TEXT MANUAL

PERSONAL COMPUTER

DIAGNOSIS

A Practical Guide to Identifying, troubleshooting, and Resolving Common PC Problems

- FIRMWARE
- SOFTWARE
- HARDWARE

- DETECT ISSUES
- ANALYZE PRONLEM
- PROVIDE SOLUTION

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INTRODUCTION

Personal Computer (PC) Diagnosis is the process of identifying, analyzing, and troubleshooting problems that affect a computer's hardware and software. It involves examining different computer components, checking system performance, and using diagnostic tools to determine the cause of technical issues. Through proper diagnosis, users and technicians can identify problems such as slow performance, system errors, overheating, hardware failure, and connectivity issues.

The main purpose of PC diagnosis is to ensure that a computer operates properly, efficiently, and reliably. It also helps prevent further damage, reduce repair costs, and maintain the computer's overall performance. Understanding the basic principles and procedures of computer diagnosis is essential for anyone who wants to develop technical skills in computer maintenance, troubleshooting, and repair.

This manual provides basic knowledge, step-by-step procedures, and practical techniques for diagnosing common personal computer problems. It aims to guide readers in understanding computer components, using diagnostic tools, identifying technical issues, and applying appropriate solutions.

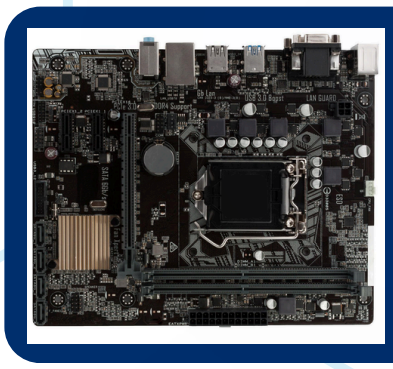
OBJECTIVES

1. Analyze every problem that have or may occur within the personal computer.
2. Detect everything from the smallest to the biggest part of the computer.
3. Provide an applicable solution and fix each problem with credibility.
4. Make sure that everything is handled properly.
5. Make sure that everything is working at its best.

BASIC COMPUTER COMPONENTS

A personal computer (PC) is made up of different hardware components that work together to process data, store information, and perform various tasks. Below is a list of the basic computer components and their functions.

INTERNAL COMPONENTS:



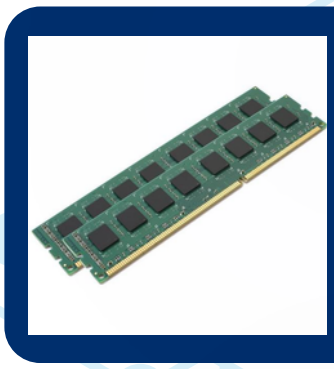
1 MOTHERBOARD

The main circuit board that connects all computer components and allows them to communicate.



2 CENTRAL PROCESSING UNIT

Known as the brain of the computer. It processes instructions and performs calculations.



3 RANDOM ACCESS MEMORY

Temporarily stores data and programs currently being used by the computer.



4 SOLID STATE DRIVE

Stores the operating system, applications, documents, and other files.



5 POWER SUPPLY UNIT

Converts electrical power into the appropriate voltages needed by computer components.



6 GRAPHICS PROCESSING UNIT

Processes images, videos, and graphics for display on the monitor.



7 COOLING SYSTEMS

Prevents the computer from overheating by removing excess heat.



8 COMPUTER CASE

Houses and protects the internal computer components.

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EXTERNAL COMPONENTS:



1 MONITOR

Displays visual information, images, videos, and computer output.



2 KEYBOARD

Allows users to enter text, numbers, and commands.



3 MOUSE

Controls the pointer and allows users to select and interact with items on the screen.



4 SOLID STATE DRIVE

Produce audio output such as music, videos, and system sounds.



5 HEADSET AND MICROPHONE

Allow users to listen to audio and record or transmit voice.



6 PRINTER

Produces physical copies of digital documents and images.



7 USB FLASH DRIVE

Provides portable storage for transferring and saving files.



8 COMPUTER CASE

Captures video and images for video calls, recording, and online meetings.

