

USER GUIDE

LG-US550

User Guide

- Screen displays and illustrations may differ from those you see on actual phone.
- Some of the contents of this guide may not apply to your phone, depending on the software and your service provider. All information in this document is subject to change without notice.
- This handset is not suitable for people who have a visual impairment due to the tap screen keyboard.
- Copyright ©2015 LG Electronics, Inc. All rights reserved. LG and the LG logo are registered trademarks of LG Group and its related entities. All other trademarks are the property of their respective owners.
- Google™, Google Maps™, Gmail™, YouTube™, Hangouts™ and Play Store™ are trademarks of Google, Inc.
- U.S. Cellular® Customer Care 1-888-944-9400.

Table of contents

Guidelines for safe and efficient use	4	Calls	29
Important notice	6	Making a call	29
Getting to know your phone.....	10	Calling your contacts	29
Phone layout.....	10	Answering and rejecting a call	29
Installing the SIM or USIM card	12	Making a second call.....	30
Charging your phone	13	Viewing your call logs	30
Unlocking the screen	14	Call settings.....	30
Your Home screen.....	15	Contacts	31
Touch screen tips	15	Searching for a contact.....	31
Home screen	16	Adding a new contact	31
Returning to recently-used applications	18	Favourites contacts.....	31
Notifications panel	18	Creating a group.....	32
On-screen keyboard	21	Messaging.....	33
Special Feature	22	Sending a message	33
Quick Glance View	22	Threaded box	34
Knock Code	23	Changing your message settings	34
QuickMemo+.....	24	E-mail.....	35
Google account setup.....	25	Managing an email account.....	35
Connecting to Networks and Devices....	26	Working with account folders.....	35
Wi-Fi	26	Composing and sending email	36
Bluetooth.....	27	Camera and Video.....	37
Wi-Fi Direct	28	Getting to know the viewfinder	37
Transferring data between a PC and the device.....	28	Using the advanced settings	38
		Taking a quick photo	39
		Once you've taken a photo.....	39
		Recording a quick video.....	40
		After recording a video.....	40
		Gallery.....	41

Multimedia	44	Safety	82
Music	44	Consumer Information About Radio	
Utilities	46	Frequency Emissions	83
Clock	46	Consumer Information on SAR	87
Calculator	47	FCC Hearing-Aid Compatibility (HAC)	
Calendar	47	Regulations for Wireless Devices	89
Voice Recorder	48	Caution: Avoid potential hearing loss.....	91
Tasks	48	TIA Safety Information	92
Voice Search.....	49	Safety Information	96
Downloads	49	FDA Consumer Update.....	100
The Web	50	Driving.....	107
Browser.....	50	Driver Safety Tips	107
Chrome	52		
Settings	53		
Networks.....	53		
Sound.....	55		
Display	57		
General.....	60		
Phone software update	68		
Phone software update.....	68		
About this user guide	70		
About this user guide.....	70		
Trademarks	70		
Troubleshooting	71		
FAQ	75		

Guidelines for safe and efficient use

 **Warning** Violation of the instructions may cause serious injury or death.

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. **Wash hands after handling.**



- Never use an unapproved battery since this could damage the phone and/or battery and could cause the battery to explode.



- Never place your phone in a microwave oven as it will cause the battery to explode.
- Do not dispose of your battery near fire or with hazardous or flammable materials.



- When riding in a car, do not leave your phone or set up the hands-free kit near the air bag. If wireless equipment is improperly installed and the air bag is deployed, you may be seriously injured.



- Do not use the phone in areas where its use is prohibited. (For example: aircraft)



- Do not expose the battery charger or adapter to direct sunlight or use it in places with high humidity, such as a bathroom.



- Do not use harsh chemicals (such as alcohol, benzene, thinners, etc.) or detergents to clean your phone. This could cause a fire.



- Do not drop, strike, or shake your phone severely. It may harm the internal circuit boards of the phone.



- Do not use your phone in high explosive areas as the phone may generate sparks.



- Do not damage the power cord by bending, twisting, pulling, or heating. Do not use the plug if it is loose as it may cause electric shock or fire.
- Do not place any heavy items on the power cord. Do not allow the power cord to be crimped as it may cause electric shock or fire.
- Do not handle the phone with wet hands while it is being charged. It may cause an electric shock or seriously damage your phone.
- Do not disassemble the phone.

- Do not place or answer calls while charging the phone as it may short-circuit the phone and/or cause electric shock or fire.
- Do not hold or let the antenna come in contact with your body during a call.
- Make sure that no sharp-edged items, such as animal's teeth or nails, come into contact with the battery. This could cause a fire.
- Store the battery out of reach of children.
- Be careful that children do not swallow any parts (such as earphone, connection parts of the phone, etc.) This could cause asphyxiation or suffocation resulting in serious injury or death.
- Unplug the power cord and charger during lightning storms to avoid electric shock or fire.
- Only use the batteries and chargers provided by LG. The warranty will not be applied to products provided by other suppliers.
- Only authorized personnel should service the phone and its accessories. Faulty installation or service may result in accidents and consequently invalidate the warranty.
- An emergency call can be made only within a service area. For an emergency call, make sure that you are within a service area and that the phone is turned on.
- Your phone is an electronic device that generates heat during normal operation. Extremely prolonged, direct skin contact in the absence of adequate ventilation may result in discomfort or minor burns. Therefore, use care when handling your phone during or immediately after operation.



Important notice

Please read this before you start using your phone!

Please check to see whether any problems you encountered with your phone are described in this section before taking the phone in for service or calling a service representative.

1. Phone memory

When there is less than 10% of space available in your phone memory, your phone cannot receive new messages. You need to check your phone memory and delete some data, such as applications or messages, to make more memory available.

To uninstall applications:

- 1 Tap  >  > **Apps** tab >  > **General** > **Apps**.
- 2 Once all applications appear, scroll to and select the application you want to uninstall.
- 3 Tap **Uninstall**.

2. Optimizing battery life

Extend your battery's power by turning off features that you don't have to run constantly in the background. You can monitor how applications and system resources consume battery power.

Extending your phone's battery life:

- Turn off radio communications when you are not using. If you are not using Wi-Fi, Bluetooth or GPS, turn them off.
- Reduce screen brightness and set a shorter screen timeout.
- Turn off automatic syncing for Gmail, Calendar, Contacts and other applications.
- Some applications you have downloaded may reduce battery power.
- While using downloaded applications, check the battery charge level.

NOTE: If you accidentally press the Power/Lock Key while the device is in your pocket, the screen will turn off automatically in order to save battery power.

3. Before installing an open source application and OS



WARNING

If you install and use an OS other than the one provided by the manufacturer it may cause your phone to malfunction. In addition, your phone will no longer be covered by the warranty.



WARNING

To protect your phone and personal data, only download applications from trusted sources, such as Play Store™. If there are improperly installed applications on your phone, the phone may not work normally or a serious error may occur. You must uninstall those applications and all associated data and settings from the phone.

4. Using the Hard Reset (Factory Reset)

If your phone does not restore to its original condition, use a Hard Reset (Factory Reset) to initialize it.

- 1 Turn the power off.
- 2 Press and hold the **Power/Lock key + Volume Down key** on the back of the phone.
- 3 Release the **Power/Lock Key** only when the boot logo is displayed, then immediately press and hold the **Power/Lock Key** again.
- 4 Release all keys when the Factory hard reset screen is displayed.

Important notice

- 5 Press the **Power/Lock Key** to continue or either of the **Volume Keys** to cancel.
- 6 Press the **Power/Lock Key** once more to confirm or either of the **Volume Keys** to cancel.



WARNING

If you perform a Hard Reset, all user applications, user data and DRM licenses will be deleted. Please remember to backup any important data before performing a Hard Reset.

5. Opening and switching applications

Multi-tasking is easy with Android, you can keep more than one application running at the same time. There is no need to quit an application before opening another one. Use and switch between several open applications. Android manages each application, stopping and starting them as needed to ensure that idle applications don't consume resources unnecessarily.

- 1 Tap . A list of recently used applications will be displayed.
 - 2 Tap the application you want to access. This does not stop the previous app running in the background on the phone. Make sure to tap  to exit an app after using it.
- To remove an app from the recent apps list, swipe the app preview to the left or right. To clear all apps, tap **Clear all**.

6. When the screen freezes

If the screen freezes or the phone does not respond when you try to operate it:

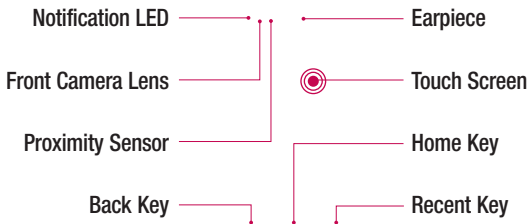
Press and hold the **Power/Lock Key** and the **Volume Down Key** for 10 seconds to turn your phone off. If it still does not work, please contact the service center.

7. Do not connect your phone when you power on/off your PC

Make sure to disconnect your phone from the PC when powering your PC on or off as it might result in PC errors.

Getting to know your phone

Phone layout



Back Key	Returns to the previous screen. Also closes pop-up items such as menus, dialog boxes, and the on-screen keyboard. Touch and hold it to access Dual window.
Home Key	Return to the Home screen from any screen.
Recent Key	Displays recently used applications. If you touch and hold this key, it opens available options menu.

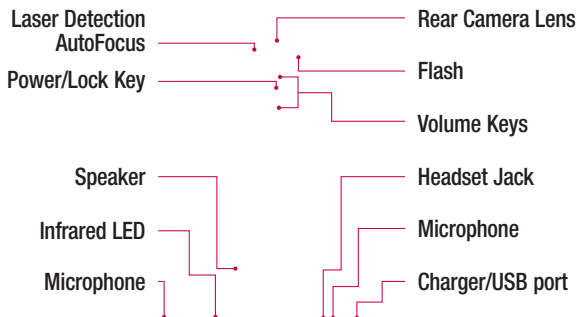
NOTE: Proximity sensor

When receiving and making calls, the proximity sensor automatically turns the backlight off and locks the touch screen by sensing when the phone is near your ear. This extends battery life and prevents you from unintentionally activating the touch screen during calls.



WARNING

Placing a heavy object on the phone or sitting on it can damage the LCD and touch screen functions. Do not cover the LCD proximity sensor with protective film. This could cause the sensor to malfunction.



Power/Lock Key	• Switch your phone on/off by pressing and holding this key • Short press to lock/unlock the screen
Volume Keys	(Whilst screen is switched off) • Long Press Up to launch QuickMemo+ • Long Press Down to launch Camera



WARNING

This part encloses the battery compartment.

Getting to know your phone

Installing the SIM or USIM card

Before you can start exploring your new phone, you'll need to set it up.

- 1 To remove the back cover, hold the phone firmly in one hand. With your other hand, lift off the back cover with your thumbnail as shown in figure below.

- 2 Slide the SIM card into the lower slot for the SIM card as shown in figure. Make sure the gold contact area on the card is facing downwards.

NOTE: Only SIM or USIM cards work with the device.

NOTE: If you want to use the memory card, insert the memory card into the slot. Make sure the gold contact area is facing downwards.

- 3 Align the back cover over the battery compartment (1) and press it down until it clicks into place (2).

Charging your phone

Charge the battery before using it for the first time. Use the charger to charge the battery. A computer can be also used to charge the device by connecting them via the USB cable.



WARNING

Use only LG-approved chargers, batteries and cables. If you use unapproved chargers, batteries or cables, it may cause battery charging delay or pop up message regarding slow charging, Or this can cause the battery to explode or damage the device, which are not covered by the warranty.

The charger connector is at the bottom of the phone. Insert the charger and plug it into an electrical outlet.

Getting to know your phone

NOTE:

- The battery must be fully charged initially to improve battery lifetime.
- Do not open the back cover while your phone is charging.

Unlocking the screen

After a period of inactivity, to conserve the battery, the screen you are currently viewing will be replaced by the lock screen.



Unlocking the screen

- 1 Press the **Power/Lock Key** key.
- 2 Swipe the screen in any direction to unlock it.

or

- 1 Double-tap the center of the screen.

Your Home screen

Touch screen tips

Here are some tips on how to navigate on your phone.

Tap or touch – A single finger tap selects items, links, shortcuts and letters on the on-screen keyboard.

Touch and hold – Touch and hold an item on the screen by tapping it and not lifting your finger until an action occurs.

Drag – Touch and hold an item for a moment and then, without lifting your finger, move your finger on the screen until you reach the target position. You can drag items on the Home screen to reposition them.

Swipe or slide – To swipe or slide, quickly move your finger across the surface of the screen, without pausing when you first tap it (so you don't drag an item instead).

Double-tap – Double-tap to zoom on a webpage or a map.

Pinch-to-Zoom – Use your index finger and thumb in a pinching or spreading motion to zoom in or out when using the browser or Maps, or when browsing pictures.

Rotate the screen – From many applications and menus, the orientation of the screen adjusts to the device's physical orientation.

NOTE:

- To select an item, tap the center of the icon.
- Do not press too hard; the tap screen is sensitive enough to pick up a light, yet firm tap.
- Use the tip of your finger to tap the option you want. Be careful not to tap any other keys.

Your Home screen

Home screen

The Home screen is the starting point for many applications and functions, and it allows you to add items like application shortcuts, or Google widgets to give you instant access to information and applications. This is the default canvas and accessible from any menu by tapping .



- 1 Shows phone's status information including the time, signal strength, battery status, and notification icons.
- 2 Widgets are self-contained applications that can be accessed through the Apps screen or on the Home screen or an extended home screen. Unlike a shortcut, the Widget appears as an on-screen application.
- 3 Tap an icon (application, folder, etc.) to open and use it.
- 4 Indicates which Home screen canvas you are viewing.
- 5 Provides one-touch access to the function in any home screen canvas.

Extended home screen

The operating system provides multiple Home screen canvases to provide more space for adding icons, widgets, and more.

- ▶ Slide your finger left or right across the Home screen.

Customizing the Home screen

You can customize your Home screen by adding apps, widgets or changing wallpapers.

