

# Computers

*Down to the Basics*



**Hardware and Software Mysteries Revealed**

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## Table of Contents

<b>The Hardware .....</b>	<b>1</b>
The Computer aka System Unit .....	2
The Monitor .....	2
The Keyboard .....	3
The Mouse .....	3
<b>Additional Hardware on the System Unit .....</b>	<b>3</b>
RAM Memory .....	4
Permanent Hard Drives .....	4
Floppy Drives .....	4
CD ROM Drive.....	4
Printers.....	5
<b>The Software .....</b>	<b>6</b>
Operating Systems .....	6
Working with Windows 95 Operating System .....	7
Desktop.....	7
Taskbar .....	7
Start Button.....	8
Shut Down .....	8
Run .....	8
Help .....	9
Find.....	9
Settings .....	9
Documents .....	9
Programs .....	10
Solitaire.....	11
Title Bar .....	12
Menu.....	12
Word Processors .....	12
Spreadsheets .....	13
Data Bases .....	13
Graphic Presentations.....	13
Web Browsers.....	13
<b>Directory Structure of Drives.....</b>	<b>14</b>

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## COMPUTERS – Down to the Basics

So you're have a computer! The world is now talking about hardware and software, bits and bytes, Word and WordPerfect, RAM and CD ROMS, Floppy and Fixed Drives, etc. What does it all mean to you?

A basic knowledge of how the computer works can help you understand what is happening, to know when you are having a problem, and to describe the symptoms.

In order to understand how a computer works, we must deal with two concepts: **hardware** and **software**. Hardware is the name for the mechanical and electronic components of a computer. Software is sets of instructions that tell the hardware what to do.

### THE HARDWARE

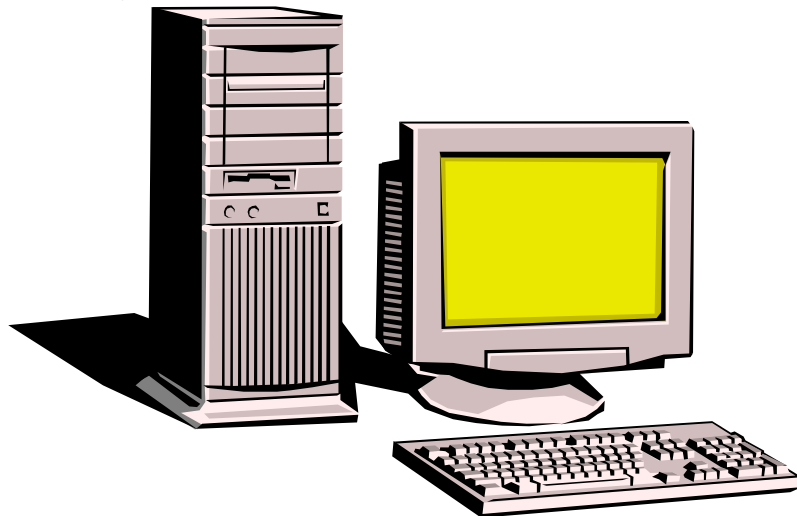
There are many types of computers, from mainframes that fill a room to microprocessors that control some of the functions in automobiles. We will focus on the PC.

The PC (personal computer) is basically a desktop computer that isn't made by Apple. At first glance, you can see that it consists of three visible parts:

The Computer (System Unit)

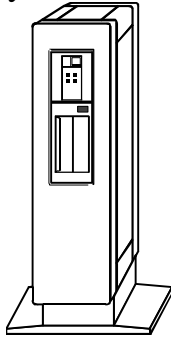
The Monitor

The Keyboard



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The COMPUTER –  
aka System Unit



The computer is also called the System Unit.