DIAGNOSTIC TOOLS/EQUIPMENTS

Computer diagnostic tools and equipment are devices and instruments used to inspect, test, identify, and troubleshoot problems in a personal computer. These tools help technicians determine whether a problem is caused by hardware, software, or other system-related issues.

TOOLS/EQUIPMENT	DESCRIPTION
Screwdriver Set	Used to remove and install screws when opening computer cases and assembling or replacing components.
Anti-Static Wrist Strap	Prevents electrostatic discharge (ESD) from damaging sensitive computer components.
Long-Nose Pliers	Used to grip, bend, and handle small wires, connectors, and components.
Precision Tweezers	Used to handle small screws, jumpers, and tiny components in tight spaces.
Plastic Spudger	Helps open computer components and separate connectors without easily scratching or damaging surfaces.
Parts Organizer Tray	Keeps screws, small parts, and other computer components organized during repairs.
Digital Multimeter	Measures voltage, resistance, and electrical continuity to help identify electrical problems.
Power Supply Tester	Checks whether a computer power supply provides the expected output voltages.
POST Diagnostic Card	Displays diagnostic codes that can help identify hardware problems during the computer's Power-On Self-Test.

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TOOLS/EQUIPMENT	DESCRIPTION
LAN Cable Tester	Checks network cables for wiring problems, open connections, and short circuits.
Infrared Thermometer	Measures surface temperatures of computer components without direct contact.
Oscilloscope	Displays electrical signals as waveforms to help diagnose advanced electronic problems.
Compressed Air Duster	Removes dust and loose debris from computer components and hard-to-reach areas.
Anti-Static Cleaning Brush	Removes dust from circuit boards, fans, and other sensitive components.
Microfiber Cloth	Cleans monitors, computer cases, and other surfaces without easily scratching them.
Isopropyl Alcohol	Used to clean electronic contacts and remove thermal paste residue when appropriate. Use high-purity alcohol and allow components to dry completely.
Thermal Paste	Improves heat transfer between the processor and its cooling system.

SAFETY PRECAUTIONS

Safety precautions are important when diagnosing, troubleshooting, repairing, and maintaining a personal computer. Following proper safety procedures helps prevent accidents, injuries, electrical hazards, and damage to computer components.

1 Electrical Safety Precautions

- Always shut down the computer properly before opening the case.
- Unplug the power cord before installing or removing components.
- Use a grounded outlet and avoid working in wet areas.
- Check for damaged cables or power cords.

2 Handling Components

- Handle components with care to prevent physical damages.
- Hold parts by the edges ang avoid touching sensitive areas.
- Use anti-static wrist strap or anti-static mat to prevent static discharge.
- Keep screws and small parts in a secure container.

3 Workspace Safety

- Work on a clean, well lit, and organized work space.
- Keep food and drink away from the work area.
- Ensure proper ventilation to prevent overheating.
- Manage cables to avoid tripping or accidental disconnection.

4 Data Safety

- Back up important files before running diagnostics or making repairs.
- Avoid making unnecessary changes to system settings.
- Be cautious when formatting or reinstalling the operating system.
- Keep a record of your finding and actions.

5 General Safety

- Follow manufacturer guidelines and use proper tools.
- Do not force components into place.
- Seek a professional help if you are unsure about the procedure.
- Always turn off and unplug the computer when not in use for an extented period.

TROUBLESHOOTING PROCEDURES

Computer troubleshooting is a systematic process of identifying, analyzing, and resolving problems that affect a personal computer. It involves checking hardware components, software applications, operating systems, and other system functions to determine the cause of a problem and apply the appropriate solution.

1 Identify the Problem

- Observe the symptoms.
- Determine when the problem occurs.
- Check for error message or an unusual behavior.

2 Perform an Innitial Inspection

- Check for obvious issues (loose cables, damage).
- Ensure all connections are secure.
- Verify that the power source is working.

3 Check the Power Supply

- Make sure the computer is plugged in carefully.
- Check the power outlet and switch.
- Test with a known working power cable or PSU.

