



Skill India
कौशल भारत - कुशल भारत



सर्वश्रेष्ठ उद्योग
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



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Transforming the skill landscape



Telecom
Sector
Skill
Council

Facilitator Guide



Sector
Telecom

Sub-Sector
Handset

Occupation
Customer Service

Reference ID: TEL/Q2201, Version 1.0
NSQF Level: 4

Handset Repair Engineer (Level II)

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Shri Narendra Modi

Prime Minister of India

**“ Skilling is building a better India.
If we have to move India towards
development then Skill Development
should be our mission. ”**

Acknowledgements

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The preparation of this guide would not have been possible without the Telecom Industry’s support. Industry feedback has been extremely encouraging from inception to conclusion and it is with their input that we have tried to bridge the skill gaps existing today in the Industry.

This facilitator guide is dedicated to the aspiring youth who desire to achieve special skills which will be a lifelong asset for their future endeavors.

About this Guide

In the last five years, the growth of the Indian telecommunications sector has outpaced the overall economic growth. This sector is poised for strong growth of about 15 percent in short term during 2013–17, driven by growth in organised retail, technological advancements, changing consumer preferences and government support. With over 1000 million subscribers, India is the second largest telecom market in the world.

The sector currently employs over 2.08 million employees and is slated to employ more than 4.16 million employees by 2022. This implies additional creation of ~2.1 million jobs in the nine-year period.

This facilitator guide is designed to impart theoretical and practical skill training to students for becoming a Handset Repair Engineer (Level II).

Individuals at this job are responsible for performing handset repair including hardware and software components, testing the handset for adequacy post repair and maintaining inventory levels of the hardware components.

This facilitator guide is based on Handset Repair Engineer (Level II) Qualification Pack (TEL/Q2201) & includes the following National Occupational Standards (NOSs):

1. Perform handset repair – hardware (TEL/N2203)
2. Perform handset repair – software (TEL/N2204)
3. Perform tablet repair – hardware and software (TEL/N2205)

The Key Learning Outcomes and the skills gained by the participant are defined in their respective units.

Post this training, the participant will be able to perform handset repair of hardware and software components and testing the handset for adequacy post repair.

We hope that this facilitator guide will provide a sound learning support to our young friends to build an attractive career in the telecom industry.

Symbols Used



Steps



Time



Tips



Notes



Objectives



Do



Ask



Explain



Elaborate



Field Visit



Practical



Lab



Demonstrate



Exercise



Team Activity



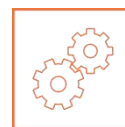
Facilitation Notes



Learning Outcomes



Say



Resources



Activity



Summary



Role Play



Example



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Transforming the skill landscape

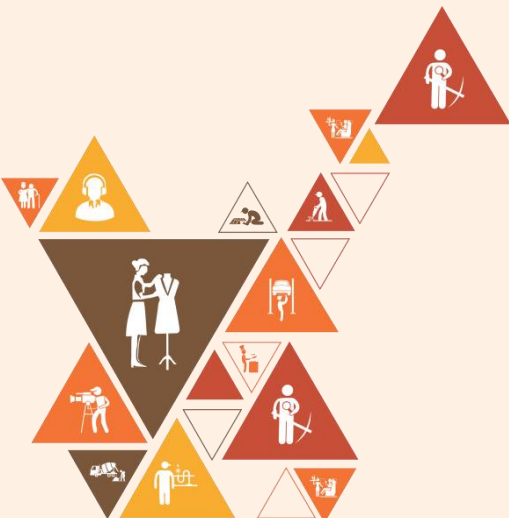


1. Introduction

Unit 1.1 – About telecom and optical fiber

Unit 1.2 – About telecom industry

Unit 1.3 – About cell phones



Key Learning Outcomes

Key Learning Outcomes



At the end of this module, you will be able to:

1. Know your fellow participants and understand training norms
2. Know about the telecom market in the country and some mobile phone vendors
3. Learn about the evolution of cell phones
4. Know and understand about how mobile communication and cell phones work
5. Learn about the role of a handset repair engineer

UNIT 1.1: About Telecom and Optical Fiber

Unit Objectives

At the end of this unit, you will be able to:

1. Introduce each other
2. Build rapport with fellow students and the trainer
3. Map participant's expectation from the training program
4. Share program agenda

Resources to be Used

- Available objects such as a duster, pen, notebook, etc.
- Flip charts.

Say

- A very good day to all of you.
- As you all know, we have got together here to attend a training designed especially for helping you to be a successful 'Handset Repair Engineer'.
- Before that let us introduce ourselves.

Do

- Make the students stand in a circle, close enough to each other so that they can pass the parcel quickly.
- Say 'Stop' when the students least expect it. The person who has the parcel at that time should get out.
- Those who get out should introduce themselves by providing their names and a little additional information such as favorite hobbies, likes and dislikes.
- The winner of the game should stand and introduce himself/herself at the end of the game.

Say



- Thank the students for their participation.
- Introduce your-self to the students.
- At the start of any journey it is natural to have expectations.
- Hence let us capture your expectations from the program.

Notes for Facilitation



- You could ask the students who get out during the game to be the music keepers. They can start and stop the music as the game progresses.
- Encourage shy students to provide information about themselves by prompting them with questions such as 'what do you enjoy doing the most', 'what is your favorite movie or book', etc.
- While introducing ensure the following guidelines - work experience, industry, etc.

Do



- This is a team exercise and each team needs to prepare a presentation (using a flip chart).
- Each team presentation should cover; what as a team they expect to gain from the workshop?
- Teams to use flip-chart for their presentation.
- Share program outline with the participants.

Notes for Facilitation



- Each team to take not more than 5 minutes to prepare their respective presentations.
- Each team to take not more than 2-3 minutes to present.
- Share the program outline with the participants and link it with program expectations.
- This helps in creating an interest in the participants.

UNIT 1.2: About Telecom Industry

Unit Objectives



At the end of this unit, you will be able to:

1. Explain and outline the growth and opportunities in the Indian telecom industry
2. List some popular mobile phone vendors in the country
3. Explain and outline the role of a handset repair engineer

Notes for Facilitation



- You could ask the students what they know about telecom industry in India.
- Give students some time to think about how the telecom industry has changed in the last five years.
- Set the context and describe the industry trends in telecom industry.
- Allow the students to list some popular mobile handset companies in India.

UNIT 1.2.1: Growth Opportunities in Indian Telecom Industry

Say



- Before we learn the skills, which will help us, do our jobs really well. It is essential that we understand the telecom market and the history of telecom growth in India.
- Liberalization in the 1990s resulted in an improved business climate and an increased investment across the country.
- India has more than 700 million subscribers with a tele-density of more than 60%.
- Telecom is still a high potential sector, and hence requires more attention and policy frame-work to address challenges.

Do



- Refer to the relevant pages in the hand book and share it with the participants.
- Share with the participants about telecom Industry Growth – benefits accrued.
- Share with the participants about Indian telecom history.
- Share with the participants about Indian telecom history – growth.
- Share with the participants about Indian Telecom Growth – urban & rural.
- Share with the participants about Indian Telecom – drivers of affordability.
- Share with the participants about Indian Telecom model.
- Share with the participants about key merger and acquisitions by Indian firms.
- Share with the participants about Indian Telecom Regulatory Authority - TRAI.

1.2.2: A Few Handset Vendors in India

Say



- Now we have some idea about the telecom market and the history of telecom growth in India.
- Let us understand about a few telecom vendors which sell handsets in India.

Ask



- Ask the students to discuss within their respective groups the various handset vendors.
- Ask the students to give group presentation about the various handset vendors.

Notes for Facilitation



- Divide the students within groups and assign “companies” to students.
- Give each group to prepare presentation on the assigned companies for around 15 minutes.
- Give 5 minutes to each group for presentation.

Do



- Summarize learning by sharing company specific pages in the hand book with the participants.
- Share with the participants about Samsung.
- Share with the participants about Lava.
- Share with the participants about Micromax.
- Share with the participants about Celkon.
- Share with the participants about Intex.
- Share with the participants about Karbonn.
- Refer to page 4, 5 and 6 of the participant’s manual.

1.2.3: Handset Repair Engineer – Career Opportunities

Say



- Now we have some idea about the telecom market and handset vendors in India.
- Let us understand about the role of a “Handset Repair Engineer (Level II)”.
- With the growth in Indian Telecom industry the demand for various professionals such as Handset Repair Engineer, Telecom Engineer, etc. is bound to increase. It is estimated that the sector as a whole is likely to create about 40 lakh direct and indirect jobs over the next 5 years.

Ask



- Ask the students about the role and responsibilities of a handset repair engineer.
- Ask the students to explain the job responsibilities of a handset repair engineer.

Notes for Facilitation



- Divide the students within groups and assign “companies” to students.
- Give each group to prepare presentation on the assigned companies for around 15 minutes.
- Give 5 minutes to each group for presentation.

Do



- Team 1 to list down on a flip chart - What Do You Understand by The Role of handset ‘Repair Engineer’?
- Team 2 to list down on a flip chart - What is the purpose of a ‘Handset Service Centre store’ & the benefits associated with it for customers?
- Team 3 to list down on a flip chart - What Your ‘Customers’ expect from you as - handset ‘Repair Engineer’?
- Team 4 to list down on a flip chart - What Does Your ‘Supervisor’ expect from you as - handset ‘Repair Engineer’?

Notes for Facilitation



- Ensure participation and also facilitate the activity within each team.
- Facilitate the discussion and avoid arguments.
- Refer to page 7 of the participant's hand book.

UNIT 1.3: About Cell Phones

Unit Objectives

At the end of this unit, you will be able to:

1. List and outline the changes in technology of a cell phone over the years
2. Explain and outline how a mobile phone work over a network
3. Explain what goes on inside the handset during mobile communication
4. List and explain common features and uses of mobile phone
5. List and explain some popular mobile phone platforms

Say

- Mobile phone design, utility and their popularity has witnessed a sea-change over the years.
- There has been a revolution of sorts in the mobile phone industry as the handsets moved from having simple features like call and text, to the smartphones of today.
- Even consumer demands have also undergone a sea-change from a simple voice, SMS requirement to mobile phones loaded with camera, and data handling capabilities. Today the consumer demands something new almost on a daily basis.

Notes for Facilitation

- You could ask the students what they know about history of growth of mobile phones.
- Set the context and enquire what do you think goes inside a mobile handset.
- Set the context and enquire about the functioning of a mobile phone.
- Set the context and enquire about the common features and uses of a mobile phone.
- Enquire about some of the popular and common mobile phone platforms.

1.3.1: Evolution of the Cell Phone

Say



- Before we move any further let us understand the evolution of the cell phone and their segmentation basis their physical design.
- Let us also understand the development of the cell phone in the chronological order.

Do



- Share with the participants, with the help of the hand book, the segmentation of the phones basis their physical design i.e., bar phone, flip phone and slider phone.
- Refer to the relevant sections on page 8 and 9 of the participant's hand book.

Notes for Facilitation



- Ensure participation and also facilitate the activity amongst the students.
- Facilitate the discussion and avoid arguments.
- Refer to page 8 and 9 of the participant's hand book.
- Conduct a quick quiz in order to test the participants understanding about the difference between the various physical designs.
- Move on to the next section which is about how cell phone works.

1.3.2: How Cell Phone Works?

Ask



- Ask the students about their understanding of how the cell phone works.
- Ask the students to explain how the mobile network functions.

Say



- Having understood the design and evolution of cell phones and their chronological development, it is also necessary for us to understand how cell phone works. We should also understand how the network functions.

Do



- Share with the participants, with the help of the hand book, how the cell phones work.
- A base station provides coverage (communication capabilities) to users on mobile phones within its coverage area.
- Users outside the coverage area receive/transmit signals with too low amplitude for reliable communications.
- Users within the coverage area transmit and receive signals from the base station.
- The base station itself is connected to the wired telephone network.
- The cellular concept: multiple lower-power base stations that service mobile users within their coverage area and handoff users to neighboring base stations as users move. Together base stations tessellate the system coverage area.
- Thus, instead of one base station covering an entire city, the city is broken up into cells, or smaller coverage areas.
- Each of these smaller coverage areas has its own lower-power base station.
- User phones in one cell communicate with the base station in that cell.
- Small cells tessellate (mosaics) overall coverage area.
- A crucial component of the cellular concept is the notion of handoffs.
- Mobile phone users are by definition mobile, i.e., they move around while using the phone.

Do (Cont.)



- Thus, the network should be able to give them continuous signals as they move. This is not a problem when users move within the same cell.
- When they move from one cell to another, a handoff is needed.
- A user is transmitting and receiving signals from a given base station, say B1.
- Assume the user moves from the coverage area of one base station into the coverage area of a second base station, B2.
- B1 notices that the signal from this user is degrading.
- B2 notices that the signal from this user is improving.
- Extensive frequency reuse allows for many users to be supported at the same time.
- Total spectrum allocated to the service provider is broken up into smaller bands.
- A cell is assigned one of these bands. This means all communications (transmissions to and from users) in this cell occur over these frequencies only.
- Neighboring cells are assigned a different frequency band, so that nearby transmissions do not interfere with each other.
- The same frequency band is reused in another cell that is far away. This large distance limits the interference caused by this co-frequency cell.
- A group of local base stations are connected (by wires) to a mobile switching center (MSC). MSC is connected to the rest of the world (normal telephone system). Mobile switching centers control and coordinate the cellular network.
- They serve as intermediary between base stations that may be handing off users between each other.
- Base stations communicate with each other via the MSC.
- MSC keep track of cell phone user subscription and connects to the wired phone network.
- FDMA – Frequency division multiple access puts each call on a separate frequency.
- CDMA – Code Division Multiple Access - gives a unique code to each cell.
- TDMA – Time Division Multiple Access - assigns each cell a certain portion of time on a designated frequency.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Refer to the relevant sections on page 10 and 11 of the participant's hand book.
- Conduct a quick quiz in order to test the participants understanding and move on to the next section.

1.3.3: Common Features of Mobile Phone

Ask



- Ask the students about their understanding of the common features of the cell phone.
- Ask them to work in their respective teams and identify some common features.

Say



- Having understood how cell phone works? We should also understand the features of the mobile phones.
- These days mobile phones allow users to do much more than hold conversations.

Do



Share with the help of the hand book the various features of cell phones with the participants:

- Store contact information.
- Make task/to-do lists.
- Keep track of appointments.
- Calculator.
- Send/receive email.
- Send/receive pictures.
- Send/receive video clips.
- Get information from the internet.
- Play games.
- Integrate with other devices (PDAs, MP3 Players, etc.)
- Small cells tessellate (mosaics) overall coverage area.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Refer to the relevant sections on page 11 and 12 of the participant's hand book.
- Conduct a quick quiz in order to test the participants understanding and move on to the next section.

1.3.4: Popular Use of Mobile Phones

Ask



- Ask the students about their understanding of the popular use of the cell phone.
- Ask them to work in their respective teams and identify some popular use.

Say



- Having understood a few common features of cell phone. We should also understand some common uses of mobile phones.
- These days mobile phones offer a huge range of benefits to the users.

Do



Share with the help of the hand book the various uses of cell phones with the participants:

- Mobile banking.
- Mobile learning.
- Mobile health.
- Mobile agriculture.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Refer to the relevant sections on page 13 and 14 of the participant's hand book.
- Conduct a quick quiz in order to test the participants understanding and move on to the next section.

1.3.5: Popular Mobile Phone Platforms

Ask



- Ask the students about their understanding of a computer's operating system.
- Ask the student about their understanding of the mobile phone platforms.
- Ask them to work in their respective teams and identify some mobile phone platforms.

Say



- Having understood the various popular use of mobile phones, we should also understand the various mobile phone platforms.
- These days there are various types of platforms which are available and some of them are extremely popular.

Do



Share with the help of the hand book the various mobile phone platforms with the participants:

- iOS
- Android
- Blackberry
- Windows

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Refer to the relevant sections on page 15 of the participant's hand book.
- Conduct a quick quiz in order to test the participants understanding and move on to the next section.
- Make sure that the students complete exercise on page 17 and 18 of the participant's handbook.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble in their teams, provide each team with a handset.
- Ask participants to discuss and identify – features, use, functionality and platform of the phones.
- At the end of 15 minutes ask participants to present it to the class; presentation time 5 minutes.



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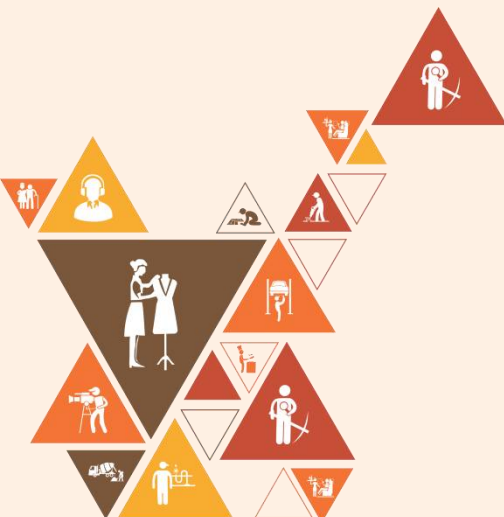
2. Handset Repair (Hardware)

Unit 2.1 - Basic electronics of a mobile phone

Unit 2.2 – Hardware repair tools

Unit 2.3 – Basic trouble shooting

Unit 2.4 – Safety guidelines



TEL/N2203

Key Learning Outcomes

Key Learning Outcomes



At the end of this module, students will be able to:

1. Identify and understand the basic electronics of a cell phone
2. Identify the various parts and components that make up a mobile handset
3. Identify and use common handset repair tools
4. Disassemble a mobile phone
5. Troubleshoot a handset for common problems
6. Identify and understand various safety precautions to take while repairing a handset
7. Learn about the radiation safety laws for mobile handsets in India

UNIT 2.1: Basic Electronics of a Mobile Phone

Unit Objectives



At the end of this unit, students will be able to:

1. Know and differentiate between the various electronic components that are used in mobile handsets

Notes for Facilitation



- You could ask the students what they know about the basic electronics of a mobile phone.
- Give students some time to think about the various card level parts and their function.
- Set the context and enquire about the PCB that is there in a mobile phone.
- Give students some time to think about the various types of electric circuit.
- Give students some time to think about the SMD (Surface Mounted Device) resistor, capacitor IC etc., which are mounted.
- Give students time to think about the various circuit symbols, electric power and earthing.

2.1.1: Architecture of a Mobile Handset

Ask



- Ask the students about their understanding of a mobile phone's architecture.
- Ask them to work in their respective teams and identify the various component of a mobile phone.

Say



- Having understood the telecom industry and the handsets, it's time to discuss the architecture of a mobile handset.
- Handset comprises of various components and we will talk about the same.

Do



- Share with the help of the hand book the architecture of a mobile phone.
- Microprocessor, ROM, RAM, digital signal processor, radio module.
- Microphone and speaker, hardware interfaces and LCD display.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss the positioning of various parts and sections in detail.
- Refer to the relevant sections on page 24, 25 and 26 of the participant's hand book.
- Conduct a quick quiz in order to test the participants understanding and move on to the next section.

Demonstrate



- Demonstrate the architecture of a mobile set to the students.
- Demonstrate the various components like RAM, ROM digital signal processor, radio module.
- Demonstrate microphone and speaker, hardware interfaces and LCD display.

2.1.2: The PCB

Ask



- Ask the students about what do you understand by PCB in a mobile phone.
- Ask the students what does the word PCB stands for.

Say



- In this session we would learn about the PCB with respect to the mobile phones.
- The word PCB stands for – Printed Circuit Board.

Do



- Share with the help of the hand book the positioning of the various parts and sections of PCB in detail.
- Antenna point and switch.
- Network section and Power Frequency Oscillator (PFO) and network IC.
- Power section and power IC, CPU.
- Flash IC, Logic IC, charging IC and audio IC.
- SMD - Resistor, Capacitor, Coil and Transformer.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss the positioning of various parts and sections in detail.
- How each section is connected and how do they get power, etc., in detail.
- Refer to the relevant sections on page 26 and 27 of the participant's hand book.
- Conduct a quick quiz in order to test the participants understanding and move on to the next section.

Demonstrate



- Demonstrate Antenna point and switch.
- Demonstrate power section and power IC, CPU.
- Demonstrate flash IC, logic IC, charging IC and audio IC.
- Demonstrate SMD - Resistor, Capacitor, Coil and Transformer.

2.1.3: Card Level Parts

Ask



- Ask the students about what do you understand by the various card level parts in a mobile.
- Ask the students what are card level parts.

Say



- In this session we would learn about the various card level parts inside the mobile phone.
- The word card level parts include – speaker, microphone, vibrator, etc.

Do



- Share with the participants details about the various card level parts.
- Front fascia, back fascia and internal fascia.
- Ringer or loudspeaker, speaker also called earpiece and microphone.
- Vibrator, Light Emitting Diode (LED), charging connector.
- Headphone or earphone connector, data cable connector, battery and battery connector.
- Memory card connector, camera and camera connector.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss the positioning of various parts and sections in detail.
- How each section is connected and how do they get power etc. in detail.
- Refer to page 28-29 of the participant's hand book.
- Conduct a quick quiz to test the participants understanding and move to the next section.

