



## Adding bookmarks

- 1 When viewing the page you want to save, tap the **Menu Key**  > **Save to bookmarks**.
- 2 Enter the desired information for **Label**, **Address**, **Account**, and **Add to** (location to save bookmark) and tap **OK**.

## Changing the Browser settings

- 1 Open the Browser and tap the **Menu Key**  > **Settings**.

# Settings

The **Settings** application contains most of the tools for customizing and configuring your phone. All of the settings in the Settings application are described in this section.

## To open the Settings application

- From the Home screen, tap the **Apps Key**



- From the Home screen, tap the **Menu Key**




## Networks tab



This menu allows you to manage Wi-Fi and Bluetooth connections, portable hotspot and data tethering, airplane mode and VPN connections.

## Airplane mode

Airplane mode allows you to quickly turn off all wireless connections.

- 1 From the Home screen, tap the **Menu Key**  > **All settings**.
- 2 Select the **Networks** tab.
- 3 Tap the **Airplane mode** switch to turn it on.
- 4 Tap the switch again to turn it off.


OR

- 1 Press and hold the **Power/Lock Key**  and tap **Turn on Airplane mode**.
- 2 Press and hold the **Power/Lock Key**  and tap **Turn off Airplane mode** to turn it off.


## Wi-Fi

To use Wi-Fi on your phone, you need access to a wireless access point, or "hotspot." Some access points are open and you can simply connect to them. Others are hidden or implement other security features, so you must configure your phone in order to connect to them.

## Turn on Wi-Fi


From the Home Screen, open the Notifications panel and tap  to turn Wi-Fi on. A blue colored icon indicates that Wi-Fi is on.

OR

From the Home screen, tap the **Menu Key**  and tap **All settings** > **Networks** tab. Then tap the **Wi-Fi** switch to turn it on.

## To connect to a Wi-Fi Network

Turn off Wi-Fi when you're not using it to extend the life of your battery.

- 1 From the Home screen, tap the **Menu Key**  and tap **All settings > Networks** tab.
- 2 Tap the **Wi-Fi** switch to turn it on and begin scanning for available Wi-Fi networks.
  - A list of available Wi-Fi networks will be displayed. Secured networks are indicated by a lock icon.
- 3 Tap a network to connect to it.
  - If the network is open, you are prompted to confirm that you want to connect to that network by tapping **Connect**.
  - If the network is secured, you are prompted to enter a password or other credentials. (Ask your network administrator for details).
- 4 The Status Bar at the top of your screen will display an icon that indicates your Wi-Fi status.

### **TIP**

If you are not in range of a Wi-Fi network and use a network connection. Additional data charges may apply.

### **NOTE**

Access to the Internet and a wireless router required. As an added convenience, AT&T has shipped certain

smartphones with Wi-Fi enabled as a default setting. Leaving Wi-Fi enabled when not connected to a Wi-Fi network may affect battery charge. Qualifying data plan required.

### **NOTE**

This device supports WEP, WPA/WPA2-PSK and 802.1x EAP. (Some EAP methods are not supported.) If your Wi-Fi service provider or network administrator sets encryption for network security, enter the key in the pop-up window. If encryption is not set, this pop-up window will not be shown. You can obtain the key from your Wi-Fi service provider or network administrator.

## Data networks


You can select whether to enable or disable mobile data. You can check the current data usage, set to enable/disable mobile data, or set the mobile data limit.

**Mobile data** - Tap the On/Off switch to enable mobile data.

**Limit mobile data usage** - Checkmark to set mobile data limit.

### Bluetooth

#### Using Bluetooth


- 1 From the Home screen, tap the **Menu Key**  > **All settings**, then tap the **Bluetooth** switch to turn on the Bluetooth functionality.
- 2 Tap **Search for devices** at the bottom of the screen.
- 3 Tap the name of the device you wish to pair with, and then tap **Pair** to pair and connect.


#### TIP


Please consult documentation included with Bluetooth device for information on pairing mode and passcode (typically 0 0 0 0 – four zeroes).


#### How to send data from your phone via Bluetooth

You can send data via Bluetooth by running a corresponding application, not from Bluetooth menu.

- \* **Sending pictures:** Open the **Gallery** application and tap a picture. Then tap  > **Bluetooth**. Check if Bluetooth is turned on and tap **Search for devices**. Then tap the device you want to send data to from the list.



- \* **Sending contacts:** Open the **Contacts** application. Tap the contact you want to share, then tap the **Menu Key**  > **Share** > **Bluetooth**. Check if Bluetooth is turned on and tap **Search for devices**. Then tap the device you want to send data to from the list.

- \* **Sending multiple contacts:** Open the **Contacts** application. To select more than one contact, tap the **Menu Key**  > **Share**. Tap the contacts you want to send or tap **Select all** at the top left corner of the screen. Tap **Attach** > **Bluetooth**. Check if Bluetooth is turned on and tap **Search for devices**. Then tap the device you want to send data to from the list.

- \* **Connecting to FTP (Only the FTP server is supported on this handset):** From the Home screen, tap the **Menu Key**  > **All settings** > **Networks** tab > **Bluetooth**. Make sure Bluetooth is turned on. Tap **Make phone visible** to make the device visible to other Bluetooth devices. Then search for other devices. Find the service you want and connect to the FTP server.

