Learning Guide-12

Unit of Competence: **Assemble and Disassemble communication & multimedia Equipment**
Module Title: **Assembling and Disassembling communication & multimedia Equipment**
LG Code: **EEL CMS2 M04 LO1- LG- 12 1019**
TTLM Code: **EEL CMS2 M04 TTLM 0919 v1**

LO3: Assemble/disassemble boards

Instruction sheet-1	Learning Guide #

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

- Performing **disassembling and** a**ssembling processes**
- Checking process according to established standards
- Checking assembled products in accordance with quality standards

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**:

- Perform a***ssembling and disassembling processes*** in accordance with OH&S policies and procedures
- Check process according to established standards and requirements
- Check assembled products in accordance with quality standards

Learning Instructions:

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 20.
3. Read the information written in the information “Sheet 1, Sheet 2, and Sheet 3.
4. Accomplish the information “Sheet 1, Sheet 2, and Sheet 3 ”.in page _____.
5. Try to answer self-check, you can ask your trainer for correction. If you finished answering the Self-check, take correction or explanation from your trainer if it is not clear.
6. If you scored a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, discuss with your trainer for further instructions or go back to learning operation sheet1.
7. Submit your accomplished Self-check. This will form part of your training portfolio.
8. Read the information written in the “Information Sheet 2”. Try to understand what are being discussed. Ask you Instructor for assistance if you have hard time understanding them.
9. Accomplish the “Self-check 2” in page_____.
   Ask from your teacher for correction (key answers) if any.

10. Read the information written in the “Information Sheets 3. Try to understand what are being discussed and ask you teacher for assistance if you have hard time understanding them.
11. Accomplish the “Self-check 3” in page _____.
12. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (To get the key answer only after you finished answering the Self-check 3).
13. If you scored a satisfactory evaluation proceed to “Operation Sheet 1” in page_____, however, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
14. Read the “Operation Sheet 1” and try to understand the procedures discussed.

Information sheet -1	Perform disassembling and assembling processes

3.1 Perform disassembling and assembling processes in accordance with OH&S

To perform assembling and disassembling processes tearing down the device in accordance with the device manual and OH & S policies and procedure by applying the workplace rule. Regarding safety necessary ideas have been already discussed in LO1 please refer to LO1 information sheet about OH&S policies and procedures.

- Use all required PPE and specific safety procedures for your activity.
- Protect your own Health and Safety and that of your co-workers;
- Not initiate or participate in the harassment of another worker; and
- Co-operate with your supervisor and anyone else with duties under the legislation.
- Avoid horseplay during your activity and follow your instruction sheet & instructor recommendation.

3.1.1. Supplies, materials and equipment preparation

For required activity necessary materials and equipments must be supplied by the person who provides training. For example we are going to disassemble PC. During your disassembling look your operation sheet and manual of the device.

SUPPLIES, MATERIALS AND EQUIPMENT HAND TOOLS

a) Full PPE
b) pair of rubber gloves
c) cutting pliers
d) Phillips screwdriver, and
e) Flathead screwdriver
f) Personal Computer
g) safety goggles
h) Working area/bench

3.1.2. Familiarize with the diagram and the product

- A **printed circuit board** (**PCB**) mechanically supports and electrically connects electronic components or electrical components using conductive tracks, pads and other features etched from one or more sheet layers of copper laminated onto and/or between sheet layers of a non-conductive substrate. Components are generally soldered onto the PCB to both electrically connect and mechanically fasten them to it.
- Printed circuit boards are used in all but the simplest electronic products. They are also used in some electrical products, such as passive switch boxes.

There are different types of PCBs layer

- Single-sided (one copper layer)
- Double-sided (two copper layers on both sides of one substrate layer), or Multi-layer (outer and inner layers of copper, alternating with layers of substrate).

Multi-layer PCBs allow for much higher component density, because circuit traces on the inner layers would otherwise take up surface space between components. The rise in popularity of multilayer PCBs with more than two, and especially with more than four, copper planes was concurrent with the adoption of surface mount technology. However, multilayer PCBs make repair, analysis, and field modification of circuits much more difficult and usually impractical

There are many different thickness PCBs; the most common thickness of PCB products is 1.6mm (0.063"). Some types of PCB are:-

