

# ADD ANOTHER HARD DISK

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## INTRODUCTION

**Consider this before buying a second hard disk.** An older computer may not recognize a large hard disk. Instead, get a new, faster computer if your system has a small hard disk, 8 GB or smaller. Makers of hard disks provide Drive Overlay software that allows large hard disks to work with older computers. But this software fools your system about the drive size and makes a hard disk unusable when it is transferred to a new computer.

**The easiest way to install another hard disk is to have a computer store do it.** But by installing it yourself, you can save money and get a better configuration. You won't have to live with the standard approach used by computer stores.

**If you really feel uncomfortable installing it yourself, this article can still help you.** Use the partitioning information to tell the technician about your configuration preference.

This article helps you install a second or third hard disk inside your case. External, USB hard disks are not discussed.

To install another hard disk, open your computer case, setup the new disk and install it. Then, run software to partition the new disk and format each partition.

This article explains how to use **FDISK** to partition a new disk and **FORMAT** to prepare each partition for use. These two programs are included in Windows 98 and Windows Me.

A floppy disk may accompany your new hard disk. This floppy contains software to partition your new disk and may let you format it, too. Web sites for makers of some hard disks also let you download their latest partitioning software. You probably should NOT use software from one hard disk maker on a competitor's hard disk. Software from makers of hard disks is usually easier to use than **FDISK** so feel free to use it instead, if it is available.

**For Windows XP**, see guidance from Microsoft, titled **HOW TO: Partition and Format a Hard Disk in Windows XP** at:  
[http://support.microsoft.com/default.aspx?scid=kb;\[LN\];Q313348](http://support.microsoft.com/default.aspx?scid=kb;[LN];Q313348)

**You may need some terminology and information explained before beginning the installation process.**

## HARD DISK CONNECTION INFORMATION

Your hard disk an IDE device. It has two connections: an IDE ribbon cable and a power adapter.

An IDE ribbon cable is always gray and is about two inches wide. You may have gotten a **spare** IDE ribbon cable with your new hard disk. It may not be needed.

Inside your computer case, the mainboard has three connectors for ribbon cables. These three connectors may be located together. One ribbon cable is used to connect floppy disk drives - *don't use it to connect a hard disk*. Another ribbon cable is connected to your original hard disk. You will need to use the **spare** ribbon cable if the third mainboard connector is empty.

When connected to the mainboard, an IDE ribbon cable has two remaining connectors, an end and a middle. The middle connector is actually positioned closer to the end connector.

An available connector, end or middle, will determine whether you need to setup your hard disk.

## **HARD DISK SETUP INFORMATION**

The terms MASTER and SLAVE define how the two connectors on a single IDE ribbon cable are used.

A device using the **end** connector should be set as MASTER.

A device using the **middle** connector should be set as SLAVE.

**MASTER and SLAVE are set using one or two jumpers.** These jumpers are located on the back of a hard disk, between the two connectors.

Hard disks may also have another jumper setting called CABLE SELECT. Setting the jumpers to CABLE SELECT lets you use either type of connector, end or middle. Both hard disks on the same ribbon cable need to have the Cable Select jumper enabled, and the disk at the end of the cable becomes the Master with the Slave disk being located in the middle.

Changing a jumper position is easier using tweezers. Choose a clutter-free environment so that you don't lose a jumper! Match the settings depicted in the diagram on top of the hard disk (or in the instructions) to make sure you do this properly.

**Most new hard disks are set to MASTER or CABLE SELECT.**

**With this information, you can now add your new hard disk.**

## **OPEN THE CASE**

**Disconnect the power cord before opening your computer case.** Never work on your computer with the power turned on. Always unplug the computer after your turn it off. Modern computers always have a little bit of electricity running through them although the power switch has been pressed to turn the computer off.

Always wait a couple of minutes after turning off the power and unplugging the computer. Some computer parts get very hot while they are running and you want to give them a few minutes to cool off before you thrust your hands inside the computer case.