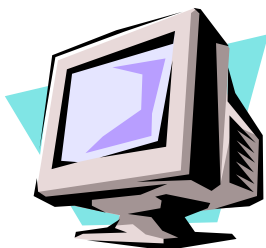
It consists of:

1. Mother Board that holds all the circuitry
2. power supply which is a transformer which takes the 11V at the wall down to 6V and has a fan to cool the computer
3. the Microprocessor (386, 486, Pentium, Pentium II) that determines the speed data is manipulated and stored in memory
4. the Interface Cards that plug into the expansion slots on the motherboard, like video cards for the monitor, sound cards, modem cards, and network interface cards.
5. Some printers and mice plug into cards if not already built into the motherboard.

One decision to make is how much power the Mother Board needs – as in processor speed. You hear terms like 386, 486, Pentium, Pentium II to denote the processors used to run the system. Even within these names for the system, you have to deal with processor speeds, like 25 megahertz for a 386 computer, up to and beyond 233 megahertz for a Pentium II processor.

As with most things in life, it comes down to what are you going to use the computer to do, and how much are you willing to pay to get the fastest machine for the job.

The MONITOR

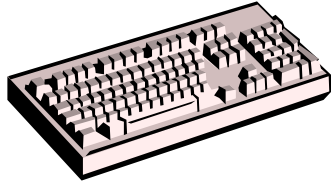


Monitor decisions again are based on the number of pixels per inch you are willing to pay for. Normal monitors are 640 x 480 pixels. This can be on a 14", 15", 17" or 21" monitor.

High density monitors have a pixel mix of 1280 x 1024 pixels. If the goal is to do a lot of graphics where edges need to be smooth, the more pixels per inch the better. Normal word processing and spreadsheet processing get along just fine with 640 x 480 pixels per inch.

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## The KEYBOARD

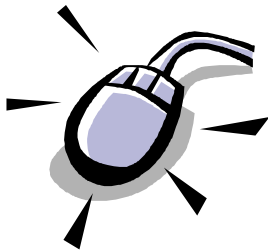


The normal keyboard is the 101 key QWERTY keyboard that has the 10 key number pad on the right side of the keyboard and twelve function keys at the top.

Specialized keyboards also are available for the "Natural" feel for the wrists by splitting the keyboard in the middle so the wrists can rest naturally instead of straight ahead.

With the occurrence of more and more people with carpal tunnel syndrome from keeping our wrists rigid while typing, some people are opting for the alternative keyboards, as well as keyboard drawers so the keyboard isn't too high for comfort on the desk, and wrist pads to relieve tension better.

## The MOUSE



Another input device (which is what the keyboard can also be called) is the mouse. The mouse can be used to point to an item on the screen, and click on it to select and execute the command. This is a skill that has to be developed because it requires hand/eye coordination that we are not born with!

There are many types of mouse devices to choose from: Two button, Three button, Trackball, Touch pad, Joy stick, and on and on. The most common mouse is a two button type. The button your index finger rests on is the normal click side, with the other side being used infrequently for alternate menu selections. You can set up your operating system to recognize the mouse being used by a left-handed person or right-handed person – translation: the activate button is switched.

## *Additional Hardware on the System Unit*

In addition to the base microcomputer system unit, you can add several components. Anything that has to do with storage space is defined by bytes (one character), kilobytes (1,024 bytes), megabytes (1 million bytes), and gigabytes (1 billion bytes).

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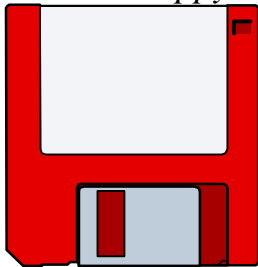
*RAM Memory*

The system unit to calculate information uses RAM Memory. It is considered temporary work space and is necessary for the programs to work properly. While we used to be able to get by with minimal RAM memory, it is recommended for the Pentium processors, a level of 32MB RAM is necessary to run programs without degradation of service.

*Permanent Hard Drives*

Hard Drives are stored on the System Unit and are used to permanently store information after it is calculated in the RAM memory. This requires giving the information a file name and deciding where to store the file – on a floppy diskette or on the hard drive on the system unit. The main decision about a hard drive is how large it needs to be. The normal configuration for a hard drive is now in the gigabytes – 1.2 gig, 2.5 gig, 3.1 gig, and 4.0 gig. Hard Drives are usually designated as Drive C (or D or E if multiple drives are used).

