




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Introduction

Congratulations on your purchase of the advanced and compact PD820 cellular phone, designed to operate with the latest digital mobile communication technology, Code Division Multiple Access (CDMA). Along with the many advanced features of the CDMA system such as greatly enhanced voice clarity this phone offers:

- Large, easy-to-read, 8-line backlight LCD with status icons.
- Paging, messaging, voice mail, and caller ID.
- 20-key keypad.
- Long battery stand-by and talk time.
- Menu-driven interface with prompts for easy operation and configuration.
- Any key answer, one-touch and speed dialing with 99 memory locations.
- Bilingual (English and Hebrew).

Important Information

This user's manual provides important information on the use and operation of your phone. Please read all the information carefully prior to using the phone for the best performance and to prevent any damage to or misuse of the phone. Any unapproved changes or modifications void your warranty.

Check Accessories

Your mobile phone comes with a one-slot desktop charger and a rechargeable battery. Please verify that these accessories are included.



FCC RF Exposure Information

WARNING! Read this information before operating the phone.

In August 1996, the Federal Communications (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 the skin a minor burn may result. Contact your local dealer for a replacement of antenna.

Bodily Contact During Operation

This device was tested for typical use with the back of the phone kept 1.5 cm from the body. To comply with FCC RF exposure requirements, a minimum separation distance of 1.5 cm must be maintained between the user's body and the back of the phone, including the antenna whether extended or retracted. Third-party belt-clips, holsters, and similar accessories containing metallic components should not be used. Avoid the use of accessories that cannot maintain 1.5 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.

Vehicle-Mounted External Antenna

(Optional, if available.)

A minimum distance of 8 in (20 cm) must be maintained between the user / bystander and the vehicle-mounted external antenna to satisfy FCC RF exposure requirements. For more information about RF exposure, visit the FCC website at www.fcc.gov.

FCC Part 15 Class B Compliance

This device and its accessories comply with part 15 of FCC rules. Operation is subject to the following two conditions: (1) This device and its accessories may not cause harmful interference, and (2) this device and its accessories must accept any interference received, including interference that causes undesired operation.











1 Getting Started













Phone Components

The following shows key components of your mobile phone.



Phone Overview

Caller LCD	When there are incoming calls and messages, the LCD flashes.
LCD Screen	Displays messages & indicator icons.
Soft Keys (the names of the functions of these keys appear at the bottom of the screen)	<p>Soft Key 1 </p> <p>Performs variety of functions according to the menu.</p> <p>Soft Key 2 </p> <p>Performs variety of functions according to the viewing function.</p>
CALL 	Allows user to place or answer calls.
END/PWR 	Used to turn power on/off and to end a call. Using this key, you can return to the main menu display screen.
Alphanumeric Keypad	These keys enable you to enter numbers and characters and choose menu items.
Navigation key	<p> : Press to check the Text, Voice and Push messages, Voice rec and Today's schedule.</p> <p> : Press to select Volume/Ringer menu.</p> <p> : Press to check the message Outbox, Inbox.</p> <p> : Press to select My Menu.</p>

Clear Key 	When writing a message, press to delete a single space or character or press and hold to delete entire words.
Lock Mode Key 	In standby mode, set the lock function by pressing and holding the  key about 3 seconds.
Manner Mode Key 	In standby mode, set the Manner mode by pressing and holding the  key about 3 seconds.
Power Mode Key 	In standby mode, set the Power mode by pressing and holding the  key about 3 seconds.
Side Keys 	Used to adjust the volume during a call. Functions same as  key when selecting menus. In Standby mode: When the folder is closed, the current time is displayed ; press once to display today's date. When the folder is open; adjust the key volume.
Phone Book 	Press to select Phone Book.
Services 	Press to select Services Menu.
OK 	Press to select the menu or connect to internet.

Using the Battery Pack

Note: It is important to charge the battery fully before the initial use of the phone.

The phone comes with a rechargeable battery. Keep the battery charged while not in use in order to maximize talk and standby time when using the phone.

Installing the Battery

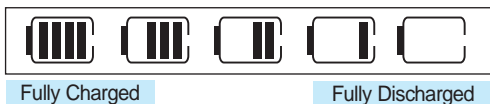
To install the battery, insert the bottom of the battery into the opening on the back of the phone. Then push the battery down until the latch clicks.

