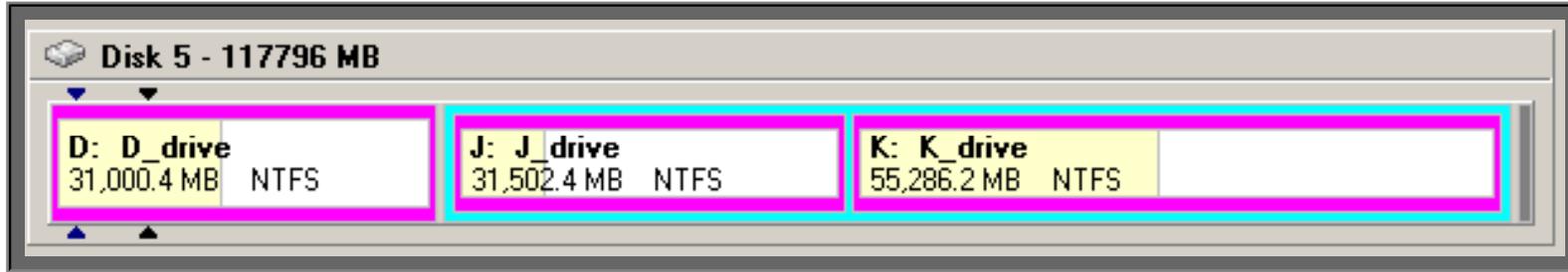# Radified Guide to FDISK
Create Hard Drive Partitions

This **FDISK guide** comes to you compliments of "the Doc": a friend who lives in Germany. It has since become one of the site's most popular features. **[**Only the Ghost guide and the ASPI guide are downloaded more frequently.**]** The 'F' in FDISK stands for **F**ixed. FDISK is a utility used to partition **F**ixed **DISK** drives. The *Create* screen looks like this:
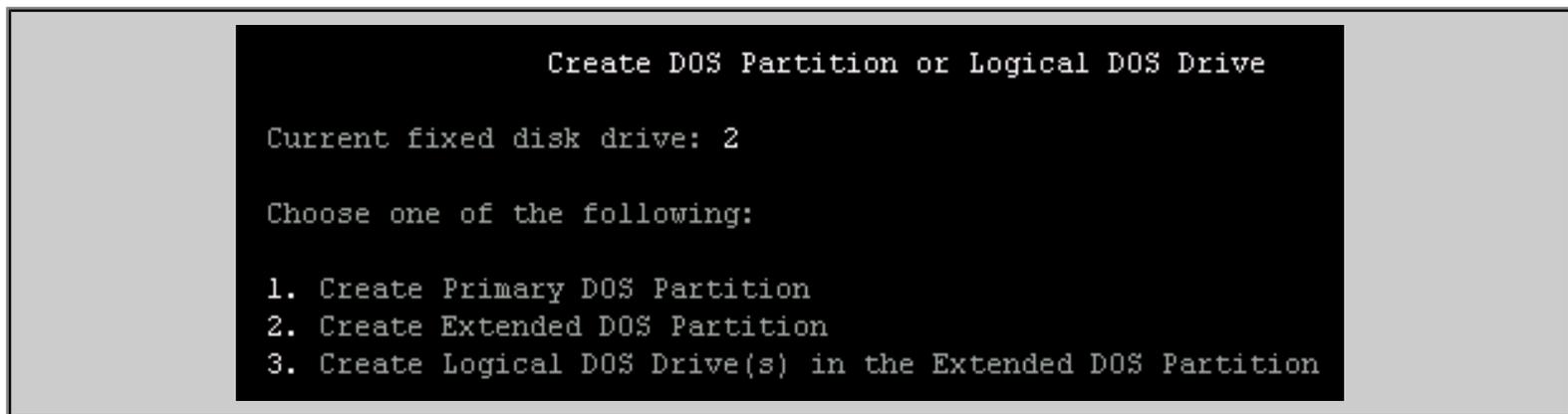
This guide/tutorial teaches you the mojo on how to **partition** a **h**ard **d**isk **d**rive (HDD) using Microsoft's DOS-based partitioning utility. Because FDISK runs from DOS, and offers no pretty **g**raphical **u**ser **i**nterface [GUI], some folks find it intimidating. But FDISK is really simple and straightforward .. once you understand a few, basic concepts.

Just because FDISK offers no GUI, that doesn't mean we can't use a graphical representation of hard drive partitions to help us understand how they work. The image located at the top of this page comes from Partition Magic: a powerful Windows-based partitioning program. PM sports a slick GUI. This graphic you see there represents a single **120**-GB drive. This drive contains **3** NTFS partitions: one **primary**, and two **logical DOS drives** in an **extended** partition [light-blue outline]. Yellow areas contain data. White areas are empty. This image should help you form a mental representation of how partitions work.

Introduction

FDISK's #**1** strength is **compatibility**. Other partitioning utilities [such as the wonderful Partition Magic] offer far more features, such as the ability to modify partitions non-destructively. Their GUI's make them easier to use. And they certainly look prettier. But none offer better compatibility .. with the infinite number of configurations possible .. taking into account both hardware & software.

