



MASINDE MULIRO UNIVERSITY OF SCIENCE & TECHNOLOGY

LAB 05 – MOBILE SERVICE MODES

Monday 24th February 2025

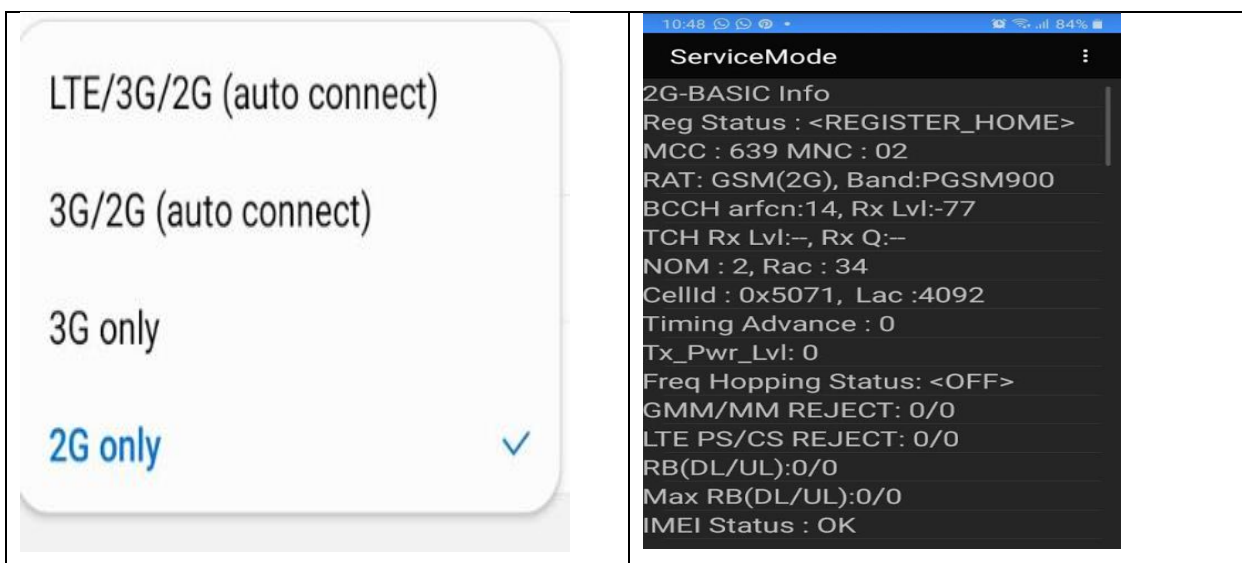
1.0 INTRODUCTION

As phones start to show age, it is very important to start getting into the habit of running mobile diagnostics tests. This is even more important for people who buy and sell used cell phones. Sometimes, our cell phones start to slow down or act funky. You may not be able to figure out what is wrong with them and if you don't have the patience, you may be inclined to purchase a new one. Luckily for the mobile phone industry, some of these problems are fairly easy to fix. This is how many mobile phone businesses are able to be successful - by buying used phones cheaply, fixing them up and selling them for a profit. The only issue is how to find out exactly what is wrong with the phone so you can fix it and get the most value out of the phone as possible.

Service mode is a secret function embedded in modern smartphones that enables easy diagnosis for a variety of problems. Entering this special mode involves typing a special code into the phone app of your Android phone. You will then be able to access diagnosis tools like RGB Test, Vibration testing, and Speaker testing, among others. You can access service mode through a simple procedure that can take only a few seconds to do. Some of these service codes are universal while some are not. This makes some of the codes useless for some phones.