Demonstrate

- Demonstrate front fascia, back fascia and internal fascia.
- Demonstrate ringer or loudspeaker, speaker also called earpiece and microphone.
- Demonstrate vibrator, Light Emitting Diode (LED), charging connector.
- Demonstrate headphone, connector, data cable connector, battery and battery connector.
- Demonstrate memory card connector, camera and camera connector.

2.1.4: The Big Parts and Functions

Ask



- Ask the students about what do you understand by the various big parts in a mobile.
- Ask the students what are the function of big parts.

Say



- In this session we would learn about the various big parts inside the mobile phone.
- In this session we would learn about the functions of the big parts inside the mobile phone.
- We will also learn what happens when these parts become faulty.

Do



- Share with the participants details about the various big parts and their functions and what if they become faulty.
- Antenna Switch is found in the Network Section of a mobile phone. It searches network and passes forward after tuning. Faulty Antenna Switch means no network in the mobile phone.
- P.F.O is found near the Antenna Switch. It filters and amplifies network frequency and selects the home network. Faulty PFO means no network in the mobile phone. If it gets short then the mobile phone will turn dead.
- RF IC / Network IC is found near the PFO and works as transmitter and receiver of audio and radio waves, as per instructions from the CPU. Faulty RF IC means network problem in the mobile phone. Sometimes the mobile phone can even get dead.
- 26 MHz Crystal Oscillator is found near the PFO and creates frequency during outgoing calls. Faulty crystal means no outgoing calls and no network.
- VCO: It is found near the Network IC and sends time, date and voltage to the RF IC and the CPU. Faulty VCO means no network in the mobile phone and it will display “Call End” or “Call Failed”.
- RX Filter: It is found in the Network Section of a Mobile Phone and filters frequency during incoming calls. Faulty filter means network problem during incoming calls.
- TX Filter is found in the Network Section of a Mobile Phone and filters frequency during outgoing calls. Faulty filter means network problem during outgoing calls.
- ROM is found in the Power Section of a Mobile Phone and loads current operating program in a Mobile Phone. Faulty ROM means software problem in the mobile phone and it will turn dead.

Do (Cont.)



- RAM is found in the Power Section of a Mobile Phone - sends & receives commands of the operating program in a mobile phone. Faulty RAM means software problem in the mobile phone and it will frequently get hanged or even get dead.
- Flash IC is found in the Power Section of a Mobile Phone. Mobile phone software is installed in the Flash IC. Faulty flash means the mobile phone will malfunction and can turn dead.
- Power IC is found in the Power Section of a Mobile Phone. It takes power from the battery and supplies to all other parts of a mobile phone. Faulty Power IC means then the set will turn dead.
- Charging IC is found in the Power Section near R22. It takes current from the charger and charges the battery. Faulty Charging IC means the set will not get charged, it will even turn dead if the Charging IC is short.
- RTC (Simple Silicon Crystal) - Real Time Clock is found in the Power Section near Power IC. It helps to run date & time in a mobile phone. Faulty RTC means there will be no date or time in the mobile phone and the set can even turn dead.
- CPU is found in the Power Section and controls all sections of a mobile phone. Faulty CPU means the mobile phone will turn dead.
- Logic IC / UI (user interface) IC is found in the power section of a mobile phone & controls the Ringer, Vibrator and LED. Faulty Logic IC means Ringer, Vibrator and LED of mobile phone will malfunction.
- Audio IC is found in Power Section of a mobile phone & controls Speaker and Microphone of a mobile phone. Faulty Audio IC means Speaker and Microphone of a mobile phone will malfunction or can even turn dead.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss the positioning of various big parts and their functions in detail.
- What happens when a big part fails?
- Refer to page 30-31 of the participant's hand book.
- Conduct a quick quiz to test the participants understanding and move to the next section.

Demonstrate



- Demonstrate antenna switch and PFO of a mobile.
- Demonstrate network IC and 26 MHz crystal oscillator of a mobile.
- Demonstrate VCO and RX Filter of a mobile.
- Demonstrate TX filter, RAM, ROM and flash IC of a mobile.
- Demonstrate power & charging IC, RTC, CPU and logic & audio IC of a mobile.

2.1.5: The Small Parts and Functions

Ask



- Ask the students about what do you understand by the various card small parts in a mobile.
- Ask the students what are the function of small parts.

Say



- In this session we would learn about the various small parts inside the mobile phone.
- In this session we would learn about the functions of the small parts inside the mobile.

Do



- Share with the participants details about the various small parts and their functions and what if they become faulty.
- Coil is found in any section of a mobile phone - filters & decreases Current, Voltage.
- Boost Coil is a little bigger than coil, its function is to increase current.
- Coupler is found in the Network Section of a Mobile Phone & filters network.
- Non-Electrolytic Capacitor is found in any section of a mobile phone and filters DC current.
- Electrolytic Capacitor is found in any section of a mobile phone & filters and stores current.
- Network Capacitor is found in any section of a mobile phone.
- Rectifier Diode is found in black color and converts AC Current to DC Current.
- LED is found in white or light yellow color and emits light.
- Zener Diode is found in charging section and acts as voltage regulator.
- Photo Diode is used for Infrared.
- Chip Resistance is found in any section of a mobile phone. It decreases current and passes forward.
- Network Resistance can be found in any section of a mobile phone.

Do (Cont.)



- Regulator component is found in any section of a mobile phone. It filters current and regulates voltage.
- Transistor is found in any section of a mobile phone and does the work of switching.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss the positioning of various small parts and their functions in detail.
- Refer to page 32-33 of the participant's hand book.
- Conduct a quick quiz to test the participants understanding and move to the next section.

Demonstrate



- Demonstrate Coil, coupler and capacitor of a mobile.
- Demonstrate various diodes and LED of a mobile.
- Demonstrate Resistor of a mobile.
- Demonstrate Regulator and transistor of a mobile.

2.1.6: Electrical Circuits and its Types

Ask



- Ask the students about what are the various electrical power, electrical earthing.
- Ask the students what are the different types of electrical circuits.

Say



- In this session we would learn about electrical circuit.
- In this session we would learn about different types of electrical circuits.

Do



Share with the participants details about the electrical circuits and their types:

- Electrical power.
- Electrical earthing.
- Types of electrical circuits - close circuit, open Circuit, short circuit, series circuit and parallel circuit.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss the electrical power & earthing, and also different types of electrical circuits.
- Refer to page 34-35 of the participant's hand book.
- Conduct a quick quiz to test the participants understanding and move to the next section.

2.1.7: Surface Mounted Device - Resistor

Ask



- Ask the students about what do you understand by SMD.
- Ask the students what are the different types of SMD device - resistor.

Say



- In this session we would learn about SMDs.
- In this session we would learn about different types of SMD device - resistor.

Do



- Share with the participants details about the SMD resistor.
- It is the obstruction created by any matter in the flow of electric current.
- Unit of resistance is Ohm and the unit of power rating is Watt.
- Share a few important things about resistor like – a resistor never gets short, it can be open.
- Also share that the value of resistor can be high and is available mostly without code in mobile phones). R and E denotes Ohms.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss SMD resistors.
- Refer to page 36 of the participant's hand book.
- Conduct a quick quiz to test the participants understanding and move to the next section.

Demonstrate



- Demonstrate SMD resistors.
- Demonstrate different types of SMD resistors that are used in mobile phones.

2.1.7.1: Resistor Rating

Ask



- Ask the students about what do you understand by the rating of a resistor.
- Ask the students what are the ways of rating a resistor.

Say



- In this session we would learn about how the resistor ratings are marked and interpreted.
- In this session we would learn about different standard practices used for the purpose.

Do



- Share with the participants details about the marking and interpretation of ratings.
- < 1000 ohms or 1K with an "R" indicates a decimal point - "R".
- Resistors have a three-digit code marked, the first two digits represent two significant digits value and the third digit represents power of 10.
- "000" and "0000" sometimes appear as values on surface-mount zero-ohm links.
- Resistances less than 100 ohms are written: 100, 220, 470. The final zero represents ten to the power zero.
- Resistances < 10 ohms have 'R' to indicate decimal point's position.
- Precision resistors are marked with a four-digit code, in which the first three digits are the significant figures and fourth is the power of 10.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss how the resistor ratings are marked interpreted.
- Refer to page 37 of the participant's hand book.
- Conduct a quick quiz to test the participants understanding and move to the next section.

2.1.8: Surface Mounted Device - Capacitor

Ask



- Ask the students about what do you understand by SMD.
- Ask the students what are the different types of SMD device - capacitor.

Say



- In this session we would learn about SMDs.
- In this session we would learn about different types of SMD device - capacitor.

Do



- Share with the participants details about the SMD capacitor.
- A capacitor is an electronic component made up of an insulator between two conductors.
- Its main function is to store electrical energy and resupply, its unit is 'farad'.
- Types of capacitors – polarized, non-polarized and their respective characteristics.
- The use of polarized, non-polarized capacitors.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss SMD capacitors.
- Refer to page 38 of the participant's hand book.
- Conduct a quick quiz to test the participants understanding and move to the next section.

Demonstrate



- Demonstrate SMD resistors.
- Demonstrate different types of SMD resistors that are used in mobile phones.

2.1.9: Surface Mounted Device – Integrated Circuit

Ask



- Ask the students about what do you understand by SMD.
- Ask the students what are the different types of SMD device – ICs (Integrated Circuits).

Say



- In this session we would learn about SMDs – ICs (Integrated Circuits).
- In this session we would learn about different types of SMD device – ICs (Integrated Circuits).

Do



- Share with the participants details about the SMD ICs (Integrated Circuits).
- An IC is an electronic component made up of combination of several other electronic components like resistor, capacitor, transistor, etc.
- Types of capacitors – leg types and ball types.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss SMD ICs (Integrated Circuits).
- Share the methodology of counting of leg type IC and counting of ball type IC.
- Refer to page 39 of the participant's hand book.
- Conduct a quick quiz to test the participants understanding and move to the next section.

Demonstrate



- Demonstrate SMD ICs (Integrated Circuits).
- Demonstrate different types of SMD ICs (Integrated Circuits) that are used in mobile phones.
- Demonstrate to the participants the counting of leg type IC and Ball type IC.

2.1.10: Surface Mounted Device - Filters

Ask



- Ask the students about what do you understand by SMD – Filters.
- Ask the students what are the different types of SMD device - Filters.

Say



- In this session we would learn about SMDs - Filters.
- In this session we would learn about different types of SMD device - Filters.

Do



- Share with the participants details about the SMD Filters.
- Filters are analogue circuits which perform signal processing functions, specifically to remove unwanted frequency components from the signal, to enhance wanted ones, or both.
- There are various types of filters – low pass, high pass, band pass and band stop filters.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss SMD filters.
- Discuss with the participants the different types of filters.
- Refer to page 40 of the participant's hand book.
- Conduct a quick quiz to test the participants understanding and move to the next section.

Demonstrate



- Demonstrate SMD Filters.
- Demonstrate different types of SMD Filters that are used in mobile phones.

2.1.11: Identifying Circuit Symbols

Ask



- Ask the students about what do you understand by circuit symbols.
- Ask the students what are the different types of circuit symbols.

Say



- In this session we would learn about common circuit symbols.

Do



- Share with the participants details about the common circuit symbols.
- Share symbols such as diode, capacitor, inductor, resistor, AC or DC voltage source.
- Share symbols such as AND gate, NAND gate, OR gate, NOR gate, XOR gate, inverter gate.
- Share about coil, crystal, LED, transistor, fuse, regulator.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss common circuit symbols.
- Discuss with the participants the different types of circuit symbols.
- Refer to page 41 of the participant's hand book.
- Conduct a quick quiz to test the participants understanding and move to the next section.

2.1.12: Electrical Power and Earthing

Ask



- Ask the students about what do you understand by electrical power.
- Ask the students, what do you understand by earthing.

Say



- In this session we would learn about electrical power.
- In this session we would learn about earthing.

Do



- Share with the participants, details about the electrical power that it is a function of voltage multiplied by current.
- In three pin plug two pins are used for phase and neutral, the third central pin is used for earthing. Earthing pin is fitted to the upper part of the device and sends current leakage into the earth, unwanted frequency components from the signal, to enhance wanted ones, or both.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss electrical power and earthing.
- Discuss with the participants the use of earth pin.
- Refer to page 42 of the participant's hand book.
- Conduct a quick quiz to test the participants understanding and move to the next section.

Demonstrate



- Demonstrate a three pin plug and the earth-pin.
- Demonstrate the movement of electrical meter (both analogue and digital) to ensure understanding of electrical power.

UNIT 2.2: Hardware Repair Tools

Unit Objectives



At the end of this unit, students will be able to:

1. Use common tools employed to repair mobile handsets

Notes for Facilitation



- You could ask the students what they know about the basic tools to repair a mobile phone.
- Give students some time to think about the various tools and their function.
- Set the context and at the same time ask the students to prepare a list of tools.

2.2.1: List of Common Repair Tools

Ask



- Ask the students about their understanding of tools that are used to repair a mobile phone.
- Ask them to work in their respective teams and identify the various and their respective functions in repairing a mobile phone.

Say



- Having understood the telecom industry, handsets, and the architecture of a mobile handset let us identify and list the tools used and their respective purpose.

Do



- Share with the help of the hand book the tools used in repairing of a mobile phone.
- Soldering Iron, Soldering Station, Solder Wire.
- PCB Cleaner, Jumper Wire, Blade Cutter, Point Cutter, Nose Cutter.
- Precision screwdriver, Tweezers, Brush, Multi-meter, Battery Booster, Ultrasonic Cleaner.
- Magnifying Lamp, Mobile Opener, DC Power Supply, Liquid Flux & Paste Flux, Solder Paste.
- Cleaning Sponge, De-soldering Wire, Screwdriver Kit, LCD Tester, Microscope, Test JIG Box.
- Wrist Strap, antistatic Hand Gloves, Antistatic Mat & Apron, Smoke Absorber, Battery tester.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss the various tools and their use in detail.
- Refer to page 43 of the hand book.
- Conduct a quiz in order to test the participants understanding and move to the next section.

Demonstrate



- Demonstrate the various tools to the students.
- Demonstrate their use and explain their purpose.
- Also ask the students to demonstrate the appropriate use of tools in groups.

2.2.2: Soldering Iron

Ask



- Ask the students about their understanding of the tool- soldering iron.
- Ask them to work in their respective teams and identify the use of a soldering iron.

Say



- Having understood the various tools let us identify a soldering iron along with its purpose.

Do



- Share with the help of the hand book the tool - soldering iron.
- Also share with the students the purpose of a soldering iron.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss the positioning of various tools and discuss their use in detail.
- Refer to page 44 of the hand book.
- Conduct a quiz in order to test the participants understanding and move to the next section.

Demonstrate



- Demonstrate soldering iron to the students.
- Demonstrate its use and explain their purpose.
- Also ask the students to demonstrate the appropriate use of a soldering iron.

2.2.2.1: Soldering

Do



- Welcome and greet the participants. Revise the learning of the previous sessions and ask them if they have any doubts.

Say



- Having understood soldering iron and its purpose let us see how soldering is performed.
- Also let us see the use of soldering while repairing a mobile phone.

Do



- Soldering is a process in which two or more metal items are joined together.
- Joining happens by melting and flowing a filler metal into the joint.
- The filler metal has a relatively lower melting point and helps in joining the two together.

Demonstrate



- Demonstrate the benefits of soldering to the students.
- Demonstrate to the students the five steps of soldering.
- Share with the students the basic precautions while performing soldering.

Steps: Soldering



STEP 1– Clean the soldering iron tip, till it shines by melting solder on it and wiping it off with the damp sponge.

STEP 2– Touch the tip of the soldering iron to the connection to be soldered for a few seconds to heat it up. Make sure the iron touches both the connector pin and the circuit board trace.

STEP 3– Touch the solder wire to the heated connection and allow it to flow onto it. Do not touch the solder directly to the soldering iron itself.

STEP 4– Let the connection cool. Blow on it to cool it faster.

STEP 5– Clean any excess flux or residue from the solder joint with the non-metallic brush solvent.

Summarise



- Refer to page 44 of the hand book.

2.2.2.2: De-Soldering

Do



- Welcome and greet the participants. Revise the learning of the previous sessions and ask them if they have any doubts.

Say



- Having understood soldering and its purpose let us see how de-soldering is performed.
- Also let us see the use of de-soldering while repairing a mobile phone.

Do

- De-soldering is the removal of solder and components from a printed circuit board.
- De-soldering is often performed for troubleshooting and replacement.

Demonstrate

- Demonstrate the benefits of de-soldering to the students.
- Demonstrate to the students the steps of de-soldering.
- Share with the students the basic precautions while performing de-soldering.

Steps: De-Soldering

STEP 1– Use a solder wick (finely braided copper) to wick away excess solder from a de-soldered connection.

STEP 2– Apply the solder wick and use the soldering iron to the de-soldered connection. The solder wick will draw the excess solder off the PCB pad.

Summarise

- Refer to page 45 of the hand book.

2.2.3: Access, Cutting and Cleaning Tools

Ask



- Ask the students about their understanding of the access, cutting and cleaning tools.
- Ask them to work in their respective teams and identify the use of these tools.

Say



- Having understood the previous section let's now understand access, cutting and cleaning tools.

Do



- Share with the help of the hand book access, cutting and cleaning tools.
- PCB holder.
- Blade cutter, point cutter and nose cutter.
- Precision screw driver, tweezers and brush.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss the access, cutting and cleaning tools and discuss their use in detail.
- Refer to page 46-47 of the hand book.
- Conduct a quiz in order to test the participants understanding and move to the next section.

Demonstrate



- Demonstrate access, cutting and cleaning tools to the students.
- Demonstrate its use and explain their purpose.
- Also ask the students to demonstrate the appropriate use of these tools.

2.2.4: Multi-Meter

Ask



- Ask the students about their understanding of the multi-meter.
- Ask them to work in their respective teams and identify the use of multi-meter.

Say



- Having understood the previous section let's now understand multi-meter.

Do



- Share with the help of the hand book multi-meter.
- Multimeter is a device with the ability to measure voltage, current and resistance.
- It is used to test and check readings of various parts and components of a cell phone.
- A multimeter whether digital or analog has two wires (also called probes).
- In electronics, always red is positive and black is negative.
- Precautions while using a multi-meter.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss the multi-meter and its use in detail.
- Refer to page 48 of the hand book.
- Conduct a quiz in order to test the participants understanding and move to the next section.

Demonstrate



- Demonstrate multi-meter to the students.
- Demonstrate its use and explain their purpose.
- Also ask the students to demonstrate the appropriate use of multi-meter Also ask the students to demonstrate the appropriate use of these tools.

2.2.4.1: How to Check Battery with a Multimeter?

Do



- Welcome and greet the participants. Revise the learning of the previous session and ask them if they have any doubts.

Say



- Having understood multimeter and its purpose.
- Also let us see the use of mutimeter in checking the battery of a mobile phone.

Demonstrate



- Demonstrate to the students the steps of checking a battery.
- Demonstrate to students in case the phone is not powering on or the battery drains quickly.
- Share with the students the basic while performing checking the battery of mobile phones.

Steps: Checking Battery with a Multi-Meter

STEP 1– Switch off the cell phone and remove the battery.

STEP 2– Read the label of the battery for its given voltage. Most cell phone batteries and tablets are of either 3.7V or 3.8V.

STEP 3– Place the battery such that its terminals face you.

STEP 4– Put the multi-meter on DC Volt setting. Keep the setting on the number above the actual voltage of the battery.

STEP 5– Touch the tip of the red probe of the multi-meter on the terminal of the battery named '+' and touch the tip of the black probe on the terminal named '-'

STEP 6– Keep touching the probes touched until you see a stable reading on the multi-meter display. And check the reading to diagnose the problem whether the battery is drained, faulty or charged.

Summarise

- Refer to page 57 of the hand book.

2.2.4.2: How to Measure DC Current with a Multimeter?

Do

- Welcome and greet the participants. Revise the learning of the previous session and ask them if they have any doubts.

Say

- Having understood multimeter and its purpose.
- Also let us see the use of mutimeter in measuring DC current.

Demonstrate



- Demonstrate to the students the steps of measuring a DC current with the help of a multi-meter.
- Share with the students the basic while performing measuring the DC current in mobile phones.

Steps: Measuring DC Current with a Multi-Meter



- STEP 1**–Fit BLACK probe in COM and RED probe in mA/Å plug.
- STEP 2**–Select current position in DCA range by rotary selector switch.
- STEP 3**–Switch OFF the power supply of the circuit.
- STEP 4**–Connect the probe of the meter with the circuit in series.
- STEP 5**–Switch ON the power supply of the circuit and read the ampere value on the display.

Summarise



- Refer to page 58 of the hand book.

