Backup Troubleshooting:-

Symptom 1: The backup software indicates "Too many bad sectors" on the tap.

You may also see an error such as Error Correction Failed. This type of error generally indicates that more than 5 percent of the sectors on a tape are unreadable. In many cases, this is due to dirty R/W heads. Try cleaning the R/W head assembly. If problems continue, try a new tape cartridge. If problems persist, check the drive's power and signal cables and make sure that they are installed property and completely.

Symptom 2: You experience excessive "shoe shining" during backups

In normal tape drive operations, the tape drive writes data to a single track from one end of the tape to another: It then writes data in a parallel data track back to the beginning of the tape, and so on, until the tape is full. Shoe shining refers to frequent back-and-forth tape motion. If you have the backup window open, minimize it. With the window open, the system has to continually update the screen, and this takes resources away from the software sending data to the tape drive. If the PC offers a "turbo mode," try disabling the turbo mode (especially when using parallel port tape drives).

Symptom-3: You encounter "media errors," "bad block errors," "system errors," or "lock-ups"

These types of problems are known to occur with travan tapes, and there are several possible problems to consider. First, try removing and reinserting the Travan data cartridge.

Symptom-4 : You cannot restore older backups under Windows XP:

For example, when you try to restore a backup in Windows XP that was created under Windows 98 or Me , you may have to receive following error message as,

"Unrecognized media : The backup file contains unrecognized data and cannot be used as backup utility: An inconsistency was encountered on the requested media."

This problem occurs because the Windows XP backup software doesn't recognize the software compression format used by older version of Microsoft backup. Ntbackup only recognizes tapes that you create with Backup do not use software compression. Also since ntbackup is designed to recognize only the .BKF file format, ntbackup doesn't recognize .QIC files that you create with Backup. The solution to this problem is you may opt for a backup application that offers better compatibility across any OS platforms.

Symptom-5 : Backup cannot restore a file form multiple Disks:

When you try to use the backup utility in Windows 98/Me to restore a backup set created in Windows 95 that spans multiple disks , a new folder may be created but the file in the backup set may not be restored. This trouble occurs when your backup set contains a file that spans multiple disks. Windows 98/Me cannot restore a Windows 95 backup set that consists of a single file that spans two or more disks. To work around this problem, use the backup utility in Windows 95 to restore your file. To correct this problem for the future do not use the Backup tool in Windows 95 to back up a single file that spans multiple disks.

Symptom 6 : Backup doesn't see removable media drives as backup devices:

When you click the where to back up box in backup under Windows 98 to view your backup devices, removable media devices like floppy drives, zip drives , jaz drives etc… do not appear on the list. Unfortunately , a removable media drive is not recognized as a backup devices like tape drive, but instead as recognized as a regular drive with a drive letter. If you want to back up to removable media, click file in the where to backup box when you make a backup.

Symptom 7 : You cannot restore from multiple tapes if one or more tapes is damaged:

For example when you try to use backup for Windows 98 to restore files from a backup that spans multiple tapes, you may receive an error message that says the backup media is damaged. If you then click OK or cancel, the restore process stops, and you are not prompted to insert the next tape. This trouble occurs when one of the backup tapes is damaged. To solve this problem, manually restore whatever files you can from each tape which defined by step by step procedure as follows :

(i) Click Start, Go to program then to accessories , the go to system tools and click backup

(ii) Insert one of the tapes from your backup set into the tape drive, and then click refresh on the restore tab. Note that you cannot restore damaged files from this tape.

(iii) When you receive a message that says your backup spans(duration) multiple tapes, click no.

(iv) From the list of files on that tape, highlight the files you want to restore, and then click Start. Repeat this process with each tape in the set until you restore all the files you want.

(v) Finally quit the backup.

BIOS Upgrade Troubleshooting:

Symptom - 1: The flash loader utility refuses to run

This is a known problem with BIOS flash utilities that have been customized for particular motherboard. For example, the MR BIOS ZIP file includes a flash loader that as specifically customized for certain Intel motherboards The file name of that flash loader will resemble the BIOS image file name (with the. BIO extension)- but other generic motherboards will typically use Zip files that contain either 29C010.EXE or28F010.EXE (or both) flash loaders.

In most cases, the flash loader attempts to qualify the flash ROM in your computer as a type that it's able to program if not, an error message to that effect is displayed, and the flash loader aborts. When this happens, you should check that a "flash-protect" jumper is set correctly to permit flash operations. If your motherboard is set for flashing but the flash loader utility refuses to run, chance are that you're trying to install a BIOS upgrade that is not intended for your specific motherboard. Verify that you've downloaded the correct BIOS update and flash loader utility. Do not attempt to "force" a flash update by using other flash loader utilities.

Symptom -2 : You receive "erase chip failure" when trying to run a flash loader

The flash BIOS chip must be erased before the new BIOS code can be programmed into the chip. The flash loader program is reporting that it cannot erase the flash chip, which may be due to several reasons.

The flash chip's voltage setting may be set to a different voltage than the chip requires. For example, most flash BIOS chips are 12 volts, but some manufacturers deliberately set the flash voltage setting on the motherboard to 5 volts. This acts like a "write protect" for the BIOS chip, which means you cannot reprogram the BIOS without first setting the voltage jumper back to 12 volts. This also protects you from certain vviruses such as the CIH virus that would try to erase the BIOS and effectively "kill" your computer. Consult your motherboard's manual for the location and settings of your "flash voltage" and "write protect" jumpers.

In other cases, the motherboard's manufacturers may are installed a flash BIOS chip that the flash loader cannot erase. Verify that you've downloaded the correct flash loader and BIOS update file for your particular motherboard. You may need to download and use a different flash loader. If there is no alternate flash loader utility for your motherboard, it will be necessary to replace the BIOS chip.

Symptom -3: You receive a "flash chip not supported" error when trying to run a flash loader

The flash loader utility must first check the type of flash chip that is currently installed on the motherboard, then determine whether the flash loader can read and write to the flash chip safely. When you encounter this error, the flash loader is indicating that it does not recognize the type of flash chip currently installed on the motherboard. Verify that you've downloaded the correct flash loader and BIOS update file for your particular motherboard. You may need to download and use a different flash loader. If there is no alternate flash loader utility for your motherboard, it will be necessary to replace the BIOS chip.

Symptom -4: After installing a new BIOS, the system now asks for a password

Your BIOS stores the configuration data for your system in the CMOS RAM/real- time clock chip that is installed on the motherboard. The data values for the new BIOS may differ from your original BIOS data configuration since new commands and features are added to newer versions of the BIOS. The first time you turn on the computer after installing the new BIOS, your new BIOS is reading the data configuration and mistakenly thinks that a password is set.

To correct this problem, you must clear the old configuration data from your CMOS RAM chip. Some motherboards offer a "clear CMOS" or "Clear Password" jumper located near the CMOS RAM/RTC chip. When this jumper is set and the system is booted, you can erase the CMOS data. Turn Off the PC and reset those jumpers to their original positions; then restart the system directly to the CMOS setup and reconfigure each of the system's setup values.

Symptom -5: After flashing the BIOS and reloading the system setup, the system refuses to recognize your drives:

This is almost always due to unforeseen motherboard updates that the BIOS was not designed for. During the course of a production run, a motherboard manufacturer may make a design change that may be as simple as a wiring trace change, or as complex as changing the components used on the motherboard. For example, When the super I/O chip of the

motherboard has been changed, the BIOS can no longer initialize and "talk" to the IDE controllers in effect, this "cuts off" your hard drives. In most cases you'll need to contact the motherboard maker and determine whether a new BIOS chip is available to replace the existing BIOS chip. If you have original BIOS file on diskette, you may be able to reflash the original BIOS back to the system.

Symptom -6: After installing a new BIOS, you cannot print under DOS or Windows:

Chances are that the new BIOS has defaulted the printer port to "standard" mode (SPP), which is inadequate for your particular printer. You'll need to enter the CMOS Setup and change the parallel port mode setting to EPP or ECP, and verify that your LPT1 port is set to address 378h. Save your changes and reboot the system.

Symptom -7: You cannot flash a MR BIOS version on a super Micro motherboard:

Super Micro motherboards normally use a 28F001 flash chip that contains a boot block loader. To use MR BIOS on this type of motherboard, you must overwrite this boot block with MR BIOS boot code. To update the motherboard to MR BIOS, you'll need to use a flash loader from MR BIOS that is specifically designed work around this boot block issue:

Symptom -8: The PC does not boot after upgrading the BIOS:

This is a classic problem that frequently haunts technicians. When you have replaced the physical BIOS chip(s), double-check the chip(s) for proper orientation and installations. Make sure that all of the pins are inserted into the socket, and that none of the DIP pins have been bent under the chip's body. If you're replacing "even and odd" BIOS chips, make sure that you have not accidentally transposed the even and odd chip locations. If the problems persists, try replacing the original BIOS Chips—if the original chips work, you may have defective or improper replacement chips.

Symptom -9: You accidentally reset or power-down the PC during a BIOS flash, and now the PC won't start :

The great weakness of flash BIOS is that it cannot be interrupted once the flash process is under way—otherwise, the BIOS will be left partially programmed and totally corrupted. Your only course of action here is to replace the BIOS chip or restore the original BIOS from the boot block.

Symptom -10: The BIOS upgrade proceeded properly, but now the system behaves erratically, or other errors appear:

There are several potential causes here. Most of the time, you've either flashed the wrong BIOS version, or the BIOS became corrupted during the flash process. If you made a backup copy of the original BIOS file during the flash process, repeat the process and restore the original BIOS version. If the system works, you can verify that you downloaded the correct flash file.

Symptom -11: The BIOS upgrade proceeded properly, but system performance seems poor:

This is a frequent complaint with BIOS upgrades. In many cases, a new BIOS will require you to restore or tweak your CMOS setup for proper performance. If you recorded your original CMOS setup contents before attempting your upgrade, you can enter the CMOS setup and compare the current settings to the original ones. Chances are that one or more performance-oriented settings have been disabled.

Symptom -12: You see a message such as " Update ESCD Successfully" on boot-up:

This is not really an error, but more of an informational message. The ESCD is a method that the BIOS uses to store resource information for both PnP and non-PnP devices. The reason it shows this message is because the system has at least one legacy device in it and it is running Windows 98/Me/Xp. The ESCD boot-up sequence arranged by Windows 98/Me/Xp is different from the ESCD boot-up sequenced arranged by the BIOS. So on boot-up, the system BIOS will attempt to update the ESCD. This will in no way affect system performance.

Symptom -13: You just upgraded the BIOS and now can't boot from the A: drive:

Otherwise, the A:drive seems to be working normally. In virtually all cases, the updated BIOS defaulted the CMOS setup to a Boot Sequence of C:/A:, so the system isn't even checking the floppy drive at startup. Start your CMOS setup and tweak the "Boot Sequence" to A:/C:, and then save your changes and try the system again. Also verify that you actually have a working bootable floppy disk in the drive.

Symptom -14: You get a message saying: "Incompatible BIOS translation detected-unable to load disk overlay" :

This typically happens when you upgrade a BIOS to support new drive features, but the hard drive in your system is already using overlay software such as Disk Manager, Since overlay software is usually incompatible with LBA and other drive features, you'll need to either disable LBA in the CMOS setup, or remove the overlay software from the hard drive. Since you probably upgraded the BIOS to support LBA anyway, chances are that you'll want to remove the overlay software:

CMOS Maintenance and Troubleshooting:

Symptom -1: Changes to CMOS are not saved after rebooting the PC:

In virtually all cases, you have exited the CMOS Setup routine incorrectly. This is very common oversight (especially given the proliferation of different BIOS version and CMOS Setup). Try making your changes again, and then be sure to select "Save Then and Exit and Reboot" or "Exit Saving Changes' from the Setup utility's main menu.

Symptom -2: The system appears to be performing poorly:

The system must be stable. If it crashes frequently, or certain devices refuse to work, you may be dealing with a system conflict in hardware or software. Use a diagnostic tool such as the Device Manager (in Windows 9X/Me/XP) to help identify and correct possible points of conflict.

If the system is free of hardware or software conflicts, you can focus on performance. Performance is often a subjective evaluation and should first be verified using a benchmark test compared to other similar PCs. If you find that your particular system is performing system is performing below its optimum level, suspect a CMOS Setup problem. In some cases, the CMOS/RAM may have been loaded with its "power-on" or "auto configuration" defaults. While defaults will almost always allow the system to function, they will rarely offer top performance. Check the advanced CMOS and chipset setup pages.