4 Check Internal Hardware Components

- Reseat RAM, GPU, and other components.
- Look for dust, overheeating, or physical damages.
- Ensure all components are properly installed.

5 Check for Overheating

- Ensure fans are working properly.
- Clean dust from vents and fans.
- Improve ventilation if needed.

6 Diagnose Software Issues

- Check for malware or virus.
- Verify system files and update drivers.
- Check for conflicting software.

7 Check the Operating System

- Ensure the OS is up to date.
- Run built-in diagnostic tools.
- Repair or reinstall the Operating System if needed.

8 Test Peripheral Devices

- Check if keyboard, mouse, and other devices are working.
- Try using different ports or cables.
- Replace faulty peripherals if necessary

9 Check for Hardware Failure

- Run memory and Hard Drive diagnostics.
- Test with known working components.
- Replace defective hardware.

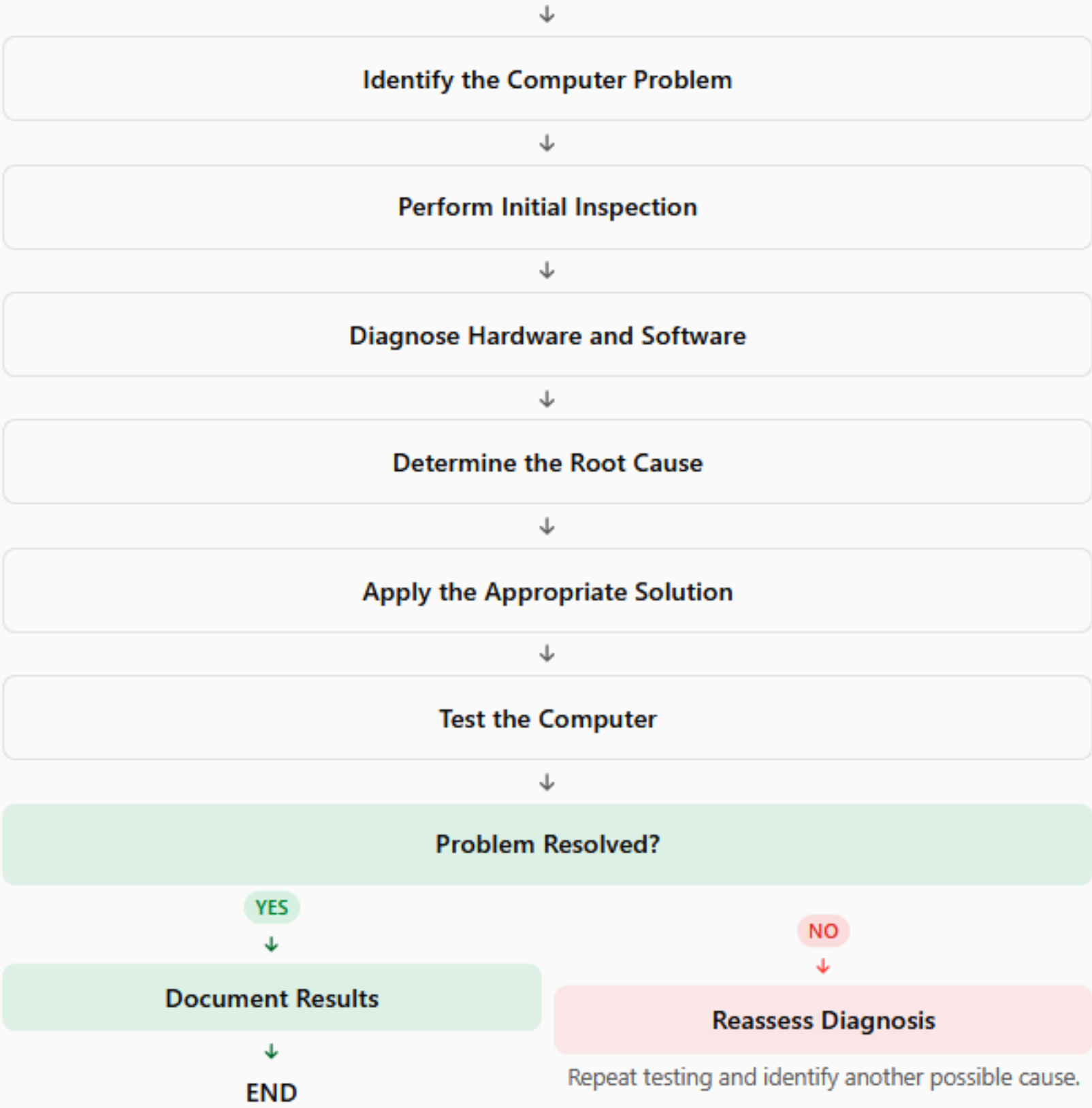
10 Seek Additional Help

- Seek manufacturer support.
- Ask a more experienced technician.
- Consider professional help if needed.

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This flowchart summarizes the overall troubleshooting process:



COMPUTER FINDINGS

Common Computer Problems and Possible Solutions

Personal computers may experience different hardware, software, operating system, and network problems. These issues can affect computer performance, reliability, and functionality.

No.	Computer Problem	Possible Solution
1	Computer Won't Turn On	Check the power cable, outlet, and power supply.
2	Computer Won't Boot	Check boot settings and use Startup Repair.
3	No Display on Monitor	Check monitor connections and graphics card.
4	Computer Running Slowly	Close unnecessary programs and free up storage space.
5	Computer Overheating	Clean cooling fans and improve ventilation.
6	Blue Screen of Death (BSOD)	Check hardware, update drivers, and repair system files.
7	Computer Randomly Restarts	Check the power supply and monitor temperatures.
8	RAM Not Detected	Reseat the RAM and test each memory module.
9	Hard Drive or SSD Not Detected	Check storage connections and BIOS/UEFI settings.
10	Graphics Card Not Working	Check connections and update graphics drivers.
11	Keyboard Not Working	Reconnect the keyboard or try another USB port.
12	Mouse Not Working	Check the connection or replace its batteries.
13	No Sound or Audio Output	Check volume settings and audio connections.
14	Computer Freezing or Hanging	Close unresponsive applications and restart the computer.
15	Applications Not Opening	Restart, update, or reinstall the application.