Removing the Battery

Turn the power off. Lift the release latch to detach the battery.

Battery Charge Level

The battery charge level is shown at the top right of the LCD screen.



When the battery charge level becomes low, the low battery sensor alerts you in three ways: sounding an audible tone, blinking the battery icon, and displaying **LOW BATTERY WARNING!** If the battery charge level becomes exceedingly low, the phone automatically switches off and any function in progress is not saved.

Using the Desktop Charger

The desktop charger has a slot for recharging batteries that accommodates the phone and battery for charging.



Warning! Use only the desktop charger provided with the phone. Using any charger other than the one included with the PD820 may damage your phone or battery.

1. Plug the charger into a wall outlet. The phone must be charged from a 120 VAC power source.
2. Insert the phone with an installed battery or the battery by itself into the slot of the charger. The red light indicates the battery is charging and the green light indicates the battery is fully charged.

The charge time varies depending upon the battery level and the maximum charge time for a fully discharged battery is 3 hours.












Technical Details

The PD820 is a single-band phone that operates on Code Division Multiple Access (CDMA) frequencies: cellular services at 800 MHz.

CDMA technology uses a feature called DSSS (Direct Sequence Spread Spectrum) that enables the phone to keep communication from being crossed and to use one frequency channel by multiple users in the same specific area. This results in a 10-fold capacity increase when compared with analog mode. In addition, features such as soft / softer handoff, hard Handoff, and dynamic RF power control technologies combine to reduce call interruptions.

The Cellular and PCS CDMA networks consist of MSO (Mobile Switching Office), BSC (Base Station Controller), BTS (Base station Transmission System), and MS (Mobile Station). The following table lists some major CDMA standards.

Screen Icons

Icons	Descriptions
	Displays the strength of the signal received by the phone and current signal strength is indicated by the number of bars displayed on the screen.
	No service The phone is not receiving a system signal.
	In use A call is in progress. * No icon indicates the phone is in standby mode.
	Indicates that a text message or voice mail has been received
	In Vibrate or Vib1+Ring or Vib2+Ring mode
	The Manner mode is selected.
	The Power mode is selected.
	When the ringer type is 'Silent' or 'Light' or when the ringer volume is 'Off'.
	In Alarm mode (alarm clock is set).
	Roaming The phone is outside of its home service area.
	Shows your current battery charge strength. (Icon shown fully charged)

Phone Menu Reference

Press Soft Key 1  Menu. Press  to Scroll.

Phone Book

1. New Entry
2. Speed Dial
3. Call Duration
4. Clear History
5. Delete All

PIMS

1. Scheduler
2. BookMarks
3. Alarm Clock
4. Wake-up Call
5. Calculator


Volume/Ringer

1. Select Ringer
2. Melody Box
3. Ring/Vibrate
4. Ring Volume
5. Key Tone
6. Flip Tone
7. Connect Alert
8. Service Alert
9. 1 Min Alert
0. Voice Guide

Security

1. Phone Lock
2. Security Code

Settings

1. 
2. Call Answer
3. Connection
4. Modem/Fax
5. Phone Info

Display

1. Display Theme
2. Banner
3. Num Setting
4. Standby Clock
5. Menu Theme
6. Backlight
7. Contrast

Press  .

Press  to Scroll.

Outbox

1. Write New
2. Received Msg
3. Sent Msg
4. Draft
5. Clear Outbox
6. SMS Info

Inbox

1. Text
2. Voice
3. Store
4. Clear Inbox
5. Clear Store
6. Inbox Alert
7. Alert Tone
8. Font Color

Press  .

Press  to Scroll.

Services

1. Internet Portal
2. Game&App
3. Rings&Pics
4. Voice Portal
5. What's New

Accessories

There are a variety of accessories available for your mobile phone. You can select these options according to your personal communication requirements. Consult your local dealer for availability.

Travel Charger

This charger allows you to charge the battery while away from home or your office. It supports standard U.S. AC120 Volt 60 Hz outlets. It takes 5 hours to charge a completely discharged battery.



Battery

The battery is available for standard battery charge.



Standard

Desktop Charger

The desktop charger allows you to place the phone in the stand for charging. It can charge a completely discharged battery in 3 hours.



Cigarette Lighter Charger

You can operate the phone and trickle charge the phone's battery from your vehicle by using the cigarette lighter charger.

