

# **Dr. SNS RAJALAKSHMI COLLEGE OF ARTS & SCIENCE(AUTONOMOUS)**

Accredited by NAAC (Cycle III) with 'A+' Grade

Affiliated to Bharathiar University

Coimbatore-641049



**DEPARTMENT OF COMPUTER APPLICATIONS**

**III UG**

**OPEN ELECTIVE ( PC HARDWARE AND  
TROUBLESHOOTING) 16PCA903**

**PREPARED BY: Mr.S.Lalitha**

**UNIT-V**

# UNIT V

## **Laptop:**

Laptop computers, also known as notebooks, are portable computers that you can take with you and use in different environments. They include a screen, keyboard, and a trackpad or trackball, which serves as the mouse. Because laptops are meant to be used on the go, they have a battery which allows them to operate without being plugged into a power outlet. Laptops also include a power adapter that allows them to use power from an outlet and recharges the battery.

## **Features**

### **1.Portability**

The primary function of a laptop is to be a computer that is capable of easily changing locations. Traditional desktop computers contain a great multitude of fragile parts which can be easily damaged when attempting to move the computer, especially if movement is frequent and lengthy. In addition to this, desktops take a considerable amount of setup time, and once in place they cannot be quickly moved

### **2.Dimensions and Weight**

Directly related to a laptop's portability are its dimensions and weight. As laptops have progressed and become more advanced, dimension and weight have changed from being simple physical facts into major selling points for laptops. Dimension-wise, most laptops boast screens around 15 inches across diagonally, with the largest currently sitting around 20 inches and the smallest going as low as 5.6 inches across.

### **3.Specifications**

Though they continue to grow in power with each year, the technical specifications of a laptop are still much more limited in scope than their desktop counterparts. This is due both to the need to fit an entire computer's worth of hardware in a small space and the lack of current technology to shrink some high-end hardware to such a small size. While as of 2011 desktop computers frequently boast processing speeds greater than 3.5 Ghz, the fastest laptop processor clocks in at 2.5 Ghz. In addition, graphic processing units are also much less powerful on laptops

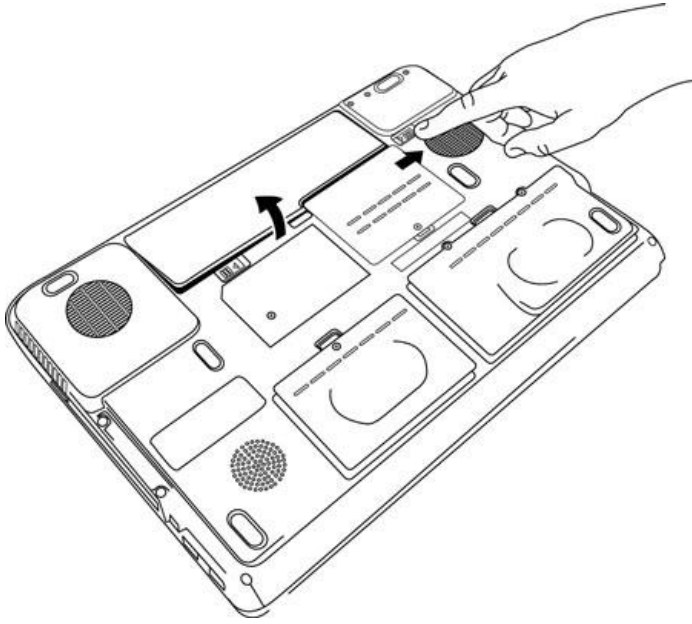
### **4. Input**

One major difference between a laptop and a desktop computer is the type of inputs available on laptops. Due to their portability, a standard computer mouse is not included with most laptops, and instead laptops use variations of touch sensitive trackpads, tracking points (little rubber nibs in the center of the keyboard), or tracking balls for mouse-input. Laptop keyboards are often somewhat smaller than those of desktops, almost always losing the adding machine-style numbers on the right side of the keyboard and thus shrinking the overall size.

## **Replacing Laptop Battery**

If your laptop battery fails or no longer holds a sufficient charge, you can easily replace it. Follow these steps:

1. Turn off your laptop and disconnect the AC adapter.
2. Release the latch or other attachment devices that hold your battery in place.
3. Slide the old battery out of its compartment or storage bay.

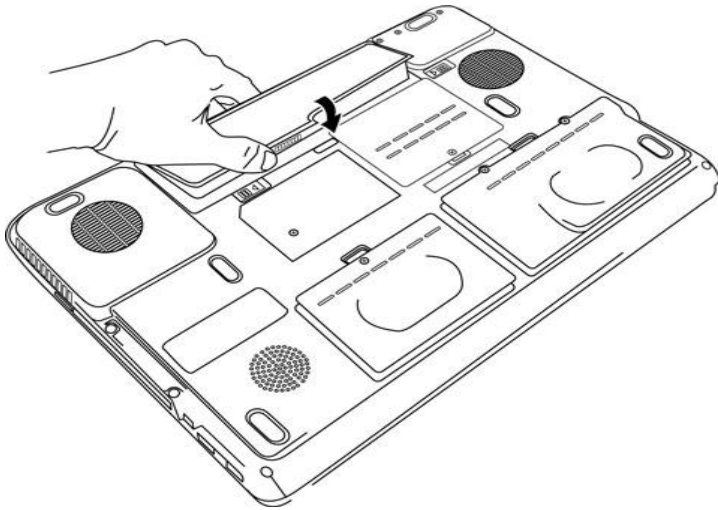


Press the release button if there is one and carefully lift the battery out of its compartment.

Avoid touching the contacts on the battery itself or inside the bay; the oils on your fingertips could reduce the conductivity of the battery.

4 Take the replacement battery out of the box.

5. Slide it into the notch or bay.



6. Close the safety latch to lock it into place.
7. Reconnect the AC adapter and give the battery a full charge.

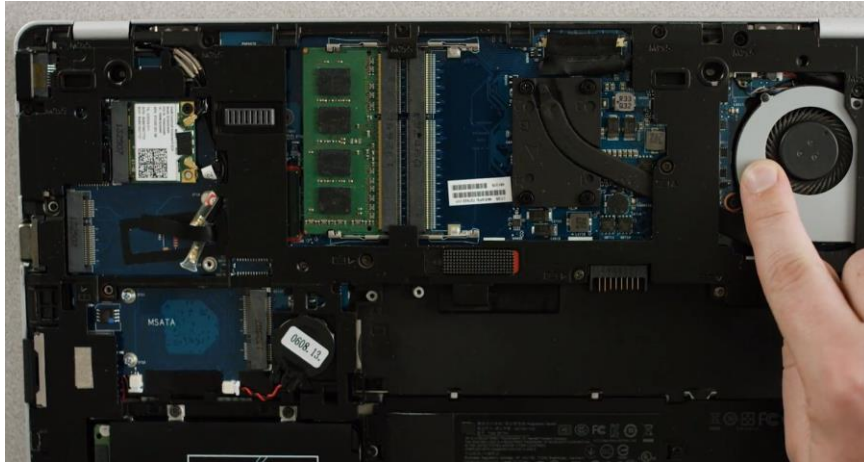
## **Dismantling Laptops**

### **Disassemble your laptop**

This is a general guide, which covers the most common laptop configuration. Laptop manufacturers vary, however, and some items might be in a slightly different place or connected differently. In general, the process is to remove the components you can reach first, being careful to disconnect any cables to the component first. Because there is little space in laptops, there is also very little slack in any cables, it's easy to stretch the cables or cause damage to the connector if you don't disconnect the cable before attempting to remove the component.

