



IT SUPPORT SERVICE LEVEL II

Learning Guide #36

Unit of Competence	:	Maintain Equipment and Consumables
Module Title	:	Maintaining Equipment and Consumables
LG Code	:	EIS ITS2 M10 1019 L01
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LO 1: Clean Equipment

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Accessing and verifying Cleaning equipment
- Recording and documenting Maintenance actions
- Cleaning equipment

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to:

1. Access and verify cleaning supplies for usability on the selected **equipment**
2. Record and document maintenance actions undertaken according to organizational procedures
3. Clean equipment as per manufacturer specifications and in line with organizational manuals

Learning Activities

1. Read the specific objectives of this Learning Guide.
 2. Read the information written in the “Information Sheets 1” in pages 3-9.
 3. Accomplish the “Self-check 1” in pages 10.
 4. Read the information written in the “Information Sheets 2” in page 11.
 5. Accomplish the “Self-check 2” in pages 12.
 6. Read the information written in the “Information Sheets 3” in page 13.
 7. Accomplish the “Self-check 2” in pages 14.
 8. If you earned a satisfactory evaluation proceed to “Operation Sheet 1”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity # 1.
 9. Perform the “Operation Sheet 1” in pages 15-17.
 10. If you earned a satisfactory evaluation proceed to “Lap Test”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Operation Sheet.
 11. Do the “LAP test” on page 18 (if you are ready) and show your output to your teacher. Your teacher will evaluate your output either satisfactory or unsatisfactory. If unsatisfactory, your teacher shall advise you on additional work. But if satisfactory you can proceed to Learning Guide 37.
- Your teacher will evaluate your output either satisfactory or unsatisfactory. If unsatisfactory, your teacher shall advise you on additional work. But if satisfactory you can proceed to the next topic.

1.1. Introduction

Maintenance

Maintenance - refers to rectifying faults and changing settings or components to ensure that equipment continues to work effectively.

Maintenance can be:

- **Routine** such as when a device or its components is serviced as matter of course. Procedures such as adding paper to the printer tray, cleaning the ink jet cartridges, aligning the print heads or changing toner cartridges are some examples of routine maintenance.
- **Non-routine** such as when a device or its components are serviced to rectify a specific fault. Procedures such as replacing a faulty floppy disk drive or adding extra RAM to a poorly performing computer are some examples of non-routine maintenance.
- **Preventative** such as scheduled repair or component replacement to keep them in optimum working condition. Procedures such as cleaning the keyboard, monitor, mouse, printers and floppy disks are some examples of preventative maintenance.

Based on the definitions above you will appreciate how important it is to maintain the operations of basic hardware (equipment) and replace consumables.

Hardware components may include but are not limited to:

- Personal computers
- Network systems
- Personal organizers
- Communication equipment

One of the consequences of omitting regular maintenance is to invite a build-up of dust and dirt. This leads to problems such as:

- Keyboard keys sticking
- Mouse skipping or erratic behavior
- Printer, fax and photocopier jamming

- Power supply failure

Routine or preventative maintenance ensures that the computer equipment will remain in good working order thereby reducing unnecessary service calls and loss of productivity.

Maintaining your computer

Keeping your computer in the best condition does more than give you room for more files. Unfortunately just deleting unused files isn't enough to keep your computer happy.

With routine and simple maintenance, your computer will be faster and more reliable. Keeping your computer in prime condition requires routine maintenance. Regular scanning and defragmenting of your computer is good for your hard drive.

If you have a computer, you have dust. Some computers have more dust than others; this depends on the environment. Computers used by smokers tend to gather more dust.

Fig. 1.1 Dusty Computer



The best way to keep your computer free of dust is to use a can of compressed air, open your computer's case, and start spraying. It is advisable to do this outdoors. You may want to pick out any larger "clumps" before you start spraying. Doing this once or twice a year can prolong the life of your computer.

Fig. 1.2 Tool Kit



Make sure you pay special attention to various fans in the computer as these cool it. You do not need to remove or disassemble anything.

Fig. 1.3 Cleaning tools



1.2. Identifying cleaning tools and equipments

To ensure that the cleaning resources required at a critical time are available and in good condition, it is often necessary for the information technology section to manage the ordering and storage of cleaning materials such as:

Pressurized air duster

- Anti-static cleaner
- Cleaning cartridges

- Lint-free cloth
- Non-streaking screen cleaner

Some maintenance activities also require the use of cleaning equipment. These may include, but are not limited to:

- Vacuum
- Voltage meter
- Maintenance kit for laser printer
- Brush

Whatever the nature of the maintenance to be undertaken, you first need to identify the materials required and access them from stores according to the organization's procedures. Accessing cleaning materials may be a simple or complex procedure depending on the nature of the organization. For example, many organizations use stock requisition forms which are completed by the person needing the stock. These forms are then countersigned by the supervisor and passed over to the storekeeper, who will arrange for the items to be taken from the storeroom.

