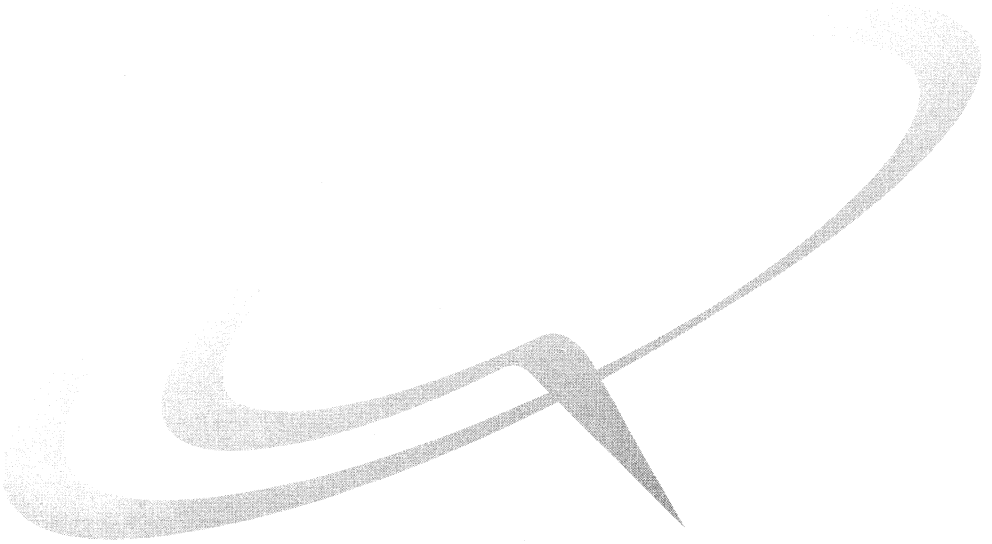
PARTITION·IT™

Safely Partitions Your Hard Drive in Minutes



User Guide

Partition-It User Guide

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Introduction

Welcome to Quarterdeck Partition-It, a revolutionary new hard drive optimization and management tool for Microsoft Windows 95 and Windows 3.1x.

Partition-It can help you:

- Increase the amount of data you can store on your hard drive without using disk compression software.
- Increase the speed at which your hard drive can access data.
- Organise data on your hard drive more efficiently, making it easier to find specific files.
- Move applications to other locations or hard drives without requiring you to edit a single INI file or registry entry.

Most importantly, you do not have to be a computer wizard to use Partition-It. Partition-It guides you step by step through various ways of optimizing your hard disk.

Partition-It cannot be used to partition removable-media drives such as Iomega's Zip and Jazz drives and the Syquest EZ drives. These drives themselves use special drivers and physical data storage schemes that are incompatible with Partition-It. You can, however, install and run Partition-It from these drives.

Throughout this manual, we use the term Windows 3.1x to refer to Windows 3.1, 3.11, and any version of Windows for Workgroups.

Basic Concepts

This section introduces some basic concepts to illustrate how Partition-It works. If you are already familiar with disk partitions, skip to "How Partition-It Helps You Optimize Your Hard Drives" on page 6.

Introduction to Disk Partitions

In using your computer, you have become familiar with the letters associated with various hard and floppy drives. A: typically represents a floppy drive, and C: is typically the hard drive from which you boot your computer.

Since the data on your computer is stored in files, a good way to think of the drive letters on your computer is to visualize them as representing file drawers in which your files are stored. Since simply throwing all of your files into a single file drawer makes it hard to locate or identify a specific file, DOS and Windows let you use directories to provide a further level of organization, just like different folders help you organize information in a filing cabinet.

Even folders can become hard to work with as you accumulate more and more folders and files on your system. Each time you want to locate a specific file, you have to find the appropriate folder, then search through that folder for the right file. If you add additional, larger hard drives, finding files can become even more difficult.

To make it easier to work with large hard drives and greater numbers of folders and files, DOS and Windows let you subdivide your hard drive into additional **partitions**. Partitions are like additional drawers in a filing cabinet—they provide additional, logical ways of dividing up the space you already have and using it more efficiently. Partitions help you access your files more efficiently in two primary ways:

- by providing an additional level for organizing data on your hard drive, partitions can make it easier to find a specific file or application.

- by speeding up access to specific files or folders. If you create multiple partitions on a single hard drive, each partition is smaller than the total amount of space available on your hard drive. Your computer can usually locate information in a small partition faster than if it has to search your entire hard drive.

Most hard drives consist of a single partition which is named C:. If you add other drives to your system, they are named D:, E:, and so on. Each partition on your hard drive is associated with a letter just like the drives themselves. The letters that are initially associated with the hard and floppy drives in your computer actually refer to single, large partitions that represent all of the space available on those drives. You have already been using partitions, and may not even have known it!

If your computer already has a C drive and you use Partition-It to create two partitions on that drive, you can access these through the letters C: and D:. If you already had a D drive in your computer, the new partition on your C drive becomes drive E. DOS and Windows assign drive letters to primary partitions on different hard drives before assigning drive letters to other partitions on those drives.

Unfortunately, while partitions are a fairly easy concept to understand, the tools provided by DOS and Windows to work with them are not so simple. That is where Partition-It comes in.

Introduction to Clusters and Cluster Size

When you format a floppy drive, hard drive, or partition using standard DOS utilities, the format utility creates a **file system**. A file system is a computer's way of pre-organizing the disk space on a partition so that it can be used more efficiently, just like notebook paper comes with lines already drawn on it.

In DOS or Windows, disk space in a partition is organized into **clusters**, that are like the sheets of paper on which your files are written. DOS and Windows systems can allocate a maximum of 65,536 clusters on a partition, regardless of its size. However, clusters can vary in size; because all partitions have the same maximum number of clusters, the larger the partition, the larger the cluster size.

Since your computer can allocate up to 65,536 clusters on each partition, the clusters on a 100 megabyte partition can be much smaller than those on a one gigabyte partition. Table 1 shows the cluster sizes associated with FAT16 partitions of different sizes (partition size given in megabytes):

Table 1: Cluster Sizes on Different FAT16 Disk Partitions

Partition Size	FAT16 Cluster Size
0 - 31MB	512 bytes
32 - 63MB	1K
64 - 127MB	2K
128 - 255MB	4K
256 - 511MB	8K
512 - 1023MB	16K
1024 - 2047MB	32K

Larger partitions can lead to wasted space on a drive. Although a file can span multiple clusters, each cluster can only be used by a single file. Suppose you have a one gigabyte partition that uses 32K clusters, and you have a file that is exactly 32K in size. If you add a single extra character to that file, the computer must allocate an entire cluster (32K) to hold that character.

Dividing a large disk drive into multiple partitions is an easy way to maximize the use of space on the drive. If you add a single character to that file on a 100 megabyte partition that uses 2K clusters, the computer need only allocate an additional 2K to hold that character. While still somewhat wasteful, using a smaller partition and cluster size saves you 30K! Multiply this by the number of files you have on your computer, and you can see that using partition sizes that are larger than necessary can waste a significant amount of space on a hard drive.

Table 2 shows a real example of the extra space required to install an application on partitions of different sizes, based on installing Microsoft Office 95. The total size of Microsoft Office 95 at the time this document was written was 99.93 megabytes. The last column shows the amount of space you would save by using a smaller cluster size (shown in the Cluster Size column), as opposed to a cluster size of 32K.

Table 2: Disk Space Used by Microsoft Office on Different FAT16 Partition Sizes

Partition Size	Cluster Size	Space used	Wasted Space	Potential Savings
1024 - 2047MB	32K	120.28MB	20.26MB	(N/A)
512 - 1023MB	16K	109.45MB	9.52MB	10.84MB
256 - 511MB	8K	104.23MB	4.30MB	16.05MB
128 - 255MB	4K	102.02MB	2.09MB	18.26MB
101 - 127MB	2K	100.89MB	0.96MB	19.39MB

If you have very large files, a large cluster size allows you to store your files on fewer clusters. This can improve performance when you access these files. However, a large cluster size will waste disk space if you have many files that are smaller than the cluster size.

Limitations of DOS and Windows Utilities

DOS and Windows include a utility, FDISK.EXE, for working with partitions. To create or modify partitions on your system using FDISK, you must reformat your hard disk, destroying all of the information on your system. This means that you have to back up your hard drive before you can modify partitions. After creating or modifying partitions, you have to restore all of the data from your backups. Usually, you must also reinstall any Windows applications that you want to move to a different partition, because all of your existing INI file and registry entries for those applications point to the original partition. In addition, DOS and Windows do not provide any way of modifying the cluster size within a partition—the FDISK utility automatically selects the cluster size when a partition is created.

How Partition-It Helps You Optimize Your Hard Drives

Partition-It provides a consistent, graphical interface that lets you see all of your drives, view the partitions and free space on those drives, and optimize those partitions by pointing and clicking. With Partition-It, you can:

- **resize** clusters to use the available space on a partition more efficiently, decreasing cluster size to reclaim wasted space or increasing it to suit the types of files stored on that partition.
- **create** additional partitions to improve the organization of, and help speed up access to, the information on your system.
- **move** partitions to reorganize the free space on your drives, so you can increase the size of existing partitions, if necessary.
- **delete** partitions to provide free space into which you can move other partitions or increase their sizes.

- **resize** partitions so you can store more information on them or use a different cluster size to optimize their storage capacity.
- **move** applications to other partitions to free space on existing partitions.

Advanced Disk Drive Concepts

This section discusses more complex partitioning concepts for advanced users—it is not necessary to read this section to use Partition-It.

Different Types of Partitions

DOS and Windows let you create a maximum of four physical partitions on a disk. A maximum of four partitions on a disk was fine when disk sizes were smaller, but may not be very efficient on today's systems, where disk drive sizes of one gigabyte and greater are common. To get around this limitation, you can identify one partition as an "extended" partition, in which you can subsequently create additional, **logical partitions**. Logical partitions do not occupy a specific portion of your disk, but exist within other (extended) partitions.

Systems running DOS, Windows 3.1x, and Windows 95 recognize and use several different types of partitions:

- **primary**—a physical portion of your disk from which DOS, Windows 3.1x, or Windows 95 can boot when you start or restart your computer. Your C drive is always a primary partition.
- **extended**—a physical partition that can be divided into multiple, logical sections that your operating system will see as partitions. An extended partition cannot contain boot information, since this type of partition is only recognized *after* you have booted an operating system.

- **logical**—a portion of an extended partition that the operating system recognizes as an actual partition. Logical partitions can only be identified by your system after the extended partitions in which they are located are identified. Logical partitions cannot contain boot information for your system.

Primary, extended, and logical partitions are known as FAT (File Allocation Table) file systems because your system maintains a table to find information within those partitions. This table is composed of records that identify the files in the partitions and the blocks of data associated with those files. These records have different sizes, depending on the size of the partition. Partitions between 0 and 127 megabytes (typically used with older systems) can use a file allocation table called FAT12, because a data address of 12 bits was sufficient to find a file and its starting location on partitions which were that small. Most current file allocation tables are called FAT16 because they use 16-bit records to locate a file and its starting location. Some OEM releases of Windows 95 support the FAT-32 file allocation table, enabling those systems to find files and their starting locations automatically in even larger partitions. See the next section for more information about FAT32 partitions. All of the examples of partition and cluster size used in this document refer to FAT16 cluster sizes, because this is still the most common type of partitions found in systems today.

Using FAT32 Partitions

The FAT32 FAT type supports larger physical partitions on hard drives by using 32-bit records for drive addressing. FAT32 partitions can be up to two terabytes (TB) in size. FAT32 partitions are only supported in Microsoft Windows 95 version 4.00.950b (known as OSR2) or greater.

To determine what version of Windows 95 you are running, select the System item from the Control Panel. The General tab displays the version of Windows 95 that you are running.

FAT32 partitions provide many advantages over FAT16 partitions on systems that only run Windows 95 4.00.950b. Table 3 shows the default cluster sizes used in FAT16 and FAT32 partitions.

Table 3: Cluster Sizes on FAT16 and FAT32 Disk Partitions

Partition Size	FAT16 Cluster Size	FAT32 Cluster Size
0 - 31MB	512 bytes	N/A
32 - 63MB	1K	512 bytes
64 - 127MB	2K	512 bytes
128 - 255MB	4K	512 bytes
256 - 511MB	8K	1K
512 - 1023MB	16K	2K
1024 - 2047MB	32K	4K
2049 - 8191MB	N/A	4K
8192MB - 16GB	N/A	8K
16 - 31GB	N/A	16K
32GB - 2TB	N/A	32K

FAT32 partitions are not supported by any operating system other than Windows 95 v4.00.950b. Windows 95 4.00.950b does not support booting multiple versions of Windows on your system. If you manage to create a system that boots Windows 95 4.00.950b and other versions of Windows (by using a third-party boot manager, for example), you will not be able to access your FAT32 partitions from these other versions of Windows.

Using Other Types of Partitions

PCs can run many different operating systems, such as DOS, Windows 95, Windows NT, Novell NetWare, OS/2, versions of UNIX such as Linux, SCO, and NetBSD, and many others. Each of these operating systems uses a different partition format to obtain maximum performance for that specific operating system. Since some users run different operating systems on the same PC, it is necessary to be able to identify the characteristics of each partition on your system. Partitions are assigned a specific numeric type that identifies them to applications, operating systems, and utilities such as Partition-It. This makes it easy for applications and other operating systems to determine whether they can effectively use the data stored in specific partitions.