### **Step 1**

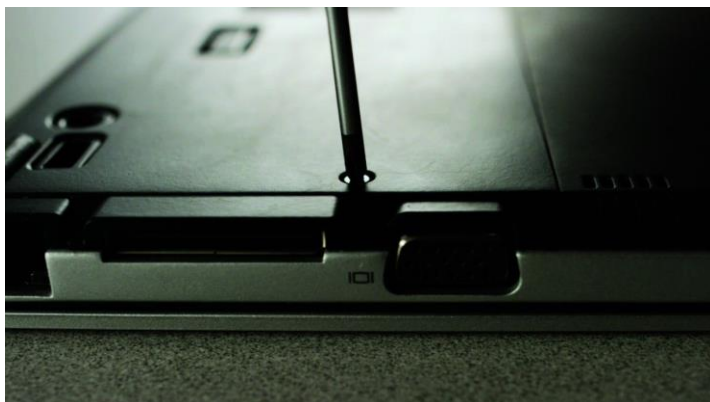
You will need a small Phillips-head screwdriver and possibly a flathead screwdriver, depending on the make of your laptop. To avoid the possibility of static electricity, wear an ESD wristband, or touch an unpainted piece of metal to discharge any built up static electricity. If you move away from your workspace, especially if you walk on carpet, touch an unpainted piece of metal again before resuming your work.



Turn off the computer, unplug it, and remove the battery by moving the locking slider to the unlock position. There will be another slider, move it in the direction indicated, then pull the battery straight out. Press the power button for at least five seconds to discharge any remaining electricity in the system.

## Step 2

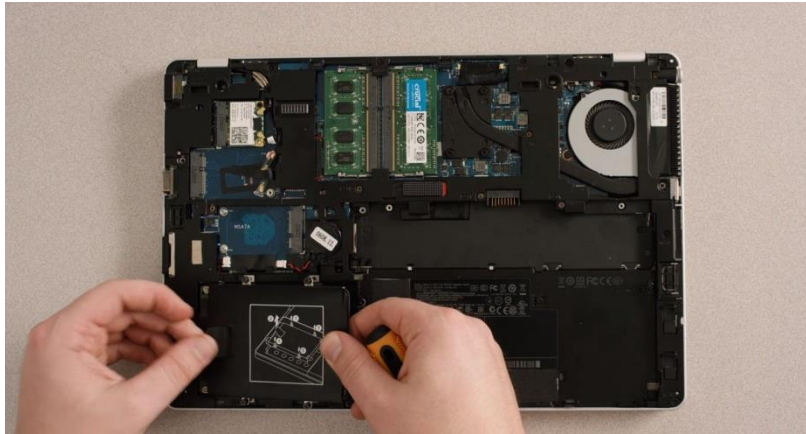
Remove the back panels by unscrewing all the available screws. Be sure to look under the rubber feet and behind stickers for any hidden screws. If you are going to reassemble the laptop, organize the covers so you can put them back in the correct places later.



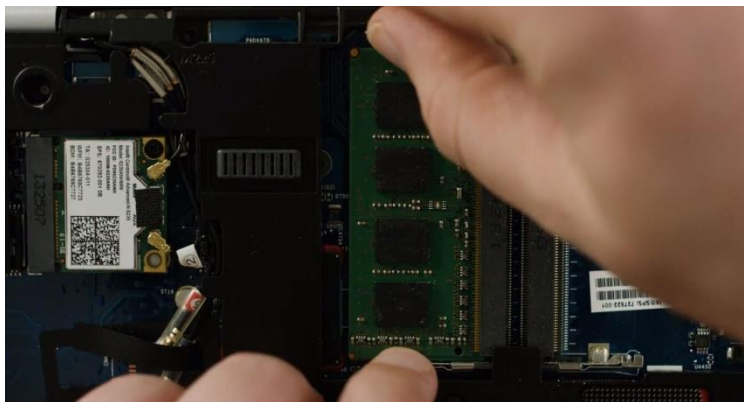
## Step 3

Many components will be immediately accessible after removing the covers. Generally, you can remove the storage drive, memory, and wireless card first.

Disconnect the cables, then remove the storage drive. Sometimes laptop manufacturers do not provide a connector on ribbon cables, instead the cable itself is clamped into the component. If this is the case, you'll need to open the clamp with the flathead screwdriver and remove the ribbon cable. The storage drive might be screwed in - if there are screws, remove them, keeping track of where each one goes.



Remove the memory modules by pressing down on the clips that hold each module in place, using your fingers or a spudger tool. The module will pop up at a 30-degree angle, allowing you to remove it. Don't touch the gold pins on the module.



The small gold-tipped cover near the wireless card is the wireless antenna. Pry this off with the flathead screwdriver, then remove the wireless card using clips similar to the memory modules.

#### **Step 4**

The next step is to remove the hinge cover plate and keyboard. Some manufacturers use screws on the hinge cover plate, some do not. If there are screws, they can be inside the removed battery area or on the hinge cover plate. Check for and remove any screws, then try to pry up the hinge cover plate. Sometimes there is a small notch that makes this easier. The plate should come loose easily, if there is more than a little resistance, check again for screws. Then, remove the hinge cover plate entirely.

Remove the screws found under the hinge cover plate to remove the keyboard. If the keyboard does not want to move when you lift it up and forward, check for additional screws.

Do not pull out the ribbon cable under the keyboard when you remove the keyboard. It will be held in place by a plastic hinge. Lift the hinge with your fingers or a plastic spudger tool.

Remove any other cables in the area under the keyboard. The connectors move either up or forward. If the cable has a small plastic plug, it just pulls out.

#### **Step 5**

To remove the laptop screen, remove the antenna cable and the LCD data cable that connects from the area that housed the keyboard to the bottom edge of the screen.

Take out the screws that connect the display to the hinge area. They could be on the back of the display, or on the inside, where the keyboard was. Gently remove the display assembly.





## **Step 6**

On the screen remove the black rubber pads around the screen to access more screws. Use your fingernails to remove the pads, aggressive tools can tear the pads. Remove all the screws you find. Pry the front cover of the screen away from the back part. If you feel resistance, look for a screw you might have missed.