I use PM myself. Everyone should keep a copy handy. But I only use it when FDISK is not an option. And I *always* use FDISK to partition **new** hard drives. Microsoft's FDISK is the closest thing there is to a partitioning *standard*. It has been around since the days when dinosaurs walked the earth .. well, almost. It is the least likely to generate quirky compatibility issues.

This guide is designed for the noobie, for those with no prior partitioning experience. Everything is spelled out, using plain language. It even identifies common problems to avoid. Doc's guide is referenced in the course syllabus by several universities and disk manufacturers such as Samsung. It has become surprisingly popular since search engine's found it. **[**Try searching for the term "FDISK" in either Google or Yahoo & you'll see what I mean.**]** For your hypertext convenience, this guide can be found at any of these fine Radified URLs:

- [http://fdisk.radified.com/]

- [http://fdisk.radified.com/fdisk.htm]
- [http://radified.com/FDISK/fdisk.htm]
- [http://radified.com/Doc/]
- [http://radified.com/Doc/fdisk.htm]

Before we begin, you might want to take a peek at some Partitioning Strategies. This guide will give you some ideas on the best way to divvy up your new drive.

Partitioning is best done correctly the first time. You can always **re**partition afterwards, but that can cause problems [as we'll discuss later]. When you decide how you want to divvy up your new drive, write down this information on a piece of paper, or on a 3x5 card. While you're doing that, I want to mention <shameless plug> a few other Radified guides you might find helpful:

- The [Guide to Ripping & Encoding CD audio] receives more kudos than any other.
- The [Guide to Booting from a SCSI hard drive] is my personal favorite, espousing a hybrid approach to disk storage.

- The [Asus CUSL2 Motherboard User's Guide] received more reader input than any other.
- The [Intel Northwood Pentium 4 CPU guide] looks at the newest 0.13-micron processor from the boys at Intel.

- The [Guide to the Best Software Programs & Applications] is growing the fastest.
- There's also a page containing a sample of [PC Benchmarks] for making comparisons, including links to benchmarking programs.

- The **newest** addition is a [Windows XP Installation guide].
- And [several others]. </shameless plug>

Hard Drive Config Primer

All motherboards come with two IDE/ATA controllers: one **primary** and one **secondary**. Each IDE/ATA controller supports two channels: one **master** and one **slave**. Master/slave settings are configured with jumper settings on the hard drives themselves. The legend for these settings is usually printed beside the jumpers, or you can visit the manufacturer's web site to find how to set them. Primary/secondary configuration depends on which IDE/ATA channel the device [cable] is plugged into. Therefore, each motherboard supports a total of **four** IDE/ATA devices [more can be added by installing an optional PCI card] like so:

1. primary-master
2. primary-slave
3. secondary-master
4. secondary slave

Typical hardware configuration for a system using of all four IDE/ATA channels might look something like this:

1. primary-master: boot/system hard drive
2. primary-slave: CD or DVD-ROM drive
3. secondary-master: CD or DVD burner/writer
4. secondary-slave: storage hard drive

FDISK Basics

Let's get started. The **first** partition of a hard drive is usually a *Primary* partition. It's normally labeled as your **C**: drive, especially when it's configured as the primary-master. There is normally only *one* Primary **partition** per hard disk [more are possible with special tricks].

The maximum number of Primary **partitions** allowed per hard disk is **4**. Again, you will normally only have *one* Primary **partition** per hard disk. If you have only *one* hard disk in your system, then you will *need* a Primary **partition** on that drive. But, if you have *more than* one hard disk [two, three, four, etc.] in your system, you *don't* need any Primary **partitions** on the second, third, fourth (etc.) disks.

- **Extended partitions** are required for hard drives with *more than one partition*. Only *one* Extended partition is allowed per hard disk. You can't do anything with an Extended Partition, without first creating a *Logical DOS drive* *in* the Extended Partition .. which leads to our next point.

- **Logical DOS drives** are created **in** *Extended partitions*. They are handy, since you (normally) can have only one Primary & one Extended partition per hard disk, giving you the ability to create more than two partitions per hard disk.

These would be your *Logical DOS drives*. For example, they would be your **D**: drive, your **E**: drive, etc. Each *Logical DOS drive* gets its own drive letter. You can create more *Logical DOS drives* on a hard drive than you'll ever have need for.

For example, you could use **FDISK** to **partition** an **80-**GB hard drive like so:

- one **20**-GB Primary partition = **C**: drive
- one **60**-GB Extended partition, containing two **30**-GB Logical DOS drives [**D + E**]. You could also create three **20**-GB Logical DOS drives here.

Boot FDISK Floppy Disk

I posted a Windows ME boot disk on my Downloads page. You can either use this one [labeled "FDISK floppy"], or grab one from bootdisk.com. I suggest the one labeled "Windows ME" as this particular disk contains the latest version of FDISK, which supports hard drives larger than **64**-GB.

There's a known-problem with trying to create **partitions** [with **FDISK**] larger than **64**GB. See here. Microsoft has a file for you to download [if you want to create partitions larger than **64**GB]. If you already have a bootable floppy disk that works for you, but merely need the updated version of FDISK for a new hard drive that is larger than 64-GB, you can download the new version of FDISK.exe from my Downloads page.