Adding items on your Home screen

- 1 Touch and hold the empty part of the Home screen.
- 2 In the Add Mode menu, select the item you wish to add. You will then see this added item on the Home screen.
- 3 Drag it to the desired location and lift your finger.

TIP! To add an application icon to the Home screen from the Apps menu, touch and hold the application you want to add.

Removing an item from the Home screen

- ▶ **Home screen** > touch and hold the icon you want to remove > drag it to .

Adding an app as a Quick key

- ▶ From the Apps menu or on the Home screen, touch and hold an application icon and drag it to the Quick key area. Up to 7 apps can be added.

Removing an app from the Quick key area

- ▶ Touch and hold the desired quick key and drag it to .

NOTE:  **Apps** key cannot be removed.

Your Home screen

Customizing apps icons on the Home screen

- 1 Touch and hold an application icon until it is unlocked from its current position. Then drop it on the screen. The editing icon  will appear in the upper right corner of the application.
- 2 Tap the application icon again and select the desired icon design and size.
- 3 Tap **OK** to save the change.

Returning to recently-used applications

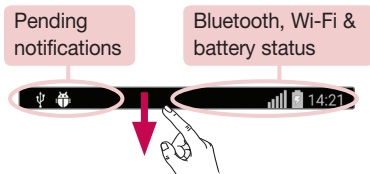
- 1 Tap . A list of recently used applications will be displayed.
- 2 Tap an icon to open the application. Or tap  to return to your previous screen.

Notifications panel

Notifications alert you the arrival of new messages, calendar events, and alarms, as well as to ongoing events, such as when you are on a call.

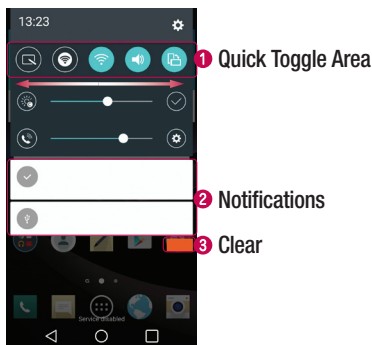
When a notification arrives, its icon appears at the top of the screen. Icons for pending notifications appear on the left, and system icons such as Wi-Fi or battery strength shown on the right.

NOTE: The available options may vary depending on the region or service provider.



Opening the notifications panel

Swipe down from the status bar to open the notifications panel. To close the notifications panel, touch and drag the screen toward the top of the screen.



- 1 Tap each quick toggle key to turn it on/off. Touch and hold the key to access the settings menu of the function. To see more toggle keys, swipe left or right. Tap  to remove, add, or rearrange toggle keys.
- 2 The current notifications are listed, each with a brief description. Tap a notification to view it.
- 3 Tap to clear all the notifications.

Your Home screen

Indicator icons on the Status Bar

Indicator icons appear on the status bar at the top of the screen to report missed calls, new messages, calendar events, device status and more.



The icons displayed at the top of the screen provide information about the status of the device. The icons listed in the table below are some of the most common ones.

Icon	Description
	No SIM card inserted
	No network signal available
	Airplane mode is on
	Connected to a Wi-Fi network
	Wired headset connected
	Call in progress
	Missed call
	Bluetooth is on
	System warning
	An alarm is set
	New voicemail available

Icon	Description
	A song is currently playing
	Ringer is silenced
	Vibrate mode is on
	Battery fully charged
	Battery is charging
	Phone is connected to PC via USB cable
	Downloading data
	Uploading data
	GPS is on
	Data is synchronizing
	Choose input method



New text or multimedia message



Wi-Fi hotspot is active

NOTE: The icons location in the status bar may differ according to the function or service.

On-screen keyboard

You can enter text using the on-screen keyboard. The on-screen keyboard appears automatically on the screen when you need to enter text. To manually display the keyboard, simply tap a text field where you want to enter text.

Using the keypad & entering text

 Tap once to capitalize the next letter you type. Double-tap for all caps.

 Tap to switch to handwriting mode.

 Tap to enter a space.

 Tap to create a new line.

 Tap to delete the previous character.

Entering accented letters

When you select French or Spanish as the text entry language, you can enter special French or Spanish characters (e.g. "á").

For example, to input "á", touch and hold the "a" key until the zoom-in key grows bigger and displays characters from different languages.

Then select the special character you want.

Special Feature

Quick Glance View

When the phone screen is turned off, you can see the status bar, time, and date by dragging your finger down from the top of the screen.



KnockON

You can lock or unlock the screen by just double-tap.

Double-tap the center screen quickly to unlock the screen. To lock the screen, double-tap the status bar in any screen (except on the camera viewfinder) or empty area on the Home screen.

NOTE: When turning the screen on, make sure you do not cover the proximity sensor. Doing so will turn the screen off immediately after turning it on in order to prevent abnormal turning on in your pocket or bag.

Knock Code

The Knock Code feature allows you to tap the screen with your own Knock Code pattern using the screen divided by 4 squares to easily turn the screen on or off. You can disable this feature in the Lock screen settings.

NOTE:

- If you enter the wrong Knock Code 6 times, it will compulsorily take you to your google account log in/backup PIN.
- Use the fingertip instead of finger nail to tap the screen for turning it on or off.
- When the Knock Code is not in use, you can use Knock On function by tapping the screen.

1 Tap  >  > **Apps tab** >  > **Display** > **Lock screen** > **Select screen lock** > **Knock Code**.

2 Tap the squares in a pattern to set your Knock Code.

Your Knock Code pattern can be 3 to 8 taps. Tap Done when you're finished.

Unlocking the screen using the Knock Code

You can unlock the screen by tapping the Knock Code pattern you already set, when the screen turns off.

Special Feature

QuickMemo+

The **QuickMemo+** allows you to create memos and capture screen shots. Capture screens, draw on them and share them with family and friends with QuickMemo+.



- 1 (While screen is switched off) Press and hold the Volume Up key.

OR



OR

Touch and slide the status bar downward and tap .



- 2 Select the desired menu option from **Pen type**, **Color**, **Eraser** and create a memo.



- 3 Tap  in the Edit menu to save the memo with the current screen. To exit QuickMemo+ at any time, tap .

Google account setup

When you first turn on your phone, you have the opportunity to activate the network, to sign into your Google Account and select how you want to use certain Google services.

Setting up your Google account:

- Sign into a Google Account from the prompted set-up screen.

OR

- Tap  >  > **Apps** tab > select a Google application, such as **Play Store** > select **OR CREATE A NEW ACCOUNT**.

If you have a Google account, enter your email address and tap **NEXT**.

Once you have set up your Google account on your phone, your phone automatically synchronizes with your Google account on the Web.

Your contacts, Gmail messages, Calendar events and other information from these applications and services on the Web are synchronized with your phone. (This will depend on your synchronization settings.)

After signing in, you can use Gmail™ and take advantage of Google services on your phone.

Connecting to Networks and Devices

Wi-Fi

You can use high-speed Internet access within the coverage of the wireless access point (AP).

Connecting to Wi-Fi networks

- 1 Tap  >  > **Apps** tab >  > **Networks** > **Wi-Fi**.
- 2 Set **Wi-Fi** to **ON** to turn it on and start scanning for available Wi-Fi networks.
- 3 Tap a network to connect to it.
 - If the network is secured with a lock icon, you need to enter a password.
- 4 The status bar displays icons that indicate Wi-Fi status.

NOTE: If you are out of the Wi-Fi zone or have set Wi-Fi to **OFF**, additional charges may be applied by your mobile operator for mobile data use.

TIP! How to obtain the MAC address

Tap  >  > **Apps** tab >  > **Networks** > **Wi-Fi** >  > **Advanced Wi-Fi** > **MAC** address.

Bluetooth

You can use Bluetooth to exchange data between near devices.

NOTE:

- LG is not responsible for the loss, interception or misuse of data sent or received via the Bluetooth feature.
- Always ensure that you share and receive data with devices that are trusted and properly secured. If there are obstacles between the devices, the operating distance may be reduced.
- Some devices, especially those that are not tested or approved by Bluetooth SIG, may be incompatible with your device.

Pairing up your phone with another Bluetooth device

- 1 Tap  >  > **Apps** tab >  > **Networks** > **Bluetooth**.
- 2 Set **Bluetooth** to **ON** to turn it.
- 3 Tap **Search for devices** to view the devices in the Bluetooth Range.
- 4 Choose the device you want to pair with from the list. Once the pairing is successful, your device will connect to the other device.

NOTE: Some devices, especially headsets or hands-free car kits, may have a fixed Bluetooth PIN, such as 0000. If the other device has a PIN, you will be asked to enter it.

Sending data via Bluetooth

- 1 Select a file or item such as a contact or media file.
- 2 Select the option for sending data via Bluetooth.

NOTE: The method for selecting an option may vary by data type.

- 3 Search for and pair with a Bluetooth-enabled device.

Connecting to Networks and Devices

Receiving data via Bluetooth

- 1 Tap  >  > **Apps** tab >  > **Networks** > **Bluetooth**.
- 2 Set **Bluetooth** to **ON** to turn it.

Wi-Fi Direct

Wi-Fi Direct supports a direct connection between Wi-Fi enabled devices without an access point.

Turning on Wi-Fi Direct:

- 1 Tap  >  > **Apps** tab >  > **Networks** > **Wi-Fi**.
- 2 Tap  > **Advanced Wi-Fi** > **Wi-Fi Direct**.
- 3 Select a device to connect with from the scanned device list.

Transferring data between a PC and the device

You can copy or move data between a PC and the device.

Transferring data

- 1 Connect your device to a PC using a USB cable.
- 2 Slide down the notifications panel, and select the **Media sync (MTP)**.
- 3 Transfer data between a PC and the device.

NOTE:

- LG Android Platform Driver on your PC.
- Check the requirement to use **Media device (MTP)**.

Items	Requirement
OS	Microsoft Windows XP SP2, Vista or higher
Window Media Player version	Windows Media Player 10 or higher

Calls

Making a call

- 1 Tap  to open the keypad.
- 2 Enter the number using the keypad. To delete a digit, tap the .
- 3 Tap  to make a call.
- 4 To end a call, tap the **End** icon .

TIP! To enter "+" to make international calls, touch and hold .

Calling your contacts

- 1 Tap  to open your contacts.
- 2 Scroll through the contact list or enter the first few letters of the contact you want to call by tapping **Search contacts**.
- 3 In the list, tap  you want to call.

Answering and rejecting a call

When you receive a call, swipe the  in any direction to Answer the incoming call.
Swipe the  in any direction to Decline an incoming call.

Calls

Making a second call

- 1 During your first call, tap  > **Add call** and dial the number.
- 2 Tap  to make the call.
- 3 Both calls are displayed on the call screen. Your initial call is locked and put on hold.
- 4 Tap the displayed number to toggle between calls. Or tap  to start a conference call.
- 5 To end active calls, tap **End**.

NOTE: You are charged for each call you make.

Viewing your call logs

On the Home screen, tap  and choose the **Call logs**.
View a complete list of all dialed, received and missed calls.

TIP!

- Tap any call log entry to view the date, time and duration of the call.
- Tap the , then tap **Delete all** to delete all the recorded items.

Call settings

You can configure phone call settings such as call forwarding, as well as other special features offered by your carrier.

- 1 On the Home screen, tap .
- 2 Tap .
- 3 Tap **Call settings** and choose the options that you wish to adjust.

Contacts

Add contacts to your phone and synchronize them with the contacts in your Google account or other accounts that support contact syncing.

Searching for a contact

On the Home screen

- 1 Tap  to open your contacts.
- 2 Tap **Search contacts** and enter the contact name using the keyboard.

Adding a new contact

- 1 Tap , enter the new contact's number, then tap the .
Tap **Add to Contacts > New contact**.
- 2 If you want to add a picture to the new contact, tap the image area.
Choose from **Take photo** or **Select from Gallery**.
- 3 Tap a category of contact information and enter the details about your contact.
- 4 Tap **Save**.

Favourites contacts

You can classify frequently called contacts as favourites.

Adding a contact to your favourites

- 1 Tap  to open your contacts.
- 2 Tap a contact to view its details.
- 3 Tap the star to the right corner of the contact's name. The star will turn yellow color.

Contacts

Removing a contact from your favourites list

- 1 Tap  to open your contacts.
- 2 Tap the **Favourites** tab, and choose a contact to view its details.
- 3 Tap the yellow color star to the right corner of the contact's name. The star turns white color and the contact is removed from your favourites.

Creating a group

- 1 Tap  to open your contacts.
- 2 Tap **Groups** and tap the . Select **New group**.
- 3 Enter a name for the new group. You can also set a ringtone for the newly created group.
- 4 Tap **Save** to save the group.

NOTE: If you delete a group, the contacts assigned to that group will not be lost. They will remain in your contacts.

Messaging

Your phone combines SMS and MMS into one intuitive, easy-to-use menu.

Sending a message

- 1 Tap  on the Home screen and tap  to open a blank message.
- 2 Enter a contact name or contact number in the **To** field. As you enter the contact name, matching contacts will appear. You can tap a suggested recipient. You can add more than one contact.

NOTE: You will be charged for a text message for every person to whom you send the message.

- 3 Tap the **Enter message** field and begin composing your message.
- 4 Tap  to open the options menu.

TIP! You can tap the  icon to attach the file, that you want to share with message.

- 5 Tap **Send** to send your message.
- 6 Responses will appear on the screen. As you view and send additional messages, a message thread is created.



WARNING:

- The 160-character limit may vary from country to country, depending on the language and how the SMS is coded.
- If an image, video or audio file is added to an SMS message, it is automatically converted into an MMS message and you are charged accordingly.

Messaging

Threaded box

Messages (SMS, MMS) exchanged with another party can be displayed in chronological order so that you can conveniently see an overview of your conversation.

Changing your message settings

Your phone message settings are pre-defined, so you can send messages immediately. You can change the settings according to your preferences.

- Tap the **Messaging** icon on the Home screen, tap  and then tap **Settings**.