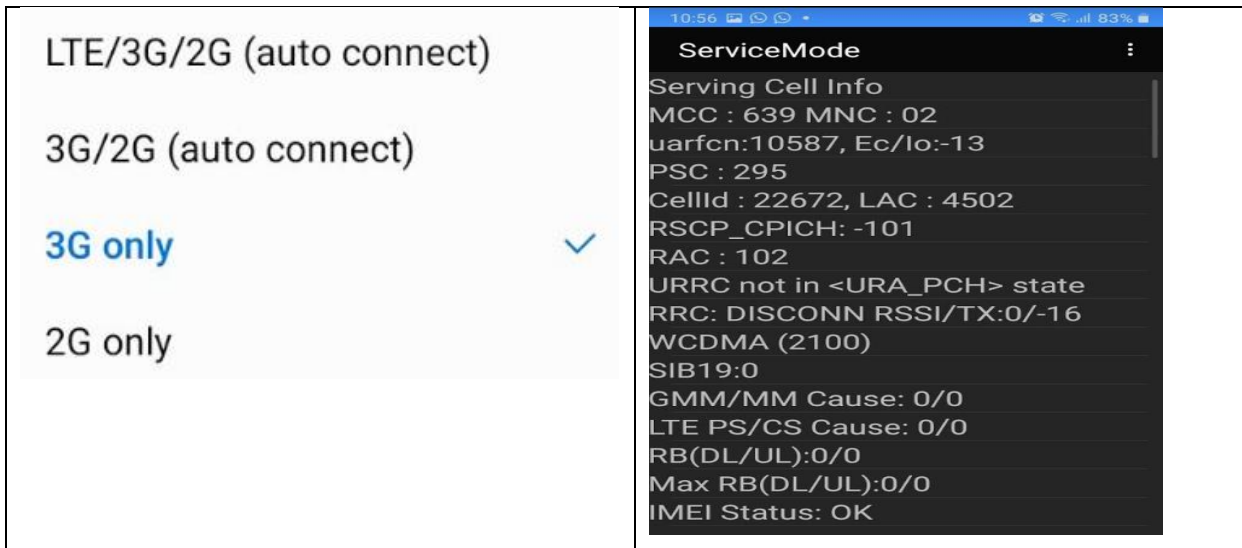
2.0. NETWORK CONNECTION DETAILS

1. Go to the **settings** and set your network mode to **2G** as shown on the left below.
2. On the keypad, press ***#0011#** to get a screen display like the one shown on the right below.



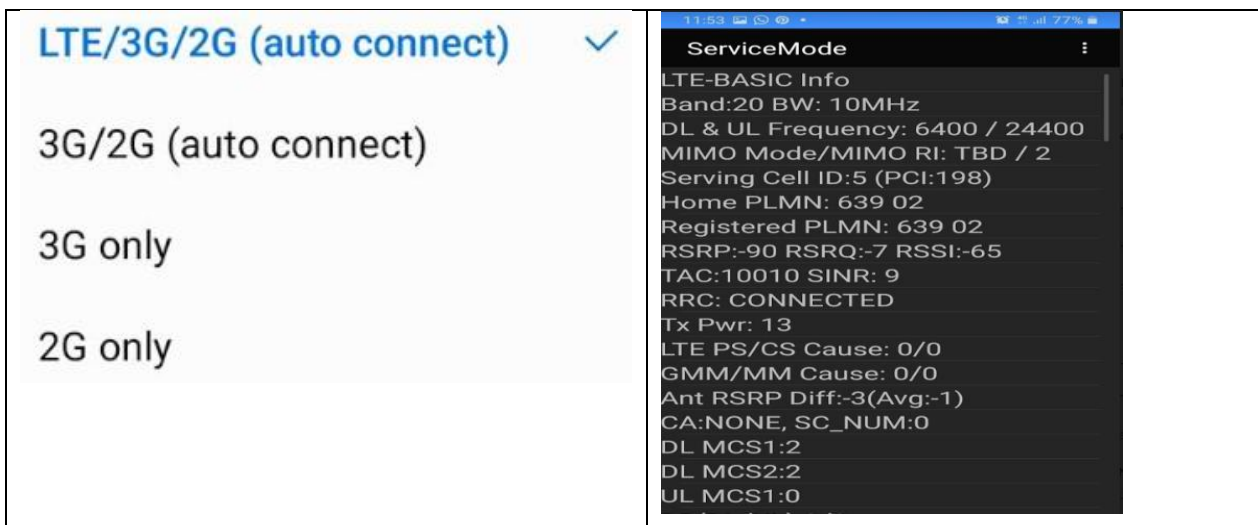
3. Go to the **settings** and set your network mode to **3G** as shown on the left below.

4. On the keypad, press ***#0011#** to get a screen display like the one shown on the right below.



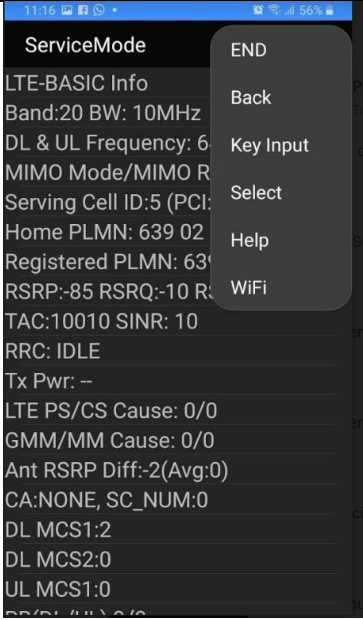
5. Go to the **settings** and set your network mode to **4G (LTE)** as shown on the left below.