16	Software Crashing	Check compatibility and install updates.
17	Virus or Malware Infection	Run a security scan and remove detected threats.
18	No Internet Connection	Check the router, modem, and network connection.
19	USB Device Not Recognized	Try another USB port and check device drivers.
20	Printer Not Working	Check cables, paper, ink, and printer drivers.

REMINDERS

Computer maintenance refers to the regular process of cleaning, inspecting, updating, and taking care of a personal computer to ensure that it operates properly and efficiently. It is an important practice that helps prevent hardware failures, improve system performance, protect important files, and extend the lifespan of computer components. Proper maintenance also reduces the possibility of unexpected problems and expensive repairs.

One important type of computer maintenance is hardware maintenance, which involves cleaning and inspecting the physical components of a computer. This includes cleaning the computer case, keyboard, mouse, monitor, cooling fans, and other internal components. It also involves checking cables, inspecting RAM modules, monitoring storage devices, and ensuring that the cooling system is functioning properly. These activities help prevent dust buildup, overheating, and physical damage.

Another type is software maintenance, which focuses on keeping the operating system and installed applications updated and functioning correctly. This includes installing system updates, updating device drivers, removing unnecessary programs, deleting temporary files, scanning for viruses and malware, and checking system performance. These procedures help improve computer speed, security, stability, and overall functionality.

Preventive maintenance involves performing regular activities to avoid possible computer problems before they occur. This includes backing up important files, using surge protectors, ensuring proper ventilation, organizing computer cables, avoiding overloaded electrical outlets, and keeping food and liquids away from computer equipment. Proper shutdown procedures and regular inspection of peripheral devices are also important in preventing unexpected damage.

In conclusion, computer maintenance plays an important role in ensuring the reliability, security, and efficiency of a personal computer. By following proper cleaning procedures, updating software, inspecting hardware, and practicing preventive maintenance, users can reduce technical problems and extend the useful life of their computers. Regular maintenance helps ensure that a computer remains safe, functional, and ready for everyday use.