**TIP**


The supported Bluetooth version is Bluetooth 3.0 and certified by Bluetooth SIG. It is compatible with other Bluetooth SIG certified devices.

- If you want to search for this phone from other devices, from the Home screen, tap the **Menu Key**  > **All settings** > **Networks** tab > **Bluetooth**. Make sure Bluetooth is turned on. Tap **Make phone visible** to make the device visible to other Bluetooth devices. Being visible for 2 minutes is set by default.
- To change the visibility time length, tap the **Menu Key**  > **Visibility timeout**. Choose from **2 minutes**, **5 minutes**, **1 hour**, or **Never time out**.
- Supported profiles are HFP/HSP, A2DP, AVRCP, OPP, FTP(Server) and PBAP.

**File networking**


File Networking requires wireless connection. Make sure that devices are using same AP(Access Point). Network folder sharing may use more battery.

**To share my folder:**

- 1 From the Home screen, tap the **Menu Key**  > **All settings**.

- 2 Select the **Networks** tab.
- 3 Tap **Connectivity** > **File networking**.
- 4 Tap **Share my folder** to share your phone's folder with other devices.
- 5 Tap **Shared folder** to configure the folder to share.
- 6 Tap **Set password** to configure password for security.
- 7 Access phone's folder with typing "\\Device name" or "\\IP address" at URL address field on PC window.

**To access other device's folder:**


- 1 From the Home screen, tap the **Menu Key**  > **All settings**.
- 2 Select the **Networks** tab.
- 3 Tap **Connectivity** > **File networking** > **Access other device folder**.
- 4 Tap a device to connect with in the **AVAILABLE DEVICES**. If the device is secured with password, you should enter User name and password. You can access folder without User name or password if computer's shared folder is set as 'Everyone'.
- 5 Select the folders to access. This may take a few seconds depending on the size of shared folders.

## Settings

- 6 After connecting devices, you can read or write shared file from other devices in phone's applications (such as Gallery, Music, File manager). Check the following mount path: /sdcard/Network\_folder\_"Device Name".

### Portable Wi-Fi hotspot

You can also use your smartphone to provide a mobile broadband connection for up to 8 other devices. Create a hotspot and share your connection.

To create a portable hotspot, from the Home screen, tap the **Menu Key**  > **All settings** > **Networks** tab > **Connectivity** > **Portable Wi-Fi hotspot**. Then tap **Portable Wi-Fi hotspot** once more to activate the feature. A blue checkmark indicates that the feature is active. Tap **Configure Wi-Fi hotspot** to change the SSID, password, security type, and other hotspot options.


#### **NOTE**

Mobile Hotspots requires an appropriate DataPro data plan. Devices connected to your Mobile Hotspot use data from your DataPro plan. Plans are not unlimited and significant charges may be incurred if the included data allowance is exceeded. Performance may

vary depending on the number of devices connected and other factors. If you do not use a password, others will be able to use your Mobile Hotspot connection.

### Miracast

You can mirror phone screen and sound onto LG Miracast dongle or TV wirelessly.

- 1 From the Home screen, tap the **Menu Key**  > **All settings**.
- 2 Select the **Networks** tab.
- 3 Tap **Connectivity** > **Miracast**.
- 4 Tap the **Miracast** switch to turn on the feature.
- 5 Turn on the Miracast feature on your TV or connect to the LG Miracast dongle.

#### **Tips**

To start Miracast feature quickly, tap the Miracast icon in the Notification Panel. While mirroring, Wi-Fi or Mobile Hotspot cannot be used simultaneously.

### Bluetooth tethering

Via Bluetooth tethering, you can use your smart phone to provide a mobile broadband connection.

To share your connection via Bluetooth tethering:

From the Home screen, tap the **Menu Key**  > **All settings** > **Networks** tab > **Connectivity** > **Bluetooth Tethering**.


### NOTE

Bluetooth tethering can be activated only when your smartphone is connected to AT&T network.

## NFC

NFC (Near Field Communication) is a wireless technology that enables data transmission between two objects when they are brought within a few inches of each other. When you enable NFC on your phone, your phone can exchange data with other NFC-enabled devices or read information from smart tags embedded in posters, stickers, and other products.

### To turn on NFC:


- 1 From the Home screen, tap the **Menu Key**  > **All settings**.
- 2 Select the **Networks** tab.
- 3 Tap **Connectivity** and tap the **NFC** switch.

## Android Beam

When this feature is turned on, you can beam app content to another NFC-capable device by holding the devices close together. For example, you can beam Browser pages, YouTube videos, People contacts, and more.

Just bring the devices together (typically back to back) and then touch your screen. The app determines what gets beamed.

### To access Android Beam:

From the Home screen, tap the **Menu Key**  > **All settings** > **Connectivity** > **NFC** > **Android Beam**.

## VPN

From your phone, you can add, set up, and manage virtual private networks (VPNs) that allow you to connect and access resources inside a secured local network, such as your corporate network.


### Prepare Your Device for VPN Connection

Depending on the type of VPN you are using at work, you may be required to enter your login credentials or install security certificates before you can connect to your company's local network. You can get this information from your network administrator. Before you can

## Settings

initiate a VPN connection, you must set the screen lock option (Pattern, PIN, or Password only).