Partition-It is specifically designed to help you optimize the performance of partitions on a DOS, Windows 3.1x, or Windows 95 PC. Partition-It immediately identifies partitions used by other operating systems, and prevents certain operations that would damage them (such as changing cluster size). In addition, Partition-It lets you create new partitions for use with other operating systems. Partition-It will not format these for you, but can quickly and easily create them so that you can use them with other operating systems.

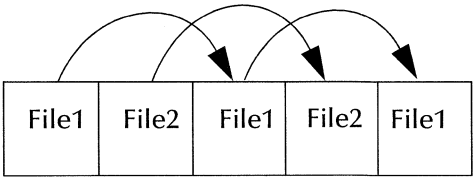
For more information on creating partitions of different types, see "Creating a Partition" on page 44.

Disk Fragmentation

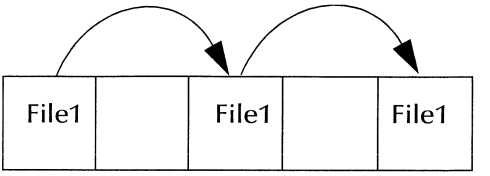
Using Partition-It to divide your disk into smaller partitions can help increase system speed by reducing the size of the areas on your disk that your system must search to locate specific files and directories. This section explains why file access can become less efficient as you create and delete files on your system over time.

When writing a file to your disk, DOS or Windows tries to write it as efficiently as possible. At a low level, DOS or Windows tries to write your files to adjacent clusters on your disk, so that it can subsequently read this information as quickly as possible. However, as you write, update, and delete files from your disk, the data on your disk becomes more scattered. This is called **fragmentation**. As an example, consider five adjacent disk clusters and the following scenario:

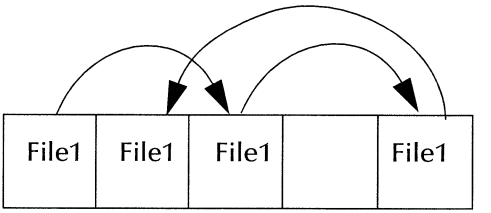
- You create file1, which completely fills the first disk cluster.
- You create file2, which completely fills the second disk cluster.
- You edit file1 and expand it. The file system allocates additional space for the expanded file in the third disk cluster, since the second cluster is already used by file2.
- You edit file2 and expand it. The file system allocates additional space for the expanded file in the fourth disk cluster, since the third cluster is already used by file1.
- You edit file1 and expand it. The file system allocates additional space for the expanded file in the fifth disk cluster, since the fourth cluster is already used by file2. The clusters now look something like this:



- You delete file2, causing the clusters to look something like this:



- You edit file1 and expand it. The file system allocates additional space for the expanded file in the second disk cluster, since that is now the first available free cluster on the disk. The clusters now look something like this:



It is easy to see how fragmentation can slow down your disk by forcing it to work harder to locate the clusters associated with a specific file. If the clusters that contain the data for a single file are spread out all over the disk, your disk drive has to do extra work to move to those locations and read the data. Using Partition-It can help minimize fragmentation by allowing you to use smaller partitions. Smaller partitions reduce the maximum amount of time that your disk must spend looking for information on a specific partition, since the partition is smaller and is therefore easier to search.

To resolve fragmentation problems in an existing partition, you can use the **Disk Defragmenter** utility provided with DOS versions greater than 6.0 and with Windows 95. This utility optimizes the organization of the information on your hard drive, reducing the amount of time it takes to read and write data to your disk.

For more information on the Disk Defragmenter utility, see your DOS or Microsoft Windows documentation.

System Requirements

Partition-It has the following system requirements:

- IBM PC, PS/2, or 100% compatible computer with an 80386 DX, i486, 80486, AMD or Cyrix 586 or 686, or Pentium processor.
- a minimum of 4 megabytes of RAM (8 megabytes are recommended).
- 3 megabytes of free hard-disk space for installation on Windows 95 systems or 6 megabytes on Windows 3.1x systems.
- Microsoft Windows 3.1, Windows for Workgroups 3.11, or Windows 95.

About This Guide

For information about installing Partition-It, see the separate install guide included with the product.

This user guide is organized as follows:

- **Chapter 1, Using Partition-It**—explains how to install Partition-It.
- **Chapter 2, Optimizing Performance with Partition-It**—discusses how to use Partition-It to enhance system performance.

- **Chapter 3, Basic Partition-It Operations**—provides a reference for Partition-It's basic operations.
- **Chapter 4, Advanced Operations**—discusses advanced features, such as hiding partitions and making partitions active. This chapter also discusses using Partition-It with other disk-related utilities and with partitions used by other operating systems.
- **Appendix A, Common Questions and Answers**—provides a list of common questions (and their answers) about using Partition-It. Check this Appendix before calling Quarterdeck Technical Support.
- **Glossary**—defines technical terms used in this manual.

Symbols

This user guide uses the following symbols:

	Indicates a noteworthy point.
	Indicates important information.
	Indicates that there is more information about a topic elsewhere – in this User Guide, the online help, or even on the Internet.
	Indicates a tip—a useful way of using a feature.

Using Partition-It

Before performing any Partition-It operation, make sure that you back up the data on any partition that you will be changing. System problems, such as hardware problems or a power outage, while you are using Partition-It could result in data loss.

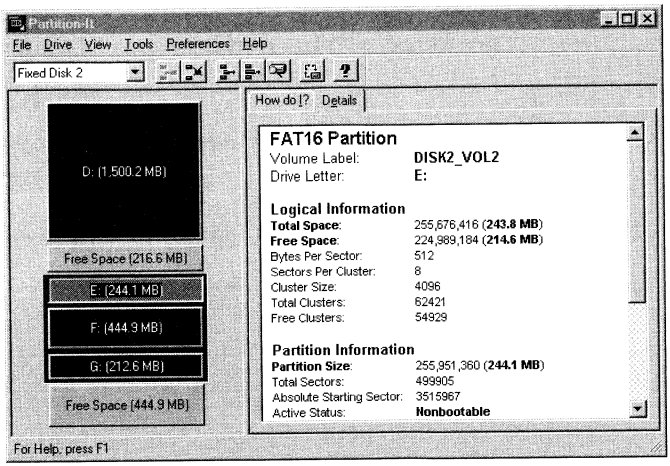
Starting Partition-It

To start Partition-It:

- On Windows 95 systems, click the **Start** button and point to **Programs**. In the Programs submenu, select **Quarterdeck Partition-It**, then click **Partition-It**.

  On Windows 3.1x systems, double-click the **Partition-It** icon in the Partition-It program group.

  The main Partition-It screen displays:



By default, Partition-It displays a graphical view of a single drive in the left pane of its main screen. To see a hierarchical view of the drives in your system, use Partition-It's Tree view, as explained in "Viewing Drives and Partitions in Partition-It" on page 24.

Resolving Problems Starting Partition-It

There are two common reasons why you may be unable to run Partition-It on your system. This section discusses each of these situations and provides suggestions for resolving the problem.

Resolving MS-DOS Compatibility Problems

Partition-It will not run if any of the drives in a Windows 95 system are running in MS-DOS compatibility mode. This may be the case if:

- some of your hardware was not correctly identified or is not supported by Windows 95
- other hardware in your system conflicts with your hard disk controller
- any of your hardware drivers are not completely Windows 95 compatible.
- a virus is present in your system.

To resolve MS-DOS compatibility problems:

1 Go to the Windows Control Panel and select the **System** icon. Use the Performance tab to identify the drive that is using MS-DOS compatibility mode, and why.

If the driver responsible for MS-DOS compatibility mode is MBRINT13.SYS, you may be running disk-geometry translation software that is intended for use with Windows 3.1x or you may have a boot sector virus. If you are running software that came with your disk drive, try commenting it out of your CONFIG.SYS file, restarting your system, and rerunning Partition-It.

If you have access to the World Wide Web and need to run your hard disk vendor's disk management software, check http://www.microsoft.com for Windows 95 compatibility information.

If this does not resolve the problem, run virus detection software on your system before proceeding. If this does not resolve the problem, proceed to the next step.

2 Check the Device Manager in the Control Panel's System icon to verify that your hard drive controller is listed. If it is not listed, select the Control Panel's **Add New Hardware** icon. Do not let it search for your controller, and select your controller from the hardware list. If your controller is not listed, contact the manufacturer of the disk controller for a Windows 95 compatible (or 32-bit Windows 3.1x) driver.

3 If the line "device=Mh32bit.386" is present in your SYSTEM.INI file, you are using an incompatible driver—comment out this line by preceding it with a semi-colon and try restarting your system.

4 If you hard disk controller is listed but displays a yellow exclamation mark, there is a DMA, I/O, IRQ, or memory conflict with another device or driver, or the protected-mode driver for this card is missing or damaged. Verify that the **Disable all 32-bit protected-mode disk drivers** check box is not selected on the File System tab of the System Icon's File System item. If this is not selected, resolve the hardware conflict using the information provided with your hard disk controller.

5 Restart Windows 95 and press **F8** at the "Starting Windows 95" prompt. Select item 2, "Logged" boot. After your system boots, check the BOOTLOG.TXT file in your WINDOWS directory to determine which driver did not start correctly.

6 If the drive controlled by the problematic disk controller shows an INITCOMPLETESUCCESS message, check the IOS.LOG file in your WINDOWS directory. This file is created if any of your drives are using MS-DOS compatibility mode. Contact Microsoft Product Support and provide them with the first few lines of this file.

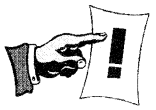
7 Check to make sure that the protected-mode driver for your disk controller is not damaged. For ESDI and IDE drives, the driver is the file ESDI_506.PDR in the IOSUBSYS subdirectory of your Windows directory. For SCSI controllers, the driver is the file SCSIPORT.PDR in the same directory. To verify these drivers, rerun the Windows 95 Setup application and select the **Verify** option.

If none of the steps listed above resolve the problem and allow you to start Partition-It, your hard drive or controller may be incompatible with Windows 95. If you cannot get Windows 95 or 32-bit Windows 3.1x drivers from the manufacturer, you may need to replace your hard drive controller with a Windows 95-compatible controller. This will enable Windows 95 to address your hard drive efficiently and will also enable you to use Partition-It to maximize your hard drive's performance and storage capability.

Resolving Hard Disk Size Conflicts

Messages stating that Partition-It cannot run because of logical errors related to the ending sector address of a hard drive are caused by configuration conflicts between your hard drive controller's BIOS and the motherboard's CMOS settings. Windows 95 reads information about the configuration of your hard drive(s) from the hard drive controller's BIOS rather than from the system CMOS. However, the information in the system CMOS is usually used when creating partitions on your hard drives. If these two sources of drive configuration information do not contain the same settings, Partition-It may not run until the problem is resolved. Such conflicts will prevent Partition-It from being able to determine partition boundaries accurately, which would cause problems when it is manipulating the physical and logical structure of your hard drive partitions. Synchronizing the information in your CMOS with the information provided by your hard drive controller will not only let you run Partition-It, but will also maximize the use of your hard disk in general.

If you have a system that includes an "Autoconfigure" (AUTO) setting for hard drive configuration and you are currently using "User Defined" values for one of your disks, you should consider letting the AUTO setting select the correct configuration settings. The AUTO option reads disk configuration information from the hard drive controller BIOS, synchronizing the two sets of values.



If you have to follow the instructions in this section, take your time and make sure that the procedure that you are following and the changes that you are making are the correct ones. If you have questions about any setting changes or other configuration issues, get technical help from the appropriate source.

To correct hard drive controller and CMOS conflicts manually:

1. Back up the data on the misconfigured drive! Under some circumstances, you will be able to modify your BIOS drive settings and not affect partition settings, but you should not count on this. If you somehow lose a partition while modifying your CMOS hard drive settings, you will not be able to recover your data. Before making any changes to your CMOS hard drive settings, make sure that you have a current and valid backup.
2. Make sure that you have a bootable operating system diskette with all the utilities you will need to reset your system and reinstall Windows 95 if necessary. Having a startup disk is especially critical if the drive you are reconfiguring is your boot drive. Without a bootable system disk, you will not be able to reinstall Windows 95.

If you did not create a Windows 95 system disk when you installed Windows 95 or if your system did not come with one, you can create a startup disk with all of the necessary files and utilities by selecting StartUp Disk from the Control Panel's Add/Remove Programs item. You must also make sure that your startup disk is configured to access your CD-ROM drive if your Windows 95 setup disk is a CD-ROM. Contact Microsoft if you are not sure how to do this.

3 Find and review any user's guides, manuals, or other technical documentation for your motherboard, CMOS configuration, and hard drive. The vendor from whom you bought your system may be able to help you reset your system. This is especially important if you don't have much experience working with computer hardware.

Most BIOS configuration conflicts are associated with 540 Megabyte drives. If the problem you are having is with a 540MB drive and you can not get information about your drives from your hardware vendor or the drive manufacturer, the most common settings for these drives are 1024 cylinders, 16 heads, and 63 sectors per track.