To remove the screen, remove the very small screws on the side of the LCD screen. Do not touch the back part of the screen. You can now access the fluorescent lamp inverter.

## **Step 7**

Pry the case on the bottom of the laptop apart.

Remove the touchpad and continue to remove screws and disconnect the cables attached to the motherboard. You don't always have to remove all the screws on the motherboard, some of them hold the motherboard components to the motherboard. Some manufacturers will mark the screws to remove the motherboard with a letter or an arrow.

After the screws have been removed, the motherboard should come out with no resistance. If there is resistance, check for more screws.

## **Rebuild your laptop**

To reassemble your laptop, do each step in reverse order. Be sure that connectors are seated securely, cables aren't kinked or stretched, and that all the screws go back into their correct holes. It's usually a good idea to alternate tightening screws on a part to avoid cracking the part. For the keyboard ribbon cable, the lighter side goes up to prevent a twist in the cable.

## Printers

### Types of Printers

A printer is a hardware output device that is used to generate hard copy and print any document. A document can be of any type such as a text file, image, or the combination of both. It accepts input command by users on a computer or on other devices to print the documents. For example, if you have to submit a project report at your college, you need to create a soft copy of your report and print it with the help of the printer.



### Types of printer

Although there are different types of printers, nowadays, two types of printers are commonly used, which are inkjet and laser printers. A list of all the various types of printers is given below:

- Inkjet Printers
- Laser Printers
- 3D Printers
- LED Printers
- Solid Ink Printers
- Dot Matrix Printers
- Multifunction or All-in-One Printers
- Thermal printer
- Plotter

## Inkjet Printers

It is widely used by home and business computer users that prints characters by spraying the ink using magnetic plates on the paper. It contains a **paper feed assembly, ink cartridge, print head, stabilizer bar, and belt.**

It stores the ink in cartridges, and uses separate cartridge to print several types of color documents. These colors are a combination of **cyan, magenta, yellow, and black color.** These types of printers have the ability to create high-quality pictures with the help of vivid colors. Furthermore, the inkjet printers are more affordable and easier to use as compared to other printers.



### **Advantages of Inkjet Printers:**

- The Inkjet printers have the ability to produce high-quality output.
- These printers are reasonably fast and easy to use.
- Additionally, these types of printers do not take warm up time.

### **Disadvantages of Inkjet Printer:**

- It may take more time to print.
- Its running cost is high.
- It does not allow the highlighter marker.
- Sometimes, it can produce a wrong warning of an empty cartridge.

## **Laser printers**

The laser printer is one of the common personal computer printers. It was introduced in 1971, and after that it was developed at Xerox PARC by Gary Starkweather. It uses the laser or non-impact photocopier technology to print the text and images on the paper. Whenever it gets input to print any document, a laser beam draws the document on the selenium-coated drum with the help of electric charges.

- When the drum is charged, it is rolled in toner (dry ink powder). The ink follows the image, which has charged on the drum. The ink is combined with the paper, including heat and pressure, then transferred on a chunk (piece) of paper.

When the document is printed, the excess toner is collected, and an electric charge is removed from the drum. Most of the laser printers are capable of printing only in monochrome. The monochrome laser printer is around ten times cheaper than a color laser printer.



There are many differences between a laser printer and inkjet printer, such as:

- The laser printer contains dry ink, while an inkjet contains **wet ink**.
- An inkjet printer is approximately ten times more expensive than the laser printer as it requires replacing the ink very frequently.
- If a paper is wet, the inkjet printer will print the document with blur, but the laser printer will print clear. The inkjet printer is suitable for printing fewer documents, while the laser printer has the ability to print more documents.

#### **Advantages of a Laser printer:**

- These types of printers have a higher paper capacity.

- It is less expensive than the inkjet printer.
- It has the ability to print documents speedily.
- Furthermore, it is able to increase productivity.

### **Disadvantages of a Laser printer:**

- Laser printers may need warm up time.
- Laser printers are bulky as they required the laser technology and imaging drum.
- It requires high voltage leads to small carbon emissions.

## 3D Printers

One of the best enhancements in the history of printing technology is the 3d printer, which was developed by **Chuck Hull** in **1984**. It produces 3D objects and items by using **quality resin**. It uses materials like plastics, polymers, metal alloys, or even food ingredients.



## LED Printers

The LED printer is mostly like a laser printer. It uses the drum, ink, and fuser system to print the black or colored documents. Initially, Casio and function developed the LED printers by focusing light throughout the whole length of the drum. These types of printers are non-impact, but instead of using a laser in the printhead they use a light-emitting diode.



## Dot Matrix Printers

The dot matrix printers are also known as a pin printer that was released by **IBM in 1957**. Although, in 1970, Centronics created the first dot-matrix impact printer. It strikes an ink ribbon using print heads that place thousands of little dots to form images and text. Nowadays, as compared to laser and inkjet printers, it is less used, as its printing speed slow and generates lower quality images. However, dot matrix printers are still in use in some sectors like package delivery companies and auto part stores



## Multifunction Printers

Multifunction printer is a hardware device that can perform various tasks such as **printing, scanning, faxing, and copying**. It is also called the All-in-One printer. It is suitable for budget-minded businesses that want to reduce costs, consolidate assets, and improve workflow. Although it is necessary to connect the printer to a computer with the help of a wire or wireless connection, sometimes it can be controlled from their control panel like standalone copiers. Furthermore, no need for more than one unit as it can easily complete multiple tasks within an office or home simultaneously.





## Thermal printer

The thermal printer is invented by **Jack Kilby** that is also known as an electrothermal printer, thermal transfer printer, or thermal wax-transfer printer. It utilizes heated pins in order to produce the image on paper. These types of printers are widely used in banking, airline, grocery, entertainment, retail, healthcare industries, fax, and calculator machines. These printers are low-cost and print fast, and do not use ink like other printers. They primarily depend on the thermal paper to produce the images.



## Plotter

A plotter is a hardware device or a printer, which was first invented by **Remington-Rand** in **1953**. It is developed to print vector graphics and uses a pencil, pen, marker, or other writing tools for drawing continuous lines instead of using ink or tonner. It is widely used to print a hard copy of schematics and other similar applications.

here are several types of plotter given in the below list:

1. **Drum plotter:** It is also known as roller plotter. It turns the paper back and forth on a drum while pens move left and right. With the help of combining these two directions, the line can be drawn in any direction.
2. **Flatbed plotter:** In flatbed plotter, a paper is placed on a large horizontal surface. A traveling bar moves across the surface and draws the lines.
3. **Electrostatic plotter:** It draws on paper that is charged negatively with positively charged ink or tonner.
4. **Inkjet Plotter:** It is a type of Pinch Roller Plotter, which produces an image with the help of showering little drops of ink on the paper.
5. **Cutting Plotter:** It is a new generation device that allows users to cut different shapes. It is mainly used for advertising, sign-making, bill board, and vehicle graphics.