Your responsibility is to find out the procedures that you are expected to follow.

Some of the important and mostly used computer components and peripherals cleaning equipments are briefly elaborated as follows:

- **Liquid Cleaning Compounds**

Before using any liquid cleaning compound make sure that your computer is turned off. If the PC has power when you use liquid cleaners, you run the risk of damaging or shorting out your components, which is an expensive risk to take. Also make sure that the component you have cleaned with a liquid cleaner is thoroughly dry before turning your computer back on!



Fig. 1.4 Electronic Components Cleaner

- **Clean or Soapy Water and a Damp Cloth**

In some cases, you need only a bit of water and a damp cloth for cleaning chores, such as when cleaning the mouse ball, the outside of the mouse, or the exterior of the monitor or computer case. If water alone cannot do the job thoroughly, you can use mild soapy water on your damp cloth. Make sure that the cloth is damp and not wet and that you do not splash or drip water into your components.

If the keys on your keyboard start to stick or you have spilled a cup of coffee into your keyboard, or, for that matter, you just know that there is a lot of dirt under the keys, you can clean the keyboard with distilled water.

- **Denatured Alcohol**

The best thing to use for cleaning floppy drive heads, motherboard, and other internal components of computers and other equipments such as printers, is denatured alcohol (methylated spirits). But how do you get it in there? You can't just pour it in! You need to use a lint free swab dipped in the alcohol to clean the floppy drive heads, or you can purchase a floppy drive cleaning kit, which almost always comes complete with denatured alcohol. Don't clean the mechanical mechanism with alcohol because the parts are lubricated and the alcohol will dissolve the lubricant.



Fig. 1.5 Methylated spirits

When cleaning your mouse, you can use a damp cloth to clean the cover and ball, as mentioned earlier, but what about the rollers?

You should regularly inspect your contacts and clean them with denatured alcohol. Denatured alcohol is the best solution for cleaning the oily residue caused by human oil secretions, and it evaporates, leaving no residue behind.

- **Glass Cleaner**

You need to turn your monitor off before cleaning to avoid damage to the screen. Many technicians clean the monitor screen with regular glass cleaner. Under most circumstances, however, water and a damp cloth will do the job just fine. Water is the safest cleaning liquid you can use on a monitor. **When cleaning the LCD display screen of a laptop, do not use glass cleaner at all. You will melt the screen!**



Fig. 1.6 Glass Cleaner

- **Fabric Softener**

Some technicians like to use a mixture of 1 part fabric softener to 10 parts water to clean the plastic casing of their computer components. As a cleaning solution it's not as good as mild soap and water, but as an anti-static solution it's excellent! Use it after the cleaning process to help protect your computer from the harmful effects of static electricity.

- **Cleaning Contacts and Connectors**

To protect your contacts and connectors from becoming dirty, avoid touching them with your hands. Your skin contains natural oils that can leave a residue on contacts and connectors, and that residue needs to be cleaned off. Leaving the contacts untouched will reduce the amount of residue and make them easier for you to clean.

- **Erasers**

Some technicians use an eraser to rub residue off contacts, but this leaves a residue of its own and may actually rub the contacts right off. If you absolutely must use erasers, make sure you use the white ones, and immediately clean any rubber residue off of the contacts. Never, ever use pink erasers to clean contacts as these contain acids that have the potential to destroy your contacts.

- **Non-Static Vacuums**

Common household dust kills PCs. Throw in some dog and cat hair and you might as well call a priest right now. A dust buildup can cause dreaded static and can cause your components to overheat and become useless. When removing dust buildup from your keyboard, inside your computer's case, and from your components, use a non-static vacuum (shown in Figure 2.1). Many hand-held vacuums are designed specifically for use on PCs. Note that you should definitely not use a common household vacuum cleaner. These create static electricity and can damage your PC!



Fig. 1.7 Non-Static Vacuum

- **Lint-Free Cloths**

Lint-free cloths are excellent for removing dust from your computer. The cloths used for cleaning eyeglasses work the best, because they will not scratch surfaces or leave lint behind.