Symptom -3: CMOS Mismatch errors occur:

These errors occur when the PC hardware devices found during the POST (e.g., hard drives) do not match equipment listed in CMOS. In most cases the CMOS backup battery has failed and should be replaced. You can then load the CMOS defaults and tweak the setup as necessary to optimize the system. Otherwise, refer to the "Basic CMOS Optimization Tactics" Section earlier in this Chapter.

Symptom -4: Some drives are not detected during boot:

This happens most often with hard drives or other devices in the Basic CMOS Setup Page. In some cases, the device simply may not be listed or entered properly. (E.g., You may have forgotten to enter your newly installed hard drive or floppy drive in the CMOS Setup.) Try to autodetect or autoconfigure any drives. In other cases, the drive may need more time to initialize at boot time. Try increasing the "boot delay" or disabling any "quick boot" feature that might be in use.

Symptom -5: The system boots from the hard drive, even though there is a bootable floppy disk in the drive:

Note that the system still boots and runs properly. The floppy disk is fully accessible. This type of issue is usually not a problem, but due instead to an improper boot sequence. Most BIOS versions allow the PC to search through several different drives to locate an operating system and will boot from the first suitable drive where an operating system is found. Chances are that your boot sequence is set to "C:A:", where drive C: is checked first. Since drive C: is connected and functional, drive A: will simply be ignored. To boot from the drive A:, you'll need to change the boot sequence to something like "A:C:" Remember to save any changes before exiting the CMOS Setup.

Symptom -6: Power management features are not available:

First, make sure that your BIOS supports power management to begin with. Modern PC power management is typically handled by a combination of BIOS and the operating system. However, power management must be supported by BIOS and enabled under the CMOS Setup in order fr the operating system to muse of it. IF you can't use power management, it probably isn't enabled in the CMOS Setup. Check the Power Management page of your CMOS Setup, and make sure that power management features are enabled. You may also want to review and adjust the various device timeouts as required. When you restart the operating system, you should then be able to configure the corresponding power management features.

Symptom -7: PnP support is not available, or PnP devices do not function properly:

First, make sure that your BIOS supports plug-and-play(pnp) standards. If not, you'll need to employ a DOS ISA Configuration Utility to support any PnP devices in the system. Also make sure that you're using an operating system that supports PnP. If you can't get support for PnP devices, make sure that PnP support is enabled in the CMOS Setup, and verify that PnP-related settings are all configured properly. If necessary, try loading the BIOS defaults for your CMOS Setup, which should give you baseline PnP support if your BIOS and OS support it. Be sure to record your original CMOS settings before attempting to load defaults.

Symptom -8: Devices in some PCI Slots are not recognized or not working properly:

First, make sure that your motherboard supports PCI slots, and verify that there is at least one PCI adapter board in the system All systems today will support PCI. Consequently, there is a proliferation of PCI-related configuration settings in the PnP/PCI area of a CMOS Setup, s it is extremely difficult to suggest any one probable oversight. If you cannot get PCI devices to work, try loading the BIOS defaults for your CMOS Setup, which should give you baseline PCI support. Be sure t record your original CMOS Settings before attempting to load defaults. If your motherboards was designed early during the development of PnP, you may need a BIOS upgrade to provide adequate PnP support.

Symptom -9: You cannot enter CMOS Setup even though the correct key combination is used:

Make sure that you're pressing that key combination quickly enough. Many BIOS versions only allow a few moments during POST to enter CMOS Setup. Once the operating system begins to load, you'll need to reboot. Also verify that you are in fact using the correct key or key combinations. It is also possible that access to CMOS Setup has been disabled through a motherboard jumper. Refer to the documentation for your particular motherboard, and locate the "CMOS access" jumper. The jumper should be in the position that allows access.

Symptom -10: The system crashes or locks up frequently:

There are many reasons for a PC to crash or lock up. Everything from a hardware fault to a bad driver to a software bug can interfere with normal system operation before you check the CMOS Setup, run a diagnostic to verify that the system hardware is performing properly, and check that there is no hardware conflict in the system then check the Device Manager and look for any signs of conflicting or inoperative devices. If the system runs properly When DOS is booted clean, there may be a buggy or conflicting driver that is interfering with system operation.

Symptom -11: COM ports don't work:

Assuming that the COM ports are installed and configured properly, operating problems can sometimes be traced to IDE Block Mode or IDE Multiple Sector Mode issues. Try disabling the Block Mode or Multiple Sector Mode, or scale back the block mode to a lower level. Of course, you should also check that the suspect COM ports are enabled and that their resource assignments do not conflict with other devices in the system.

System -12: The RTC doesn't keep proper time over a month:

This is a very common provides for real-time clock(RTC) units. RTCs are notoriously inaccurate devices anyway often straying by as much as several minutes per month. Some third-tier RTCs may be off by more than several minutes per week. In practice, there is very little that can be done to correct this kind of poor timekeeping other than to replace the motherboard with one using a better-quality RTC, or to use a "time-correcting utility" that compensates for the RTC's drift.

Symptom -13: The RTC doesn't keep time while system power is off:

Time seems maintained while system is on, but the RTC appears to stop while the system is turned off. This often a classic sign of impending CMOS backup battery failure. Since the RTC usually takes a bit more power than the CMOS RAM- and CMOS RAM can be maintained by a latent change this kind of "clock stall" is often the first sign that the CMOS battery is failing. Record your CMOS Setup and replace the CMOS battery at your earliest opportunity.

Symptom -14: You see an "Invalid System Configuration Data" error:

This type of error often means that there is a problem with the extended system configuration data (ESCD). This is a storage space for the configuration data in a plug-and-play system. Once you have configured your system properly, the plug-and-play BIOS uses your ESCD to load the same configuration from one boot to the next.

Symptom--15: You encounter "CMOS checksum" errors after updating a flash

BIOS Flashing a BIOS chip will typically require you to clear the CMOS Setup and to reconfigure the Setup again from scratch. Most current motherboards offer a "Clear CMOS" jumper that can be used to wipe out all the CMOS Settings. This is sometimes referred to as a CMOS clear or CMOS NVRAM clear. Try clearing the CMOS RAM, and then load the BIOS defaults. At that points, the errors should stop and you may need to optimize the CMOS Setup entries in order to tweak the system. If you documented the original CMOS Setup entries with PRINTSCREEN before upgrading the BIOS, you should be able to reset key entries in a matter of minutes. Remember to save your changes when exiting.

Symptom -16: You notice that only some CMOS Setup entries are corrupted when running a particular application:

This rare kind of error sometimes happens with several games and other programs on the market that access memory locations used by CMOS RAM and the BIOS data Area(BDA) that are shadowed into the upper memory area. This can alter or corrupt at least some CMOS locations. One solutions is to contact the program maker and see if there is a patch or fix that will prevent CMOS access. Alternatively, try disabling BIOS shadowing features through the CMOS Setup.

Troubleshooting CPU Problems:

Symptom 1: The system is completely dead the system power LED lights properly.

CPU faults is never subtle. When a CPU problems manifests itself, the system will invariably crash. Consequently, systems that do not boot stand an excellent chance of suffering from a CPU fault. The frustration with this kind of symptom is that the PC typically does not run long enough to execute its POST diagnostics, nor does the system boot to run any third-party real-mode diagnostics. As a result, such "dead" systems require a bit of blind faith on the part of a technician.

Symptom -2: You get a beep code I/O post code indicating a possible CPU fault.

The system will almost always fail to boot. When the POST starts, it will test each of the key motherboard components (including CPU). If a CPU fault is indicating during the POST usually a single-byte hexadecimal code written to port 80h and read with a POST card. Check each output from the system power supply.

Symptom 3: **The system boots with no problems, but crashes or freezes when certain application are run:**

It may seems as if the application is corrupt, but try a diagnostic such as AMIDIAG from AMI or tuff test from Windsor Technologies. Run repetitive tests on the CPU. While the CPU may work in real mode diagnostics can detect errors running protected-mode instructions and performs through register checking.

Symptom -4: **The system boots with no problem, but crashes or freezes after several minutes of operation:**

This happens regardless of the application being run. You will also probably note that no diagnostic indicates CPU problems. If you shut the system off and wait several minutes, the system will probably boot fine and run for several more minutes before stopping again this is typical of thermal failures.

Symptom -5: **The system BIOS mis-identifies the processor:**

This frequently happens after a processor upgrade and is almost always due to a problem with the BIOS. Most BIOS versions will query the CPU with a CPUID instruction, then identify the CPU through a look-up table in the BIOS. If the CPU does not have an entry in the BIOS, it will not be identified.

Symptom -6: **An older system refuses to run properly when the CPU's internal cache is enabled.**

This type of symptom occurred frequently with older processors and can almost always be traced to a configuration issue. The processor may fail if run at an incorrect us speed, so check and correct the motherboard bus speed and multiplier to accommodate the specific CPU's requirements. This symptom can also occur when running the CPU at an incorrect operating voltage.

Symptom -7: **You cannot run a 3.45V CPU in a 5V motherboard, even though an appropriate voltage regulator module is being used.**

Here's another problem that frequently crops up with older motherboards. Double-check the voltage regulator module. The VRM must have adequate current handling capacity to support the CPU's power demands. Otherwise, the VRM will be overloaded and fail to provide adequate power. Check with the CPU manufacturers for its VRM recommendations. You might also try the CPU/VRM in another 5V motherboard.

Symptom -8: **A system malfunctions under HIMEM.SYS or DOS4GW.EXE after installing a new CPU.**

This type of symptom occurred frequently with older CPU's and could generally be traced to errors in the motherboard CPU voltage and type settings. Check the motherboard's CPU configuration jumpers.

Symptom -9: **The P4 or Athalon XP speed is reported incorrectly.**

In most cases, the problem occurs because the FSB is set improperly. A Pentium 4 quadraples the FSB, 400MHz becomes 533 MHz), and the Athlon processors double the FSB.

Symptom -10: **L2 cache fails after upgrading to a Pentium OverDrive processor.**

Installing an Overdrive-type processor can sometimes result in the secondary cache being. This is usually due to a BIOS version that is not compatible with the OverDrive processor.

TROUBLESHOOTING COOLING PROBLEMS

Cooling is often one of the most overlooked and neglected features of PC. In many basic off the shelf systems, cooling is sufficient- but just barely(hardly). But over the time, constant use, environmental factors, and upgrades, the cooling plan need to be reviewed or revised. As with many other elements of PC service, successful troubleshooting means knowing where to look. There are different factors when we consider PC cooling and cooling problems, they are :

(i) FAN WEAR
(ii) BAD HEAT SINK CONTACT
(iii) CPU VIBRATION FAILURE
(iv) SUNLIGHT
(v) THERMAL CYCLING
(vi) EXCESSIVE DEVICES
(vii) DUST
(viii) AC POWER PROBLEMS
(ix) BLOCKED VENTS(EMISSION)
(x) EXCESSIVE CPU VOLTAGE

Troubleshooting cooling problems:

Cooling problems manifest(clear) themselves in a variety of ways. That is usually through intermittent(irregular) system operation and frequent failures. To deal with heat problems, the user should know when excessive heating occurs. Nowadays the power management and cooling systems of most motherboards uses hardware monitoring that will report cooling fan speeds and indicate the CPU temperature. The user can then set alarm points that will alert the user if a cooling fan stops and CPU temperature exceeds our preset value. If the user are working with older systems the user can use after market heat detectors to alert the user to excess heat.

Devices like the 110 Alert Motor interior case temperature and processor cooler fan rotation inside any computer. At 110 Fahrenheit(40 degree Celsius) , a loud audible alarm will sound. The 110 alert also monitors electrical current to the processor's cooling fan, so the audible alarm will sound when the cooling fan slows by 30 percent or more. To install a device such as the 110 Alert, connect the spare power lead to the connector labeled"110 Alert" and then connect the opposite end directly to the processor's cooling fan power connector.

The following are the General Symptoms or the problems of the Cooling problems :

Problem or Symptom 1 : The fan is producing an unusual amount of noise, but it seems to be working properly.

Solution to the above problem : The above error can happen after replacing the fan and it is typically the result of fan vibration which are introduced to PC chassis(skeleton). This problem is a rare harmful to the system. It is quite annoying(disturbing).

Now check the way in which the new fan is mounted. See it is mounted properly and you ensure that the damping(wet) material is in proper place. Otherwise you may try adding small

standoffs(fighting) of foam(bubble) around each mounting screw to damp vibration. If till the problem persists, replace the new fan.

Problem or Symptom 2: The fan has stopped turning :

Solution : You may see this problem reported as an alert. First check to see if the fan is the type that works intermittently(irregular) by means of a small internal thermostat. If so the fan may simply have stopped normally. The user must see fan start and stop as required. Because most of the fans run continuously, so if the fan stopped , it may have disconnected or it may be failed.