## **Installing Printers**

A computer printer does not work until you install the included drivers and software. If you have lost the CD for your printer, you can download the drivers for your printer and use them to install your printer. A listing of printer manufacturers and links to their associated driver download pages are on our printer drivers page.

## **Connecting the printer to the computer**

Connect the printer to the computer either using a USB cable, parallel port cable, or SCSI cable, and then connect the power plug to a power outlet. Today, most home computer printers are using a USB cable similar to the example picture.

## **Turning on a printer**

After connecting the printer to the computer, it can be turned on using the power button on the front of the printer. Typically the power button is on the front right corner of the printer. However, the button placement depends on the type of printer you have. Older laser printers may even have a power switch in one of the back bottom corners of the printer.

## **Setup printer and install software**

After connecting the printer and turning it on, you'll need to install the printer's software and drivers. Every printer should come with the software used to install a printer in Windows or your operating system.

1. After everything is plugged in, turn on the computer.
2. Insert the CD that came with the printer. If the CD does not automatically start, open My Computer, double-click the CD drive, and then click the **Setup** or **Install** file. If you have downloaded the drivers, run the downloaded setup file.

3. Follow the installation wizard, and once completed, your software is installed.
4. Test the printer to make sure it is working.

### **Computer with no CD, DVD, or disc drive**

If your computer does not have a disc drive or you lost the CD, you can download the software for your printer from the manufactures printer's driver page. Once the drivers are downloaded, you can run the file to install the drivers.

## **Maintenance and Troubleshooting**

### **Maintenance**

Certain types of basic maintenance are simple enough that you can do it yourself. Things like changing the toner cartridge or refilling the paper do not require special knowledge. Just review your owner's manual before you do it the first time and you'll be all set. If your printer comes equipped with a hole-punch or staple function, you should also learn how to maintain these features. There will be a receptacle for the chads that are removed by the hole-punch and this receptacle will need to be emptied periodically. You will also need to refill the staple cartridge from time to time. Other types of simple DIY maintenance include using compressed air to remove lint particles and cleaning the exposure glass.

### **Troubleshooting**

Handling printer repair on your own is often not a good choice. If you damage something while trying to repair the device, it may not be covered by your warranty. However, there are a few simple things you can probably take care of yourself without taking any big risks. One of the most common mishaps with printers and copiers are paper jams. When paper jams occur, it's wise to consult your owner's manual to determine if the device needs to be stopped, turned off, or unplugged. Next, you can begin to clear the jam by removing the jam. If you feel a lot of resistance when pulling the paper free, try pulling it in the other direction. A major jam could have paper in multiple different areas, so check everything over carefully. Once the printer gets going again, you may want to inspect your copies carefully to make sure no pages are missing.

### ***Software Issues***

Some printer repair issues focus on the software or network settings of the device rather than the printer itself. If you're having trouble with your printer settings, you may be able to diagnose and repair the problem yourself. Consult your manual to learn more about how to configure your device and when it's necessary to update software and printer drivers. If you are tech savvy, figuring out these types of printer repairs may be a breeze. If not, don't hesitate to contact your local copier company for help. That's what we're here for!

### **Common Problems and Solutions.**

1. Printer is unresponsive
2. Printer won't print
3. Bad print quality
4. Uncertain about printer security
5. My printer won't scan
6. Too many paper jams
7. Prints too slowly
8. Printing is too expensive
9. I can't print from my mobile device
10. Wi-Fi printing takes too long

#### **1. Printer is Unresponsive**

Before we get too deep into specific common printer problems and solutions, consider the best practices that our Managed Print technicians follow first. Always make sure the basics have been checked before trying to solve common problems with printers:

- Is the printer on?
- Does it have paper?
- Are all necessary cables connected?
- Are all wireless connections working properly?
- Have you checked the printer ink or toner cartridges?

With those questions answered, you can explore further with some of the following solutions.

## **2. Printer Won't Print**

Are you getting error messages on the control panel or simply feel like your print job is stuck somewhere in cyberspace? While the easiest solution is to hit the power button and restart your printer, it's essential to double-check you've selected the correct print settings—preferably before you send a dozen copies of your document to another device located in the next room.

If your printer driver has two-way communication, you may be warned about an issue even before you go to the printer only to find nothing waiting for you on the print tray. Luckily, these warnings often tell you what the problem is and will recommend troubleshooting tactics. If all else fails, turn your printer off, wait a few minutes, and then restart your printer and software application.

## **3. Bad Print Quality**

It may seem insignificant, but the paper you print on can make a major difference in your final print quality. Generally, photo paper sold by your printer's manufacturer will have fewer issues than generic printer paper. But what's even more important? Match the printer settings to what you're printing.

This means more than making sure the correct type of paper is selected; it also means choosing the appropriate print quality settings for your printed pages. Do you want to print photos for a presentation or is it just a copy of an email you're going to file away? If you're printing high-

quality photos on glossy paper, draft quality and plain paper settings will not suffice. Furthermore, mixing brands and types of paper within one printer tray can cause further issues.

#### **4. Uncertain About Printer Security**

Most printer manufacturers come with security features already installed to protect against unauthorized access. However, if certain measures aren't taken, a hacker could use your printer as a back door to breach your network. The biggest steps you can take to prevent this include changing the default password on your printer and ensuring the latest security updates have been installed.

If you're unsure how to do that, ask your IT manager or Managed Print Service (MPS) provider to configure your security settings. They'll ensure you have a digital lockbox and have updated security settings. They can even set up confidential printing modes to protect against potential internal threats.

#### **5. My Printer Won't Scan Anymore**

When an MFP no longer scans, corrupted scanner software often plays the role of the villain. To get your printer scanning again, reinstall the printing software package. If that's not successful, read through the user manual's troubleshooting section, or look online at the manufacturer's website to find your specific printer model. There may be a hardware issue that needs to be repaired or replaced.

#### **6. Too Many Paper Jams**

While the obvious paper jam culprit may be foreign objects loose inside the printer, there are several lesser-known culprits, including an overfilled paper tray or improperly inserted paper. Try fanning the stack of paper to reduce any static and dust, and re-insert the paper while keeping it flush with the guides. When using thicker paper, it's often better to manually feed each sheet into the printer through a bypass tray.

## **7. Prints Too Slowly**

Even though inkjet printers can be notoriously slow with ink drying time, laser printers can have issues, too. Just as printing in draft quality for detailed photos can result in print quality issues, so can printing in presentation quality for simple black and white text documents.

The lesser the standard for print quality, the faster it will print. Also consider whether your print job is printing in duplex mode (using both sides of the paper). In this case, the printer has to take time to flip each sheet of paper over. If your goal is speed, the simpler the printer settings, the better.