4 Once you know the settings you need to use for your hard drive and the procedures required to change those values, correctly set the parameters for your hard drive.

5 Reboot your system.

If your system reboots correctly, you should now be able to use Partition-It. If the changes you had to make significantly altered your hard drive configuration, you may have to re-partition and reformat your drive using the Startup disk, make it bootable, and then reinstall Windows 95 and your backup software so that you can restore your original Windows configuration and software.

Accessing Partition-It Commands

Partition-It provides three ways to access commands:

- use the icons on the toolbar at the top of the screen. As you move the cursor over any icon on the toolbar, an explanation of that icon displays at the bottom of the main Partition-It window. See Table 4 on page 23 for an explanation of each icon in Partition-It's toolbar.
- select commands from the menus at the top of the window.
- position the cursor over the desired drive or partition in the left pane of the main Partition-It screen and right-clicking to display a menu of available commands.

Partition-It will only let you select those toolbar icons or menu commands that are valid for the item that is currently selected in the main Partition-It screen.

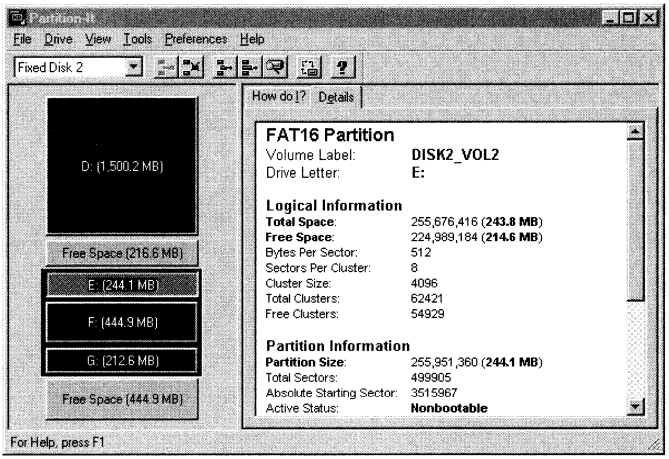
Table 4: Toolbar Icons in Partition-It

Icon	Partition-It Feature
	Creates a new partition in selected free space.
	Deletes the selected partition.
	Moves the selected partition.
	Resizes the selected partition.
	Resizes clusters in the selected partition.
	Moves applications.
	Provides context-sensitive help for Partition-It icons, commands, buttons, and dialogs.

Viewing Drives and Partitions in Partition-It

Partition-It provides two different ways of viewing the drives in your system: hierarchically, using a tree view, or graphically.

Partition-It's graphical view provides a graphical representation of a single drive in your system. Fixed Disk 1 in your system is shown by default when you start Partition-It. Here is an example of a graphical view of Fixed Disk 2 in a system:



Different colours are used for different kinds of partitions, as indicated in the following table.

Table 5: Partition Color Codes

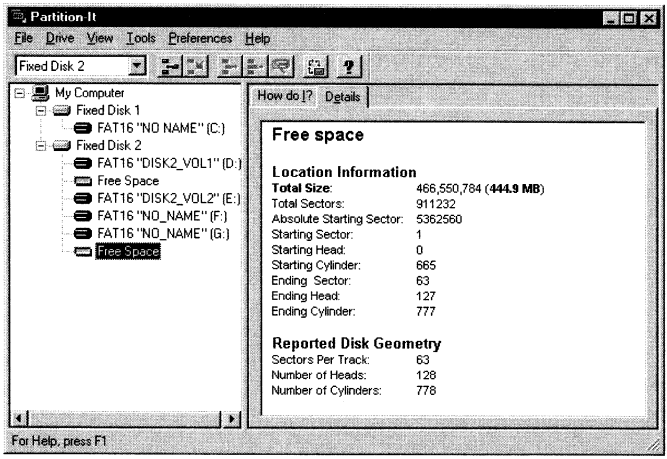
blue	existing partition
cyan (light blue)	free space
brown	HPFS (OS/2)
dark red	NTFS (Windows NT)
green	FAT32

When you are using Partition-It's graphical display, extended partitions are shown with a dark border to differentiate them from primary partitions.

To see a graphical view of another drive when using Partition-It's graphical view:

- Select that drive from the pull-down list at the left of Partition-It's toolbar.

A **tree view** lists all of the drives in your system and the partitions they contain, and provides summary information about the names and sizes of those partitions. Here is a sample tree view:



To activate Partition-It's tree view:

- Select the **Tree View** command from the **Preferences** menu.

2

Optimizing Performance with Partition-It

In this chapter you will learn how to:

- Create additional partitions to improve storage capacity and performance.
- Change the cluster size on existing partitions to increase the amount of data you can store on those partitions.
- Improve Windows performance by creating a separate partition for virtual memory files.

Creating Multiple Partitions to Reclaim Disk Space

As discussed in "Introduction to Clusters and Cluster Size" on page 3, partitions of different sizes store information in different-sized chunks, which can waste disk space on larger partitions. This section describes how to reclaim wasted space from larger drives by dividing those drives into multiple, smaller partitions. Decreasing partition size can also increase performance by limiting disk fragmentation and improving relative access times for data within a partition.

Suppose you have a relatively large hard drive (greater than 540MB), partitioned into a single large partition. As explained in "Introduction to Clusters and Cluster Size" on page 3, the smallest amount of disk space (the cluster size) that DOS or Windows can allocate on a drive of this size is 16K if your drive is smaller than one GB, or 32K if your drive is one GB or larger. Each time you increase a file by one byte more than the cluster

size on your drive or partition, DOS or Windows allocates an entire cluster to hold this extra character. By simply dividing this drive into two partitions, you can decrease the cluster size and therefore increase the actual amount of data that can be stored on this drive (as shown in the example of disk use by Microsoft Office in Table 2 on page 5).

This section provides a simple example of increasing the amount of data storage available on a hard drive by dividing it into two partitions. By creating more than two partitions on a drive, you may be able to further increase the amount of data you can store.

To create an additional partition on a current drive:

1. Start Partition-It and click the drive that you want to partition. Click the Details tab in the right pane of the Partition-It window if it is not already selected.

   Disk usage information about that drive displays in the left pane of the primary Partition-It window. The Free Space figure in the Logical Information section shows the amount of free space available on that drive.

2. Compare the amount of free space on your drive against the values in Table 3 on page 9 to determine the size of the partition that you want to create.

If you do not have sufficient free disk space to create a new partition on your hard drive, you must either add another drive or delete some existing data or applications from your drive (be sure to back them up first). Partition-It can only create partitions in free space on a disk.

3. Select the **Resize** icon in the Partition-It toolbar or the **Resize** command from the Tools menu.

The Resize dialog displays.

If you want to resize the partition in which Windows is located, you will have to reboot your system so that Partition-It can automatically complete the operation in MS-DOS mode. Exit all Windows applications with open data files before modifying the partition on which Windows is located.

4 Drag the right border of the existing drive to the left, or use the up and down arrows to create free space equal to the partition size you identified in Step 2. Click **OK** to resize the existing partition and create free space on your drive.

   The existing partition is resized and free space is created. The Resize dialog closes.

5 Select the newly-created free space in the left pane of the main Partition-It window, then select **Create** from the Tools menu.

   The Create dialog displays.

6 Click **OK** to create a partition of the default (maximum) size.

   A partition of the specified size is created.

That is all there is to it! By dividing your existing drive into multiple partitions, you can now make more efficient use of the storage available on that drive.

Changing the Cluster Size on Existing Partitions

As explained in "Introduction to Clusters and Cluster Size" on page 3, partitions of different sizes use different cluster sizes. Generally, selecting the smallest cluster size possible for a specific partition can both save disk space and improve performance. If a partition already uses the smallest possible cluster size for its size but you are very low on disk space, you may want to reduce the size of the partition first, enabling you to select a smaller cluster size. See Table 3 on page 9 for a list of partition sizes and corresponding cluster sizes.

In some cases, you may want to increase cluster size on a partition, depending on the type of data files it holds. For example, database files are typically accessed record by record—if the record size used in your databases is close to a larger cluster size, you may want to use the larger cluster size for the partition where those database files are stored. Similarly, multimedia files are typically very large, and are read sequentially, in their entirety. Increasing the cluster size on a partition where these are stored may also result in a performance improvement.

To change the cluster size of an existing partition:

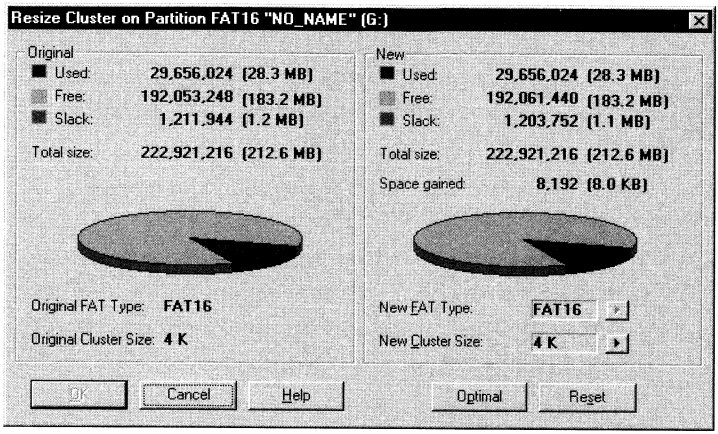
1. In the main Partition-It window, use the mouse to select the partition in which you want to modify the cluster size.

   The selected partition is highlighted.

2. Click the **Resize Cluster** icon in the Partition-It toolbar or the **Resize Cluster** command from the **Tools** menu.

You can right-click in the left pane of the main Partition-It window to display a menu containing the ***Resize Cluster*** *command.*

The Cluster Size dialog displays:



3 Unless you are creating a partition to hold database files with large record sizes or large multimedia files, let Partition-It automatically select the optimal FAT Type and Cluster Size for the selected partition by clicking **Optimal** and skipping to Step 8.

If you click **Optimal**, the **Space gained** item changes to show the free space you can regain by using the FAT type and cluster size that Partition-It selected for you.

4 If you want to select the FAT type of your partition manually, click on the **New FAT Type** selection box; otherwise, skip to Step 6.

A drop-down list displays your choices.

For more information on FAT types, see "Different Types of Partitions" on page 7.

5 Select the new FAT type.

The selected FAT Type displays in the **New FAT Type** selection box.

6 Click the **New Cluster Size** selection box.

A drop-down list displays your choices.

For more information on potential savings from different cluster sizes, see "Introduction to Clusters and Cluster Size" on page 3.

7 Select the new cluster size.

The selected cluster size displays in the **New Cluster Size** selection box. The **Space gained** item changes to show the free space you can gain by using the currently selected FAT type and cluster size.

8 Click **OK** to accept the FAT type and cluster size.

A dialog displays, showing the progress of Partition-It's changes to the selected partition. Once the FAT type and cluster size have been successfully modified on the selected partition, an **Operation Completed** dialog displays.

9 Click **OK** to close this dialog and return to the main Partition-It window.

Creating a Separate Partition for Virtual Memory Files

The process described in this section is an optional way of increasing performance on your system. We recommend that you have a basic knowledge of virtual memory concepts so you can understand the consequences of the changes you are making.

Microsoft Windows allows you to run multiple applications simultaneously, even though they may not fit into the amount of physical memory in your computer. To accomplish this, Windows uses a *swap file* (or *paging file* in Windows 95 terminology) on your hard drive as *virtual memory*. A swap or paging file is a file that Windows can use as a temporary

location in which to save portions of the contents of system memory when other applications need more physical memory. The size and location of this file is automatically specified by Windows, but can also be set by using:

- Windows 3.1x: the **Virtual Memory** option on the Control Panel's **386 Enhanced** item.
- Windows 95: the **Performance** tab's **Virtual Memory** dialog, located in the Control Panel's **System** option.

By default, your swap (or paging) file is a temporary file located on your boot drive that is recreated each time you start Windows. Since it takes time to create this temporary file each time you start Windows, creating a permanent swap file immediately improves system performance. Taking this one step further, you can usually obtain an additional performance improvement by putting this swap or paging file in its own partition. This can minimize the physical movement of the parts of your disk drive when Windows writes memory to disk.

Creating a separate partition for a Windows 3.1x swap file will almost always provide a noticeable performance increase. Creating a separate partition for your paging file under Windows 95 is less likely to provide a substantial performance increase, depending on the speed and size of the drive on which your swap file is located, as well as on the driver and interface used by that drive.

Extensive changes were made to swap file use and management between Windows 3.1x, Windows for Workgroups, and Windows 95. While Windows 3.1x and Windows for Workgroups use a swap file whose size is determined when you start Windows, Windows 95 uses a dynamic swap file whose size can change depending upon the number and sizes of the applications that you are running.

Before proceeding with the remainder of this section, make sure that you have sufficient space available on one of your disk drives to create a permanent swap partition. The size of your swap partition should be somewhere between one half and two and a half times the amount of physical memory in your computer. You should always locate your swap file on the fastest drive in your system.

Creating a Swap Partition Under Windows 3.1x

To create a separate swap partition under Windows 3.1x:

1. Close all open applications on your system and double-click the **Control Panel** icon in the **Main** program group.

   The Control Panel displays.

2. Double-click the **386 Enhanced** icon.

   The 386 Enhanced Control Panel option displays.