Download your bootdisk of choice and put a brand new, formatted floppy into your **A**: [floppy-disk] drive. Extract the contents of the self-extracting executable file to the floppy. Leave the boot floppy in the A:/floppy drive and reboot. At the command prompt [A:\>], type "**FDISK**" (without the quotes) and hit the <Enter> key. Here we go.

The program will ask if you want Large Disc Support. Answer: '**Yes**' by pressing the <Enter> key when the letter '**Y**' is selected/highlighted. "Large disc support" provides support for **FAT32** [and NTFS], which allows you to create partitions larger than **2**GB. If you answer 'No,' you would get **FAT16**, which limits your partitions to **2**GB each [this would be bad, especially if you have a large hard disk].

Initial FDISK Screen

The initial FDISK screen looks like this:

1. **Create** DOS partition or Logical DOS Drive
2. Set **active** partition **[**Your C: drive is usually your active partition**]**
3. **Delete** Partitions or Logical DOS Drive {Brand new drives won't have any partitions to delete]
4. **Display** partition information **[**Use this option to verify your work**]**
5. **Change** current fixed drive **[**For systems with more than one HDD**]**

Hopefully you've already **backed up** any data, if the drive is not brand new. Repartitioning will cause you to **lose** any data contained on the repartitioned drive(s). If you have four IDE/ATA hard disks in your system, **FDISK** will report them in the following order:

- Disk drive **1** = Primary-Master
- Disk drive **2** = Primary-Slave
- Disk drive **3** = Secondary-Master
- Disk drive **4** = Secondary-Slave

If your system contains **no** primary-slave nor secondary-master as a fixed disk drive, then your secondary-slave would be reported as: *Current fixed disk drive: 2*. Assuming the drive is *not* new, we first need to remove existing partitions. Select item #**3**. [If you have a brand new hard drive, you won't have any partitions to delete.] **Note**: If you have **more than one** hard drive in your system, you will first have to select item #**5**: *Change current fixed drive*, to access the desired drive.

Caution: If you have **more than one** physical hard drive, you need to be absolutely certain the drive you *think* you're working with is indeed that one. I cannot stress this strongly enough. If you partition or format the wrong drive, you will cry. At the top of this window, FDISK will display the *Current fixed disk drive*. This is the drive you're working on/with. Some people disconnect all other hard drives before partitioning and formatting. I don't feel this is necessary, and that a little caution should suffice. But it's not a bad idea, especially for **FDISK** noobies, or if you're unsure about which drive you're working with.

The FDISK Delete Screen

The delete screen in FDISK looks like this:

1. Delete **Primary** DOS Partition **[**Delete this partition last**]**
2. Delete **Extended** DOS Partition **[**Delete this partition next**]**
3. Delete **Logical** DOS Drive(s) in the Extended DOS Partition **[**Delete these first**]**
4. Delete **Non-DOS** Partition **[**These can be difficult to delete with FDISK**]**

Always **delete** partitions in the *reverse* order you create them. In other words, always delete partitions like so: First delete all *Logical DOS drives* [highest drive letter first]. Next delete the *Extended partition*. Lastly delete the Primary partition.

Eric from New York City wrote to say he encountered a problem with a Windows 98 start-up disk. It gives him the error: *NTLDR is missing. Press any key to restart.* Pressing the proverbial "any key" does no damn good. The Windows Me boot disk from bootdisk.com allowed him to load DOS and access FDISK. But FDISK could not delete his NTFS partition. A utility called **delpart.exe** was required. You can download delpart.exe from either my Binaries page, or from the utilities page at bootdisk.com [listed near the bottom, scroll down to heading labeled "Partitioning"]. It's **123**KB. Copy it to your boot floppy and execute it from there. Delete NTFS partitions as desired. Then reboot and create partitions with FDISK. So the combo that works to delete NTFS partitions is: delpart.exe on a WinMe boot floppy.

Deleting Hard Drive Partitions

FDISK has trouble deleting non-DOS partitions. This section has grown so large that I've given it its own page. If you're having trouble deleting partitions for any reason, see here: **[**Problems deleting Partitions**]**. After all **partitions** have been removed/deleted, return to the first screen [ESC]. Now we'll create our new partitions. Select item #**1**: *Create DOS partition or Logical DOS Drive*.

The FDISK Create Screen

The Create Screen looks like this:

1. Create **Primary** DOS Partition **[**Create this first**]**
2. Create **Extended** DOS Partition **[**Create next, use *all* remaining space**]**
3. Create **Logical DOS Drive**(s) in the Extended DOS Partition **[**Create last**]**

Create partitions in the following order: First > Primary. Second > Extended. Lastly > Logical DOS Drives [in the Extended partition]. Note: you don't necessarily *have to* create a **Primary partition**. Your drive will work fine with **no** Primary partitions, long as it's not the only hard drive in your system. You need only one Primary partition per *system*. All other drives can be comprised entirely of *Logical DOS drives* in *Extended* partitions. With that said, each hard drive normally has one Primary partition.