### Add a VPN Connection

- 1 From the Home screen, tap the **Menu Key**  > **All settings**.
- 2 Select the **Networks** tab.
- 3 Tap **Connectivity > VPN > Add VPN network**.
- 4 Enter the VPN network according to the security details you have obtained from your network administrator.
- 5 When finished, tap **Save**.

## Mobile networks

You can set whether to enable or disable data access on your phone.

### Data enabled

Select whether to enable or disable data access.

### International data roaming

Select whether to enable or disable data access while international roaming.

### Access Point Names

You can select the access point name, add a new APN, or reset to default.

## Network operators

You can search for all available networks or automatically select preferred network.

## Call

You can set **Fixed dialing numbers**, **Voicemail** and **Other call settings** including **Call reject**, **Quick messages**, **TTY mode**, **Hearing aids**, **Call duration**, **Caller ID**, and **Sound settings**.

## Sound tab

Adjust sound, notification default settings and vibrate mode. You can also manage audible and Haptic feedback.

## Sound profile

Allows you to set the sound profile to Sound, Vibrate only, or Silent.

## Volumes

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

## Quiet time

Tap the Quiet Time switch to activate the feature and set times to turn off all sounds except alarm and media.



## Ringtone with vibration

Checkmark for vibration feedback for calls and notifications.

## Phone ringtone

Select the ringtone for incoming calls.

## Notification sound

Select the ringtone for notifications such as new messages receipt or calendar events.

## Wise ringtone

Select to automatically increase the volume of the ringtone when outside noise is loud.

## Touch feedback & system

Allows you to set dial pad touch tones, touch sounds, screen lock sound, and vibrate on touch.

## Display tab

### Home screen

**Animation** - Set whether you want to enjoy animated transitions for all supported effects (including when navigating from screen to screen) or to use the phone without any optional animation effects (this setting does not control animation in all applications).

**Screen swipe effect** - Allows you to select the type of effect to display when you swipe from one Home screen canvas to the next.

**Wallpaper** - Allows you to set the wallpaper.

**Portrait view only** - Select to display the Home screen always in portrait view.

**Scroll screens circularly** - Checkmark to show the first screen after last screen when scrolling.

**Home backup & restore** - Select to backup and restore app/widget configurations and the theme.

### Lock screen

**Select screen lock** - Select the desired option to secure your phone from the below.

**None** - No lock screen.

**Swipe** - Swipe any part of the screen to unlock screen.

**Face Unlock** - Unlocks the screen through facial recognition. Follow the prompts. You are asked to select Pattern and/or PIN as a backup.

**Pattern** - Opens a set of screens that guide you through drawing a screen unlock pattern. It's recommended that you enter backup PIN as well in case that you might

## Settings

lost the pattern. Then, you can set the wallpaper on the lock screen, whether to show the owner information, the lock timer, vibrate on touch, or whether to make the pattern visible.

**PIN** - Enter a numeric PIN to unlock screen.


**Password** - Enter a password to unlock screen.

**Wallpaper** - Select the wallpaper to display for your lock screen.

**Clocks & shortcuts** - Customize clocks and shortcuts on the lock screen.

**Owner info** - Display the owner info on the lock screen.

**Lock timer** - Allows you to set 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.

**Vibrate on touch** - Select to make the device vibrate when you unlock it.

### Brightness

Adjust the brightness of the screen.

### Screen timeout

Set the time delay before the screen automatically turns off.

### Wise screen

Checkmark this to keep screen on when the phone detects your face looking at the screen.

### Auto-rotate screen

Set to switch orientation automatically when you rotate the phone.

### Aspect ratio correction

Change the resolution size of downloaded applications to fit the screen size.

### Font type

Select the desired font type.

### Font size

Select the desired font size.

### Front key light

Tap to set the Front key light options.

**Turn on front key light:** Checkmark this to set the the front keys (Menu Key, Home Key, Back Key) are turned on, when you use

the device.

**Front key light duration:** Select how long the front keys remain backlit while the screen is turned on.

## Notification flash

Checkmark each item to set to turn on.

## Motion sensor calibration

Improve the accuracy of the tilt and speed of the sensor.

## General tab

### Power saver

Tap the **Power saver** switch to turn this feature on. Tap the switch again to turn it off.

**Turn Power saver on** - Select the level you want to turn on the Power saver.

**Power saver Tips** - Touch to access some tips for Power saver.

### POWER SAVING ITEMS

Checkmark each feature to turn off or adjust when battery is low.

**Auto-sync:** Turns off Auto-sync.

**Wi-Fi:** Turns off Wi-Fi if data is not in use.

**Bluetooth:** Turns off Bluetooth if not connected.

**Eco mode:** Enables Eco mode. Eco mode extends battery life by dynamically optimizing CPU control policy.

**Vibrate on touch:** Turns off touch feedback.

**Brightness:** Adjust the brightness.

**Screen timeout:** Adjust screen timeout of screen.

**Front key light:** Adjust Front key light timeout.

## BATTERY INFORMATION

**Battery percentage:** Display battery percentage on the Status Bar.

**Battery use:** View which components and application use the most battery.

## Applications

You use the Applications settings menu to view details about the applications installed on your phone, manage their data, force them to stop, and to set whether you want to permit installation of applications that you obtain from websites and email. Tap the **Downloaded**, **Running** or **All** tabs to view information about your installed apps.