Check the fan power connection. If the problem persists, try a new fan.

Problem or Symptom 3 : The CPU freezes(over cool) intermittently.

Solution: This is a classic sign of CPU overheating. The overheating sill not necessarily destroy a CPU immediately, or repeated overheating can precipitate(sudden) a permanent failure. Check the heat sink or CPU fan attached to the CPU. The solution is remount the CPU cooling unit if necessary.

Problem or Symptom 4: You are experiencing frequent CPU failures :

Solution : Chronic(persist or constant) CPU failures are rare occurrences and can often be traced to insufficient cooling. Particularly after the system has been overclocked. If the CPU does not have a heat sink, try adding one. If a heat sink is already attached , try a larger heat sink or CPU fan. But if CPU fan is already in use, there may be a vibration problem which shortens the CPU life.

Problem or Symptom 5 : You are experiencing frequent drive failures :

Solution: This problem often particularly for the hard drive failures. When you are replacing the hard drive in an overloaded system, take careful note of the exhaust(weaken) heat and the overall number of devices in the system. If the exhaust is unusually warm(hot) , or there are many adjacent drives in the system, try mounting the replacement drive by itself away from other drives, may be rear(back) drive bay. If possible try mounting the drive vertically. If it is impossible then try to add supplement fan or fan card to improve the airflow inside the cabinet. Also you must fit drive cooling unit inside the cabinet. This is the solution to solve this problem.

Problem or Symptom 6 : The system does not alert user to CPU temperature or fan speed problems:

Solution: Recent PCs typically employ hardware monitoring features that monitor factors such as CPU temperature and fan speeds, then provide alerts if hardware problem arise. In order for a system to use those features , they must be supported in BIOS and operating system, and you must have suitable hardware in place. If this features is not supported, check the system documentation to determine whether this features are supported and think how this features are enabled.

Keyboard Maintenance and Troubleshooting:

Symptom 1: During initialization, you see an error message indicating that no keyboard is connected:

Check your keyboard cable and see that it is inserted properly and completely into the PC connector. Remember that you have to reboot your system to clear this error message. Try another compatible keyboard. If a new keyboard assembly works properly, there is probably a wiring fault in the original keyboard. Given the very low price of new keyboards, it is usually most economical simply to replace a defective keyboard. If you're working on a file or network server, see that the CMOS Setup has enabled the keyboard.

Symptom 2: During initialization, you see an error message indicating that the keyboard lock is on:

In many cases, the detection of a "locked" keyboard will halt system initialization. Make sure that the keyboard lock switch is set completely to the "unlocked" position. If the switch is unlocked, but the system detects it is locked, the switch may be defective. Turn off and unplug the system, then use a multimeter to measure continuity across the lock switch. In one position, the switch should measure as an open circuit. In the opposing position, the switch should measure as a short circuit. If this is not the case, the lock switch is probably bad and should be replaced. If the switch measures properly, there is probably a logic fault on the motherboard. Your best course is to try another motherboard.

Symptom -3: The keyboard is completely dead—no keys appear to function at all

All other computer operations are normal. This symptom assumes that your computer initializes and boots to its DOS prompt or other operating system as expected, but the keyboard does not respond when touched. Keyboard status LEDs may or may not be working properly. Your first step in such a situation is to try a known-good keyboard in the system. Note that you should reboot the system when a keyboard is replaced. If a known-good keyboard works, the fault is probably on the keyboard interface chip. You can attempt to replace this chip if you wish, but it is often most economical to simply replace the keyboard.

Symptom -4: The keyboard is acting erratically. One or more keys appear to work intermittently or are inoperative.

The computer operates normally and most keys work just fine, but one or more keys do not respond when presses. Extra force or repeated strikes may be needed to operate the key. This type of problem can usually range from a minor nuisance to a major headache. Chances are that your key contacts are dirty, sooner or later, dust and debris works into all key switches. Electrical contacts eventually become coated and fail to make contact reliably. This symptom is typical of older keyboards, or keyboards that have been in service for prolonged periods of time in many cases, you need only vacuum the keyboard and clean the suspect contacts with a good-quality electronics-grade contact cleaner.

Symptom -5: The keyboard is acting erratically. One or more keys may be stuck or repeating:

Suspect a shorted or jammed key. Short circuits can be caused by conductive foreign objects falling into the keyboard and landing across PC board contacts. Remove all power and disassemble the keyboard housing assembly. Once the keyboard is exposed, shake out the foreign objects or remove it with a pair of needle-nose pliers or sharp tweezers.

Symptom -6: You see "KBC Error" displayed during system:

When your computer initializes it executes a comprehensive self-test routine that checks the key chips in the system. As part of this power-on-self-test (POST) routine, the computer looks for the KBCLK signal, along with a series of test scan codes generated by the keyboard controller chip. You can see the keyboard LEDs flash as the controller sequences through its codes. If either the keyboard clock or keyboard data signals are missing, the controller sequences thorough its codes. If either the keyboard clock or keyboard data signals are missing the POST knows that either the keyboard is disconnected or the KBC has failed. If you are using a POST board, it will probably display a code corresponding to a KBC error. Unless you have the tools and inclination to replace a KBC controller chip, your best course is simply to replace the motherboard.

Symptom -7: The mouse and keyboard do not respond:

For example, this is known to occur under Windows XP if the system starts in the safe mode after removing mouse keyboard drivers, and is typically caused by a corrupted windows registry. To correct this problem, replace the current registry with the backup copy available in the repair directory using the windows XP recovery console. Alternatively, you may use the system restore feature to try recovering the system.

Symptom -8: A Logitech keyboard malfunctions under Windows XP:

This is typically a software-based problem that is known to occur with multifunction keyboards such as Logitech's Internet Navigator Keyboard, and you may see an error such as Internet navigator has encountered a problem and needs to close.

The trouble can usually be traced to the itouch.exe utility for the keyboard, and results because the utility is incompatible with windows XP. Check with Logitech for updated Windows XP drivers, or remove the offending utility and use the keyboard as a standard keyboard until a fix is available.

Symptom - 9: Windows XP uses an original keyboard layout

For example, the previous default keyboard layout maybe used after you install and configure a new input method editor as the default keyboard layout. This problem occurs when a user without administrator permissions is logged on to windows, or when the default keyboard entry in the registry does not match the default keyboard layout. In virtually all cases, the msctf.dll file doesn't have the correct permissions to configure the new keyboard layout from the registry. This is a problem with windows XP, so check with Microsoft for a patch or service pack that will correct the issue.

Symptom -10: You cannot clear macros from a programmable keyboard.

In most cases, you need to use the correct key combinations to clear the macros. If the keyboard has a REMAP key, press that first. Press the CTRLkey twice to map the key to itself. Press ALT twice to map the key to itself. Press he SUSPEND MACRO key. Press the CTRL and ALT keys while pressing SUSPEND MACRO. This will clear all of the keyboard's programming. The key sequence used for your keyboard may be different, so be sure to check the procedure for your own keyboard. If problems persist, replace the keyboard.

MEMORY TROUBLESHOOTING

1. **Symptom 1 : New memory is installed , but the system refuses to recognize it :**

   New memory installation has always presented some unique problems since different generations of PCs deal with new memory differently. The oldest PCs require the user to set jumpers or DIP switches in order to recognize new blocks of memory.

   For example the i286 and i386 systems use a setup disk to tell CMOS about PC configuration . More recent i386 and i486 systems incorporate an "installed memory" setting into a CMOS setup utility BIOS that must be updated after the memory is installed or updated. The solution to the above problem is first check the memory bank has been filled properly. The PC may not recognize any additional memory unless an entire bank has been filled. This is the solution to above problem. But latest motherboard don't need banks filled in order.

2. **Symptom2:New memory has been installed or replaced and the system refuses to boot:**

   The system may also produce a beep code. Memory installation often produced flawlessly (perfectly). But when boot problems occur, the user can usually narrow the problem down to several key areas. Always start by checking AC power, the system power switch, and power connections to the motherboard. Check that none of the system cabling was dislodged during the memory installation. Also see that all expansion boards and cables are inserted evenly and completely.

   To check the above problem, you must check the memory modules are correctly inserted or not. If not , take the modules out and seat them again making sure that the locking arms are holding the module securely in place. If the problem continues, you probably do not have the right memory module for that particular computer. Make sure that the memory module is the correct art that is compatible with our PC. Finally check for any particular "device order" that may be required by the motherboard.

3. **Symptom3:After adding RAM , the monitor remains blank:**

   This is the common problem occurs during memory upgrades, and is almost always caused by disconnecting the monitor or dislodging(removing) the video adapter. Power down the system and recheck the video card and monitor connection. Then try booting the system again. Double check that you have the memory modules for the computer. For example, if you have non-parity or non ECC memory in computer that requires error-checking memory, or DDR SDRAM memory in a computer that supports on SDRAM.

4. **The system only recognizes half of the newly installed memory at start time :**

   The memory count takes place at POST, but not all of the new memory is recognized by the POST. In virtually all cases, the full capacity of the memory module is not properly read because BIOS may not address the memory module's chip density properly. Hence you exchange the new memory modules for devices with an acceptable chip density. You may also be able to correct this trouble by updating the BIOS.

5. **Symptom5:You see a " Decreasing Available Memory" error message:**
   This is basically a confirmation message that indicates a failure has been detected in memory and that all memory after the failure has been disabled to allow the system to continue operating. Our first step in this problem is we should be to reseat each memory module and ensure that they are properly inserted and secured. Next step is take a good memory module and step through each occupied slot until the problem disappears. The device that had been removed is probably the faulty one.
6. **You find that you cannot use 256 MB DIMMs that contain 64Mbit RAM components:**
   This type of problem may also occur with other memory types and sizes, and is typically caused by a compatibility problem between the motherboard and memory technology. You should double check the manufacturer's recommendations for your motherboard and verify the type of DIMM sizes and technologies best suited to the particular motherboard. Some motherboard models cannot use RAM components on DIMM of that capacity. Hence the solution is try smaller DIMM or use DIMM with less dense memory.
7. **The system intermittently reports errors, crashes or reboots spontaneously :**
   Many potential problem can result in errors, crashes and reboots. But memory issues are very common causes. Possible memory problems include electrostatic discharge(ESD), memory overheating , contact corrosion and a faulty power supply. Memory devices damaged through ESD should be replaced. ESD can typically be prevented through proper grounding of the power supply and the AC electrical receptacle(holder). Contact corrosion can be correlated by cleaning the memory contacts and the slots. If you suspect power supply with a good quality model with enough power to allow for future expansion of the system.
8. **Memory devices from various vendors refuse to work together:**
   The system experiences a memory failure during the memory count at start time. The problem often occurs when the memory modules appear identical , but subtle (slightly) timing differences exist that cause system performance or stability problems when modules are paired from different vendors. This tends to be a very machine specific problem. Though it can occur on any PC under the right circumstances. For example Solo PCs can suffer this problem when customers use the same size of memory modules made by different vendors. Hence we try to match the memory modules from the same manufacturer.
9. **After Installing a Rambus Kit, you get a "use 40 ns memory error":**
   For example after installing a Rambus memory kit into a new P4 system, you get an error message such as "memory is not fast enough for the system. Use 40 ns memory". In virtually all cases, the Rambus memory is too slow and the motherboard requires 800 MHz 40 ns Rambus modules or faster. Motherboards running at 533 MHz FSB(Front side bus) may require 1066 MHz RDRAM memory modules.
10. **You see a "ROM Error" message displayed on the Monitor:**
    This error appear in few systems. To guarantee the integrity of the system ROM, a checksum error test is performed as part of the POST. If this error occurs , one or more ROM locations may be faulty. The solution is to replace the BIOS ROM(s) and retest the system.
11. **You see cache memory failure – disabling cache error:**
    The cache system has filed usually on older motherboard. The tag RAM, cache logic (motherboard chipset) or cache memory on our mother board is defective. Our best choice is to replace the cache RAM chip or COAST(cache on a stick) module. If the problem persists , try replacing the cache logic or tag RAM. This is the solution.

12. Windows Protection Errors occur after adding memory modules :

You may find that Windows halts with Windows Protection Errors during boot or randomly crashes with "Fatal Exception Errors" when we open the applications. This is older problem in Intel Thor Motherboard using the CNT BIOS. This issue is usually due to certain third party SIMMs operating at speeds faster or slower than 60 ns.

So we try Some SIMMs from a different manufacturer. It is also possible that a BIOS upgrade may loosen timing enough to make a SIMMs usable. Even with later systems, "protection errors" that appear after adding memory can usually be traced to issues with the memory modules. Check the modules specifications against the motherboard's requirements, and exchange the modules for more appropriate versions if necessary.