3. Click the **Virtual Memory** button.

   The Virtual Memory dialog displays.

4. Check the **Swapfile Settings** portion of the Virtual Memory dialog. If this indicates that you are using a **Temporary** or **Permanent** swap file on your boot drive, write down the current size of your swap file and skip to Step 12.

   If you are using a permanent swap file on any disk other than your boot drive and creating the new swap partition will change the drive letter for this drive, you must continue to the next step so that you can create a temporary swap file located on the boot drive of your system.

5. Click the **Change** button to change the location and type of your swap file.

   The **New Swapfile Settings** portion of the Virtual Memory dialog displays.

6 Click your boot drive in the **Drive** selection box.

7 Use the selection arrow to select **Temporary** from the **Type** selection box.

8 Either accept the suggested new size of your swap file in the **New Size** text entry box, or enter a new value. This value must be less than the amount of free disk space available on your boot drive. Write down the size of your swap file for future reference.

9 Click **Save**.

Windows displays a message stating that you must reboot your system to use the new virtual memory settings.

10 Click **Reboot now** to reboot your system. (You can click **Continue** if you need to save data in open applications before rebooting.)

Your system reboots.

11 Start Windows.

12 Start Partition-It, select your fastest disk drive from the drives list in the upper left corner of the Partition-It screen, and click on a free space area to use for your new swap partition.

13 Follow the procedure in "Creating a Partition" on page 44 to create the new swap partition. The size of this partition should be at least as large as the swap file size that you recorded in Step 4 or Step 8.

14 Double-click the **Control Panel** icon in the **Main** program group.

The Control Panel displays.

15 Double-click the **386 Enhanced** icon.

The 386 Enhanced Control Panel option displays.

16 Click the **Virtual Memory** button.

The Virtual Memory dialog displays.

17 Click the **Change** button to change the location and type of your swap file.

The **New Swapfile Settings** portion of the Virtual Memory dialog displays.

18 In the **Drive** selection box, select the partition in which your new swap partition is located.

19 In the **Type** selection box, use the selection arrow to select **Permanent** as the swap file type.

Permanent displays in the swap file Type box.

20 In the **New Size** text entry box, enter the size of your new swap partition.

21 Click **Save**.

Windows displays a message stating that you must reboot your system to use the new virtual memory settings.

22 Click **Reboot now** to reboot your system. (You can click **Continue** if you need to save data in open applications before rebooting.)

Your system reboots. When your system restarts, you will be using the new partition for your swap file.

Creating a Swap Partition Under Windows 95

To create a separate swap partition under Windows 95:

1 Close all open applications on your system and select the **Control Panel** option from the **Start** button's **Settings** menu.

The Control Panel displays.

2 Double-click the **System** icon.

The System Properties Control Panel option displays.

3 Select the **Performance** tab.

The Performance tab displays.

4 Click the **Virtual Memory** button.

The Virtual Memory dialog displays. If the **Let Windows manage my virtual memory settings** button is selected, click **Cancel**, then click **Close** to close the System Properties item, close the Control Panel, and skip to Step 9.

5 Select the **Let Windows manage my virtual memory settings** button.

6 Click **OK** to accept the changes you have made.

Windows displays a message stating that you must reboot your system to use the new virtual memory settings.

7 Click **Reboot now** to reboot your system, or click **Continue** if you need to save data in open applications before rebooting.

Your system reboots.

8 Start Windows.

9 Start Partition-It, select your fastest disk drive from the drives list in the upper left corner of the Partition-It screen, and click on a free space area to use for your new swap partition.

10 Follow the procedure in "Creating a Partition" on page 44 to create the new swap partition. This partition should be at least as large as the amount of physical memory in your computer.

11 Reboot your system using the **Start** button's **Shutdown** option to ensure that the new partition is available.

Your system reboots.

12 Select the **Control Panel** option from the **Start** button's **Settings** menu.

The Control Panel displays.

13 Double-click the **System** icon.

The System Properties Control Panel option displays.

14 Select the **Performance** tab.

The Performance tab displays.

15 Click the **Virtual Memory** button.

The Virtual Memory dialog displays.

16 Select the **Let me manage my virtual memory settings** button.

17 Select the partition you just created in the **Hard Drive** selection box.

18 Specify a value one-half MB less than the size of the partition you just created as the maximum and minimum size of the swap file.

19 Click **OK** to accept the changes you have made.

Windows displays a dialog stating that you must reboot your system to use the new virtual memory settings.

20 Click **Reboot now** to reboot your system. (You can click **Continue** if you need to save data in open applications before rebooting.)

Your system reboots and runs with the new swap file.

3

Basic Partition-It Operations

In this chapter you will learn how to:

- Get information about disks and partitions on your system.
- Resize partitions.
- Create new partitions.
- Move partitions.
- Delete partitions.
- Move applications between partitions.

Getting Information About a Disk or Partition

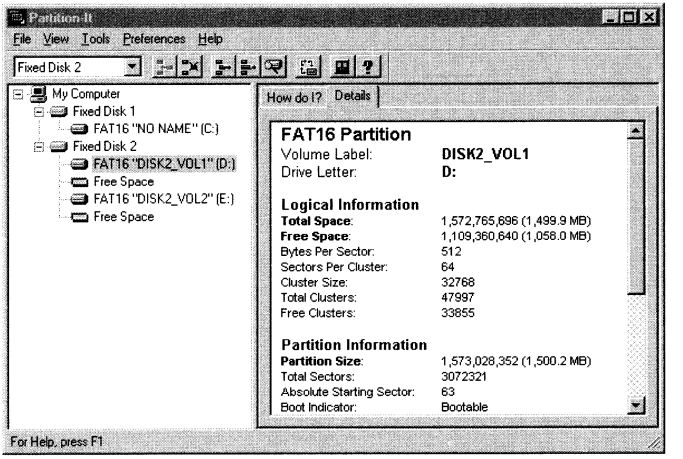
Partition-It provides precise information about the hard drives in your system and the partitions located on those drives. If you are adding a new drive to your system, Partition-It can provide detailed information about the size and geometry of that drive. Partition-It can also help you identify bootable drives, determine where primary partitions are physically located, and determine the exact amount of available disk space available in different portions of your disk. Information about the physical location of partitions on your drives can be especially useful if problems develop with a particular head or disk surface. Advanced users may want to use this information to move partitions to safe locations on your disk.

The values displayed by Partition-It are more accurate than those shown by DOS utilities (such as FDISK) that round off the values they display.

To get information about a disk or partition:

1. In the left pane of the Partition-It window, click the disk or partition about which you want information.
2. Select the **Details** tab in the right pane of Partition-It's main window.

   Information about the selected disk or partition displays in the right pane:



For more information about the values shown in Partition-It's Details window, see the online help.

Resizing a Partition

You may want to resize existing partitions for various purposes:

- freeing space so that you can create additional partitions
- making a partition smaller so that you can reduce the cluster size for increased data storage
- increasing the size of a partition that you use to hold large data files, where a larger cluster size may be more efficient for your applications.

If you plan to reduce the size of a partition, defragment it first, using Microsoft's Disk Defragmenter (DEFRAG.EXE). This will give you the most accurate picture of the minimum size required for a selected partition.

When you enlarge a partition and the new partition size requires a different FAT type or cluster size, Partition-It will automatically change them to the values required by DOS and Windows for the new partition. To override these changes when resizing a partition, see "Using the Advanced Resize Partition Dialog" on page 73.

To resize a partition:

1 In the main Partition-It window, use the mouse to select the partition you want to resize.

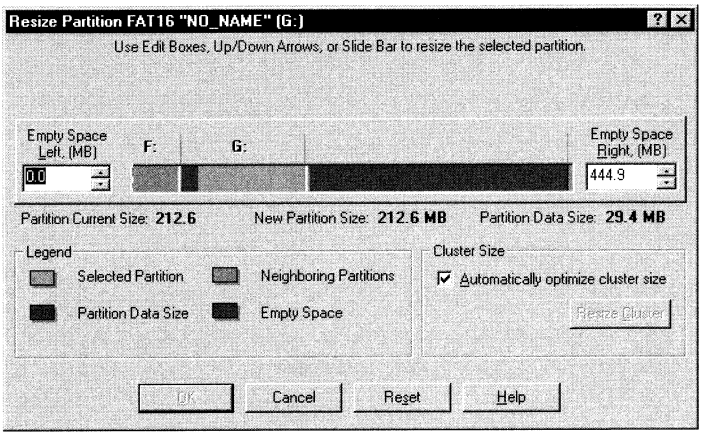
The selected partition is highlighted.

If you want to resize the partition on which Windows is located, you will have to reboot your system to let Partition-It automatically complete the operation from your system's MS-DOS mode. Exit all applications with open data files before resizing the partition where Windows is installed.

2 Click the **Resize Partition** icon in the Partition-It toolbar or select **Resize** from the Tools menu.

Partition-It displays its Scan dialog, which shows the progress of the automatic consistency check that Partition-It performs to verify the structure and consistency of the data on the selected partition.

Once this scan has completed, the Resize Partition dialog displays:



3 Enter the amount of free space you want to remain on either side of the partition you are resizing. You can use the up and down arrows on either side of the selected partition to change the amount of free space on either side of the partition, or just type numeric values in the text entry boxes. The red portion of the free space indicator shows the minimum size of the partition. The bright green area is the space currently allocated to the partition you are resizing.

You can also resize a partition by selecting either end of the graphical partition indicator and dragging it.

As you specify the free space size, the numbers in the Empty Space Left, (MB) and Empty Space Right, (MB) text boxes change, and the New Partition Size entry changes appropriately.

You cannot resize a partition below the size required to hold the data that it currently contains. You also cannot resize a partition beyond the boundaries of an adjacent partition.

4 Click **OK** to accept the currently displayed partition size.

You can click **Reset** *if you want to restore the values shown when you first opened the Resize Partition dialog.*

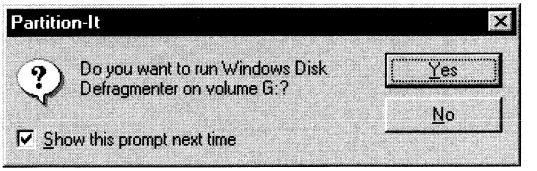
A dialog displays as the partition is resized, and an Operation Completed dialog displays when the operation finishes.

Resizing a partition can take a bit of time, depending on the size and speed of the disk, the cluster size, and the original size of the partition you are resizing.

5 Click **OK**.

If you are running Windows 3.x, Partition-It will drop into DOS mode to complete this task. Windows 3.x users will have to defragment resized partitions manually.

If you are running Windows 95 and the Preferences menu's Prompt for Defrag option is selected, Partition-It's defragmentation dialog displays:



6 Click **Yes** to defragment the resized partition.

Defragmenting a partition is a good idea after you resize it. When data is moved to accommodate the new partition size, it can become fragmented.

Windows' Defragment Drive dialog displays. Follow the on-screen prompts to defragment the partition.

Creating a Partition

You will want to create partitions on disks that you have just added to your system or on existing disks after moving or decreasing the size of a partition.

If you attempt to create a logical partition at the beginning of a new disk, you will notice that you cannot position this partition at the exact beginning of your disk. All hard drives reserve their first cylinder for a primary partition. If you want to create a partition that starts at the exact physical beginning of your disk, it must be a primary partition.

To create a new partition, you must have free space on one of the disks in your system.

In terms of disk partitions, free space is a portion of the disk that is not currently allocated to a partition—it is not the same as unused space in an existing partition. If a portion of any of your disks is not allocated to a partition, it is shown in the left pane of the Partition-It window and is labeled "Free Space."

To create free space on a disk, use Partition-It's Resize Partition feature, as explained in "Resizing a Partition" on page 41. If all partitions are full on the disk where you want to create the new partition, use Partition-It's Move-It Wizard to move applications to another disk, as explained in "Moving Applications" on page 53.

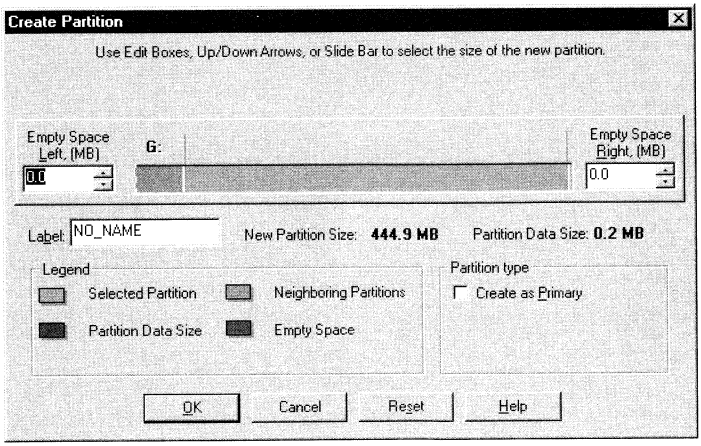
To create a new partition:

1. In the main Partition-It window, click the free space area in which you want to create the new partition.

   The selected free space area is highlighted.

2. Click the **Create Partition** icon in the Partition-It toolbar, or select **Create** from the Tools menu.

   The Create Partition dialog displays:



If you want to specify the FAT type or cluster size used when you create a partition, see "Using the Advanced Create Partition Dialog" on page 70 for more information.