### Quad core control

You can access the menu to turn on Eco mode through the Quad core control. Eco mode extends battery life by dynamically optimizing CPU control policy. When Eco mode is turned off, Automatic mode is used to control the Quad cores to provide optimized system performance.

### Storage

#### INTERNAL STORAGE

You can monitor the used and available space on the system memory.

#### SD CARD

You can monitor the used and available space on your microSD card.

**Total space** - Lists the total amount of space on any microSD card installed in your phone. It is divided by the type of files stored.

**Unmount SD card** - Tap this to unmount the microSD card from your phone so that you can format the card or safely remove.

**Erase SD card** - Permanently erases everything on the microSD card and prepares it for use with your phone. You must unmount the microSD card before you can format it.

### Gestures

**Move home screen items** - Press and hold an item and tilt the device to move to other home screens.

**Tilt sensitivity** - Test and adjust sensitivity of tilt sensor for the Home screen and applications.

**Silence incoming calls** - Flip the device to silence incoming calls.

**Snooze or stop alarm** - Flip the device to snooze or stop the alarm.

**Pause video** - Flip the device to pause the video.

**Help** - Touch to get information on using the Gesture function of your device.

### Accounts & sync

Use the Accounts & sync settings menu to add, remove, and manage your Google™ and other supported accounts. You also use these settings to control how and whether all applications send, receive, and sync data on their own schedules and whether all applications can synchronize user data automatically. Gmail™, Calendar, and other applications may also have their own settings to control how they synchronize data; see the

sections on those applications for details. Tap the On/Off switch to enable adding account or sync. Touch **ADD ACCOUNT** to add new account.

## Location services

Use the Location services menu to set your preferences for using and sharing your location when you search for information and use location-based applications, such as Maps.

**Google's location services** - Checkmark to use information from Wi-Fi and mobile networks to determine your approximate location, used while searching in Google Maps and other applications. When you checkmark this option, you're asked whether you consent to sharing your location anonymously with Google's location service.

**GPS satellites** - Checkmark to enable your phone's standalone global positioning system (GPS) satellite receiver to pinpoint your location to within an accuracy as close as several meters ("street level"). Actual GPS accuracy depends on a clear view of the sky and other factors.

**Location & Google search** - Let Google use your location to improve search results and other services.

## Security

Use the Security settings to configure how to help secure your phone and its data.

### ENCRYPTION

**Encrypt phone** - Opens a screen that encrypts data on the phone for security. You will be required to enter a PIN or password to decrypt your phone each time you power it on.

### SIM CARD LOCK

**Set up SIM card lock** - Opens a screen to set if you want to require a PIN to use or, if set, allows you to change the PIN.

### PASSWORDS

**Password typing visible** - Checkmark to briefly show each character of passwords as you enter them so that you can see what you enter.

### PHONE ADMINISTRATION

**Phone administrators** - Add or remove phone administrators.

**Unknown sources** - Allow installation of non-Play Store applications.

### CREDENTIAL STORAGE

**Trusted credentials** - Checkmark to allow applications to access your phone's encrypted

## Settings

store of secure certificates and related passwords and other credentials. You use credential storage to establish some kinds of VPN and Wi-Fi connections. If you have not set a password for the secure credential storage, this setting is dimmed.

**Install from storage** - Touch to install a secure certificate from a microSD card.

**Clear credentials** - Deletes all secure certificates and related credentials and erases the secure storage's own password, after prompting you to confirm that you want to do this.

### Backup & reset

#### BACKUP & RESTORE

**Back up my data** - Back up app data, Wi-Fi passwords, and other settings to Google servers.

**Back up account** - Displays the accounts that are currently being backed up.

**Automatic restore** - When reinstalling an app, restore backed up settings and data.

#### PERSONAL DATA

**Factory data reset** - Erases all data on the phone.

### Date & time

Set your preferences for how the date and time is displayed.

### Language & input


Select the language for the text on your phone and for configuring the on-screen keyboard, including words that you've added to its dictionary.

**Language** - Choose a language to use on your phone.

**Spelling correction** - Allows spelling correction when using the on-screen keyboard.

**Personal dictionary** - Allows you to view, edit, and add words to your personal dictionary.

#### KEYBOARD & INPUT METHODS

**Default** - Shows the default keyboard type. Checkmark the keyboard you want to use from **Android keyboard**, **Google voice typing**, **LG Keyboard**. Tap  to configure each keyboard's settings.

#### SPEECH

**Voice Search** - Touch to configure the Voice Search settings.

**Text-to speech output** - Touch to set the preferred engine or general settings for text-to-speech output.

## MOUSE/TRACKPAD

**Pointer speed** - Adjust the pointer speed.

## Accessibility

Use the Accessibility settings to configure any accessibility plug-ins you have installed on your phone.

### NOTE

Requires additional plug-ins to become selectable.

## PC connection

**USB connection type** - Opens a dialog box to choose the default connection mode when connecting your phone to a PC via USB. Choose from Charge only, Media sync (MTP), USB tethering, PC software, or Camera (PTP).

### USB Tethering

You can use your phone to provide a data connection to a computer by activating data tethering and connecting them with a USB cable.

## To tether your phone with your computer using the USB

- 1 Connect your phone to your computer with a USB cable.
- 2 The USB connection type prompt is displayed. Tap **USB tethering** to confirm.

