

Select the type of OS using the down arrow in the Type box.

Press Next to start the process.

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



After the partition is created, you can use the installation program of your new OS to install it into the new partition. Insert the new OS boot CD or diskette before you exit and reboot the system. For OSes that do not use the FAT/FAT32/NTFS/Linux file systems, you will need to format the partition to make it usable. Most OS installations handle this job for you.

Manual Partitioning

This option is described in detail in Chapter 5. 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.

5: Partitioning Start Menu

In addition to using the Partition Wizard, you can manually change your partitions, undo partitioning operations, and make other choices.

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



You can then select your desired action:

Partition Wizard - Automated partitioning to get more drive space, faster disk access, better organization or add an OS. Prepare your system for a new OS installation. See the prior chapter for complete details.

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

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

Copy Commander - Copy all of the contents from one drive to another. This is useful when you plan to replace a smaller drive with a new blank large drive. Copy Commander can copy all the data and, if desired, expand the partitions to match the new drive. Help is available on-line and the PDF manual is available on the CD and is also installed with the Partition Commander manual.

Settings - Change the way the Partition Wizard operates, its defaults, and video resolution. These are described in the next chapter.

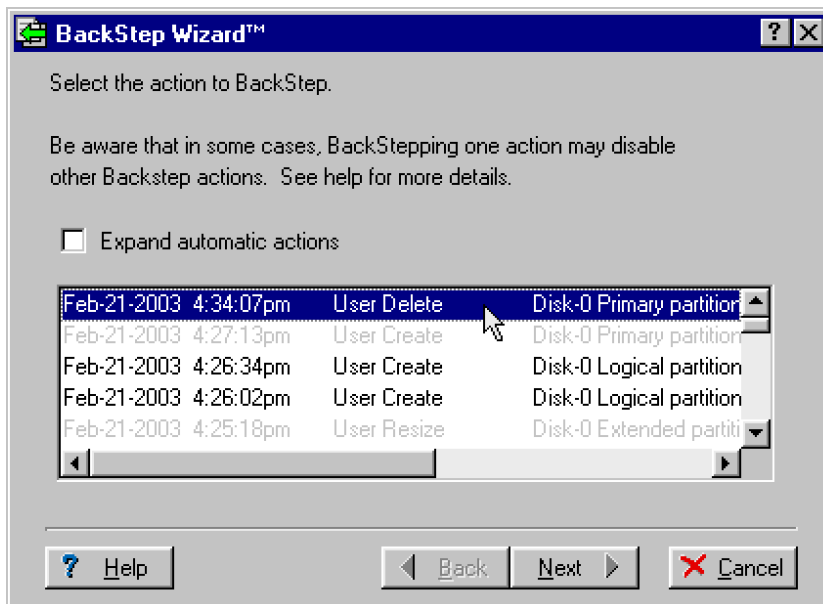
View - View various configuration files such as BOOT.INI, AUTOEXEC.BAT and CONFIG.SYS.

Help - On-line help about using the Partition 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 a partition delete operation that can now be undone. 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 Partition Wizard operations, check the "Expand automatic actions" box.



Important: 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 Partition Commander, such as the use of DOS FDISK, it may prevent some or all BackStep operations.

In general, if you use the Partition Wizard to prepare your system, you can usually BackStep to 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.



