



Description of Installation, Maintenance and Repairs of Computers

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Abstract In assembling of a computer, the opportunity to practically handle all other related projects, especially in the area of information Technology including installation, repairs and maintenance of computer, laptops, scanners, printers. It will also aid in the writing of manuals that are used in the course of their study in the college and offices. Investigated and resolved hardware and software related faults as well as quality of service issues, while implementing strict prevention maintenance routine that achieved 99.9% availability of superior quality of service and on unmatched service delivery to thousands of our customers.

Activity participated in the excellent and neat assembly of desktop computers in our company.

Keywords Electronic, Central Processing Unit, Installation, Maintenance, Technology

Introduction

A computer is an electronic machine that process data. It accepts data as input and then processes them to give information as output. A computer is given information called "data" and a set of instruction called "program" telling it what to do with the information. It then shows us the results. The data put into the computer is call "input" and the result, which comes out, is known as the output. We use computers in all areas of life. We rely on them to process information quickly. A computer is an electronic machine because it uses electricity. System components: In these days of commodity parts and components pricing, building your own system from scratch is no longer the daunting process it once was. Every component necessary to build a PC system is available off the shelf at competitive pricing. The system you build and the top named-brand systems can both use the same components. There are, however, some cautions to heed. The main thing to note is that you rarely save money when building your own system; purchasing a complete branded system is expensive. The reasons are

- (1) Those who build branded systems save some money by buying in bulk than those who buy components to build only one system.
- (2) You may buy inferior Chinese products and encounter problem with any of the components and have to make additional calls or send malfunctioning parts back for replacement.

It is clear that the reasons for building a system from scratch often have less to do with saving money and more to do with the experience you gain which will expose to computer repairs and the result you achieve. In the end, you have a custom-system that contains the exact components and features you have selected. You don't have to compromise in some way. The experience is also very rewarding. You know exactly how your system is constructed and configured because you have done it yourself. This makes future support and installation of additional accessories much easier. Below are the components needed to assemble your own computer. The components used in building a typical PC are

Each of these components is discussed in the following sections





Figure 1: A set of computer

Description

There are three basic Component units of computer system namely;

1. The Central Processing Unit (CPU)
 - a) Casing and Power pack
 - b) Motherboard
 - c) Processor with heat sink
 - d) Memory
 - e) Floppy drive
 - f) Hard disk drive
 - g) CD-ROM/DVD drive
 - h) Video Graphic Adapter (VGA)
 - i) Sound card
 - j) Cooling fan
 - k) Power/IDE (Integrated Digital Electronics) cable
 - l) Hardware nuts, screws
 - m) Operating system software

2. The input devices
 - a) Keyboard
 - b) mouse.

3. The output device
 - a) Monitor
 - b) Speakers
 - c) printers.

Computer Operations

This has to do with the ways by which we can maintain the computer system and concerning the repairs too. I am going to discuss computer operations the following subheadings;

- **The Principle of Maintenance and Repair**

In setting your computer, it is important to select hard flat, stable surface in a location where it would not be exposed to rain, direct sunlight or extreme cold. In addition your computer should not be operated in a dusty or dirty location or near equipment that generates a magnetic field.

Adequate measures should be taken to maintain system reliability and effectual reduction in system downtime. Computer requires a steady and smooth sinusoidal (AC) wavelength in it is power supply to operate effectively.



Contrary to this expectation, A.C supply suffers many anomalies such as surges, spikes, sags, and total black outs that endanger the reliability of the Computer systems.

Surges: These are small over voltage conditions that occur over relatively long periods. This can create overheating in the computer power supply and cause an eventual damage.

Spike: It is a transient and large over voltage conditions that occur over relatively long periods. This can create overheating in the computer power supply and cause an eventual damage.

Sags or Brownout: Are under voltage conditions caused by excessive electrical load on AC circuit. Equipment such as air conditioners, photocopiers, deep freezers etc in response to under voltage conditions, the computer can draw excessive current that will lead to overheating.