### NOTE

- Data Tethering requires an appropriate DataPro data plan. Devices connected by tethering use data from your DataPro plan. Plans are not unlimited and significant charges may be incurred if the included data allowance is exceeded. Performance may vary depending on the number of devices connected and other factors.
- You cannot access your phone's microSD card on your computer when using USB tethering.

**Ask on connection** - Checkmark to have the phone ask you to choose which USB connection mode it should connect with to a PC.

**Help** - Touch to get information on the different types of USB connections.

### LG SOFTWARE

**On-Screen Phone** - Turns the On-Screen Phone function on so that you can receive Wi-Fi connection requests. Refer to page 82 for **LG On-Screen Phone**.

**Help** - Displays help information for the On-Screen Phone function.

### Developer options

**USB debugging** - Checkmark to set Debug mode when USB is connected.

**Development device ID** - Displays the development device ID.

**Stay awake** - If activated, the screen will never sleep while charging.

**Allow mock locations** - Checkmark to allow mock locations.

**Desktop backup password** - Allows you to set a desktop backup password.

### USER INTERFACE

**Enable strict mode** - Checkmark to flash the screen when apps operate for a long time on the main thread.

**Show touch data** - Checkmark to make touch data visible on the screen.

**Show touches** - Checkmark to show visual feedback when the screen is touched.

**Show screen updates** - Checkmark to flash areas of the screen when they update.

**Show CPU usage** - Checkmark to display a screen overlay showing current CPU usage.

**Force GPU rendering** - Checkmark to use 2D hardware acceleration in applications.

**Window animation scale** - Select to set the window animation scale.

**Transition animation scale** - Select to set transition animation scale.

### APPS

**Don't keep activities** - Checkmark to quit every activity as soon as the user leaves it.

**Background process limit** - Set the preferred Background process limit.

**Show all ANRs** Checkmark to show App Not Responding dialog for background apps.

### About phone

View legal information, check phone status and software versions, and perform the software update.








# LG On-Screen Phone 3.0

## LG SOFTWARE

On-Screen Phone allows you to view your mobile phone screen from a PC via a USB. You can also control your mobile phone from your PC, using the mouse or keyboard.

### On-Screen Phone 3.0 icons

-  Launches LG Home Panorama or changes the On-Screen Phone preferences.
-  Connects your mobile phone to your PC, or disconnects it.
-  Minimizes the On-Screen Phone window.
-  Maximizes the On-Screen Phone window.
-  Exits the On-Screen Phone program.

### On-Screen Phone 3.0 features

- **Real-time transfer and control:** Displays and controls your mobile phone screen when connected to your PC.
- **Mouse control:** Allows you to control your mobile phone by using the mouse to click and drag on your PC screen.
- **Text input with keyboard:** Allows you to compose a text message or note using your computer keyboard.

- **File transfer (mobile phone to PC):** Sends a file from your mobile phone (e.g. Gallery, Video Player, Music and Polaris Office) to your PC. Simply right-click on the file and drag it to send it to your PC.

- **File transfer (PC to mobile phone):** Sends files from your PC to your mobile phone. Just select the files you wish to transfer and drag and drop them into the On-Screen Phone window. The sent files are stored in the OSP folder.

- **LG Home Panorama:** Shows all of the work spaces of LG Home. You can easily organize icons or widgets and run an application by double-clicking the shortcut.

### NOTE

Please make sure that LG Home is the default launcher. Some widgets may not work properly on the LG Home Panorama.

- **Real-time event notifications:** Prompts a pop-up to inform you of any incoming calls or text messages, as well as alarm and event notifications.


### How to install On-Screen Phone on your PC

Visit **LG.com** (<http://www.lg.com/us>). Locate the search box in the upper right corner and enter the model number. From the **SUPPORT** list, select your model. Scroll down and select the **OSP** tab and click on **DOWNLOAD**. When prompted, select **Run** to install On-Screen Phone on your PC.

### How to connect your mobile phone to your PC

On-Screen Phone 3.0 provides USB and Wi-Fi connection. Please follow the instructions on the Connection Wizard of the On-Screen Phone program.

#### ! NOTE

To use On-Screen Phone using Wi-Fi connection, from the Home screen tap the **Menu Key**  > **All settings** > **General** tab > **PC connection** > **On-Screen Phone check box** is selected.

Please make sure that the battery may run out more quickly due to the current consumption if On-Screen Phone is connected via Wi-Fi.

When you connect your mobile phone to your


PC via Mobile Hotspot and access to the Internet on the PC, additional data charges may be incurred depending on your DataPro data plan.

Access to the Internet using Wi-Fi networks may not work well depending on the network's traffic. When you enlarge the On-Screen Phone window, the display on the screen might become slow.

### To check the phone-to-PC connection

Once the devices have been connected, drag down the Status Bar at the top of the Home screen to check the On-Screen Phone connection status.

### To disconnect your phone from your PC

Click  in the top left of the On-Screen Phone window. Alternatively, drag down the Status Bar at the top of the Home screen and select **On-Screen Phone connected** > **OK**.

# Software Update

## Phone Software Update

This feature allows you to update the firmware of your phone to the latest version conveniently from the internet without the need to visit a service center.

For more information on how to use this function, please visit:

<http://update.lgmobile.com> or


<http://www.lg.com/common/index.jsp>.