13. An error indicates that there is not enough memory to start Windows:

This problem can occur if there is not enough real and virtual memory to start the Windows shell . Start your computer to the DOS prompt and free some space on the hard disk containing the swap file. Once you free some space on your hard disk, restart Windows normally and try to run the program again. If the problem persists , try adding RAM to the system.

14. **The PC halts or crashes when entering a CPU power-down state under Windows 98:**

If your power management settings are configured to allow the processor to enter a "C3" power state on a computer supporting the "Advanced Configuration and Power Interface(ACPI)" standard, you may encounter symptoms such as corrupted memory after several minutes of inactivity.

This problem is due to an issue with the Intel 440 BX chipset under Windows 98 that may allow memory contents to be corrupted when a CPU enters or leaves its power down state. If that motherboard uses the Intel PIX4-E IDE controller chipset, the computer might hang.

To solve this, exit Windows and reboot the computer. Enter the CMOS setup and set the "lv13_latency" entry to a value greater than 0x3E8h. If "lv13_latency" is greater than 0x3E8h, the Windows 98 ACPI driver does not enter the C3 state. Finally you save your changes and reboot the PC for those settings to take effect.

15. Windows appears unstable after disabling Virtual Memory:

There is not enough RAM in the system. This can occur if you disable virtual memory with inadequate RAM in the system. Later versions of Windows Operating System have higher memory requirements than earlier versions. To solve this problem , install more RAM in your computer, enable virtual memory or both. To enable virtual memory under Windows 98 or Me, we do the following steps :

(i) Restart your computer and hold down the CTRL key until the Windows 98 Startup Menu appears.
(ii) Choose safe mode from the Startup menu.
(iii) Click start , then go to settings and click control panel.
(iv) Double click the system , click the performance tab, and click the virtual memory.
(v) Click the option labelled , "Let Windows Mange my virtual memory settings"
(vi) Click OK, click close and click Yes when you prompted to restart your computer.

Troubleshooting a Motherboard

The motherboard is the heart of any personal computer. It is the motherboard that provides system resources , supports the core components such as the CPU, chipset(s), and real time clock (RTC), and handles the system memory. Which includes DDR SDRAM or RDRAM , BIOS ROM and CMOS RAM. Many current motherboards also incorporate additional cost saving features like USB ports, integrated video, onboard sound and Ethernet Port for network access.

Since motherboards contain the majority of system processing components, it is likely that you will encounter a faulty motherboard sooner or later. The BIOS POST is written to test each subsection of the motherboard each time the PC is powered-up, so most problems are detected well before you ever see the DOS prompt. Errors are reported in myriad ways. Beep codes and POST codes provide indications of fatal errors that occur before the videos system is initialized. Still, there are plenty of symptoms that can elude the initial testing at start time. This part of the chapter digs in and presents a lengthy selection of motherboard symptoms for you to reference.

The basics of motherboard troubleshooting includes:

(i) Check all connectors on the motherboard
(ii) Check all socket mounted chips
(iii) Check power levels
(iv) Check the motherboard for foreign objects
(v) Check that all motherboard DIP switches and jumpers are correct.
(vi) Check for intermittent connections and accidental grounding.

Remember that all checking is done when power is switched off.

Symptom-1 : The Slot 1 retention mechanism is not holding the Slot 1 processor securely in place :

You find that there is "play" which allows the processor to move (and possibly fall out of its slot). In virtually all cases, this means the retention mechanism is not mounted securely on the motherboard. It's probably sitting too high, and allowing the CPU to "float." You'll need to check the installation of that retention mechanism. Support the motherboard so that it will not bend while the retention mechanism is being pressed into the mounting holes. (But do not place the motherboard on a hard surface to install the retention mechanism.) If the retention mechanism push pins are not secured properly, the retention mechanism can become loose, causing the processor to disconnect, and even fall out of the motherboard. To install a retention mechanism with captive brass fasteners, simply use a medium Phillips screwdriver the fasteners into the preinstalled brass Pemstuds. To install the retention mechanism with plastic fasteners.

1. Leave space below each mounting hole so that the fastener can protrude through the hole.
2. Find the slot 1 connector on the motherboard.
3. Position the retention mechanism on the motherboard next to the slot 1 connector.
4. Push down on the retention bracket until the black plastic fasteners are correctly seated and the retention mechanism fits snugly against the board.

5. Push each white retainer pin into its respective black fastener until the head of each pins is seated onto the head of each fastener. This should keep the retention mechanism securely in place.

Symptom-2

After removing a hard drive or other IDE device, the system seems to boot slowly, but seems fine otherwise:

This is usually on oversight with the CMOS Setup. Changes are that the BIOS still expects an IDE device to respond, and it is waiting for the device that you removed. This is what causes the delay. If you remove a secondary drive on the primary channel, or any drive on the secondary channel, you should check the CMOSS Setup and set the corresponding drive position to "none" or "not installed." Save your changes and reboot the system. You should see that the BIOS is no longer waiting for devices that you marked out in the CMOS Setup, and there should be no delay during that part of the startup process.

Symptom-3

When upgrading the motherboard, the system won't boot when using an older CPU, but it boots fine with a newer CPU

You find that the older CPU runs fine on another system (so you know that the processor is functional). This generally means that the newer motherboard contains a "lockout" that prevents 66-MHz bus speeds. This forces the motherboard to use 100 MHz or 133 MHz bus speed. If a 66-MHz front side bus processor is installed, the motherboard will simply not boot. If this is the case, there is no way around the problem except to use an appropriate processor model.

Symptom-4 - The motherboard's COM port(s)—or other port—won't work

This type of trouble occurs frequently when the motherboard supplies no external I/O ports—only headers that require you to connect short cables from the motherboard to ports on separate brackets. In almost every case, an inability to use a COM port (or other ports like serial, parallel, and so on) is a result of not using the supplied header cables, or the respective ports are disabled in the CMOS Setup. To ensure that the motherboard is recognizing and initializing the ports correctly, boot the system and check the CMOS Setup. Locate the settings that control your COM ports (or other affected ports). Verify that the ports are enabled. You port header cables closely. See that the header is fit over every pin and is oriented properly (look for "pin l"). Since many motherboard makers use different pin assignment for COM port header cables, make sure that you're using the header cable that's specifically intended for your particular motherboard model.

One other point—if your system has internal modems or other serial devices such as a multi-I/O card with one or more COM ports), see that those other serial devices are not conflicting with the motherboard's COM port(s). You may need to reconfigure or remove the conflicting devices(s).

Symptom-5 - A motherboard failure is reported, but goes away when the PC's outer cover is removed

There is likely to be an intermittent connection on the motherboard. When the housing is secured, the PC chassis warps just slightly. This may be enough to precipitate an intermittent

connection. Replace the outer cover and gently retighten each screw with the system running. Chances are that you will find one screw that triggers the problem. You can leave that screw out, but it is advisable to replace the motherboard as a long-term fix.

Symptom-6

The POST (or your software diagnostic) reports a problem with the floating point unit

Math coprocessor (also called the floating point unit or FPU), problems are generally reported when one or more MCP registers do not respond as expected. Fortunately, MCP faults are not always fatal. It is often possible to remove the MCP or disable the MCP availability through the CMOS Setup. Of course, programs that depend on the MCP will no longer run, but at least the system can be used until a new one is installed. On older systems that use separate MCP chips, the device is socket mounted and should be very straight forward to replace. Be sure to remove all power to the PC, and make careful use of static controls when replacing an MPC. Mark the questionable MPC with indelible ink before replacing it. When the MCP function is integrated into the CPU (as is the case with all current processors), the process is a bit more expensive. You'll need to replace the entire CPU, but the replacement process is no more difficult.(Remember to remount any heat sink/fan assembly properly.)

Symptom-7

The POST (or software diagnostic) reports an interrupt controller (PIC) failure

The programmable interrupt controller (PIC) is often an 8529 or compatible device, and there are two PICs on the typical AT motherboard. (PIC 1 handles IRQ0 through IRQ7, and PIC2 handles IRQ8 through IRQ15.) of the two, PIC 1 is more important since the lower interrupts have a higher priority, and the lowest channels handle critical low-level functions such as the system timer and keyboard interface. Generally, a diagnostic will reveal which of the two PICs has failed. Make sure that there are no interrupt conflicts between two or more system devices. You can then replace the defective PIC. In all current systems, both PICs are integrated into a system controller chip or chipset device. You can replace the defective chip if you have the appropriate surface-mount equipment available, or replace the motherboard entirely.

Symptom-8

A keyboarded error is reported, but a new keyboard has not effect

Remember that traditional keyboards are powered through the PS/2 port, and the +5 Vdc supply is protected by a fuse on the motherboard. (USB keyboards are powered by the USB port, which are relatively immune from such overloads.) The keyboard fuse on the motherboard may have failed. Many motherboard designs incorporate a small fuse (called a pico-fuse) in the +5 V dc line that drives the keyboard. If this fuse fails, the keyboard will be dead. Use your multimeter and measure the +5 Vdc line at the keyboard connector. If this reads 0 V dc, locate the keyboard fuse on the motherboard and replace it. (You may have to trace the line back to the fuse that looks almost exactly like a resistor.) Otherwise, you'll need to replace the entire motherboard.

Symptom-9

The POST (or software diagnostic) reports a CMOS or RTC fault

With either error, it is the same device that is usually at fault. The CMOS RAM and RTC are generally fabricated onto the same device—though some motherboards (such as Intel's D854EBT or D850GB) integrate these features into the Firmware Hub chipset device. RTC problems indicate that the real-time clock portion of the chip has failed or is not being updated.

CMOS RAM failure can be due to a dead backup battery or a failure of the chip itself. When dealing with a CMOS or setup problem, first try a new backup battery and reload the CMOS Setup variables (usually selecting the BIOS Default values will get the system working). If a new battery does not resolve the problem, the CMOS/RTCA chip should be replaced. Often, the CMOS/RTC chip is surface mounted and will have to be replaced (or the motherboard will have to be replaced). However, some manufacturers use a socket-mounted chip including the battery in a single replaceable module (such as the Dallas Semiconductor-type devices). Modules are typically replaceable DIP devices.

Symptom-10

Less memory is detected than the amount you installed.

This tends to be a chipset-related problem where the chipset doesn't support the memory configuration that's installed. For example, when installing two 64MB SIMM's on an older system, only 32MB of RAM are displayed when the computer powers-up. This is known to occur on motherboards with a430VX (or similar)chipset, which-through 128MB of RAM-will not support 64MB memory devices. In actual practice , the 430VX only supports the following memory device:

512K*32-bit (2MB)
1M*32-bit (4MB)
2M*32-bit (8MB)
4M*32-bit (16MB)

The layout for a 64MB SIMM is 16M*32- bit, which isn't the list just shown. When you install tow 64MB SIMMs, the system will use the 4M*32-bit specification to calculate the memory, thus displaying 32MB. This type of problem can also occur on later systems if you attempt to install memory layouts that are incompatible with the PC. Unfortunately, this is a limitation of the motherboard and cannot be corrected without upgrading the motherboard (or using smaller memory modules).

Symptom-11

A PnP expansion card refuses to work on one motherboard, but works on others

For example, you find that Creative Labs PnP sound board refuses to work on one motherboard, but the board works just fine on another motherboard (thought this can also occur with other types of PnP cards.) This verifies that the expansion cad is working properly, and is generally an issue where the PnP BIOS is usually at fault. Check with the motherboard manufacturer to see if there is a BIOS update to correct PnP problems. If not, you may need to disable the sound card's PnP compatibility and configure the card manually (as a legacy device). If that's not possible, you may need to select another expansion card for the system.

Symptom-12 - You cannot control power management through windows

For example, your Power Management icon does not appear in the Windows Control Panel. This occurs even though the APM parameter under the BIOS Power Management Setup is enabled. This problem occurs if you do not enable the APM function before you install Windows 9x/Me. If you have already installed Windows 9x/Me, you should reinstall it. Before doing, so however, make sure that the APM function is enabled. Under operation systems like Windows XP, see that ACPI support (and legacy APM support if available) is enabled in the CMOS Setup preferably before installing the operation system. If Windows does not enable power management functions after enabling ACPI/APM features in the BIOS, reinstall the operating system from scratch.

Symptom-13

The System hangs up or crashes when the chipset-specific PCI-IDE DOS driver is loaded

This is a known problem with Micro-Star motherboard using a VIA VP1 Chipset and Award BIOS 4.50PG. The problem is with the BIOS version and its interaction with the PCI controller portion of the VIA chipset. Upgrading the BIOS version should resolve the problem. Otherwise, it may be necessary to upgrade the motherboard.