Creating a **Primary partition** can change your drive-letter designation configuration on pre-existing hard drives, which can generate problems. If your system thinks a certain file is located on a certain drive letter [say for example: D, and your D drive changes to E], and that drive letter changes, your system won't be able to locate that file. This can cause problems. I'll discuss problems associated with drive-letter changes later, and give you ways to solve the issues. Refer to the section below labeled "Drive Letters" for more info along these lines.

Now we're going to create a **Primary partition**. If asked to use *all* space, answer '**No**' and enter the amount you wish for the **C**: drive [or whatever drive it will be] .. unless you want only a single-partition hard drive. In which case, you would answer 'Yes'. The first partition on your first hard drive should automatically be set to **Active partition**. If not, **FDISK** may ask you, or you may have to select item **2**: *Set active partition* from the main menu. The active partition is usually the **C**: drive. Even if you don't install your **o**perating **s**ystem to your **C**: drive, your O/S will still install key boot files [such as boot.ini] to your active partition.

While it is possible to have up to **4** Primary partitions per hard disk, only one can be active at any one time. You can change which **partition** is active, altho you will probably never need to do this. **Note**: FDISK has a problem displaying information for hard drives that **exceed 100-GB**. The extra character causes the size value to **wrap** to the next line. Once you realize what is happening, it's not difficult to interpret the data. But it can be confusing and takes a little extra care. The program still works fine, tho.

When entering data for partition sizes, you can enter either absolute values [in MB, 30000 MB = 30-GB], or you can enter percent values [25% of a 120-GB hard drive = 30-GB]. FDISK will not allow you to enter a value greater than 99999 MB [99-GB]. You would have to use a percent value in this case. This is no problem. You need to include the "**%**" character.

Extended Partitions

Next we create the **Extended** partition. Recall that each hard drive can only have one *Extended partition*. Use *all* remaining space. Repeat, use **all** remaining space to create your Extended partition. If you don't, you'll wind up with **unused space** on your hard drive [a common noobie problem]. For more info along these lines, refer to the section below labeled "Two Common Problems".

FDISK should automatically advance to the next step -> creating *Logical DOS drives*. It should give you a message that says (something like), *This drive has no Logical DOS drives. Would you like to create some now?* Enter the amount for the **size** you want to make the first *Logical DOS drive/partition*.

If you only have one hard disk in your system, this will be your **D**_drive. If you only want two partitions on this drive [one primary and one logical DOS drive], then you would enter all remaining space contianed in the Extended partition for the size of this *logical DOS drive*. After you create the first *Logical DOS drive*, enter the remaining space for the third **partition** .. or make it however big you want, and add however many *Logical DOS drives* you'd like. Now we're **finished** with FDISK, so exit out.

Drive Letters

Windows assigns drive letters like so:

- 1st -> Primary partition of Primary-master
- Next -> Primary partition of Primary-slave
- Next -> Primary partition of Secondary-master
- Next -> Primary partition of Secondary-slave
- Next -> Primary partition on SCSI ID 0
- Next -> Primary partition on SCSI ID 1 (and so on, until all Primary partitions for all SCSI IDs are assigned)
- Next -> All Logical DOS drives of partitions on Primary-master
- Next -> All Logical DOS drives of partitions on Primary-slave
- Next -> All Logical DOS drives of partitions on Secondary-master
- Next -> All Logical DOS drives of partitions on Secondary-slave
- Next -> All Logical DOS drives of partitions on SCSI ID 0
- Next -> All Logical DOS drives of partitions on SCSI ID 1 (and so on, until all drive letters are assigned to all Logical DOS drives on all SCSI IDs).

The thing to note here is that *all* Primary partitions receive drive letters before ANY Logical DOS drives do. Pay particular attention to the *drive letters* FDISK assigns to these new partitions. You will need this information when it comes time to **format** these newly created partitions [in the next step]. If you format the **wrong** partitions, you're screwed. You will **lose** all data in the partitions you format. [In the section labeled **Data Recovery** below, you will find a list of programs that might help if you accidentally partition or format the wrong drive.] Write down this drive-letter information on a piece of paper.

Another method to avoid formatting the wrong drive is to use descriptive **drive labels**. At the completion of formatting, the program will ask you if you want to label the drive. If you don't, it will automatically assign some arbitrary, meaningless label for you. It's better to label each partition yourself. Use something that makes sense to you, such as: **C_drive**, or **D_drive**, etc.

Letter-based labels can become confusing if/when you add more hard drives. Your **F**_drive, for example, might become your **G**_drive or **H**_drive when you add another hard drive later. But you can always change their label. I tape a **3x5 card** to the side of my monitor. It contains all partitioning info, in a single glance.

A third trick to keep from formatting the wrong drive is to make all your partitions **unique sizes**. For example, if you have two **60**-GB drives, instead of creating three **20**-GB partitions on each drive, you might make one drive: 15-GB, 20-GB & 25-GB, and the other 12-GB, 18-GB & 30-GB. This would make it difficult to confuse your partitions, and easy to tell them apart. If you need to reformat a particular drive, and that drive is supposed to be **18**-GB, but it's being reported as **25**-GB, you know something isn't right.