3 In the **Label** text entry box, enter a name for the new partition. This name can be up to 11 characters long—if possible, use a name that indicates the purpose or contents of the partition.

4 Proceed to Step 5 if you want to allocate all available free space in the selected free space area to the new partition. To create a partition that uses only a portion of the available free space, use the up and down arrows or enter numeric values on either side of the graphical partition display to select the amount of free space you want to remain on either side of the partition you are creating.

You can also use the mouse to change the size of the new partition by selecting either end of the graphical partition display and dragging that end of the display to resize it.

As you specify the amount of free space, the graphical representation of the partition changes, the numbers in the Empty Space Left, (MB) and Empty Space Right, (MB) text boxes change appropriately, and the maximum size of the partition decreases.

5 To create the new partition as a primary partition, click the **Create as Primary** check box.

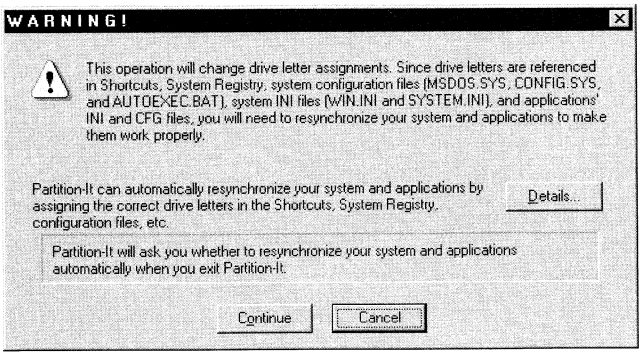
A hard drive can contain a maximum of four primary partitions. For more information on partition types, see "Different Types of Partitions" on page 7.

Selecting the ***Create as Primary*** *check box will slightly increase the size of the new partition you are creating. Extended partitions require a small amount of additional space on the disk to store the extended partition boot record. On disks where only an extended partition has been created, this additional space is allocated at the beginning of the disk, in space that can only otherwise be used by a primary partition.*

6 Click **OK** to create the new partition using the information that is currently displayed.

You can click **Reset** *if you want to restore the partition size value shown when you first opened the Create Partition dialog.*

If creating the new partition has caused any existing drive letters to change, a warning displays:



7 Click **Continue** and follow the on-screen prompts to complete this operation.

If creating a new partition has caused the letters associated with existing drives to change and you do not restart your computer at this point, it may be difficult to access applications on those drives, or those drives themselves, until you restart your computer. If the new drive letters conflict with any network drives that you previously mapped to drive letters on your system, Partition-It displays the label ***Overlapped*** *beside the conflicting partition. You must re-map the network drives to other letters before you can use or modify the new partitions.*

Rules for Creating Partitions

You can only create four physical partitions on a disk, only one of which can be an extended partition. You can subsequently create additional logical partitions in the extended partition. However, if you try to create an additional partition on a drive that already has four partitions, and the partition you are trying to create is not adjacent to the extended partition, Partition-It will display an error message. To create additional partitions in this case, make sure that one of your partitions is an extended partition (created without the **Create as Primary** check box selected), and move partitions as needed to relocate any free space on your disk so that it is adjacent to the extended partition. You can then create additional partitions in the extended partition. You can identify an extended partition by the dark border that surrounds it in the graphical view of your disk in Partition-It's main window.

Partition-It and FDISK

Under Windows 3.1, you cannot start a DOS window and use FDISK to create new partitions. FDISK is not supported correctly when it runs within a DOS window. If you attempt to create a partition in this way, Windows will display multiple

error messages because of differences in the default partition format assumptions used by Windows 3.1 and DOS. These formats are substantially different.

If you want to create partitions using both Partition-It and FDISK, boot your computer to the DOS prompt and run FDISK there.

Deleting a Partition

You may want to delete a partition for various reasons, such as to create free space for new partitions, or to remove partitions created for use with other operating systems (such as OS/2 or Linux) so you can partition them for use with Windows.

When you delete a partition, all data on that partition is deleted. You can no longer access any files or data on that partition. Before deleting a partition, make ***absolutely*** *sure that you do not need anything on that partition, or that you have a good backup of that partition.*

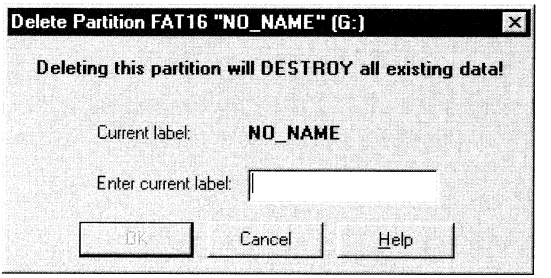
To delete a partition:

1. In the main Partition-It window, click the partition that you want to delete.

   The selected partition is highlighted.

2. Click the **Delete Partition** icon in the Partition-It toolbar or select **Delete** from the Tools menu.

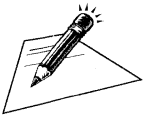
   The Delete Partition dialog box displays:



3. If you are sure you want to delete this Partition, type the current label of the selected partition in the Enter Current Label text entry box and click **OK**. This is provided as a safety measure—the partition name is listed in the Current label field and as part of the Selected Partition field.

   An Operation Completed dialog displays.

4. Click **OK** to return to the main Partition-It window.



If deleting a partition has caused the letters associated with existing drives to change and you do not restart your computer at this point, it may be difficult to access applications on those drives, or those drives themselves, until you restart your computer.

Moving a Partition

You may want to move partitions to consolidate free disk space, usually after deleting or resizing another partition, so that you can create other partitions in this free space.

You cannot move the partition on which an operating system is located.

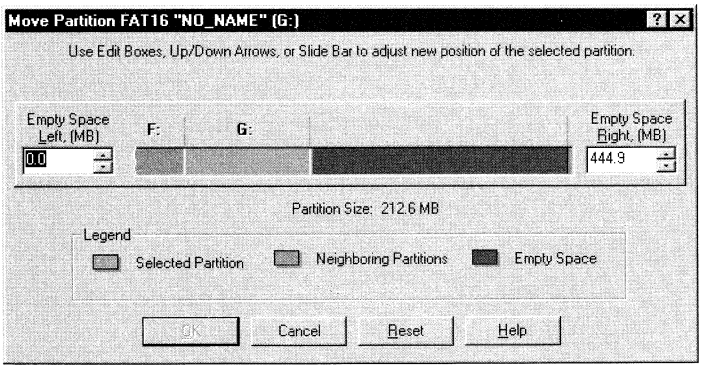
To move a partition:

1. In the main Partition-It window, select the partition you want to move.

   The selected partition is highlighted.

2. Click the **Move Partition** icon in the Partition-It toolbar or select **Move** from the Tools menu.

   The Move Partition dialog displays:



3. Enter the amount of free space you want to leave on either side of the partition you are moving. You can use the up and down arrows on either side of the selected partition or just type numeric values in the text entry

boxes. The bright green area is the space currently allocated to the partition you are moving.

You can also move a partition by selecting the partition and dragging it to the location to which you want to move it.

As you modify the free space area, the numbers in the Empty Space Left, (MB) and Empty Space Right, (MB) text boxes change, and the New Partition Size entry changes appropriately.

4 Click **OK** to accept the new location of the selected partition.

You can click **Reset** *if you want to restore the values shown when you first opened the Move Partition dialog.*

An Operation Completed dialog displays when the operation finishes.

Moving a partition can take a bit of time, depending on the size and speed of the disk, the cluster size, and the amount of data in the partition you are moving.

5 Click **OK**.

The main Partition-It window displays.

Moving Applications

Partition-It's Move-It Wizard lets you move individual application or program groups from one partition to another. Common reasons for moving applications or groups of related applications are to:

- free disk space on selected partitions before resizing them
- relocate applications before deleting a partition that is otherwise unused
- better organize applications and data on your disks

Without Partition-It, moving an application would involve complicated and time-consuming steps such as trying to identify and locate all of the Dynamic Link Library (DLL) files used by that application and searching through initialization files and the registry to locate and modify all references to the location of that application.

To simplify moving an application, make sure that the application is not running and that any related functions in Windows 95's system tray or the Windows 3.1x desktop are closed or unloaded.

Partition-It's Move-It Wizard easily moves applications from one partition to another, automatically relocating any resources required by the application and updating all references to that application in INI files and the Windows 95 registry. Move-It also automatically creates a compressed backup copy of the application before moving it and logs all changes to files related to the move, in case you encounter system problems (such as a power failure) while the application is being moved. The backup copy is deleted after the application has been moved successfully. If you subsequently decide to move the application to a different location, Move-It displays a dialog asking if you want to use the old log file to expedite the move.

The backup files created by moving an application are compressed, but in some cases may still require as much as 75% of the disk space taken up by the application itself. Before moving an application, make sure you have sufficient disk space.

You cannot use Partition-It's Move-It Wizard to move an operating system such as Windows 3.1x or Windows 95 from one partition to another.

If you want to move applications from the partition where Partition-It is installed and do not have much free disk space on that partition, you may want to change the location where Move-It creates its backup and log files, as explained in "Changing the Location of Move-It Backup Files" on page 75.

Move-It lets you move single applications or entire program groups or folders. Program groups or folders generally contain sets of applications that are installed together, and may share DLL files and a common directory location.

You should usually move an entire program group/folder together, rather than trying to move individual applications in that group/folder. You may not be able to move DLL files used by a single application because all of the applications in the group usually require many of the same DLL files. By default, Move-It will copy them instead of moving them. In the long run, this wastes disk space rather than conserving it.

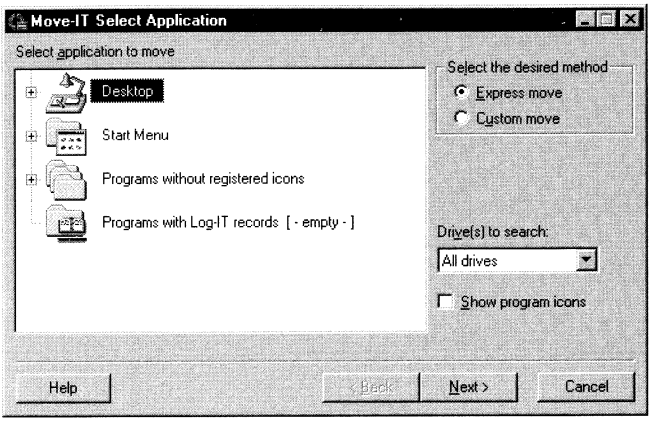
To move an application:

1 Click the **Move Application** icon in the Partition-It toolbar.

Move-It begins scanning the hard drives in your system for applications and related files, displaying a status message as it scans your disks. Once Move-It finishes scanning, it also analyses all files registered in the Windows shell, to ensure that it can subsequently update all references to them if you move them.

Scanning the drives in your system will take longer the first time you start Move-It, because Move-It saves a copy of this information. Subsequently, Move-It will use this information as a starting point each time you use it.

After Move-It finishes scanning your disks and Windows environment, the Select Application dialog displays:



The items shown in the Select Application dialog are:

- **Desktop** (Windows 95 only)—Applications whose icons are located on the desktop.
- **Start Menu** (Windows 95 only)—Applications whose icons and/or folders are located on the Start Menu.
- **Programs without registered icons**—Windows applications that are not found in the Start Menu or any program group/folder.
- **Programs with Log-It records**—Applications that you have already moved using Move-It, and whose backup files are still present on your system.

2 If you want to view the icons for the items displayed in the Select Application to Move dialog, click the **Show program icons** check box.

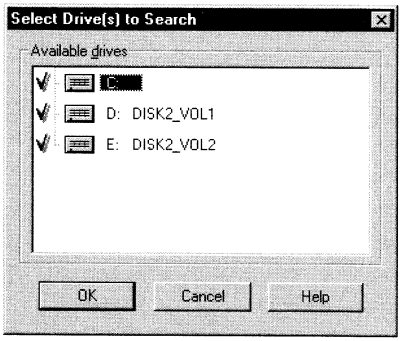
If you checked **Show program icons**, all of the items in the Select Applications to Move dialog expand to show the icons for the programs they contain.

3 Navigate through the items displayed in the Select Application to Move list and select the application or program group/folder that you want to move.

4 Select the method that you want Move-It to use by clicking the button beside either the **Custom move** or **Express move** entry. The Custom method displays an additional dialog that lets you select and change the individual files that Move-It will move. The Express method automatically selects the files that will be moved.

5 If you want to limit the drives that Move-It searches when looking for DLL files that may be required by the application(s) you selected in Step 3, click the **Drive(s) to search** selection list. Move-It's default action is to search **All Drives** that it has scanned. If you are searching all drives on your system, skip to Step 7.

The Select Drive(s) to Search dialog displays:



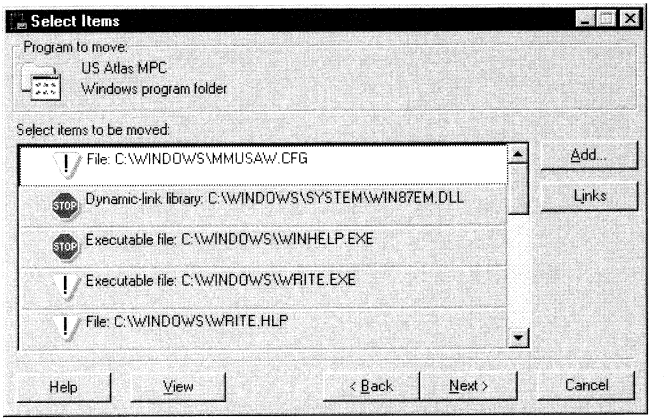
6 Deselect those drives that you do not want to search by clicking the check mark displayed to their left, and click **OK**.