Symptom-14 -You customers forget their BIOS password

The PC password is stored in the CMOS RAM located in either the motherboard chipset or the real-time clock(RTC) chip. If it is stored in the chipset, the CMOS memory is backed up by a coin-shaped lithium battery (or other battery). If it is stored in the RTC chip, it has an internal battery to back up the CMOS RAM. For the external battery, first make a complete backup of the CMOS settings. Turn off the system, and then remove the battery for at least two hours. This should clear the CMOS setting and erase the password. For the RTC battery, determine which RTC chip you have. There are five classical kinds of real-time clock CMOS chips:
Dallas DS 12887 Real Time
Benchmarc
Dalls DS 12B887
Dalls DS 12887A
BQ3287A
For the Dallas DS 12887 and Benchmark RTC chips, if you can boot to the A: prompt, flash the BIOS chip with the same boot clock record but different BIOS revision. For example, if you have a P/I P55TP4XE motherboard with BIOS revision 0202, flash the BIOS chip to BIOS revision 0115. A BIOS checksum error will be generated. Enter the CMOS Setup screen, reload setup defaults, and then save and exit. At this point, the password has been cleared. You can flash the BIOS back to the original revision. If you can't boot to the A: prompt, turn off the system, remove the BIOS chip, and insert another with the same boot block record but different BIOS version. Power-on the system again, and press DEL to enter the BIOS setup screen, Reload the setup defaults, and then save and exit.

For the Dallas DS 12887A, there is a jumper on the motherboard that clears the CMOS. Please check your manual for the location of this jumper, which will vary among motherboard . Shorting this jumper should erase the system configuration information (including password) stored in the CMOS. To clear the CMOS, make sure the system is off. Short the jumper for a moment and then remove it. Do not leave this jumper shorted. After clearing the CMOS, the password should be erased. For the BQ3287A and Dallas DS12B887 RTC chips, short the same jumper as in the previous section, but make sure to power the system on and off before removing the jumper.

Symptom-15 - You flash a BIOS, but now you get no video

When you flash a BIOS, The old CMOS settings are usually left useless. This means you'll have to restore the proper CMOS settings before the system may run properly. Clear you CMOS RAM and reload the proper settings (or choose the BIOS Defaults for a good system baseline). The BIOS chip itself may also be troublesome. There are some problems when flashing an older Intel flash ROM chip. Make sure that there are o warnings or cautions in the system documentations or from the manufacturer's Website before flashing a particular BIOS chip. Try restoring the original BIOS if possible, or contact the manufacturer for a replacement BIOS chip. If the problem persists, you may need to replace the entire motherboard.

Sympton-16 - The motherboard fails to auto detect the hard drive parameters

This is a known problem on older Data Expert EXP8551S motherboards, and is due to a problem with Windows 95 in recognizing the PCI/ISA/I/O controller portion of the chipset. You can use the following procedure to force Windows 95 to recognize the chipset properly.

1. Boot up the Windows 95 system normally.
2. Change the directory to /WINDOWS/INF.
3. Edit the hidden file MSHDC.INF.
4. Search for all lines with the "1230" device ID. Copy the lines and replace "1230" with 7010(the correct device ID).
5. Save the file MSHDC.INF.
6. Remove the Standard IDE/ESDI Hard Disk Controller entry from the Device Manager.
7. Restart the computer, and then choose the Windows default driver following instructions shown onscreen.

   If the problem persists, try entering the specific hard drive parameters for your particular drive into the CMOS Setup. As an alternative, you may be able to upgrade the motherboard's BIOS or operating system, or upgrade the motherboard entirely.

Symptom-17 - The motherboard refuses to detect the SCSI controller during boot-up

This problem has been identified with the older Data Expert EXP8551 motherboard, but may occur on many different types of PCI motherboard. In most cases, you will have to change the configuration of your PCI slots on the motherboard. For example, if the SCSI controller is installed on Slot 2, you will need to configure the PCI Slot 2 in CMOS Setup. You can also try moving the card to a different PCI Slot, or upgrade the motherboard outright.

Symptom-18 - The SMP (dual processor) mode refuses to run in Windows NT

The most common problem is an incompatibility with the SMP HAL shipped with Windows NT (versions prior to 3.51) and the motherboard's chipset . If you are upgrading from an older version of NT (prior to 3.51), first install NT as a standard PC (single processor kernel), and then install NT with the default multiprocessor kernel it provides. (NT will not recognize your dual CPUs if you upgrade straight to a multiprocessor configuration). This problem should not occur under Windows NT 4.0 or 2000.

Symptom-20

When attempting to upgrade your flash BIOS, you encounter an "insufficient memory" error :

In most cases, you simply don't have enough conventional memory available to execute the flash program. Most flash programs require about 560KB of conventional RAM. Try booting clean with a DOS floppy disk (without any CONFIG.SYS or AUTOEXC.BAT files), and then run the flash upgrade utility.

Symptom-21 - The system hangs after installing a Cyrix 6x68 CPU

This is a classic symptom related to the processor's interaction with the motherboard. There is probably a problem with the utilization of system cache, which is causing the system to hang. Try disabling the internal (L1) and external (L2) cache through the CMOS Setup. Upgrade the BIOS to provide better 6x86 support, or upgrade the motherboard.

Symptom-22 - External devices do not wake the system

Chances are that you have a power supply issue. You don't need a special power supply to support an "Instantly Available PC" , but the power supply must provide enough standby current to support the needs of all wake-capable devices in the system. The more wake-capable devices in the system (e.g., a LAN card), the greater the standby current required from the power supply. Intel recommends starting with a power supply capable of providing a minimum of 1.5 Amps (2.0 Amps recommended) of +5V standby current. To be sure, total the amount standby current required by the various components that can wake the system from the standby

state. Make sure the power supply provides at least that amount of standby current. In some cases, you may need to upgrade the power supply.

Symptom-23 - You cannot get parallel port devices to work on your motherboard

In most cases, you must set the proper parallel port mode (such as SPP/ECP/EPP) for the particular device you plan to use. Often, setting the port to Compatibility Mode will work for many common peripherals, but not for more advanced printers or interactive devices. Parallel port modes are selected through the CMOS Setup—usually under Integrated Peripherals or some similar heading.

Troubleshooting PnP devices:

The PnP system requires one or more devices like modems, video adapters, chipsets, drive adapters and other hardware elements in the PC. But every device in the PC will be PnP compatible and today's system do contain virtually the PnP devices. The PnP device are capable of identifying themselves and their resource requirements to the rest of the system.

PNP BIOS

A PnP system requires a PnP BIOS particularly at boot time. Since PnP devices initialize in the inactive state by default, the PnP BIOS is needed to initialize the core PnP devices in order to complete the POST and launch the operating system. The original version of PnP BIOS was finalized in May 1994. In October 1994 , additional clarifications are added. The older PnP systems are not fully compliant with the current specification. The PnP support problems on older systems can usually corrected by the BIOS upgrade. Modern PnP systems employ the automatic configuration and power interface standard for device identification and configuration.

Symptom -1: Windows Setup Crashes on first boot after configuring PnP devices:

This problem can occur if all the following conditions exist 1. Your computer has a PCI bus with PCI adapters, 2. There is an ISA Adapter in your computer, 3. The ISA Adapter was not configured before you ran Setup, and 4. You have not changed any of your computer's CMOS Settings.

Symptom -2: Selecting a None of the Above hardware profile under Windows may reset your device configurations:

This problem was known to occur under Windows 95 and earlier versions of windows 98. When you have multiple hardware profiles configured on your system, an option labelled None of the Above is included in the list of available hardware profiles when you start the computer.

Symptom -3: The Energy Star check box is not available for your monitor:

When you check the Monitor tab in the Display properties dialog box under Windows 98, the Monitor is Energy Star compliant check box may not be available. This trouble can occur if Windows 98 is configured to automatically detect plug-and-play monitors.

Symptom -4: After upgrading Windows, the sound device is disabled:

For example, when you check the sound device. Plug and play audio drive sound card in device manager. You'll notice a yellow exclamation point and a status of "Code 10" for the sound card. This problem occurs after you upgrade your Windows 95/98 system to windows 98 second Edition SE or higher.

Symptom -5: The system crashes when you run the Add New Hardware wizard under Windows 98/Me:

This issue may be caused by the incorrect interpretation of data stored in the computer's CMOS RAM. On certain motherboards, Windows 98/Me may not be able to successfully complete the plug-and-play detection process. You can probably resolve this issue by upgrading the system BIOS. In some cases, you can try clearing the CMOS RAM and ESCD RAM first and use if the system is capable of reconfiguring itself.

Symptom -6: you encounter an error when updating a PnP device under Windows 98:

For example, after you update the Crystal Plug and Play Audio Codec driver in your Device Manager, you may receive error message such as:

Crystal PnP Audio CODEC:

Setup cannot upgrade the existing driver for this device. Press OK to continue.

This problem can occur if Windows 98 cannot safely upgrade the driver that's already installed. The problem might also occur if such an upgrade might disable a feature that the current driver provides, or if the information file for the driver is missing. Very that you're trying to update the latest driver for the operating system, and obtain a current .INF file if possible.

Symptom -7: You find that a joystick port is not removed when you remove the sound card:

When you remove a sound card from your computer, and remove the sound card in the Windows 98/ME Device Manager, the joystick on the sound card continues to appear in Device Manager. This trouble occurs because there is no parent-child relationship between the sound card and the joystick port.

Symptom -8: You notice more than one instance of the same port in the Windows 98/Me Add New Hardware wizard:

When you're manually installing new hardware using the Add New Hardware wizard, multiple instances of COM or LPT ports may appear as options in the port selection dialog. This trouble can occur when there are duplicate entries for a COM or LPT port in the registry. Duplicate entries can occur if the computer does not contain a Plug-and-Play BIOS. You may be able to fix this problem by removing all instances of the particular port through the Device Manager, then reboot the system and allow Windows to redetect the port(S) properly.

Symptom -9: You cannot select a higher display resolution in the Windows 98/Me Display Properties dialog:

When you try to increase the screen resolution in the Display Properties dialog. You may be unable to choose a higher resolution than the video system is capable of. For example your monitor may support a maximum resolution of 1600*1200 pixels, but this setting may be missing from the Screen Area box.

Symptom -10: You see wavy lines when using a MAG DX-1795 monitor under Windows 98/Me:

For example, this problem is known to occur with the MAG DX-1795 monitor and may be caused if your video adapter is configured for 1600*1200 resolution, and the automatically detect. Plug & Play Monitors check box is selected on the monitor tab in the Display Properties dialog.

INSTALLING SPEAKERS AND HEADPHONES

If our computer has a sound card and you are probably going to want to hear what our computer is using that sound card for it. In that case we can connect either headphones or speakers to our computer. Most sound card ports and multimedia peripherals are color coded to make hook-up(connect) easier. Standard speaker 1/8-inch phono cables that plug into a sound card are color coded green. The port that we plugged into is green as well. Microphone connections are typically color coded pink. The following diagram shows sound inputs and outputs on a typical computer. They are all 1/8-inch phono jacks.

(a) Head Phone

(b) speaker

INSTALLING THE OPERATING SYSTEM:

Usually, you install an OS from scratch that is, you install it on a computer that currently has no OS. If the computer already has an OS, you will be essentially performing an OS upgrade. In this section, you will learn how to perform an installation of the five main Windows operating system:

 # Windows 98
 # Windows Me

 # Windows NT Workstation
 # Windows 2000 Professional
 # Windows XP Professional.

you will also learn the prerequisites for installation of each OS.

Installation Prerequisites:

Before you can begin to install an OS, there are several items you must consider in order to have a perfect installation. You must perform these takes before you even put the OS installation CD-ROM into your computer's CD-ROM drive. These items essentially set the stage for the procedure you are about to perform:

 # Determining hardware compatibility and minimum requirements
 # Determining installation options
 # Determining the installation method
 # Preparing the computer for installation

Let's begin our discussion by talking about hardware compatibility issues and requirements for installing the various versions of Windows.

DETERMINE THE HARDWARE COMPATIBILITY AND MINIMUM REQUIREMENTS:

Before you can begin to install any version of Windows, it is a important that you determine whether the hardware you will be using is supported by the windows version you will be running. That is, will the version of window have problems running any drivers for the hardware you have.

To answer this question, Microsoft has come up with several version of its Hardware Compatibility disc List(HCL).This is a list of all the hardware that works with window and which version of Windows it works with. You can find this list at Microsoft 's Hardware driver Quality .Before you install Windows, you should check all your computers component against the list and make sure each item is compatible with the version of windows you plan to install.