Before you reach inside your computer case, make sure you are properly grounded. Static electricity can severely damage your computer. Touch the power supply often to avoid buildup of static charge. To further lower the risk, avoid standing on carpet.

## SETUP HARD DISK

Verify your hard disk is set to **MASTER**.

Install the spare ribbon cable if the third mainboard connector is empty.

Find an unused connector on an IDE ribbon cable that is connected to the mainboard. Note the connector position on the ribbon cable, **end** or **middle**.

**To use a middle connector**, change the jumper setting to SLAVE or CABLE SELECT.

## INSTALL HARD DISK

Inside the case, find a place to hold another hard disk. There should be an empty spot near your original hard disk. Slide your new disk into this slot. Install it with two screws on each side of the computer chassis.

**Locate the IDE ribbon connector you found earlier.** Connect it to the back of a new hard disk. When the tab on the connector faces upward, the connection is easy.

A power adapter is not provided with your new hard disk. Most computers have one or two extra power adapters. It is a white, four-prong female connector. Find one and plug it into the back of your disk, **curved side up**. Computer stores sell extra power adapters if you need one.

**You can close the case now, but you might want to wait to verify that your jumper settings are valid.** Be sure to remove any loose items before closing the case.

## COMPUTER STARTUP

Connect the power cord to your computer and turn it on.

Your computer should startup in the usual amount of time. If startup takes MUCH longer, you may have wrong jumper settings. Shutdown and compare the jumper setting with the position of the ribbon-cable connector being used.

When you turn your computer on, and it starts normally, it should automatically detect the new disk. But **My Computer** will not show the new disk yet.

## PARTITION THE NEW DISK

A hard disk can have one large partition or several smaller ones.

Smaller partitions (drives) let you segregate data and save "used" disk space. You'll also get faster run times for ScanDisk, Disk Defragmenter and Backup programs.

Use one large partition, with folders, to store large files such as backups, photographs and videos.

### IMPORTANT NOTE

**FDISK** can also be run without running Windows. If you have **any** difficulty using these instructions, exit **FDISK** and shutdown your computer. Put your **Startup** disk into the floppy

drive and start your computer. When you see the cursor flashing after an "A Prompt" that looks like **A:\>** type **FDISK** and press the Enter key. Then finish partitioning your hard disk.

**To open FDISK in Windows, left-click the Start menu and click Run.**

In the "Open" box, type FDISK and click the OK button.

A window FDISK opens. It has a black background with white text. This is a DOS window and your mouse will not work in it. Only keyboard keys can be used to make selections. To enter numbers, use the row of number keys or the number keypad on your keyboard. You may need to press the **Num Lock** key to activate the number keypad.

You are asked if you wish to enable large disk support. **Y** should already be selected. Press Enter.

The main menu, FDISK Options, appears and "Current fixed disk drive" is set to 1.

When a computer has two or more physical hard disks, FDISK displays a fifth option named "Change current fixed disk drive", that lets you switch to another hard disk.

**If Option 5 is NOT shown**, press the Esc key to exit FDISK. Shutdown your computer. You may have incorrect jumper settings. Compare the jumper setting with the position of the ribbon cable connector being used, and begin again.

**If Option 5 is shown**, type 5 to select "Change current fixed disk drive" and press Enter.

In the window "Change Current Fixed Disk Drive", look in the Disk column. Find the number for your new hard disk. There won't be a drive letter listed the "DRV" column for that disk. Type the number for your new disk and press Enter.

This takes you back to the main menu, FDISK Options. You should see the number 2 for "Current fixed disk drive" if adding a second hard disk, or number 3 for a third disk addition.

Type 1 to select "Create DOS Partition or Logical DOS Disk" and press Enter.

In the window "Create DOS Partition or Logical DOS Drive", there are three options:

1. Create primary DOS Partition
2. Create Extended DOS Partition
3. Create Logical DOS Drives(s) in the Extended DOS Partition

**Many people and most computer stores use Option 1 when adding another hard disk.**

**This is why you should not use Option 1 to add a second or third hard disk.**

Option 1 should only be used on a hard disk that will contain Drive C, or on a hard disk intended for an alternate operating system. Option 1 is used to create a bootable partition.

