

# IC3 Training & Testing \* Computer Fundamentals \* HW \* Page 1

## Computer Systems:

Main Frame Systems	MultiUserS * Room Size & Costly & Hi Speed
Minicomputers	MultiUserS * Part of Room Size & Not so costly
Microcomputers	Small & Cheap * Individual Users & Home/Office
Notebooks/Laptops	Small & Relatively Cheap for Individual Users
Personal Digital Assistants (PDAs)	Very small & Somewhat Costly * Individual Users
( <u>PDAs</u> : Appts, Phone #s, Notes <b>Adv</b> <u>PDAs</u> : Email, WWW, Images)	

Workstation can be any PC ( Tower or Desktop) normally considered a PC without Hard Drive since it does store applications & data it needs Main Frame or MiniPC access.

## Computer Networks:

Network is many PCs hooked together allowing many users simultaneous access to same applications and data. PCs can communicate and share resources.

<u>LAN</u> Local Area Network	Small to Medium Company    Short Distance
<u>WAN</u> Wide Area Network	Medium to Large Company    Long Distance
<u>MAN</u> Metro Area Network	City Wide Comm & Shared Resources
<u>CAN</u> Campus Area Network	Campus Wide Comm & Shared Resources
<u>HAN</u> Home Area Network	<u>Wired</u> or <u>Wireless</u> Network for Homes

All PCs on a network require a **Network Interface Card** (NIC) which connects the PC to the network via Wired or Wireless Connections allowing high speed access.

PCMCIA: Personal Computer Memory Card International Association Notebooks or Laptops.

**Traditional** Trend of Network Server stores **all** data and programs in network system.

**Contemporary** Trend Network Client/Server Technology with individual PCs containing programs so as to be stand alones but data is stored on Server.

## **Features and Benefits of Networks:**

Share Info & Resources	Large Storage
Lower Cost to upgrade	Organized Data Storage
Maintain Updates	Administer & Maintain Security
Easy SetUp of New Users	Ability to Back Up & Restore All Data
SetUp Different and Roaming Profiles (Persona Settings) for all Users	
Secure remote access for trips and home use as well as Virus protection	

## **Interacting with Networks**

UserName: Alphanumeric    Password: Alphanumeric at least 8 or more

User Profile defines User Privileges and Access to Volumes, Drives, Printers, Folders, ( Also, known as Personal Settings for Desktop, Display, etc... )

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### Elements of a Personal Computer:

- User:** Central or Key element, who dictates and performs tasks.  
**Hardware:** Keyboard, Mouse, System Unit or Box, Monitor, Printer  
**Software:** Applications or Programs to be accessed by User  
(**Programs** are coded set of instructions) (**Instructions** are a series of On/Off signals)  
**Electricity:** enables all to work On/Off signals Telegraph similar Dots & Dashes

Simple PC task(s) using all elements is to create a letter or spreadsheet or data file or drawing.  
On/Off      Select Application      Keyboard Input      Save      Print Out

### Components of a Personal Computer contained in a System Unit or Box:

<u>Monitor</u>	<u>ROM</u>	<u>RAM</u>	<u>Printer</u>
<u>Keyboard</u>	<u>BIOS</u>	<u>CPU</u>	<u>Mouse</u>
	<u>HD</u>		

**Memory Storage:** Floppy A, Zip Drive, CD / DVD, Flash Drive, Flash Pen

Personal Computer arrangements are either in a **Tower** or **Desktop** Model  
**Motherboard** contains CPU, RAM Cards, ROM BIOS, e.g. Daughter Cards ???  
Slots on MotherBoard: RAM, Video Card, Sound, Modem, Serial, Parallel, USB, etc...  
**CPU** is called the Brains or Central Processing Unit / Microprocessor Chip  
Three Major Speeds in System Unit: CPU Speed, Chip to Chip Speed, Interface Speed  
Older Sys: 8088, 80286, 80386, 80486      New Sys: Pentium, Pen I, Pen II, Pentium 4  
Speeds Starting at 4 to 10 MHz      Speeds Ending up at 1.4 to 2.5 GHz (+)

Multi-Media eXtention (**MMX**) Technology is the ability to play Video and Audio  
Power Supply in System Unit converts 110VAC to 5V-CKT Boards & 12V DC-Drives  
**Expansion Slots:** Internal PCI Exp Slot, Int ISA Exp Slot, SCSI Exp Slot  
Memory, Sound, Video, Modems, Scanners, Digital Cameras, etc...