2.2.4.3: How to Check Shorting with a Multimeter?

Do



- Welcome and greet the participants. Revise the learning of the previous session and ask them if they have any doubts.

Say



- Having understood multimeter and its purpose.
- Also let us see the use of mutimeter in order to check shorting in a mobile phone.

Demonstrate



- Demonstrate to the students the steps to check shorting with the help of a multi-meter in case the mobile phone is dead.
- Share with the students the basics in order to check shorting in mobile phones.

Steps: Check Shorting with a Multi-Meter



STEP 1– Keep the multimeter on continuity setting (also called diode setting).

STEP 2– Identify the positive and negative terminals of the battery connector.

STEP 3– Touch the red probe (+) of the multimeter on the GND pin and black probe (-) on vBat pin.

STEP 4– If you see any reading on the multimeter or hear a continuous beep sound, then the motherboard is short i.e., your mobile phone is short. If there is no reading or no continuous beep sound, the board is not short.

Summarise



- Refer to page 59 of the hand book.

2.2.4.4: How to Check Ringer with a Multimeter?

Do



- Welcome and greet the participants. Revise the learning of the previous session and ask them if they have any doubts.

Say



- Having understood multimeter and its purpose, let us see the use of mutimeter in order to check ringer in a mobile phone.

Demonstrate



- Demonstrate to the students the steps to check ringer with the help of a multi-meter.
- Share with the students the basics in order to check ringer in mobile phones.

Steps: Check Ringing with a Multi-Meter



STEP 1– Switch off the phone and dismantle it.

STEP 2– Remove the ringer.

STEP 3– Keep the multimeter on continuity setting.

STEP 4–Touch the tip of the 2 probes of the multimeter (the red and the black wires) to the 2 terminals (pins) of the ringer. If you hear a beep sound, ringer is good. In case you are unable to hear any beep sound, then the ringer is faulty.

Summarise



- Refer to page 59 of the hand book.

2.2.4.5: How to Check Microphone with a Multimeter?

Do



- Welcome and greet the participants. Revise the learning of the previous session and ask them if they have any doubts.

Say



- Having understood multimeter and its purpose.
- Also let us see the use of multimeter in order to check microphone in a mobile phone.

Demonstrate



- Demonstrate to the students the steps to check the microphone with the help of a multi-meter.
- Share with the students the basics in order to check microphone in mobile phones, in case the while talking on mobile phone the other party is unable to your voice.

Steps: Check Microphone with a Multi-Meter



STEP 1– Switch off the phone and dismantle it.

STEP 2– Remove the microphone.

STEP 4– Keep the multimeter on resistance setting (indicated by Ω). Chose 20K or 20K Ω setting.

STEP 5– Touch the tip of the 2 probes of the multimeter (the red and the black wires) to the 2 terminals (pins) of the microphone. Now move your mouth close to the microphone and blow air into its hole. If the reading on the screen increases rapidly, the microphone is good. If the reading is still 1, the microphone is faulty.

Summarise



- Refer to page 60 of the hand book.

2.2.4.6: How to Measure Frequency & Logic with a Multimeter?

Do



- Welcome and greet the participants. Revise the learning of the previous session and ask them if they have any doubts.

Say



- Having understood multimeter and its purpose.
- Also let us see the use of multimeter in order to measure frequency and logic in a mobile phone.

Demonstrate



- Demonstrate to the students the steps to measure frequency and logic with the help of a multi-meter.
- Share with the students the basics in order to check frequency and logic.

Steps: Check Frequency with a Multi-Meter



- STEP 1**– Fit the BLACK probe in COMMON plug and RED probe in V plug.
- STEP 2**– Select KHz range by rotary selector switch.
- STEP 3**– Touch the point with the probe where frequency is to be checked.
- STEP 4**– Read the value on the display.

Steps: Check Logic with a Multi-Meter



- STEP 1**– Fit the BLACK probe in COMMON plug and RED probe in V plug.
- STEP 2**– Select logic range by rotary selector switch.
- STEP 3**– Place the BLACK probe on the ground terminal of the circuit and RED probe at the testing point.
- STEP 4**– High for logic 1, low for logic 0 and pulse reading, will be displayed.

Summarise



Refer to page 61 of the hand book.

2.2.5: How to Work with a Hot Air Rework Station?

Do



- Welcome and greet the participants. Revise the learning of the previous session and ask them if they have any doubts.

Say



- Having understood hot air rework station and its purpose.
- Also let us see the use of hot air rework station.

Demonstrate



- Demonstrate to the students the steps to work with a hot air work station.
- Share with the students the basics in order to work with a hot air work station.

Steps: How to Work With a Hot Air Rework Station



STEP 1– Set the temperature and air flow at the required setting.

STEP 2– Identify the faulty IC and gradually give hot air to it.

STEP 3– When the solder paste melts; remove the faulty IC using a tweezer or IC pick up tool.

Clean the track properly.

STEP 4– Dispense fresh solder paste on the track and place the new IC.

STEP 5– Give heat starting from some height & gradually decreasing the height of the hand piece of the hot air blower.

STEP 6– When the solder melts, remove blower, new IC is soldered.

Summarise



- Refer to page 62 of the hand book.

2.2.6: Other Tools

Ask



- Ask the students about their understanding of other tools required to repair a mobile phone.
- Ask them to work in their respective teams and identify other tools and their respective use.

Say



- Having understood the previous section let's now understand other tools required to repair a mobile phone.

Do



- Share with the help of the hand book other tools.
- Battery Booster is used to boost the power of battery of a mobile phone.
- Battery tester is used to test and analyze status or condition of battery of a mobile cell phone.
- Ultrasonic Cleaner is used to clean PCB of a mobile phone and electronic components.
- Ultrasonic Cleaner is used to clean PCB of a mobile phone and electronic components.
- DC Power Supply is regulated DC (Direct Current) power supply is used to supply DC current to a mobile phone.
- Microscope is used to see a magnified view of PCB or electronic components. These are available in different zoom options.
- Liquid Flux is used to clean PCB track and legs or pins of electronic components while soldering.
- Paste Flux is used while soldering.
- Solder Paste is solder in molted semi-solid form and is used while re-balling the ICs.
- De-soldering Wire is used to remove excess solder from the track of PCB.
- Screwdriver Kit has several screwdrivers of different shapes and sizes to disassemble and assemble a mobile phone.
- Wrist Strap works in the wrist of the person who is repairing a mobile phone and helps in discharging electrostatic current.
- Torque screw driver.
- Cleaning Sponge is used to clean tip of the soldering iron while soldering.
- Antistatic Hand Gloves are important to wear as they are ESD-safe and avoid a lot of damages.
- Mobile Opener is used to open the housing or body of a mobile phone.
- Antistatic Mat is laid or placed on the table or workbench where mobile repairing is done.

Do (Cont.)



- Antistatic Apron is a dress worn by people who repair mobile phones. Like the antistatic mat, it helps save the mobile handsets from dangerous static electricity.
- Smoke Absorber is like an exhaust fan that helps to filter smoke.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss other tools and their respective use in detail.
- Refer to page 63 - 67 of the hand book.
- Conduct a quiz in order to test the participants understanding and move to the next section.

Demonstrate



- Demonstrate the various tools to the students.
- Demonstrate its use and explain their purpose.
- Also ask the students to demonstrate the appropriate use these 'other tools'.

UNIT 2.3: Basic Troubleshooting

Unit Objectives



At the end of this unit, students will be able to:

1. Disassemble a mobile phone using the common hardware repair tools
2. Identify and fix common handset problems

Notes for Facilitation



- You could ask the students what they know about the basic trouble shooting of a mobile phone.
- Give students some time to think about basic trouble shooting.
- Set the context and at the same time ask the students to prepare for the same.

2.3.1: Dis-Assembling a Mobile Phone

Do



- Welcome and greet the participants. Revise the learning of the previous session and ask them if they have any doubts.

Say



- In the previous session we learnt about the various tools required to repair a mobile phone.
- In this session we will learn the dis-assembling of a mobile phone.

Demonstrate



- Demonstrate to the students the steps to dis-assemble a mobile phone.
- Share with the students that the process of taking a cell phone apart is basically the same but can vary slightly depending on the type and model of phone that you have.
- Tools required for the purpose are a screw driver and a mobile opener.

Steps: How to Dis-assemble a Mobile Phone?



- STEP 1**– Remove your back cover (using a mobile opener tool), battery, sim and memory card.
- STEP 2**– Try the battery compartment off. The volume and camera buttons will also come loose.
- STEP 3**– The micro switches for the lock button and volume button are to be carefully peeled away from the side of the phone, but still attached to the circuit board.
- STEP 4**– Pull the circuit board towards you and lever up and remove the ribbon connector
- STEP 5**– Detach the ribbons, just lever each one up to unplug.
- STEP 6**–Lift the circuit board away from the phone, another ribbon connector (green circle) will disconnect as you remove the circuit board. Now remove the respective screws, antenna.
- STEP 7**– Carefully peel the identification sticker off and push your screwdriver to release the keypad.
- STEP 8**–Just flick the black latch up, opposite to the side the ribbon enters its socket. The ribbon will now be loose. Now pull the front cover so that the front cover separates from the black metal plate.
- STEP 9**– Now slide a sharp mobile opener tool all the way under the LCD screen to release it. Pull the circuit board towards you and lever up and remove the ribbon connector.
- STEP 10**– De You should now have the LCD screen removed. Reverse the whole process to assemble the phone back to its original state.

Summarise



- Refer to page 60-65 of the hand book.

2.3.2: Solutions to Battery Related Problem

Do



- Welcome and greet the participants. Revise the learning of the previous session and ask them if they have any doubts.

Say



- In the previous session we learnt to dis-assemble a mobile phone.
- In this session we will learn the solutions to battery related problem.

Demonstrate



- Demonstrate to the students the solutions to battery related problems.
- Share with the students solutions can be tried in case of low battery, battery drains fast, low battery back-up or battery not charging.

Steps: Solutions to Battery Related Problem



- STEP 1**– Check the battery connector and charger plug to see if there is any problem.
- STEP 2**– Check if there is any dust or corrosion in the connector or any broken pin. Clean the points using cleaning swabs.
- STEP 3**– Check the interface connector to see if there is any dust. If dust present, clean or replace the interface connector.
- STEP 4**– If the battery problem is not solved then upgrade the software or operating system to latest version.
- STEP 5**– If the problem remains then check the current consumption of mobile phone.
- STEP 6**–Check for any short-circuit.
- STEP 7**– If there is serious problem at the board level then it is better to replace the whole logic-board of the mobile phone.

Summarise



- Refer to page 66 of the hand book.

2.3.3: Solutions to Network Not Working

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt solutions to battery related problems.
- In this session we will learn the solutions to network not working.

Demonstrate



- Demonstrate to the students the solutions to network not working.
- Share with the student solutions can be tried in case, there is no network in the mobile phone, less or weak network signal or the signal is intermittent.

Steps: Solutions to Network Not Working



STEP 1– Manually search for the network. If the ‘no network problem’ persists, then there is a problem with the antenna switch. Repair or replace it.

STEP 2– If the network resumes after manual search but the home network cannot be selected, then there is a problem with the PFO. Repair or change the PFO.

STEP 3– If the network gets disconnected during phone calls then you should repair or change the network IC.

STEP 4– Clean the antenna tips and point

STEP 5– If the network problem persists, heat or change the 26MHz crystal oscillator.

STEP 6–If the problem is still not solved then heat or change the antenna switch. You can also jumper if the antenna switch is not available.

STEP 7– Heat, change or jumper the PFO if the problem still persists.

STEP 8 - Heat, re-ball or change the network IC.

STEP 9 – Heat, re-ball or change the power IC.

STEP 10 - Heat, re-ball or change the CPU.

Summarise



- Refer to page 67 of the hand book.

2.3.4: Solutions to Network Signals and Call Drops

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt solutions to network not working.
- In this session we will learn the solutions to network signals and call drops.

Demonstrate



- Demonstrate to the students the solutions to network not working.
- Share with the student solutions that can be tried, in case the mobile phone is having network related problem or call drops.

Steps: Solutions to Network Not Working



STEP 1– Check the SIM Card. Insert the SIM card in other mobile phone and see if the network problem or the call drop problem persists.

STEP 2– Alternatively; try to insert another SIM card inside the mobile phone that has the network problem.

STEP 3– If the problem is caused by the SIM card, then you should change or replace it.

STEP 4– If the problem is still not resolved then upgrade the operating system to the latest version.

STEP 5– If the problem is not solved then the mobile phone is to be changed.

Summarise



- Refer to page 63 of the hand book.

2.3.5: Solutions to Mobile Phone Overheating

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt solutions to network signals and call drops.
- In this session we will learn the solutions to mobile phone overheating.

Demonstrate



- Demonstrate to the students the solutions to mobile phone overheating.
- Share with the student solutions that can be tried, in case the mobile phone overheats either inside or outside the body.

Steps: Solutions to Mobile Overheating Problems



STEP 1– If the software troubleshooting fails to resolve the issue then there is some internal hardware problem. Change the PCB or logic-board to solve the heating problem.

Summarise



- Refer to page 63 of the hand book.

2.3.6: Solutions to Earpiece Problem

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt solutions to mobile phone overheating.
- In this session we will learn the solutions to mobile earpiece problems.

Demonstrate



- Demonstrate to the students the solutions to mobile phone earpiece problems.
- Share with the student solutions that can be tried in case, of no sound during the phone call, low sound during the call or if sound has interruptions.

Steps: Solutions to Mobile Overheating Problems



STEP 1– Check the speaker volume during a phone call.

STEP 2– If speaker volume is fine and then check the earpiece by keeping the multi-meter in buzzer mode. The value must be between 25~35 Ohm. If the value is not between 25~35 Ohm then, change the earpiece.

STEP 3– If the problem remains then check the circuit track of the earpiece section. Do jumper wherever required.

STEP 4– If the problem persists heat, reball or change the UEM/Audio IC.

STEP 5– If the problem is still not solved then heat, reball or change the CPU.

Summarise



- Refer to page 64 of the hand book.

2.3.7: Solutions to Ringer Problem

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt solutions to mobile earpiece problems.
- In this session we will learn the solutions to mobile ringer problems.

Demonstrate



- Demonstrate to the students the solutions to mobile phone ringer problems.
- Share with the student solutions that can be tried in case, ringer is not working, low sound from the ringer, sound has interruptions or sound is not clear.

Steps: Solutions to Mobile Overheating Problems



STEP 1– Check the ringer settings in the mobile phone. Check Ringer volume and silent mode. Adjust or change the volume and /or mode if required.

STEP 2– If the problem is not solved then open the mobile phone and clean the ringer point and ringer connector.

STEP 3– If the problem is not solved then check the ringer by keeping the multimeter in buzzer mode. The value must be between 8 ~ 10 Ohm. If the value is not between 8~10 Ohm then, change the ringer.

STEP 4– If the problem is not solved then check the track of ringer section. Do jumper wherever required.

STEP 5– If the problem is not solved then check the ringer IC. Heat or change the IC.

STEP 6– If the problem is not solved then heat, reball or change the UEM / Logic IC. 7. If the problem is still not solved then heat, reball or change the CPU.

Summarise



- Refer to page 65 of the hand book.

2.3.8: Solutions to Vibrator Problem

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt solutions to mobile ringer problems.
- In this session we will learn the solutions to mobile vibrator problems.

Demonstrate



- Demonstrate to the students the solutions to mobile phone vibrator problems.
- Share with the student solutions that can be tried in case, vibrator is not working, vibrator hangs, if vibrator has interruptions.

Steps: Solutions to Mobile Overheating Problems



STEP 1– Check the Vibrator settings in the mobile phone. Check if the Vibrator is ON or OFF.

STEP 2– If the problem is not solved then open the mobile cell phone and clean the vibrator tips and connector.

STEP 3– If the problem is not solved then check the vibrator with the multimeter in buzzer mode. The value must be between 8~16 Ohm. If the value is not between 8~16 Ohm then change the Vibrator or Motor.

STEP 4– If the problem is not solved then check the track of the vibrator section. Do jumper wherever required.

STEP 5– If the problem is not solved then heat, reball or change the UEM/Logic IC /Power IC.

STEP 6– If the problem is still not solved then heat, reball or change the CPU.

Summarise



- Refer to page 66 of the hand book.

2.3.9: Solutions to Microphone Problem

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt solutions to vibrator problems.
- In this session we will learn the solutions to mobile microphone problems.

Demonstrate



- Demonstrate to the students the solutions to mobile microphone problems.
- Share with the student solutions that can be tried in case there is low sound during calls, sound has interruptions, change in sound.

Steps: Solutions to Mobile Overheating Problems



STEP 1– Check the Vibrator settings in the mobile phone. Check if the Vibrator is ON or OFF.

STEP 2– If the problem is not solved then open the mobile cell phone and clean the vibrator tips and connector.

STEP 3– If the problem is not solved then check the vibrator with the multimeter in buzzer mode. The value must be between 8~16 Ohm. If the value is not between 8~16 Ohm then change the Vibrator or Motor.

STEP 4– If the problem is not solved then check the track of the vibrator section. Do jumper wherever required.

STEP 5– If the problem is not solved then heat, reball or change the UEM/Logic IC /Power IC.

STEP 6– If the problem is still not solved then heat, reball or change the CPU.

Summarise



- Refer to page 66 of the hand book.

2.3.10: Solutions to Mobile Phone Display Problem

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt solutions to microphone problems.
- In this session we will learn the solutions to mobile phone display problems.

Demonstrate



- Demonstrate to the students the solutions to mobile phone display problems.
- Share with the student solutions that can be tried in case display is blank or white or not working properly, only half the display works, display is inverted, display is broken, when the mobile phone is switched on the logo appears and then the display is blank.

Steps: Solutions to Display Problem



- STEP 1**– Clean the display tips and display connector.
- STEP 2**– Resold the display connector.
- STEP 3**– Change the display.
- STEP 4**– Check the display track.
- STEP 5**– Resolder or change the display IC.
- STEP 6**– Heat, reball or change the CPU.

Summarise



- Refer to page 68 of the hand book.

2.3.11: Solutions to LED Problem

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt solutions to display problems.
- In this session we will learn the solutions to mobile phone LED problems.

Demonstrate



- Demonstrate to the students the solutions to mobile phone LED problems.
- Share with the student solutions that can be tried in case of no light, light only in keypad or display, some lights are not working.

Steps: Solutions to Display Problem



STEP 1– check the light settings.

STEP 2– If the settings are normal then resolder all the LED.

STEP 3– If the problem is not solved then change the display or the screen.

STEP 4– Check all the LEDs with the multimeter on buzzer mode. If the LED is good then it will glow. If the LED is faulty then it will not glow.

STEP 5– Change the LED or jumper if required.

STEP 6– If the problem is not solved then check the Track of the light section of the PCB and jumper if required.

STEP 7– Next check the boosting coil and change if required.

STEP 8– If the problem is not solved then heat or change the Light IC.

STEP 9– If the problem is still not solved then heat, reball or change the Power IC.

Summarise



- Refer to page 69 of the hand book.

2.3.12: Solutions to Touch Screen Problem

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt solutions to LED problems.
- In this session we will learn the solutions to mobile phone touch screens problems.

Demonstrate



- Demonstrate to the students the solutions to mobile phone touch screen problems.
- Share with the student solutions that can be tried in case touch screen not working, only half of the touch screen is working, one key is pressed and the other key works.

Steps: Solutions to Touch Screen Problem



STEP 1– Check the settings if the mobile phone has both a keypad and a touch screen.

STEP 2– Clean and resold the PDA Tips and PDA connector.

STEP 3– Change the PDA.

STEP 4– Check the Track of the PDA section and jumper if required.

STEP 5– Heat or change the PDA IC.

STEP 6– Heat, reball or change the CPU.

Summarise



- Refer to page 70 of the hand book.

2.3.12.1: Steps to Replace Touch Screen

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt solutions to touch screen problems.
- In this session we will learn the solutions to mobile phone touch screens problems.

Demonstrate



- Demonstrate to the students the solutions to mobile phone touch screen problems.
- Share with the student solutions that can be tried in case touch screen is broken, too many scratches warrant replacement.

Steps: Solutions to Touch Screen Problem



STEP 1– Remove any cover, battery, SIM and SD cards.

STEP 2– Now remove screws from the base around the battery cover. If in doubt it's a good idea to photograph your device as you go along.

STEP 3– Remove the back cover using the pry tool. These are tricky to use but start at a corner and try and work the pry tool under the edge. Work along the edges popping out the clips and lift away the cover. In this particular model only the top camera cover needs the pry tool.

STEP 4– Remove any more screws that are revealed. Any visible connections can also be unclipped.

STEP 5– We can now carefully "push" the main device out of the metal chassis screen first. Be careful here to bend up the lower PCB, as it'll catch on the rear of the chassis. You should not need to force it at all.

STEP 6– Remove any more screws at the top or bottom and remove the plastic bracket that this releases. It'll just lift away.