The Select Drive(s) to Search dialog closes.

7 Click **Next** on Move-It's Select Applications dialog.

Move-It begins scanning for files related to the application(s) you selected.

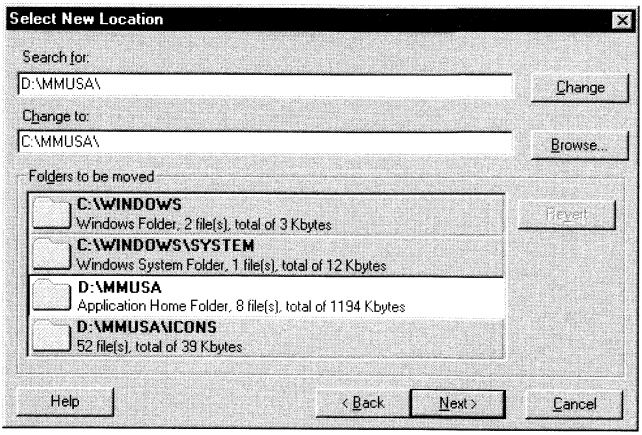
If you selected **Express** as the move method to use in Step 4, skip to Step 8. Otherwise, the Select Items dialog displays:



This dialog displays a list of each item that is associated with the application that you want to move. Items that Move-It identifies as safe to move are displayed with a green GO icon. Items that Move-It identifies as potentially unsafe to move are listed beside a yellow CAUTION icon. Items that Move-It identifies as unsafe to move are displayed with a red STOP icon. By default, only GO items will be moved.

Review the list and select any additional items that you want to move by clicking to the left of their icon. Deselect any items that you do not want to move by clicking on the check mark to the left of those items. Click **Next** to continue.

8 The Select New Location dialog displays:



9 In the Folders to be Moved section, select the folder that corresponds to the directory location of the application(s) that you are moving.

The selected folder is highlighted.

10 Enter the location to which you want to move the selected application in the Change to: field, or use the **Browse** button to select the new location.

11 Click **Next** to continue.

Move-It displays a confirmation dialog for each directory (folder) and subdirectory that will be moved.

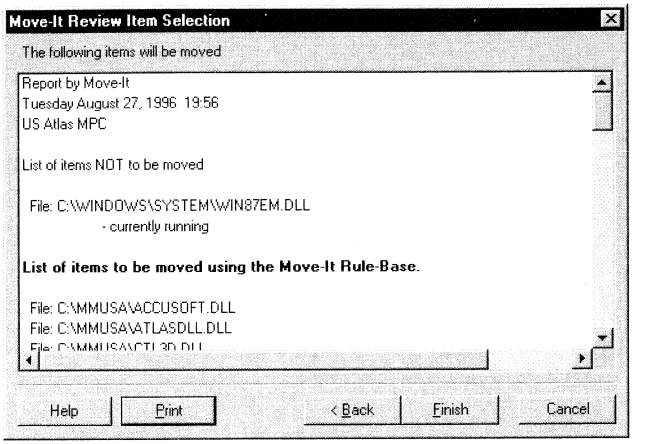
12 Click **Yes** to confirm each folder that you want to move.

If you choose not to move a folder that is critical to the application you are moving, you may not be able to run the application after it has been moved.

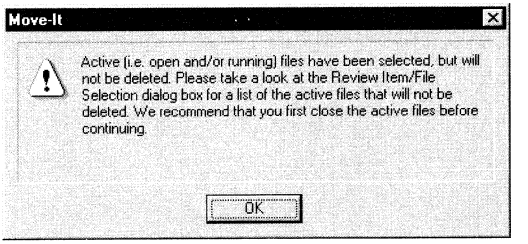
A summary dialog displays, listing the number of folders that will be moved.

13 Click **OK** to continue.

Move-It's Review Item Selection dialog displays:



If any open files (such as DLL files that are currently running) are associated with the application you are moving, Move-It displays a warning dialog to let you know that such files exist and will not be deleted:



Open files are copied by Partition-It when an application is moved. The original copies of these files are deleted the next time you boot your system.

14 If the preceding dialog displays, click **OK** to continue.

15 Use the scroll bars in the Review Item Selection dialog to review all of the items that Move-It will move with the selected application. Click **Print** if you want to print a copy of this information. To proceed with moving the application, click **Finish**.

Move-It displays three progress dialogs as it creates a compressed backup copy of your application, deletes the original application, and then moves the application to the new location using the backup copy.

The Move Complete dialog displays, listing the total number of items moved.

16 In the Move Complete dialog, click **OK** to return to the Select Application dialog. To see a listing of all of the items that were moved, click **Detail**.

If you want to undo the move, click **Undo,** *which restores the application to its original location and deletes the backup copies of the application you moved.*

If you selected **OK**, Move-It's Select Application dialog displays.

17 To move another application, return to Step 1 on page 55. To return to the main Partition-It window, click **Cancel**.

4

Advanced Operations

In this chapter you will learn how to:

- Create and use a recovery disk that can help you complete Partition-It operations that were in progress when a system failure occurred.
- Set advanced partition attributes.
- Use the advanced dialogs for Partition-It's Create and Resize operations.
- Change the location where Move-It stores its backup and log files.
- Use Partition-It on systems that run multiple operating systems.
- Use Partition-It with other disk compression and diagnostic utilities.

Creating and Using Partition-It Recovery Disks

No software package can prevent problems, such as power failures, that can damage your system if it is the middle of performing a complex operation such as moving or resizing partitions. To help eliminate the chance that such a failure could corrupt your system while Partition-It is running, Partition-It includes a DOS application, PARTDOS.EXE. This application enables you to complete most Partition-It operations that were interrupted by a system failure, and can usually prevent any loss of data or corruption of partition information.

To enable you to recover from system failures that occur when Partition-It is running, Partition-It offers to create a recovery disk during installation. This section explains how to create a recovery disk if you did not do so when you installed Partition-It. This section also explains how to use the recovery disk if a system failure occurs while you are using Partition-It.

We strongly suggest that you create a recovery disk for Partition-It before using any Partition-It functions. If you experience a system failure while using any Partition-It operation, **you must not let your system restart from the hard drive.** *Turn your machine off, locate the Partition-It recovery disk, and restart your system from the floppy disk.*

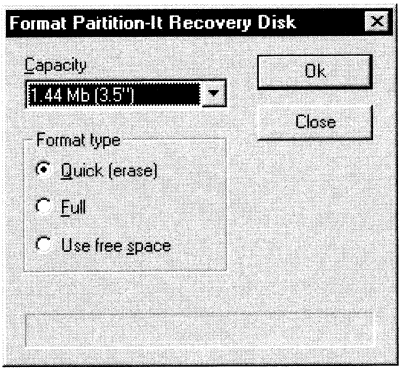
To create a recovery disk if you have not already done so:

1. Click the Tools menu and select **Recovery Disk.**

   The Recovery Disk dialog displays.

2. Insert a floppy disk into drive A: on your system, and click **Yes.**

   The Format Partition-It Recovery Disk dialog displays:



3 Select the way in which you want to format the floppy disk:

- **Quick** erases all of the files on the floppy disk without reformatting it.
- **Full** completely reformats the floppy disk. You will need to do this if the disk is not already formatted.
- **Use free space** adds Partition-It's recovery files to any files that are currently on the floppy disk. If you do not have sufficient free space on the disk for these files, an error dialog displays, and you will have to select one of the other two options to proceed.

4 Click **OK**.

The recovery disk is created. Label the disk "Partition-It Recovery Disk" and put it in a safe place.

To use a Partition-It recovery disk if a system failure occurs:

1 Insert the Partition-It recovery disk in the main floppy drive for your system.

2 Reboot your system.

3 If the PARTDOS application does not start automatically, type PARTDOS at the DOS command-line prompt.

The PARTDOS application completes the operation that was in progress when the system failure occurred.

4 When the PARTDOS application finishes, exit from the application, remove the recovery floppy from the floppy drive, and reboot your system normally.

Setting Advanced Partition Attributes

Partition attributes are settings that determine how your system displays and uses each partition. This section explains how to use Partition-It to set the most important partition attributes. Besides the partition type, the most commonly-used partition attributes are:

- **active**—whether a primary partition is one from which you can boot.
- **shown/hidden**—whether a partition is visible to DOS or Windows applications.

You can have up to four physical partitions on a hard disk (one of which can be an extended partition), but only one of these is active at a given time. Your computer identifies the active partition from your hard drive's master boot record (MBR) and boots from this partition when you start your computer.

For more information on partition types, see "Using Other Types of Partitions" on page 10.

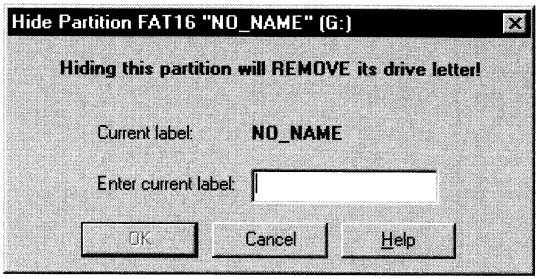
Hiding a Partition

You may want to hide a partition to store data that you do not want casual users of your machine to see, or to reserve disk space for future expansion.

To hide a partition:

1. In the left pane of the main Partition-It window, select the partition you want to hide.
2. Select **Hide** from the Tools menu.

   The Hide Partition dialog displays:



3. Enter the label for the partition and click **OK**.

   The selected partition is marked as hidden. This partition will not be visible in Windows 95 after you reboot your system. The icon for this partition displays the letter **h** to indicate that it is hidden.

Making a Hidden Partition Visible

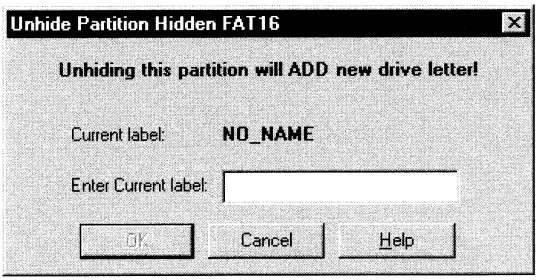
As you need to use more of the disk space on your computer, you may want to "un-hide" a partition that you had previously marked as hidden.

To make a hidden partition visible to the system:

1. In the left pane of the main Partition-It window, select the hidden partition you want to make visible.
2. Select **Unhide** from the Tools menu.

   A message displays, stating that the partition will only be visible after you restart Windows 95.
3. Click **OK**.

   The Unhide Partition dialog displays:



4. Enter the label for the selected partition and click **OK**.

   The selected partition is unhidden. A drive letter will be assigned to this partition and the partition will be visible to DOS and Windows applications the next time you start Windows 95.

Marking a Partition as Active

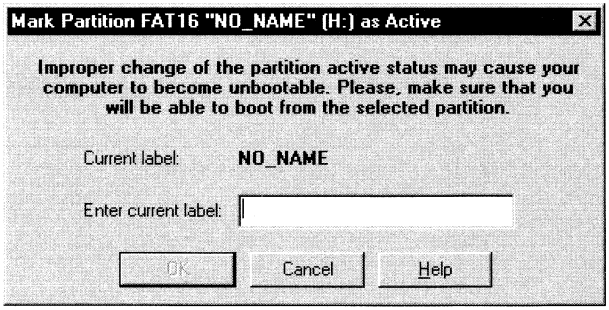
An active partition is one from which your computer can boot. If you are experimenting with or using multiple operating systems on your computer, you may want to mark a partition as active to boot from it or for testing purposes.

Some operating systems (such as OS/2) have problems with multiple partitions that are marked as active. If you are marking a new partition as active, make sure that you either have another bootable partition or that you install a bootable version of your operating system in the new active partition.

To mark a partition as active:

1. In the left pane of the main Partition-It window, select the partition you want to mark as active. This must be a primary partition—extended partitions cannot be marked as active.
2. Select **Set Active** from the Tools menu.

   The Set Active Partition dialog displays:



3. Enter the label for the selected partition and click **OK**.

   The selected partition is marked as active, and will be examined for bootable information the next time you start Windows.

Using Partition-It's Advanced Dialogs

Partition-It provides advanced Create and Resize Partition dialogs that enable you to specify the FAT type and cluster size used when partitions are created or resized. You may want to override the default FAT type and cluster size if you plan to use the new or resized partition for a specific purpose, such as holding large database or multimedia files where reading and writing larger amounts of data may provide a performance improvement.

For more information on cluster sizes and their implications on a disk partition, see "Introduction to Clusters and Cluster Size" on page 3. For more information on FAT types, see "Different Types of Partitions" on page 7.