In addition to general compatibility, it is important that your computer have enough "oomph" to run the version of windows you plan to install. For that matter, it is important for your computer to have enough resources to run any software to plan to use. Toward that end, Microsoft publishes a list both minimum and recommended hardware specifications that you should follow when installing windows.
Maximum recommendations are the absolute minimum specifications for hardware you should have in your system in order to install to run the OS you have chosen. Recommended hardware specifications are what you should have in your system to realize useable performance. Always try to have the recommended hardware in your computer. If you don’t, you may have upgrade your hardware before you upgrade your OS.
Other hardware-sound cards, network cards, modems, video cards and so on-may or may not work with Windows, If the devices is fairly recent ,you can be relatively certain that was built to work with the newest version of Windows. But if it is older, you may need to find out

who made the hardware and their website to see if they have drivers for the version of windows you are installing

DETERMINING THE OS INSTALLITION OPTIONS:

In addition to making sure you have enough and the right kind of hardware, you must determine a few of the windows installation options. These option control how window will be installed, as well as which windows components will be installed. Some of these options include:

1. Installation type
2. Network configuration
3. File system type
4. Dual-boot support

INSTALLATION TYPE:

When you install application, OSs, or any software, you almost always have option as to how that software installed. Especially with OSs, there are usually many packages that makes up the software. You can choose how to install the, many different components; these options not usually called sometime like typically, full, minimal, custom:

1. A typically installation installs the most commonly used components of the software, but not all of the components.
2. A full installation installs every last component, even those that may not be required or used frequently.
3. A minimal installation installs only those components need to get the software functional.
4. A custom installation usually allow you to choose exactly which components are installed.

All windows version use these, or derivation of these installation types, and you should decide ahead of time which method you are going to use (which may be dictated by the amount of disk space you have available).

NETWORK CONFIGURATION

With many version of windows, you can choose whether to install networking options. If you do install networking, you can also choose which networking components you want installed. With later version of Windows, like windows 2002/XP, you also must know which workgroup or domain you are going to install.

FILESYSTEM TYPE:

As Window has evolved, a number of changes have been made to the basic architecture, as you might expect. One of the architecture items that has been changed
the most is the disk system structure .there have been multiple changes in the file system since DOS.

FILE ALLOCATION TABLE:

An acronym for the file on this file system used to keep track of where files are. Its also the name given to this type of file system, introduced in 1981.Many Oss have built their file system on the design of FAT, but without its limitations. A FAT file system uses the 8.3 name convention. The later become known as FAT because it used a 16-bit binary number to hold cluster-numbering information. Because of that number, the largest FAT disk partition that could be created was approximately 2GB.

VIRTUAL FAT:

An extension of the FAT file system that was introduced with Windows 95. It augmented the 8.3 file-naming conventions and allows filenames with up to 255 characters.

It created to names for each file; a long name and 8.3-compatable name so that older programs could still access files. When VFAT was incorporated into windows 95,it uses 32-bit code for improved disk access while keeping the 16-bit naming system for backward compatibility with FAT. It also had the 2GB disk partition limitation.

FAT32: Introduced along with windows 95 OEM service release 2.As disk sizes grew, so did the need to be able to format a partition larger than 2GB,FAT32 was based on VFAT more than FAT16 ,It allowed for 32-bit cluster addressing, which in turn provided for a maximum partition size of 2 terabyte(2048GB).it also include smaller sizes to avoid wasted space,FAT32 support is included in windows98 /Me/windows 2000,and windows XP.

NT FILE SYSTEM:

Introduced alone with Windows NT. NFTS is a much more advanced file system in almost every way all the version of the FAT file system. It includes features like individual file security and compression, RAID supports, as well as support for extremely large file and partition sizes and disk transaction monitoring. It is the file system of choice for higher-performance computing. When you're installing any windows OS, you will be asked first to format the drive using one of these disk technologies. choose the disk technology based on what the computer will be during and which OS you are installed.

DUAL BOOT SUPPORT:

Occasionally, a mission critical program doesn't support the OS to which you are upgrading. There may be a newer release in the future ,but at the present time, is isn't supported. In that case, you may have to install the new OS in a DUAL-BOOT configuration.

In a dual-boot configuration, you essential have two OSs on the computer (windows 98 and windows 2000,for eg). At the boot time, you have the option the selection which OS you want to use. Both OSs can share the same disk space or, in some cases, can use separate disks. It is possible to multiple-boot to all Microsoft OSs, including DOS recommends that each installation be done to a separate disk in order to avoid conflicts with built in programs like internet explorer. In a addition, you should install the oldest OS first and then proceed in chronological order of the newest Windows XP.

DETERMINING THE INSTALLATION METHOD:

Another item you must determine is which method you are going to use to install the Windows. Most version of the windows come on a CD-ROM. It is possible to install older version of the windows using floppy disks. Granted, there were several disks(the first windows 95 installation used nineteen 3 1/2-inch floppy diskettes). However, this isn't the most efficient method.CD-ROMs, because of their large storage capacity, are the perfect medium to distribute

software. Windows XP comes on a single CD-ROM (although there are companion CDs with other software, the OS still fits on one CD when compressed).It is possible to boot to this CD and begin the installation process. However, your system must have a system BIOS and CD-ROM capable of support bootable CDs.

If you don't have a bootable CD, you must first boot the computer using some other bootable media ,which then loads the CD-ROM driver so that you can access the installation program on the CD. with and windows 98//NT/2000, these bootable disks usually come with the packaged operating system.

If you have many installs to do and installing by CD is too much work for many computers, you want to do the network install. In a network installation ,the installation CD is copied to shared location on the network. Then , individual workstations boot and access the network share. The workstation can boot either through a boot disk or through a built-network boot devices known as boot ROM. Boot ROMs essentially download a small file that contains an OS and network drivers and has enough information to boot the computer in a limited fashions. At the very least ,it can boot the computer so it can access the network share and begin the installation.

The final method OS installing windows isn't really an installation method, per se. Drive imaging is a popular option among system manufactures. In drive imaging, a system is installed completely, with all the device drivers and software configured. Then, the system is booted to a floppy disk with a program such as Norton's ghost installed. The drive is copied, sector by sector, to a file. The is a known as an image because it is a duplicate or mirror image of the system being copied. Then the image file is transferred to the computer windows an OS. You boot new system with the ghost floppy and start the image download. The new system 's disk drive is made into an exact sector -by-sector copy of the original file.

Imaging has the major upsides. The biggest one is speed. In larger network with multiple with new computers, you can configure tens to hundred of computers using imaging in just hours, rather than the day is would take to individually install the OS, application and drivers.

There are major downsides to imaging as well. The system behind imaged and the system receiving the image should be identical. Although this requirement is not absolute, if they are not identical, each machine must be separately reconfigured, and you lose the primary benefit of imaging. Also, you must do a lot of preimaging work. For example you must configure Windows so that on boot up after imaging, it asks for the licenses key to uniquely identify the computers. Also ,it is a good idea to run a defragment routine before imaging, to reduce the amount of time spent imaging. If all the data is in contiguous sector, the imaging process will take less work.

PREPARING THE COMPUTER FOR INSTALLATION:

Once you have verified that the machine on which you are planning to install windows is capable of running it properly, you are sure all hardware is supported and you have chosen your installation options, you need to make certain that the system is ready for the install. The primary question is whether you are planning to perform a fresh of windows or whether you are going to upgrade an existing system.

THE WINDOWS STARTUP DISK:

If you are installing windows onto a system that does not already have a functioning OS, you have a bit of work to do before you get to installation itself. New disk drives need two critical function performed on them before they can be used:

1. Partitioning is the process of assigning part or all of the drive for use by the computer.

2. Formatting is a process of preparing to partition to store data in the particular fashion.

You can deal with these two procedures in windows by using the FDISK.EXE and FORMAT.COM commands. Running any sort of command on a machine that has no OS is well, impossible, though, so you need to boot the computer using the floppy disk that is bootable to MS-DOS or the windows 9x command line. Windows9x solves the problem through the use of a start up the disk that allow you to a boot computer and run these and other basic commands. Windows NT/2000/XP can do these operation as part of the normal installation routine. These startup disks should be include in the windows packages you are installing from ,but, if not ,you will need to make them.

PARTITOON USING A WINDOW 9X BOOT DISK:

Once you have a DOS or Windows startup disks, it is time to boot the computer and prepare it for the windows installation. When the computer first boot up, the Windows 95 boot disk will bring you to an A:\>PROMPT.

Partition refers to established large allocation of hard-drive space. A Partition is a continuous section of sectors that are next to each others. In DOS and Windows a partition is referred to by a drive letter, such as C: or D:.Partition a drive into two or more parts gives in the appearance of being two or more physical hard drives.

When a drive is Partitioned in DOS, the first Partition you create is a primary Partition, which marked to active. The active Partition is the location of the boot -up files for DOS or Windows. If there is more than one Partition, the second and remaining DOS Partitions are found inside another Partition type called an extended Partition. An extended Partition contain one or more logical Partition; the logical Partition have drive letters associated with them. Only one primary and one extended Partition can be created per disk using the window 95,not a limitation of a hard drive.

When FDISK is executed, a screen appears that give four or five options. The Fifth option, which allow you to select a hard drive, appears only when there is more than one physical hard drive. FDISK will Partition only one hard drive at a time.

With FDISK you can create partitions, delete Partitions mark a Partitions as active ,or display available Partitioning information. You must create a primary Partition before you can create any other Partitions. If space is still available on the drive, then you can create a second ,extended Partition. No drive letters is assigned to the extended Partition. One or more logical Partitions must be defined within the extended Partition, and they can then have drive letters attached op them so user can access them.

FDISK creates a start and an end to a section of hard-drive space. At the beginning of that space ,it creates a special file called the Master Boot Record(MBR).The MBR contains the Partition information about the beginning and end of the primary and extended Partitions. At the beginning of the Partitions, this record is called the DOS volume boot sector. The size of the

Partition determines certain aspects of a file pointer table called the file allocation table(FAT).The larger drive Partition. the more space will be wasted on the drive.

FORMATTING THE HARD DRIVE

The next step in management of a hard drive is formatting, initiated by the FORMAT command. Technically, the sort of formatting we are talking about is high-level formatting. This should not be confused with low-level formatting, although it can be just as destructive to information on the hard drive .High kevel formatting is, these days, normally only formatting a technician will do. when high-level formatting is performed, the following action takes place:

1.The surface of the hard drive platter is briefly scanned to find any possible bad spots, and the areas surrounding a bad spot are marked as bad sector.

2.Magnetic tracks are laid down in concentric circles. These tracks are where information is eventually encoded. These tracks, in turn, are split into pieces of 512 bytes called sectors. Some spaces in reserved in between the sector for error-correction information, referred to as Cyclic Redundancy Checks(CRC) information. The OS may use CRC information to re-create data that has been partially lost from a sector.

3.A file allocation table (FAT) is created. This table contains information about the location of files as there are placed onto the hard drive. The FAT has a limited number of entries. Therefore , the space allocated for the Partition may need not to be divide int0 cluster of sectors, where a sector is the smallest part of the hard drive.

OPTIMIZATION:

Each FAT has a set of number of entries; the number depends on the size of the hard drive. On a very small hard drive ,the FAT could theoretically be large enough to track all the sectors ,but in practice this never occurs .Only high-density floppy disks have FATs that track individual sectors. Sectors on hard devices are clumped together in what is called a cluster or allocation unit. In general as the drive or drive Partition increase in size, the number of second per cluster increases.

A drive between 16MB and 128MB has four sector per cluster. A larger drive up to 256MB has eight sector per cluster. Thus drives of up to 512MB have 16 per cluster, drives of up to 1024MB have 32 sector per cluster and so on. Cluster of 32 sectors are 16KB in size.

Allocation units may not be used by two different files, thus any empty space in an allocation unit is wasted. Many files almost fill the last cluster allocated to them, but other files barley use this last allocation cluster. On averages, files use half of the last cluster allocated to them. Imagine large cluster with one cluster per file being only half filled. If these clusters are 16kb and there are 5,000files,then roughly 40mb of hard-drive space is designated but unused For example ,if a hard drive has almost 25,000 files on one Partition ,that translate to 200mb of wasted space.

One solution to be optimizing hard-drive space is to set up multiple Partition that are smaller size and therefore use smaller clusters. It is not unusual for 1gbdrive to region

200mb or more when spilt into two Partitions. You should avoid Partition sizes that are just covered the limit for cluster sizes. A 528MB Partition has less available space on it than a 512mb Partition does, because the cluster are large enough to waste more than the extra space on the larger Partition. As new drives get larger ,though the difference between 528mb and

512mb becomes largely irrelevant. Because of this, a new filesystem-FAT32-solves many of these problems.