As the mobile phone firmware update requires the user's full attention for the duration of the update process, please make sure to check all instructions and notes that appear at each step before proceeding. Please note that removing the USB cable or battery during the upgrade may seriously damage your mobile phone.

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

This feature allows you to update the firmware of your phone to the newer version conveniently via OTA without connecting the USB data cable. This feature is only available if and when LG makes the newer version of the firmware available for your device.

First, you can check the software version on your mobile phone:

From the Home screen, tap the **Menu Key**  > **All settings** > **General** tab > **About phone** > **Software information**.

To perform the phone software update, from the Home screen, tap the **Menu Key**  > **All settings** > **General** tab > **About phone** > **Software update** > **Update now**.

### NOTE

Your personal data—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 back up your personal data before updating your phone's software. LG does not take responsibility for any loss of personal data.

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## DivX Mobile

**ABOUT DIVX VIDEO:** DivX® is a digital video format created by DivX, LLC, a subsidiary of Rovi Corporation. This is an official DivX Certified® device that plays DivX video. Visit [www.divx.com](http://www.divx.com) for more information and software tools to convert your files into DivX video.

**ABOUT DIVX VIDEO-ON-DEMAND:** This DivX Certified® device must be registered in order to play purchased DivX Video on-Demand (VOD) movies. To obtain your registration code, locate the DivX VOD section in your device setup menu. Go to [vod.divx.com](http://vod.divx.com) for more information on how to complete your registration.

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Please check to see if any problems you have encountered with the phone are described in this section before taking the phone in for a service or calling the Customer Service Center.

**Q** How do I view the list of outgoing calls, incoming calls and missed calls?

**A** Tap the **Phone Key**  and tap the **Call logs**  tab.

**Q** Why is the connection inconsistent or not audible in certain areas?

**A** When the frequency environment is unstable in a certain area, connection may be inconsistent and inaudible. Relocate to another area and try again.

**Q** Why is the connection inconsistent or abruptly disconnects even when established?

**A** When frequency is unstable or weak, or if there are too many users, a connection may be cut off even after it was established. Please try again later or attempt again after relocating to other areas.

**Q** Why does the phone heat up?

**A** The phone may get hot when there is a very long call duration, when games are played or even when surfing the Internet for a long time. This has no effect upon the life of the product or performance.



**Q** Why does the battery run out so quickly during normal use?

**A** This may be due to the user environment, a large number of calls or a weak signal.

**Q** Why is no number dialed when an Address Book entry is recalled?

**A** Check that the number has been stored correctly by using the Address book Search feature. Re-store them, if necessary.

**Q** The screen got frozen. How can I solve this problem?

**A** Press and hold the **Power/Lock Key**  for 10 seconds to turn it off. Then press and hold the **Power/Lock Key**  again for 3 seconds to reboot the phone.

# Accessories

There are a variety of accessories available for your mobile phone, some of which may be sold separately. You can select these options according to your personal communication requirements. Visit your local AT&T store or [www.att.com/wirelessaccessories](http://www.att.com/wirelessaccessories) for specific offerings.

## NOTE

- Always use genuine LG accessories. Failure to do this may invalidate your warranty.
- Accessories may be different in different regions; please check with our regional service company or agent for further enquiries.

# For Your Safety

## Important Information

This user guide contains important information on the use and operation of this phone. Please read all the information carefully for optimal performance and to prevent any damage to or misuse of the phone. Any changes or modifications not expressly approved in this user guide could void your warranty for this equipment. Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

## Before You Start

**WARNING!** This product contains chemicals known to the State of California to cause cancer and birth defects or reproductive harm.

***Wash hands after handling.***

## Safety Instructions

**WARNING!** To reduce the possibility of electric shock, do not expose your phone to high humidity areas, such as the bathroom, swimming pool, etc.

**Always store your phone away from heat.**

Never store your phone in settings that may expose it to temperatures less than 32°F or greater than 104°F, such as outside during

extreme weather conditions or in your car on a hot day. Exposure to excessive cold or heat will result in malfunction, damage and/or catastrophic failure.

**Be careful when using your phone near other electronic devices.** RF emissions

from your mobile phone may affect nearby in adequately shielded electronic equipment. You should consult with manufacturers of any personal medical devices such as pacemakers and hearing aides to determine if they are susceptible to interference from your mobile phone. Turn off your phone in a medical facility or at a gas station. Never place your phone in a microwave oven as this will cause the battery to explode.

**IMPORTANT!** Please read the TIA SAFETY INFORMATION before using your phone.

## Safety Information

Read these simple guidelines. Breaking the rules may be dangerous or illegal. Further detailed information is given in this user guide.

- ▶ Do not disassemble this unit. Take it to a qualified service technician when repair work is required.

## For Your Safety

- ▶ Keep away from electrical appliances such as TVs, radios, and personal computers.
- ▶ The unit should be kept away from heat sources such as radiators or cookers.
- ▶ Do not drop.
- ▶ Do not subject this unit to mechanical vibration or shock.
- ▶ The coating of the phone may be damaged if covered with wrap or vinyl wrapper.
- ▶ Use dry cloth to clean the exterior of the unit. (Do not use solvent such as benzene, thinner or alcohol.)
- ▶ Do not subject this unit to excessive smoke or dust.
- ▶ Do not keep the phone next to credit cards or transport tickets; it can affect the information on the magnetic strips.
- ▶ Do not tap the screen with a sharp object; otherwise, it may damage the phone.
- ▶ Do not expose the phone to liquid or moisture.
- ▶ Use the accessories like an earphone cautiously. Do not tap the antenna unnecessarily.