Blackout: It is complete of electrical power due to faults from the generating plant, transmission or distribution lines. It can lead to loss of data, corruption of files that were actively processing during its occurrence and other possible faults on peripherals such as electro-photographic printer.

- **Power Protection Devices**

Surges Suppressors: Are designed to absolve over voltage conditions caused by surges ad spikes. It operates by clamping voltages above a certain level, it is however not a perfect solution to power protection.

Stabilizers: This employs a more effective device that surge suppressors regulate the over voltage supply. Through this, it also tolerates an under voltage to a certain level.

The Uninterrupted Power Supply (UPS): This is the best in

Power protection through its working principles. It attends to all power problems of surges, spikes, sags and blackout. It provides a modulated DC that enables the computer to run from battery power continuously. AC only keeps the batteries charged. It is not an alternative to AC power supply. When there is a power failure, it will only provide power for limited time to allow the user to save data and shut down. Unnecessary long usage after the A.C failure will drain the batteries and shorten its life sp

Hardware Installation

This has to do with the physical connection of computer system together with its peripherals. Connect the stabilizer to the power source if it exists. Then connect the UPS to, the output of the stabilizer, Output of the UPS powers both the system unit and the monitor. Interface the monitor, Printer and other peripherals through their signals/communication cables to the system unit. Then put on the switch on the monitor first and then the system unit. If the system is a branded system like IBM, etc, the first time' it is powered it will expand all the pre- loaded software from the factory; It is after this process that the system can be put to use.

- **Preventive Maintenance**

Preventive maintenance is the key to obtaining years of trouble free service from the computer system. A properly administered preventive maintenance program pays for; itself by reducing problem behavior, data loss and component failure and by ensuring long life for the system.

- **Hardware Troubleshooting**

Troubleshooting is the process of detecting and correcting faults associated with system components. Some common troubleshooting problems associated with certain hardware components and possible solutions are presented below.



- **Floppy Drives**

Problems: The drive is not accessible.

Possible cause/solution: The first thing to do in this situation is to determine if the diskette is bad (several diskettes can be tested). The diskette can be tested in a different system where the floppy drive is known to be working. If they are accessible in the other system, then the first drive could be dirty or out rightly faulty. If cleaning the read/write head does not solve the problem, then a replacement or further repairs on the drive might be necessary.

Problem: Error writing to disk.

Possible cause/solution: This problem indicates that the floppy controller is communicating properly with the computer but simply cannot access the diskette. The diskette should be tested and if it okay, the read/write head should be cleaned. If the problem persists, then it might lie within the electronic of the drive.

Problem: A floppy drive light that is perpetually on.

Possible cause/solution: This indicates that the floppy driver ribbon cable (data cable) is not properly connected. The red strip must align with pin 1 on the board and on the drive.

Problem: An "invalid error message.

Possible cause solution: This suggests that the computer does not recognize, the presence of the floppy drive, implying the drive is not communicating properly with it. Proper connection must then be made to correct the problem.

- **Hard Drives**

Problem: The computer does not boot properly.

Possible cause/solution: This problem can arise as a result of the hard disk not being accessed by the system. The system can be booted with a startup disk and if the problem is not solved, it should be ensured that the hard disk is properly connected and detected. Check if the ribbon cable is bad or poorly connected. Also, check the jumper setting (for a master/slave configuration).

Problem: A "Missing Operating System" message during booting.

Possible cause/solution: If this message shows even if an OS has already been installed, it is likely that some necessary system files for booting are missing or corrupt. To solve the problem, boot the system with a startup disk and at the system prompt A:\>, type sys c: <ENTER>. This command copies the system files into the hard disk (C) so that it can be bootable. It could also be that there are bad sectors formed in the disk as a result of frequent abrupt failure such that files found in such sectors are not accessible. A full system scan can be run in situations like this.

Problem: The hard disk slow.

Possible cause/solution: This can arise due to fragmented sectors on the disk such that file access time is increased. To solve this problem, a defragmentation process may need to be carried out on the disk. This process arranges files into a proper order creating extra space on the disk and improving file access time.