## **8. Printing is Too Expensive**

Before you pay for another set of toner cartridges, consider the following:

- Can the majority of your documents be printed in draft quality?
- Do you need every page of the document, or maybe just a few?
- Is duplex or two-sided printing an option?
- Are your ink cartridges truly made for your device and are they being purchased from a reputable vendor?

If you're buying the lower-priced third-party ink, clogged print nozzles and sub-par ink quality are two common complaints and inevitably result in more frequent ink orders. Making sure all employees adhere to common printing standards can also save money. You may also want to consider switching to a paperless electronic content management (ECM) system which can store and route documents through the cloud, helping your company further its green initiatives.

## **9. I Can't Print from My Mobile Device**

Almost every major printer company has released an app allowing you to connect your mobile device with your printer to print wirelessly. Your wireless printer doesn't even require Wi-Fi



connectivity, it simply needs a wireless access point that allows you to install the necessary software.

If you're having trouble printing from a smartphone or other mobile device, check for any app and software updates and make sure they're compatible with your print device.

### **10. Wi-Fi Printing Takes Too Long**

If your printer speed is fine when connected via USB but wireless printing is painfully slow, your printer is likely an innocent bystander; it's how the print data is being transferred that's the guilty party. Try moving the router and printer closer together.

If moving your printer closer to the router isn't possible, make sure your router is well-equipped for Wi-Fi printing with 802.11n support, up-to-date firmware, and that it offers the 5GHz band and has 2.4GHz. Switching to a wired connection, then back to wireless, can sometimes work as well.

Ultimately, if none of these techniques work or your printer is well beyond its expected lifespan, consider getting a service contract with your next replacement. Knowing how to fix printer problems sometimes requires knowing who to contact. Calling in an expert that is already familiar with your machine will save you time and frustration in the long run. To learn more about Managed Print Services and its benefits, check out the infographic below.

If any of these common printer problems are persistent, it may be time to consult with a business technology expert who can help with your printing concerns. Contact Gordon Flesch Company for a free, no-obligation Managed Print Services needs assessment.

## Scanners and Speakers::

# Scanning

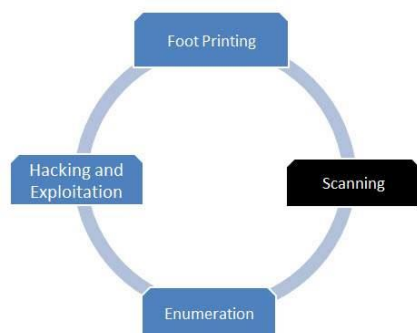
Scanning is the second step that is performed after footprinting. It involves scanning open ports, fingerprinting the operating system, and uncovering services on ports. The ultimate goal of scanning is to find open ports through external or internal network scanning, pinging machines, determining network ranges, and port scanning individual systems

## Tools Used in Scanning

Following are the common set of tools/resources used in Scanning –

- NMap
- Ping
- Traceroute
- Superscan
- Netcat
- NeoTrace

## Flow Diagram



*Popular scanner manufacturing companies*

- *Canon Scanners.*
- *Epson Digital Scanner.*
- *HP Digital Scanner.*
- *Fujitsu Scanners.*
- *HP Sheet Feed Scanner.*
- *Kodak Scanners.*
- *Umax Digital Scanner.*
- *Plustek Digital Scanner.*
- *Microtech*

*Different Types of Scanner in Computer*

- *Drum Scanner*
- *Handheld Scanner*
- *Flatbed Scanner*
- *Optical Character Recognition*
- *Magnetic Ink Character Recognition*
- *Image Scanner*
- *Light Pen*
- *Barcode Reader*
  
- *Drum Scanner*

The drum scanner scan images in high resolutions all the small details included in the documents and images are scanned in the process.

The image is kept on the glass tube where glass tubes revolve around the image to scan the document from all angles.

There is a sensor mounted in the centre of the cylinder. This sensor divides the light coming from the document into 3 beams.

### ***Handheld Scanner***

The handheld scanners or hand scanners are small and compact in size devices; they are one of the popular input devices of the computer systems.

They are capable of scanning any size of products, they are less weighted therefore can be used accordingly.

They are also considered as small manual scanning devices that is generally used with hands for manual scanning.

They are used while gently scrolling over the image or barcode to capture the complete details related to the product such as product manufacturing details, price, expiry date and batch number.

### ***Flatbed Scanner***

They are the most famous and popular scanners and therefore widely used and accepted. They are also known as desktop scanners or personal computer scanners.

*They are primarily and extensively used in homes and small offices.*

Flatbed scanners have a large glass surface and a lid.

These scanners work best with flat objects such as photos and paper, but you can also place large objects such as open books on the scanner bed.

Some models of flatbed scanners come with built-in all-in-one devices that function as printers, scanners, copy machines, and fax machines.

### ***Optical Character Recognition***

*The OCR stands for optical character recognition.*

OCR is a mechanical device that can convert *images, pictures, documents, or manually written content* into readable form.

These scanned documents are later provided to the system for further processing like modification and updates using editing software like *Photoshop and adobe reader*.

### ***Magnetic Ink Character Recognition***

*MICR stands for magnetic ink character recognition.*

MICR is an input device of a computer system that is generally used in the banking sector where numerous cheques are handled and processed every day.

### ***Image Scanner***

The image scanner is a digital device also an input device of the computer that is used to scan images, pictures, printed text, documents and objects and later convert it into a digital image.

Image scanners are used in a variety of domestic and industrial applications such as *design, reverse engineering, orthotics, gaming and testing*.

### ***Light Pen***

The light pen is a computer input device similar to a pen used to read bar codes, also capable of pointing at the object and characters on the monitor screen.

The light pen helps users modify changes in the drawings. It is also considered a handheld light-sensitive device known as a "*Pointing Device*".

The light pen is used to command the computer system for performing specific and special operations.

*They are also called “Electronic Pen”.*

It is a pointing device that can be used as a computer mouse to point, select, and drag elements on the computer screen.

### ***Barcode Reader***

These barcodes are scanned with the help of a barcode scanner or barcode reader to check the details regarding the price, item no, batch code, etc.

This barcode reader or barcode scanner is attached to the computer system. After scanning, the complete details of the item can be fetched on the computer for quick access with database administration.

### **Features:**

#### **The Feeder Type**

To begin with, you want to find out what kind of scanner you want which breaks down to two main categories: flatbed and sheetfed. A flatbed scanner will just offer a flat surface upon which you place the document for scanning, close the lid, and hit the scan functions. A sheetfed scanner utilizes a feeder port will bring documents into the scanner in order to be scanned.