E-mail

You can use the E-mail application to read emails from services like Gmail. The E-mail application supports the following account types: POP3, IMAP and Exchange. Your service provider or system administrator can provide you with the account settings you need.

Managing an email account

The first time you open the **E-mail** application, a set-up wizard opens to help you to set up an email account.

After the initial set-up, E-mail displays the contents of your inbox.

Adding another email account:

- Tap  >  > **Apps** tab > **E-mail** > tap  > **Settings** >  **Add account.**

Changing an email general settings:

- Tap  >  > **Apps** tab > **E-mail** > tap  > **Settings** > **General settings.**

Deleting an email account:

- Tap  >  > **Apps** tab > **E-mail** > tap  > **Settings** > tap  > **Remove account** > Select the account to delete > **Remove** > select **Yes.**

Working with account folders

Tap  >  > **Apps** tab > **E-mail** > tap  and select **Folders.**

Each account has an Inbox, Outbox, Sent and Drafts folder. Depending on the features supported by your account's service provider, you may have additional folders.

Composing and sending email

Composing and send a message

- 1 While in the **E-mail** application, tap the .
- 2 Enter an address for the message's intended recipient. As you enter text, matching addresses will be proposed from your Contacts. Separate multiple addresses using semicolons.
- 3 Tap the  to add a Cc/Bcc and tap  to attach files, if required.
- 4 Enter the text of the message.
- 5 Tap .

TIP! When a new email arrives in your Inbox, you will be notified by a sound or vibration.

Camera and Video

To open the Camera application, tap  >  > **Apps** tab > .

Getting to know the viewfinder



- 1 **Clear view on&off** – Tap to display and hide the camera options on the screen.
- 2 **Flash** – Tap to choose from **Off** , **On** , **Auto** .
- 3 **Swap camera** – Tap to swap between the rear camera lens and the front camera lens.
- 4 **Settings** – Tap to adjust the camera and video settings.
- 5 **Gallery** – Tap to access your Gallery.
- 6 **Record** – Tap to start recording a video.
- 7 **Capture** – Tap to take a photo.
- 8 **Back key** – Tap to close the selected menu or exit the Camera app.

NOTE: Please ensure the camera lens is clean before taking pictures.

Camera and Video

Using the advanced settings

In the viewfinder, tap  to open the advanced options. You can change the camera settings by scrolling through the list. After selecting the option, tap .



Selects photo resolution. If you choose high resolution, file size will increase, which means you will be able to store fewer photos in the memory.



To take a photo, say one of the following words: Cheese, Smile, Whiskey, Kimchi or LG.



Sets a delay after the capture button is pressed. This is ideal if you want to be in the photo.



It is easily used to take better pictures to keeping horizontal and verticals.



Opens the help guide to know how a function operates.

TIP!

The setting menu is superimposed over the viewfinder, so when you change photo color or quality elements, you will see a preview of the changed image behind the Settings menu.

Taking a quick photo

- 1 Open the **Camera** application and point the lens toward the subject you want to photograph.
- 2 Focus boxes will appear in the center of the viewfinder screen. You can also tap anywhere on the screen to focus on that spot.
- 3 When the focus box turns blue, the camera has focused on your subject.
- 4 Tap  to capture the photo.

Once you've taken a photo

Tap the image thumbnail at the bottom of the Camera screen to view the last photo you took.

	Tap to edit the photo.
	Tap to take another photo immediately.
	Tap to send your photo to others or share it via social network services.
	Tap to delete the photo.
	Tap to access the options that you wish to adjust.

TIP! If you have an SNS account set up on your phone, you can share your photo with your SNS community.

NOTE: Additional charges may apply when MMS messages are downloaded while roaming.

Camera and Video

Recording a quick video

- 1 Open the **Camera** application.
- 2 Holding the phone, point the lens towards the subject you wish to capture in your video.
- 3 Tap  once to start recording.
- 4 A red light will appear at the top right corner of the viewfinder with a timer showing the length of the video.
- 5 Tap on the screen to stop recording.

TIP!



– Tap to capture an image during recording a video.



– Tap to pause recording a video.

After recording a video

In the viewfinder, tap the video thumbnail at the top of the screen to view the last video you took.



Tap to record another video immediately.



Tap to to open the available sharing options (such as Messaging or Bluetooth) to share.



Tap to delete the video.



Tap to access the options that you with to adjust.

NOTE: Additional charges may apply when MMS messages are downloaded while roaming.

Multi-point Auto Focus

When you take a picture, the Multi-point Auto Focus (AF) function operates automatically and will allow you to see a clear image.

Gallery

Open the **Gallery** application to view albums of your pictures and videos.

1 Tap  >  > **Apps** tab > .

You can manage and share all your image and video files with Gallery.

NOTE:

- Some file formats are not supported, depending on the software installed on the device.
- Some files may not play properly, depending on how they are encoded.

Viewing pictures

Launching Gallery displays your available folders. When another application, such as E-mail, saves a picture, the download folder is automatically created to contain the picture. Likewise, capturing a screenshot automatically creates the Screenshots folder. Select a folder to open it.

Pictures are displayed by creation date in a folder. Select a picture to view it full screen. Scroll left or right to view the next or previous image.

Zooming in and out

Use one of the following methods to zoom in on an image:

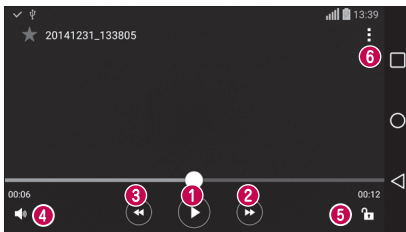
- Double-tap anywhere to zoom in.
- Spread two fingers apart on any place to zoom in. Pinch to zoom out, or double-tap to return.

Camera and Video

Playing videos

Video files show the  icon in the preview. Select a video to watch it and tap . The Videos application will launch.

- 1 Touch  > **Apps** tab > .
- 2 Select the video you want to play.



	Touch to pause/resume video playback.
	Touch to go 10 seconds forward.
	Touch to go 10 seconds backward.
	Touch to manage the video volume.
	Touch to lock/unlock a video screen.
	Tap to access the options that you wish to adjust.

To change the volume while watching a video, press the up and down volume keys on the back of the phone.

Editing photos

When viewing an photo, tap .

Deleting photos/videos

Use one of the following methods:

- In a folder, tap  and select photos/videos by ticking, and then tap on **Delete**.
- When viewing a photo, tap .

Setting as wallpaper

When viewing a photo, tap  > **Set image as** to set the image as wallpaper or assign to a contact.

NOTE:

- Some file formats are not supported, depending on the device software.
- If the file size exceeds the available memory, an error can occur when you open files.

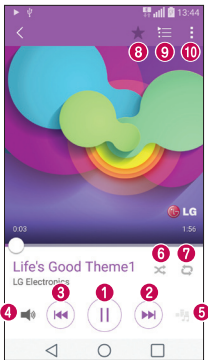
Multimedia

Music

Your phone has a built-in music player that lets you play all your favorite tracks. To access the music player, tap  >  > **Apps** tab > .

Playing a song

- 1 Tap  >  > **Apps** tab > .
- 2 Tap **Songs**.
- 3 Select the song you want to play.



1		Tap to pause playback.
		Tap to resume playback.
2		Tap to skip to the next track in the album, playlist, or shuffle. Touch and hold to fast forward.
3		Tap to restart the current track or skip to the previous track in the album, playlist, or shuffle. Touch and hold to rewind.

4		Tap to display the Volume slider bar, then adjust the playback volume on the slider bar.
5		Tap to set audio effects.
6		Tap to play the current playlist in shuffle mode (tracks are played in random order).
7		Tap to toggle through the repeat modes to repeat all songs, repeat current song, or repeat off.
8		Tap to add the song to your favourites.
9		Tap to open the current playlist.
10		Tap to access the options that you wish to adjust.

To change the volume while listening to music, press the up and down volume keys on the back side of the phone.

NOTE:

- Some file formats are not supported, depending on the device software.
- If the file size exceeds the available memory, an error can occur when you open files.

NOTE: Music file copyrights may be protected by international treaties and national copyright laws.

Therefore, it may be necessary to obtain permission or a licence to reproduce or copy music.

In some countries, national laws prohibit private copying of copyrighted material. Before downloading or copying the file, check the national laws of the relevant country concerning the use of such material.

Utilities

Clock

The Clock app to access the Alarms, Timer, World clock and Stopwatch functions. Access these functions by tapping the tabs across the top of the screen or swiping horizontally across the screen.

Tap  >  > **Apps** tab > .

Alarm

The Alarms tab allows you to set varying alarm clocks.

- 1 Open the **Clock** app, then select the **Alarm** tab.
- 2 Tap the **New alarm** icon to add a new alarm, tap an alarm time to modify that alarm or tap a current alarm icon to activate an existing alarm.

Timer

The Timer tab can be used to alert you with an audible signal when a set amount of time has passed.

- 1 Open the **Clock** app, then select the **Timer** tab.
- 2 Set the time on the digital timer. Tap the **Hour**, **Minute** or **Second** field then enter the numbers as necessary.

World clock

The World clock tab allows you to set up a list of cities to easily check current times in other time zones with a quick glance.

- 1 Open the **Clock** app, then select the **World clock** tab.
- 2 Tap the **New city** icon, search through the available cities, then tap the one you want.

Stopwatch

The Stopwatch tab allows you to use your phone as a Stopwatch.

- 1 Open the **Clock** app, then select the **World clock** tab.
- 2 Tap the **Start** button and tap the **Stop** button to stop the time.
You can use the Lap function by tapping the Lap button to record multiple milestone times within the same timing session.
- 3 Tap the **Reset** button to reset the Stopwatch or Tap the green **Resume** button to continue monitoring time.

Calculator

The Calculator app allows you to perform mathematical calculations using a standard calculator or a scientific calculator.

- 1 Tap  >  > **Apps** tab > .
- 2 Tap the number keys to enter numbers.
- 3 For simple calculations, tap the function you want to perform (+, -, x or ÷) followed by =.
- 4 For more complex calculations, tap , then tap **Scientific calculator**.
- 5 To check the history, tap the icon .

Calendar

The Calendar app allows you to track your schedule of events(That you created or that you've been invited to), organized by day, week, month, year or agenda.

- 1 Tap  >  > **Apps** tab > .
- 2 On the screen, you can find the different view types for the Calendar (Day, Week, Month, Year, Agenda).
- 3 Tap on the date for which you wish to add an event and tap .

Utilities

Voice Recorder

The Voice Recorder app records audible files for you to use in a variety of ways.

Recording a sound or voice

- 1 Tap  >  > .
- 2 Tap  to begin recording.
- 3 Tap  to end the recording.
- 4 Tap  to listen to the recording.

NOTE: Tap  to access your album. You can listen to the saved recording. The available recording time may differ from actual recording time.

Tasks

This task can be synchronized with MS Exchange account. You can create task, revise it and delete it in MS outlook or MS Office Outlook Web Access.

Synchronizing MS Exchange

- 1 Tap  >  > **Apps** tab > .
- 2 Tap **General** > **Accounts & sync** > **Add account**.
- 3 Tap **Microsoft Exchange** to create Email address and Password.
- 4 Make sure if you checkmark Sync task.

NOTE: MS Exchange may not be supported depending on email server.

Voice Search

Use this application to search webpages using voice.

- 1 Tap  >  > **Apps** tab > **Google** folder > .
- 2 Say a keyword or phrase when **Speak now** appears on the screen. Select one of the suggested keywords that appear.

NOTE: This application may not be available depending on the region or service provider.

Downloads

Use this application to see what files have been downloaded through the applications.

- Tap  >  > **Apps** tab > .

NOTE: This application may not be available depending on the region or service provider.

The Web

Browser

Use this application to browse the Internet. Browser gives you a fast, full-color world of games, music, news, sports, entertainment and much more, right on your mobile phone wherever you are and whatever you enjoy.

NOTE: Additional charges apply when connecting to these services and downloading content. Check data charges with your network provider.

1 Tap  >  > **Apps** tab > .

Using the Web toolbar

Tap slide it upwards with your finger to open.



Tap to go back one page.



Tap to go forward one page, to the page you connected to after the current one. This is the opposite of what happens when you tap , which takes you to the previous page.



Tap to go to the Home page.



Tap to add a new window.



Tap to access bookmarks.

Viewing webpages

Tap the address field, enter the web address and tap **Go**.

Opening a page

To go to new page, tap  → .

To go to another webpage, tap , scroll up or down, and tap the page to select it.

Searching the web by voice

Tap the address field, tap , speak a keyword, and then select one of the suggested keywords that appear.

NOTE: This feature may not be available depending on the region or service provider.

Bookmarks

To bookmark the current webpage, tap  > **Add to bookmarks** > **OK**.

To open a bookmarked webpage, tap  and select one.

History

Tap  > **History** to open a webpage from the list of recently-visited webpages. To clear all history, tap  → **Yes**.

Using Popup Browser

Use this feature to access the Internet without closing the current application.

While viewing content, such as contacts or notes that include web addresses, select a web address and then tap Popup Browser to open the pop-up browser. Touch and drag the browser to move it to another location.

To view the browser in full screen, tap .

To close the browser, tap .

The Web

Chrome

Use Chrome to search for information and browse webpages.

1 Tap  >  > **Apps** tab > .

NOTE: This application may not be available, depending on your region and service provider.

Viewing webpages

Tap the Address field, and then enter a web address or search criteria.

Opening a page

To go to a new page, tap  > **New tab**.

To go to another webpage, tap , scroll up or down and tap the page to select it.

Settings

This section provides an overview of items you can change using your phone's System settings menus.

Accessing the Settings menu:

Tap  > touch and hold  > **System settings**.

- or -

Tap  >  > **Apps** tab > .

Networks

< WIRELESS NETWORKS >

Airplane mode

After switching to Airplane mode, all wireless connections are disabled.

Wi-Fi

Turns on Wi-Fi to connect to available Wi-Fi networks.

Bluetooth

Turn the Bluetooth wireless feature on or off to use Bluetooth.

Mobile data

Displays the data usage and set mobile data usage limit.