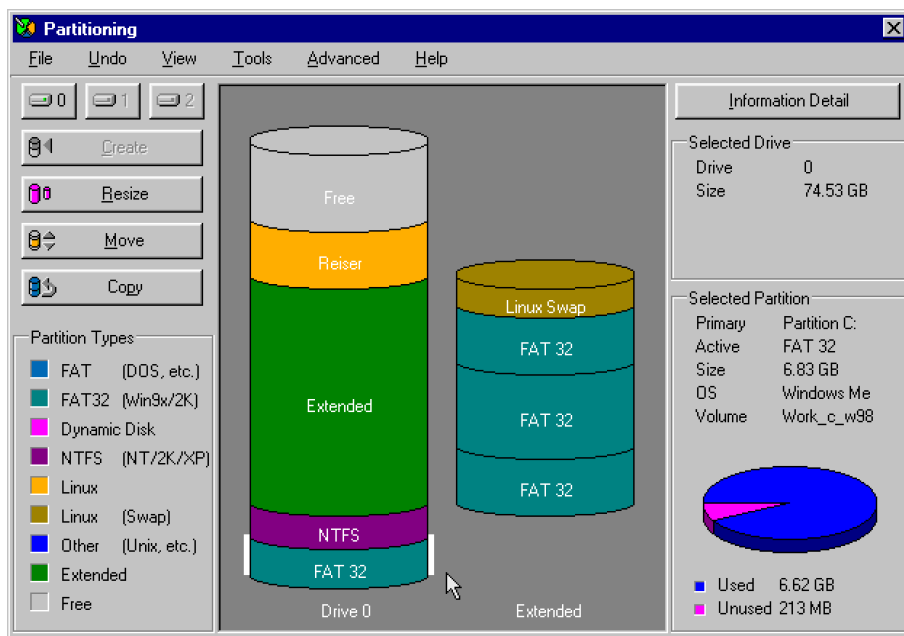
You can only BackStep operations when Partition Commander is run from the installed drive. If you run Partition Commander via a boot CD or boot diskette, you will not be able to save BackStep information needed to later perform a BackStep. In some situations you may still be able to undo a format. To do so, go to the manual partitioning menu, then Undo.

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6: 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 Cancel, Start, and then Partitioning. This brings up the Manual Partitioning dialog box shown below.



This dialog box always opens showing the first physical drive, labeled as Drive 0, in the graphical display in the center of the screen. In the lower left 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 sections. The top section shows the selected drive information and the lower panel shows the selected partition information. In the 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 it once in the graphical display. A white bar appears on both sides of the partition that you have selected.

To change drives, click on File, then Select Drive. A list of available hard drives is shown. Select the drive that you wish to work with and the display automatically updates to show the information for that drive. For systems with 3 or fewer drives there are instant drive select 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	Contains the submenus: Open lets you browse files on the selected partition. Select drive allows you to choose the drive to view. Close clears the window.
Undo	Reverses the Delete and Format commands. Undo Delete restores the last partition deleted. Undo Format restores the selected FAT/FAT32 partition that was previously formatted. Once data is written into a formatted partition, you cannot unformat it. BackStep Wizard will undo OS Wizard or manual partitioning. See Chapter 5 for complete details.
View	Allows you to quickly view and edit text files such as BOOT.INI or AUTOEXEC.BAT. Partition Explorer to view and edit files in FAT/FAT32 or NTFS partitions.
Tools	Provides various submenu commands for changing a partition as listed below. Create builds a new partition and is described below.

Resize changes the size of an existing partition and is described below.

Delete allows you to delete the selected partition. This function is described below.



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).

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 left of the dialog box 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.

- | | |
|----------------|--------------------------------------------------------------------------------------------------------------------------|
| 0, 1, 2 | Allows you to select the physical drive. If you have more than 3 drives, select the drive using File, then Select Drive. |
| 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.

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 white bars appear on each side when it is selected. 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 24 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, nor 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 performed. 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*.

Use Copy Commander if you wish to copy an entire drive. Access Copy Commander from the Start menu.

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. 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 NT security identifier for 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. If you perform a partition copy, the SID should be updated.

Settings Provides the following settings:

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.

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!

Auto BootFixer 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.

Disable auto-save makes these option settings apply only to the current session - they are not saved.

Confirm NTFS convert 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.

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.

7: System Commander - Personal Edition

Partition Commander includes System Commander Personal Edition (SCPE) for the purpose of managing multiple OSES on your computer. It is based on the award-winning System Commander, also from VCOM. Like the full System Commander, SCPE supports different OSES installed in separate partitions. Upon booting your system, you can choose which OS you want to run. You can upgrade at a discount to the full System Commander. Full details are in Appendix B: VCOM Products.

If you already have System Commander 7 or later installed, the features from both products are automatically merged during installation.