Lastly, you should *always* have a **back-up image** of your boot partition(s) on hand. You can create a back-up image with an imaging utility such as Symantec's Norton Ghost, or Powerquest's Drive Image. If you need help with creating an image of your boot drive/partition, check out the world-famous Radified Guide to Norton Ghost. This way, if you ever accidentally wipe out [re-format] your boot partition, you can quickly & easily **restore** it .. in a matter of *minutes*. You shouldn't be without an imaging utility. They can save you from so much grief.

One of the tools that comes with *Partition Magic*, called **DriveMapper**, can help in the event the installation of a new hard drive causes drive letters to change on existing drives/partitions. From the Partition Magic Help file:

Drive letters can change when you create, delete, hide, or unhide partitions, which can cause applications not to run because application

> shortcuts, initialization files, and registry entries refer to incorrect drives. **DriveMapper** is a wizard that lets you easily update drive letter references.
>
> If you are using Windows NT or Windows 2000 as your only operating system, we recommend using the **Change Drive Letter** operation (Operation Advanced Change Drive Letter) rather than DriveMapper. Change Drive Letter lets you permanently set the drive letters for your partitions so that adding and removing partitions does not affect drive letters.

If you install your OS to a SCSI drive, before installing any IDE drives, and make it your *active* partition, the primary partition on your SCSI drive becomes your C: drive. If you later add an IDE drive, your SCSI drive will **remain** your C_drive, even tho you have a primary partition on your primary-master drive. I have never done this, but this is what I've been told. For more info about drive letter assignments, see here (annoyances.org). A freeware letter-assigner is posted here (I have not tried it). Ed K. from Topeka, Kansas writes to mention a free utility named **COA** (**C**hange **o**f **A**ddress). He says:

> PCMag has a great little program that I've used many times under Windows W9x. It modifies registry entries, ini files, etc., so that, when adding a new drive letter, changes the system is updated with changes to previous drive letters. For example, you can tell COA to **replace all D:\ with E:** The program can be found at Hotfiles.com, search for COA. They also have a 32bit version available.

NTFS vs FAT32

Windows 2000 and XP support both FAT32 [**F**ile **A**llocation **T**able 32] and NTFS [**N**ew **T**echnologies **F**ile **S**ystem]. Windows 98 and ME support only FAT32. So if you boot either to Windows 98 or ME, you won't be able to read/access/write to your NTFS partitions. If you boot to either Windows 2000 or XP, you'll be able to read/access/write to both FAT32 and NTFS partitions.

In my opinion, it is almost always **better to format** your drives **using NTFS**. A good discussion on NTFS vs FAT32 is posted here. The main reason for prefering NTFS is its "self-healing" properties. I could wax techie and say NTFS features "journaling" and is "fault tolerant", but all you need to know is that it's more reliable than FAT32. Speedwise, FAT32 is usually a little zippier, especially for smaller disks. But I doubt you'll notice any real-world difference. If you want a faster hard drive, buy a 15K-RPM SCSI drive.

The only time you would might prefer FAT32 over NTFS is if you dual/multi-boot Win98/ME with either Windows 2000 or XP. If all your drives are formatted as FAT32, you would be able to read_from/write_to/access any drive from any operating system. You **used to** [not any more, tho] have to keep a FAT32 partition on your system in order to receive/store Ghost images. But the latest version of Norton Ghost [v2003] now supports writing images directly to NTFS partitions, so this is no longer a requirement. Windows **2000** uses NTFS v**5.0**, while Windows **XP** uses v**5.1** of the NT file system. They are not the same.

NTFS is better for video-storage drives, because it isn't limited to 4GB files, like FAT32 is. If your PC is located in an office where someone might pry, **NTFS** is the way to go because it offers better security than FAT32. Before doing anything with NTFS partitions, read this support page from Microsoft. Some people prefer to load their operating system to a FAT32 drive. Their reason is that many disk-repair utilities work from DOS, and DOS supports FAT32 [but not NTFS]. Therefore, if they have a problem with their boot disk, they can always boot to DOS and run these disk-repair utilities. This is a valid strategy. But my rationale is that NTFS is **more reliable** than FAT32, and that you're less likely to *need* the use of these disk-repair utilities with NTFS, which is a "self-healing" file system. If you have a major problem, you could always restore an image [provided you created one].

Miscellaneous Info

- Linux uses ext2/3 as its native file system. Even tho many Linux distros come with a partitioning utility, I've found that it's best to use *Partition Magic* to create partitions for Linux. The best place to get answers about partitioning for Linux is here (JustLinux).

- Install Linux to a *Primary* partition. If you first *shrink* your Windows partition, to make room for Linux, instead of converting them to ext2/3 [entirely], you'll maintain your current drive-letter configuration. If you *convert* a Windows partition to ext2/3, your Windows drive-letter config will change, cuz Windows cannot see/recognize **ext** partitions.