USING WINDOWS 98 BOOT DISK:

If you are using a windows98 boot disk to prepare a drive, you will notice that a few things are different. First, the machine starts up, you are presented with two options: boot with CD-ROM support or boot without it. The default is to boot with CD support. If you are planning to install from CD-ROM, this option makes life easy, because most supported CD drives are loaded automatically.

Second as you start the windows 98 FDISK program, you are presented with the message about working with large hard drives. Standard FAT (FAT16) has problems dealing with large drives, both due to maximum partition size of 2gb and because its uses extremely large cluster sizes for large partitions. At the sizes of computer hard drives increased this become a serious problem ,so Microsoft added support for second format type-FAT32. As a comparison of how the new system saves your space, a 2Gb drive with FAT16 has cluster of 32KB; with FAT32, the cluster.FAT32 would use four 4kb cluster, for a total of 16KB .FAT32 wastes an unused 1kb, whereas FAT wastes 15 times as much. The disadvantages of FAT32 is that it is not compatible with older DOS., Windows 3x,and windows 95 OSs. This means that when you boot a windows 95 or windows 98 FAT32-formatted partition with a DOS boot floppy, you can't read the partition.

WINDOWS 9X INSTALLATION:

If you chosen to do a fresh installation of windows 95, windows 98,or windows 95,windows Millennium Edition (ME),the process is basically the same. The screens may look different and be in a slightly different order. To simply things a bit ,we will refer to them collectively as windows 9x.

There are six parts to the windows 9x installation process:

1.Starting the installation
2.Profile copy phase
3.File-copy phase
4.Enumerated/detection phase
5.Configuring system settings
6.Configuring internet explorer setting.

STARTING A WINDOWS 9x INSTALLATION:

Once you have the drive prepared, you are ready to start the windows install process. To do this, boot to startup disk and put either the CD-ROM or the first setup disk into the machine. The program that performs the installation is called SETUP.EXE, and it's located either in the root directory of disk 1 of the set of installation floppies or in theWIN95 or WIN 98 or WIN 9x directory of the installation CD-ROM. It examines your hard disk and make sure there is enough room to install Windows, and then copies a few temporary files to your hard disk. These temporary for the components of the installation wizards that will guide you through the installation of windows 9x. You can few option with the setup program. To use them, you place them after SETUP at the command line, separated by a single space.

To start the installation, you can change to the drive letter where the installation are and enter SETUP (with the appropriate startup switches)like so:

C:>D:

D:>SETUP

Setup will tell you that it's going to check your system and that you must press enter to continued .If you want to cancel the installation without containing, you can press ESC.

When press the enter setup copies a very basic windows system to your computer from the CD and starts it. Setup then executes in a window environment and welcomes you to the installation.

PREFILE COPY PHASE:

Once you click continue, you begin the profile copy phase of the installation. During the phase, the Windows 9x setup program performs several operation to gather information about how Windows 9x should be installed:

1. Runs scandisk to check for hard disk problem before installation.
2. Ask you to read and accept the END USER LICENSE AGREEMENT(EULA).
3. Ask you have a few questions about the installation(including which component to install, what you want to call this computer on the network, which network workgroup to install it in, and a computer to use).

4. Asks you what location you want this computer to operate in (which country settings you want this computer to use).

5. Prompts you to make a startup disk (optional).

Once you have finished going through each of these screens, the Setup Wizard will tell you that it is ready to start copying files.

FILE - COPY PHASE

During the file-copy phase, the Windows 9x Setup program copies all the files needed to get Windows operational. During the copy, you will see a screen similar to the one Notice the progress bar in the lower-left hand corner of the screen; it advances according to how far along the file copy is.

When the file copy is finished, the windows 9x Setup program prompts you to remove all disks from any disk drives. When you clicks the OK button in the dialog box that appears, Windows 9x Setup displays another window and begin a countdown to the restart of the computer. You can wait for the countdown to finish, or click the Restart Now button to restart the computer. This ends the file-copy phase of Windows 9x installation.

ENUMERATION / DETECTION PHASE

Once the computer reboots, the enumeration(details)/detection phase if Windows 9x Setup begins. During the enumeration / detection phase of the Windows 9x installation process, Windows 9x Setup configures the installation of Windows 9x to run on your computer.

After the computer reboots, you will see Windows 9x splash screen. Notice it says that it is restarting Windows for the first time. Now, follow these

Steps:

1. The computer runs the Setup program immediately and asks you to type in your name and a company name to uniquely identify you.

2. **You are asked to read the EULA and indicate that you agree to its terms. Essentially, the EULA states that you won't give away or copy the OS and won't use it to** do anything illegal (or if you do, that you won't blame Microsoft). It's an interesting read; if you have 20 minutes, read it sometimes.

3. Enter the Windows product key. This 25-digit alphanumeric string uniquely identifies the installation of Windows. It can be found in one a few places, including:

 # Back cover of the Windows 9x manual

 # Windows 9x CD-ROM case

 # A label affixed to the computer (on most OEM install)

Type in the characters exactly as found, and continue the installation.

4. Windows 9x detects and install drivers for any hardware that you have. During this process, it may ask you for drivers that aren't on the Windows 9x installation CD. You must either insert a driver disk or cancel that request for drivers and install the drivers later (after Windows 9x is completely installed) using the installation CD that comes with the hardware in question.

During this process of detection and installation, Windows may need to reboot several times. Make sure the windows 9x installation CD is not the drive during boot up so that your computer boots to the partial installation of Windows 9x. Ideally, setup should only have to reboot once.

5. When all the hardware has been detected and the final reboot has occurred, setup sets up any plug-and-play (PnP) devices and then presents you with a window to properly set the data and time. You are now finished with the phase of the installation.

CONFIGURING SYSTEM SETTINGS:

The final phase of Windows 9x installation and uses the windows 9x setup program is the configuring of the system settings. During this phase, the setup program prompts you for the correct and data and time as well as a time zone in which this computer will operate. You may have to click the Time zone tab on the Date and time window that appear in order to set the time zone. You can click ok when you're finished.

Windows 9x then updates system settings, including control panel items, items on the start menu, windows help files, and MS-DOS program setting, and update the registry. During this last step, a box appears that indicates the progress of the system. This takes some time.

Once the update is finished, you are prompted to reboot. This should be last reboot before the system is completely operational. Also, this is the last time the windows 9x setup wizards is used. After this reboot, you are presented with the windows 9x desktop.

CONFIGURED INTERNET EXPLORER SETTING:

When the computers boots, you can see a regular windows 9x startup screen. The computer should that detect any remaining hardware, as well as configure your personal setting for internet explorer. Windows 9x then continuous to the login process. After login you should be presented with the windows desktop.

The welcome screen is the cool the first time you see it, but you may want to uncheck the show this screen each time windows 9x starts check box, test the screen becoming

annoying. You are now finished installing windows 9x.you may have a few post-installation items to do.

NOTE: Like the above procedure which is used for installation of Windows'98 , this same procedure is used to install the Windows NT, Windows XP, Windows 2000 and also for advanced windows systems. This procedure is same as for Linux and Unix operating systems. To Install any Operating Systems , we must follow important points, they are :

- Partition the Hard disk
- Nature of partition like NTFS, FAT16, FAT32
- Formatting (High level or low level)
- Boot priority setup in BIOS(boot from CD)
- License key for the Operating system(25 digit)
- Name of the computer
- Name of the computer owner
- Organization of the owner(that is he is working)
- Keyboard settings
- Language Settings
- Time settings
- Nature of installation types(Typical, Minimal, Custom
- Choose custom during installation (custom installs all packages).

REMOVAL AND REPLACEMENT PROCEDURES

We are great deal about installing components into computers. During our employment as a PC service technician, we will troubleshoot many computers. Occasionally , we will find a bad part that needs to be replaced. But service technician don't de solder individual chips anymore. Service practices have advanced point where we think in terms of Field Replaceable Units(FRUs). An FRU is a computer subassembly that can be easily replaced by removing and replacing some screws and cables. Although the components are individually more expensive, there is a much greater savings to the consumer in terms of time. With labor rates always on the rise, FRUs make PC service much more economical.

If the user need to remove a part and replace it, the procedures are not much different than those he already learned. To remove a component, simply reverse the process for installation. To replace a component , remove the broken or damaged unit, and then follow the installation procedures for the specific component. He may have to remove a few other components to get at the component that he try to replace. But that just means he must reinstall them when the user are finished replacing the FRU. He may then have to return the damaged component to the manufacturer for a warranty credit.

UPGRADING PC COMPONENTS

Why Upgrade

Is an upgrade is necessary? This question is not as simple as it sounds. We may want to upgrade so that we can play the latest video game, but however, we may not need an upgrade. Our computer will play the game, just not as well as we want it do.

The answer to the above question may be "no" , if the cost of the new component we must buy to replace the old one is close to or more than the cost of a new computer with similar speeds and abilities. As our computer gets older, it does not necessarily get any slower , but the new software

we install requires more and more relative power to operate correctly. And our computer may not be as fast as the computers the application was designed to run on.

IS AN UPGRADE POSSIBLE

Suppose when we are deciding whether to upgrade, this is the major question we must ask ourselves before processing. Many times, the newer hardware and software that we want to run are not compatible with our existing hardware. For example, if we want to install a new AGP based video card to replace the older PCI card in our system that does not support the newest game as we want to run. The requirements state that we must have an AGP port in our system that will support that card. If we don't have proper AGP port on the system we may to upgrade the motherboard. If we upgraded the motherboard the processor is not supported by the newer motherboard and we have to replace it. This leads to buy a newer computer with all newer components. There are different issues that affect the possibility of an upgrade , they are :

(i) Power supply output capacity
(ii) Memory capacity and characteristics
(iii) Processor speed and compatibility
(iv) Hard drive capacity and characteristics
(v) System firmware limitations
(vi) Bus types and characteristics
(vii) Drivers for legacy devices
(viii) Cache relationship to motherboards

(i) Power supply output capacity: Whenever we add a newer device to an older system, we must keep in mind the power requirements of the newer device and the output level of our power supply. If our system is already drawing the maximum power output from the power supply and we try to add a component that draw more power than the component it replaces, we could have major problems. At the very least, the new component won't function. **But more, possibly , we could blow a fuse on the power supply or cause damage to the other components of the computer. Hence the solution is to calculate the power requirements for the system.**

(ii) **Memory capacity and characteristics :** This requirement is necessary when we are upgrading to a new operating system or adding new memory to the system. First, we must ensure that we have enough memory to meet the requirements of any OS upgrade. On the other hand, if we are upgrading the memory to more capacity or a different kind of memory, we must make sure the memory we are installing matches the motherboard. For example, if our motherboard uses RIMMs, we must make sure we are buying and installing RIMMs. But if we have non-DDR RAM on motherboard, and install DDR memory , it is not work.

(iii) **Processor Speed and Compatibility :** If we need to upgrade the processor in our system, we must make sure the processor we are adding is compatible with the motherboard. Processors and motherboards are designed together, and after some time, the processor and motherboard architecture change. For example the Pentium III processor to Pentium IV processor is not upgraded in a single motherboard.

(iv) **Hard drive Capacity and characteristics :** If we are installing a new software, we must ensure that we have enough hard disk space available for the new software.

(v) **System/Firmware Limitation :** These are the hardest things to check and predict it. As we know the BIOS controls which hardware is supported by the motherboard. Most times, the BIOS is forgiving about what can be installed. If new features are released, we may need to upgrade the software in BIOS.

WHAT CAN BE UPGRADED

In computer not everything is upgraded. Some components are designed to be upgraded, because they rely heavily on other components in the system and would cause problems if they were upgraded. The following is a list of the most commonly upgraded items on a computer .

(i) Memory
(ii) Hard Disk
(iii) Video Card
(iv) CD-ROM
(v) Motherboard
(vi) CPU
(vii) Power Supply
(viii) BIOS

This is by no means a comprehensive list, but we will notice a trend. All of these items are field replaceable units(FRUs). That is, they are modules that are designed to be replaced at any point. The connection used to secure them to the computer and other components are temporary in nature.
On the other hand, some components are not designed to be upgraded. These components are usually subcomponents of the FRUs, and although many people would like to upgrade them, they are not upgradable without replacing the entire FRU.

(i) Chipset
(ii) Onboard Video circuits
(iii) Onboard ports like parallel, mouse ,LAN , etc…
(iv) Anything proprietary

The main reason to notice is that a component is upgradeable when :

(i) It can be removed and replaced
(ii) A replacement is available that is better than the old component
(iii) The new component is supported by the supporting hardware already in the computer
(iv) The new component is supported by the current OS.