What System Commander Personal Edition Does

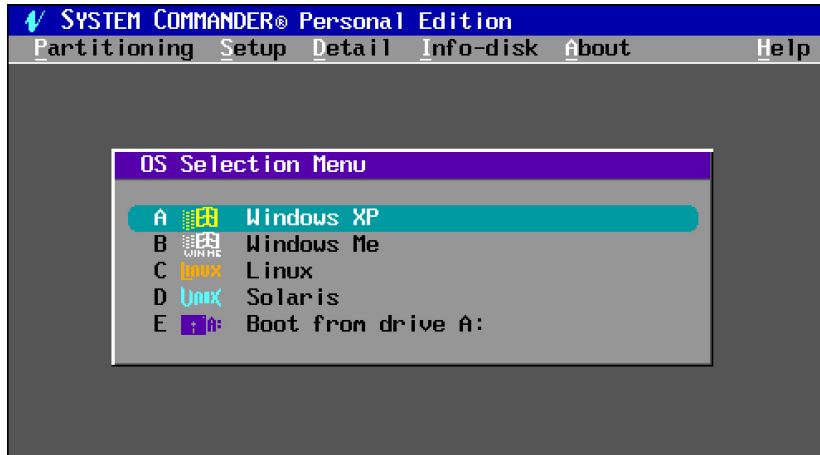
When you install System Commander Personal Edition, it saves the old Master Boot Record and inserts its own Master Boot Record. The old MBR is saved to use for the uninstall option, and all of the current partition table information about existing operating systems is retained. After installation, whenever you reboot your system, the new master boot record is used. This presents you with the option of selecting any of the OSES you have installed on your system. Once the OS is launched, SCPE disappears and does not interfere with the OS performance or operation.

Installing System Commander Personal Edition

When you install Partition Commander, you will be prompted if you wish to enable SCPE at the same time. You can also use the Partition Commander Console utility (Windows) or SCIN utility (DOS) to enable SCPE at a later time or to disable it. See the later sections in this chapter for more on using these utilities.

OS Selection Menu

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



You can make a selection by using the up/down arrow keys and then pressing Enter. Press an indicated letter to instantly make a selection or move your mouse up and down and then left click once. To select a SCPE option from menu bar, hold the Alt key down and press the desired underlined letter. For example, press **Alt-S** for Setup.

Functions available include:

- | | |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Partitioning | Run Partition Wizard to automatically or manually partition the drives (press Alt-P). |
| Setup | Use this menu for setting timeout options, adding and removing OS selections, passwords, descriptions, icons and many other features. See Setup, later in this chapter for complete details (for Setup, press Alt-S). |
| Detail | Toggle additional details about each operating system (press Alt-D). |

This option toggles between showing the product information that SCPE identifies, showing the OEM name from the OS vendor, and blanking the information area.

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. Other letters may appear after the partition number; consult the online help (**Alt-H** or **F1**) for more information.



With some OSes, the OEM name is cryptic or misleading. Do not rely on it. See Inaccurate OEM names in the Troubleshooting Chapter.

Info-Disk

Shows primary and logical partition information for the drives on your system (press **Alt-I**). 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 of the Info-Disk screen include:

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

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

Detail to toggle the type of information (press **Alt-D**).

About

Displays version and other information about System Commander Personal Edition (press **Alt-A**).

Help

Displays help about SCPE. (press **Alt-H**).

Back

This minor option does not appear on the menu. It allows you to view the background screen prior to SCPE appearing (press **Alt-B**).

Setup Menu

The setup menu is accessed from the OS selection menu by pressing **Alt-S**. Use Setup to select from a number of SCPE options and features. The setup menu contains the following submenus.

- Timeout and default OS
- Hardware
- General
- Specific OS options
- Order, Add and Remove
- Description and Icons
- Assistance and Help

These submenus are described in more detail on the following pages. Use the Up and Down arrow keys to move between options, and **Enter** to select the desired menu option. Press **Esc** to return to the OS selection menu.

Timeout and default OS Options

This menu provides options to set the timeout delay, default OS and sound effects.

Timeout to selection (Yes/No) - When the SCPE selection screen appears, a timeout can be set for the length of time SCPE will stay on screen before it automatically makes the default selection. Select YES if you want this option, otherwise use NO to have SCPE wait for a manual selection.