*Floppy Drives*



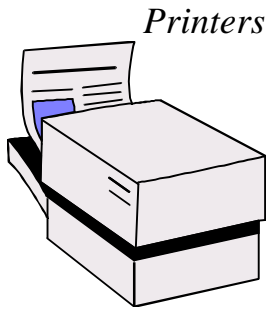
The advantage of using a floppy disk is that it is transportable. It can be taken from one machine and run in another. Floppy disks also come in various sizes. High Density 3 1/2" Disks hold 1.4MB Low Density 3 1/2" Disks (not usually available) High Density 5 1/4" Disks (usually found on older machines) Low Density 5 1/4" Disks (usually found on older machines)

Floppy Drives are usually designated as Drive A or Drive B if more than one floppy drive.

*CD ROM Drive*

The CD ROM Drive is used for reading files, but not writing or saving them. They are used to hold all the software installs as well as information for games and encyclopedias.

If the proper sound cards are on the machine, the



CDROM can also be used to play audio CDs. Laser Printers, Dot Matrix Printers, DeskJet Color printers, Electronic Typewriter printers. How much do you want to pay for good print and fast output?

The most popular printer for the office has been the HP Laserjet printers. This is great for black and white print. The HP DeskJet printers can also provide great print, but also have color graphics and type.

Most printers require a parallel port on the PC (usually standard with all system units) and a cable connecting the two together (the printer and the PC).

Other than that, all you have to worry about is keeping it full of paper and ink.

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## THE SOFTWARE

Just as an automobile without a driver is useless, a computer without software is useless. The software provides the commands that tell the hardware what tasks to perform, what to read and write, how to send the end result (the output) to a monitor and/or printer.

There are several different types of software, but the main types are these:

Operating Systems	Word Processors
Spreadsheets	Databases
Graphics	Web Browsers

### *Operating Systems*

**WIN95**

**WINNT**

**DOS**

**MAC**

Operating systems are the supervisors of the computer. This is how the computer knows where information is stored, change file names, delete files, see how much space is left on the drive, etc. The operating system also keeps up with the software you have installed on the PC as well as where you want to keep your data files.

It is essential to have an operating system, and there are several around. Windows 3.1 is an operating environment that works with DOS 3.x through DOS 6.x and runs on 16 bit based machines.

Windows 95 is an operating system that runs on 32 bit based machines.

Windows NT is a network operating system that uses Windows 95 software packages as well as NT packages and is a 32 bit based machine.

The operating system will determine which version of software to buy. If you are using Windows 95 operating system, you will want to purchase Office97 for WIN95, not Office97 for MAC.

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## Working with Windows 95 Operating System



### **DESKTOP**

Some icons always on desktop – My Computer, Recycle Bin, Network Neighborhood. Others added as shortcuts to programs.

### **TASK BAR**

Located at the bottom of screen, and displays all open programs, can display time of day. Includes START Button.