Make sure you never use "dry dusting" lint-free cloths and the like for cleaning anything in or on your computer. Cloths such as the Swiffer Sweeper do wonders for dusting those hard-to-reach places in your house, but they use static electricity to collect the dust. As you probably know by now, static electricity is computer enemy number one!

1.3. Precautions

Precautions are guidelines to be followed to prevent damage to equipment or injury to people. The following are very important precautions:

- Before cleaning any electrical equipment make sure that it is switched off and unplugged from the mains.
- Allow certain equipment, such as monitors and laser printers, to cool down and lose their capacitance (charge) before cleaning them for at least 30minutes.
- When cleaning inside the PC, or handling parts from a PC such as hard disk or circuit boards, you should earth yourself using antistatic wrist strap.
- Always refer to the manufactures manual before attempting to clean any equipment, because improper cleaning or maintenance may be dangerous and also may invalidate your warranty.

- Some equipment such as power supplies and monitors use voltages and therefore should only be maintained by specially trained people. It could be dangerous for any one else to open these up for maintenance.

Cleaning in an IT environment

Why clean?

Dust needs to be removed because it acts as an insulator that prevents air from circulating over or through the components and this can cause overheating. If dust contains conductive particles it can also cause a short circuit, which can damage components or even cause a fire.

Removing Dust

Dust can be removed using a household vacuum cleaner with an appropriate attachment, although it is much easier to use a purpose-built computer vacuum cleaner or keyboard cleaner.

Residue from hands

The human skin produces residues that cling to surface of the computer hardware we touch, which can be removed with liquid cleaners. However, use only specifically designed cleaners for cleaning computer equipment. Unsuitable cleaners may:

- cause dangerous fumes
- damage the plastics used in computer hardware
- release ozone-damaging gases
- not clean effectively

Name: _____

Date: _____

Instruction: Answer all the questions listed below, if you have some clarifications- feel free to ask your teacher. Please ask your trainer for the questionnaire for this Self-Check.

Choice: Choose the correct answer

1. Cleaning your computer components and peripherals is used to:
 - A. Keep the components and computer in good working condition
 - B. keep the computers from spreading germs
 - C. Protect your computer's system from viruses
 - D. All except C
2. It is not necessary to turn off your computer while using any liquid cleaning compound.
 - A. True
 - B. False
3. Which one of the following is a cleaning tool used to remove dust buildup from your keyboard, inside your computer's case, and from your components?
 - A. Non-Static Vacuum
 - B. Eraser
 - B. Lint-Free Cloths
 - D. Fabric Softener
4. Which one of the following is an important precaution?
 - A. Before cleaning any electrical equipment make sure that it is switched off.
 - B. Allow certain equipment, such as monitors and laser printers, to cool down and lose their charge before cleaning them for at least 30 minutes.
 - C. When cleaning inside the PC, you should earth yourself using antistatic wrist strap.
 - D. Always refer to the manufactures manual before attempting to clean any equipment.
 - E. All
5. Using unsuitable cleaners may
 - A. cause dangerous fumes
 - B. damage the plastics used in computer hardware
 - C. release ozone-damaging gases
 - D. All

2.1. Access inventory systems and document events

Inventory - A record of items in stock (store). This is used to track consumables or to accurately describe devices.

In an IT organization inventory is likely to be computerized. If you have access to those files it will be possible for you to check the stock (store) levels to see if the cleaning materials or consumables that you require are available. Your organization may operate one of the following systems:

- **Perpetual Inventory System**

This system enables the availability of the balance of stock on hand at any point in time because a continuous record of additions to and reductions from inventory is maintained. The perpetual inventory system can be computer based and is easier, less costly and effective for monitoring stock.

- **Periodic Inventory System**

Costs of inventory used and balances on hand are computed periodically such as at the end of a month or year. The main objective of the periodic inventory system is to determine the quantity of stock on hand at a particular point in time.

In documenting events, be sure to:

- ✓ Record description/code of item received or issued
- ✓ Record the date and quantity received and issued
- ✓ Record/calculate the balance e.g. opening inventory + receipts – issues = closing inventory
- ✓ Count stock (physical inventory) and compare with inventory records
- ✓ Record adjustments to correct inventory records
- ✓ Prepare reports to summarize inventory balances
- ✓ Submit reports to management as required

NOTE: These are just guidelines. The rule of thumb is to follow organizational procedures.

Self-Check 2**Written Test**

Name: _____

Date: _____

Instruction: Answer all the questions listed below, if you have some clarifications- feel free to ask your teacher. Please ask your trainer for the questionnaire for this Self-Check.