Call

Voicemail – Sets up your standard voicemail settings.

Auto retry – Sets the amount of time to wait before automatically redialing a call that failed to connect. Choose from **Off**, **10 sec**, **30 sec**, and **60 sec**.

Incoming voice call pop-up – Checkmark to display an an incoming call pop-up when an app is in use. Use the pop-up to Answer, Ignore, or Ignore with message.

Decline with message – Sets the **Ignore with message** icon on the Incoming Call screen which allows you to ignore an incoming call and respond to the caller with a specified Quick text message instead. Tap to manage your Quick text messages.

Settings

Tap the **New** icon  to create a new quick message, tap a message to edit it, or tap the **Delete** icon  to delete a message.

Auto answer – Allows you to answer calls automatically when using hands-free mode.

TTY mode – Sets the TTY mode to communicate with other TTY devices.

Hearing aids – Checkmark to turn on hearing aid compatibility.

Noise suppression – Checkmark to suppress background noise on my end during a call.

Voice clarity – Checkmark to enhance voice clarity in noisy environments, allowing you to hear more clearly.

Save unknown numbers – Allows you to save unknown numbers to your contacts after a call.

Power key ends call – Checkmark to allow you to end voice calls by pressing the **Power/Lock Key**  (on the back of the phone) instead of returning to the Call screen to end the call.

DTMF tones – Sets the length of the DTMF tones. Choose **Normal** or **Long**.

Call restrictions – Allows you to restrict incoming or outgoing calls.

Call duration – Tap to check call duration(s).

Voice privacy – Checkmark to enable enhanced privacy mode.

< CONNECTIVITY >

Tethering & networks

USB tethering – Connect the USB cable to share the internet connection with the computer.

Wi-Fi hotspot – You can also use your phone to provide a mobile broadband connection. Create a hotspot and share your connection. Please "**Sharing your phone's data connection**" for more information.

Bluetooth tethering – Allows you to set your phone whether you are sharing the Internet connection or not.

Help – Tap to view help information on the Wi-Fi hotspot and Bluetooth tethering functions.

NOTE: You must set a lock screen PIN or password before you can use credential storage.

Mobile networks – Set options for data roaming, network mode & operators, access point names (APNs) etc.

VPN – Displays the list of Virtual Private Networks (VPNs) that you've previously configured. Allows you to add different types of VPNs.

Sound

< BASIC >

Sound profile

Choose the **Sound**, **Vibrate only** or **Do not disturb**.

Volume

Adjust the phone's volume settings to suit your needs and your environment.

Vibration strength

Allows you to set the vibrate strength for calls, notifications, and touch feedback.

< RINGTONES & VIBRATIONS >

Ringtone

Set the ringtone for calls. You can also add a ringtone by tapping  at the top right corner of the screen.

Notification sound

Set the notification sound. You can also add a notification sound by tapping  at the top right corner of the screen.

Sound with vibration

Checkmark to set the phone to vibrate in addition to the ringtone when you receive calls.

Settings

Vibration type

Allows you to choose the type of vibration.

< NOTIFICATIONS >

Do not disturb

Tap to set notifications. You can have no interruptions from notifications.

Lock screen

Allows you to show all notifications on the Lock screen.

Apps

Allows you to set notifications for apps.

< ADVANCED SETTINGS >

Vibrate on tap

Checkmark to vibrate when tapping the Home touch buttons and during other UI interactions.

Sound effects

Tap to set the dial pad touch tones, touch sounds, and screen lock sound.

Dialpad touch sounds – Checkmark to play tones while using dial pad.

Touch sounds – Checkmark to play sound when making screen selection.

Screen lock sound – Checkmark to play sound when locking and unlocking the screen.

Message/call voice notifications

Tap the **Message/call voice notifications** switch to toggle it On or Off. On allows your device to incoming call and message events automatically.

Display

< HOME & LOCK >

Home screen

Select Home – Set **Home** or **EasyHome** as default home.

Smart Bulletin – Tap the **Smart Bulletin** switch to toggle it On or Off. It includes an additional Home screen showing customized information. Checkmark **LG Health**, or **Smart Tips**.

Wallpaper – Sets the wallpaper to use on your Home screen. Select it from **Wallpaper gallery**, **Gallery**, **Live wallpapers**, **Multi-photo** or **Photos**.

Screen swipe effect – Sets the effect when you swipe to change screens. Choose from **Domino**, **Breeze**, **Accordion**, **Panorama**, **Carousel**, **Layer**, or **Slide**.

Allow Home screen looping – Checkmark to allow continuous Home screen scrolling (loop back to first screen after last screen).

Home backup & restore – Set to backup and restore Home app layout and wallpaper.

Help – Displays information regarding the Home screen items and functions.

Lock screen

Select screen lock – Set a screen lock type to secure your phone. Opens a set of screens that guide you through drawing a screen unlock pattern. Set **None**, **Swipe**, **Knock Code**, **Pattern**, **PIN** or **Password**.

If you have enabled a Pattern lock type when you turn on your phone or wake up the screen, you will be asked to draw your unlock pattern to unlock the screen.

Smart Lock – Checkmark to keep the screen from timing-out when the device detects your face.

Screen swipe effect – Sets the screen swipe effect options. Choose from **Water ripple**, **Light particle**, **Mosaic** and **Soda**.

Settings

NOTE: This setting name may be Pattern effect if the Screen lock is set to Pattern.

Wallpaper – Sets your Lock screen wallpaper. Select it from **Gallery** or **Wallpaper gallery**.

Shortcuts – Allows you to change the shortcuts on the **Swipe** Lock screen.

Weather animation – Checkmark to show weather animation for current location on lock screen.

Contact info for lost phone – Allows you to set the device owner's name to be displayed on the Lock screen.

Lock timer – Sets the amount of time before the screen automatically locks after the screen has timed-out.

Power button instantly locks – Checkmark to instantly lock the screen when the Power/Lock Key is pressed. This setting overrides the Security lock timer setting.

Home touch buttons

Set the Home Touch Keys displayed at the bottom of all of the screens. Set which ones are displayed, their position on the bar, and what they look like. Select the keys and order, the theme, and the background.

< FONT >

Font type

Sets the type of font used for the phone and menus.

Font size

Sets the size of the font displayed in the phone and menus.

< OTHER SCREEN SETTINGS >

Brightness

Adjusts the brightness of the screen. For best battery performance, use the dimmest comfortable brightness.

Notification LED

Tap the switch to toggle it On or Off. On will activate the LED light for the notifications you select, in the color you set for each one.

Auto-rotate screen

Checkmark to set the phone to automatically rotate the screen based on the phone orientation (portrait or landscape).

Screen timeout

Sets the amount of time before the screen times out.

Screen mode

Checkmark to allow the screen to stay on when phone detects your face.

< ADVANCED SETTINGS >

Screen-off effect

Sets the screen-off effect. Choose from **Fade out**, **Black hole** and **Retro TV**.

Settings

Daydream

Tap the Daydream switch to toggle it On or Off. On allows the set screensaver to be displayed when the phone is sleeping while docked and/or charging. Choose from

Clock and **Goole Photos**.

Auto-adjust screen tone

Checkmark to save battery power by adjusting screen brightness automatically with analysis of image colour.

General

< PERSONAL >

Language & input

Use the Language & input settings to select the language for the text on your phone and to configure the on-screen keyboard, including words you've added to its dictionary.

Language – Sets the language to use on your device.

Default – Sets the default on-screen keyboard to use when entering text.

LG Keyboard – Checkmark to select the LG Keyboard to enter data. Tap the Settings icon to change the following settings:

Google voice typing – Checkmark to select Google voice typing to enter data. Tap the Settings icon (Settings icon) to change the Google voice settings.

Text-to-speech output – Sets the preferred speech engine and speech rate (very slow to very fast). Also plays a short demonstration of speech synthesis.

Pointer speed – Sets the pointer speed on a slide bar.

Location

Turn on location service, your phone determines your approximate location using GPS, Wi-Fi and mobile networks.

Mode – Set the location mode from **High accuracy (GPS and networks)**, **Battery saving (Networks only)** and **Device sensors only (GPS only)**.

LocationServices – Tap to check **Locationservices app** information.

Camera – Checkmark to tag photos or videos with their locations.

Google Location Reporting – Select whether to turn on or off **Google Location Reporting** options. For further information, tap  > **Help & feedback**.

Accounts & sync

Permits applications to synchronize data in the background, whether or not you are actively working in them. Deselecting this setting can save battery power and lower (but not eliminate) data usage.

Cloud

Add a cloud account to quickly and easily use cloud service on LG apps.

Accessibility

Improves accessibility for users who have impaired vision, hearing, or reduced dexterity.

TalkBack – Tap the **TalkBack** switch  (at the upper-right corner of the screen) to toggle it On or Off. On allows you to set up the TalkBack function which assists people with impaired vision by providing verbal feedback. Tap **Settings** (at the bottom of the screen) to adjust the TalkBack settings.

When TalkBack is turned on, the touchscreen settings require the user to first tap an item they want to select, and then double tap the item again in order to access this feature.

NOTE: Passwords can be heard as they are entered when headsets are connected to the phone unless settings are changed to read passwords aloud without a headset.

Font size – Sets the font size. Choose from **Minimum**, **Small**, **Medium**, **Large**, **Very large**, and **Maximum**.

Invert colors – Checkmark to invert the screen color contrast for people with difficulty perceiving colors.

Color adjustment – Tap the **Color adjustment** switch  (at the upper-right corner of the screen) to toggle it On or Off. On allows you to adjust contrast and hue by dragging your finger across the screen.

Settings

Touch zoom – Tap the Touch zoom switch  (at the upper-right corner of the screen) to toggle it On or Off. On allows you to zoom in and out by triple-tapping the screen.

Message/call voice notifications – Tap the Voice notifications switch  (at the upper-right corner of the screen) to toggle it On or Off. On allows you to hear automatic spoken alerts for incoming calls and messages.

Calls: Checkmark to read caller information out loud.

Messages: Checkmark to read sender information out loud.

Read messages: Checkmark to read messages out loud.

Message/call voice notifications language: Tap to set Text-to-speech output. Choose **Google Text-to-speech Engine** or **LG TTS+**. If you choose **Google Text-to-speech Engine**, tap the **Settings** icon  to set **Language** and **Settings for Google Text-to-speech Engine**, and **Install voice data**. If you choose **LG TTS+**, tap the **Settings** icon  to set **Language** and **Settings for LG TTS+**.

Speech rate: Sets the speech rate. Choose from **Very slow**, **Slow**, **Normal**, **Fast**, and **Very fast**.

Listen to an example: Tap to play a short demonstration of Text-to-speech.

Default language status: English (United States) is fully supported.

Screen shade – Checkmark to dim the screen's backlight for a darker contrast.

Accessibility shortcut – Open accessibility options quickly on any screen.

Text-to-speech output – Tap to customize text-to-speech (TTS) settings.

Audio type – Sets the audio type. Choose **Mono** or **Stereo**.

Sound balance – Routes the sound through both the right and left channel when a headset is connected. To manually set the audio route, move the slider on the sound balance slide bar to set it.

Notification LED – Tap the **Notification LED** switch  (at the upper-right corner of the screen) to toggle it On or Off. On activates the LED light for incoming calls and notifications.

Flash alerts – Checkmark to allow a flash to blink for incoming calls and notifications.

Call reject message – Checkmark to send a message customized for those with hearing impairments when a call is rejected.

Turn off all sounds – Checkmark to turn off all sounds.

Captions – Tap the **Captions** switch  (at the upper-right corner of the screen) to toggle it On or Off. On customizes caption settings for those with hearing impairments. Set **Language**, **Font size**, and **Caption style**.

Touch feedback time – Sets the touch feedback. Choose from **Short**, **Medium**, and **Long**.

Universal touch – Tap the **Universal touch** switch  to toggle it On or Off. On allows you to replace the hardware keys with a Universal touch board  that is displayed on the touchscreen. Tap the Universal touch icon  to be able to tap its **Power** button, **Home** button, **Volume down** button, **Volume up** button, and the **more** button (**Screen capture** button, **Settings** button, and **Pinch** button). Draw a "C" ("call") on the board to automatically display the Dial tab. Draw an "M" on the board to automatically display the Messaging app. Draw a "W" ("web") on the board to automatically launch the Chrome app. Draw an "S" ("Settings") on the board to automatically display the settings app. Draw an "L" ("Lock screen") on the board to go directly to the Lock screen.

Screen timeout – Sets the screen timeout. Choose from **15 sec**, **30 sec**, **1 min**, **2 min**, **5 min**, **10 min**, **15 min**, and **Keep screen turned on**.

Touch control areas – Tap the **Touch control areas** switch  (at the upper-right corner of the screen) to toggle it On or Off. On allows you to select an area of the screen to limit touch control. Press the **Volume Down Key** and tap the **Home Key** at the same time to activate and deactivate this feature.

Auto-rotate screen – Checkmark to allow the phone to rotate the screen depending on the phone orientation (portrait or landscape).

Password voice confirmation – Checkmark so that your phone can read passwords you enter.

Power key ends call – Checkmark so that you can end voice calls by pressing the

Settings

Power/Lock Key (on the back of the phone). When enabled, pressing the **Power/Lock Key** during a call does not lock the screen.

Accessibility settings shortcut – Sets quick, easy access to selected features when you triple-tap the **Home Key**  (in the Touch Keys bar). Choose from **Off**, **Show all**, **TalkBack**, **Invert colors**, **Universal touch**, and **Accessibility settings**.

One-touch input – Checkmark to enable one-touch input. It allows each finger touch to enter letter or character on the LG keyboard.

Services – Displays the list of accessibility services installed on your phone.

One-handed operation

Dial keypad – Checkmark to enable you move the dial keypad to the right or left side of the device. Simply tap the arrow to move it to one side or the other.

LG keyboard – Checkmark to enable you move the keyboard to the right or left side of the device. Simply tap the arrow to move it to one side or the other.

Lock screen – Checkmark to enable you move the PIN Lock screen keypad to the right or left side of the device. Simply tap the arrow to move it to one side or the other.