Seconds until timeout (1-99) - If the Timeout to selection option is set to YES, you can set the number of seconds to wait before using the default selection from 1 second to 99 seconds.

Default selection (A-Z, Last) - After a reboot, SCPE will highlight the default menu selection. You can choose any of the first 26 possible operating systems A to Z as the default, or have SCPE remember the last OS you selected.

Select sound - This lets you choose from any of 15 different alert sounds, which will occur at boot time. You can choose no sound with the QUIET option, or have SCPE select a different sound every time with the RANDOM option. Pressing **Enter** while in the sound selection field lets you hear the current sound choice.

Hardware Options

This menu controls various hardware choices, such as the display, disk and mouse.

Graphics style options - Select from various visual styles from ordinary text to several graphics styles (2D and 3D). Graphics style options also allows for European characters (EURO).

Laptop style override - Most laptops have a single fixed resolution. Laptop style overrides can often make SCPE's graphics look better. For 640 x 480 screens, we recommend using the option 8x16. For higher resolution screens, you might try the 9x19 selection. For non-laptops, the "NO" option is the best.

Stretched display - This may help the appearance on fixed pixel LCD screens that distort the image. Change the setting to disable or change the stretching options (for those video systems that follow VESA standards).

Disk drives, above drive 0, ignored - Specify drives to be completely ignored. This is useful for drives that do not function properly without special device drivers

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 YES to ensure that at least one (1) partition is active on the first drive. If you do not get any BIOS error messages, leave this option set to NO.

Disable Mouse - Allow automatic detection and use of the mouse. USB mice are only supported when the BIOS provides legacy mouse support.

General Options

This menu controls general options not specific to an OS.

Disable CHECKMBR insertions - The CHECKMBR program is normally inserted into the AUTOEXEC.BAT file. CHECKMBR verifies that SCPE's MBR has not been destroyed by a new OS installation and corrects this condition, if necessary. CHECKMBR is not a TSR. Setting this option to YES disables this feature.

PC Wizard alternate start - When you select Partitioning, if it stops with the message "Wizard is analyzing your system...", try changing this setting to use an alternate startup method. Normally, this option is set as needed.

MBR virus detector - This option allows you to turn of the automatic MBR virus detector. If active and an MBR virus is detected, you will be offered the option to remove the virus in the MBR.

Edit personal text - Press Enter to edit the personal text string that appears when the About option is selected from the OS selection menu. You may include your phone number and/or driver's license as identification. This may help in the recovery of your computer if it is lost or stolen.

OS Specific Options

This menu provides options specific to the currently selected OS, which can also be changed at this menu. Options include:

Bootable/active status across partitions - This option makes all similar partitions appear bootable when a selection is made. The only operating systems we've found that require this unusual state are SCO UNIX System V and UnixWare.

OS/2 boot drive letter - The boot drive letter is normally selected by SCPE when set to AUTO. It is based on the placement of the bootable OS/2 partition relative to other partitions. In very rare situations, it may be necessary to override SCPE's default, and force a different drive letter, C to P. This would be used if OS/2 fails to boot with an error message about not finding COUNTRY.SYS or AUTOEXEC.BAT.

Primary partitions visible on drive *n* - For each drive on the system, a submenu overrides SCPE's defaults and can either hide or expose different primary partitions from the selected OS. The default AUTO mode will select the correct partitions to be active in almost all cases. This feature is handy when you wish to hide a partition from an OS. For example, a Windows NT partition in NTFS must be hidden from Windows XP. Otherwise when XP runs, it will automatically convert the NT partition into a format unusable by NT. Use help (**Alt-H**) for additional information.

Order, Add and Remove Options

This menu is used to change the order of selections, add and remove selections. The Order menu lists OSes installed on your system and is similar to the OS selection menu.

Changing the order of OS selections - Use the Down and Up arrow keys to choose the selection you wish to move. Press **Alt-T** to move that selection to the top, or press **Alt-B** to move the selection to the bottom.

Adding a new selection to the menu - Press **Alt-A** to add a new selection to the menu. When adding a primary or logical partition, select P for partition. Then select the partition and press **Alt-T** to toggle the bootable status to Yes. System Commander will not let you add a partition that is not bootable.