Choice: Choose the correct answer

1. A file that enables you to check the stock (store) levels to see if the cleaning materials or consumables that you require are available:
A. Inventory B. Any excel file C. Schedule D. All
2. In the case of _____ inventory system, costs of inventory used and balances on hand are computed periodically such as at the end of a month or year.
A. Perpetual B. Periodic C. Random D. None
3. Which one of the following is true about Inventory System?
A. It is used to check if equipments are available
B. It is used to determine the quantity of stock on hand at a particular point in time.
C. Perpetual inventory system can be computer based and is easier, less costly and effective for monitoring stock.
D. All
4. In documenting events in to an inventory file, you need to be sure that you include:
A. Description/code of item received or issued
B. The date and quantity received and issued
C. Adjustments to correct inventory records
D. All

3.1. Cleaning peripherals as recommended by manual

Cleaning keyboards, discs, screens and other peripherals is a standard housekeeping function; and guidelines or instructions are usually included with the operational and technical manuals for each piece of equipment. The manual also recommends a maintenance schedule and a failure to follow this recommendation runs the risk of system malfunction. This can be detrimental to all concerned.

Peripherals that require cleaning include:

- Printers
- Scanners
- Tape cartridges
- Multimedia kits
- Keyboard
- Speakers
- Mouse
- Touch Pad

Computer equipment is sold with manuals that advise the purchaser about maintenance. Therefore, your first point of reference when cleaning discs/peripherals is the manual. Nevertheless, here are some common recommendations for cleaning discs/peripherals:

- **Keyboard.** Turn it upside down and gently tap the bottom
- **Monitors.** Use a damp cloth
- **Mouse.** Turn upside down, remove the panel, and clean the tracking ball and the rollers inside. If you have a laser make sure that the light is clear, free of dirt or blockage.
- **Printers.** Clear out paper jams, change cartridges and clean. Most printers have a print head cleaning function or you can use a print head cleaning kit.

NOTE: Make sure that you read the manufacturer's instructions before you perform any maintenance and that you follow your organization's procedures. This will safeguard against loss and damage to equipment due to inappropriate use of cleaning fluid or methods.

1.1. Monitors

Carefully clean dust away from the vents in the monitor's enclosure using a vacuum cleaner. Anything other than a vacuum cleaner (e.g. a rag or air blower) is likely to push the dust inside the enclosure where it can lie on electrical components, causing failure. You should clean the glass screen with one of the cleaners described previously.

If you use a spray to clean a monitor you should be careful to spray the wipe.

Steps to follow:

- **STEP 1:** Ensure that you have the supplies that you need: non streaking window cleaner, soft cloth, duster and a dust mask if you're allergic to dust.
- **STEP 2:** Check the manual. If the manufacturer has provided specific instructions, follow them.
- **STEP 3:** Shut down the computer and ensure the power is off at the wall.
- **STEP 4:** Use the duster to dust around the outside of the monitor at the back and the sides.
- **STEP 5:** Spray the window cleaner onto the cloth and wipe over the monitor. This is alright to do with LCD screens too.
- **STEP 6:** make sure the screen is wiped dry afterwards.
- **STEP 7:** turn power back on.

1.2. Printers

You will get the greatest benefit from cleaning a printer if you can remove any dust from the paths of moving parts. To do this you may need to remove covers or paper trays.

However, at all times refer to the printer manual. It will contain the instructions for removing parts and may even have some tips on cleaning. Do not use any liquid cleaner on a printer unless the manufacturer recommends it.

Laser Printers**To clean laser printers:**

- Switch off and unplug the printer, and wait at least 30 minutes for it to cool.
- Wear disposable plastics gloves.
- Clean the outer casing of the printer using a dampened paper towel or a lint-free cloth with a little detergent on it.
- Check for, and remove any loose bits of paper.
- Vacuum inside the printer using a static-safe vacuum cleaner.

- Use a lint-free swab dipped in isopropyl alcohol to clean the corona wire.

1.3. Keyboards

The keyboard tends to not only accumulate a lot of dust and skin residue but also some hair and lint from clothing. Loose matter can generally be removed with the vacuum cleaner.

Follow the following steps to clean a keyboard:

- **STEP 1:** Ensure that you have the supplies that you need: compressed air (in an aerosol can); a soft rag, any nonabrasive household cleaning fluid suitable for cleaning plastic; and a dust mask if you're allergic to dust.
- **STEP 2:** Check the manual. If the manufacturer has provided specific instructions, follow them. Generally speaking cleaning keyboards is reasonably straight forwards so this should not be an issue.
- **STEP 3:** Shut down the computer.
- **STEP 4:** Disconnect the keyboard.
- **STEP 5:** Use compressed air to clean between the keys. Spray at an angle to dislodge dust and grime.
- **STEP 6:** Shake loose dust gently out of the keyboard.
- **STEP 7:** If using aerosol cleaning fluid, follow the manufacturer's instructions. Otherwise, spray a small amount of fluid onto a rag.