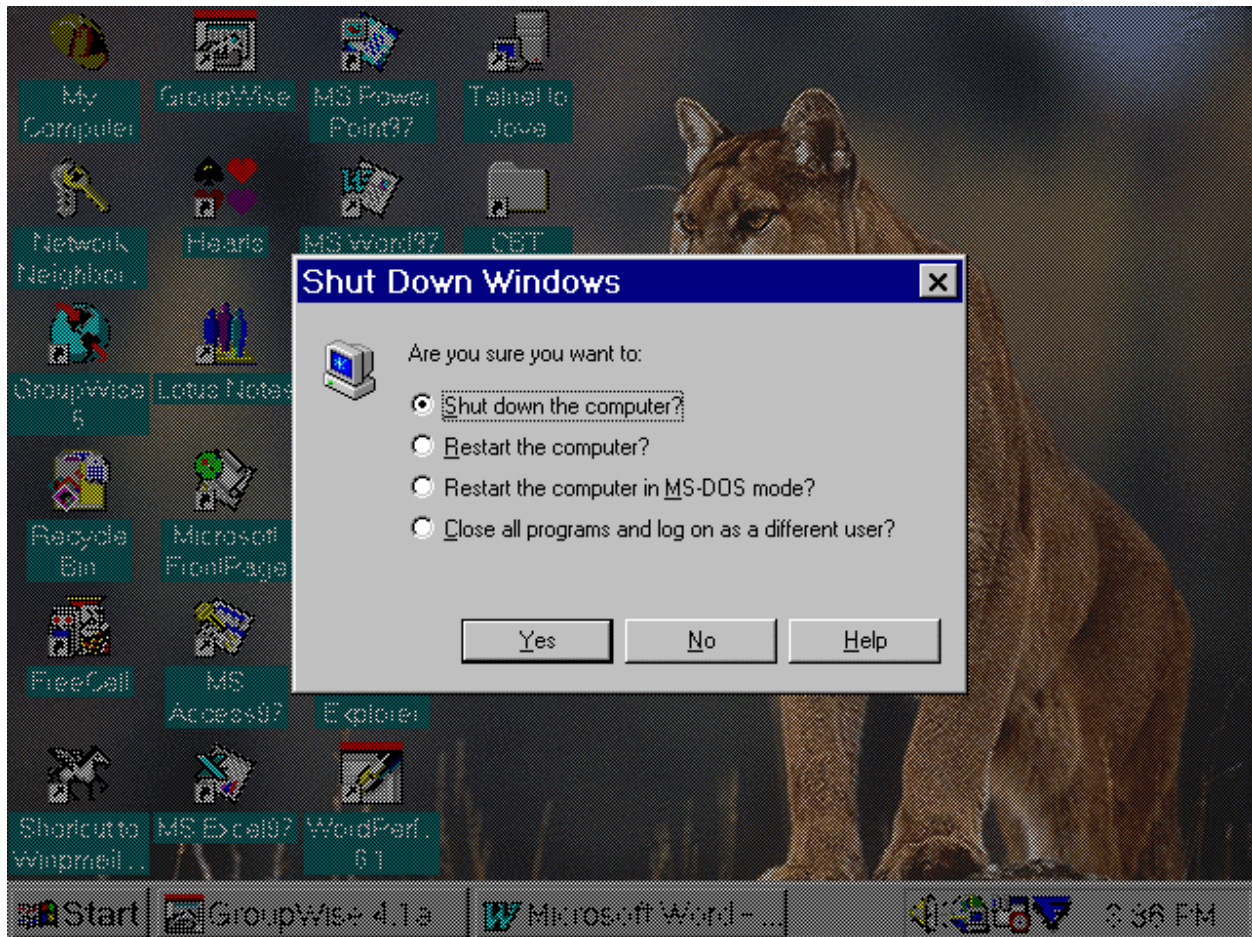
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## START

Entrance to all the programs in Windows 95 operating system and software programs.