Removing a selection from the menu - Press **Alt-R** to remove the highlighted entry. At the removal confirmation question, select **OK**.

Description and Icon Options

Use this menu to set your own OS menu descriptions and to select or change the appearance or color of the icons representing the Oses on your system.

Changing the Description - Highlight the description line and edit the current description for the indicated selection. To make a different selection, use **PgUp** or **PgDn**.

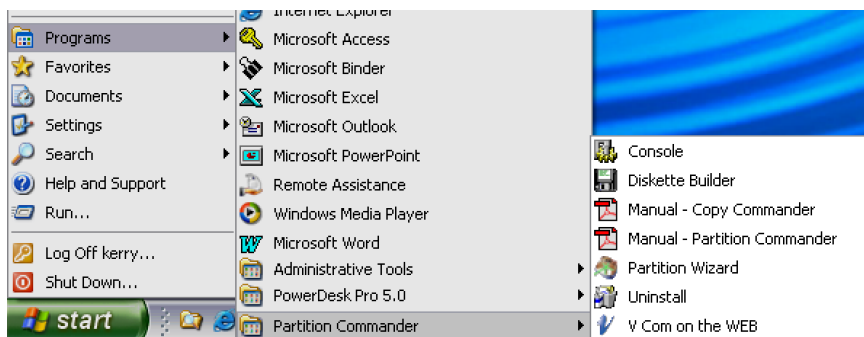
Icon Control - Select the type of icons from DOS, OS/2, Windows, UNIX, Diskette, Other, or None. To select an icon, use the left and right arrow keys. To change the color of the current icon, press **Enter**, **+** or **-**. Use **F7** or **F8** at any time to also change the color of the current icon.

Set default descriptions, icons & order - Pressing Enter on this option will allow you to reset all the descriptions and icons to the SCPE defaults. This option is **NOT** reversible once invoked. It will ask for confirmation before setting the defaults. After the defaults are loaded, you can edit the descriptions and icons as desired.

Reset all - Reset every OS description and icon to our standard defaults. A confirmation is required before the action occurs.

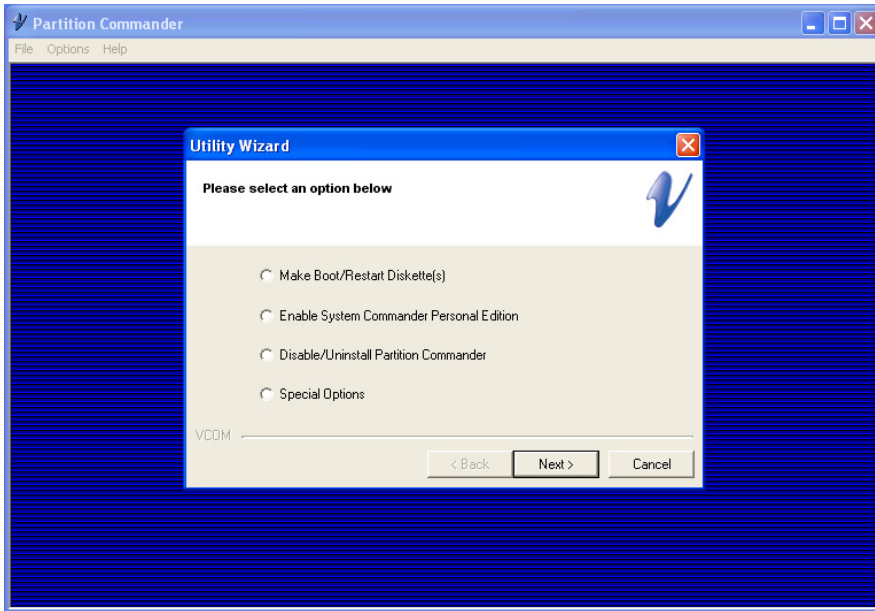
System Commander Windows Utilities

When Partition Commander is installed under any Windows, the following utilities and options are available from clicking on *Start*, *Programs*, and then *Partition Commander*. The following choices appear:



Console

This program provides a number of options. When run, the utility Wizard appears:



From the Wizard, the following options are available:

Make Boot/Restart Diskettes - Use this option to build the Partition Commander Utility diskette 1 and/or the Partition Commander Restart diskette 2. These are the same diskettes that you would normally create during the installation. For retail versions, the bootable CD can be used in place of Restart diskette 2. If you install a new update of Partition Commander, a new set of diskettes should be made, and the old ones discarded.