It takes 5 hours to charge a completely discharged battery.



Hands-Free Car Kit (Portable)

The hands-free car kit enables you to attach the phone to the power jack in your car, providing you with hands-free operation. It can charge a completely discharged battery in 5 hours.



Safety Information

Please read and observe the following information for safe and proper use of your phone and to prevent damage. Also, keep the user's guide in an accessible place at all the times after reading it.

Explosion, Shock, and Fire Hazards

- Make sure that no sharp-edged items such as animal's teeth, nails, come into contact with the battery. There is a risk of this causing a fire.
- Do not use harsh chemicals (such as alcohol, benzene, thinners, etc.) or detergents to clean your phone. There is a risk of this causing a fire.
- When riding in a car, do not leave your phone or set up the hands-free kit near to the air bag. If wireless equipment is improperly installed and the air bag is activated, you may be seriously injured.
- 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 drop, strike, or shake your phone severely. Such actions may harm the internal circuit boards of the phone.
- Be careful that children do not swallow any parts such as rubber plugs (earphone, connection parts of the phone, etc.). This could cause asphyxiation or suffocation.
- Do not use your phone in high explosive areas as the phone may generate sparks.
- 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.

- 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 a fire or electric shock.
- When using the power plug, ensure that it is firmly connected. If it is not, it may cause excessive heat 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 fire or electric shock.
- 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.
- 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.
- Never place your phone in a microwave oven as it will cause the battery to explode.

General Warnings and Cautions

- Only use the batteries, antennas, and chargers provided by LG. The warranty will not be applied to products provided by other suppliers.
- Store the battery in a place out of reach of children.
- 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.
- Do not hold or let the antenna come in contact with your body during a call.
- 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.
- Only authorized personnel should service the phone and its accessories. Faulty installation or service may result in accidents and consequently invalidate the warranty.
- 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 use the phone in areas where its use is prohibited. (For example: aircraft).
- 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.
- The power cord on this product will expose you to lead, a chemical known to the State of California to cause (cancer, and) birth defects or other reproductive harm. Wash hands after handling.

Battery Information and Care

- Please dispose of your battery properly or take it to your local wireless carrier for recycling.
- Do not dispose of your battery in fire or with hazardous or flammable materials.
- Never store your phone in temperatures less than -4° F or greater than 122° F.
- Never use an unapproved battery since this could damage the phone and/or battery and could cause the battery to explode.
- 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 short-circuit the battery.
- 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, MiniBrowser, and data connectivity kits affect battery life and talk/standby times.

CDMA Standard	Designator	Description
Basic Air Interface	TIA/EIA-95A TSB-74 ANSI J-STD-008 TIA/EIA-IS2000	CDMA Dual-Mode Air Interface 14.4kbps radio link protocol and inter-band operations IS-95 adapted for PCS frequency band cdma2000 1xRTT Air Interface
Network	TIA/EIA/IS-634 TIA/EIA/IS/651 TIA/EIA/IS-41-C TIA/EIA/IS-124	MAS-BS PCSC-RS Intersystem operations Non-signaling data comm.
Service	TIA/EIA/IS-96-B TIA/EIA/IS-99 TIA/EIA/IS-637 TIA/EIA/IS-657 IS-801	Speech CODEC Assign data and fax Short message service Packet data Position Determination Service (gpsOne)
Performance	TIA/EIA/IS-97 TIA/EIA/IS-98 ANSI J-STD-018 ANSI J-STD-019 TIA/EIA/IS-125	Cellular base station Cellular mobile station PCS personal station PCS base station Speech CODEC

* TSB -74: Protocol between an IS-95A system and ANSI J-STD-008


1xRTT system receives twice as many subscribers in the wireless section as IS-95. Its battery life is twice as long as IS-95. High-speed data transmission is also possible.



2 Basic Functions


Turning the Phone On and Off

Turning the Phone On

- 1) Install a charged battery pack or connect the phone to an external power source such as the cigarette lighter adaptor or car kit.
- 2) Hold down the Key  for 2 seconds until the LCD screen flashes.

NOTE As any other communication device, avoid any unnecessary contact with the antenna while your phone is turned on.

Turning the Phone Off

- 1) Press and hold  until display screen turns off, then release the key.