## Shut Down

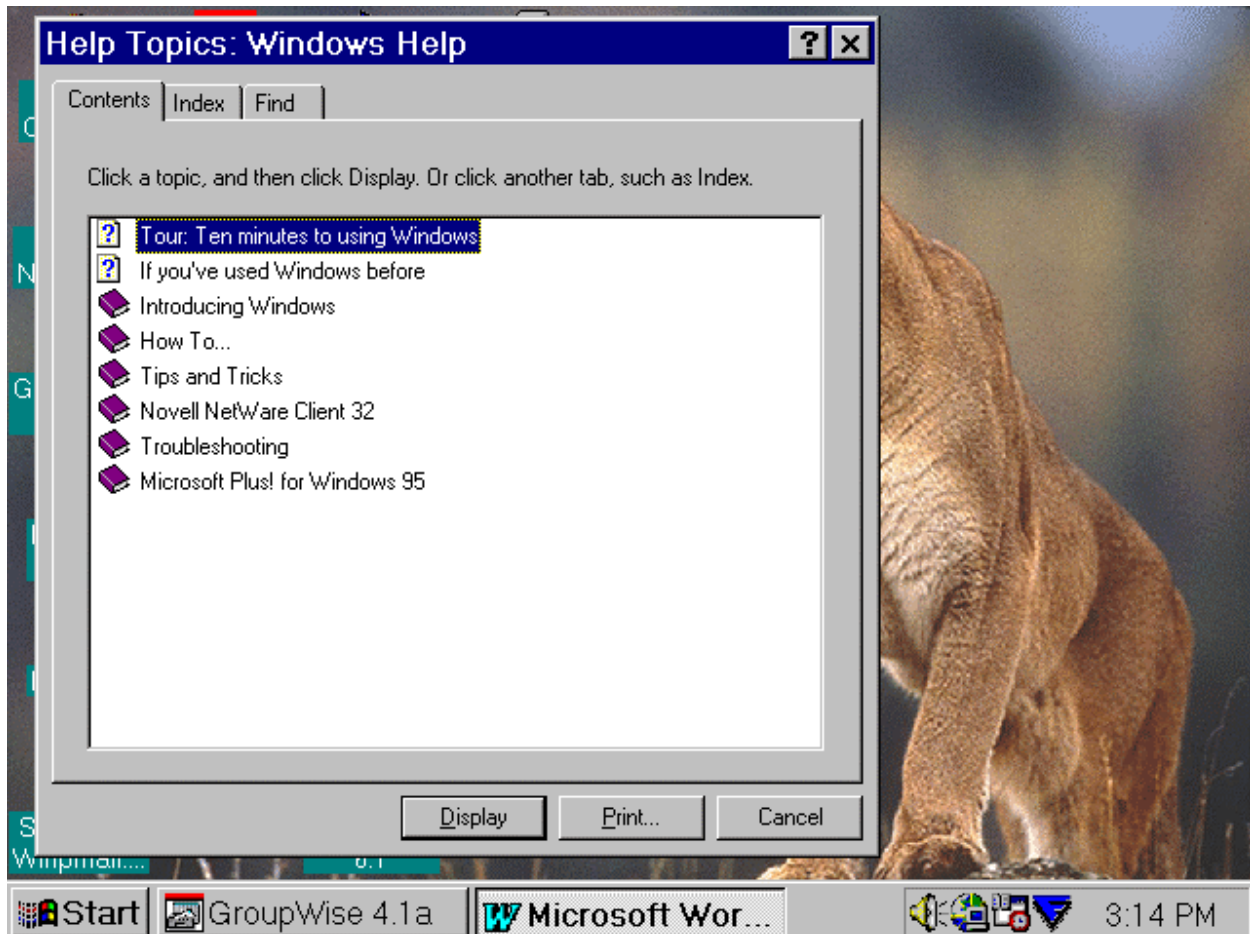
- must always use to exit windows to close temporary files.



## Run

To execute programs from a floppy disk, CD-Rom, or any program you know the .EXE file name.

**Help** Contents and Index. Contents will give help in book form, by showing chapters and subchapters, with a more leisurely style of learning. Index lets you type in key phrases, so you can quickly go to your specific need.