Help – Displays information regarding one-handed operation.

Shortcut key

Get quick access to apps by pressing and holding the Volume keys when screen is off or locked. Tap the Shortcut key switch (Shortcut key switch image) at the top right corner of the screen to toggle it **On** or **Off**.

< PRIVACY >

Security

Content lock – Select lock types to lock files in Gallery. Choose from **Password** or **Pattern**.

Encrypt SD card storage – Allows you to encrypt SD card storage and keep data unavailable for other devices.

Phone Lock – Allows you to lock phone when powered on to protect data if lost or stolen.

Password typing visible – Show the last character of the hidden password as you type.

Phone administrators – View or deactivate phone administrators.

Unknown sources – Default setting to install non-Play store applications.

Verify apps – Disallow or warn before installation of apps that may cause harm.

Storage type – Hardware-backed.

Trusted credentials – Display trusted CA certificates.

Install from storage – Choose to install encrypted certificates.

Clear credentials – Remove all certificates.

Trust agents – View or deactivate Trust agents.

Screen pin – You can enable your device to only show a certain app's screen using screen pin.

< SMART FUNCTIONS >

Gestures

Answer an incoming call – Checkmark to enable you to bring the phone to your ear to automatically answer the incoming call.

Fade out ringtone – Checkmark to enable you to pick up the phone from the flat surface to fade out the incoming call ringtone.

Silence incoming calls – Checkmark to enable you to flip the phone to silence incoming calls.

Snooze or stop alarm – Checkmark to enable you to simply flip the device to snooze or stop the alarm.

Pause video – Checkmark to enable you to simply flip the device to pause the currently playing video.

Help – Opens a help guide on how to use the Gestures features of your device.

Motion sensor calibration – Allows you to improve the accuracy of the tilt and speed of the sensor.

Settings

QuickCircle case

Activate to make features, such as music, weather, and clock, available in small view when using the QuickCircle case.

Dual window

The two split-screen can be viewed at the same time.

Split view – Checkmark to tap a link on the full screen or attachment from emails to run dual windows automatically.

Help – Display tips for using dual window.

< PHONE MANAGEMENT >

Date & time

Use **Date & time** settings to set how dates will be displayed. You can also use these settings to set your own time and time zone rather than obtaining the current time from the mobile network.

Storage

INTERNAL STORAGE – View the internal storage usage.

Battery

BATTERY INFORMATION – The Battery charge information is displayed on a battery graphic along with the percentage of the remaining charge and its status.

Touch the Battery charge icon to display the Battery use screen to see battery usage level and battery use details. It displays which components and applications are using the most battery power. Tap one of the entries to see more detailed information.

Battery usage – View the battery usage.

Battery percentage on status bar – Checkmark to display the battery level percentage on the Status Bar next to the battery icon.

BATTERY SAVER – Tap the Battery saver switch to toggle it On or Off. Tap Battery saver to access the following settings:

TURN BATTERY SAVER ON – Sets the battery charge percent level that will automatically turn on Battery saver. Choose from Immediately, 5% battery and 15% battery.

Help – Display battery saving items information.

Smart cleaning

Display the space in use and free in your phone. Tap  at the top right corner of the screen to set notification interval and idle time period.

Apps

View and manage your applications.

Default message app

Set **Messaging** or **Hangouts** as default app.

Backup & reset

Change the settings for managing your settings and data.

Backup my data – Set to backup your settings and application data to the Google server.

Backup account – Set to backup your account.

Automatic restore – Set to restore your settings and application data when the applications are reinstalled on your device.

LG Backup service – Backs up all information on the device and restores it in the event of data loss or replacement.

Factory data reset – Reset your settings to the factory default values and delete all your data. If you reset the phone this way, you are prompted to re-enter the same information as when you first started Android.

Printing

Cloud Print – Tap to searching for printers. Tap the Cloud Print switch at the top right corner of the screen to toggle it **ON** or **OFF**.

About phone

View legal information and check your phone status and software version.

Phone software update

Phone software update

LG Mobile phone software update from the Internet

For more information about using this function, please visit <http://www.lg.com/common/index.jsp> → select your country and language.

This feature allows you to conveniently update the firmware on your phone to a newer version from the Internet without needing to visit a service center. This feature will only be available if and when LG makes a newer firmware version available for your device. Because the mobile phone firmware update requires the user's full attention for the duration of the update process, please make sure you check all instructions and notes that appear at each step before proceeding. Please note that removing the USB data cable during the upgrade may seriously damage your mobile phone.

NOTE: LG reserves the right to make firmware updates available only for selected models at its own discretion and does not guarantee the availability of the newer version of the firmware for all handset models.

LG Mobile Phone software update via Over-the-Air (OTA)

This feature allows you to conveniently update your phone's software to a newer version via OTA, without connecting using a USB data cable. This feature will only be available if and when LG makes a newer firmware version available for your device. You should first check the software version on your mobile phone: **Settings > General tab > About phone > Update Center > Software Update > Check now for update.**

NOTE: Your personal data from internal phone storage—including information about your Google account and any other accounts, your system/application data and settings, any downloaded applications and your DRM licence—might be lost in the process of updating your phone's software. Therefore, LG recommends that you backup your personal data before updating your phone's software. LG does not take responsibility for any loss of personal data.

NOTE: This feature depends on your network service provider, region and country.

About this user guide

About this user guide

- Before using your device, please carefully read this manual. This will ensure that you use your phone safely and correctly.
- Some of the images and screenshots provided in this guide may appear differently on your phone.
- Your content may differ from the final product, or from software supplied by service providers or carriers. This content may be subject to change without prior notice. For the latest version of this manual, please visit the LG website at www.lg.com.
- Your phone's applications and their functions may vary by country, region, or hardware specifications. LG cannot be held liable for any performance issues resulting from the use of applications developed by providers other than LG.
- LG cannot be held liable for performance or incompatibility issues resulting from edited registry settings being edited or operating system software being modified. Any attempt to customize your operating system may cause the device or its applications to not work as they should.
- Software, audio, wallpaper, images, and other media supplied with your device are licensed for limited use. If you extract and use these materials for commercial or other purposes is, you may be infringing copyright laws. As a user, you are fully are entirely responsible for the illegal use of media.
- Additional charges may be applied for data services, such as messaging, uploading and downloading, auto-syncing, or using location services. To avoid additional charges, select a data plan to is suitable for your needs. Contact your service provider to obtain additional details.

Trademarks

- LG and the LG logo are registered trademarks of LG Electronics.
- All other trademarks and copyrights are the property of their respective owners.

Troubleshooting

This chapter lists some problems you might encounter when using your phone. Some problems require you to call your service provider, but most are easy to fix yourself.

Message	Possible causes	Possible corrective measures
SIM or USIM card error	There is no SIM or USIM card in the phone or it is inserted incorrectly.	Make sure that the SIM or USIM card is correctly inserted.
No network connection/ Dropped network	Signal is weak or you are outside the carrier network.	Move toward a window or into an open area. Check the network operator coverage map.
	Operator applied new services.	Check whether the SIM or USIM card is more than 6~12 months old. If so, change your SIM or USIM card at your network provider's nearest branch. Contact your service provider.
Codes do not match	To change a security code, you will need to confirm the new code by re-entering it.	If you forget the code, contact your service provider.
	The two codes you have entered do not match.	

Troubleshooting

Message	Possible causes	Possible corrective measures
No applications can be set	Not supported by service provider or registration required.	Contact your service provider.
Calls not available	Dialling error	New network not authorized.
	New SIM or USIM card inserted.	Check for new restrictions.
	Pre-paid charge limit reached.	Contact service provider or reset limit with PIN2.
Phone cannot be switched on	On/Off key pressed too briefly.	Press the On/Off key for at least two seconds.
	Battery is not charged.	Charge battery. Check the charging indicator on the display.

Message	Possible causes	Possible corrective measures
Charging error	Battery is not charged.	Charge battery.
	Outside temperature is too hot or cold.	Make sure phone is charging at a normal temperature.
	Contact problem	Check the charger and its connection to the phone.
	No voltage	Plug the charger into a different socket.
	Charger defective	Replace the charger.
	Wrong charger	Use only original LG accessories.
Number not allowed	The Fixed dialling number function is on.	Check the Settings menu and turn the function off.
Impossible to receive / send SMS & photos	Memory full	Delete some messages from your phone.
Files do not open	Unsupported file format	Check the supported file formats.

Troubleshooting

Message	Possible causes	Possible corrective measures
The screen does not turn on when I receive a call.	Proximity sensor problem	If you use a protection tape or case, make sure it has not covered the area around the proximity sensor. Make sure that the area around the proximity sensor is clean.
No sound	Vibration mode	Check the settings status in the sound menu to make sure you are not in vibration or silent mode.
Hangs up or freezes	Intermittent software problem	Try to perform a software update via the website.

Category Sub-Category	Question	Answer
BT Bluetooth Devices	What are the functions available via Bluetooth	You can connect a Bluetooth audio device such as a Stereo/Mono headset or Car Kit.
Data Contacts Backup	How can I backup Contacts?	The Contacts data can be synchronized between your phone and Gmail™.
Data Synchronization	Is it possible to set up one-way sync with Gmail?	Only two-way synchronization is available.
Data Synchronization	Is it possible to synchronize all email folders?	The Inbox is automatically synchronized. You can view other folders by tapping the ☐ and select Folders to choose a folder.
Google™ Service Gmail Log-In	Do I have to log into Gmail whenever I want to access Gmail?	Once you have logged into Gmail, no need to log into Gmail again.
Google™ Service Google Account	Is it possible to filter emails?	No, email filtering is not supported via the phone.
Phone Function Email	What happens when I execute another application while writing an email?	Your email will automatically be saved as a draft.

FAQ

Category Sub-Category	Question	Answer
Phone Function Ringtone	Is there a file size limitation for when I want to use MP3 file as ring tone?	There is no file size limitation.
Phone Function Message Time	My phone does not display the time of receipt for messages older than 24 hrs. How can I change this?	You will only be able to see the times for messages received the same day.
Phone Function Navigation	Is it possible to install another navigation application on my phone?	Any application that is available at Play Store™ and is compatible with the hardware can be installed and used.
Phone Function Synchronisation	Is it possible to synchronize my contacts from all my email accounts?	Only Gmail and MS Exchange server (company email server) contacts can be synchronized.
Phone Function Wait and Pause	Is it possible to save a contact with Wait and Pause in the numbers?	If you transferred a contact with the W & P functions saved into the number, you will not be able to use those features. You will need to re-save each number. How to save with Wait and Pause: 1. From the Home screen, tap the . 2. Dial the number, then tap the . 3. Tap Add 2-sec pause or Add wait.

Category Sub- Category	Question	Answer
Phone Function Security	What are the phone's security functions?	You are able to set the phone to require that an Unlock Pattern be entered before the phone can be accessed or used.
Phone Function Unlock Pattern	How do I create the Unlock Pattern?	1. From the Home screen, tap and hold . 2. Tap System settings > Display tab > Lock screen. 3. Tap Select screen lock > Pattern. The first time you do this, a short tutorial about creating an Unlock Pattern will appear. 4. Set up by drawing your pattern once, and once again for confirmation. Precautions to take when using the pattern lock. It is very important to remember the unlock pattern you set. You will not be able to access your phone if you use an incorrect pattern five times. You have five chances to enter your unlock pattern, PIN or password. If you have used all 5 opportunities, you can try again after 30 seconds. (Or, if you preset the backup PIN, you can use the backup PIN code to unlock the pattern.)

Category Sub- Category	Question	Answer
Phone Function Unlock Pattern	What should I do if I forget the unlock pattern and I didn't create my Google account on the phone?	If you have forgotten your pattern: If you logged into your Google account on the phone but failed to enter the correct pattern 5 times, tap the forgot pattern button. You are then required to log in with your Google account to unlock your phone. If you have not created a Google account on the phone or you have forgotten it, you will have to perform a hard reset. Caution: If you perform a factory reset, all user applications and user data will be deleted. Please remember to backup any important data before performing a factory reset.
Phone Function Memory	Will I know when my memory is full?	Yes, you will receive a notification.
Phone Function Language Support	Is it possible to change my phone's language?	The phone has multilingual capabilities. To change the language: 1. From the Home screen, tap and hold  and tap System settings. 2. Tap General tab > Language & input > Language. 3. Tap the desired language.

Category Sub- Category	Question	Answer
Phone Function VPN	How do I set up a VPN?	VPN access configuration is different for each company. To configure VPN access from your phone, you must obtain the details from your company's network administrator.
Phone Function Screen time out	My screen turns off after only 15 seconds. How can I change the amount of time for the backlight to turn off?	1. From the Home screen, tap and hold . 2. Tap System settings > Display. 3. Tap Screen timeout. 4. Tap the preferred screen backlight timeout time.
Phone Function Wi-Fi & mobile network	When Wi-Fi and mobile network are both available, which service will my phone use?	When using data, your phone may default to the Wi-Fi connection (if Wi-Fi connectivity on your phone is set to On). However, there will be no notification when your phone switches from one to the other. To know which data connection is being used, view the mobile network or Wi-Fi icon at the top of your screen.
Phone Function Home screen	Is it possible to remove an application from the Home screen?	Yes. Just touch and hold the icon until the dustbin icon appears at the top and center of the screen. Then, without lifting your finger, drag the icon to the trash can.

Category Sub- Category	Question	Answer
Phone Function Application	I downloaded an application and it causes a lot of errors. How do I remove it?	1. From the Home screen, tap and hold . 2. Tap System settings > General > Apps > DOWNLOADED. 3. Tap the application, then tap Uninstall.
Phone Function Charger	Is it possible to charge my phone using a USB data cable without installing the necessary USB driver?	Yes, the phone will be charged by the USB cable regardless of whether the necessary drivers are installed or not.
Phone Function Alarm	Can I use music files for my alarm?	Yes. After saving a music file as a ringtone, you can use it as your alarm. 1. Touch and hold a song in a library list. In the menu that opens, tap Set as ringtone > Phone ringtone or Contact ringtone. 2. In the alarm clock setting screen, select the song as a ringtone.
Phone Function Alarm	Will my alarm be audible or will it go off if the phone is turned off?	No, this is not supported.
Phone Function Alarm	If my ringer volume is set to Off or Vibrate, will I hear my alarm?	Your alarm is programmed to be audible even in these scenarios.