- The FAT32 default cluster size increases from **4**kb to **8**kb for partitions that exceed **8**GB. For maximum space utilization, make your FAT32 partitions no larger than **8**GB. In general you want *smaller* clusters for the partition(s) where you'll store/load your operating system (Windows), which is full of many small files (less than **1**KB). NTFS uses **4**KB clusters regardless of partition size.

- If you opt for FAT32, you want *larger* cluster sizes for partitions that will be used to archive large media files, such as MP3s, video, and graphics. So, if you want to create a partition that is roughly **8** gigs to be used to store your MP3s, you'd do better to make it **8.1**GB, rather than **7.9**GB. This would increase the cluster size.

- The FAT32 default cluster size increases from **8**kb to **16**kb for partitions that exceed **16**GB. The default cluster size jumps again for partitions that exceed **32**GBs.

- There's a known-issue with (trying to) create **FAT32** partitions larger than **32**GBs using Windows 2000 CD. (You will have no such problem is you use **FDISK** from DOS, like described here). I heard that the reason that Microsoft doesn't allow you to create FAT32 partitions greater than **32**GB from the

Win2K/XP Install CD is because they want you to use **NTFS**.

- If you use Partition Magic to resize a partition, under NO circumstances should you turn off your computer or reset it. It might seem like it's locked up, but it's not unusual for this operation to take a loooong time. If you turn it off in the middle, you'll be sorry.

- Some older motherboards need a **BIOS update** to support hard disks larger than **32**GB.

- Windows does *not* have to be installed to a Primary partition, but Win98/SE/ME are usually installed to Primary partitions. I have both Win2000 and WinXP installed to *Logical DOS drives*, so I know it's no problem.

- If you plan to install both WinXP and W98/ME, install W98/ME first, then launch the WinXP installer from the CD while you're in Win98/ME. It will gather system info, and then reboot automatically.

- If you install a new/second/additional hard disk, and create a *Primary* partition in that new hard disk, Windows will assign a drive-letter to it that may have previously been assigned to one of you *Logical DOS drives* on your original hard disk, which can create problems.

- If you run into problems, or have specific questions, the guys at the Storagereview forums can usually help.

- It is possible to convert FAT32 partitions to NTFS without losing the data contained on them. But most people advise against this. It is better to format [not convert] NTFS partitions. You would do this by right-clicking on the drive in "My Computer" and selecting "format". You should *never* attempt to convert an NTFS partition to FAT32.

Formatting

Note that I recommend the NTFS file system over FAT32. DOS does not support the NTFS file system, therefore you cannot format a partition with the NTFS file system using a DOS boot floppy. You have to use a Windows XP or 2000 CD to format with NTFS. You can also format with NTFS from within Windows XP or 2000 by right-clicking on the partition/drive and selecting "format" from the menu. If you format with a DOS boot floppy, your partition will be formatted as FAT32.

Reboot with the boot disk inserted in the floppy drive. All partitions that were created need to be *formatted* before you can use the drive. But first, enter **FDISK** again [by typing: **FDISK** at the command prompt (A:\>) and hitting the <Enter> key]. First we're going to *check* the status of the partitions you made. In particular, check the *Logical DOS drives* that you made. Make sure the number of drives is correct and note their drive letters. Ensure everything looks the way you expect it to.

I have seen instances where **2** *Logical DOS drives* were created in **FDISK**, but after rebooting, only one was reported. In this case, simply re-make the 2nd/last *Logical DOS drive* [in the *Extended partition*]. Then reboot and check again. The second time has never failed to work for me. Do this until all partitions/drives look the way you expect them to [in **FDISK**]. When the *Logical DOS drives* look correct, it's time to **format** the partitions we made. The larger your drive, the longer it'll take to format. You cannot use a particular partition/drive until it is formatted. Formatting is different from partitioning. Formatting does not use FDISK.

You have to decide between FAT32 and NTFS. If you want to format say your **C**_drive with FAT32, you would type "**format c:**" (without the quotes) at the command prompt, and then hit the <enter> key. You need to **make absolutely sure** that you're formatting the right partition/drive. You will **lose** data if you format the wrong partition. Repeat this outline until you have formatted all the partitions you created. After formatting all the partitions/drives you created, reboot & you're ready to use you new drive. Most people usually install their operating system at this point.

If your system supports *Booting from CD* (most newer ones do), insert your Windows CD & reboot. Setup will start automatically. You may have to configure your motherboard BIOS to look for a bootable CD in your CD-ROM drive. If your system does *not* support *Booting from CD*, follow these steps:

1. Insert both the Windows CD and the Start-up floppy disk [use the Windows ME OEM disk for this].
2. Reboot
3. choose **2**: *Boot with CDROM support*.
4. Once your system arrives at the command prompt, change to your CD-drive letter (which will be different for each user, depending upon your particular partition setup). For example, if your CD is your **K**: drive, type: "**k:**" (without quotes) and hit the <Enter> key. The command prompt will change to K:\> [or whatever drive letter you entered]. You might have to add an extra letter for the RAM drive that gets created.
   Note: if you have plenty of disk space available, you could copy the entire Windows CD to a location on your hard drive [such as a folder named "wxp"] and execute the Windows set-up program from there.
5. Type "**setup**" (without quotes) and hit the <Enter> key. You're there. Follow the instructions. Windows 2000 and XP give you the option to format any partition before installing the O/S.