#### **Compatibility of the Software**

You also have to consider the software that you need in order to run the scanner, and if you can get it to work with the kind of computer you have. Software is usually always included with each unit sold. This is the program that allows you to choose such options as resolution, color depth, scan or copy and in most cases a photo editing program. The editing program will let you crop and modify any document or photo

you have scanned. An operating software will let you print or save the edited image to your computer or send it to a printer.

### **Color Depth and Resolution**

In the event you are concerned about how good the image looks in the scanner, take a look at the resolution and color depth that is offered with that scanner. The DPI, or dots per inch, is what determines the resolution; the higher the DPI, the better the image will turn out all things being equal. Typically the more dpi the image contains, the more crisp and clear it is displayed on your computer screen or when printed.

Color depth refers to whether you get true colors when scanning an object, picture or document. The unit uses bit color to determine whether the color is true or just close. When looking at color depth, you are finding out the amount of color that every pixel can receive; the higher the depth, the better the quality of the image.

### **Scanning Bed Size**

You will find many flatbed scanners to hold anything of legal paper or smaller size (8.5" x 14"). For those people who want to scan bigger images than that, you will either need a large flatbed scanner or utilize a software stitching program for piecing together multiple small scans of a large item. There are actually large format scanners that will scan up to an 11×17" size.

### **Extra Amenities**

A lot of scanners are an all-in-one package, usually referred to as all-in-one printers. An all-in-one printers will scan, print, and even fax a document while maintaining the size of a standard printer. Those who have home offices in which scanning is just one need will be well served by a multifunctional device. You can cut down on costs by

only purchasing one machine that does all of that, plus save space in your office. On the flip side though, you will likely lose a bit in image quality.

### **Warranty and Service**

You can often run into issues when running technical equipment such as this. Therefore, you really want to take a look at the service plan and warranty that you have with it. Verify that you do not have to pay anything to send it in for repairs in the event that something goes wrong with it, especially within the warranty period. Also check for a dedicated customer service line should you need help with troubleshooting.

### **The Cost**

When you compare the options and features of the various models of scanners available, you will notice you also have some options as far as price. The more options and features the unit contains, the more you will normally have to pay. Specialty scanners like a slide and photo scanner may cost a bit more than your basic flatbed.

### **Scanner Issues**

If you are having an issue with your scanner, it may indicate one of several possible problems. It could be cables connected improperly, no power supply, or invalid driver software. To determine the issue, you will need to perform general troubleshooting techniques for your scanner.

Cable Connections – Start by checking to see that all cables are connected properly. A scanner will most likely have two connections located on the back of the scanner. One cable will be plugged into a power outlet, while the other will plug into the computer. Be sure that they are securely plugged in. Some scanners rely solely on the USB cable for power, and thus they don't have a separate power cord. For these scanners, it is wise to connect them directly to the PC USB



port rather than connecting them to an unpowered USB hub because that may not generate sufficient power to run the scanner.

**Power** – Once you have checked all the connections and verified they are plugged in correctly, if the scanner is still not working, you may want to check that the power cord is plugged in directly to a working power outlet. You should always connect your sensitive computer equipment to surge protectors--make sure the surge protectors are powered on and verify current is flowing by plugging other devices into the outlet in question. An indicator light (much like that for the printer) should illuminate on the scanner if it is properly connected. Also, most scanners when plugged in will do a "self-test", meaning they will do a motor adjustment and/or quick scan test. If power is an issue, you need to contact the manufacture for service/repairs. This information can usually be found in the scanner manual.

**Other Devices** – If you have other devices connected to the computer, then try shutting down your computer and disconnecting non-essential devices. Parallel, SCSI, Firewire, and other USB devices may interfere with the scanner operations.

**Drivers** – Always contact the manufacture's website for the latest software drivers for your scanner model. If all else fails, do a full uninstall of any scanner software/drivers, reboot the machine, and run the latest scanner driver installation program.

**Other Causes and Solutions** – It is possible that if an application is running in the background, the scanner may not be able to scan. Do not run any other applications while scanning. Review applications running in the TaskManager.

## **Scanner Maintenance**

### **Professional Installation**

Correctly setting up a remote deposit capture is not always a quick and easy process. It's prudent to consider software compatibility, regulations, and several other factors. As you might imagine,

improper installation is more likely to lead to problems when you try to use your check scanner. Following the remote deposit capture best practices checklist will help you ensure proper installation and prevent scanner issues.

### **Track Your Scanner Use**

Keeping track of your check scanner usage will help you determine how it should function and how to address any issues. Heavily used check scanners may require more extensive troubleshooting, like a head replacement or system overall. On the other hand, check scanners with light use may only require a minor repair or adjustment to address the problem's underlying cause. If you've had your scanner for a while, keep in mind that 500,000 scans is the milestone for replacement.

### **Clean Your Check Scanner**

Without regular cleaning, scanners are susceptible to malfunction. If it's not already, make sure that check scanner cleaning is part of your preventive maintenance checklist. Giving your check scanner a thorough cleaning will remove the buildup that could be causing a problem. It's best to clean your scanner approximately every 5,000 to 8,000 scans.

### **Choose a High-Quality Scanner**

There are several types and brands of scanners to choose from, and they are not all created equally. While any check scanner can run into issues, choosing a high-quality scanner is an excellent way to minimize the potential of future problems. We've made it much simpler to choose the best RDC check scanner for your business with this guide.

### **Assess The Cause of the Problem**


Many scanner problems are resolvable by addressing user errors. While some issues may include physical damage or broken parts, many scanner malfunctions are preventable. Some common user errors that create scanner malfunctions include:

- Checks with weak magnetic ink
- Folded, crumpled, or damaged checks
- Misaligned MICR character spacing
- Improperly inserted documents
- Dust, dirt, or particles on the read head
- Double-feeding the check by mistake

To resolve these common problems, train your team on how to use and clean your scanner inventory. For end-users, provide training and cleaning manuals and set them up with a maintenance provider.

## Common Problems and Solutions

### Scanner Operation Problems

- ▼ The  Start button light does not come on
- ▼ The scanner does not scan
- ▼ Pressing the button does not start scanning
- ▼ Pressing the buttons in a Mac OS X environment starts Classic mode
- ▼ You cannot scan multiple images
- ▼ You cannot scan from the Automatic Document Feeder
- ▼ Paper jams in the Automatic Document Feeder

Problems you may have while using the scanner often involve the operation of your software and computer. Operation problems usually occur because of:

- Incorrect setup of the interface
- Incorrect setup of your computer or software
- Incorrect operation of your software

## SPEAKERS

Sound systems are output devices which are used to get multimedia content such as voice, music, etc., as output. Some of examples of sound systems are speakers, headphones, and microphones.

## **Types of speakers by size and location**

### **Bookshelf Speakers**

Bookshelf speakers are small speakers that can be placed on a shelf or stand. Bookshelf speakers are usually used in home audio systems. They are small or medium-sized and there are many options available on the market with different price ranges and quality. Some have low quality but you can get a nice pair of bookshelf speakers if you have the budget.