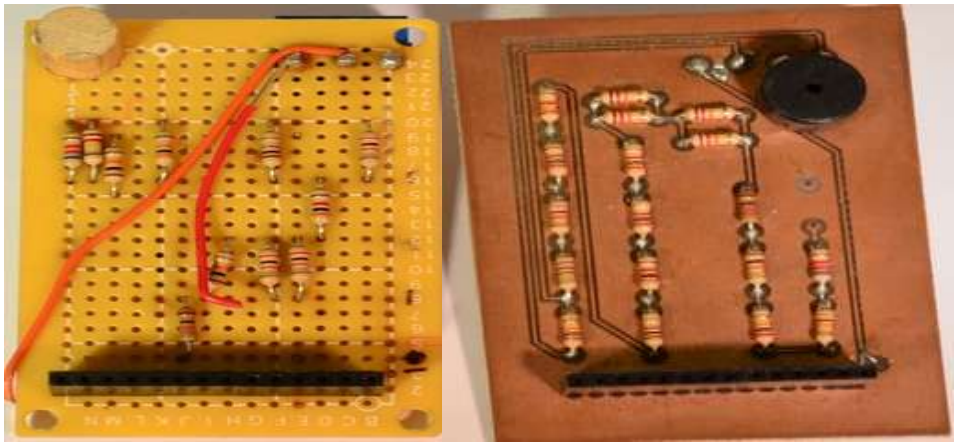
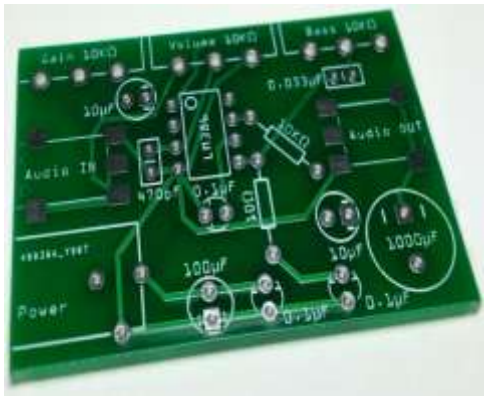


Fig. a) Bread Board b) copper PCB board



C) unsoldered Printed Circuit Board

COMPUTER CASES

Most computer cases come in four distinct sizes: small form factor (SFF), mini tower, mid tower and full tower. The image below shows the distinct difference between PC case sizes:disassemble and study internal parts of computer

Fig. Disassembled personal computer

Main components of computer system unit

1. Mother board
2. CPU
3. RAM
4. Power supply
5. Different types of connecting cables
6. Different types of Cards
7. Hard disk
8. CPU Fan…..etc
9. CD/DVD driver

Fig. power supply

Fig. hard disk drive

Fig. RAM(Random Access Memory)

Fig. CPU Fan

CD/DVD driver

Mother board

Every hardware device installed to the computer connects to the system through the motherboard. Hard drives, power supplies, memory modules and adapter cards all connect to the motherboard via cables, which are inserted into the appropriate slots or connectors on the board. Along the motherboard are circuits that allow these components to transfer data back and forth.

To disassemble the motherboard, you must disconnect all of the components -- both internal and external hardware linked to the circuit board. Disassembling a motherboard requires a fair amount of computer expertise and at least a working knowledge of the different components installed to a computer.