Category Sub- Category	Question	Answer
Phone Function Display	I tried to make the brightness of screen to the max but it still feels dark. How can i change the brightness of screen more brightly?	1. From the Home screen, tap and hold . 2. Tap System settings > Display > Auto-adjust screen tone. 3. Tap the check box to cancel the function.
Recovery Solution Hard Reset (Factory Reset)	How can I perform a factory reset if I can't access the phone's setting menu?	If your phone does not restore to its original condition, use a hard reset (factory reset) to initialize it.

Safety

HAC disclosure statement

This phone has been tested and rated for use with hearing aids for some of the wireless technologies that it uses. However, there may be some newer wireless technologies used in this phone that have not been tested yet for use with hearing aids. It is important to try the different features of this phone thoroughly and in different locations, using your hearing aid or cochlear implant, to determine if you hear any interfering noise. Consult your service provider or the manufacturer of this phone for information on hearing aid compatibility. If you have questions about return or exchange policies, consult your service provider or phone retailer.

FCC RF Exposure Information

WARNING! Read this information before operating the phone.

In August 1996, the Federal Communications Commission (FCC) of the United States, with its action in Report and Order FCC 96-326, adopted an updated safety standard for human exposure to Radio Frequency (RF) electromagnetic energy emitted by FCC regulated transmitters. Those guidelines are consistent with the safety standard previously set by both U.S. and international standards bodies. The design of this phone complies with the FCC guidelines and these international standards.

Bodily Contact During Operation

This device was tested for typical use with the back of the phone kept 0.39 inches (1.0 cm) from the body. To comply with FCC RF exposure requirements, a minimum separation distance of 0.39 inches (1.0 cm) must be maintained between the user's body and the back of the phone, including the antenna, whether extended or retracted. Any Party belt-clips, holsters, and similar accessories containing metallic components may not be used. Avoid the use of accessories that cannot maintain 0.39 inches (1.0 cm) distance between the user's body and the back of the phone and have not been tested for compliance with FCC RF exposure limits.

Caution

Use only the supplied antenna. Use of unauthorized antennas (or modifications to the antenna) could impair call quality, damage the phone, void your warranty and/or violate FCC regulations. Don't use the phone with a damaged antenna. A damaged antenna could cause a minor skin burn. Contact your local dealer for a replacement antenna.

Consumer Information About Radio Frequency Emissions

Your wireless phone, which contains a radio transmitter and receiver, emits radio frequency energy during use. The following consumer information addresses commonly asked questions about the health effects of wireless phones.

Are wireless phones safe?

Scientific research on the subject of wireless phones and radio frequency ("RF") energy has been conducted worldwide for many years, and continues. In the United States, the Food and Drug Administration ("FDA") and the Federal Communications Commission ("FCC") set policies and procedures for wireless phones. The FDA issued a website publication on health issues related to cell phone usage where it states, "The scientific community at large ...believes that the weight of scientific evidence does not show

an association between exposure to radiofrequency (RF) from cell phones and adverse health outcomes. Still the scientific community does recommend conducting additional research to address gaps in knowledge. That research is being conducted around the world and FDA continues to monitor developments in this field. You can access the joint FDA/FCC website at <http://www.fda.gov> (under “c” in the subject index, select Cell Phones > Research). You can also contact the FDA toll-free at (888) 463-6332 or (888) INFO-FDA. In June 2000, the FDA entered into a cooperative research and development agreement through which additional scientific research is being conducted. The FCC issued its own website publication stating that “there is no scientific evidence that proves that wireless phone usage can lead to cancer or a variety of other problems, including headaches, dizziness or memory loss.” This publication is available at <http://www.fcc.gov/cgb/cellular.html> or through the FCC at (888) 225-5322 or (888) CALL-FCC.

What does “SAR” mean?

In 1996, the FCC, working with the FDA, the U.S. Environmental Protection Agency, and other agencies, established RF exposure safety guidelines for wireless phones in the United States. Before a wireless phone model is available for sale to the public, it must be tested by the manufacturer and certified to the FCC that it does not exceed limits established by the FCC. One of these limits is expressed as a Specific Absorption Rate, or “SAR.” SAR is a measure of the rate of absorption of RF energy in the body. Tests for SAR are conducted with the phone transmitting at its highest power level in all tested frequency bands. Since 1996, the FCC has required that the SAR of handheld wireless phones not exceed 1.6 watts per kilogram, averaged over one gram of tissue. Although the SAR is determined at the highest power level, the actual SAR value of a wireless phone while operating can be less than the reported SAR value. This is because the SAR value may vary from call to call, depending on factors such as proximity to a cell site, the proximity of the phone to the body while in use, and the use of hands-free devices. For more information about SARs, see the FCC’s OET

Bulletins 56 and 65 at http://www.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins or visit the Cellular Telecommunications Industry Association website at

http://www.ctia.org/consumer_info/index.cfm/AID/10371. You may also wish to contact the manufacturer of your phone.

Can I minimize my RF exposure?

If you are concerned about RF, there are several simple steps you can take to minimize your RF exposure. You can, of course, reduce your talk time. You can place more distance between your body and the source of the RF, as the exposure level drops off dramatically with distance. The FDA/FCC website states that “hands-free kits can be used with wireless phones for convenience and comfort. These systems reduce the absorption of RF energy in the head because the phone, which is the source of the RF emissions, will not be placed against the head. On the other hand, if the phone is mounted against the waist or other part of the body during use, then that part of the body will absorb more RF energy. Wireless phones marketed in the U.S. are required to meet safety requirements regardless of whether they are used against the head or against the body. Either configuration should result in compliance with the safety limit.” Also, if you use your wireless phone while in a car, you can use a phone with an antenna on the outside of the vehicle. You should also read and follow your wireless phone manufacturer’s instructions for the safe operation of your phone.

Do wireless phones pose any special risks to children?

The FDA/FCC website states that “the scientific evidence does not show a danger to users of wireless communication devices, including children.” The FDA/FCC website further states that “some groups sponsored by other national governments have advised that children be discouraged from using wireless phones at all”. For example, the Stewart Report from the United Kingdom [“UK”] made such a recommendation in December 2000. In this report a group of independent experts noted that no evidence exists that using a cell phone causes brain tumors or other ill effects. [The UK’s] recommendation to limit cell phone use by children was strictly precautionary; it was not based on scientific evidence that any health hazard exists. A copy of the UK’s leaflet is available at <http://www.dh.gov.uk> (search “mobile”), or you can write to: NRPB, Chilton, Didcot, Oxon OX11 0RQ, United Kingdom. Copies of the UK’s annual reports on mobile phones and RF are available online at www.iegmp.org.uk and <http://www.>

Safety

hpa.org.uk/radiation/ (search “mobile”). Parents who wish to reduce their children’s RF exposure may choose to restrict their children’s wireless phone use.

Where can I get further information about RF emissions?

For further information, see the following additional resources (websites current as of April 2005):

U.S. Food and Drug Administration

FDA Consumer magazine November-December 2000

Telephone: (888) INFO-FDA

<http://www.fda.gov> (Under “c” in the subject index, select Cell Phones > Research.)

U.S. Federal Communications Commission

445 12th Street, S.W. Washington, D.C. 20554

Telephone: (888) 225-5322

<http://www.fcc.gov/oet/rfsafety>

Independent Expert Group on Mobile Phones

<http://www.iegmp.org.uk>

Royal Society of Canada Expert Panels on Potential Health Risks of Radio Frequency Fields from Wireless Telecommunication Devices

283 Sparks Street Ottawa, Ontario K1R 7X9 Canada

Telephone: (613) 991-6990

http://www.rsc.ca/index.php?page=Expert_Panels_RF&Lang_id=120

World Health Organization

Avenue Appia 20 1211 Geneva 27 Switzerland

Telephone: 011 41 22 791 21 11

<http://www.who.int/mediacentre/factsheets/fs193/en/>

International Commission on Non-Ionizing Radiation Protection

c/o Bundesamt für Strahlenschutz

Ingolstaedter Landstr. 1

85764 Oberschleissheim Germany

Telephone: 011 49 1888 333 2156

<http://www.icnirp.de>

American National Standards Institute

1819 L Street, N.W., 6th Floor Washington, D.C. 20036

Telephone: (202) 293-8020

<http://www.ansi.org>

National Council on Radiation Protection and Measurements

7910 Woodmont Avenue, Suite 800 Bethesda, MD 20814-3095

Telephone: (301) 657-2652

<http://www.ncrponline.org>

Engineering in Medicine and Biology Society, Committee on Man and Radiation (COMAR) of the Institute of Electrical and Electronics Engineers

<http://ewh.ieee.org/soc/embs/comar/>

Consumer Information on SAR

(Specific Absorption Rate)

This model phone meets the Government's requirements for exposure to radio waves. Your wireless phone is a radio transmitter and receiver. It is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission (FCC) of the U.S. Government. These FCC exposure limits are derived from the recommendations of two expert organizations, the National Council on Radiation Protection and Measurement (NCRP) and the Institute of Electrical and Electronics Engineers (IEEE). In both cases, the recommendations were developed by scientific and engineering experts drawn from industry, government, and academia after extensive reviews of the scientific literature related to the biological effects of RF energy. The exposure limit for wireless mobile phones employs a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR is a measure of the rate of absorption of RF energy by the human body expressed in units of watts

Safety

per kilogram (W/kg). The FCC requires wireless phones to comply with a safety limit of 1.6 watts per kilogram (1.6 W/kg). The FCC exposure limit incorporates a substantial margin of safety to give additional protection to the public and to account for any variations in measurements. Tests for SAR are conducted using standard operating positions specified by the FCC with the phone transmitting at its highest certified power level in all tested frequency bands. Although SAR is determined at the highest certified power level, the actual SAR level of the phone while operating can be well below the maximum value. Because the phone is designed to operate at multiple power levels to use only the power required to reach the network, in general, the closer you are to a wireless base station antenna, the lower the power output. Before a phone model is available for sale to the public, it must be tested and certified to the FCC that it does not exceed the limit established by the government adopted requirement for safe exposure. The tests are performed in positions and locations (e.g., at the ear and worn on the body) as required by the FCC for each model. The FCC has granted an Equipment Authorization for this model phone with all reported SAR levels evaluated as in compliance with the FCC RF emission guidelines. While there may be differences between SAR levels of various phones and at various positions, they all meet the government requirement for safe exposure. SAR information on this model phone is on file with the FCC and can be found under the Display Grant section of <http://www.fcc.gov/oet/ea/fccid/> after searching on FCC ID ZNFUS550. To find information that pertains to a particular model phone, this site uses the phone FCC ID number which is usually printed somewhere on the case of the phone. Sometimes it may be necessary to remove the battery pack to find the number. Once you have the FCC ID number for a particular phone, follow the instructions on the website and it should provide values for typical or maximum SAR for a particular phone. Additional information on Specific Absorption Rates (SAR) can be

found on the Cellular Telecommunications Industry Association (CTIA) website at <http://www.ctia.org/>

* In the United States and Canada, the SAR limit for mobile phones used by the public is 1.6 watts/kg (W/kg) averaged over one gram of tissue. The standard incorporates a substantial margin of safety to give additional protection for the public and to account for any variations in measurements.

FCC Hearing-Aid Compatibility (HAC) Regulations for Wireless Devices

On July 10, 2003, the U.S. Federal Communications Commission (FCC) Report and Order in WT Docket 01-309 modified the exception of wireless phones under the Hearing Aid Compatibility Act of 1988 (HAC Act) to require digital wireless phones be compatible with hearing-aids. The intent of the HAC Act is to ensure reasonable access to telecommunications services for persons with hearing disabilities. While some wireless phones are used near some hearing devices (hearing aids and cochlear implants), users may detect a buzzing, humming, or whining noise. Some hearing devices are more immune than others to this interference noise, and phones also vary in the amount of interference they generate. The wireless telephone industry has developed a rating system for wireless phones, to assist hearing device users to find phones that may be compatible with their hearing devices. Not all phones have been rated. Phones that are rated have the rating on their box or a label located on the box. The ratings are not guarantees. Results will vary depending on the user's hearing device and hearing loss. If your hearing device happens to be vulnerable to interference, you may not be able to use a rated phone successfully. Trying out the phone with your hearing device is the best way to evaluate it for your personal needs.

M-Ratings: Phones rated M3 or M4 meet FCC requirements and are likely to generate less interference to hearing devices than phones that are not labeled. M4 is the better/higher of the two ratings.

Safety

T-Ratings: Phones rated T3 or T4 meet FCC requirements and are likely to generate less interference to hearing devices than phones that are not labeled. T4 is the better/higher of the two ratings.

Hearing devices may also be rated. Your hearing device manufacturer or hearing health professional may help you find this rating. Higher ratings mean that the hearing device is relatively immune to interference noise. The hearing aid and wireless phone rating values are then added together. A sum of 5 is considered acceptable for normal use. A sum of 6 is considered for best use.



In the above example, if a hearing aid meets the M2 level rating and the wireless phone meets the M3 level rating, the sum of the two values equal M5. This should provide the hearing aid user with “normal usage” while using their hearing aid with the particular wireless phone. “Normal usage” in this context is defined as a signal quality that’s acceptable for normal operation. When you’re talking on a cell phone, it’s recommended that you turn the BT or WLAN mode off for HAC. The M mark is intended to be synonymous with the U mark. The T mark is intended to be synonymous with the UT mark. The M and T marks are recommended by the Alliance for Telecommunications Industries Solutions (ATIS). The U and UT marks are referenced in Section 20.19 of the FCC Rules. The HAC rating and measurement procedure are described in the American National Standards Institute (ANSI) C63.19 standard. To ensure that the Hearing Aid Compatibility rating for your phone is maintained, secondary transmitters such as Bluetooth and WLAN components must be disabled during a call. When you’re talking over the cell phone, it’s recommended you’d turn the BT (Bluetooth) or WLAN mode off for HAC. This phone has been tested and rated for use with hearing aids for some of the wireless technologies that it uses. However, there may be some newer wireless technologies used in this phone that have not been tested yet for use with hearing aids. It is important to try the different features of this phone thoroughly and in different

locations, using your hearing aid or cochlear implant, to determine if you hear any interfering noise. Consult your service provider or the manufacturer of this phone for information on hearing aid compatibility. If you have questions about return or exchange policies, consult your service provider or phone retailer.