### **Tower Speakers**

Tower speakers are also called floor standing speakers. They are tall and can stand on the ground or be mounted to a wall. These types of speakers tend to have more bass than a bookshelf speaker due to their larger size which allows for bigger drivers with greater performance capabilities, but they do need space in your room so you may want to measure before purchasing one if your living conditions require them not taking too much space. The price also affects a lot.

## **Soundbar speakers**

A soundbar is a long bar speaker. Its main function is to improve the audio quality of your TV by adding more depth and clarity to it produced with two small speakers in one single enclosure with inputs for TVs, Blu-ray players, cable boxes, or game consoles. Soundbars might not be as good as a pair of stereo speakers, but they're easier to install.

## **Built-in speakers**

Built-in speakers may not be as great sounding as tower or bookshelf speakers but they do have the advantage of being installed within a TV. They are usually small and weak, so you shouldn't expect them to produce really loud sound with deep bass, but for watching movies in your living room without having too much space it's a good option.

## **In-ceiling and in-wall speakers**

In-ceiling and in-wall speakers are the best options in terms of appearance. They provide decent performance with a wide dispersion of sound due to their omnidirectional design, they look good because you don't see them from the outside and there's no clutter on your living room floor or space required by placing a speaker on a shelf or stand.

## **Outdoor speakers**

Outdoor speakers are also called weatherproof speakers. They can be placed outside in a covered area so they won't get damaged from rain or snow and exterior temperatures. These types of speakers have special features that protect them against water, UV rays, humidity, and other elements to ensure you'll never have problems with them when it comes to their performance even after several years of use under different conditions.

## **Portable speakers**

Portable speakers are smaller than average and usually come in the form of a cylindrical column, they can be used to play music from your phone or tablet. They have rechargeable batteries so you don't need power sockets nearby and enjoy sound wherever you want without having to carry big speakers with you which would take up too much space.

## **Types of speakers by frequency range**

### **Subwoofer or bass speaker**

Subwoofers are speakers that handle the deep bass frequencies. They come in different sizes but they're all big and bulky to allow enough air movement for producing lower tones which makes them suitable for

music genres such as rock, pop, or jazz where you need accurate guitar sounds coming from a subwoofer speaker.

### **Mid-range/midbass drivers**

Mid-range drivers are also called midbass drivers because their frequency range is somewhere between your tweeters (high end) and subwoofers (low end). They usually have large diaphragms of up to 18 inches wide so it's easy for them not only to produce vocals by themselves without any additional assistance from other types of speakers but even reproduce hard-hitting drum beats or string instruments with a lot of pressure.

### **Tweeters**

Tweeters handle very high-pitched sounds up to 20KHz which is the highest frequency a human being can hear. They're usually small dome-shaped speakers that produce very sharp sounds and give you crystal clear volume from high-pitched instruments such as cymbals, high hats, or violins for example.

### **Features of Speakers**

## **COMBINING CONVENIENCE WITH GREAT SOUND**

The popularity of Bluetooth-capable speakers, especially in the portable speaker market, has skyrocketed. It's not surprising—these convenient and portable devices make listening to personal music libraries from any mobile device easy and fun. Music lovers can share their favorite tunes with the world anytime, anywhere, without worrying about tangling wires or finding an outlet to plug into. Aside from the obvious convenience of Bluetooth capability, here are five more great features your customers are looking for in these trending products.

### **VERSATILE PORTABILITY**

Bluetooth speakers come in all sorts of shapes and sizes. Some feature clips and handles to suit your customers' lifestyles. For instance, some speakers feature a convenient carabiner for clipping onto belt loops, backpacks, and bags.

Many speakers offer big sound in a portable package like the 6.5-Inch Portable Bluetooth Speaker from SuperSonic. Don't let the small size fool you. It has a range of up to 22 feet and a carrying handle. So, your customers can move it wherever they want and entertain their friends, no matter where they go. Petra has a range of convenient portable speakers to choose from so you can find the ideal speaker for your customers.

### **WATER-RESISTANCE**

If your customers intend to take their speakers to the pool, the beach, or maybe even a party that could involve a spilled drink, water-resistance can be great insurance for protecting their speakers. The Waterproof Bluetooth Floating Portable Speaker from SuperSonic can be taken wherever your customers want to splash around water. With its small size and carabiner, users can move this speaker from place to place. Your customers won't need to worry about getting their Bluetooth speakers wet with this feature. Check out our full line of water-resistant speakers [here](#).

### **RECHARGEABLE BATTERY**

Most Bluetooth portable speakers feature an internal rechargeable battery, which adds to their convenience and energy efficiency. Since they don't require any electric batteries, they're better for the environment and your customers won't have to continually buy new batteries for them.



The Everyday 5-Watt Portable Bluetooth Rechargeable Speaker from Raycon lasts for an impressive 11-hour run time on a full charge. Users can listen all day without worrying about changing batteries.

## **VISUAL EFFECTS**

A fun party addition to a Bluetooth speaker is lighting or water-dancing effects. Users can watch as well as listen to their music with this cool feature. Sylvania's Bluetooth Light-Up LED Speaker boasts a range of up to 30 feet, with exciting LED lights that add style to its impressive sound. Your customers will be the life of any party with Bluetooth effects.

## **RUGGED DURABILITY**

Some speakers can outlast both weather and usual wear and tear. The ToughTested Satellite Outdoor Rugged True Wireless Stereo Bluetooth Speaker with FM Radio has a shockproof design that helps protect it from drops and breaks. It's also able to pair with another speaker, doubling the sound.

# **Common Problems and Solutions**

## **5 Common Audio System Problems and Their Solutions**

### **1. No Sound Or Distorted Sound From Speakers**

The first step is to check your source audio. If you are playing music over a cable connected to your phone, see if that works when connected to another speaker. Once you are sure that the original audio sounds fine on another speaker or audio system, you need to check if you've selected the right 'Source'.

Audio systems featuring multiple inputs have a Source option, depending on the features, it could include 3.5mm audio, optical audio, RCA, and even Bluetooth. Ensure that you've selected the correct audio source and not one which is not in use. If you've selected the correct audio source for your speakers, but the audio is still not audible or has distortions or frequent drop-outs and disturbance, it is possible that your cables are faulty.

Check the cable (if you're using one) between your playback source and your audio system. Next, turn your attention to the cabling between your amplifier (or an all-in-one system like

an AV receiver) and speakers. Over time, even the best cabling can get damaged or wear out. In some cases, audio systems use a wire that latches into a small port behind the speaker. If that's the case with your audio system as well, try cleaning the wire with sandpaper to remove any carbon deposits.