STEP 7– At this point we are working towards separating the display elements from the phone motherboard. On this particular model the two ribbon cables coming in to the side are the digitizer and display connections. Using the pry tool remove any tape but save this. Lift up the white locking element and using the help of a small screw driver remove the ribbons.

Steps: Solutions to Touch Screen Problem (Cont.)



STEP 10—This is the hardest part of the whole tear-down. An adhesive gasket binds the digitizer to the display chassis. This needs to be heated to loosen the adhesive and using the pry tool separate the digitizer from the display. Use a hot-air gun but be extra careful, use the lowest setting and keep it moving. A hair dryer can also be used.

STEP 11—Start on just the bottom edge or the least broken section. Use the pry tool to test how "sticky" the adhesive is and reheat, repeat until it starts coming away. Move on to the next small section and repeat. Eventually you will lift the entire digitizer out. The process takes a while but if you can save the gasket it'll help avoid the next step.

STEP 12—If you have damaged the adhesive gasket, this will need to be replaced with 1mm or 2mm adhesive tape designed for phones. If any area of the digitizer touches the display or chassis it will short and you will get false-positive touches.

STEP 13—Remove any protective film on either side, feed the new digitizer's ribbon through the lower hole and carefully from the base, angle it back into place firmly pushing it down to make sure the adhesive holds well. Feed the ribbon along the back of the display and reverse this process to carefully rebuild your phone.

STEP 14—Press the power button now. If all has gone well your phone will come back to life and the display will be sensing your touch again.

Summarise



- Refer to page 76-81 of the hand book.

2.3.13: Solutions to Key Pad Problem

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt solutions to touch screen problems.
- In this session we will learn the solutions to key pad problems.

Demonstrate



- Demonstrate to the students the solutions to mobile key pad problems.
- Share with the student solutions that can be tried in case some keys not working, keys need more pressure to work, when a key is pressed it works continuously, when a key is pressed some other key starts working, when a key is pressed some other key works simultaneously.

Steps: Solutions to Key Pad Problem



STEP 1– Check the facial of the keypad.

STEP 2– Clean the keypad and keypad points shown in figure.

STEP 3– Using the multimeter in buzzer Mode and check the row and column of the Keypad. If there is a beeping sound then the keypad is working.

STEP 4– If there is no improvement, heat or change the Keypad IC or the Interface IC.

STEP 5– If still no change, heat, reball or change the CPU.

STEP 8– We are now free to part the display and the motherboard. As with many phones these are glued together, using the pry tool carefully and slowly start to separate the two, the glue will give you just need to take your time and work around the edge.

STEP 9– Carefully fold open the phone and disconnect the final two connecting elements. This leaves you with the display section and the motherboard section.

Summarise



- Refer to page 82 of the hand book.

2.3.14: Solutions to SIM Problem

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt solutions to key pad problems.
- In this session we will learn the solutions to SIM problems.

Demonstrate



- Demonstrate to the students the solutions to mobile SIM problems.
- Share with the student solutions that can be tried in case SIM is inserted but the message says “Insert SIM”, the mobile phone goes OFFLINE when the SIM card is inserted, the SIM works for some time and then stops working and there is a message that says “Invalid SIM”.

Steps: Solutions to SIM Problem



STEP 1– Check settings and see if the mobile phone is in Flight Mode. If it is in ‘Flight Mode’ then change it to Normal mode.

STEP 2– Clean the SIM card tips and SIM connector.

STEP 3– If the problem is not solved then change the SIM card and check.

STEP 4– If the problem remains then change the SIM connector.

STEP 5– If you still do not find a solution to the problem, check the track of the SIM section.

STEP 6– If the problem is still not solved then heat or change the SIM IC.

STEP 7– Finally, if there is no change, heat, reball or change the Power IC.

Summarise



- Refer to page 83 of the hand book.

UNIT 2.4: Safety Guidelines

Unit Objectives



At the end of this unit, students will be able to:

1. Understand and follow standard safety precautions while repairing a handset
2. Understand and follow radiation compliance standards for mobile phones in India

Notes for Facilitation



- You could ask the students what they know about the safety guidelines while repairing mobile.
- Give students some time to think about basic safety guidelines.
- Set the context and at the same time ask the students to prepare a list of such guidelines.

2.4.1: Safety Tips and Precautions

Ask



- Ask the students about their understanding of safety tips and precaution to be followed while repairing a mobile phone.
- Ask them to work in their respective teams and identify a list of safety tips and precautions.

Say



- Having understood the previous section let's now understand the various safety tips and precautions to be followed while repairing a mobile phone.

Do



- Share with the help of the hand book safety tips and precautions.
- Use ESD-Safe Mat, ESD-Safe Clothing like ESD-Safe Apron, ESD-Safe Slippers, ESD-Safe Hand Gloves and Anti-static wrist strap. This prevents the gadget or mobile phone from any potential damage to sensitive electronic components due to static electricity.
- Use only dedicated tools for particular device you want to repair and fix. Tools should be well organized.
- Machines and equipment must be used and handled carefully.
- In case you have to perform a factory reset in a mobile phone, make sure to backup all data first.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss the safety tips and precautions to be followed while repairing mobile phones in detail.
- Refer to page 84 of the hand book.
- Conduct a quiz in order to test the participants understanding and move to the next section.

Demonstrate

- Demonstrate various safety tips, aids and precautions to the students.
- Demonstrate its use and explain their purpose.
- Also ask the students to demonstrate the appropriate use of various safety tips and aids.

2.4.2: Radiation Compliance for Mobile Handsets

Ask



- Ask the students about their understanding of radiation compliance for mobile phone.
- Ask them to work in their respective teams and identify compliance for mobile phones.

Say



- Having understood the previous section let's now understand the radiation compliance for mobile phone.

Do



- Share with the help of the hand book safety tips and precautions against 'Electro Magnetic Field Exposure' by the government of India.
- India has adopted the most stringent international norms for mobile handsets.
- All the new designs of mobile handsets shall comply with the SAR values of 1.6 W/kg averaged over 1 gram of human tissue w.e.f. 1st Sept. 2012.
- The mobile handsets with existing designs which are compliant with 2.0 W/kg averaged over 10 gram of human tissue, continue to co-exist up to 31st August 2013. From 1st Sept. 2013, only the mobile handsets with revised SAR value of 1.6 W/kg would be permitted to be manufactured or imported in India.
- Specific Absorption Rate (SAR) value information display on the mobile handsets like IMEI (International Mobile Equipment Identity) display. The information on SAR values to be made available to the consumer at the point of sale.
- Mobile hand set manufactured and sold in India or imported from other countries shall be checked on random basis for compliance of SAR limit after TEC SAR Laboratory is set up by end of year 2012. Test results from International accredited labs shall be acceptable in the interim period.
- All cell phone handsets sold in the market in India shall comply with relevant standards and shall be available in hand free mode.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss the radiation compliance for mobile handsets in detail.
- Refer to page 85 of the hand book.
- Conduct a quiz in order to test the participants understanding and move to the next section.

Demonstrate



- Demonstrate radiation compliance for mobile handsets in detail to the students.
- Demonstrate its use and explain their purpose.
- Also ask the students to demonstrate radiation compliance for mobile handsets in detail.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize the participants into four teams - Team 1 - Torque Screw driver, Magnifying Lamp, Team 2 - Multimeter, Battery Booster & Tester, Team 3 - DC Power Supply, Hot Air SMD re-work machine and Team 4 - Ultrasonic Cleaner, LCD Tester, Microscope.
- Ask participants to practice tools that are there under the supervision of a professional instructor.
- There after let the teams interchange each tool set as mentioned above till every team and therefore every participant is completely thorough with each and every tool.
- Make sure that all the tools are used keeping in mind the precautions related to handling as well as health and safety of participants.

Activity (Cont.)



Skill Practice	Time	Resources
Mobile Handset Repair Tools	5 hours	<ul style="list-style-type: none">• Torque Screw driver
		<ul style="list-style-type: none">• Magnifying Lamp
		<ul style="list-style-type: none">• Multimeter
		<ul style="list-style-type: none">• Battery Booster & Tester
		<ul style="list-style-type: none">• DC Power Supply, Hot Air SMD re-work machine and Ultrasonic Cleaner
		<ul style="list-style-type: none">• LCD Tester and Microscope

Do



- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.



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सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N S D C
National
Skill Development
Corporation

Transforming the skill landscape



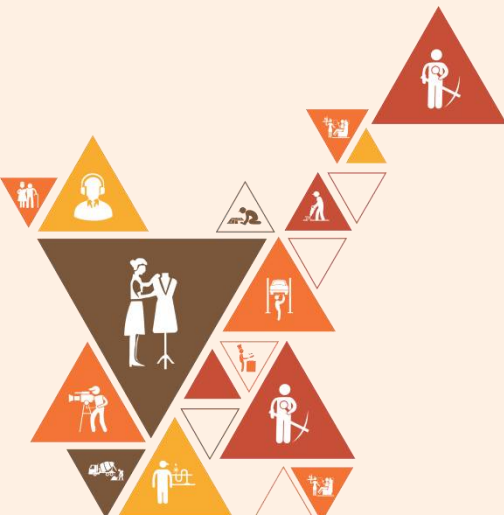
3. Handset Repair (Software)

Unit 3.1 – Resetting a Phone

Unit 3.2 – Fixing the firmware

Unit 3.3 – Basic troubleshooting

Unit 3.4 – Safety guidelines



TEL/N2204

Key Learning Outcomes

Key Learning Outcomes



At the end of this module, students will be able to:

1. Reset popular models of mobile phones to their original factory settings
2. Identify and troubleshoot problems related to the mobile phone firmware
3. Identify and troubleshoot common software issues in handsets

UNIT 3.1: Resetting - Mobile Phone

Unit Objectives



At the end of this unit, students will be able to:

3. Recall and demonstrate steps to reset a phone to its original factory settings
4. Recall and demonstrate steps to download apps and set-up email accounts on a handset

Notes for Facilitation



- You could ask the students what they know about resetting of a mobile phone.
- Give students some time to think about the various phones and how to reset them.
- You could ask the students what they know about downloading apps.
- Give students some time to think about the common apps.
- You could ask the students what they know about setting up e-mail accounts on a handset.
- Give students some time to think about the same.
- Set the context and enquire about the various ways to reset a mobile phone, downloading apps and setting up e-mail accounts on a handset.

3.1.1: Need to Reset – a Mobile Phone

Ask



- Ask the students about their understanding of the need to reset a mobile phone.
- Ask them to work in their respective teams and identify the need to reset a mobile phone.

Say



- Having understood how to perform handset repair related to hardware.
- We will now understand the need to reset a mobile phone.

Do



- Share with the help of the hand book the need to reset a mobile phone.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss the positioning of various parts and sections in detail.
- Refer to the relevant sections on page 94 of the participant's hand book.
- Conduct a quick quiz in order to test the participants understanding and move on to the next section.

Summarise



- Refer to page 94 of the hand book.

3.1.2: Steps to Reset a Mobile Handset

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt the need to reset mobile handsets.
- In this session we will learn about the steps to reset a mobile handsets.

Demonstrate



- Demonstrate to the students the steps to reset a mobile phone.
- Share with the student these steps for various types and brands of phones.
- Also, give them adequate practice time.

Steps: How to Reset Mobile Phones?



Apple iPhone

Step 1– Tap on "Settings" from the home screen of your iPhone.

Step 2– Tap "General Settings" from the list of options provided.

Step 3– Tap on "Reset". Your iPhone will take several minutes to restore depending on the memory capacity of your device.

Android Phone

Step 1– Select "Settings" from your application menu.

Step 2– Access the option for "Factory Data Reset" based on the make & model of your Android device, this option will be located in either the folder labelled "Privacy" or "SD & Phone Storage".

Step 3– Select "Reset Phone".

Step 4– Select "Erase Everything" when shown the warning that a reset will erase all personal data from your device.

Blackberry Phone

Step 1– Select "Options" from your Blackberry's main menu.

Step 2– Select the icon labelled "Security" or "Security Options".

Step 3– Choose either "Wipe Handheld" or "Security Wipe" from the options provided.

Steps: How to Reset Mobile Phones? (Cont.)



Step 4– Select the appropriate option to confirm the reset process; Enter "blackberry" when prompted for reset password.

Windows iPhone

Step 1– Access "Settings" from the Start menu or programs list of your Windows mobile device.

Step 2– Select "Clear Storage" or "Hard Reset" from the options provided. On some Windows mobile phones, you may need to access these options from the "System" folder.

Step 3– Type "1234" when prompted to enter a password for the reset.

Step 4– Answer "Yes" when prompted to confirm that you want to reset your Windows mobile cell phone.

LG Phone

Step 1– Remove the SIM card from the mobile.

Step 2– Type 2945#*#.

Step 3– Select the "RESET" option.

Motorola Phone

Step 1– Remove the SIM card from the mobile.

Step 2– Type *##*367628# and call.

Step 3– After one minute type *##*778337#.

Nokia Phone

Step 1– For soft formatting type *#7370# followed by 12345.

Step 2– For hard formatting type *#7780# followed by 12345.

Summarise



- Refer to page 95-96 of the hand book.

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize participants into four teams; Team 1 – Windows phone and LG phone Team 2 – An Android phone and Windows Phone Team 3 – Blackberry and a Motorola Phone Team 4 – An iPhone and Samsung phone.
- Ask participants to practice steps to reset under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for resetting as mentioned above till every team and therefore every participant is completely thorough with each and every step.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Skill Practice	Time	Resources
Mobile Handset Reset	5 hours	<ul style="list-style-type: none"> • Windows Phone & LG Phone
		<ul style="list-style-type: none"> • Android Phone & Windows Phone
		<ul style="list-style-type: none"> • Blackberry and Motorola Phone
		<ul style="list-style-type: none"> • iPhone & Samsung phone

Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

3.1.3: Steps to Install Apps

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about the steps to reset a mobile handsets.
- In this session we will learn about the steps to Install Apps.

Demonstrate



- Demonstrate to the students the steps to install mobile Apps.
- Share with the student these steps for various types and brands of phones.
- Also, give them adequate practice time.

Steps: How to Install Apps?



- **Android**

Step 1– On the Home screen tap the Play Store (also Android Market or Google Play).

Step 2– If this is the first time then you'll be asked to accept the terms of service.

Step 3– Type Mobile APP's name in the search above. A list pops up as you write. Select the one you want and tap Install.

Step 4– Tap on the desired APP's icon in your App list. Log in with your details.

- **Blackberry**

Step 1– Scroll to BlackBerry App World and click.

Step 2– Tap on the search Icon and type in mobile App's name.

Step 3– Select the desired App from the list below.

Step 4– Tap Download. You'll be prompted for your Blackberry ID and password.

Step 5– Tap Ok.

Step 6– Tap on the desired icon in your App list. Log on with your details.

Steps: How to Install Apps? (Cont.)



- **iPhone**

Step 1– Make sure you've an Apple ID before the installation.

Step 2– Tap App Store.

Step 3– Tap Search and type in mobile App's name.

Step 4– Tap App's name. Tap Free. Tap Install. You may be prompted to put in the password for your Apple ID.

Step 5– Tap on the desired icon in your App list. Log in with your details.

- **Windows Mobile**

Step 1– Scroll the Home screen to go to the second screen.

Step 2– Tap on Store.

Step 3– Tap on the search icon and type Mobile APP's name in the search bar.

Step 4– Select the one you want and tap Install.

Step 5– Tap Allow to give the application access to location.

Step 6– Tap on desired icon in your App list. Log on with your details.

Summarise



- Refer to page 97-98 of the hand book.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize participants into four teams; Team 1 – Windows phone, Team 2 – An Android phone, Team 3 – Blackberry and Team 4 – An iPhone.
- Ask participants to practice steps to install Apps under the supervision of a professional instructor.
- There after let the teams interchange phone types for installing Apps as mentioned above till every team and therefore every participant is completely thorough with each and every step for each and every type of phone.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Activity (Cont.)



Skill Practice	Time	Resources
Mobile Handset Apps installation steps	10 hours	<ul style="list-style-type: none">• Windows Phone
		<ul style="list-style-type: none">• Android Phone
		<ul style="list-style-type: none">• Blackberry
		<ul style="list-style-type: none">• iPhone

Do



- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

3.1.4: Steps to Set-up Emails

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about the steps to install Apps.
- In this session we will learn about the steps to set-up email.

Demonstrate



- Demonstrate to the students the steps to set-up email.
- Share with the student these steps for various types and brands of phones.
- Also, give them adequate practice time.

Steps: How to Setup E-mails?



- **Android**

Step 1– Tap Email.

Step 2– Tap Add account.

Step 3– Type your email and password.

Step 4– Select the account type.

Step 5– Type your full email address in the Username field, related password in the Password field, for POP3 type in *pop.<your domain>.com* into the POP3 server field and for IMAP type in *imap.<your domain>.com* into the IMAP server field.

Step 6– Type *smtp.<your domain>.com* in the SMTP Server field, check 'Require sign-in' box, fill in your full email address in the Username field and password, in the Password field.

Step 7– Select the email checking frequency settings.

Step 8– Check 'Send email from this account by default' if you want to use this email account as default for sending emails.

Step 9– Fill in a name for the email account and your name that will appear on outgoing emails.

Steps: How to Setup E-mails? (Cont.)



- **On Blackberry**

Step 1– Go to Home menu and select setup.

Step 2– Select email settings.

Step 3– Enter your Blackberry Service username and password as provided by your mobile network provider.

Step 4– Enter your Blackberry Service username and password as provided by your mobile network provider.

Step 5– Select 'Add My Existing Email Account'.

Step 6– Select your mail service provider and type in your relevant account details, select 'Other' to set up the email manually.

- **On iPhone**

Step 1–Tap Settings.

Step 2–Scroll down and tap Mail, Contacts and Calendars.

Step 3–Tap Add Account.

Step 4–Select your Email provider. If not present then select 'Other'. Follow the instructions and provide the necessary information to configure your Email account.

- **On Windows Phones**

Step 1– In the App List taps settings.

Step 2– Tap Email + accounts.

Step 3– Tap Add an account.

Step 4– Select your Email provider. If not present then select 'Other Account'. Follow instructions and provide the necessary information to configure your Email account. If you are adding an account manually then select 'Advanced setup'.

Step 5– Enter your email address and password.

Step 6– Tap Internet email.

Steps: How to Setup E-mails? (Cont.)



- **Do the following in case you are unable to send/receive mails:**

Step 1– Verify if the Phone is connected to a data or Wi-Fi network using the mobile browser.

Step 2– If network present then verify the email address and password again. You may need to re-enter the password if it was changed recently.

Step 3– Check mail account server settings if Step 2 fails.

Step 4– If nothing works then delete the mail account and set it up again.

Summarise



- Refer to page 99-100 of the hand book.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize the participants into four teams; Team 1 – Windows phone, Team 2 – An Android phone, Team 3 – Blackberry and Team 4 – An iPhone.
- Ask participants to practice steps to setup e-mails under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for setting up e-mails as mentioned above till every team and therefore every participant is completely thorough with each and every step for each and every type of phone.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Activity (Cont.)



Skill Practice	Time	Resources
Mobile Handset email setup steps	10 hours	<ul style="list-style-type: none"> • Windows Phone
		<ul style="list-style-type: none"> • Android Phone
		<ul style="list-style-type: none"> • Blackberry
		<ul style="list-style-type: none"> • iPhone

Do



- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

UNIT 3.2: Fixing the Firmware

Unit Objectives



At the end of this unit, students will be able to:

1. Outline and explain the role of firmware in a handset
2. Recall and demonstrate steps to install a new firmware

Notes for Facilitation



- You could ask the students what they know about the role of a firmware in mobiles.
- Give students some time to think about the ways to install a new firmware in phones.
- You could ask the students what they know installing a new firmware.
- Give students some time to think about the same.
- Set the context and enquire about the various ways to install a new firmware on a handset.

3.2.1: Understanding Firmware and How to Fix it?

Ask



- Ask the students about their understanding of the term firmware.
- Ask them to work in their respective teams and identify how to fix the firmware of a mobile.

Say



- Having understood how to perform handset repair related to resetting of a mobile phone.
- We will now understand how to fix the firmware of a mobile phone.

Do



- Share with the help of the hand book how to reset a mobile phone.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss the various steps in detail.
- Refer to the relevant sections on page 102 of the participant's hand book.
- Conduct a quick quiz in order to test the participants understanding and move on to the next section.

Summarise



- Refer to page 102 of the hand book.

3.2.2: Steps to Flash a Mobile Phone

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about firmware.
- In this session we will learn about the steps to *flash* a mobile phone.

Demonstrate



- Demonstrate to the students the steps to set-up email.
- Share with the student these steps.
- Also give them adequate practice time.

Steps: How to Flash a Mobile?



Step 1– Search and download the flashing program for your phone onto your computer.

Step 2– Unzip the files and read the instructions carefully, make sure your phone is updated and has all the latest drivers.

Step 3– Be ready with answers about your original carrier, what you're flashing to, and your phone's make and model. The software will also prompt you to choose between a "half flash" and a "full flash." A "half flash" is just talk and text.