## microSD card information and care

- ▶ The microSD card cannot be used for recording copyright-protected data.
- ▶ Keep the microSD card out of the small children's reach.
- ▶ Do not leave the microSD card in extremely hot location.
- ▶ Do not disassemble or modify the microSD card.

## 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.



## **CAUTION**

Use only the supplied and approved antenna. Use of unauthorized antennas or modifications could impair call quality, damage the phone, void your warranty and/or result in violation of FCC regulations. Do not use the phone with a damaged antenna. If a damaged antenna comes into contact with skin, a minor burn may result. Contact your local dealer for a replacement antenna.

## **Body-worn Operation**

This device was tested for typical body-worn operations with the back of the phone kept 0.39 inches (1cm) between the user's body and the back of the phone. To comply with FCC RF exposure requirements, a minimum separation distance of 0.39 inches (1cm) must be maintained between the user's body and the back of the phone. Third-party belt-clips, holsters, and similar accessories containing metallic components should not be used. Body-worn accessories that cannot maintain 0.39 inches (1cm) separation distance between the user's body and the back of the phone, and have not been tested for typical body-worn operations may not comply with FCC RF exposure limits and should be avoided.

## **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 occur in a particular installation.

## For Your Safety

If this equipment does cause harmful interference or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct 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.

### Cautions for Battery

- ▶ Do not disassemble or open crush, bend or deform, puncture or shred.
- ▶ Do not modify or remanufacture, attempt to insert foreign objects into the battery, immerse or expose to water or other liquids, expose to fire, explosion or other hazard.

- ▶ Only use the battery for the system for which it is specified.
- ▶ Only use the battery with a charging system that has been qualified with the system per this standard. Use of an unqualified battery or charger may present a risk of fire, explosion, leakage, or other hazard.
- ▶ Do not short circuit a battery or allow metallic conductive objects to contact battery terminals.
- ▶ Replace the battery only with another battery that has been qualified with the system per this standard, IEEE-Std-1725-200x. Use of an unqualified battery may present a risk of fire, explosion, leakage or other hazard.
- ▶ Promptly dispose of used batteries in accordance with local regulations.
- ▶ Battery usage by children should be supervised.
- ▶ Avoid dropping the phone or battery. If the phone or battery is dropped, especially on a hard surface, and the user suspects damage, take it to a service center for inspection.

- ▶ Improper battery use may result in a fire, explosion or other hazard.
- ▶ For those host devices that utilize a USB port as a charging source, the host device's user manual shall include a statement that the phone shall only be connected to products that bear the USB-IF logo or have completed the USB-IF compliance program.
- ▶ If you are listening to music while out and about, please ensure that the volume is at a reasonable level so that you are aware of your surroundings. This is particularly imperative when attempting to cross the street.

### **Adapter (Charger) Cautions**

- ▶ Using the wrong battery charger could damage your phone and void your warranty.
- ▶ The adapter or battery charger is intended for indoor use only.

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

### **Avoid damage to your hearing**

- ▶ Damage to your hearing can occur if you are exposed to loud sound for long periods of time. We therefore recommend that you do not turn on or off the handset close to your ear. We also recommend that music and call volumes are set to a reasonable level.

# Safety Guidelines

## TIA Safety Information

Provided herein is the complete TIA Safety Information for Wireless Handheld phones. Inclusion of the text covering Pacemakers, Hearing Aids, and Other Medical Devices is required in the owner's manual for CTIA Certification. Use of the remaining TIA language is encouraged when appropriate.

## Exposure to Radio Frequency Signal

Your wireless handheld portable telephone is a lowpower radio transmitter and receiver. When it is ON, it receives and also 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)

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).

\* American National Standards Institute;  
National Council on Radiation Protection and Measurements; International Commission on Non-Ionizing Radiation Protection

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:

- ▶ Do not tap 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.

### Driving

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

- ▶ 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 so require.

### 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 inches from their pacemaker when the phone is turned ON;
- ▶ Should not carry the phone in a breast pocket.
- ▶ Should use the ear opposite the pacemaker to minimize the potential for interference.
- ▶ If you have any reason to suspect that interference is taking place, turn your phone OFF immediately.

### Hearing Aids

Some digital wireless phones may interfere with some hearing aids. In the event of such interference, you may want to consult AT&T.

## Safety Guidelines

### Other Medical Devices

If you use any other personal medical device, consult the manufacturer of your device to determine if they are 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. Turn your phone OFF before boarding an aircraft.

### Blasting Areas

To avoid interfering with blasting operations, turn your phone OFF when in a 'blasting areas 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.

### Charger and Adapter Safety

- ▶ The charger and adapter are intended for indoor use only.

### Battery Information and Care

- ▶ Please dispose of your battery properly or take it to your local wireless carrier for recycling.
- ▶ The battery does not need to be fully discharged before recharging.
- ▶ Use only LG-approved chargers specific to your phone model since they are designed to maximize battery life.
- ▶ Do not disassemble or impact the battery as it may cause electric shock, short-circuit, and fire. Store the battery in a

place out of reach of children.