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.

Disable/Uninstall Partition Commander - To temporarily disable System Commander Personal Edition or uninstall Partition Commander completely, 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 to restore normal System Commander operation. Remove performs a disable and removes the Partition Commander files.

After choosing either option, 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 or Disk Administrator to specify a different active primary partition to boot from.

Special Options - Control a number of System Commander options from the console (which can also be set while running System Commander at boot time).

Diskette Builder

Use this option to build the Partition Commander Utility diskette 1 and/or the Partition Commander Restart diskette 2. These are the same diskette that you would normally build during the installation. For retail versions, the bootable CD can be used in place of Restart diskette 2. If you install a new update of Partition Commander, a new set of diskettes should be made, and the old ones discarded.

Manual

View the Copy Commander or Partition Commander manuals. Adobe Acrobat is required and can be installed from our CD or downloaded from our website.

Partition Wizard

Run Partition Commander now.

Uninstall

Uninstall Partition Commander and delete it's files. This option is also available from the standard Windows Control Panel option *Add/Remove Programs*.

VCOM on the Web

Link to our home page on the web.

System Commander 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 Partition Commander Utility disk 1. If you are using Windows, we recommend using the previously described Windows Utilities instead.

Using SCIN - Installation & Configuration (DOS)

Run **SCIN** from the System Commander Personal Edition directory (default is c:\sc). Options include:

Installation Notes - View notes about using System Commander.

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

At this point, SCPE is no longer in the bootup loop, and the OS you last booted from will boot directly.

Enable/Update System Commander - This updates the master boot record. All prior SCPE user options and settings are unaffected.

Special Options - These provide less frequently used options. Such as hard drive diagnostics and an advanced DOS system transfer.

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' products. This option also presents information such as the version and serial number.

Exit - Leave the SCIN program.

Using SCDISK (DOS)

The SCDISK utility allows you to examine disk information, view the current OS selections, preset some SCPE boot options, and preset the bootable partition for special OS installations. To use SCDISK at a Windows 95/98/Me or DOS prompt, run:

V Communications, Inc.

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

A menu of choices appears, listing the following selections:

- Partition Information
- View OS Boot Menu
- Command Line Options
- System Commander Personal Edition Information
- Change Boot Status for OS Install

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.

Using CHECKMBR

The Checkmbr utility helps keep System Commander working, in the event a new OS installation erases the System Commander MBR. When run, if System Commander's MBR does not appear and System Commander is otherwise detected, it reinstalls the correct MBR automatically. It never changes any partition information.

Checkmbr is automatically placed in the AUTOEXEC.BAT file.

Checkmbr has one command line option to replace the System Commander MBR with a generic MBR. This effectively removes System Commander from the system start up process, similar to the Disable command in the Console or SCIN utilities. To do this, at a prompt, type:

```
C:> \sc\checkmbr /mbr
```

For Windows the Winmbr program provides a similar function as Checkmbr. During installation, Winmbr is placed in the startup process of Windows. Winmbr exits immediately after it runs. It does not consume any system resources.

8: 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 see support, go to **www.v-com.com/support** and select the product Partition Commander 8. Also remember, context sensitive help is available for most functions by pressing the F1 key.

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.
- Messages from Partition Commander at bootup.
- Messages from NT/2000/XP/2003.
- Messages from Linux.
- Inaccurate OEM names.

Problems without Messages

OS Selection Menu does not appear after reboot

This might occur if a newly installed OS overwrites System Commander's master boot record. Using the utility boot diskette you made during installation, boot from this diskette and at the prompt, type: A:\CHECKMBR. This will restore System Commander's normal operation.

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:

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 defragmented. 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 Partition Commander (which will also install System Commander Personal Edition).