## **2. Surround Sound Directions Seem Wrong Or Audio Does Not Work**

Do you have a multi-speaker surround sound system that is giving trouble? You may be facing issues such as no audio, or lack of surround sound effect, or perhaps surround sound audio coming from the wrong direction. In case of wrong surround sound direction, you may have just placed the satellite speakers incorrectly.

Check the speakers and the user manual to see which speaker goes where. It's also possible, in the case of wired surround sound systems, that the wrong wire is connected to the wrong channel on the amplifier output ports (or to the wrong speaker). Carefully trace the wires back to see which port leads to which speaker, and then check in the user manual if that's the correct one.

Other frequent complaints with surround sound involve poor sound quality (with a lack of surround effect), or even no audio. In this case, the most likely possibility is that one of the components – either the audio system, the cables, or the source audio, does not support the right surround sound format (Dolby Audio, DTS, DTS HD, or Dolby Atmos).

## **3. Humming Sound In The Speakers**

First, check what surround sound format your TV or streaming device is using. Ensure that your audio system also supports this format. If it doesn't, don't worry: Many streaming devices (such as the [Amazon Fire TV Stick](#)) and TVs let you choose what format you want to output. Try changing the surround formats to match the ones you know for sure your audio system will work with. If the format is supported on both ends, then it's possible you're either using the wrong cable or have a damaged cable.

Some formats require HDMI cables as the audio signals are digital and are DRM protected, while others will work via optical (Toslink) or RCA cables. Ensure you're using the correct cable as well. Remember that 3.5mm cables and Bluetooth do not support surround sound so

if you're playing back wirelessly (or over a headphone cable) from your TV, you'll have to settle for stereo (2-channel) audio.

#### **4. Music Lacks Treble Or Bass**

1. The first possibility is that you're playing the audio systems at a really high volume. Not only does this increase distortion, but it also magnifies any other sound quality issues in your audio system.
2. Another possibility is that your equalizer settings aren't correct. Check any equalizer controls, not just in the audio system, but also the playback source.
3. You may also need to check the placement of your audio systems. Subwoofers are less finicky about placement, but tweeters and other (satellite) speakers should be placed as recommended by your audio system's brand in the user manual.
4. Finally, we're back to cables, and it is possible that a damaged wire is responsible and you should check out the troubleshooting steps we mentioned right at the beginning of this article.
5. If none of that helps, check if your speakers have any damages to their tweeters and woofers. If that's the case, you need to get them repaired through an experienced AV service engineer.

#### **5. Audio Volume Gets Too Loud**

If you're watching a movie and you find some scenes getting very loud, that's probably due to the way the audio has been mixed. But that doesn't mean you have to keep changing the volume settings every time. A lot of home audio systems offer a Dynamic Range Control (sometimes referred to as a Loudness Control). Turn this on to see if it helps. This will reduce the volume of the loudest parts. At the same time, it should also raise the volume of the quietest scenes, helping you enjoy a movie without constantly adjusting the volume.

These are the most common issues that people face with their audio systems. If the issue is related to the cables, connections, or placement of the speakers, you can solve it easily. However, if the issue is related to the speaker's driver or internal components such as the

amplifier or DAC's (Digital To Analogue Converter) internal circuits, you would definitely need to consult a service professional to get the issue fixed.

## Speaker Repair:

### What Do I Need for Speaker Repair?

You can buy replacement speakers, speaker repair kits, foam, wire, and other parts and materials at electronic and audio stores. These are other things you may need:

- Multimeter
- Rubber cement
  - Kraft paper patch or repair kit

# Common Speaker Repair Diagnostics and Troubleshooting



*Check to make sure the wires from the terminal block at the rear of the speaker enclosure are connected to the back of the driver.*

1. **#1 speaker not making any noise**
2. If the speakers didn't make any noise, obviously you may need to check wires. If it is not plugged properly, it won't work. If anyone side of the speaker works and another side not working, try to switch the wires to solve the issue. To check the ohms between the positive and negative leads to the speaker, use a multimeter.

The range should be between 1 and 16 ohms, if it is 0 or infinity there are likely problems and the speaker may be blown.

3. **Active or Passive?**

4. When you start to repair, check whether the power cord is plugged in an active speaker. And for the passive check, the amplifier is on and sending the signal. You may need to diagnose the problem if the amplifier part is broken. But, if the amplifier is working and the speaker is just blown, you should repair or replace the speaker.

5. **#2 Speakers making a funny noise**

6. If your speaker makes a funny noise, take off the grill and figure out the speaker cone. Look for problems like cracked or loose parts. Gently push the speaker in without applying power. If there are any loose pieces of dust cap or rubber surround or if you hear a crunching noise, you may glue it with epoxy or super-glue.

7. **Replace speaker driver or tweeter**

8. One of the easiest ways is to obtain a replacement tweeter or woofer. Search for a model online and get reliable parts.

9. **Reckoning a speaker**

Make sure that the voice coil, speaker cone as well as rubber surrounding are in a good condition. If any of the parts are damaged, replace them.

10. **Cleaning it up:**

Clean all traces of the old speaker cone. Peel off the entire outer surround or gasket as well as the cone and the voice coil by using a razor blade or scraper tool. There is a crinkled piece of wavy material under the speaker cone that serves to suspend the speaker cone. It may be called a spider sometimes. As well as, clean

out the air gap in the magnet. Clean all pieces of the cone and surrounding rubber with the recon kit obtained from the manufacturer.

#### **11. Prepping the area for gluing:**

Clean the outer and inner area of a speaker and pre-assemble the voice coil and driver. Make sure if all the areas are covered otherwise use glue.

#### **12. Assembly and glue:**

Assemble the speaker cone and voice coil, as well as the dust cap and spider by applying adhesive. Attach the metal frame with the new speaker and also reattach the positive and negative terminal of the speaker. Refer to the manufacturer's guidelines and assemble it.

#### **13. Letting it all dry:**

Let the speaker dry and then test the speaker voice coil by pushing the cone in and out with your hand. If something is rubbing or scraping, you need to tear it out and check the gap for foreign material.

#### **14. Steps to repair on your own:**

##### **Disassemble a speaker unit:**

1. First, unplug the speaker cable and if it is a powered unit, unplug it from the electrical receptacle.
2. Remove the front grill and access the drivers and the crossover network.
3. In front, drivers on a bass reflex speaker are screwed, and some speakers require a sharp knife to break the seal. If so, after the repair is over replace the seal with a sealer.

4. Gain access to the wire connectors that attach the terminal block to the driver by lifting the driver from the enclosure. Carefully remove the wires from the rear of the driver or the terminal block by using pliers. Make sure that the internal wire is clipped or soldered.
5. To access the internal parts, remove the crossover network from the unit and access inside the unit once the main driver is removed.
6. Test the unit's fuse by using a multimeter
7. Test resistance by using the multimeter,
8. Reassemble and replace components as needed.