6. On the keypad, press ***#0011#** to get a screen display like the one shown on the right below.



6. On the keypad, press ***#0011#** and select 'menu' to get a screen display like the one shown on the left below.

7. Select **WiFi** on the menu to get the screen display shown on the right.

 The screenshot shows a mobile application interface. At the top, the status bar displays the time 11:16, battery level at 56%, and signal strength. The main screen is titled 'ServiceMode' and lists various LTE-BASIC information fields. A dark grey menu overlay is visible on the right side of the screen, containing the following options: END, Back, Key Input, Select, Help, and WiFi. The background text of the application includes fields like Band:20 BW: 10MHz, DL & UL Frequency: 6, MIMO Mode/MIMO R, Serving Cell ID:5 (PCI:), Home PLMN: 639 02, Registered PLMN: 639, RSRP:-85 RSRQ:-10 R, TAC:10010 SINR: 10, RRC: IDLE, Tx Pwr: -, LTE PS/CS Cause: 0/0, GMM/MM Cause: 0/0, Ant RSRP Diff:-2(Avg:0), CA:NONE, SC_NUM:0, DL MCS1:2, DL MCS2:0, UL MCS1:0, and RSRP: -85 RSRQ: -10.	 The screenshot shows a mobile application interface titled 'WiFi Information'. It displays detailed information about a connected WiFi network. The status is 'CONNECTED'. The SSID is 'AMBANI'. The AP MAC is 8c:04:ff:bd:b9:38. The BSS CH is 1 [Frequency : 2412MHz]. The WSEC is [WPA2-PSK-CCMP+TKIP]. The [RSN-PSK-CCMP+TKIP][WPA-PSK-CCMP+TKIP] [ESS][WPS]. The Hi/Op is Open. The RSSI is -50. The Modulation is 64-QAM. The CR is 5/6. The PER is %. The TX is 12dBm. The Link Speed is 72Mbps. The NETWORK is 802.11n. The IP is 192.168.0.21. The MAC is 80:CE:B9:5F:F6:2D. The passpoint is Supported. The P2P Group mode is null. The P2P Freq is null. The P2P Peers is null. The P2P IP Addr is null. The MHS MAC is null. The WifiSharing is No. The IWC is QAI: -1, SS: true, Q: 0.00 / 2.00 / 4.48. At the bottom, there is a 'PING TEST' button and the value '0.0.0.0'.
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Results and Analysis

1. Explain the meaning and use of the following 2G network fields: (i) RAT, (ii) BCCH Arfcn (iii)TCH and (iv) Timing Advance
2. Calculate the uplink and downlink frequencies for the broadcast control Channel (BCCH).
3. Explain the meaning and use of the following 3G network fields: (i) UARFCN, (ii) LAC (iii) RAC
3. Explain the meaning and use of the following 4G network fields (i) LTE PS/CS Cause, (ii) GMM/MM Cause (iii) TAC (iii) RRC
4. Explain the meaning and use of the following WiFi fields (i) AP MAC, (ii) RSSI, (iii) TX (iii) MAC

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LAB 06 – MOBILE FIELD TEST MODES

1.0 INTRODUCTION

Field test mode (FTM) (or field test display (FTD)) is a software application often pre-installed on mobile phones that provides the user with technical details, statistics relating to the mobile phone network and allows the user to run hardware tests on the phone. On older Nokia phones this mode is known as Netmonitor while newer Series 60 phones have a Field test application which requires a hacked phone to be installed. Many other brands of phones have similar functionality available, often accessed by entering a code into the phone.

EXPERIMENT 1 – ADVANCED MENU TEST

Advanced Test Menu can test most futures on the phone including LCD Display, Touch, LED light, Front and Back Cameras and much more.

1. On the keypad, press ***#0*#** for phones running Android e.g. Samsung Galaxy (***3001#12345#*** for iPhone xx running iOS 11 or 12) to get the display shown below.
2. Press all pads and write down your observations.

RED	GREEN	BLUE
RECEIVER	VIBRATION	DIMMING
MEGA CAM	SENSOR	TOUCH
SLEEP	SPEAKER	SUB KEY
FRONT CAM	LOW FREQUENCY	BLACK

Results and Analysis

1. What are the uses of the pads Red, Green and Blue.
2. What is it necessary to provide low frequency test but not high-frequency test?
3. What are the functions of the sensor tests, i.e accelerometer and the proximity sensor tests?
4. What is being tested when you press the receiver pad?