Step 4– Know your MEID (mobile equipment identifier) and ESN (electronic serial number). This information can be found underneath your phone's battery. The program you are using to flash can also give you all this information. The MEID will be 18 digits (starting with 2) if it is MEID Dec or 15 numbers and letters if it is MEID Hex. The ESN will be 8 numbers long and possibly labeled PESN.

Step 5– Detect your phone using the software. It will determine the COM port for you. In case there is a problem, you can manually find the port through Device Manager.

Step 6– Select "write" and confirm. On selecting "yes", phone will get flashed and automatically reboot when successful.

Summarise



- Refer to page 103 of the hand book.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize the participants into four teams; Team 1 – Windows phone & LG phone, Team 2 – An Android phone & Windows phone, Team 3 – Blackberry & Motorola phone and Team 4 – An iPhone & Samsung phone.
- Ask participants to practice steps to flashing under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for flashing as mentioned above till every team and therefore every participant is completely thorough with each and every step for each and every type of phone.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Skill Practice	Time	Resources
Mobile Handset Flashing steps	10 hours	<ul style="list-style-type: none"> • Windows Phone & LG phone
		<ul style="list-style-type: none"> • Android Phone & Windows phone
		<ul style="list-style-type: none"> • Blackberry & Motorola phone
		<ul style="list-style-type: none"> • iPhone & Samsung phone

Do



- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

3.3: Basic Trouble Shooting

Unit Objectives



At the end of this unit, students will be able to:

1. Identify and troubleshoot common software related issues in phones
2. Create back up data from the handset

Notes for Facilitation



- You could ask the students what they know about software related trouble shooting in mobiles.
- Give students some time to think about the ways to troubleshoot software problems in phones.
- Give students some time to think about the same.
- Set the context and enquire about the various ways to troubleshoot software related problems in handset.

3.3.1: Common Software Problems and Solutions

Ask



- Ask the students what are the common software problems in a handset.
- Ask them to work in their respective teams and identify how to fix them.

Say



- Having understood how to identify and fix firmware related problem in mobile phone.
- We will now understand how to fix common software related problem in a mobile phone.

Do



- Share with the help of the hand book how to solve common software related problem in a mobile phone.
- Share with the participant – battery related issues, Bluetooth related issues, cellular data issues and camera glitches.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss the various steps in detail.
- Refer to the relevant sections on page 104 of the participant's hand book.
- Conduct a quick quiz in order to test the participants understanding and move on to the next section.

Summarise



- Refer to page 104 of the hand book.

3.3.2: Steps to Update a Phone

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about common software problems and solution.
- In this session we will learn about the steps to update a mobile phone.

Demonstrate



- Demonstrate to the students the steps to update a mobile phone.
- Share with the student these steps.
- Also give them adequate practice time.

Steps: How to Update a Mobile?



Android

Step 1– Navigate to the Setting menu of your phone.

Step 2– Scroll down the Settings menu and click on 'About Phone'. If you have a tabbed settings menu then this will appear in the 'general' section.

Step 3– Click the 'Software Update' or a similar option.

Step 4– Your phone will now search for an available update. If you are taken to another menu, select the 'Software update check' button or something similar. If an update is available for your device then you will be asked whether you wish to install it. If you select yes then the system will download and install the new software and reboot the mobile phone.

iPhone

From the phone directly

Step 1– Plug your phone in to power and connect to the Internet with Wi-Fi.

Step 2– Tap Settings > General > Software Update.

Steps: How to Update a Mobile? (Cont.)



Step 3– Tap Download and Install.

Step 4– To update now, tap Install.

Step 5– If prompted, enter your pass code.

Through iTunes

Step 1– Install the latest version of iTunes on your computer.

Step 2– Connect the phone to your computer.

Step 3– Open iTunes and select your iPhone.

Step 4– Click Summary, then click ‘Check for Update’.

Step 5– Click Download and Update.

Windows

Step 1– Tap Settings.

Step 2– Tap ‘phone update’.

Step 3– Tap the button ‘check for updates’.

Step 4– You can choose to install the update immediately or postpone the update for a more convenient time.

Blackberry

Step 1– Visit the <http://www.blackberry.com/update> web site.

Step 2– Click ‘Check for Updates’.

Step 3– Complete the instructions on the screen to perform the software reload.

Summarise



- Refer to page 105, 106 of the hand book.

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize participants into four teams; Team 1 – Windows phone, Team 2 – An Android phone, Team 3 – Blackberry, and Team 4 – iPhone & iTune.
- Ask participants to practice steps to update the phone under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for updating as mentioned above till every team and therefore every participant is completely thorough with each and every step for each and every type of phone.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Skill Practice	Time	Resources
Mobile Handset Updating steps	10 hours	<ul style="list-style-type: none"> • Windows Phone
		<ul style="list-style-type: none"> • Android Phone
		<ul style="list-style-type: none"> • Blackberry
		<ul style="list-style-type: none"> • iPhone

Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

3.3.3: Steps – Mobile Data Transfer

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt to update a phone.
- In this session we will learn about the steps to mobile phone data transfer.

Demonstrate



- Demonstrate to the students the steps to mobile data transfer.
- Share with the student these steps.
- Also give them adequate practice time.

Steps: Mobile Data Transfer



Using USB Cable

Step 1– Connect the mobile to your computer using the USB cable that comes with the phone.

Step 2– Find the icon of a removable drive (your mobile) on your computer under My Computer or Finder if a pop-up window does not open.

Step 3– Drag and drop files that you want to copy from your mobile to the computer (or vice-versa).

Step 4– When you are finished, close the window and disconnect the USB cable.

Using Bluetooth

Step 1– Make sure Bluetooth is turned on in both the mobile and computer. You can activate it in your phone by looking under Settings or Controls. If you have a Mac, you can make sure your Bluetooth is on by clicking on the Bluetooth symbol on the right side of the upper toolbar. The symbol should be to the left of the Date and Time and should look like a white B with a blue background. On Windows it should be under the Control Panel.

Step 2– Make sure that the phone is not too far away from the computer.

Step 3– Find and select the file (phone) that you want to transfer.

Steps: Mobile Data Transfer (Cont.)



Step 4– Select Copy or Send in the menu.

Step 5– Choose the Bluetooth option.

Step 6– Select the "Look for Devices" or a similar option in the Bluetooth menu that pops up.

Step 7– Select your device (computer).

Step 8– Request would be sent to the device to accept the file.

Step 9– Accept request & data will be sent from mobile to computer and vice-versa.

Using Memory Card Reader

Step 1– Plug in your memory card into a memory card reader. If it's a micro SD card then insert into an adapter and then insert the adapter into the reader.

Step 2– Connect the card reader to your computer via the USB port. Many computers already have an inbuilt card reader.

Step 3– Look for the card as a removable device on your computer under My Computer or Finder if a pop-up window does not open. Drag and drop the data you want to copy on your local drive. On a Mac, open iPhoto, go to File>Import to Library & select photos you wish to import from memory Card.

Using iTunes

Step 1– Connect iPhone to computer using a USB cable. If iTunes doesn't open automatically, open it from the Start Menu or your Applications folder.

Step 2– Select your iPhone from the list under Devices button (upper right corner of iTunes window).

Step 3– Choose the media (Apps, Music, Movies, etc.) that you want to sync. Click on each tab that you want to add to your device and check the "Sync" checkbox. You can choose to sync all media of that type, or just specific files.

Summarise



- Refer to page 107-108 of the hand book.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize participants into four teams; Team 1 – A Windows Phone & LG Phone – so as to transfer data using USB connectivity, Team 2 – An Android Phone & Windows Phone – so as to transfer data using Bluetooth, Team 3 – A Blackberry & Motorola Phone – so as to transfer data using memory card reader, and Team 4 – An iPhone & Samsung Phone – so as to transfer data using iTunes.
- Ask participants to practice steps to transfer the mobile data under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for updating as mentioned above till every team and therefore every participant is completely thorough with each and every step for each and every type of phone.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Skill Practice	Time	Resources
Mobile Handset Updating steps	10 hours	<ul style="list-style-type: none"> • Windows Phone, Android Phone, Blackberry and iPhone
		<ul style="list-style-type: none"> • USB, Bluetooth, memory card, iTunes

Do



- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

3.4: Safety Guidelines

Unit Objectives



At the end of this unit, students will be able to:

- Understand and follow common safety precautions to be undertaken while repairing a handset

Notes for Facilitation



- You could ask the students what they know about safety guidelines while repairing mobiles.
- Give students some time to think about the various safety guidelines.
- Set the context and enquire about the various safety guidelines required to service mobile phones.

3.4.1: Safety Guidelines

Ask



- Ask the students what are the common safety guidelines while repairing a handset.
- Ask them to work in their respective teams and identify them.

Say



- Having understood how to transfer mobile data using various ways.
- We will now understand and demonstrate various safety guidelines in a mobile-phone.

Do



- Share with the help of the hand book the various safety related guidelines to be followed while repairing a mobile phone.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss the various steps in detail.
- Refer to the relevant sections on page 109 of the participant's hand book.
- Conduct a quick quiz in order to test the participants understanding and move on to the next section.

Summarise



- Refer to page 109 of the hand book.



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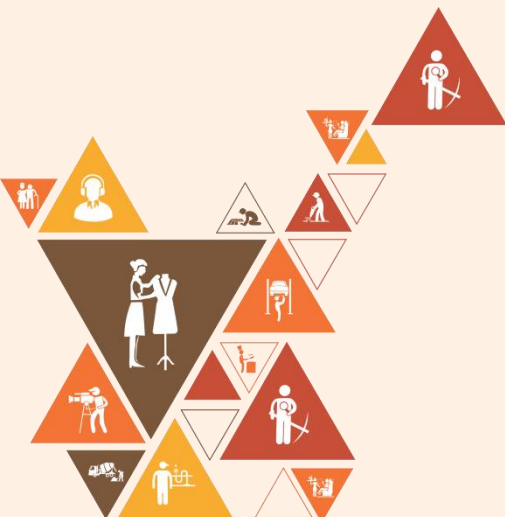
4. Perform Table Repair

Unit 4.1 – Introduction to Tablets

Unit 4.2 – Replacing common parts

Unit 4.3 – Basic troubleshooting

Unit 4.4 – Safety guidelines



TEL/N2205

4.1: Introduction to Tablets

Unit Objectives

At the end of this unit, students will be able to:

1. Outline and explain a tablet and compare it with a traditional computer

Ask

- Ask the students what you understand by tablets.
- Ask them to work in their respective teams and identify the various models and uses of tablets.

Say

- Having understood how to troubleshoot software related issues in mobile phones.
- We will now explain and outline the features of a tablet and its use.

Do

- Share with the help of the hand book the range of tablets, its use and the various operating systems.

Notes for Facilitation

- Facilitate the discussion and avoid arguments.
- Discuss the various steps in detail.
- Conduct a quick quiz in order to test the participants understanding and move on to the next section.

Summarise

- Refer to page 118-119 of the hand book.

4.2: Replacing Common Parts

Unit Objectives



At the end of this unit, students will be able to:

1. Understand and follow common safety precautions to be undertaken while repairing a handset

Notes for Facilitation



- You could ask the students what they know about replacing common parts of a tablet.
- Also ask students about the various tools required to replace the common parts.
- Give students some time to think about the various steps and tools.
- Set the context and enquire about the steps to replace the common parts of the tablet and the tools required for the same.

4.2.1: Repairing Tablets

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about the various tablets and its features, etc.
- In this session we will learn about repairing tablets.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss with the students that repairs for most tablet computers because of their small size and frequent use of adhesive is involved.
- Discuss with the students the tools required – set of screwdrivers, spudger, mobile opener, tweezers, etc.
- Refer to the relevant sections on page 120 of the participant's hand book.
- Conduct a quick quiz in order to test the participants' understanding and move on to the next section.

Summarise



- Refer to page 120 of the hand book.

4.2.2: Steps – How to Replace a Battery?

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt replacing tablets.
- In this session we will learn about the steps to replace a battery.

Demonstrate



- Demonstrate to the students the steps to replace a battery.
- Share with the student these steps.
- Also give them adequate practice time.

Steps: How to Replace a Battery?



Step 1– Insert the metal spudger in the gap between the rubber outer ring on the front panel and the rear case near the USB connector. Pry the front panel up carefully.

Step 2– Repeat the above process along the long edge on the volume button side until there is a gap between the front panel and the rear case.

Step 3– Pry up the front panel along the top edge.

Step 4– Pry up the front panel along the edge closest to the home screen button.

Step 5– Before lifting the free side of the front panel up from the rear case releases it from the plastic retaining clips.

Step 6– Lift the front panel assembly away from the rear case.

Step 7– Using the attached black tab pull the display data cable upwards from the socket on the motherboard.

Steps: How to Replace a Battery? (Cont.)



Step 8– Use your fingernail to carefully flip up the retaining flaps on the two digitizer ribbon cable ZIF sockets. Now pull the digitizer ribbon cable straight out of its two sockets on the motherboard.

Step 9– Remove the front panel assembly.

Step 10–Using a plastic opening tool peel up the two pieces of copper tape covering the USB connector board near the battery and the motherboard.

Step 11–Remove the screws securing the USB connector board to the rear case.

Step 12–Pry the upper end of the USB connector board upwards to disconnect it from its socket.

Step 13–Pull the USB connector board away from the bottom edge of the rear case and lift, do not remove it completely.

Step 14–Pull the vibrator motor from its socket on the USB connector board, and completely remove the USB connector board.

Step 15– Remove (if present) the two pieces of tape boxed in red.

Step 16– Using a plastic opening tool flip up the retaining flap on the volume control/power button ribbon cable socket and pull out the cable.

Step 17– Using a plastic opening tool lift the camera connector up & out of its socket, bend camera cable away from the motherboard.

Step 18– Flip up the retaining flap on microphone cable socket and pull out the microphone cable.

Step 19– Using your plastic opening tool pry the upper antenna connector up from its socket.

Step 20– Pry up the retaining flap on the headphone jack ribbon cable socket and pull the headphone jack ribbon cable out.

Step 21– Pry (from beneath the wires) the speaker cable connector up from its socket on the motherboard.

Step 22– Using a plastic opening tool flip up the retaining flap on the digitiser board ribbon cable socket and pull it out.

Step 23– Pry up the lower antenna cable connector from its socket.

Step 24– De-route the antenna cable, carefully pulling it out from under its retaining clip near the top right corner of the battery.

Step 25– Remove screws securing battery, motherboard to the rear case.

Step 26– Using a plastic opening tool pry the battery up from the tape securing it to the rear case.

Step 27– Lift the motherboard assembly out of the rear case, carefully avoiding any cables.

Step 28– Remove the battery by pulling it away from the motherboard to disconnect its cable.

Step 29– Battery remains.

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize the participants into three teams - Team 1, 2 & 3; Hand over an Android tablet to each team.
- Ask participants to practice steps to replace battery under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for updating as mentioned above till every team and therefore every participant is completely thorough with each and every step for each and every type of phone.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Skill Practice	Time	Resources
Replacing battery of a tablet	5 hours	<ul style="list-style-type: none"> • Tablets - Android

Do

- Ask them to get into teams for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

Summarise

- Refer to page 121-130 of the hand book.

4.2.3: Steps – How to Replace a Camera?

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt replacing battery of tablets.
- In this session we will learn about the steps to replace the camera of the tablet.

Demonstrate



- Demonstrate to the students the steps to replace camera.
- Share with the student these steps.
- Also give them adequate practice time.

Steps: How to Replace a Camera?



Step 1– Insert the metal spudger in the gap between the rubber outer ring on the front panel and the rear case near the USB connector. Pry the front panel up carefully.

Step 2– Repeat the above process along the long edge on the volume button side until there is a gap between the front panel and the rear case.

Step 3– Pry up the front panel along the top edge.

Step 4– Pry up the front panel along the edge closest to the home screen button.

Step 5– Before lifting the free sides of the front panel up from the rear case release it from the plastic retaining clips.

Step 6– Lift the front panel assembly away from the rear case.

Step 7– Using the attached black tab pull the display data cable upwards from the socket on the motherboard.

Step 8– Pull the digitiser ribbon cable straight out of its two sockets on the motherboard.

Steps: How to Replace a Camera? (Cont.)



Step 9– Remove the front panel assembly.

Step 10– Use a plastic opening tool to lift the camera connector up and out of its socket.

Step 11– Using a plastic opening tool move the camera upwards to dislodge it from its recess in the rear case. Lift the camera out.

Step 12– Using a plastic opening tool move the camera upwards to dislodge it from its recess in the rear case. Lift the camera out.

Step 13– Lift the camera out.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize the participants into three teams - Team 1, 2 & 3; hand over an Android tablet to each team.
- Ask participants to practice steps to replace camera under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for updating as mentioned above till every team and therefore every participant is completely thorough with each and every step for each and every type of phone.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Skill Practice	Time	Resources
Replacing camera of a tablet	3 hours	<ul style="list-style-type: none"> • Tablets - Android

Do



- Ask them to get into teams for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

Summarise



- Refer to page 131-132 of the hand book.

4.2.4: Steps – How to Replace a Control Button Assembly?

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt replacing the camera of tablets.
- In this session we will learn about the steps to replace the control button assembly of the tablet.

Demonstrate



- Demonstrate to the students the steps to replace camera the control button assembly of the tablet.
- Share with the student these steps.
- Also give them adequate practice time.

Steps: How to Replace Control Button Assembly?



Step 1– Insert the metal spudger in the gap between the rubber outer ring on the front panel and the rear case near the USB connector. Pry the front panel up carefully.

Step 2– Repeat the above process along the long edge on the volume button side until there is a gap between the front panel and the rear case.

Step 3– Pry up the front panel along the top edge.

Step 4– Pry up the front panel along the edge closest to the home screen button.

Step 5– Before lifting the free side of the front panel up from the rear case releases it from the plastic retaining clips.

Step 6– Lift the front panel assembly away from the rear case.

Step 7– Using the attached black tab pull the display data cable upwards from the socket on the motherboard.

Step 8– Pull the digitiser ribbon cable straight out of its two sockets on the motherboard.

Step 9– Remove the front panel assembly.

Step 10– Using a plastic opening tool flip up the retaining flap on the control button cable ZIF socket, and pull the control button ribbon cable straight out of its socket.

Step 11– Use a plastic opening tool to peel the ambient light sensor off the body of the control button assembly, and find hidden screws.

Step 12– Remove the screws securing the control button assembly to the rear case.

Step 13– Use a plastic opening tool to lift the control button assembly up from its housing, and remove it completely.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize the participants into three teams - Team 1, 2 & 3; hand over an Android tablet to each team.
- Ask participants to practice steps to replace control button assembly under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for updating as mentioned above till every team and therefore every participant is completely thorough with each and every step for each and every type of phone.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Skill Practice	Time	Resources
Replacing control button assembly of a tablet	3 hours	<ul style="list-style-type: none"> • Tablets - Android

Do



- Ask them to get into teams for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

Summarise



- Refer to page 133-134 of the hand book.

4.2.5: Steps – How to Replace Digitiser Control Board?

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt replacing the control button assembly.
- In this session we will learn about the steps to replace the digitiser control board of the tablet.

Demonstrate



- Demonstrate to the students the steps to replace the digitizer control board of the tablet.
- Share with the student these steps.
- Also give them adequate practice time.

Steps: How to Replace Digitiser Control Board (DCB)?



Step 1– Insert the metal spudger in the gap between the rubber outer ring on the front panel and the rear case near the USB connector. Pry the front panel up carefully.

Step 2– Repeat the above process along the long edge on the volume button side until there is a gap between the front panel and the rear case.

Step 3– Pry up the front panel along the top edge.

Step 4– Pry up the front panel along the edge closest to the home screen button.

Step 5– Before lifting the free side of the front panel up from the rear case releases it from the plastic retaining clips.

Step 6– Lift the front panel assembly away from the rear case.

Step 7– Using the attached black tab pull the display data cable upwards from the socket on the motherboard.

Step 8– Pull the digitiser ribbon cable straight out of its two sockets on the motherboard.

Step 9– Remove the front panel assembly.

Step 10– Remove screws securing the digitiser control board to the rear case.

Step 11– Carefully lift (not remove) the digitiser control board as it is still connected to the motherboard by the digitiser control board ribbon cable.

Steps: How to Replace (DCB)? (Cont.)



Step 12– Using the edge of a plastic opening tool, carefully flip up the retaining flap on the digitiser control board ribbon cable ZIF socket, and pull out the digitiser control board ribbon cable.

Step 13– Now safely remove the digitiser control board.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize the participants into three teams - Team 1, 2 & 3; hand over an Android tablet to each team.
- Ask participants to practice steps to replace digitizer control board under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for updating as mentioned above till every team and therefore every participant is completely thorough with each and every step for each and every type of phone.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Skill Practice	Time	Resources
Replacing digitizer control board of a tablet	3 hours	<ul style="list-style-type: none"> • Tablets - Android

Do



- Ask them to get into teams for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

Summarise



- Refer to page 135-136 of the hand book.