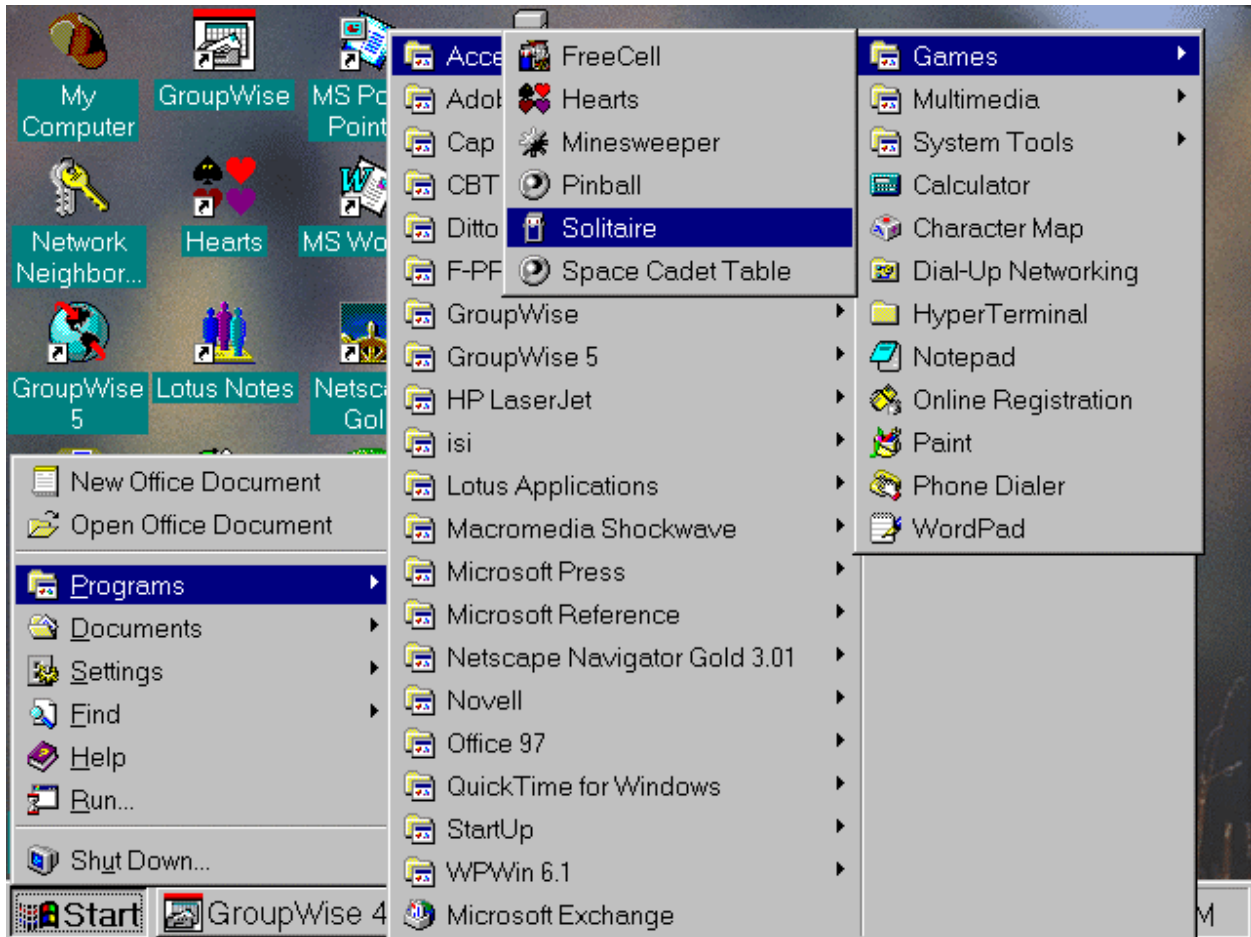


**Find** You know it's there – but which directory. Use FIND to locate files. By typing in any part of the file's name, you can locate all matching files, and choose from the list.

**Settings** To change the setup for all the devices on the computer, as well as printing, and the look of the TaskBar.

**Documents** List of most currently used documents, for easy access to the document and program used, rather than going through Programs, and then opening the document.

**Programs** All installed programs will show up in the Programs list. Any items with the arrow to the right of the name has additional selections to choose from. Those items without the arrow to the right is a program into itself, and is executed directly from the list, i.e. Windows Explorer.



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## PRACTICE TIME

To learn how to use the TaskBar, Start button, and Programs, we are going to play Solitaire.

To find the game, we need to start at the START Button, by pointing the mouse at START, and click once on the right side of the mouse.

Slide the mouse pointer to the word PROGRAMS, which will bring up another group box of program names. Slide the pointer to the group named ACCESSORIES. Slide the pointer to GAMES, and then to SOLITAIRE. Click once on SOLITAIRE.