For information about hearing aids and digital wireless phones

Wireless Phones and Hearing Aid Accessibility

<http://www.accesswireless.org/>

Gallaudet University, RERC

<http://tap.gallaudet.edu/Voice/>

FCC Hearing Aid Compatibility and Volume Control

<http://www.fcc.gov/cgb/dro/hearing.html>

The Hearing Aid Compatibility FCC Order

http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-03-168A1.pdf

Hearing Loss Association of America [HLAA]

<http://hearingloss.org/content/telephones-and-mobile-devices>

Caution: Avoid potential hearing loss.

Prolonged exposure to loud sounds (including music) is the most common cause of preventable hearing loss. Some scientific research suggests that using portable audio devices, such as portable music players and cellular telephones, at high volume settings for long durations may lead to permanent noise-induced hearing loss. This includes the use of headphones (including headsets, earbuds and Bluetooth® or other wireless devices). Exposure to very loud sound has also been associated in some studies with tinnitus (a ringing in the ear), hypersensitivity to sound and distorted hearing. Individual susceptibility to noise-induced hearing loss and other potential hearing problems varies. The amount of sound produced by a portable audio device varies depending on the nature of the sound, the device, the device settings and the headphones. You should follow some commonsense recommendations when using any portable audio device:

Safety

- Set the volume in a quiet environment and select the lowest volume at which you can hear adequately.
- When using headphones, turn the volume down if you cannot hear the people speaking near you or if the person sitting next to you can hear what you are listening to.
- Do not turn the volume up to block out noisy surroundings. If you choose to listen to your portable device in a noisy environment, use noise-cancelling headphones to block out background environmental noise.
- Limit the amount of time you listen. As the volume increases, less time is required before your hearing could be affected.
- Avoid using headphones after exposure to extremely loud noises, such as rock concerts, that might cause temporary hearing loss. Temporary hearing loss might cause unsafe volumes to sound normal.
- Do not listen at any volume that causes you discomfort. If you experience ringing in your ears, hear muffled speech or experience any temporary hearing difficulty after listening to your portable audio device, discontinue use and consult your doctor.

TIA Safety Information

The following is the complete TIA Safety Information for wireless handheld phones.

Exposure to Radio Frequency Signal

Your wireless handheld portable phone is a low power radio transmitter and receiver. When ON, it receives and sends out Radio Frequency (RF) signals.

In August, 1996, the Federal Communications Commissions (FCC) adopted RF exposure guidelines with safety levels for handheld wireless phones. Those guidelines are consistent with the safety standards previously set by both U.S. and international standards bodies:

ANSI C95.1 (1992) *

NCRP Report 86 (1986)

ICNIRP (1996)

* American National Standards Institute; National Council on Radiation Protection and Measurements; International Commission on Non-Ionizing Radiation Protection Those standards were based on comprehensive and periodic evaluations of the relevant scientific literature. For example, over 120 scientists, engineers, and physicians from universities, government health agencies, and industry reviewed the available body of research to develop the ANSI Standard (C95.1). The design of your phone complies with the FCC guidelines (and those standards).

Antenna Care

Use only the supplied or an approved replacement antenna. Unauthorized antennas, modifications, or attachments could damage the phone and may violate FCC regulations.

Tips on Efficient Operation

For your phone to operate most efficiently:

Don't touch the antenna unnecessarily when the phone is in use. Contact with the antenna affects call quality and may cause the phone to operate at a higher power level than otherwise needed.

Electronic Devices

Most modern electronic equipment is shielded from RF signals. However, certain electronic equipment may not be shielded against the RF signals from your wireless phone.

Pacemakers

The Health Industry Manufacturers Association recommends that a minimum separation of six (6) inches be maintained between a handheld wireless phone and a pacemaker to avoid potential interference with the pacemaker. These recommendations are consistent with the independent research by and recommendations of Wireless Technology Research. Persons with pacemakers.

- Should ALWAYS keep the phone more than six (6) inches from their pacemaker when the phone is turned ON;
- Should not carry the phone in a breast pocket;

Safety

- Should use the ear opposite the pacemaker to minimize the potential for interference;
- Should turn the phone OFF immediately if there is any reason to suspect that interference is taking place.

Hearing Aids

Some digital wireless phones may interfere with some hearing aids. In the event of such interference, you may want to consult your service provider (or call the customer service line to discuss alternatives).

Other Medical Devices

If you use any other personal medical device, consult the manufacturer of your device to determine if it is adequately shielded from external RF energy. Your physician may be able to assist you in obtaining this information.

Health Care Facilities

Turn your phone OFF in health care facilities when any regulations posted in these areas instruct you to do so. Hospitals or health care facilities may use equipment that could be sensitive to external RF energy.

Vehicles

RF signals may affect improperly installed or inadequately shielded electronic systems in motor vehicles. Check with the manufacturer or its representative regarding your vehicle. You should also consult the manufacturer of any equipment that has been added to your vehicle.

Posted Facilities

Turn your phone OFF in any facility where posted notices so require.

Aircraft

FCC regulations prohibit using your phone while in the air. Switch OFF your phone before boarding an aircraft.

Blasting Areas

To avoid interfering with blasting operations, turn your phone OFF when in a “blasting area” or in areas posted: “Turn off two-way radio”. Obey all signs and instructions.

Potentially Explosive Atmosphere

Turn your phone OFF when in any area with a potentially explosive atmosphere and obey all signs and instructions. Sparks in such areas could cause an explosion or fire resulting in bodily injury or even death.

Areas with a potentially explosive atmosphere are often, but not always marked clearly. Potential areas may include: fueling areas (such as gasoline stations); below deck on boats; fuel or chemical transfer or storage facilities; vehicles using liquefied petroleum gas (such as propane or butane); areas where the air contains chemicals or particles (such as grain, dust, or metal powders); and any other area where you would normally be advised to turn off your vehicle engine.

For Vehicles Equipped with an Air Bag

An air bag inflates with great force. DO NOT place objects, including either installed or portable wireless equipment, in the area over the air bag or in the air bag deployment area. If in-vehicle wireless equipment is improperly installed and the air bag inflates, serious injury could result.

Part 15.19 statement

This device complies with part 15 of FCC rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Part 15.105 statement

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not

Safety

occur in a particular installation. If you experience interference with reception (e.g., television), determine if this equipment is causing the harmful interference by turning the equipment off and then back on to see if the interference is affected. If necessary, try correcting the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Part 15.21 statement

Change or Modifications that are not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Safety Information

Please read and observe the following information for safe and proper use of your phone and to prevent damage.

Caution

Charger and Adapter Safety

- The charger and adapter are intended for indoor use only.
- Insert the battery pack charger vertically into the wall power socket.
- Only use the LG-approved battery charger. Otherwise, you may cause serious damage to your phone.
- Use the correct adapter for your phone when using the battery pack charger abroad.

Battery Information and Care

- Always unplug the charger from the wall socket after the phone is fully charged to save unnecessary power consumption of the charger.

- Please read the manual of proper installation and removal of the battery.
- Please read the manual of specified charger about charging method.
- Do not damage the power cord by bending, twisting, or heating. Do not use the plug if it is loose as it may cause electric shock or fire. Do not place any heavy items on the power cord.
- Do not allow the power cord to be crimped as it may cause electric shock or fire.
- Unplug the power cord prior to cleaning your phone, and clean the power plug pin when it's dirty. When using the power plug, ensure that it's firmly connected. If not, it may cause excessive heat or fire. If you put your phone in a pocket or bag without covering the receptacle of the phone (power plug pin), metallic articles (such as a coin, paperclip or pen) may short-circuit the phone. Always cover the receptacle when not in use.
- Recharge the battery after long periods of non-use to maximize battery life. Battery life will vary due to usage pattern and environmental conditions.
- Please use only an LG-approved charging accessory to charge your LG phone. Improper handling of the charging port, as well as the use of an incompatible charger, may cause damage to your phone and void the warranty.
- Charging temperature range is regulated between 32°F (0°C) and 113°F (45°C). Do not charge the battery out of recommended temperature range. Charging out of recommended range might cause the generating heat or serious damage of battery. And also, it might cause the deterioration of battery's characteristics and cycle life.
- Do not use or leave the battery under the blazing sun or in heated car by sunshine. The battery may generate heat, smoke or flame. And also, it might cause the deterioration of battery's characteristics or cycle life.
- The battery pack has protection circuit to avoid the danger. Do not use nearby the place where generates static electricity more than 100V which gives damage to the protection circuit. If the protection circuit were broken, the battery would generate smoke, rupture or flame.
- When the battery has rust, bad smell or something abnormal at first-time-using, do

Safety

- not use the equipment and go to bring the battery to the shop which it was bought.
- In case younger children use the battery, their parents should teach them how to use batteries according to the manual with care.
- If the skin or cloth is smeared with liquid from the battery, wash with fresh water. It may cause the skin inflammation. Remove and do not use the battery.
- Do not handle the phone with wet hands while it is being charged. It may cause an electric shock or seriously damage your phone.
- Do not place or answer calls while charging the phone as it may short-circuit the phone and/or cause electric shock or fire.
- The charger and adapter are intended for indoor use only.
- Insert the battery pack charger vertically into the wall power socket.
- Only use the LG-approved battery charger. Otherwise, you may cause serious damage to your phone and risk of overheating, fire or explosion may occur.
- Use the correct adapter for your phone when using the battery pack charger abroad.
- Talking on your phone for a long period of time may reduce call quality due to heat generated during use.
- Do not use harsh chemicals (such as alcohol, benzene, thinners, etc.) or detergents to clean your phone. This could cause a fire. Do not place or answer calls while charging the phone as it may short-circuit the phone and/or cause electric shock or fire. Don't short-circuit the battery. Metallic articles such as a coin, paperclip or pen in your pocket or bag may short-circuit the + and – terminals of the battery (metal strips on the battery) upon moving. Short-circuit of the terminal may damage the battery and cause an explosion.
- Never use and unapproved battery since this could damage the phone and/or battery and could cause the battery to explode. Only use the batteries and chargers provided by LG. The warranty will not be applied to products provided by other suppliers. Only authorized personnel should service the phone and its accessories. Faulty installation or service may result in accidents and consequently invalidate the warranty.

Explosion, Shock, and Fire Hazards

- Do not put your phone in a place subject to excessive dust and keep the minimum required distance between the power cord and heat sources.
- Unplug the power cord prior to cleaning your phone, and clean the power plug pin when it's dirty.
- When using the power plug, ensure that it's firmly connected. If not, it may cause excessive heat or fire.
- If you put your phone in a pocket or bag without covering the receptacle of the phone (power plug pin), metallic articles (such as a coin, paperclip or pen) may short-circuit the phone and may cause an explosion. Always cover the receptacle when not in use.
- Don't short-circuit the battery. Metallic articles such as a coin, paperclip or pen in your pocket or bag or contact with sharp objects including animal bites may short-circuit the + and – terminals of the battery (metal strips on the battery) upon moving. Shortcircuit of the terminal may damage the battery and cause an explosion.

General Notice

- Using a damaged battery or placing a battery in your mouth or animal's mouth may cause serious injury including a fire or explosion.
- Do not place items containing magnetic components such as a credit card, phone card, bank book, or subway ticket near your phone. The magnetism of the phone may damage the data stored in the magnetic strip.
- Talking on your phone for a long period of time may reduce call quality due to heat generated during use.
- When the phone is not used for a long period time, store it in a safe place with the power cord unplugged.
- Using the phone in proximity to receiving equipment (i.e., TV or radio) may cause interference to the phone.
- Do not use the phone if the antenna is damaged. If a damaged antenna contacts skin, it may cause a slight burn. Please contact an LG Authorized Service Center to replace the damaged antenna.

Safety

- Do not immerse your phone in water, liquid, or expose to high humidity. If this happens, turn it off immediately and remove the battery. Immediately, take it to an LG Authorized Service Center.
- Do not paint your phone.
- The data saved in your phone might be deleted due to careless use, repair of the phone, or upgrade of the software. Please backup your important phone numbers. (Ringtones, text messages, voice messages, pictures, and videos could also be deleted.) The manufacturer is not liable for damage due to the loss of data.
- When you use the phone in public places, set the ringtone to vibration so you don't disturb others.
- Do not turn your phone on or off when putting it to your ear.
- Use accessories, such as earphones and headsets, with caution. Ensure that cables are tucked away safely and do not touch the antenna unnecessarily.

FDA Consumer Update

 The U.S. Food and Drug Administration's Center for Devices and Radiological Health Consumer Update on Mobile Phones

1. Do wireless phones pose a health hazard?

The available scientific evidence does not show that any health problems are associated with using wireless phones. There is no proof, however, that wireless phones are absolutely safe. Wireless phones emit low levels of Radio Frequency (RF) energy in the microwave range while being used. They also emit very low levels of RF when in standby mode. Whereas high levels of RF can produce health effects (by heating tissue), exposure to low level RF that does not produce heating effects causes no known adverse health effects. Many studies of low level RF exposures have not found any biological effects. Some studies have suggested that some biological effects may occur, but such findings have not been confirmed by additional research. In some cases, other researchers have had difficulty in reproducing those studies, or in determining the reasons for inconsistent results.

2. What is the FDA's role concerning the safety of wireless phones?

Under the law, the FDA does not review the safety of radiation-emitting consumer products such as wireless phones before they can be sold, as it does with new drugs or medical devices. However, the agency has authority to take action if wireless phones are shown to emit Radio Frequency (RF) energy at a level that is hazardous to the user. In such a case, the FDA could require the manufacturers of wireless phones to notify users of the health hazard and to repair, replace, or recall the phones so that the hazard no longer exists.