4.2.6: Steps – How to Replace Display Data Cable?

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt replacing the digitizer control board.
- In this session we will learn about the steps to replace the display data cable of the tablet.

Demonstrate



- Demonstrate to the students the steps to replace the display data cable of the tablet.
- Share with the student these steps.
- Also give them adequate practice time.

Steps: How to Replace the Display Data Cable? (DDC)



Step 1– Insert the metal spudger in the gap between the rubber outer ring on the front panel and the rear case near the USB connector. Pry the front panel up carefully.

Step 2– Repeat the above process along the long edge on the volume button side until there is a gap between the front panel and the rear case.

Step 3– Pry up the front panel along the top edge.

Step 4– Pry up the front panel along the edge closest to the home screen button.

Step 5– Before lifting the free sides of the front panel up from the rear case release it from the plastic retaining clips.

Step 6– Lift the front panel assembly away from the rear case.

Step 7– Using the attached black tab pull the display data cable upwards from the socket on the motherboard.

Step 8– Pull the digitiser ribbon cable straight out of its two sockets on the motherboard.

Step 9– Remove the front panel assembly.

Step 10– Using a plastic opening tool peel up the self-adhesive pull tab stuck to the display data cable.

Steps: How to Replace the DDC? (Cont.)



Step 11– Pull the tab up to unlock the display data cable connector from its socket on the LCD.

Step 12– Pull the display data cable out of its socket.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize participants into three teams - Team 1, 2 & 3; hand over an Android tablet to each team.
- Ask participants to practice steps to replace display data cable under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for updating as mentioned above till every team and therefore every participant is completely thorough with each and every step for each and every type of phone.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Skill Practice	Time	Resources
Replacing display data cable of a tablet	3 hours	<ul style="list-style-type: none"> • Tablets - Android

Do



- Ask them to get into teams for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

Summarise



- Refer to page 137-138 of the hand book.

4.2.7: Steps – How to Replace Front Cable?

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt replacing the display data cable.
- In this session we will learn about the steps to replace the front panel of the tablet.

Demonstrate



- Demonstrate to the students the steps to replace the front panel of the tablet.
- Share with the student these steps.
- Also give them adequate practice time.

Steps: How to Replace the Front Panel?



Step 1– Insert the metal spudger in the gap between the rubber outer ring on the front panel and the rear case near the USB connector. Pry the front panel up carefully.

Step 2– Repeat the above process along the long edge on the volume button side until there is a gap between the front panel and the rear case.

Step 3– Pry up the front panel along the top edge.

Step 4– Pry up the front panel along the edge closest to the home screen button.

Step 5– Before lifting the free sides of the front panel up from the rear case release it from the plastic retaining clips.

Step 6– Lift the front panel assembly away from the rear case.

Step 7– Using the attached black tab pull the display data cable upwards from the socket on the motherboard.

Steps: How to Replace the Front Panel? (Cont.)



Step 8– Pull the digitiser ribbon cable straight out of its two sockets on the motherboard.

Step 9– Remove the front panel assembly.

Step 10– Remove screws securing the LCD to the front panel.

Step 11– Lift up and remove the LCD assembly from the front panel.

Step 12– Front panel remains.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize participants into three teams - Team 1, 2 & 3; hand over an Android tablet to each team.
- Ask participants to practice steps to replace front panel under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for updating as mentioned above till every team and therefore every participant is completely thorough with each and every step for each and every type of phone.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Skill Practice	Time	Resources
Replacing front panel of a tablet	3 hours	<ul style="list-style-type: none"> • Tablets - Android

Do



- Ask them to get into teams for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

Summarise



- Refer to page 139-140 of the hand book.

4.2.8: Steps – How to Replace Head Phone Jack?

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt replacing the front panel.
- In this session we will learn about the steps to replace the head phone jack of the tablet.

Demonstrate



- Demonstrate to the students the steps to replace the head phone jack of the tablet.
- Share with the student these steps.
- Also give them adequate practice time.

Steps: How to Replace the Head Phone Jack?



Step 1– Insert the metal spudger in the gap between the rubber outer ring on the front panel and the rear case near the USB connector. Pry the front panel up carefully.

Step 2– Repeat the above process along the long edge on the volume button side until there is a gap between the front panel and the rear case.

Step 3– Pry up the front panel along the top edge.

Step 4– Pry up the front panel along the edge closest to the home screen button.

Step 5– Before lifting the free sides of the front panel up from the rear case release it from the plastic retaining clips.

Step 6– Lift the front panel assembly away from the rear case.

Step 7– Using the attached black tab pull the display data cable upwards from the socket on the motherboard.

Step 8– Pull the digitiser ribbon cable straight out of its two sockets on the motherboard.

Step 9– Remove the front panel assembly.

Step 10– Using a plastic opening tool flip up the retaining flap on the headphone jack ribbon cable ZIF socket and pull the headphone jack ribbon cable out of its socket.

Steps: How to Replace the Head Phone Jack? (Cont.)



Step 11– Remove screws securing the headphone jack to the rear case.

Step 12– Using a plastic opening tool remove the headphone jack away from the adhesive securing it to the rear case.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize participants into three teams - Team 1, 2 & 3; hand over an Android tablet to each team.
- Ask participants to practice steps to replace head phone jack under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for updating as mentioned above till every team and therefore every participant is completely thorough with each and every step for each and every type of phone.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Skill Practice	Time	Resources
Replacing head phone jack of a tablet	3 hours	<ul style="list-style-type: none"> • Tablets - Android

Do



- Ask them to get into teams for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

Summarise



- Refer to page 141-142 of the hand book.

4.2.9: Steps – How to Replace Home Button Board?

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt replacing the head phone jack.
- In this session we will learn about the steps to replace the home button board of the tablet.

Demonstrate



- Demonstrate to the students the steps to replace the home button board of the tablet.
- Share with the student these steps.
- Also give them adequate practice time.

Steps: How to Replace the Home Button Board?



Step 1– Insert the metal spudger in the gap between the rubber outer ring on the front panel and the rear case near the USB connector. Pry the front panel up carefully.

Step 2– Repeat the above process along the long edge on the volume button side until there is a gap between the front panel and the rear case.

Step 3– Pry up the front panel along the top edge.

Step 4– Pry up the front panel along the edge closest to the home screen button.

Step 5– Before lifting the free sides of the front panel up from the rear case release it from the plastic retaining clips.

Step 6– Lift the front panel assembly away from the rear case.

Step 7– Using the attached black tab pull the display data cable upwards from the socket on the motherboard.

Steps: How to Replace the Home Button? (Cont.)



Step 8– Pull the digitiser ribbon cable straight out of its two sockets on the motherboard.

Step 9– Remove the front panel assembly.

Steps 10– Using a plastic opening tool carefully pry the home button board off the adhesive securing it to the front panel.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize the participants into three teams - Team 1, 2 & 3; hand over an Android tablet to each team.
- Ask participants to practice steps to replace home button board under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for updating as mentioned above till every team and therefore every participant is completely thorough with each and every step for each and every type of phone.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Skill Practice	Time	Resources
Replacing home button board of a tablet	3 hours	<ul style="list-style-type: none"> • Tablets - Android

Do



- Ask them to get into teams for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

Summarise



- Refer to page 143-144 of the hand book.

4.2.10: Steps – How to Replace LCD?

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt replacing home button board.
- In this session we will learn about the steps to replace the LCD of the tablet.

Demonstrate



- Demonstrate to the students the steps to replace the LCD of the tablet.
- Share with the student these steps.
- Also give them adequate practice time.

Steps: How to Replace the LCD?



Step 1– Insert the metal spudger in the gap between the rubber outer ring on the front panel and the rear case near the USB connector. Pry the front panel up carefully.

Step 2– Repeat the above process along the long edge on the volume button side until there is a gap between the front panel and the rear case.

Step 3– Pry up the front panel along the top edge.

Step 4– Pry up the front panel along the edge closest to the home screen button.

Step 5– Before lifting the free sides of the front panel up from the rear case release it from the plastic retaining clips.

Step 6– Lift the front panel assembly away from the rear case.

Steps: How to Replace the LCD? (Cont.)



Step 7– Using the attached black tab pull the display data cable upwards from the socket on the motherboard.

Step 8– Pull the digitiser ribbon cable straight out of its two sockets on the motherboard.

Step 9– Remove the front panel assembly.

Step 10– Remove screws securing the LCD to the front panel.

Step 11– Lift up and remove the LCD assembly from the front panel.

Step 12– Using a plastic opening tool peel up the self-adhesive pull tab stuck to the display data cable.

Step 13– Pull the tab up to unlock the display data cable connector from its socket on the LCD. Pull the display data cable (parallel to the LCD) out of its socket.

Step 14– LCD remains.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize participants into three teams - Team 1, 2 & 3; hand over an Android tablet to each team.
- Ask participants to practice steps to replace LCD under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for updating as mentioned above till every team and therefore every participant is completely thorough with each and every step.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Skill Practice	Time	Resources
Replacing LCD of a tablet	3 hours	• Tablets – Android

Do

- Ask them to get into teams for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

Summarise

- Refer to page 144-145 of the hand book.

4.2.11: Steps – How to Replace Lower Antenna?

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt replacing LCD.
- In this session we will learn about the steps to replace the lower antenna of the tablet.

Demonstrate



- Demonstrate to the students the steps to replace the LCD of the tablet.
- Share with the student these steps.
- Also give them adequate practice time.

Steps: How to Replace the Lower Antenna?



Step 1– Insert the metal spudger in the gap between the rubber outer ring on the front panel and the rear case near the USB connector. Pry the front panel up carefully.

Step 2– Repeat the above process along the long edge on the volume button side until there is a gap between the front panel and the rear case.

Step 3– Pry up the front panel along the top edge.

Step 4– Pry up the front panel along the edge closest to the home screen button.

Step 5– Before lifting the free sides of the front panel up from the rear case release it from the plastic retaining clips.

Step 6– Lift the front panel assembly away from the rear case.

Step 7– Using the attached black tab pull the display data cable upwards from the socket on the motherboard.

Steps: How to Replace the Lower Antenna? (Cont.)



- Step 8**– Pull the digitiser ribbon cable straight out of its two sockets on the motherboard.
- Step 9**– Remove the front panel assembly.
- Step 10**–Using a plastic opening tool peel up the two pieces of copper tape covering the USB connector board near the battery and the motherboard.
- Step 11**–Remove screws securing the USB connector board to the rear case.
- Step 12**–Pry the upper end of the USB connector board upwards to disconnect it from its socket.
- Step 13**–Pull the USB connector board away from the bottom edge of the rear case and lift, do not remove it completely.
- Step 14**–Pull the vibrator motor from its socket on the USB connector board, and completely remove the USB connector board. (In case the vibrator motor is soldered on to the USB Board, the motor is to be removed along with the board.)
- Step 15**– Remove (if present) the two pieces of tape boxed in red.
- Step 16**– Using a plastic opening tool pry the lower antenna connector up from its socket.
- Step 17**– De-route the antenna cable, carefully pulling it out from under its retaining clip near the top right corner of the battery.
- Step 18**– Pull the lower antenna cable out of the plastic retaining clip.
- Step 19**– Using a plastic opening tool peel the lower antenna off the adhesive securing it to the rear case.
- Step 20**– Peel the foil tape attached to the lower antenna and remove the antenna completely.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize participants into three teams - Team 1, 2 & 3; hand over an Android tablet to each team.
- Ask participants to practice steps to replace lower antenna under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for updating as mentioned above till every team and therefore every participant is completely thorough with each and every step.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Activity (Cont.)



Skill Practice	Time	Resources
Replacing lower antenna of a tablet	3 hours	<ul style="list-style-type: none"> Tablets - Android

Do



- Ask them to get into teams for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

Summarise



- Refer to page 146-148 of the hand book.

4.2.12: Steps – How to Replace a Microphone?

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt replace the lower antenna.
- In this session we will learn about the steps to replace a microphone.

Demonstrate



- Demonstrate to the students the steps to replace the microphone of the tablet.
- Share with the student these steps.
- Also give them adequate practice time.

Steps: How to Replace Microphone?



Step 1– Insert the metal spudger in the gap between the rubber outer ring on the front panel and the rear case near the USB connector. Pry the front panel up carefully.

Step 2– Repeat the above process along the long edge on the volume button side until there is a gap between the front panel and the rear case.

Step 3– Pry up the front panel along the top edge.

Step 4– Pry up the front panel along the edge closest to the home screen button.

Step 5– Before lifting the free sides of the front panel up from the rear case release it from the plastic retaining clips.

Step 6– Lift the front panel assembly away from the rear case.

Step 7– Using the attached black tab pull the display data cable upwards from the socket on the motherboard.

Step 8– Pull the digitiser ribbon cable straight out of its two sockets on the motherboard.

Steps: How to Replace Microphone? (Cont.)



Step 9– Remove the front panel assembly.

Step 10– Using a plastic opening tool flip up the microphone ribbon cable retaining flap. Use a pair of tweezers to pull the microphone cable out of its socket on the motherboard.

Step 11– Using your tweezers remove the black rubber fastener between the microphone and rear case.

Step 12– Using a plastic opening tool pry the microphone away from the rear case right above the camera.

Step 13– Remove the microphone.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize the participants into three teams - Team 1, 2 & 3; hand over an Android tablet to each team.
- Ask participants to practice steps to replace microphone under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for updating as mentioned above till every team and therefore every participant is completely thorough with each and every step.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Skill Practice	Time	Resources
Replacing microphone of a tablet	3 hours	<ul style="list-style-type: none"> • Tablets - Android

Do

- Ask them to get into teams for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

Summarise

- Refer to page 146-148 of the hand book.

4.2.13: Steps – How to Replace Upper Antenna?

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt replace the microphone.
- In this session we will learn about the steps to replace the upper antenna.

Demonstrate



- Demonstrate to the students the steps to replace the upper antenna of the tablet.
- Share with the student these steps.
- Also give them adequate practice time.

Steps: How to Replace Upper Antenna?



Step 1– Insert the metal spudger in the gap between the rubber outer ring on the front panel and the rear case near the USB connector. Pry the front panel up carefully.

Step 2– Repeat the above process along the long edge on the volume button side until there is a gap between the front panel and the rear case.

Step 3– Pry up the front panel along the top edge.

Step 4– Pry up the front panel along the edge closest to the home screen button.

Step 5– Before lifting the free sides of the front panel up from the rear case release it from the plastic retaining clips.

Step 6– Lift the front panel assembly away from the rear case.

Step 7– Using the attached black tab pull the display data cable upwards from the socket on the motherboard.

Step 8– Pull the digitiser ribbon cable straight out of its two sockets on the motherboard.

Step 9– Remove the front panel assembly.

Step 10– Use the edge of a plastic opening tool to flip up the retaining flap on the headphone jack ribbon cable ZIF socket. Pull the headphone jack ribbon cable out of its socket and bend the cable away from the large piece of EMI foil stuck to the top speaker.

Steps: How to Replace Upper Antenna? (Cont.)



Step 11–Using a plastic opening tool pry the upper antenna connector up from its socket.

Step 12–Using a plastic opening tool peel the upper antenna off the adhesive securing it to the top speaker.

Step 13– Carefully peel the foil tape attached to the upper antenna off the top speaker and remove the upper antenna.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize the participants into three teams - Team 1, 2 & 3; hand over an Android tablet to each team.
- Ask participants to practice steps to replace upper antenna under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for updating as mentioned above till every team and therefore every participant is completely thorough with each and every step.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Skill Practice	Time	Resources
Replacing upper antenna of a tablet	3 hours	<ul style="list-style-type: none"> • Tablets - Android

Do



- Ask them to get into teams for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

Summarise



- Refer to page 149-150 of the hand book.

4.2.14: Steps – How to Replace USB Connector Board?

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt how to replace the upper antenna.
- In this session we will learn about the steps to replace.

Demonstrate



- Demonstrate to the students the steps to replace the USB connector board of the tablet.
- Share with the student these steps.
- Also give them adequate practice time.

Steps: How to Replace Upper Antenna?



Step 1– Insert the metal spudger in the gap between the rubber outer ring on the front panel and the rear case near the USB connector. Pry the front panel up carefully.

Step 2– Repeat the above process along the long edge on the volume button side until there is a gap between the front panel and the rear case.

Step 3– Pry up the front panel along the top edge.

Step 4– Pry up the front panel along the edge closest to the home screen button.

Step 5– Before lifting the free side of the front panel up from the rear case release it from the plastic retaining clips.

Step 6– Lift the front panel assembly away from the rear case.

Step 7– Using the attached black tab pull the display data cable upwards from the socket on the motherboard.

Step 8– Pull the digitiser ribbon cable straight out of its two sockets on the motherboard.

Step 9– Remove the front panel assembly.

Step 10–Using a plastic opening tool peel up the two pieces of copper tape covering the USB connector board near the battery and the motherboard.

Step 11–Remove the four 3.2 mm screws securing the USB connector board to the rear case.

Steps: How to Replace Upper Antenna? (Cont.)



Step 12—Pry the upper end of the USB connector board upwards to disconnect it from its socket.

Step 13—Pull the USB connector board away from the bottom edge of the rear case and lift, do not remove it completely.

Step 14—Pull the vibrator motor from its socket on the USB connector board, and completely remove the USB connector board.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize the participants into three teams - Team 1, 2 & 3; hand over an Android tablet to each team.
- Ask participants to practice steps to replace USB connector board under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for updating as mentioned above till every team and therefore every participant is completely thorough with each and every step.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Skill Practice	Time	Resources
Replacing USB connector board of a tablet	3 hours	<ul style="list-style-type: none"> • Tablets - Android

Do



- Ask them to get into teams for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

Summarise



- Refer to page 153 of the hand book.

4.2.15: Steps – How to Replace Vibrator Motor?

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt how to replace USB connector board.
- In this session we will learn about the steps to replace vibrator motor.

Demonstrate



- Demonstrate to the students the steps to replace the vibrator motor of the tablet.
- Share with the student these steps.
- Also give them adequate practice time.

Steps: How to Replace Vibrator Motor?



Step 1– Insert the metal spudger in the gap between the rubber outer ring on the front panel and the rear case near the USB connector. Pry the front panel up carefully.

Step 2– Repeat the above process along the long edge on the volume button side until there is a gap between the front panel and the rear case.

Step 3– Pry up the front panel along the top edge.

Step 4– Pry up the front panel along the edge closest to the home screen button.

Step 5– Before lifting the free sides of the front panel up from the rear case release it from the plastic retaining clips.

Step 6– Lift the front panel assembly away from the rear case.

Step 7– Using the attached black tab pull the display data cable upwards from the socket on the motherboard.

Step 8– Pull the digitiser ribbon cable straight out of its two sockets on the motherboard.

Steps: How to Replace Vibrator Motor? (Cont.)



Step 9– Remove the front panel assembly.

Step 10–Using a pair of tweezers carefully pull the vibrator motor Out of its recess.

Step 11–Pull the vibrator motor connector away from its socket.

Step 12– Safely remove the vibrator motor from the rear case.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize the participants into three teams - Team 1, 2 & 3; hand over an Android tablet to each team.
- Ask participants to practice steps to replace vibrator motor under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for updating as mentioned above till every team and therefore every participant is completely thorough with each and every step.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Skill Practice	Time	Resources
Replacing vibrator motor of a tablet	3 hours	<ul style="list-style-type: none"> • Tablets - Android

Do



- Ask them to get into teams for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

Summarise



- Refer to page 154 of the hand book.

4.2.16: Steps – How to Replace Motherboard?

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt how to replace vibrator motor.
- In this session we will learn about the steps to replace motherboard board.

Demonstrate



- Demonstrate to the students the steps to replace the motherboard board of the tablet.
- Share with the student these steps.
- Also give them adequate practice time.

Steps: How to Replace Motherboard?



Step 1– Insert the metal spudger in the gap between the rubber outer ring on the front panel and the rear case near the USB connector. Pry the front panel up carefully.

Step 2– Repeat the above process along the long edge on the volume button side until there is a gap between the front panel and the rear case.

Step 3– Pry up the front panel along the top edge.

Step 4– Pry up the front panel along the edge closest to the home screen button.

Step 5– Before lifting the free side of the front panel up from the rear case release it from the plastic retaining clips.

Step 6– Lift the front panel assembly away from the rear case.

Step 7– Using the attached black tab pull the display data cable upwards from the socket on the motherboard.

Step 8– Use your fingernail to carefully flip up the retaining flaps on the two digitiser ribbon cable ZIF sockets. Now pull the digitiser ribbon cable straight out of its two sockets on the motherboard.

Steps: How to Replace Motherboard? (Cont.)



Step 9– Remove the front panel assembly.

Step 10–Using a plastic opening tool peel up the two pieces of copper tape covering the USB connector board near the battery and the motherboard.

Step 11–Remove the screws securing the USB connector board to the rear case.

Step 12–Pry the upper end of the USB connector board upwards to disconnect it from its socket.