**By not using Option 1**, drive letters will be sequential, from Disk 1 to Disk 2, and so on. If Disk 1 has Drive C and D, Disk 2 will have Drive E and F, in a neat, sequential order.

When Option 1 is used, Windows assigns drive letters to Primary partitions before assigning drive letters to the logical drives. In the previous example, if a Primary Partition was on both Disk 1 and Disk 2, the drive letter sequence would be:

Drive C (Disk 1 Primary)

Drive D (Disk 2 Primary)

Drive E (Disk 1 Logical)

Drive F (Disk 2 Logical)

which is very confusing! Avoid this mess by not using Option 1.

**So, in the window "Create DOS Partition or Logical DOS Drive", type 2 to select "Create Extended DOS Partition" and press Enter.**

The window "Create Extended DOS Partition" appears. Your computer will verify the new disk's integrity. This process may take a while to complete.

Then, the window shows the total disk space and asks you to enter a partition size. A number for the total disk space is already selected. Press Enter.

After FDISK creates the partition, you'll see the message "Extended DOS Partition created". Usage will be shown as 100% and that is the correct value. Press Esc to continue.

The disk integrity is verified again. Before the new extended partition will work, it needs to have one or more Logical DOS Drives created on it. So you'll see a message "No logical drives defined". Below, the size of the "Total Extended DOS Partition" is shown.

**This is where you specify how many partitions (drives) to create.**

**To create one large partition**, just press Enter to create it. You'll see a new letter assigned to the new partition you just created. Press Esc to exit this screen and return to main menu.

**To create multiple partitions**, you need to set the size of each new partition. To do this, enter a value next to "Enter logical drive size in Mbytes or percent of disk space <%>".

**For example**, if your new hard drive is 60 GB and you'd like to create three 20 GB drives, entering 33% works nicely. *Be sure to type the percent symbol.* To enter a number in Mbytes, take the total number in Mbytes and divide it appropriately to get the correct number to input. But to make it all easier, just use a percentage of the total hard disk size and let your computer do the math for you.

**Press Backspace, type an entry. After pressing Enter, you'll see a new letter assigned to the new partition you just created.**

Repeat to create remaining partitions. **For the last partition, just press Enter.** You'll see the message "All available space in the Extended DOS Partition is assigned to logical drives". Press Esc to exit this screen and return to main menu.

**In the main menu window, FDISK Options**, type 5 to select "Change current fixed disk drive" and press Enter. You will see all the drives on your computer, including those you just created. Notice that the drive letters are sequential.

**You are done partitioning. Press Esc twice.**

You must restart your computer before the new partitions will be recognized. ***But read the next section before restarting your computer.*** You may want to restart to **Safe Mode**.

Press Esc again to exit FDISK.

## **FORMAT PARTITIONS**

The last step is to format each partition (drive) you created to make it ready for use.

*Formatting deletes everything on a partition (drive) so you do not want to select a drive with data on it.*

*Your anti-virus program won't allow anything to modify the master boot record.* So it is important to totally disable your anti-virus program before attempting to format your new hard drive(s). Since you may overlook background processes, a better alternative is to format in **Safe Mode**. The usual way to do this is by pressing F8 during startup. Consult documentation that came with your computer if F8 doesn't work.

**To format your new hard drive(s), follow these directions:**

Open My Computer. You'll see one or more new drive letters, depending on the number of partitions you created. For each new drive letter (*make absolutely sure it is a NEW drive letter*):

Right-click a NEW drive letter and click Format from the menu.

In the Format window, change "Format type" to Full

Designate a label if you wish

Leave "Copy system files" unchecked

Click the Start button in the Format window to begin formatting the drive

## **REFERENCE**

How to Use the Fdisk Tool and the Format Tool to Partition or Repartition a Hard Disk

To view this article, go to Google ([www.google.com](http://www.google.com)) and enter this search term:

**Microsoft Knowledge Base Article 255867**