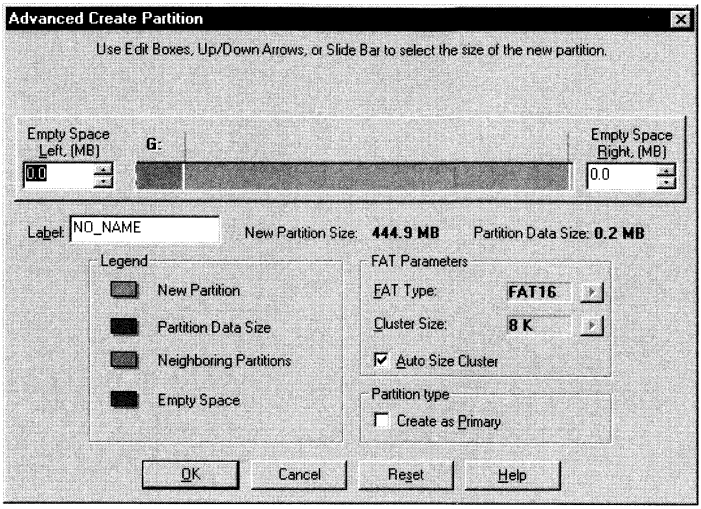
Using the Advanced Create Partition Dialog

To display the Advanced Create Partition dialog instead of the standard Create Partition dialog, select the **Advanced Dialogs** option from the **Preferences** menu before selecting the **Create** command.

To specify the FAT Type or Cluster Size used when creating a partition:

1. Select **Advanced Dialogs** from the Preferences menu.
2. Select **Create** from the Tools menu.

The Advanced Create Partition dialog displays:



3 Select the free space area in which you want to create the new partition, as explained in "Creating a Partition" on page 44.

4 Clear the **Auto size cluster** check box.

The **New FAT Type** and **New Cluster Size** options activate.

5 To specify the FAT Type for the new partition, click **New FAT Type** and select the FAT type you want to assign to the partition.

A pop-up list displays, giving the FAT types that are valid for the new partition. If only one FAT type is valid, only one value displays. The selected FAT type value displays in the **New FAT Type** entry box.

6 To specify the cluster size for the new partition, click **New Cluster Size** and select the cluster size you want to assign to the partition.

A pop-up list displays the cluster sizes that are valid for the new partition. If only one cluster size is valid, only one value displays. The selected cluster size value displays in the **New Cluster Size** entry box.

*If you modify the default FAT type and cluster size values selected by Partition-It and then change your mind, you can restore these default values by clicking the **Reset** button.*

7 Click **OK** to create the partition with the selected FAT type and cluster size values.

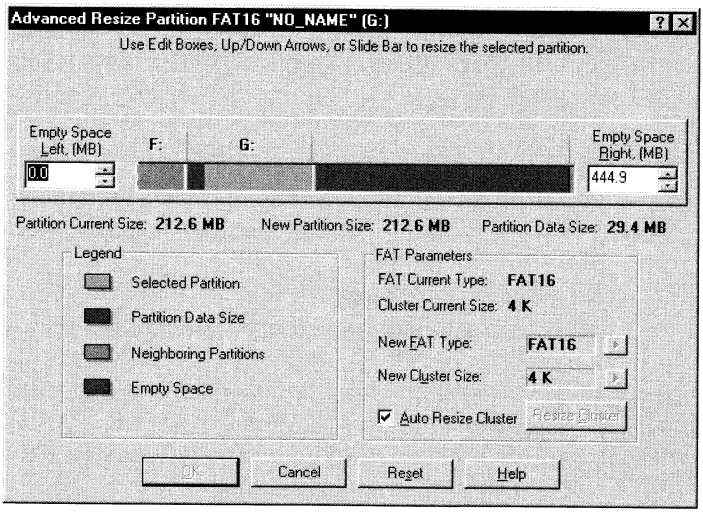
Using the Advanced Resize Partition Dialog

To display the Advanced Resize Partition dialog instead of the standard Create Partition dialog, select the **Advanced Dialogs** option from the **Preferences** menu before selecting the **Resize** command.

To specify the FAT Type or Cluster Size used when resizing a partition:

1. Select **Advanced Dialogs** from the Preferences menu.
2. Select **Resize** from the Tools menu.

   The Advanced Resize Partition dialog displays:



3. Select the new size for the partition as explained in "Resizing a Partition" on page 41.
4. Clear the **Auto-Resize Cluster** checkbox.

   The **New FAT Type** and **New Cluster Size** options activate.

5 To specify the FAT Type for the resized partition, click **New FAT Type** and select the FAT type you want to assign to the partition.

A pop-up list displays the FAT types that are valid for the new size of the partition. If only one FAT type is valid, only one value displays. The selected FAT type value displays in the **New FAT Type** entry box.

6 To specify the cluster size for the resized partition, click **New Cluster Size** and select the cluster size you want to assign to the partition.

A pop-up list displays the cluster sizes that are valid for the new size of the partition. If only one cluster size is valid, only one value displays. The selected cluster size value displays in the **New Cluster Size** entry box.

*If you modify the default FAT type and cluster size values selected by Partition-It and then change your mind, you can restore these default values by clicking the **Reset** button.*

7 Click **OK** to resize the partition with the selected FAT type and cluster size values.

For more information about cluster sizes and FAT types, see "Introduction to Clusters and Cluster Size" on page 3 or "Common Questions and Answers" on page 83.

Changing the Location of Move-It Backup Files

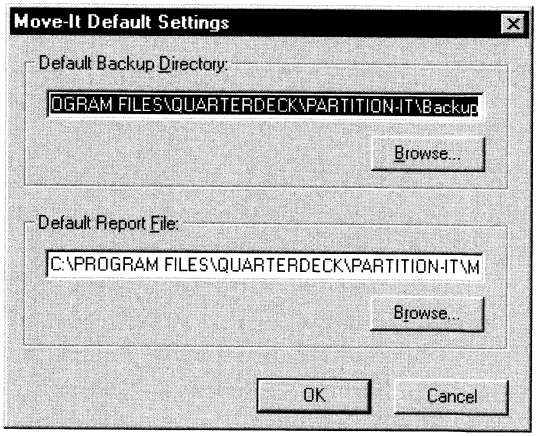
While moving applications, Move-It automatically creates both a compressed backup copy of the application before moving it and creates a log file listing all changes to files related to the move. These files are created in case you encounter system problems (such as a power failure) while the application is being moved. The backup copy is deleted after the application has been successfully moved, but can temporarily require up to 75% of the disk space required by the application you are moving.

If you want to move applications from the partition where Partition-It is installed and do not have much free disk space on that partition, you may want to change the location where Move-It creates its backup and log files. By default, Move-It stores these files in the BACKUP subdirectory of the directory where you installed Partition-It. Changing the location where Move-It creates these files enables you to store them on a disk or partition where you have sufficient free space.

To change the location of Move-It backup and log files:

1 Click the **Preferences** menu and select **Move-It Setup**.

The Move-It Default Settings dialog displays:



2 Enter the drive letter and full pathname of the new location where you want to store Move-It's backup and log files, or use the browse buttons to select the new drive and pathname.

3 Click **OK** to save the new location(s).

Hardware Issues for Partition-It

If any of the drives in your system were created using your BIOS's LBA mode, changing your system setup to disable LBA mode may cause partitions on those drives to be inaccessible.

Using Partition-It With Other Operating Systems

Partition-It cannot directly modify non-FAT partitions used by other operating systems. This section explains some issues you must take into account if you are running multiple operating systems on your PC and are using Partition-It.

If your system can boot multiple operating systems ("dual boots"), we strongly recommend that you do not add or delete partitions with lower drive letters than any existing, bootable partitions on your machine.

Using Partition-It on Systems That Also Run Windows NT

Windows NT uses a hidden file called BOOT.INI, located in the root directory of your system's boot drive, to determine which operating systems are available and identify the partitions where they are located. Windows NT also stores information about installed applications in the NT registry. Windows NT assigns drive letters differently than DOS, Windows 3.1x, or Windows 95, and uses numeric identifiers for partitions in the BOOT.INI file rather than using drive

letters. Because Partition-It cannot always access these files (such as when they are located in NTFS partitions), creating or deleting partitions with a lower drive letter than a bootable NT partition may cause you to have to re-install NT and your applications.

If using Partition-It has changed your Windows NT drive letters and you created an emergency disk when you installed Windows NT, you may be able to boot off the emergency disk and use this disk to resynchronize your Windows NT drive letters. You will still have to reinstall any applications installed on NTFS partitions.

Using Partition-It on Systems That Also Run OS/2

When booting OS/2, the Boot Manager looks for a specific partition location, as defined using the OS/2 FDISK utility. If you move an OS/2 boot partition, its entry is cleared from the OS/2 Boot manager menu until that partition is re-entered in the Boot Manager using OS/2's FDISK or FDISKPM utilities.

To re-enter OS/2 boot partition locations:

1. Reboot OS/2 from the installation disks.
2. Run the FDISK utility from the final OS/2 installation disk.
3. Select the OS/2 boot partition and choose **Add to Boot Manager menu** from the FDISK **Options** menu.
4. Reboot your system to verify that OS/2 can find the relocated boot partition.

Using Partition-It on Systems That Also Run Linux

If you want to create, delete, or move partitions on a disk that also contains a Linux partition and are using the LILO boot manager, you will need to have a Linux boot floppy available and you must uninstall the LILO boot manager before modifying the partitions on this disk. This is necessary because many versions of the LILO boot manager do not recognize their own partition once that partition has been physically moved. Removing the LILO boot manager, moving the partition, booting with the Linux boot disk, and reinstalling the LILO boot manager will resolve this problem.

Using Partition-It with other Utility Programs

Partition-It modifies your system at a very low level, and may interact with other low-level applications such as virus-scanning and disk-monitoring software. This section discusses how Partition-It interacts with other disk utilities such as virus checkers, software that verifies the structure of your hard drive, and various disk compression utilities.

Anti-Virus Software

Many anti-virus software packages, such as Quarterdeck ViruSweep and those from Central Point Software, Norton, and McAfee, interpret any change to the partition tables on your system as evidence of a possible virus. These applications are designed to be very vigilant, so you should always instruct these applications to re-examine your hard drives after you create, delete, or resize partitions using Partition-It. This guarantees that these packages will recognize and accept any changes you made using Partition-It.

Anti-virus software packages may also display messages when Partition-It updates the partition information stored in the master boot record on your system's boot drive. If such messages display, simply continue—do not repair or reject Partition-It's changes. Doing so may over-write or destroy the changes you have just made to your disk using Partition-It.

Norton Disk Doctor and Norton Anti Virus

Norton Disk Doctor and Anti Virus software save a copy of your system's master boot record (MBR) to enable you to recover from viruses or other forms of disk corruption. After using Partition-It to make changes to the partitions on your system and rebooting your computer, Norton Disk Doctor and Anti Virus will detect the changes to the MBR and partition table as a potential virus or corruption. Do *not* attempt to repair these changes or revive the old MBR or partition table. See the next sections for specific information on using Partition-It with these packages.

Norton Anti Virus (NAV)

After you reboot your system, NAV displays a message indicating that "The master boot record of drive X: has changed since inoculation" (where X: is the letter of the partition that was modified by Partition-It). NAV displays the following options: REPAIR, INOCULATE, or CONTINUE.

You **must** select INOCULATE to cause NAV to accept the changes made by Partition-It. This also causes NAV to update its copy of the MBR and partition table to reflect the changes made by Partition-It.

Do not select REPAIR! *Selecting NAV's REPAIR option will destroy Partition-It's changes to your disk and result in data loss.*

Do not select CONTINUE, because this will only bypass the problem for the current session. The next time you reboot your system, NAV will display the same REPAIR, INOCULATE, or CONTINUE message. You should choose INOCULATE if you see this message again.

Norton Disk Doctor (NDD)

After rebooting your system, NDD displays the following message: "A DOS partition has been found, but DOS currently can't access it. If you are unable to access a disk that you previously could, you should revive this partition. Would you like to revive this partition? Yes or No."

1 Select **NO**.

   The following message displays: "Partition Search. You have chosen not to revive the partition. Do you want Norton Disk Doctor to mark the partition so it doesn't ask about it again? Yes or No."

2 Select **YES**.

   A dialog displays the message: "Create Undo File. The Norton Disk Doctor is about to make changes to your disk. You may wish to create an Undo file so that changes can be undone... Create Undo File, Skip Undo File, or Exit."

3 Select **SKIP UNDO FILE**.

   The following message displays: "If you wish to undulate this partition at a later time, use the / UNDELETE switch when starting NDD. OK."

4 Select **OK**.

The following message displays: "Partition information has been changed. In order for the new changes to take effect, your computer must be restarted. After the computer is restarted... Would you like to restart your computer?"

5 Select **RESTART YOUR COMPUTER**.

NDD updates its files and reboots your computer.

Stacker

Partition-It does not conflict with Stacker and similar software packages (such as DiskSpace and DriveSpace), but cannot directly increase the amount of disk space available to these utilities. These disk compression software packages create compressed files that DOS and Windows can use as virtual partitions. These files are located on existing DOS physical partitions. Since virtual partitions use customized algorithms to allocate and use disk space, they let you store large amounts of data in small partitions.

Since Stacker "partitions" are actually files that are located in FAT partitions, you can only use Partition-It to increase the size of the physical partitions in which stacked drives are located. You can then subsequently use Stacker to increase the size of the virtual partition, since the physical partition is now larger. Partition-It does not let you resize Stacked partitions directly, because they are not real partitions.