Step 13–Pull the USB connector board away from the bottom edge of the rear case and lift, do not remove it completely.

Step 14–Pull the vibrator motor from its socket on the USB connector board, and completely remove the USB connector board.

Step 15– Remove (if present) the two pieces of tape boxed in red.

Step 16– Using a plastic opening tool flip up the retaining flap on the volume control/power button ribbon cable socket and pull out the cable.

Step 17– Using a plastic opening tool lift the camera connector up & out of its socket, bend camera cable away from the motherboard.

Step 18– Flip up the retaining flap on microphone cable socket and pull out the microphone cable.

Step 19– Using your plastic opening tool pry the upper antenna connector up from its socket.

Step 20– Pry up the retaining flap on the headphone jack ribbon cable socket and pull the headphone jack ribbon cable out.

Step 21– Pry (from beneath the wires) the speaker cable connector up from its socket on the motherboard.

Step 22– Using a plastic opening tool flip up the retaining flap on the digitiser board ribbon cable socket and pull it out.

Step 23– Pry up the lower antenna cable connector from its socket.

Step 24– De-route the antenna cable, carefully pulling it out from under its retaining clip near the top right corner of the battery.

Step 25– Remove screws securing battery, motherboard to the rear case.

Step 26– Using a plastic opening tool pry the battery up from the tape securing it to the rear case.

Step 27– Lift the motherboard assembly out of the rear case, carefully avoiding any cables.

Step 28– Remove the battery by pulling it away from the motherboard to disconnect its cable.

Step 29– Remove and replace the motherboard.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize the participants into three teams - Team 1, 2 & 3; hand over an Android tablet to each team.
- Ask participants to practice steps to replace motherboard under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for updating as mentioned above till every team and therefore every participant is completely thorough with each and every step.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Skill Practice	Time	Resources
Replacing motherboard of a tablet	3 hours	<ul style="list-style-type: none"> • Tablets - Android

Do



- Ask them to get into teams for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

Summarise



- Refer to page 155-156 of the hand book.

4.3: Basic Trouble Shooting

Unit Objectives



At the end of this unit, students will be able to:

1. Recall and demonstrate steps to troubleshoot common software related issues in tablets
2. Recall and demonstrate steps to update the software of popular tablets and create a back-up of data from tablet to a computer

Notes for Facilitation



- You could ask the students what they know about software related trouble shooting in mobiles.
- Give students some time to think about the ways to troubleshoot software problems in tablets.
- Give students some time to think about the same.
- Set the context and enquire about the various ways to troubleshoot software related problems in tablets.

4.3.1: Common Software Problems and Solutions

Ask



- Ask the students what are the common software problems in a tablet.
- Ask them to work in their respective teams and identify how to fix them.

Say



- Having understood how to replace different parts and components of a tablet.
- We will now understand how to fix common software related problem in a tablet.

Do



- Share with the help of the hand book how to solve common software related problem in a mobile phone.
- Share with the participant – screen issues, power & battery related issues, computer not recognizing tablet, etc.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss the various steps in detail.
- Refer to the relevant sections on page 157 of the participant's hand book.
- Conduct a quick quiz in order to test the participants understanding and move on to the next section.

Summarise



- Refer to page 157 of the hand book.

4.3.2: Steps to Update a Tablet

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about common software problems and solution.
- In this session we will learn about the steps to update a tablet.

Demonstrate



- Demonstrate to the students the steps to update a tablet.
- Share with the student these steps.
- Also give them adequate practice time.

Steps: How to Update a Tablet?



It is a good practice to back up your data such as contacts and photos before a tablet upgrade.

Android

Step 1– Navigate to the Setting menu of your tablet.

Step 2– Scroll down the Settings menu and click on 'About Device'. If you have a tabbed settings menu then this will appear in the 'general' section.

Step 3– Click the 'Software Update' or a similar option.

Step 4– Your tablet will now search for an available update. If you are taken to another menu, select the 'Software update check' button or something similar. If an update is available for your device then you will be asked whether you wish to install it. If you select yes then the system will download and install the new software and reboot the tablet.

Steps: How to Update a Tablet? (Cont.)



iPad

From the tab directly

Step 1– Plug your iPad in to power and connect to the Internet with Wi-Fi.

Step 2– Tap Settings > General > Software Update.

Step 3– Tap, download and Install.

Step 4– To update now, tap Install.

Step 5– If prompted, enter your pass code.

Through iTunes

Step 1– Install the latest version of iTunes on your computer.

Step 2– Connect the iPad to your computer.

Step 3– Open iTunes and select your iPad.

Step 4– Click Summary, then click ‘Check for Update’.

Step 5– Click, download and Update.

Summarise



- Refer to page 158 of the hand book.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize the participants into three teams - Team 1, 2 & 3; share with them an Android and an iOS tablet each. Now ask them to practice steps to update the tablet under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for updating as mentioned above till every team and therefore every participant is completely thorough with each and every step for each and every type of tablet.

Activity (Cont.)



- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Skill Practice	Time	Resources
Tablet update steps	3 hours	<ul style="list-style-type: none">• Android tablet
		<ul style="list-style-type: none">• iPad

Do



- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

4.3.3: Steps Tablet Data Transfer

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about steps to update a tablet.
- In this session we will learn about the steps to transfer tablet data.

Demonstrate



- Demonstrate to the students the steps to transfer tablet data.
- Share with the student these steps.
- Also give them adequate practice time.

Steps: How to Transfer Tablet Data?



Using USB Cable

Step 1– Connect the tablet to your computer using the USB cable that comes with the tablet.

Step 2– Find the icon of a removable drive (your tablet) on your computer under My Computer or Finder if a pop-up window does not open.

Step 3– Drag and drop files that you want to copy from your tablet to the computer (or vice-versa).

Step 4– When you are finished, close the window and disconnect the USB cable.

Using Bluetooth

Step 1– Make sure Bluetooth is turned on in both the tablet and computer. You can activate it in your tablet by looking under Settings or Controls. If you have a Mac, you can make sure your Bluetooth is on by clicking on the Bluetooth symbol on the right side of the upper toolbar. The symbol should be to the left of the Date and Time and should look like a white B with a blue background. On Windows it should be under the Control Panel.

Step 2– Make sure that the tablet is not too far away from the computer.

Step 3– Find and select the file (tablet) that you want to transfer.

Step 4– Select Copy or Send in the menu.

Step 5– Choose the Bluetooth option.

Step 6– Select the "Look for Devices" or a similar option in the Bluetooth menu that pops up.

Step 7– Select your device (computer).

Step 8– Request would be sent to the device to accept the file.

Step 9– Accept request and data will be sent from tablet to computer and vice-versa.

Steps: How to Transfer Tablet Data? (Cont.)



Using iTunes

Step 1– Connect iPad to computer using a USB cable. If iTunes doesn't open automatically, open it from the Start Menu or your Applications folder.

Step 2– Select your iPad from the list under Devices button (upper right corner of iTunes window).

Step 3– Choose the media (Apps, Music, Movies, etc.) that you want to sync. Click on each tab that you want to add to your device and check the “Sync” checkbox. You can choose to sync all media of that type, or just specific files.

Summarise



- Refer to pages 159-160 of the hand book.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize the participants into three teams - Team 1, 2 & 3; share with them an Android and an iOS tablet each. Now ask them to practice steps to transfer tablet data under the supervision of a professional instructor thoroughly.
- There after let the teams interchange phone types for updating as mentioned above till every team and therefore every participant is completely thorough with each and every step for each and every type of tablet.
- Make sure that all the steps are followed keeping in mind the precautions related to handling as well as health and safety of participants.

Skill Practice	Time	Resources
Tablet data transfer steps	3 hours	<ul style="list-style-type: none"> • Android tablet • iPad

Do



- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

4.4: Safety Guidelines

Unit Objectives



At the end of this unit, students will be able to:

- Understand and follow common safety precautions to be undertaken while repairing a handset

Notes for Facilitation



- You could ask the students what they know about safety guidelines while repairing mobiles.
- Give students some time to think about the various safety guidelines.
- Set the context and enquire about the various safety guidelines required to service mobile phones.

4.4.1: Safety Guidelines

Ask



- Ask the students what are the common safety guidelines while troubleshooting a tablet.
- Ask them to work in their respective teams and identify them.

Say



- Having understood how to transfer tablet data using various ways.
- We will now understand and demonstrate various safety related guidelines in a tablet.

Do



- Share with the help of the hand book the various safety related guidelines to be followed while repairing a tablet.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss the various steps in detail.
- Refer to the relevant sections on page 161 of the participant's hand book.
- Conduct a quick quiz in order to test the participants understanding and move on to the next section.

Summarise



- Refer to page 161 of the hand book.



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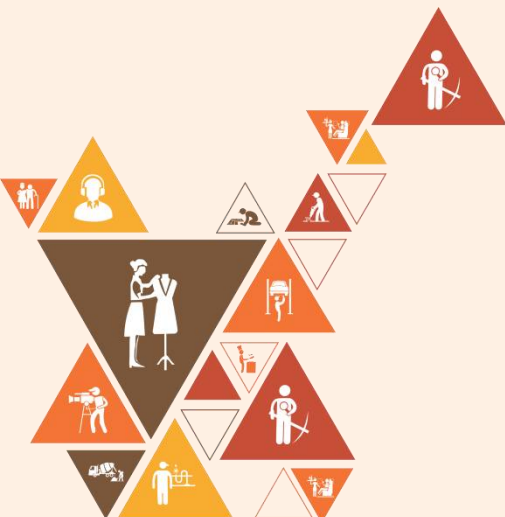
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5. Reporting & Documentation

Unit 5.1 – Report and Document daily activities



Key Learning Outcomes

Key Learning Outcomes



At the end of this module, you will be able to:

1. Identify and illustrate the documents that are used to record repair details

5.1: Report & Document Daily Activities

Unit Objectives



At the end of this unit, students will be able to:

1. Identify and fill up a job-card, a daily activity report, and a customer feedback form

Notes for Facilitation



- You could ask the students what they know about reporting & documentation.
- Also ask students about the various reporting documents required by a handset repair engineer
- Give students some time to think about the various reports.
- Set the context and enquire about the reports to be filled by a handset repair engineer.

5.1.1: Repair Job Card

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about the various tablets, replacement of its various parts, common problems and safety guidelines.
- In this session we will learn about repair job card.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss with the students that it is important to completely fill the job card and take a sign-off from the customer.
- Discuss with the students the various elements of the job card – customer details, attention tag, product details, customer approvals, etc.
- Refer to the relevant sections on page 170 of the participant’s hand book.
- Conduct a quick quiz in order to test the participants understanding and move on to the next section.

Summarise



- Refer to page 170 of the hand book.

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize the participants into three teams - Team 1, 2 & 3; share with each team and individual a daily job card. Now ask participants to practice steps to fill the job card under the supervision of a professional instructor thoroughly.
- There after let the teams discuss the repair job card for filling as mentioned above till every team and therefore every participant is completely thorough with each and every step for the repair job card.
- Make sure that all the steps are followed keeping in mind the precautions related to the repair job card.

Skill Practice	Time	Resources
Filling repair job card	3 hours	• Repair job card

Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

5.1.2: Daily Activity Report

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about the repair job card.
- In this session we will learn about daily activity report.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss with the students that it is important to duly fill the daily activity report.
- Discuss with the students the various elements of the daily activity report – customer details, symptom, cause – parts replaced, costs incurred, completion time, etc.
- Refer to the relevant sections on page 171 of the participant's hand book.
- Conduct a quick quiz in order to test the participants understanding and move on to the next section.

Summarise



- Refer to page 171 of the hand book.

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize the participants into three teams - Team 1, 2 & 3; share with each team and individual a daily activity report format. Now ask participants to practice steps to fill the daily activity report format under the supervision of a professional instructor thoroughly.
- There after let the teams discuss the daily activity report format for filling as mentioned above till every team and therefore every participant is completely thorough with each and every step for the daily activity report format.
- Make sure that all the steps are followed keeping in mind the precautions related to the daily activity report format.

Skill Practice	Time	Resources
daily activity report format	3.5 hours	• daily activity report format

Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

5.1.3: Customer Feedback Form

Do



- Welcome the participants. Review the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about the daily activity report.
- In this session we will learn about the customer feedback form.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss with the students that it is important to duly fill the daily activity report.
- Discuss with the students the various elements of the daily activity report – customer details, customer feedback, completion time, etc.
- Refer to the relevant sections on page 171 of the participant’s hand book.
- Conduct a quick quiz in order to test the participants understanding and move on to the next section.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize the participants into three teams - Team 1, 2 & 3; share with each team and individual a customer feedback form. Now ask participants to practice steps to fill a customer feedback form under the supervision of a professional instructor thoroughly.

Activity (Cont.)



- There after let the teams discuss the a customer feedback form for filling as mentioned above till every team and therefore every participant is completely thorough with each and every step for the a customer feedback form.
- Make sure that all the steps are followed keeping in mind the precautions related to the customer feedback form.

Skill Practice	Time	Resources
A customer feedback form	3.5 hours	• Customer feedback form

Do



- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.



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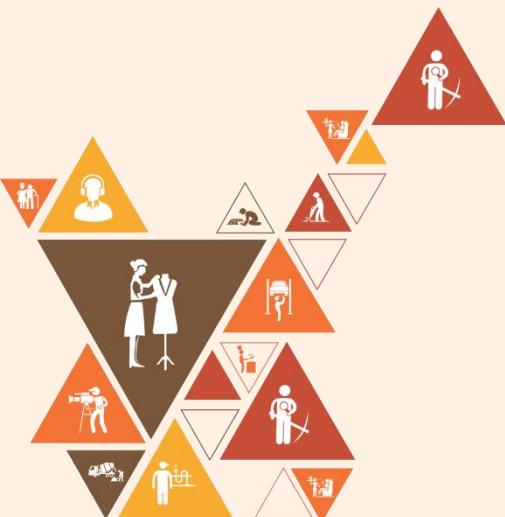
6. Soft Skills

Unit 6.1 – Grooming

Unit 6.2 – Communication Skills

Unit 6.3 – Time Management

Unit 6.4 – Problem Solving



Key Learning Outcomes

Key Learning Outcomes



At the end of this module, you will be able to:

1. Identify follow standard grooming guidelines
2. Identify and demonstrate effective communicate skills in your personal and professional life
3. Identify and eliminate time wasters at work so as to appropriately manage your work schedule
4. Create experience to improve customer satisfaction

6.1: Grooming

Unit Objectives



At the end of this unit, students will be able to:

1. Understand and display grooming as a handset repair engineer
2. Understand the importance of grooming
3. Follow professional grooming guidelines for a handset repair engineer

Notes for Facilitation



- You could ask the students what they know about grooming.
- Also ask students about the professional grooming guidelines for a handset repair engineer.
- Give students some time to think about the various points.
- Set the context and enquire about the importance of grooming and grooming guidelines for a handset repair engineer.

6.1.1: What is Grooming?

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about the various reports and documents.
- In this session we will learn about grooming, its importance and guidelines.

Notes for Facilitation



- To understand what is grooming. We will discuss the basic grooming etiquette that is required to accomplish our jobs effectively.
- Discuss with grooming with the students in detail.
- Discuss with the students the various elements of the grooming – looks, personal hygiene, dress / uniform, etc.
- Refer to the relevant sections on page 177 of the participant's hand book.

Summarise



- Refer to page 177 of the hand book.

6.1.2: Importance of Grooming?

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about grooming.
- In this session we will learn about the importance of grooming.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- The objectives of this module are to describe the importance of grooming.
- Share with the students, importance of grooming by discussing – professionalism, level of sophistication, intelligence (perceived), credibility or reliability (perceived), respect.
- Refer to the relevant sections on page 178 of the participant's hand book.

Summarise



- Refer to page 178 of the hand book.

6.1.3: Grooming Guidelines?

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about the importance of grooming.
- In this session we will learn about the grooming guidelines.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- The objective of this module is to share grooming guidelines with the students.
- Discuss with the students in detail, following grooming guidelines as specified by your organization:
 - Neatly trimmed hair and properly combed.
 - Daily shave, bath and brush your teeth.
 - Wear neat, clean and well ironed clothes or uniform.
 - Polish your shoes regularly and wear fresh pair of socks daily.
 - Always wear your ESD-safe clothing.
- Refer to the relevant sections on page 178 of the participant's hand book.

Summarise



- Refer to page 178 of the hand book.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Organize the participants into pairs; each student will audit his partner – so as to check his adherence to grooming guidelines. For each correct point give 1 mark or else 0.
- Collate the score on a sheet for the entire class
- There after let the pairs discuss the scores, till every participant is completely thorough with each and every step aspect of the grooming guideline.
- Make sure that all the steps are followed keeping in mind the precautions related to the handset repair engineer.

Skill Practice	Time	Resources
Grooming guidelines	3 hours	• Repair job card

Do



- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.
- Ask the students to complete the exercise in their participant handbook.

6.2: Communication Skills

Unit Objectives



At the end of this unit, students will be able to:

1. Identify and understand the need for effective communication as a handset repair engineer
2. Understand and demonstrate effective process of communication at your work place
3. Display different types of communication
4. Demonstrate effective listening skills in your day-to-day life

Notes for Facilitation



- You could ask the students what they know about communication skills.
- Also ask students about the need for communications as applicable to a handset repair engineer.
- Give students some time to think about the various points.
- Set the context and enquire about the process and types of communication as well as listening skills.

6.2.1: Need for Effective Communication at Work Place

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about grooming, its importance and grooming guidelines.
- In this session we will learn about the need for effective communication at work place.

Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Ask for three volunteers; show one of the participants (say participant A) the figure to be recreated. Participant A now has to stand with his back facing the other two. The other two participants will try to recreate the figure from instructions that Participant A will provide. However, Participant A cannot repeat the instructions nor can the participants ask any questions. Draw a figure by following the instructions given in the class.



Activity (Cont.)



- Perform the round 2 for the activity with a different set of three volunteers. The same procedure has to be followed. However, this time Participant A can repeat the instructions and the other two participants can also ask questions. Draw a figure by following the instructions given in the class.
- Both the pictures should be compared with what has been drawn by participants, in activity 1 & 2.
- Ask the importance of communication capture responses on the flipchart.

Skill Practice	Time	Resources
Grooming guidelines	30 minutes hours	<ul style="list-style-type: none"> • Repair job card

Do



- Ask them to follow the instructions properly.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points.
- Ask the students to complete the exercise in their participant handbook.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- To understand what is communication. In addition to this we will also discuss the need for communication and how it helps in the task of a handset repair engineer.
- Discuss with the students in detail.
- Refer to the relevant sections on page 179 of the participant's hand book.

Summarise



- Refer to page 179 of the hand book.

6.2.2: Process of Communication

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about the need for effective communication at work place.
- In this session we will learn about the process of effective communication at work place.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- To understand the process of communication.
- Discuss with the students in detail – three important steps of communication.
- In addition to this we will also discuss where all we use communication as a key skill – both personally as well as professionally.
- Refer to the relevant sections on page 180 of the participant's hand book.

Summarise



- Refer to page 180 of the hand book.

6.2.3: Types of Communication

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about the process of effective communication at work place.
- In this session we will learn about the types of effective communication at work place.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- To understand the types of communication.
- Discuss with the students in detail – verbal and non-verbal communication (including body language).
- In addition to this we will also discuss written communication.
- Refer to the relevant sections on page 181-182 of the participant's hand book.

Summarise



- Refer to page 181-182 of the hand book.

6.2.4: Effective Listening Skills

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about the types of effective communication at work place.
- In this session we will learn about effective listening skills at work place.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- Discuss with the students in detail – effective listening skills as an important ingredient of communication.
- Refer to the relevant sections on page 182 of the participant's hand book.

Summarise



- Refer to page 182 of the hand book.

6.3: Time Management

Unit Objectives



At the end of this unit, students will be able to:

1. Identify and understand effective time management and its benefit
2. Identify time wasters as stumbling blocks
3. Improve your time management skills by using building blocks

Notes for Facilitation



- You could ask the students what they know about effective time management.
- Also ask students about the need for effective time management as applicable to a handset repair engineer.
- Give students some time to think about the various points.
- Set the context and enquire about time management and its benefits, time wasters and time management building blocks.

6.3.1: Time Management and its Benefits

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about effective communication at work place.
- In this session we will learn about time management and its benefits.

Notes for Facilitation



- Facilitate the discussion and avoid arguments
- To understand what is time management and its benefits.
- Discuss with the students in detail time management benefits like – improving productivity, smoothening progress of your goals, reducing minimizing your stress, achieving work-life balance.
- Refer to the relevant sections on page 183 of the participant's hand book.

Summarise



- Refer to page 183 of the hand book.

6.3.2: Time Wasters as Stumbling Blocks

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about time management and its benefits.
- In this session we will learn about time wasters as stumbling blocks.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- To understand what are time wasters as stumbling blocks.
- Discuss with the students in detail time wasters like – Leaving unfinished tasks, breaks, socializing, communication gap, visitors and procrastination, etc.
- Refer to the relevant sections on page 184 of the participant's hand book.