INSTALLING PC PERIPHERALS

Gathering Parts Once we prepared our workspace sufficiently, we need to make sure that we have all the right parts. Many stores in larger communities sell computer parts so we can build our own computer system. Each one is slightly different and carries different brands of components. In order to build a computer , we need several parts. They are :

(i) PC case
(ii) Power supply
(iii) Motherboard
(iv) CPU/Processor
(v) Memory
(vi) Hard Disk(s)
(vii) Floppy Drive
(viii) CD-ROM Drive(s)
(ix) Expansion Cards
(x) Keyboard
(xi) Mouse
(xii) Monitor
(xiii) Software

Installing Motherboard : The first step in building a computer is to prepare the motherboard for installation. As a part of this process, we sill install several hardware components , it will be easier to do so,

So now, while the board is out of the computer. To prepare the motherboard, we must do the following :

(i) Remove the motherboard from its box
(ii) Install the CPU /Processor and its cooling mechanism
(iii) Install the memory

Remove the motherboard from its box

The first part is somewhat clear. We must remove the motherboard from its box. Several items come in a motherboard box besides the motherboard itself. Here we will get the following :

- A motherboard is in an antistatic bag
- A manual for the motherboard
- Multiple cables
- Dongles for onboard USB, Sound
- Registration card

Remove the motherboard from the box and set it on our work surface inside its antistatic bag
Here carefully remove the motherboard from its antistatic bag and set it on the top of the bag.

Installing the CPU/Processor and its Cooling Mechanism

Now the motherboard is the out of the box and out of the antistatic bag, now we are ready to install the processor. Most processors today use the Zero Insertion Force(ZIF) processor socket. Hence the installation of the processor is easy.

Installing the Processor

First locate the processor socket. It is a large plastic square hole in the middle. It is usually white or light brown, and it is surrounded by lots of small pinholes. On one side of the socket is a small lever. Lift the lever into the complete vertical position. You have to push the lever gently to one side to

release it from its locking tabs. Once you have opened the socket , remove the processor from its packaging. Be very careful not to bend any pins on the processor. In fact, don't touch the pins because you may damage them. They are almost impossible to straighten properly, and if they are bent or damaged, the processor may not fit properly into the socket.

The processor has two sides, the side with many small pins and top side. On the top side notice that there is a small dot. Also notice that on the pin side, the pins are arranged in square with two corners cut off. These cut off corners match up with a similar pattern in the socket. When the processor slips into place, we must secure it. To secure the processor, simply push the retaining lever back down into its original position.

COOLING MECHANISM

Once the processor is locked in place, you must then install whatever cooling mechanism you are going to use to cool the CPU. There are two main types , air cooled and water cooled. The most popular type of CPU cooling method is air cooled method. In this method processors use a large block of copper or aluminum called heatsink , that is shaped into fins. A small fan is usually mounted on top of these fins to provide the moving air to cool them. Note the fins and the fan on top, as well as the small clip used to hold the assembly to the processor socket.

The water cooling on the other hand, involves the use of smaller block of aluminum called as water block mounted to the processor. Instead of fins, the block has two small connectors for a water inlet and outlet. These are connected to a small pump and a radiator. Cool water is pumped into the water block. It flows through series of back and forth channels, where it absorbs heat from the processor. The heated water travels to radiator where it is cooled by air blown over the fins of the radiator. The cooled water then returns to the pump and is ready to do it again.

Installing the Heatsink and Fan: Most motherboards today have a special connector known as CPU_FAN connector. This connector powers the fan for the CPU and also monitors its speed. The connector is usually what is known as the three pin fan connector. PC fans can use either two or three wires. The first two wires are for power and ground and the third wire is for speed sensing. That why the fan can report its speed to the motherboard or other sensing device. This is very important for the CPU fans, because if the CPU fan is not spinning at the proper speed, the CPU will not get adequate cooling. By using the three wire fan the motherboard can constantly tell if the fan is spinning properly and can shut down the computer if the fan does not spin up properly.

The hook the CPU fan to the motherboard, first find the CPU_FAN connector. It is usually white or brown and is labelled on the motherboard next to it as CPU_FAN. Also refer motherboard documentation , then push the fan's connector onto the motherboard connector.

Before you are proceeding make sure that the heat sink is seated firmly on the processor and that is not in any way resting on the processor socket. If so then you are ready to proceed to the next step.

INSTALLING MEMORY

It is our next step to install the memory. It is a simple procedure. If you have DIMMs or RIIMs, the process is the same.

Locate the memory slots in the Motherboard. Note the small levers. Flip down the two white or brown levels called as retaining clips on the sides of the socket in which you will be installing memory. Line up the memory so that it will fit into the socket. In order to do this, you must notice where the notches are on the bottom of the stick of memory. The stick should be oriented so that notches line up with the small bumps in the bottom of the memory slot And so that the copper or gold fingers are down.

Next, slip the memory stick into the slot and push it down until it makes contact with the slot retaining clips. Once the memory makes contact with these clips , it will be increasingly difficult to push on the memory stick. However, you must continue to push until the memory seats into the bottom of the slot and the memory retainer clips fold over and latch into the sides of the memory stick. Thus holding in a place. Now you notice that the memory is installed into the motherboard.

INSTALLING NETWORK/MODEM CONNECTIONS

If we have Network Interface Card or Modem in our computer either as expansion card or as an on-board device, we must connect it appropriately before we can use the computer.

Connect the NIC(Network Interface Card) to our network using the appropriate type of network cable. Most often, our use is 10BaseT or 100BaseT. We will connect it with a twisted pair cable to the RJ-45 connector on our computer. If we use another type of network, we use a different cable and a different type of NIC.

If we are going to use a modem , on the other hand , simply connect a phone cable from the wall jack to the RJ-11 jack on our modem labelled line. This is illustrated in diagram.

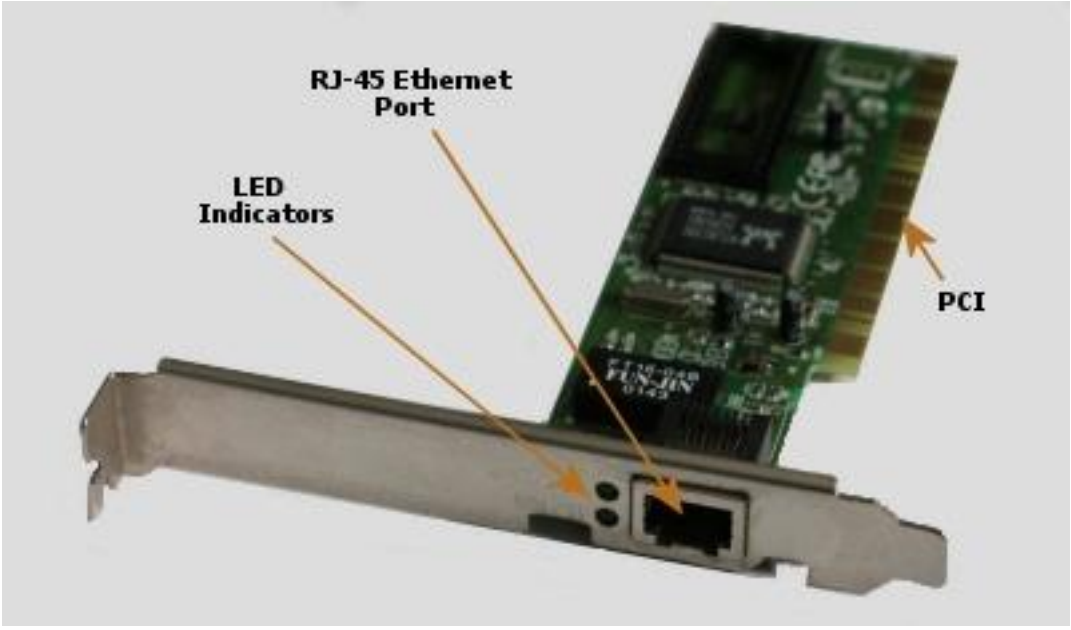
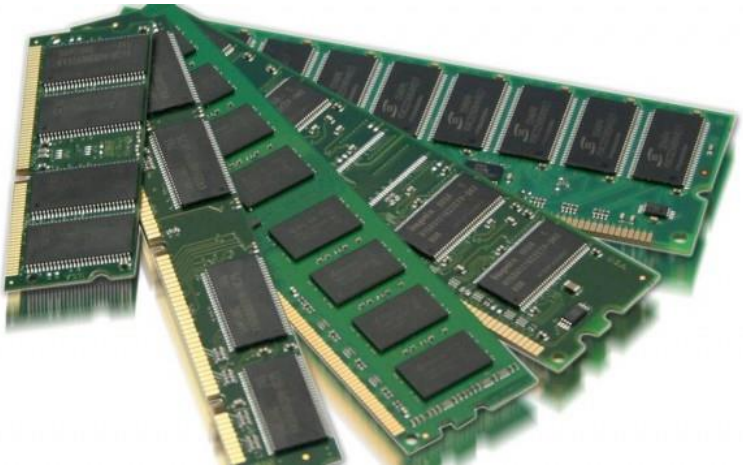


Diagram of PC components

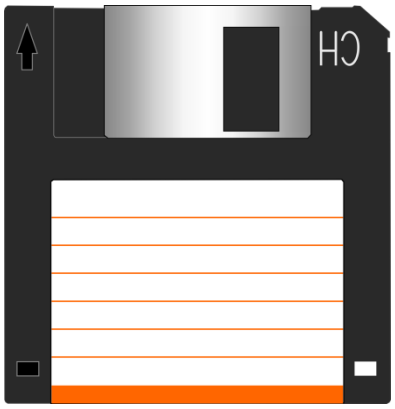
(a) CPU fan



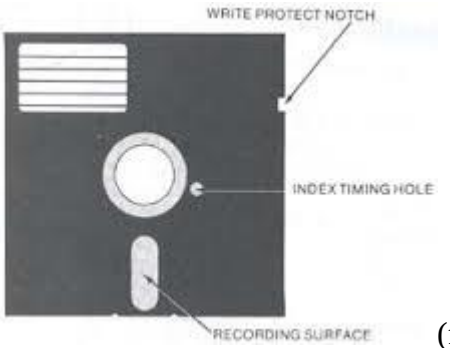
(b) Memory

(c) Motherboard

(d) Floppy cable

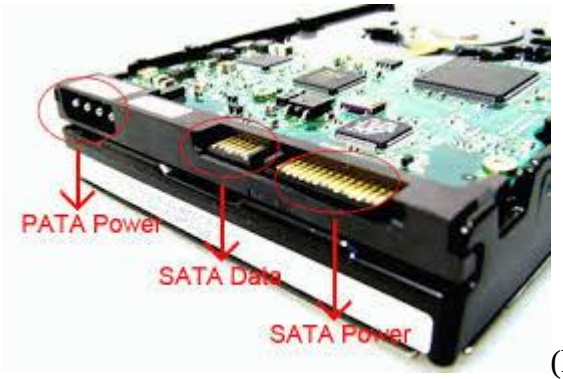


(e) Floppy Disk

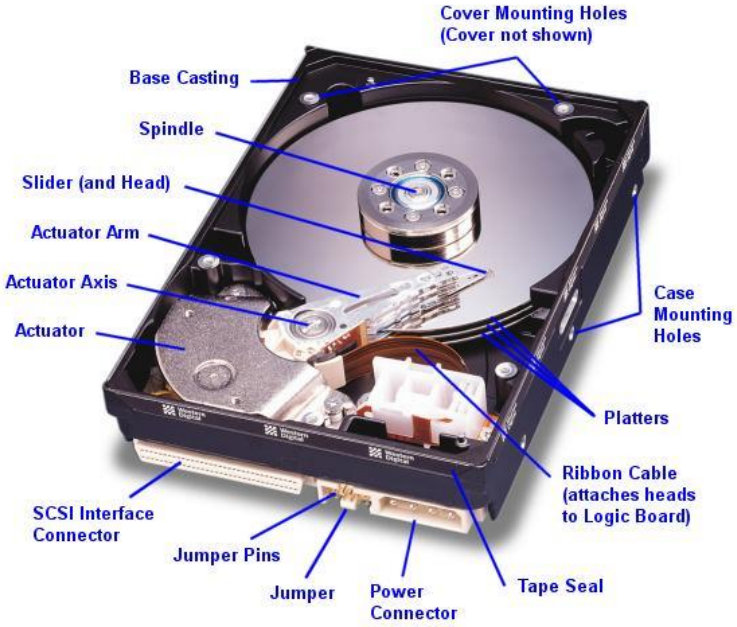


(f) Floppy Disk

(g) Hard Disk



(h) Hard Disk



(i) Hard disk components