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 SCPE'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 SCPE 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 a Windows 95/98/Me or DOS startup diskette. We next need to run the Partition Commander SCIN.EXE program. This will be in the C:\SC directory on the hard disk. You can also run it from the Partition Commander CD in the \install directory or it can be found in the root of the Partition Commander utility diskette 1. Run SCIN and select *Disable or Remove System Commander*. Then select *Temporarily Disable*. Exit and reboot normally. At this point Partition Commander/SCPE are removed from the boot-up sequence.



Disable/Remove only replaces the master boot record. It does not change the current partition information. There is no problem performing a Disable/Remove, even if you had changed the partition information after Partition 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 Partition Commander utility **CHECKMBR /MBR**, 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 Partition Commander by running Partition 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.

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 Setup (**Alt-S**) from the OS selection menu, and move to the *Order, add and removal menu*. Select the OS partition to remove, and press **Alt-R** (Remove).

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

Messages From NT/2000/XP/2003

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, so that it displaces the NT/2000/XP/2003 partition.

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. Partition Commander's BootFixer™ can automatically repair the BOOT.INI file. Run Partition Commander (it can 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 Partition Commander 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 a number of 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 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 superbblock (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.

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 3.1
Windows 2003 in NTFS partition	NTFS 3.1

When Windows 95/98/Me installs, it changes all boot records on all FAT type primary and logical partitions to Windows 95/98/Me. 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.

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Appendix A: Technical Support



We hope that you will never encounter problems with Partition 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 and check out our latest support information on our web site.

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

Contacting Technical Support (USA)

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.

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Appendix B: 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

System Commander® Upgrade

Beyond SCPE included in Partition Commander, our full System Commander includes OS Wizard to automate the OS preparation process; support for multiple OSeS in the same FAT/FAT32 partition; boot choices directly to a prompt in Windows 95/98/Me; multiple graphic "skins" GUI; boot-time screen saver; full mouse support, multi-user password control and more!



You can order a copy of System Commander at a discount from our web site at www.v-com.com. Click on [Upgrade Now](#).

More products from VCOM!

Fix-It Utilities™

Keeps PCs running better, faster and longer. It includes an easy one-step maintenance process to locate and solve problems. It also optimizes system performance, protects against viruses, provides emergency fix and rescue tools, recovers lost data, and much more! Fix-It Utilities is fully integrated into a single seamless package, making it easy to use. Full support is included for Windows XP, and NTFS file systems, along with older OSes and file systems.

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.

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 eliminating the need to buy and install each package.

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's 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

Appendix C: OS & 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 we are not compatible. 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 95/98/Me

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.

Limitations of Windows NT/2000/XP/2003

- 1) NTFS file format can only be seen from Windows NT/2000/XP/2003. Other OSes like Windows 95/98/Me and DOS cannot see a partition with the NTFS file format.
- 2) NT/2000/XP/2003 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 (not NT) can see FAT32 partitions.
- 4) If using a dynamic disk (an option defaulted off in 2000/XP/2003), some Partition Commander features will not be available for that drive. Windows 95/98/Me/NT cannot see dynamic drives.

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 the SCPE's Setting's option *OS specific options* for your Linux to hide the Solaris partition from Linux.

Product Limitations

Dynamic Disk

Windows 2000/XP/2003 has 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 install to or resize dynamic disks. Partition

Commander can convert a dynamic disk back to a basic disk that has partitions understood by other OSes.(a feature not available in Windows)

Anti-Virus Software (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 SCPE as a virus, and should you choose to repair the MBR, you will wipe out SCPE. If this should happen, Enable/Update SCPE to restore the SCPE MBR using the Partition Commander console utility in Windows.

In no case should you choose to repair the MBR if SCPE has been installed. SCPE 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 SCPE 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, Partition Commander will not install. You can still run Partition Commander from the Partition 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 Partition Commander, it will not let Partition Commander install. If Partition Commander is installed prior to GoBack, Partition Commander is disabled.

The reason for these problems is that GoBack partly resides in the MBR, where boot management products must reside. While Partition Commander's SCPE 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.

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.

Windows NT/2000XP/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)

- 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 Partition Commander's Diskette Builder

Click on Start, Programs, Partition 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 at least to make the Utility diskette. In addition to making the diskette bootable, scin will copy a number of useful DOS command utilities.

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