

SCII/00825/2019
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TELECOMMUNICATION LAB REPORT FOR DATE 18TH NOV, 2021

SOLDERING/DE-SOLDERING

- ✓ This is the process of joining two or more metal surfaces by melting and flowing a filler metal into the joint to make a complete electrical joint or circuit.
- ✓ The filler metal should have relatively low melting point.

TOOLS AND MATERIALS FOR SOLDERING

TOOLS

1. SOLDERING IRON/GUN

- ✓ It supplies heat to melt solder so that it can flow into the joint between two workpieces.

TYPES OF SOLDERING IRONS

a. Main Power Soldering Iron

- ✓ Powered by main source and heats at specific temperature controlled by a thermistor and operates at maximum 25 watts

b. Iron Station

- ✓ Powered from main source and has a maximum temperature of 400 degrees, applicable to wide range of soldering process.

c. Gas powered soldering Iron

- ✓ Uses fitted gas cylinders called butane gas.

d. Low powered soldering iron

- ✓ Powered by lower power battery 12v.

2. A PAIR OF TWIZERS

- ✓ Used for holding components and inserting them.

3. LONG NOSE PLIERS

- ✓ Used for wire cutting, trimming and holding components when soldering

4. WIRE STRIPPER

- ✓ Removes insulating cover from a wire at the point of soldering.

5. SOLDERING SUCKER

- ✓ A manually-operated device which is used to remove solder from a printed circuit board.

6. BRUSH

- ✓ Removes excess stray molds on the board and in turn prevents short circuiting.

7. IC HOLDER

- ✓ Used for holding the IC'S

8. IC SOCKET

9. DRILLS

MATERIALS

1.SOLDERING WIRE

- ✓ It is a fusible metal alloy used to create a permanent bond between metal workpieces.

2. STRIP BOARD

3. WIRE JUMPERS

ONBOARD FACTORS CONSIDERED WHEN SOLDERING

- ✓ Rate of heat. Too much heat will destroy the plastic components
- ✓ Magnetic field. Without consideration may lead to shorting.

CONSIDERATION TO THE HUMAN BEINGS

- ✓ Avoid touching the components as it may lead to shock
- ✓ Protective gloves
- ✓ Not burning the workbench

TECHNIQUES FOR SOLDERING

1. WET SOLDERING

- ✓ Soldering involves joining two metals together through a solder alloy.
- ✓ The solder iron is heated to a maximum temperature and the two surfaces to be soldered are touched by hot solder bit at the same time and let the heat to the required temperature.
- ✓ During the wetting process, the solder becomes fluid molten and can adhere properly to the component for an optimal solder joint.

2. OPEN CIRCUIT

- ✓ The soldering wire is melted and let to flow on the joint without heating the metallic surface to be joint.

3. COLD SOLDERING

- ✓ Only the surface is heated and the filler metal is applied leading to only 1 surface holding the filler metal and letting the other without making a complete metal joint.

STEPS TO PROPER SOLDERING

1. Proper cleaning of the metal surfaces, mechanically using emery cloth or chemically using acids.
2. Application of flux to promote wetting of the surface by the solder.
3. Application of heat: Heating the joints evenly or uniformly is of utmost importance to insure a sound joint.
4. Applying the Solder takes place in two steps:
 - ✓ Wetting the metal surfaces
 - ✓ Filling the gap between the wetted surfaces with solder
5. Cooling the Joint:
 - ✓ As soon as possible after soldering the joint may be cooled using a water spray or air blast. Slow

STEPS TO DE-SOLDERING

- ✓ Turn on the heat gun.
- ✓ Hold the PCB firmly using a stand or pliers.
- ✓ Hold the tip of the heat gun against the solder until it melts.
- ✓ Blow the molten solder from the holes.
- ✓ Remove the components using a pair of pliers.