If you already have your O/S installed, you can simply right-click on the new partition/drive [from 'My Computer'] and select "format". Here you can select either NTFS or FAT32. Some people format *twice* .. once in **DOS**, and then again in **Windows**. While this sounds rather thorough, I have never done it this way, and have never had a problem. You cannot format NTFS partitions from DOS as DOS does not support NTFS.

The best way to understand how partitioning works is by viewing partitions graphically. Posted here is a screen-shot taken from Partition Magic. Here you see **6** hard drives. [Actually, you can't see all of Disk #6.] The first **3** disks are SCSI. The last **3** are IDE/ATA. The legend for this graph is posted here.
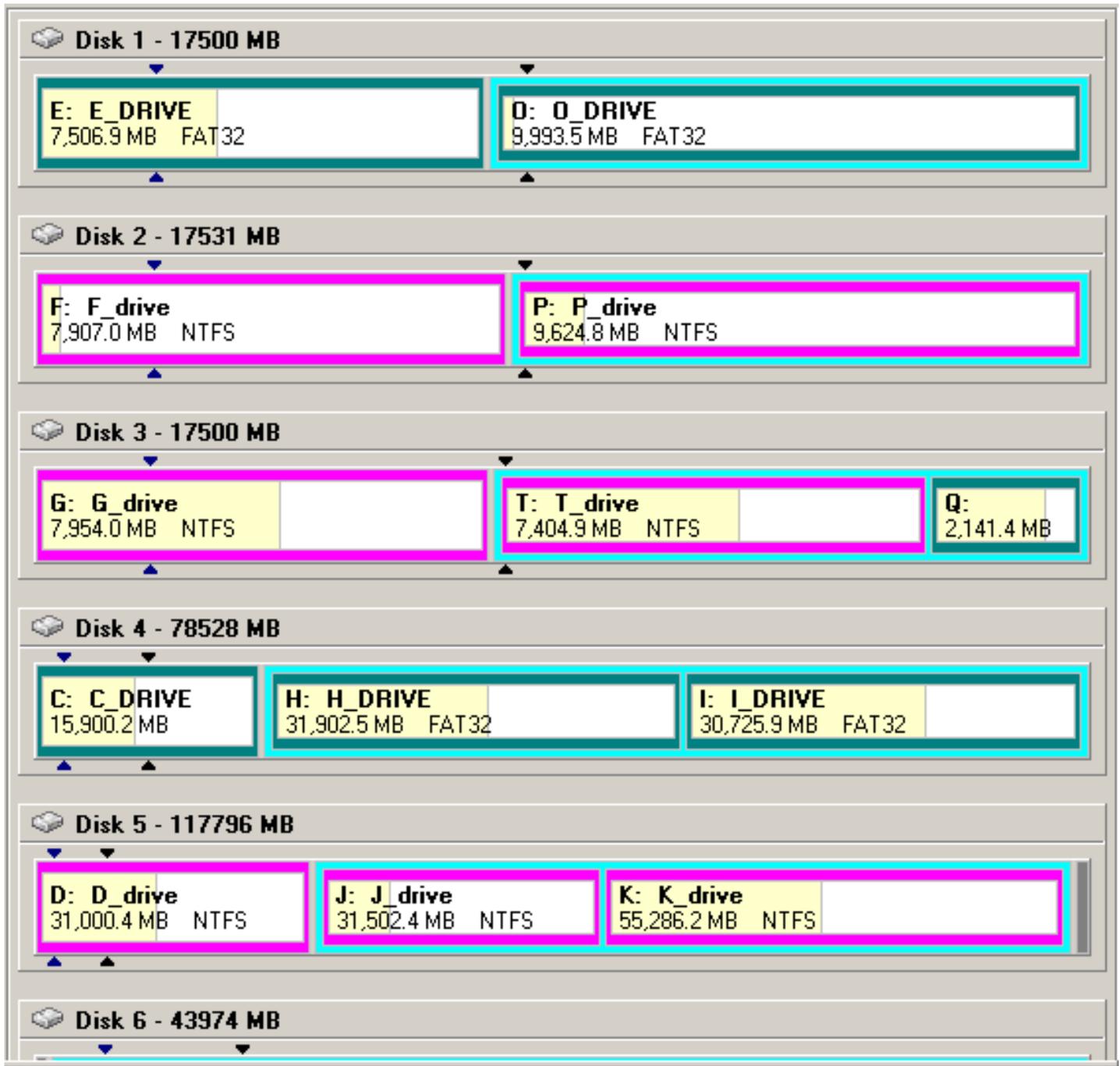
Notice that Disk #3 contains both NTFS and FAT32 partitions. Notice, too, how multiple **logical DOS drives** are always enclosed with-in **extended** partitions [light-blue outline]. If you look closely, you can see that Disk #6 has **no primary partitions**. This disk is comprised entirely of an **extended** partition, containing multiple *Logical DOS drives*.