- **The CD-ROM**

Problem: The CD-ROM cannot be accessed.

Possible cause/solution: Ensure that the disc is properly inserted (positioned). Test the disc in a different drive and if it is not working, clean the CD's surface using methylated spirit and a soft piece of cloth. If the drive itself is the problem, ensure that it has been detected by the system. If it has been detected, establish proper connection. Also, check to see to that the CD-ROM jumper is configured to a slave.



- **Sound Devices**

Problem: The speakers fail to produce sound.

Possible cause/solution: First stage (checking the physical speakers

- Check to see that the volume is set high enough.
- Ensure that the speakers are plugged to the sound' card.
- Ensure that the power cable is properly attached and the speakers are turned on.
- Try the speakers in another system.
- Ensure that the sound card is properly and securely seated in the expansion slot.

Second Stage (Checking the audio software):-

- Make sure that the mute option has been enable and that the software control volume is adjusted to a sufficient level.
- Ensure that the proper resources and device drivers are available.

ii. **Problem:** The right sounds are not produced.

- Possible solution: Try another sound file
- Replace CD and try it with the sound file. If the problem persists, try to reinstall the sound application itself (with the motherboard CD).

- **Monitor and Video**

Problem: The computer beeps continuously at startup and won't boot properly.

Problem cause/solution: This is an indication of a missing monitor or a missing or 'faulty video card. Check to ensure that the monitor is properly connected to the video card. Check the functionality of the video card.

Problem: Complete lack of picture.

Possible solution: Move the mouse or press a key on keyboard. If the problem persists, check the video components and ensure that the monitor' is properly connected. Also, check to see that the brightness is at the adequate level. Try swapping monitors.

Problem: Flickering monitor.

Possible solution: Replace the monitor with another to see if the problem continues. If the problem persists, then the refresh rate might need to be reset.

Problem: Screen elements replicated all over the screen.

Possible Cause/solution: This is due to irregular or improper video. Resolution setting (which is common with old video cards) adjusts the resolution from the video control panel

- **The CMOS Battery**

Most CMOS problems are associated with wrong system settings for the system components. The major remedy is to correct the setting, in SETUP and save them. If this does not work, then change the CMOS battery.

- **Power Supply**

Problem: No power supply.

Solution: Ensure that there is proper contact from the mains.

Problem: The computer keeps rebooting on its own.

Possible cause/ solution: Check the power supply.

Voltage fluctuation can cause this problem. Determine the incoming voltage and ensure that the required is achieved, possibly with the use of stabilizer.

- **The Mouse**

Problem: The mouse pointer does not move on the smoothly



Possible cause/solution: Check to see if the roller is dirty and clean it thoroughly.

Problem: The mouse pointer does not move screen.

Possible cause/solution: This problem indicates that the computer cannot communicate properly with the mouse and therefore cannot receive the appropriate signals to move the mouse. This may be as a result of a missing or corrupt mouse driver. To fix the problem, manually load a missing driver from the setup disc that came with the mouse. Also, you can turn off the system and boot again as most Operating Systems would automatically detect the mouse sitting. The mechanism is like a conversation between a group of people, if two people speak at the same time, they both stop and then one starts to speak again.

Conclusion

In this paper, there was diversified and a superior level of experiences most relevant to computer hardware thereby projecting any company or establishment to a high level with satisfactory service to their customers. Investigated and resolved hardware and software related faults as well as quality of service issues, while implementing strict prevention maintenance routine that achieved 99.9% availability of superior quality of service and on unmatched service delivery to thousands of our customer.

Reference

1. Ieeexplore.ieee.org/document/6853477/, accessed on 29th May, 2017.
2. Disassembling and Assembling the XComputer System, <https://turbofuter.com/computer>, accessed on 27th May, 2017.
3. K. L. James, The Internert: A user Guide, 2nd Edition,
4. Fundamentals of Computre Networks, 2nd Edition, SudakshinaKundu