## SOLITAIRE

Turn cards over with single mouse click, drag and drop cards to different stacks, and double click to move to "Ace" stacks. This program teaches Mouse Skills (Hand-eye coordination). The program won't allow you to cheat and move the wrong card.

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**TITLE BAR**

Notice the title bar on the Solitaire window. Notice the name of the program on the left, and the 3 icons on the right. **Minimize, Maximize/Restore and Exit.**

1. Practice minimize and maximize, and restore.
2. Make sure you are not maximized, so you can resize the window on its borders.
3. Also you can move the entire window by pointing to the title bar and dragging.

**MENU**

Look at the menu – Game, Help. Notice one character is underlined This allows for using the Keyboard to access the menu by using Alt+ the underlined letter, as well as pointing and clicking on the menu item.

All Windows 95 programs will have menus with the same Alt+ underlined letter functions. Some menus will include other shortcut keys for different needs – CTRL+P to Print, CTRL+S to Save.

All Windows programs will have help screens, some more extensive than others.

Changes to the program can be made from the menu, such as looking at **Game, Options** to change the number of cards drawn at one time, or the different ways to score the game. Choose **Game, Deck**, you can change the front of the cards to a different design. This is also where you can **deal** yourself a new game, or **exit** the program.

*Word Processors*

Word Processors are usually the first application that leads people to using a computer for their work. Word Processors will normally have the following capabilities built into them. Spell checking, standard layouts for normal documents, the ability to have some characters appear in bold print, italics, or underlined. You can center lines, make text line up on the left side of the paper, or the right side of the paper. You can save the

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	document so it can be used again, and you can print the document. Two of the most common programs are WordPerfect and Microsoft Word.
<i>Spreadsheets</i>	Calculation packages – need to do a budget or your checking account. The spreadsheet packages are designed to use number and formulas to do calculations with ease. The most commonly used are Microsoft Excel and Lotus 123.
<i>Data Bases</i>	Do you have to manage lots of lists? Membership lists, students, grades, instructors all have to be maintained by something so you can find what you need quickly and accurately. Database programs are designed for this type of application. Some of the most commonly used are Microsoft Access and dBASE.
<i>Graphic Presentations</i>	Do you have to give presentations using overheads? The presentation programs can make this chore an easy one. The most recognized are Microsoft PowerPoint and Harvard Graphics.
<i>Web Browsers</i>	Everyone is wanting to go surf the Internet. Web Browsers provide an easy to use way to do this task as well as provide a way to get to public accessible information. Do you want to see the President's budget proposals – check out the web page at the White House. Use search engines to find people, places, and things world-wide. To date, no other planet has placed web pages on the web – but nothing should surprise you!  The two most popular web browsers are Netscape and Microsoft Internet Explorer.

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## Directory Structure of Drives

A: Drive, S: Drive, H: Drive - it sounds like a bad game of Wheel of Fortune. What does it all mean to the computer user.

These letters actually are short cuts for the longer names of drives. Instead of saying the floppy drive on top, you say - Drive A. Instead of saying the other floppy drive, you say Drive B. Drive letters C, D, and E are reserved for additional components on your physical PC. Drive C is your hard drive. Drive D is usually the CD Rom drive, unless you have more than one hard drive, in which case it becomes Drive E.

Any drive letter that begins with the letter F: through Z:, are network drives and are not physically located on your PC, but on a remote network server that is connected to your PC by a network card and a cable, or perhaps a phone line.

Each drive can be divided into directories - or not. Because a floppy drive only holds a limited amount of information (3 1/2" high density disk - 1.44MB), you don't normally create directories, but you can.

The larger physical drives, as well as the network drives, would be impossible to deal with if they weren't divided into smaller components called directories, and also known as folders.

For instance, if you decide to install the Microsoft Office Suite on your hard drive, you would create a directory called MSOFFICE. You could then have subdirectories under this directory for the different products available, like WORD, EXCEL, POWERPOINT, and ACCESS. Then each of these products have directories for their particular needs, like TEMPLATES, MACROS, DOCUMENTS, and GRAPHICS.

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It is starting to look like an organization chart.