Although the existing scientific data do not justify FDA regulatory actions, the FDA has urged the wireless phone industry to take a number of steps, including the following.

- Support needed research into possible biological effects of RF of the type emitted by wireless phones;
- Design wireless phones in a way that minimizes any RF exposure to the user that is not necessary for device function; and
- Cooperate in providing users of wireless phones with the best possible information on possible effects of wireless phone use on human health.

The FDA belongs to an interagency working group of the federal agencies that have responsibility for different aspects of RF safety to ensure coordinated efforts at the federal level. The following agencies belong to this working group:

- National Institute for Occupational Safety and Health
- Environmental Protection Agency
- Occupational Safety and Health Administration
- National Telecommunications and Information Administration

The National Institutes of Health participates in some interagency working group activities, as well. The FDA shares regulatory responsibilities for wireless phones with the Federal Communications Commission (FCC). All phones that are sold in the United States must comply with FCC safety guidelines that limit RF exposure.

The FCC relies on the FDA and other health agencies for safety questions about wireless phones.

The FCC also regulates the base stations that the wireless phone networks rely upon. While these base stations operate at higher power than do the wireless phones themselves, the RF exposures that people get from these base stations are typically thousands of times lower than those they can get from wireless phones. Base stations are thus not the subject of the safety questions discussed in this document.

3. What kinds of phones are the subject of this update?

The term “wireless phone” refers here to handheld wireless phones with built-in antennas, often called “cell”, “mobile”, or “PCS” phones. These types of wireless phones can expose the user to measurable Radio Frequency (RF) energy because of the short distance between the phone and the user’s head.

These RF exposures are limited by FCC safety guidelines that were developed with the advice of the FDA and other federal health and safety agencies. When the phone is located at greater distances from the user, the exposure to RF is drastically lower because a person’s RF exposure decreases rapidly with increasing distance from the source. The so-called “cordless phones,” which have a base unit connected to the telephone wiring in a house, typically operate at far lower power levels, and thus produce RF exposures far below the FCC safety limits.

4. What are the results of the research done already?

The research done thus far has produced conflicting results, and many studies have suffered from flaws in their research methods. Animal experiments investigating the effects of Radio Frequency (RF) energy exposures characteristic of wireless phones have yielded conflicting results that often cannot be repeated in other laboratories. A few animal studies, however, have suggested that low levels of RF could accelerate the development of cancer in laboratory animals. However, many of the studies that showed increased tumor development used animals that had been genetically engineered or treated with cancer-causing chemicals so as to be pre-disposed to develop cancer in the absence of RF exposure. Other studies exposed the animals to RF for up to 22 hours per day. These conditions are not similar to the conditions under which people use wireless phones, so we do not know with certainty what the results of such studies

mean for human health. Three large epidemiology studies have been published since December 2000. Between them, the studies investigated any possible association between the use of wireless phones and primary brain cancer, glioma, meningioma, or acoustic neuroma, tumors of the brain or salivary gland, leukemia, or other cancers. None of the studies demonstrated the existence of any harmful health effects from wireless phone RF exposures. However, none of the studies can answer questions about long-term exposures, since the average period of phone use in these studies was around three years.

5. What research is needed to decide whether RF exposure from wireless phones poses a health risk?

A combination of laboratory studies and epidemiological studies of people actually using wireless phones would provide some of the data that are needed. Lifetime animal exposure studies could be completed in a few years. However, very large numbers of animals would be needed to provide reliable proof of a cancer promoting effect if one exists. Epidemiological studies can provide data that is directly applicable to human populations, but ten or more years follow-up may be needed to provide answers about some health effects, such as cancer. This is because the interval between the time of exposure to a cancer-causing agent and the time tumors develop — if they do — may be many, many years. The interpretation of epidemiological studies is hampered by difficulties in measuring actual RF exposure during day-to-day use of wireless phones. Many factors affect this measurement, such as the angle at which the phone is held, or which model of phone is used.

6. What is the FDA doing to find out more about the possible health effects of wireless phone RF?

The FDA is working with the U.S. National Toxicology Program and with groups of investigators around the world to ensure that high priority animal studies are conducted to address important questions about the effects of exposure to Radio Frequency (RF) energy. The FDA has been a leading participant in the World Health Organization International Electro Magnetic Fields (EMF) Project since its inception in 1996. An influential result of this work has been the development of a detailed agenda of

research needs that has driven the establishment of new research programs around the world. The project has also helped develop a series of public information documents on EMF issues. The FDA and the Cellular Telecommunications & Internet Association (CTIA) have a formal Cooperative Research And Development Agreement (CRADA) to do research on wireless phone safety. The FDA provides the scientific oversight, obtaining input from experts in government, industry, and academic organizations. CTIA-funded research is conducted through contracts with independent investigators. The initial research will include both laboratory studies and studies of wireless phone users. The CRADA will also include a broad assessment of additional research needs in the context of the latest research developments around the world.

7. How can I find out how much Radio Frequency energy exposure I can get by using my wireless phone?

All phones sold in the United States must comply with Federal Communications Commission (FCC) guidelines that limit Radio Frequency (RF) energy exposures. The FCC established these guidelines in consultation with the FDA and the other federal health and safety agencies. The FCC limit for RF exposure from wireless phones is set at a Specific Absorption Rate (SAR) of 1.6 watts per kilogram (1.6 W/kg). The FCC limit is consistent with the safety standards developed by the Institute of Electrical and Electronic Engineering (IEEE) and the National Council on Radiation Protection and Measurement. The exposure limit takes into consideration the body's ability to remove heat from the tissues that absorb energy from the wireless phone and is set well below levels known to have effects. Manufacturers of wireless phones must report the RF exposure level for each model of phone to the FCC. The FCC website (<http://www.fcc.gov/oet/rfsafety>) gives directions for locating the FCC identification number on your phone so you can find your phone's RF exposure level in the online listing.

8. What has the FDA done to measure the Radio Frequency energy coming from wireless phones?

The Institute of Electrical and Electronic Engineers (IEEE) is developing a technical standard for measuring the Radio Frequency (RF) energy exposure from wireless phones and other wireless handsets with the participation and leadership of FDA

scientists and engineers. The standard, “Recommended Practice for Determining the Spatial-Peak Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques”, sets forth the first consistent test methodology for measuring the rate at which RF is deposited in the heads of wireless phone users. The test method uses a tissue-simulating model of the human head. Standardized SAR test methodology is expected to greatly improve the consistency of measurements made at different laboratories on the same phone. SAR is the measurement of the amount of energy absorbed in tissue, either by the whole body or a small part of the body. It is measured in watts/kg (or milliwatts/g) of matter. This measurement is used to determine whether a wireless phone complies with safety guidelines.

9. What steps can I take to reduce my exposure to Radio Frequency energy from my wireless phone?

If there is a risk from these products — and at this point we do not know that there is — it is probably very small. But if you are concerned about avoiding even potential risks, you can take a few simple steps to minimize your exposure to Radio Frequency (RF) energy. Since time is a key factor in how much exposure a person receives, reducing the amount of time spent using a wireless phone will reduce RF exposure. If you must conduct extended conversations by wireless phone every day, you could place more distance between your body and the source of the RF, since the exposure level drops off dramatically with distance. For example, you could use a headset and carry the wireless phone away from your body or use a wireless phone connected to a remote antenna. Again, the scientific data does not demonstrate that wireless phones are harmful. But if you are concerned about the RF exposure from these products, you can use measures like those described above to reduce your RF exposure from wireless phone use.

10. What about children using wireless phones?

The scientific evidence does not show a danger to users of wireless phones, including children and teenagers. If you want to take steps to lower exposure to Radio Frequency (RF) energy, the measures described above would apply to children and teenagers using

wireless phones. Reducing the time of wireless phone use and increasing the distance between the user and the RF source will reduce RF exposure.

Some groups sponsored by other national governments have advised that children be discouraged from using wireless phones at all. For example, the government in the United Kingdom distributed leaflets containing such a recommendation in December 2000. They noted that no evidence exists that using a wireless phone causes brain tumors or other ill effects. Their recommendation to limit wireless phone use by children was strictly precautionary; it was not based on scientific evidence that any health hazard exists.

11. What about wireless phone interference with medical equipment?

Radio Frequency (RF) energy from wireless phones can interact with some electronic devices. For this reason, the FDA helped develop a detailed test method to measure Electro Magnetic Interference (EMI) of implanted cardiac pacemakers and defibrillators from wireless telephones. This test method is now part of a standard sponsored by the Association for the Advancement of Medical Instrumentation (AAMI). The final draft, a joint effort by the FDA, medical device manufacturers, and many other groups, was completed in late 2000. This standard will allow manufacturers to ensure that cardiac pacemakers and defibrillators are safe from wireless phone EMI. The FDA has tested hearing aids for interference from handheld wireless phones and helped develop a voluntary standard sponsored by the Institute of Electrical and Electronic Engineers (IEEE). This standard specifies test methods and performance requirements for hearing aids and wireless phones so that no interference occurs when a person uses a “compatible” phone and a “compatible” hearing aid at the same time. This standard was approved by the IEEE in 2000.

The FDA continues to monitor the use of wireless phones for possible interactions with other medical devices. Should harmful interference be found to occur, the FDA will conduct testing to assess the interference and work to resolve the problem.

12. Where can I find additional information?

For additional information, please refer to the following resources:

FDA web page on wireless phones (<http://www.fda.gov/cellphones/>)

Federal Communications Commission (FCC) RF Safety Program (<http://www.fcc.gov/oet/rfsafety>)

International Commission on Non-Ionizing Radiation Protection (<http://www.icnirp.de>)

World Health Organization (WHO) International EMF Project (<http://www.who.int/emf>)

National Radiological Protection Board (UK) (<http://www.hpa.org.uk/radiation/>)

Driving

Check the laws and regulations on the use of wireless phones in the areas where you drive and always obey them. Also, if using your phone while driving, please observe the following:

- Give full attention to driving – driving safely is your first responsibility;
- Use hands-free operation, if available;
- Pull off the road and park before making or answering a call if driving conditions or the law require it.

Driver Safety Tips

Your wireless phone gives you the powerful ability to communicate by voice almost anywhere, anytime. An important responsibility accompanies the benefits of wireless phones, one that every user must uphold. When operating a car, driving is your first responsibility. When using your wireless phone behind the wheel of a car, practice good common sense and remember the following tips:

- 1 Get to know your wireless phone and its features such as speed dial and redial. Carefully read your instruction manual and learn to take advantage of valuable features most phones offer, including automatic redial and memory. Also, work to memorize the phone keypad so you can use the speed dial function without taking your attention off the road.

Safety

- 2 When available, use a hands-free device. A number of hands-free wireless phone accessories are readily available today. Whether you choose an installed mounted device for your wireless phone or a speaker phone accessory, take advantage of these devices if available to you.
- 3 Make sure you place your wireless phone within easy reach and where you can reach it without removing your eyes from the road. If you get an incoming call at an inconvenient time, if possible, let your voicemail answer it for you.
- 4 Suspend conversations during hazardous driving conditions or situations. Let the person you are speaking with know you are driving; if necessary, suspend the call in heavy traffic or hazardous weather conditions. Rain, sleet, snow, and ice can be hazardous, but so is heavy traffic. As a driver, your first responsibility is to pay attention to the road.
- 5 Don't take notes or look up phone numbers while driving. If you are reading an address book or business card, or writing a "to-do" list while driving a car, you are not watching where you are going. It is common sense. Do not get caught in a dangerous situation because you are reading or writing and not paying attention to the road or nearby vehicles.
- 6 Dial sensibly and assess the traffic; if possible, place calls when you are not moving or before pulling into traffic. Try to plan your calls before you begin your trip or attempt to coincide your calls with times you may be stopped at a stop sign, red light, or otherwise stationary. But if you need to dial while driving, follow this simple tip – dial only a few numbers, check the road and your mirrors, then continue.
- 7 Do not engage in stressful or emotional conversations that may be distracting. Stressful or emotional conversations and driving do not mix; they are distracting and even dangerous when you are behind the wheel of a car. Make people you are talking with aware you are driving and if necessary, suspend conversations which have the potential to divert your attention from the road.
- 8 Use your wireless phone to call for help. Your wireless phone is one of the greatest tools you can own to protect yourself and your family in dangerous situations – with your phone at your side, help is only three numbers away. Dial 911 or other local

emergency number in the case of fire, traffic accident, road hazard, or medical emergency. Remember, it's a free call on your wireless phone!

9 Use your wireless phone to help others in emergencies. Your wireless phone provides you a perfect opportunity to be a "Good Samaritan" in your community. If you see an auto accident, crime in progress or other serious emergency where lives are in danger, call 911 or other local emergency number, as you would want others to do for you.

10 Call roadside assistance or a special wireless nonemergency assistance number when necessary. Certain situations you encounter while driving may require attention, but are not urgent enough to merit a call for emergency services. But you can still use your wireless phone to lend a hand. If you see a broken-down vehicle posing no serious hazard, a broken traffic signal, a minor traffic accident where no one appears injured or a vehicle you know to be stolen, call roadside assistance or other special nonemergency wireless number.

The above tips are meant as general guidelines. Before deciding to use your mobile device while operating a vehicle, it is recommended that you consult your applicable jurisdiction's local laws or other regulations regarding such use. Such laws or other regulations may prohibit or otherwise restrict the manner in which a driver may use his or her phone while operating a vehicle.

Notice: Open Source Software

To obtain the source code under GPL, LGPL, MPL, and other open source licenses, that is contained in this product, please visit

<http://opensource.lge.com>.

In addition to the source code, all referred license terms, warranty disclaimers and copyright notices are available for download.

LG Electronics will also provide open source code to you on CD-ROM for a charge covering the cost of performing such distribution (such as the cost of media, shipping, and handling) upon email request to opensource@lge.com. This offer is valid for three (3) years from the date on which you purchased the product.