This is a trick you can use when adding a new hard drive to your system. If you partition it so the new drive contains no primary partitions, but contains only *Logical DOS drives* within an Extended partition, it will prevent the newly added disk(s) from usurping drive letters from *Logical DOS drives* already installed in your system. [Because Windows assigns drive letters to all primary partitions before it does to any *Logical DOS drives*.]

Two Common Problems

1. Not using the entire amount of the disk. For example, after partitioning your **120-**GB drive into **3** equal parts [you thought], you find you're only using **80** gigs. To avoid this problem:

> 1. When creating the **Extended** partition, ensure you use the *entire* amount/size of whatever is left after creating the Primary partition.

> 2. Continue to create **Logical DOS drives** until *all* the space is used. **[**Obviously, if you only make one, large primary partition, neither of these items apply.**]**

2. After partitioning, you later discover one of the partitions didn't "take" [for whatever reason]. As a result, you end up formatting the wrong drive, and losing valuable data. Obviously this is bad, bad, bad. To avoid this problem:

> After partitioning, do not immediately format the new partition(s). Instead, reboot and return to FDISK. From there, select your new disk and view the partition information to verify they "took" [Select item **#4**: Display partition information]. Ensure the partitions and drive letters look the way you expect them to.
>
> I have had to re-do partitions before, because they didn't 'take' the first time. Simply repeat the process. Format only after you are positive that all partitions you created (thought you created) look the way you expect them to.

Data Recovery

If you *do* screw up and format the wrong partition, these programs might help you recover your data. As long as you don't write to the partition, you have a good chance of restoring the data. Programs are listed alphabetically. I have no experience with any of them. The list contains one freeware option. Professional data recovery services are notoriously expensive.

[Active@Partition Recovery] [CGSecurity] [Directory Snoop] [DiskPatch] [File Recovery.net] [Final Data] [LC Technology] [NTFS.com] [Ontrack] [O&O Unerase] [PC Inspector File Recovery - freeware] [Recover It All]

Re-sizing Partitions

Sometimes you don't need to need to create, add or delete partitions - you merely need to *resize* the ones you already have. For example, perhaps you have a small C: drive, which is rapidly filling up, and giving you system warnings and errors about not enough space.The following is an example I heard, so it is the one I'll use.

Suppose you have two hard disk drives in your system. The first has a **20**GB capacity. This hard disk has **3** partitions. The **C**: drive is **2**GB and is **full**. The **D**: drive is **6**GB and is half full. The last partition, the **E**: drive is **12**GB and is also half full [6GB free]. The second hard disk is **40**GB. It is a single 40GB partition: half full [20 gigs free]. You have two options is this type of scenario:

1. You could use Partition Magic to resize the partitions. Partition Magic has the ability to resize partitions on-the-fly without destroying data contained on the partition.

2. The other is to use Norton Ghost [Symantec] to image the partitions on the first hard disk drive to the second. Then **delete** all the partitions on the first disk. You will **lose** all data on the first hard disk [this is why you back-up the partitions using Ghost images]. Then create **new** partitions on the first hard disk the way you want them [a larger C: drive]. Lastly, restore all images.

GDISK

Vondrook writes to mention GDISK: Symantec's version of FDISK. It comes with Norton Ghost and offers a cool feature. He says:

> After all the good reports about Ghost, I decided to give GDISK a whirl. Mind you, I've never tangled with anything other than FDISK [for compatibility reasons], and was reluctant to do so. Symantec touts GDISK as being far more user-friendly then FDISK, but is still a DOS program.
>
> The feature I wanted with GDISK was the ability to **hide partitions**. You simply enter: **gdisk 1 /hide /p:2** [for disk #1, partition #2]. It's sweet. Thus I can unhide my D: partition, dump a back-up [Ghost] image to it, then re-hide it .. and my office girls never even know it's there [let alone mess with it].
>
> You might want to include GDISK in your FDISK guide. It's slick for this one reason. And yes, you can still perform **gdisk /mbr** and other FDISK-like functions if you suspect a virus in the **m**aster **b**oot **r**ecord.

I've never used **GDISK**, but did a little research. Seems they offer **two versions**: GDISK.exe is a **DOS**-based program, and GDISK**32**.exe **Windows**-based.

Tutorial posted here.

Ranish Partition Manager

I'm reluctant to endorse anything for which I have no first-hand experience. But since I've heard many good things about it, I'll mention Ranish Partition Manager [RPM]: a freeware partitioning utility. A guide to installing and using RPM is included in this tutorial posted here. FAQ posted here. FIPS is another freeware partitioning utility. One reader wrote to say:

> Might be worth mentioning that the **Ranish** will confuse Powerquest's Drive Image. Removal and reinstallation of RPM is easy. So the solution when you want to image a hard drive with **DI** is to remove RPM before imaging. Then re-install RPM.
>
> Funny. It could be that Drive Image checks the MBR or something. I don't know. The workaround is easy. Except for that one problem, I haven't experienced any strange behavior. RPM is highly recommended!

If you want to read more about **FDISK**, the boring Microsoft version is posted here. More partitioning info is posted here. You might also find this helpful. The ultimate FDISK reference site is fdisk.com. **THE END**.

[RADIFIED HOME]