### Memory Types: ( Volatile – Temporary      Non-Volatile – Permanent )

**ROM:** Read Only Memory BIOS: Basic In / Out System ( Starting, Checking, Loading )

**RAM:** Random Access Memory ( Software, Data, Information )

**Hard Drive:** Software Programs, Applications, Utilities, Data, etc...

**CD / DVD** ( Temporary and normally Read / Write )

**RAM** user input data or information      **Also**, System / A&V Information / Cache

**RAM:** Bytes: Letters, Numbers, Symbols      **Code** On/Off signals/switches: 10110011

Kilo = 1,000      Mega = 1,000,000      Giga =  $10^9$       Tera =  $10^{12}$

**Cache:** Temporary Storage of Information for later & quick access How Cache Works?

**SRAM** – Static & Hi Speed & Internal      **DRAM** – Dynamic & Slower & Cheaper

**Level I** – Internal or Primary & Small      **Level II** – External or Secondary & Larger

**SIMM** – Single Sided Inline Memory Module      **DIMM** – Double Sided Inline Memory Module

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### In & Out Devices:

Input: Keyboard, Mouse, Microphone, Scanner, Digital Camera/Camcorder  
Output: Monitor(Soft), Printer(Hard), Speakers, TV/VCR Converter, Projector  
 Communicate with Internet & WWW using Networks and Modems  
 All peripheral devices are connected at the back of the System Unit or Box.

If any device becomes loose Turn PC **OFF** tighten then Turn PC **ON**

**Paralled Port, Serial Port, Video Port, USB Port, Keyboard Port, Mouse Port,**

**Keyboard:** Alphanumeric characters ( Letters, Numbers, Symbols = Bytes )

Common Keyboards are of a **QUERTY** type: Letters in Top Left Row of Letters.

<p><b>ESC</b>  <b>Tilda</b>  <b>TAB</b>  <b>Caps Lock</b>  <b>Shift</b>  <b>Ctrl, Ws, Alt</b></p>		<p><b>BackSpace</b>   <b>Enter</b>  <b>Shift</b>  <b>Alt, Ws, Menu, Ctrl</b></p>
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**Monitor:** SoftCopy, On/Off, Brightness&Contrast, **Cathode Ray Tube**, **Liquid Crystal Display**

**Resolution:** Sharpness & Clarity Resolution: **Dot Pitch**

**Screen Etching** ( Burning Image ) eliminated by using Screen Saver or Low Brightness.

<b><u>Mouse:</u></b> Wired or Wireless	Wheel Button	Track Ball
One Click (Select)	Double Click ( Execute)	Right Click (Menu)
Left Drag (Move)	Scrolling (Up & Dn)	Right Drag (Mo&Co)

**Microphones**  
 Omi & Uni Directional

**JoyStick**  
 Control Pad

**Speakers**  
 Volume & Options

**Digital Cameras**  
 BMP, Gif, JPEG

**Scanners**  
 Flatbed, HH, Vertical

**Camcorders**  
 Analog or Digital

**TV/VCR Converters**  
 Analog to Digital

**Digital TVs**  
 Not Analog

**Data Projectors**  
 PC to Screen

**Floppy A Drives**  
 Tracks/Sectors

**Zip Drives**  
 Track/Sectors

**Jazz Drives**  
 1 to 2 MB

**CD Drive**  
 650 to 750 MB

**DVD Drives**  
 4.7GB

**Tape Drive**  
 250MB to 80GB

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### Common In/Out Communication Ports (Connectors)

<u>Serial</u> Port	9 Pin DB	Mouse, Modem, Digital Camera
<u>Parallel</u> Port	25 Pin DB	Printer, Scanner, Zip
<u>Video</u> Port	15 Pin DB	Monitor or Projector
<u>SCSI</u> Port	50 Pin DB	Small Computer System Interface
<u>USB</u> Port	Connector	Universal Serial Bus ( Hi Speed )

USB allows Hot Plugging or Connect or Disconnect while working.

Modem: Phone, DSL, Cable                      Network: Home, Intranet, Internet  
DSL Modem    Cable Modem

Daisy Chain Devices is connecting in series devices: Parallel => Zip => Scanner

USB and NIC: Hub to connect multiple devices to a single internet connection.