A

Common Questions and Answers

What size should my partitions be?

The answer to this question is actually a trade-off. In general, the smaller your partitions are, the more data you can store. However, the smaller you make your partitions, the more impractical they become. For instance, a 100MB FAT16 partition can use 2K clusters, but large programs (like Microsoft Office) will not fit on a partition that is this small. Partitions between 250 and 500MB are large enough to be practical and small enough to save hard disk space.

Ideal partition sizes are just below the maximum partition size that their cluster size will allow. A 510MB partition uses 8K clusters, but a 520K partition must use 16K clusters. The 510MB partition is large enough to be useful and also provides the savings associated with a smaller cluster size.

How do I assign a drive letter to a new partition?

If you have created a partition but cannot access it (it has no drive letter), make sure you have formatted the partition, then restart your computer. Your computer assigns drive letters each time you boot. Partition-It automatically formats any partitions that are created using Partition-It.

How do I create a Windows 3.1x/95 dual boot—do I need two partitions?

Although you can use separate partitions if you plan to use Windows 3.1x and Windows 95, you do not have to. To install Windows 3.1x and Windows 95 (the upgrade version) on the same partition, install Windows 3.1x first, then install Windows 95. The Windows 95 installation program will ask you the name of the directory in which you want to install Windows 95. If you choose a directory other than your Windows 3.1x main directory (which is usually C:\WINDOWS), Windows 95 automatically sets up a dual-boot system. You can access Windows 3.1x by pressing <F8> during boot and choosing the "Previous version of DOS" option.

Creating a system that boots both Windows 3.1x and Windows 95 is not supported by the OEM release of Windows 95 known as OSR2 or Windows 4.00.950b.

What will happen to my CD-ROM drive if I make a new partition?

In Windows 95, your CD-ROM drive is usually assigned the first available drive letter assignment after drive letters have been assigned to all of your hard drive partitions. If your CD-ROM drive is currently assigned the letter D: and you create a partition after C:, your new partition will become D: and your CD-ROM drive will become E: when you restart Windows. If your CD-ROM drive is unassigned and inaccessible when you restart Windows, you are probably using a 16-bit driver (just like in Windows 3.1x) to load your CD-ROM drive. Follow the instructions in the next paragraph if your CD-ROM drive is unassigned or unavailable after creating a partition.

In Windows 3.1x, CD-ROM drives are assigned drive letters when your computer's AUTOEXEC.BAT file is run. Windows 3.1x runs the program MSCDEX.EXE to add the extensions necessary for DOS and Windows 3.1x to access your CD-ROM. If your CD-ROM drive is inaccessible after you create a new partition, open C:\AUTOEXEC.BAT using Edit or Notepad. Look for a line that includes MSCDEX, and look for the switch /L after MSCDEX. This switch is used to assign a specific drive letter to your CD-ROM drive, and if your CD-ROM drive is inaccessible to Windows, the /L switch is probably set to a drive letter that is already in use by one of your partitions. Change this assignment to the next available drive letter. For example, if you create a new partition D: and the switch /L sets the CD-ROM drive to D:, changing the switch /L:D to read /L:E will assign the drive letter E: to your CD-ROM drive the next time you boot your computer.

What does the message "Your CD-ROM may not be accessible when Windows restarts" mean?

If you are using Windows 95 drivers for your CD-ROM drive, your CD-ROM drive will be assigned the first available drive letter and will be accessible after you create another partition and restart Windows. If you are using Windows 3.1x drivers (either in Windows 3.1x or Windows 95) you may need to change the /L switch (as described in the previous section) after creating a new partition.

Can I assign new partitions my own drive letters?

No. DOS and Windows assign each partition the next available drive letter, starting with C:, and then assign drive letters to CD-ROM and removable media devices. Your hard disk partitions will always be assigned drive letters before your other devices.

When I choose my hard drive in Partition-It, why is the 'Create' option greyed out?

New partitions can only be created from free space, which is any portion of your disk that is not currently associated with a partition. (See the next section for more information about free space.) If you do not have any free space, you must use Partition-It to obtain some before you can create a new partition. To do this in Partition-It, right-click your current partition, choose **Resize**, and make that partition smaller. If you subsequently right-click the free space, Partition-It will give you the option to create a new partition.

What is the difference between free space in Partition-It and free space in the Windows 3.1x File Manager, Windows 95 Explorer, or DOS?

The amount of free space in File Manager, Explorer, or DOS shows the amount of a hard disk partition that is unused. When you create or view free space in Partition-It, you see the part of the hard disk that is not included in a partition, and is not assigned a drive letter. If you create a new partition from the free space, the free space becomes unused space within a partition, and is then visible as unused space in the new partition from the File Manager, Explorer, or DOS.

Why is the cluster size not changing when I click the 'Optimal' button in the Resize Cluster dialog?

The partition's cluster size is probably already at the optimal setting. To check this setting, click on the arrow next to New Cluster Size and choose another cluster size. You can then examine the "Space gained" or "Space lost" items to find the most efficient cluster size.

Why can I not choose another cluster size in the Resize Cluster dialog?

There are two possible reasons why you may be limited to one cluster size.

- Your partition may be too big to use smaller clusters. For example, a FAT16 partition larger than one gigabyte can only use 32K clusters; this is a limitation of DOS. To use a smaller cluster size and gain hard disk space, you must first decrease the size of your partition(s).
- The partition may not have enough free space to support smaller clusters. If this is the case, you will see the error message:

  ```
  The Partition cluster size cannot be resized
  because the space needed for system areas and
  data alignment doesn't fit in current
  boundaries. Please free up space by temporarily
  archiving any files or moving them to another
  partition. Select resize partition for more
  details.
  ```

This means you must temporarily remove some data files before Partition-It can continue. After the operation, you will have more than enough room to replace the missing files.

Why can I not create or use FAT32 partitions?

FAT32 partitions are only supported in Microsoft Windows 95 version 4.00.950b (known as OSR2) or greater. To determine what version of Windows 95 you are running, select the System item from the Control Panel. The General tab displays the version of Windows 95 that you are running.

See "Using FAT32 Partitions" on page 8 for more information about FAT32 partitions.

Can I add FAT32 support as an upgrade?

No. At the time that this manual went to press, FAT32 support was only available as part of Windows 95 version 4.00.950b (OSR2), which is only available on new computers from OEM vendors. The next commercial release of Windows, at time of writing to be called Windows 98, should provide an upgrade path.

If I remove Partition-It, will the new partitions be deleted?

No. Partition-It acts like FDISK to make permanent changes to your hard drives. Unlike FDISK, it can accomplish this task without losing existing data. After you make a change with Partition-It, you can remove Partition-It from your computer until you want to partition your hard drive again.

Can I use Move-It to move operating systems?

No, Move-It is not designed to move operating systems. If you must move an operating system to a new location, you should reinstall the operating system in the new location.

Under Windows 3.1, DOS must be located on a primary partition on the first physical hard drive. Windows 95 does not have this limitation.

What does the error "The Partition-It information is absent. The process cannot be continued." mean?

Partition-It temporarily writes information to track 0 on your hard drive so it can make the changes you request. If you use an anti-virus program, this program may detect Partition-It's changes and alert you that information on your hard drive has changed. You must choose "Inoculate," or the anti-virus program will overwrite Partition-It's changes, resulting in an error message. This may also occur if you boot your system using the Partition-It emergency disk without first running Partition-It.

Glossary

A

active partition
A partition from which an operating system can boot.

B

boot information
Information used by an operating system to start that operating system from a disk or partition.

boot manager
An application that enables you to select from a list of bootable partitions.

boot record
See master boot record.

bootable partition
A partition that contains the information necessary to start a specific operating system.

cluster

The smallest unit of disk space that can be allocated to a file in a FAT file system. The size of a cluster is determined by the type and size of partition on which a file is located. See: FAT file system, cluster size, partition size.

cluster size

The size of the smallest amount of disk space that can be allocated to a file on a partition. The cluster size is determined by the partition type and partition size, as shown in the following table for cluster sizes on a FAT16 partition:

Table 6: FAT16 Partition and Cluster Sizes

Partition Size	Cluster Size
1 - 31 MB	512 byte
32 - 63 MB	1 K
64 - 127 MB	2 K
128 - 255 MB	4 K
256 - 511 MB	8 K
512 - 1023 MB	16 K
1024 - 2047 MB	32 K

If you are running Windows 4.00.950b, see Table 3 on page 9 for information about the differences in cluster sizes between FAT16 and FAT32 partitions.

cylinder

Hard, floppy, and removable-media drives are composed of tracks, which are concentric circles of data on each platter in the drive; cylinders, which are the collection of tracks located directly above one another on all platters; and sectors, which are the portions of each track that the hard, floppy, or removable-media device can read and write. Clusters are composed of multiple sectors. See cluster, cluster size.

D

device

A piece of hardware in your computer system used for input or output.

DLL

Dynamic **L**ink **L**ibrary: a file containing program code that performs functions that can be used by one or more Windows applications.

drive

A storage device that is present in your system. Drives can be removable (such as floppy disks, ZIP drives, Bernoulli drives, etc.) or fixed. Partition-It only manages fixed drives. See: fixed drives.

drive letter

A letter (such as C:) that uniquely identifies a physical or logical partition to an operating system.

dual boot

A system that is configured to start one of multiple operating systems.

E

extended partition

A physical partition on your hard drive that can contain one or more logical partitions. See: logical partition, partition.

extended partition boot record

The portion of a hard drive that DOS/Windows allocates to hold information about the partitions located within an extended partition. This space is allocated at the beginning of any hard drive that contains extended partitions.

F

FAT

File Allocation Table: the construct used by DOS/Windows systems to locate files and free space within a partition. See: file systems, FAT file system.

FAT file system

Formatted partitions that use a FAT to track the allocation of space to files and directories. See: FAT, FAT12, FAT16, FAT-32, file systems.

FAT12

A FAT partition that uses 12-bit records to store information about the location of blocks associated with files on that partition. FAT12 partitions can be from zero to 32 MB in size.

FAT16

A FAT partition that uses 16-bit records to store information about the location of blocks associated with files on that partition. FAT16 partitions can be up to two GB in size.

FAT32

A FAT partition that uses 32-bit records to store information about the location of blocks associated with files on that partition. FAT32 partitions can be any size up to $(2^{32}-1)$K.

FDISK.EXE

The DOS/Windows utility provided to create partitions. This utility does not provide the ability to modify partitions without deleting and recreating them.

file system

Once a partition is allocated, the storage associated with that partition must be formatted in a way that it can be used by an operating system. DOS and Windows systems format partitions using the FAT file system. Other operating systems use other partition types that are optimized for those operating systems—for example, OS/2 uses a file system type known as HPFS (High Performance File System) and Windows NT uses a file system type know as NTFS (NT File System). See: FAT file system.

fixed drives

Drives whose storage media cannot be removed from your system. Frequently referred to as *hard drives.*

formatted partitions

Partitions that have been "pre-processed" to be able to record information as required by a specific operating system.

free space

In Partition-It, a portion of your hard disk that is not currently allocated to a partition.

H

hard drive controller

The system hardware that manages access to your hard drives. This hardware may be a card in a slot in your PC or can also be integrated into your system's primary circuit board.

hard drives

Storage devices that cannot be removed from your system.

hidden partition

A partition to which disk space is allocated but which is not visible to DOS/Windows applications.

HPFS

High **P**erformance **F**ile **S**ystem, the OS/2 file system.

I

IDE

Integrated **D**rive **E**lectronics: a mechanism implemented in hardware to integrate some functions of the hard drive controller into the hard drive itself.

L

LBA

See: logical block addressing.

logical block addressing

A method used by some system BIOSs to extend the standard cylinder/head/sector block location mechanism in order to support larger drives and partitions.

logical partition

A contiguous portion of an extended partition on your hard drive that can be used by your operating system as a partition. A logical partition cannot be made active. See: extended partition, partition.

M

master boot record

The first sector of a hard disk, used to store information about the partitions on that disk. If any partition on that disk is active, the MBR also stores boot information. See: active partition, boot information.

MBR

See: master boot record.

N

NTFS

NT File System, the Windows NT file system.

P

partition

A portion of your hard drive that DOS or Windows can address using a letter.

partition size

The amount of disk space associated with a partition. The size of a partition determines the maximum cluster size used in that partition. See: cluster, cluster size.

physical partition

A partition that occupies a physical portion of your hard drive. See: logical partition, extended partition.

primary partition

A physical partition on your hard drive that is not an extended partition (and which therefore does not contain any logical partitions). Primary partitions can be made active, or bootable.

S

sector

Hard, floppy, and removable-media drives are composed of tracks, which are concentric circles of data on each platter in the drive; cylinders, which are the collection of tracks located directly above one another on all platters; and sectors, which are the portions of each track that the hard, floppy, or removable-media device can read and write. Clusters are composed of multiple sectors. See cluster, cluster size.

storage media

The physical surfaces where information is stored on storage devices in your system. See: hard drives.

T

track

Hard, floppy, and removable-media drives are composed of tracks, which are concentric circles of data on each platter in the drive; cylinders, which are the collection of tracks located directly above one another on all platters; and sectors, which are the portions of each track that the hard, floppy, or removable-media device can read and write. Clusters are composed of multiple sectors. See cluster, cluster size.

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