OPTIONAL: If the keyboard is not working right the keys can be gently prized off and excessive amounts of dust or dried sticky liquid has probably dried and formed a residue which is preventing the keyboard from working properly. Clean the keyboard with a damp cloth and detergent and let it dry before reconnecting. (may take up to 72 hours)

- **STEP 8:** Wipe the keys and chassis. The keys can be cleaned with a damp cloth and detergent. A small brush can be used to dust between the keys.
- **STEP 9:** Wait until the keyboard is dry before reconnecting it to the computer.
- **STEP 10:** Reconnect the keyboard and restart the computer.

1.4. Mouse

The mouse tends to accumulate a mixture of dust and skin residue from the surface it rolls on. Therefore to properly clean the mouse you should follow the following steps:

- **STEP 1:** Shut down the computer.
- **STEP 2:** Check the manual. If the manufacturer has provided specific instructions, follow them.
- **STEP 3:** Disconnect the mouse.

- **STEP 4:** Turn the mouse upside down and remove ball-cover ring by turning it in the direction shown which is generally counterclockwise. If it does not have a cover you can generally remove a screw and open the mouse up.
- **STEP 6:** Remove the ball.
- **STEP 7:** Rinse the ball with warm water.
- **STEP 8:** Use a cotton bud covered with isopropyl alcohol to remove dust.
- **STEP 9:** Carefully scrape the three rollers with a small hard object such as a small jewelers screw driver, tweezers or even a paper clip to remove gunk. Some say to use a toothpick but the trouble is they break and can leave debris which may interfere with the operation of the mouse.
- **STEP 10:** Clean rollers with a swab dipped in alcohol.
- **STEP 11:** Reassemble mouse when all the parts are dry.
- **STEP 12:** Reconnect the mouse to your computer.

1.5. Scanners and photocopiers

The glass top flatbed scanners, like those of monitors and photocopiers, can get pretty dirty with finger marks. Usually you would use a lint-free cloth dabbed with whatever chemical the manufacture recommends to wipe it clean.

1.6. Power Supplies

Maintenance for the power supply to PCs includes:

- ✓ Vacuuming dust from the vent holes
- ✓ Checking that the cables coming out of them are not damaged or broken
- ✓ Checking that the power socket is clear of dust and dirt

1.7. CD/DVD Drive

To clean a CD or DVD you will require a lint free cloth and solution. You will need to gently wipe from the centre out.

- CD/DVD drives are cleaned using a special disk soaked with a solvent.
- The disk is placed into the drive.
- The drive will try to access the cleaning disk and will eventually give an error message.
- You will need to do this 3 times.
- Allow the drive to stand a while for any solvent to dry before using it.

Lap Test

Practical Demonstration

Name: _____

Date: _____

Time started: _____

Time finished: _____

Instructions: You are required to perform the following individually with the presence of your teacher.

Please ask your trainer for the instructions for this lap test.

Activity 1: Documentation

1. Use *Microsoft Word* to create the table which will contain the following:
 - ✓ Record description/code of item received or issued (**Item Code**)
 - ✓ Record the date and quantity received and issued (**Date**)
 - ✓ Inventory balances (**In Stock/Store**)
 - ✓ Cleaned by
2. Save the document as *Maintenance Documentation Template*
3. Print the document (a blank table)
4. This document will be used to keep a record of each task you complete in the remaining activities.
Complete the table by hand as you complete each task.
5. Once the table is full, type your hand written information into the document
6. Print the completed document and save as *Maintenance Documentation for Your Name*

Activity 2: Clean your Computer

1. Complete *Operation Sheet 1* step by step to clean your computer, monitor, mouse and keyboard.
2. Update your personal *Maintenance Documentation* as you go (see Activity 1 above)
3. Get your work marked (ask for the teacher) immediately after you have finished to demonstrate your competence in this task.

➤ *Your teacher will evaluate your output either satisfactory or unsatisfactory. If unsatisfactory, your trainer shall advice you on additional work. But if satisfactory, you can proceed to the next topic.*

Self Check Answer Sheet

Self-Check 1

1. D
2. B
3. A
4. E
5. D

Self-Check 2

1. A
2. B
3. D
4. D

Self-Check 2

1. B
2. A
3. C
4. D