### Common Types of Printers:

Dot Matrix Printers: LQ/NLQ Paper/Ribbon/Pins Tractor Feed/Fan Folder Paper  
Inexpensive and Relatively Inexpensive to operate or maintain

Ink Jet Printer: 64 nozzles 300 to 1200 dpi Similar to DMP operation  
Black or Color Ink is **injected** out through nozzles onto paper

Bubble Jet Printer: 64 nozzles 300 to 1200 dpi Siilar to IJP but heats Ink  
Black or Color Ink is **heated** & bubbles **force** ink out of nozzles onto paper

Laser Printer: Electro Static (+/-) Charges Laser/PhotoDrum/Toner/Paper  
Initial Cost but much better quailty & lower cost per pape operation

General Information on all (3) items from PC TechGuide

Keyboards

Mice

Touchscreen

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### Software Programs:

Used to assist user **perform** tasks. No one is **any better** than another?  
Choice of application depends upon deg of detail and features needed by user.  
**Beta** Copy is preview and evaluated by few. **Gold** Copy to few before Public version.  
**Bugs** (errors) unusual not to have errors. **Patches** are used to fix bugs (errors).  
**Updates:** requirements, regulations, viruses, revisions, etc...

### Operating Systems:      DOS      MSDOS (clones)      PCDOS (IBM)

Collection of programs designed to control communication and interaction with user.  
Operating System (OS) manages:    Input / Output / Storage / Operations  
All PC needs Operating System      Operating System **loaded before** Software.

DOS & MSDOS & PCDOS are older operating systems (Text & Command Driven)  
Microsoft Windows newer operating system using Graphic User Interface (GUI)  
Mac OS (Operating System) is also GUI and WYSIWYG output derived from Unix.  
Unix Operating System (derived from C) Command Driven not GUI however  
Popular with Universities and Research Institutes for detail and controlled work.  
Linux Operating System (based upon Unix and GUI Driven is another popular OS.  
    **DOS** (Disadvantage) limits File Names to 8 and Extentions to 3 Characters.  
    **MS Windows** allows for longer and more descriptive names for files and folders.

### Application Software:

**Production SW:**      Word Processing, Spreadsheet, Data Base, Paint & Draw, etc...  
Word Processor: MS Word, Word Perfect, AppleWorks & Microworks WPs, etc...  
Spreadsheet: MS Excel, Corel Quattro Pro, AppleWorks & Microworks SSs, etc...  
Data Base: MS Excel, Corel Paradox, AppleWorks & Microworks DBs, etc...  
Presentations: MS PowerPoint, Corel Presents, Appleworks & MicroWorks Slideshows

**Communication SW:**    Email: Eudora & MS Outlook      Browser: MSIE & NN/NC  
**Multimedia SW:** Macromedia Flash, Macromedia Director, Hyperstudio, etc...  
**Graphic SW:** Adobe PhotoShop, Print Shop Pro, Microsoft Draw & Art, etc...  
**Paint&Draw:** MS Draw & Art, Paint Shop Deluxe, Paint Programs, etc...  
**Web Design SW:** DreamWeaver, Adobe GoLive, Front Page, HTML Editors, etc...  
**Utility SW:** Norton AntiVirus, McAfee AntiVirus, PC Tools: DiscScan & Defrag,  
    Conversion Plus, Adobe Acrobat (PDF),  
**Accounting SW:** ACCPAC, QuickBooks, PeachTree, etc...  
**Personal Finances SW:** MS Money, Intuit Quicken, Roxio CD Manager, etc...  
**Suites:** MS Office, Word Perfect Office, Lotus SmartSuite, etc...  
**WWW Browsers:** MS Internet Explorer, Netscape Navigator&Communicator,  
    Opera (much smaller in size, quick, stable),  
    Mosaic (first widely-distributed graphical Browser)

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### Cold & Warm Boot Procedures:

**Cold Boot**: Off then On / OS is Loaded / Diagnostic Check / A,C,D, etc.. / User

**Warm Boot**: On then Off then On / Clears RAM / Reloads OS / Best for Restart  
( PC Freezes, PC Locks Up, PC Hanging )

**Glitch**: PC stops working, Mouse freezes, Screen goes Blank, etc...

Step I: Control C Breaks Code or Executes

Step II: Control Break Hold Control and Tap Pause/Break Button

Step III: Ctrl / Alt / Del Hold Control & Alternate Tap Delete

### Boot Procedure or ROM BIOS:

Starting / Checking (Diagnostic) / Loading OS & others...

### **Re-Boot** Procedure:

Start / Turn Off PC / Reset / Easy Reboot Procedure

Press Reset Button below On/Off Button on front of System Unit or Box

**Last Resort** is to Pull the Plug and Wait for at least 30 seconds then Plug In.

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