Summarise



- Refer to page 184 of the hand book.

6.3.3: Time Management Building Blocks

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about time wasters as stumbling blocks.
- In this session we will learn about time management building blocks.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- To understand what are time management building blocks.
- Discuss with the students in detail time management building blocks such as – Goals, task list, time management tool, and scheduled planning session.
- Refer to the relevant sections on page 184 of the participant's hand book.

Summarise



- Refer to page 184 of the hand book.

6.4: Problem Solving

Unit Objectives



At the end of this unit, students will be able to:

1. Understand and demonstrate effective problem solving skills
2. Identify, understand and demonstrate benefits of problem solving
3. Demonstrate formula for effective problem solving

Notes for Facilitation



- You could ask the students what they know about problem solving.
- Also ask students about types of people, benefits of problem solving and formula for problem solving.
- Give students some time to think about the various points.
- Set the context and enquire about problem solving skills for a handset repair engineer.

6.4.1: Types of People

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about the various time management.
- In this session we will learn about types of people with respect to problem solving skills.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- To understand the types of people – critical thinkers and idea shoppers.
- Discuss with types of people with the students in detail.
- Refer to the relevant sections on page 177 of the participant's hand book.

Summarise



- Refer to page 185 of the hand book.

6.4.2: Benefits of Problem Solving

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about the types of people.
- In this session we will learn about the benefits of problem solving skills.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- To understand the benefits of problem solving – increased self-reliance, creativity, decreased dependency, etc.
- Discuss with types of people with the students in detail.
- Refer to the relevant sections on page 185 of the participant's hand book.

Summarise



- Refer to page 185 of the hand book.

6.4.3: Formula for Problem Solving

Do



- Welcome the participants. Revise the learning of the previous session and clarify doubts if any.

Say



- In the previous session we learnt about the benefits of problem solving skills.
- In this session we will learn about the formula for problem solving.

Notes for Facilitation



- Facilitate the discussion and avoid arguments.
- To understand the formula for problem solving – define the problem, collect the facts, generate solutions, pick the best solution, implement the solution, evaluate the solution
- Discuss with problem solving formula with the students in detail.
- Refer to the relevant sections on page 186-187 of the participant's hand book.

Summarise



- Refer to page 186-187 of the hand book.



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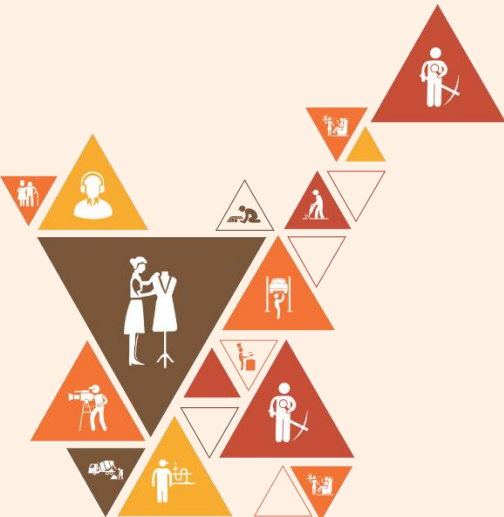
Transforming the skill landscape



7. Annexures

Annexure I: Training Delivery Plan

Annexure II: Assessment Criteria



Annexure I

Training Delivery Plan

Training Delivery Plan			
Program Name:	Certificate Course in Handset Repair Engineer (Level II)		
Qualification Pack Name & Ref. ID	Handset Repair Engineer (Level II) - TEL/Q2201		
Version No.	1.0	Version Update Date	31/08/2016
Pre-requisites to Training (if any)	10+2 / ITI / Diploma / Certification in repairing services Bachelor in Technology (Electronics, Computer Science, IT and related field)		
Training Outcomes	<p>By the end of this program, the participants will be able to:</p> <ul style="list-style-type: none"> Assemble tools, spares and software: Identification of tools, its uses and procedure for fault diagnosis, testing and resolving. Aggregate potential knowledge and skill to vouchsafe the importance of health and safety of self and equipment: Safeguard compliance of safety regulation, personal protection and clean environment for equipment. Conduct test for repairs, effectiveness and performance of close activity: Test equipment for proper calibration, rectification and handover to correct owner Comprehend and initiate the importance of reporting and recording: Ensure inventors, record sheet, company documents are documented for future references Collect handsets/tablets: Ensure admittance of faulty handsets, prioritize repair activities and timeline 		

Sl. No	Module Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration
1	Introduction	Icebreaker	<ul style="list-style-type: none"> Introduce each other Build rapport with fellow students and the facilitator 	N.A.	Group Activity: Passing the Parcel	<ul style="list-style-type: none"> Available objects such as a book, pen, duster etc. 	1 hours
		About telecom industry in India	<ul style="list-style-type: none"> Know about the growth & opportunities in the Indian telecom industry Know about some popular mobile phone vendors in the country 	NA	Facilitator-led-discussion Videos	Projector/Notes/Slides, Video	4.5 hrs

			<ul style="list-style-type: none"> Know and understand the role of a handset repair engineer 				
		About Cell-phones	<ul style="list-style-type: none"> Learn about the changes in technology of a cell phone over the years Understand how a mobile phone work over a network Know and understand what goes on inside the handset during mobile communication Learn about the common features and uses of mobile phone Learn about the popular mobile phone platforms 	N.A.	Facilitator-led-discussion Videos	Projector/Notes/Slides, Video	4.5 hrs
2	Handset Repair Hardware	Basic electronics of a mobile phone	<ul style="list-style-type: none"> Know and differentiate between the various electronic components that are used in mobile handsets 	TEL/N2203 KB1,KB2,KB3,KB4	Facilitator-led-discussion videos, team presentations	<ul style="list-style-type: none"> Laptop, white board, marker, projector. Basic electronic components – IC, resistors, capacitors etc. IC's, transistors, capacitors, circuit boards, miniature cams, microphone and speakers etc. 	5 hrs
		Hardware repair tools	<ul style="list-style-type: none"> Use common tools employed to repair mobile 	TEL/N2203 PC1,PC2,PC3,PC4,PC5, KB6,KB7	Facilitator-led-discussion	<ul style="list-style-type: none"> Soldering Iron, Solder Wire PCB Cleaner, Blade, point 	5 hrs (Theory) 20 hrs

					videos, team presentations	and nose Cutter <ul style="list-style-type: none"> Precision screwdriver, Tweezers, Brush, Multi-meter, Battery Booster, Ultrasonic Cleaner etc. 	(practical)
		Basic trouble shooting	<ul style="list-style-type: none"> Disassemble a mobile phone using the common hardware repair tools Identify and fix common handset problems 	TEL/N2203 PC1,PC2,PC3,PC4,PC5,PC6,PC7 KB5,KB8,KB9	Facilitator-led-discussion videos, team presentations	<ul style="list-style-type: none"> GSM/CDMA Microphone, speaker, keypad touch screen etc. 	15 hrs (Theory) 35 hrs (practical)
		Safety guidelines	<ul style="list-style-type: none"> Understand and follow standard safety precautions while repairing a handset Understand and follow radiation compliance standards for mobile phones in India 	TEL/N2203 PC1,PC2,PC3,PC4 KB7	Facilitator-led-discussion videos, team presentations	<ul style="list-style-type: none"> GSM/CDMA Microphone, speaker, keypad touch screen etc. 	5 hrs (Theory)
3	Handset repair (software)	Resetting a phone	<ul style="list-style-type: none"> Recall and demonstrate steps to reset a phone to its original factory settings Recall and demonstrate steps to download apps and set-up email accounts on a handset 	TEL/N2204 PC1,PC2,PC3,PC4,PC5 KB5,KB6,KB7,KB8,KB9,KB10,KB11	Facilitator-led-discussion videos, team presentations	<ul style="list-style-type: none"> Phone of different brands, Samsung, Windows, LG, i-Phone etc. 	10 hrs (Theory) 25 hrs (Practical)
		Fixing the firmware	<ul style="list-style-type: none"> Outline and explain the role of firmware in a handset Recall & demonstrate steps to install a new firmware 	TEL/N2204 PC1,PC2,PC3,PC4,PC5 KB1,KB2,KB3	Facilitator-led-discussion videos, team presentations	<ul style="list-style-type: none"> Phone of different brands, Samsung, Windows, LG, i-Phone etc. 	10 hrs (Theory) 10 hrs (Practical)

		Basic trouble shooting	<ul style="list-style-type: none"> Identify and troubleshoot common software related issues in phones Create back up data from the handset 	TEL/N2204 PC1,PC2,PC3,PC4,PC5 KB5,KB6,KB7,KB8,KB9,KB10,KB11	Facilitator-led-discussion videos, team presentations	<ul style="list-style-type: none"> Phone of different brands, Samsung, Windows, LG, i-Phone etc. 	5 hrs (Theory) 20 hrs (Practical)
		Safety guidelines	<ul style="list-style-type: none"> Understand and follow common safety precautions to be undertaken while repairing a handset 	TEL/N2204 PC1,PC2,PC3,PC4 KA8	Facilitator-led-discussion videos, team presentations	<ul style="list-style-type: none"> Phone of different brands, connectors, laptop 	5 hrs (Theory)
4	Tablet repair (hardware & software)	Introduction to tablets	<ul style="list-style-type: none"> Outline and explain a tablet and compare it with a traditional computer 	TEL/N2205 PC1,PC2,PC3,PC4,PC5 KB2,KB3,KB4,KB5,KB6	Facilitator-led-discussion videos, team presentations	<ul style="list-style-type: none"> Tablets of different brands 	5 hrs (Theory)
Replacing common parts		<ul style="list-style-type: none"> Outline and demonstrate steps to replace common parts of a tablet 	TEL/N2205 PC1,PC2,PC3,PC4,PC5,PC6,PC7,KB7,KB8,KB9,KB10,KB11,KB12,KB13	Facilitator-led-discussion videos, team presentations	<ul style="list-style-type: none"> Laptop, white board, marker, projector, Tablet, opener, computer. 	10 hrs (Theory) 45 hrs (practical)	
Basic trouble shooting		<ul style="list-style-type: none"> Recall and demonstrate steps to troubleshoot common software related issues in tablets Recall and demonstrate steps to update the software of popular tablets and create a back-up of data from tablet to a computer 	TEL/N2205 PC1,PC2,PC3,PC4,PC5,PC6,PC7,KB7,KB8,KB9,KB10,KB11,KB12,KB13	Facilitator-led-discussion videos, team presentations	<ul style="list-style-type: none"> Laptop, white board, marker, projector, Tablet, opener, computer. 	10 hrs (Theory) 10 hrs (practical)	
Safety precautions		<ul style="list-style-type: none"> Understand and follow common safety precautions to be undertaken while repairing a tablet 	TEL/N2205 PC1,PC2,PC3,PC4 KA9,KA10,	Facilitator-led-discussion	<ul style="list-style-type: none"> Laptop, Tablet, data cable, computer 	5 hrs	

				KB11	videos, team presentations		
	Reporting and documentation	Report and document daily activities	<ul style="list-style-type: none"> Identify and fill up a job-card, a daily activity report, and a customer feedback form 	N.A.	Facilitator-led-discussion videos, team presentations	<ul style="list-style-type: none"> Various report formats 	10 hrs
6	Soft skills	Grooming	<ul style="list-style-type: none"> Understand and demonstrate grooming norms pertaining to optical fiber technician Understand the importance of grooming Follow professional grooming guidelines for an optical fiber technician 	N.A.	<ul style="list-style-type: none"> Facilitator-led-discussion Skill Practice (Team Activity) 	<ul style="list-style-type: none"> Projector / Notes slides / Videos / Relevant information Grooming 	2 hours
		Communication skills	<ul style="list-style-type: none"> Identify and understand the need for effective communication as an OFC technician Understand and demonstrate effective process of communication at your work place Display types of communication Demonstrate effective listening skills 	N.A.	<ul style="list-style-type: none"> Facilitator-led-discussion Skill Practice (Team Activity) 	<ul style="list-style-type: none"> Projector / Notes slides / Videos / Relevant information Game – communication skills 	3 hours
		Time management	<ul style="list-style-type: none"> Identify and understand effective time management and its benefit Identify time wasters as stumbling blocks Improve your time management skills by using building blocks 	N.A.	<ul style="list-style-type: none"> Facilitator-led-discussion Skill Practice (Team Activity) 	<ul style="list-style-type: none"> Projector / Notes slides / Videos / Relevant information Time management 	2 hours

		<p>Problem solving</p> <ul style="list-style-type: none"> • Understand and demonstrate effective problem solving skills • Identify, understand and demonstrate benefits of problem solving • Demonstrate formula for effective problem solving 	<p>N.A.</p>	<ul style="list-style-type: none"> • Facilitator-led discussion • Skill Practice (Team Activity) 	<ul style="list-style-type: none"> • Projector / Notes slides / Videos / Relevant information • Problem solving 	<p>3 hours</p>
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Annexure II

Assessment Criteria

CRITERIA FOR ASSESSMENT OF TRAINEES

Assessment Criteria for Handset Repair Engineer	
Job Role	Handset Repair Engineer (Level II)
Qualification Pack	TEL/Q2201, v1.0
Sector Skill Council	Telecom

Sr. No.	Guidelines for Assessment
1	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. TSSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2	The assessment for the theory part will be based on knowledge bank of questions created by the TSSC.
3	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below).
4	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below).
5	To pass the Qualification Pack, every trainee should score overall of 70%.
6	In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation	
				Theory	Skills Practical
1. TEL/N2203: Perform Handset Repair (Hardware)	PC1. Ensure faulty handsets are received from the customer facing team		15	15	
	PC2. Obtain/ note fault details as mentioned by the customer facing team and other handset specifications				
	PC3. Obtain the committed repair timelines (SLAs)				
	PC4. Prioritize repair activities as per guidelines				
	PC1. Ensure clean, neat, dust free and organized working environment				

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC2. Determine components required based on fault diagnosis				
	PC3. Obtain materials required(such as components, equipment, testing devices and other inventory) as per organizational procedures				
	PC4. Ensure that tools, equipment and testing devices are in proper working condition and calibrated				
	PC5. Ensure compliance with lead free soldering techniques		15	15	
	PC1.Refer the company (handset manufacturer) specific technical database to identify root cause of handset fault and to determine rectification options				
	PC2. Isolate the cause of fault by conducting appropriate diagnostic test, in case details are not available.				
	PC3. determine the options to rectify the fault and confirm with supervisors, if required				
	PC4. Dismantle handset/components as per organizational guidelines/procedures				
	PC5. Ensure rectification of handset fault within the SLAs				
	PC6. Ensure timely escalation of emergency/ unresolved issues according to established procedures				
	PC7. Ensure all repairs conform to the quality targets in terms of bounce and repeat repair percentages, first time fix, etc		45	45	

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC1. Pass through ESD test before entering the facility				
	PC2. ensure that protection equipment like ESD equipment				
	PC3. ensure compliance with site risk control, OHS, environmental and quality requirements				
	PC4. Ensure escalation of safety incidents to relevant Authorities as per guidelines and procedure.		10	10	
	PC1. Ensure that handset inventory in hand for repairs is tracked and accounted for appropriately as per company procedures				
	PC2. Ensure record sheets are completed accurately, as per company guidelines				
	PC3. Ensure all relevant parties (including supervisors, customer teams) are notified of the completion of repair activity				
	PC4. retain documents for specific period of time, as per company procedure		10	10	
	Total		100	50	50
2. TEL/N2204: Perform Handset Repair (Software)	PC1. Ensure faulty handsets are received from the customer facing team				
	PC2. Obtain/ note fault details as mentioned by the customer facing team and other handset specifications				
	PC3. Obtain the committed repair timelines (SLAs)		10	10	
	PC4. Prioritize repair activities as per guidelines		5	5	
	PC1. Undertake fault diagnosis on software components				
	PC2. Interpret results and isolate fault.				
	PC3. Estimate repair timelines				
PC4. Refer the company (handset manufacturer) specific technical database for optimal rectification options					

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC5. check availability of correct software versions/modules		15	7	8
	PC1. Ensure clean, dust free and organized working environment				
	PC2. Ensure availability of connectors/cables				
	PC3. Obtain and ensure all tools are available and diagnostic equipment operational				
	PC4. Obtain software required as per organizational procedures				
	PC5. Ensure that the software versions are current and ready to use		10	10	
	PC1. Carry out necessary software fault rectification (correction/ Up gradation, software replacement)				
	PC2. Rectification of handset fault within the SLAs				
	PC3. Check handset performance to ascertain fault has been rectified.				
	PC3. Check handset performance to ascertain fault has been rectified				
	PC4. Ensure timely escalation of emergency/ unresolved issues according to established procedures				
	PC5. Ensure all repairs conform to the quality targets		25	3	22
	PC1. Confirm effectiveness of the repair process, by testing the handset utilizing appropriate software jigs and standard test processes C15. Ensure scientific disposal of culled carcasses as per guideline.				

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC2. Take appropriate action to rectify any deficiencies post testing				
	PC3. Ensure that fault has been rectified without any consequential damage				
	PC4. Handover repaired handset to QA team				
	PC5. Ensure completion of administrative jobs like site clearance, return of test equipments		15	3	12
	PC1. pass through ESD test before entering the facility				
	PC2. Ensure that protection equipments like antistatic bands, clothes and gloves are appropriately used as required				
	PC3. Ensure compliance with site risk control, OHS, environmental and quality requirements as per company's norms				
	PC4. ensure escalation of safety incidents to relevant authorities as per guidelines		10	10	
	PC1. Ensure that handset inventory in hand (for repairs) is tracked and accounted for appropriately				
	PC2. ensure record sheets are completed accurately, as per company guidelines				
	PC3. ensure all concerned (supervisors, QA team, customer teams) are notified of the completion of repair activity				
	PC4. retain documents for specific period of time, as a company procedure		10	10	

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation		
				Theory	Skills Practical	
			100	58	42	
3. TEL/N2205: Perform Tablet Repair (Hardware & Software)	PC1. Ensure faulty tablets are received from the customer facing team		10	10		
	PC2. Obtain/ note fault details as mentioned by the customer facing team and other tablet specifications					
	PC3. Obtain the committed repair timelines (SLAs)					
	PC4. prioritize repair activities as per guidelines					
	PC1. Ensure clean, neat, dust free and organized working environment		15	7	8	
	PC2. Determine hardware components & software required based on fault diagnosis					
	PC3. Obtain hardware & software required(such as components, OS, Applications, testing devices and other inventory) as per organizational procedures					
	PC4. Ensure that tools, equipment and testing devices are in proper working condition and calibrated					
	PC5. Ensure compliance with lead free soldering techniques					
	PC1. Refer the company (tablet manufacturer) specific					

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation	
				Theory	Skills Practical
	technical database to identify root cause of tablet fault and to determine rectification options				
	PC2. Isolate the cause of fault by conducting appropriate hardware/software diagnostic test				
	PC3. Determine the options to rectify the fault and confirm with supervisors, if required				
	PC4. Dismantle tablet as per product/manufacture guidelines				
	PC5. Ensure rectification of tablet fault within the SLAs				
	PC6. Ensure timely escalation of emergency/ unresolved issues according to established procedures				
	PC7. ensure all repairs conform to the quality targets in terms of bounce and repeat repair percentages, first time fix, etc		45	45	
	PC1. Assess test equipment is appropriately calibrated				
	PC2. Confirm effectiveness of the repair process, by utilizing appropriate test equipment as per standard test processes				
	PC3. Ensure that fault has been rectified without any collateral damage to tablet				
	PC4. Handover repaired tablet to appropriate authority				
	PC5. Ensure completion of administrative jobs like site clearance, return of test equipment.		10	10	
	PC1. Pass through ESD test before entering the facility				

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC2. Ensure that protection equipment like ESD equipment, anti-static bands, clothes and gloves are appropriately used as required		10	10	
	PC3. ensure compliance with site risk control, OHS, environmental and quality requirements as per company's norms				
	PC4. ensure escalation of safety incidents to relevant authorities as per guidelines				
	PC1. Ensure that tablet inventory in hand for repairs is tracked and accounted for appropriately as per company procedures		10	10	10
	PC2. Ensure record sheets are completed accurately, as per company guidelines				
	PC3. Ensure all relevant parties (including supervisors, customer teams) are notified of the completion of repair activity				
	PC4. Retain documents for specific period of time, as per company procedure				
	Grand Total	300	300	143	157
	<u>Percentage Weightage:</u>			50%	50%
	<u>Minimum Pass% to qualify (aggregate):</u>			70%	

Do



- Explain each Guideline for Assessment in detail
- Explain the score that each trainee needs to obtain
- Recapitulate each NOS one-by-one and take participants through the allocation of marks for Theory and Skills Practical.
- Explain the Allocation of Marks. Explain that they will be assessed on Theory and Skills Practical.
- Explain that for the first NOS, 50 marks are allotted for Theory and & 50 for Skills Practical.





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