- ▶ Keep the battery's metal contacts clean.
- ▶ Replace the battery when it no longer provides acceptable performance. The battery can be recharged several hundred times before replacement.
- ▶ Recharge the battery after long periods of non-use to maximize battery life.
- ▶ Battery life will vary due to usage patterns and environmental conditions.
- ▶ Use of extended backlighting, **MEdia** Net Browsing, and data connectivity kits affect battery life and talk/standby times.
- ▶ The self-protection function of the battery cuts the power of the phone when its operation is in an abnormal state. In this case, remove the battery from the phone, reinstall it, and turn the phone on.
- ▶ Actual battery life will depend on network configuration, product settings, usage patterns, battery and environmental conditions.
- ▶ Always unplug the charger from the wall socket after the phone is fully charged to save unnecessary power consumption of the charger.

### 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 is dirty.
- ▶ When using the power plug, ensure that it is firmly connected. If it is 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.
- ▶ Do not 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.

### General Notice

- ▶ Using a damaged battery or placing a battery in your mouth may cause serious injury.
- ▶ 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.



- ▶ Do not immerse your phone in water. If this happens, turn it off immediately and remove the battery. If the phone does not work, 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. (Ring tones, 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 ring tone to vibration so as not to disturb others.
- ▶ Do not turn your phone on or off when putting it in your ear.
- ▶ 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.

### 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: **204 Safety**

- ▶ Set the volume in a quiet environment and select the lowest volume at which you can hear adequately.

## Safety Guidelines

- ▶ 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 noisecancelling 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.

You can obtain additional information on this subject from the following sources:

### **Safety 205**

American Academy of Audiology 11730 Plaza  
American Drive, Suite 300

Reston, VA 20190

Voice: (800) 222-2336

Email: [info@audiology.org](mailto:info@audiology.org)

Internet: [www.audiology.org](http://www.audiology.org)

National Institute on Deafness and Other  
Communication

Disorders

National Institutes of Health

31 Center Drive, MSC 2320

Bethesda, MD USA 20892-2320

Voice: (301) 496-7243

Email: [nidcdinfo@nih.gov](mailto:nidcdinfo@nih.gov)

Internet: [http://www.nidcd.nih.gov/health/  
hearing](http://www.nidcd.nih.gov/health/hearing)

National Institute for Occupational Safety and  
Health Hubert H. Humphrey Bldg.

200 Independence Ave., SW Washington,  
DC 20201 Voice: 1-800-35-NIOSH (1-800-  
356-4674)

Internet: <http://www.cdc.gov/niosh/topics/>

noise/default.html

### FDA Consumer Update

The U.S. Food and Drug Administration 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 radiofrequency energy (RF) in the microwave range while being used. They also emit very low levels of RF when in the Home screen. 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 radiofrequency energy (RF) 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

## Safety Guidelines

- ▶ 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 radiofrequency energy (RF) 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 radiofrequency energy (RF) 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 don't 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

## Safety Guidelines

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 10 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 radiofrequency energy (RF). The FDA has been a leading participant in the World Health Organization International Electromagnetic 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 energy (RF) 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 telephones 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 energy (RF) 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 tissuesimulating 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

## Safety Guidelines

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 radiofrequency 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 radiofrequency energy (RF). 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

do 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 radiofrequency energy (RF), 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 energy (RF) from wireless phones can interact with some electronic devices. For this reason, the FDA helped develop a detailed test method to measure electromagnetic 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>, click on "C" in the index and "Cell Phones")

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

International Commission on Non-Ionizing  
Radiation Protection

## Safety Guidelines

(<http://www.icnirp.de>)

World Health Organization (WHO)

International EMF Project

(<http://www.who.int/emf>)

National Radiological Protection Board (UK)

(<http://www.nrpb.org.uk/radiation/>)

### 10 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.
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. Position your wireless phone within easy reach. 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. Do not 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.

Don't 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 is 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 non-emergency 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 non-emergency wireless number.

For more information, please call to 888-901-SAFE, or visit our website <http://www.ctia.org>.

### 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 limits are part of comprehensive guidelines and establish permitted levels of RF energy for the general population. The guidelines are based on standards that were developed by independent scientific organizations through periodic and thorough evaluation of scientific studies. The standards include a substantial safety margin designed to assure the safety of all persons, regardless of age and health.

The exposure standard for wireless mobile phones employs a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6 W/kg.\* 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 highest SAR value for this phone when tested for use at the ear is 0.601 W/kg and when worn on the body, as described in this user's manual, is 0.612 W/kg. (Body-worn measurements differ among phones models, depending upon available accessories and FCC requirements.) While there may be differences between SAR levels of various phones and at various positions, they all meet the government requirement for safe exposure.

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. 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/fccid> after searching on FCC ID ZNFP875.

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.

### Wi-Fi Caution

This device is capable of operating in 802.11a/n mode. For 802.11a/n devices operating in the frequency range of 5.15 - 5.25 GHz, they are restricted for indoor operations to reduce any potential harmful interference for Mobile Satellite Services (MSS) in the US.

WiFi Access Points that are capable of allowing your device to operate in 802.11a/n mode(5.15 - 5.25 GHz band) are optimized for indoor use only.

If your WiFi network is capable of operating in this mode, please restrict your WiFi use indoors to not violate federal regulations to protect Mobile Satellite Services.