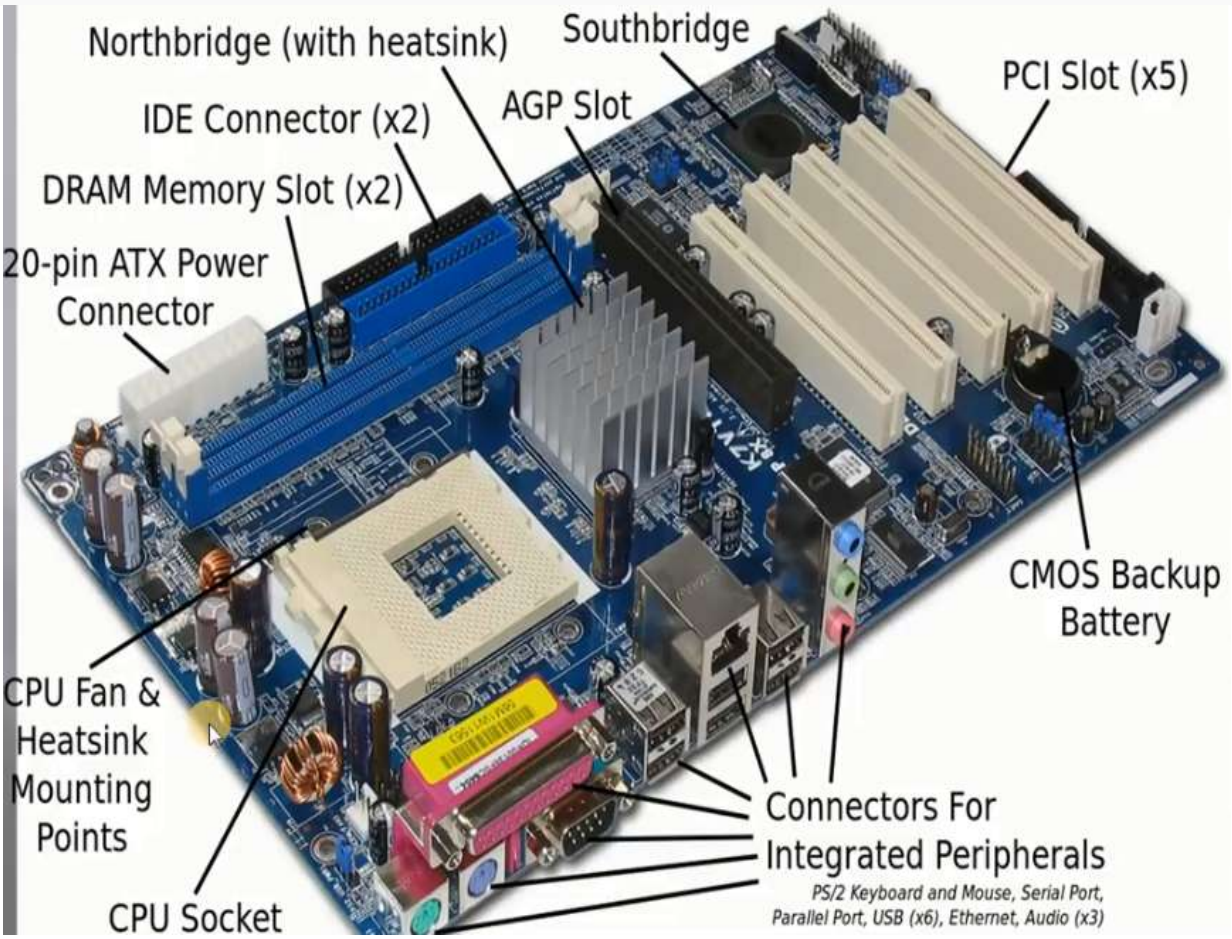


Fig. C) Mother board

Self-check-2	Familiarize with the diagram and the product

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page

Match column “B” to Column “A” and put the answer on the dash space

	No	Column “A”	Column “B”
____	1	Disassembling the unit	A) CD/DVD driver
____	2	A computer part which hold components	B) power supply
____	3		C) hard disk drive
____	4		D) tearing down
____	5		E) mother board
____	6		F) RAM CPU Fan
____	7		G) RAM

Note: **Satisfactory rating - 2 points**	**Unsatisfactory - below 2 points**
You can ask you teacher for the copy of the correct answers.	
Answer sheet	Score = _____ Rating: _____

Name: _____ Date: _____

Short Answer Questions

1._____

Information sheet -2	Check process according to established standards

3.1. Check process according to established standards

Here you will check the process that you have attended in the above disassembling steps and confirm the presence of each part at their correct status and functionality.

To get it open, you will need only some screwdrivers, instruction sheet or service manual and for the most part used only a Philips screwdriver, but the idea is to have a kit with many screwdrivers, because you may need a strange screw or nuts in PC to disassemble.

Every screw is turned by hand and each cable is clipped and tucked away with care to ensure optimal airflow, thermal, and acoustical properties. Once assembled, every finely crafted PC is put through a stringent 200-point checklist to ensure quality control of everything from physical appearance to software, performance, and usability. We're obsessed with perfection. There are no assembly lines in training place (workshop) please follow safe and hazard free procedure for all.

Case Preparation

- One of our trained and certified technicians gathers the pre-tested components kit required for each system order.
- The case's side panel is removed and stored inside the cardboard container along with the power cord and any other case accessories.
- Any additional case fans are installed in the proper vent areas.
- Motherboard standoffs are installed in the correct configuration to align with the chosen motherboard.

Motherboard Insertion

- The CPU and RAM are installed on the motherboard prior to insertion into the case to avoid any possible stress or damage.
- Any concealed wiring to be done under the motherboard is taped down to hold the wires while the board is set in place.
- The motherboard is placed inside the case.
- The power cable, case fan cable, CPU fan cable or liquid cooling pump cable, power on button, reset button, internal speaker, and all case LED light cables are connected, tucked, and clipped.

Information sheet-3	Check the assembled and disassembled product

3.3. Check the assembled and disassembled product

- After the study is completed, assemble the PC as it is, following service manual or your trainer's instruction. After assembling is completed the functionality of the device is the main criteria of your activity depending on the interests/plan of your work and resource you have provided for this activity.

Initial Testing

- An assembly technician tests the system with our 200-point checklist.
- The system receives a rigorous battery of diagnostic software testing and benchmarking.
- A separate physical checklist is run to check for things like loose or missing screws, tight cable connections, and audio cable tie downs.
- A separate quality control technician gives the system a final review. If it does not meet this personals seal of approval, it returns to the technician for correction.

Diagnostic Test

- Every system receives a diagnostic test to ensure all subsystems are properly installed.
- Every screw must be carefully re-tightened and every cable securely strapped before the cover is installed. The case cover is needed for all other tests to make sure it allows proper air flow and minimal vibration during use.

Performance Test

- After running overnight, the system must properly wake up and restore itself from suspended sleep. This test is run various times on the machine to ensure proper functionality.
- Software is installed to perform a variety of benchmark performance tests. These tests provide information about the overall speed of the system and help diagnose specific problems.
- Benchmark results are compared against systems from other manufacturers as well other in-house PCs.

Usability Tests

- A variety of basic tests, including CD and DVD functionality, are performed.
- The media reader and optical drives are checked for proper eject operation or any abnormalities.

Final Testing

- Just prior to shut down and packaging, every system is restarted and tested to see exactly what the customer will experience when they receive the system.

Reference

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