Signal Strength

The quality of a call depends on the strength of the signal supplied by the operator. The phone shows its signal strength through bars, located at the left top of the screen. If there are more bars (a maximum of six), the phone holds more signal strength. If the signal strength is not satisfactory, try to change the position of the phone. If you are in a building, try to be near to a window, where the reception of the signal may be better.




In some places such as : tunnels, elevators, basements and garages, there may be limitation of the signal supplied by the operator.

Power Save Mode



When the phone is in an area without service for about 5 minutes, it stops searching for service and enters into the Power Save Mode. When your phone activates this feature, Power Save is displayed on your screen. The phone automatically checks for service periodically or you can check manually by pressing any key.

Making a Call




Every time you make a call, follow these steps:

- 1) Make sure that the phone is turned on. If not, hold down  for 2 seconds.
- 2) Type the phone number and then press  .
 - If the phone is locked, type the lock code. The lock code is '0000' by default.
- 3) To end the call press  .

Correcting Dial Errors




If you typed a wrong number, press the Key  once to delete the lastly typed digit, or Hold down the Key  for 2 seconds to delete all the typed digits at the same time.



Receiving Calls

- 1) When the phone rings or vibrates (if the Vibrate Mode is enabled), open the folder or if the folder is open, press any key (except ) to answer.
 - If you press  once when you receive a call, the phone stops ringing or vibrating and the call remains unanswered.
- 2) To end an answered call press .

My Menu

Lets you access to favorite menu quickly by customising my menu. Max 10 items can be stored in My Menu.

- 1) Press Soft Key 1 **Menu**.
- 2) Select the menu of your choice by using , then press .
- 3) Select the Menu to add to My Menu with , then press Soft Key 1 **Menu**. (Select **Yes** to add the entire Menu selected to My Menu.)



NOTE : Select the item of choice with  +  from the Stand-by screen.

Adjusting the Volume

The volume keys on the left side (Side Keys) of the phone can be used to adjust the earpiece, ring, and key volumes. The upper key is used to increase and the lower key is used to decrease the volume.

- You may adjust the earpiece volume during a call.
- The key volume is adjusted through side key only.
- The ring volume can be adjusted through the Menu feature.


Ring Volume

- 1) Press Soft Key 1 **Menu**.
- 2) Press **2^{ABC}** **Volume/Ringer**.
- 3) Press **4^{GHI}** **Ring Volume**.
- 4) Adjust the volume of the ringer with .
- 5) Then press  to save the ring volume.

Quick Adjust

Adjusting Manner Mode

Use Vibrate Mode in a public place.

1) In standby mode, activate manner mode quickly by pressing the . (for 3 seconds) instead of using the Menu function.

- When manner Mode is set, Key tone does not sound and Vibrate is the selected ringer type.


NOTE : To cancel Vibrate mode, press  again until **Deactivated manner mode** is displayed.

NOTE : Selecting Vibrate mode will allow you to maintain your phone under Vibrate Mode even when you turn it off and turn it back on.

Adjusting Lock Function

Used to prevent other persons from using your phone without your permission.



There are two ways to enable the Lock Function - with one key and by using the Menu.

1) In standby mode, to activate the lock mode quickly, press the  (for 3 seconds).

NOTE : To cancel the Lock Mode, Press Soft Key 2 **Cncl**, then enter your password (4 digits). Default value is '0000'.



Call Waiting

Your cellular service provider may offer a call waiting function. While a call is in progress, you may hear two beeps indicating another incoming call. When call waiting is enabled, you may put the active call on hold while you answer the other incoming call. Check with **your service provider** for information about this function.


- 1) Press  to receive a waiting call.
- 2) Press  again to switch between calls.

Mute

The mute function prevents the other party from hearing your voice, but allows you to hear the other party.

- 1) Press Soft Key 1 **Menu** and  during a call.
- 2) To cancel Mute, press Soft Key 1 **Menu** and  again.



Redialing Calls

- 1) Press  to redial the last dialed number(s) in Call History.
- You can also dial any of the last 60 Missed/Received/Dialed numbers stored in the Call History list

Speed Dialing

Speed dialing is a convenient feature, which allows you to make phone calls quickly and easily. Your phone recalls the phone number from your personal directory, displays it briefly and then dials it.


To use **Speed Dial** register a phone number first.

- 1) Enter memory location number 1 to 99 .
- 2) Press  .
- 3) To end the call, Press  .

One-Touch Speed Dialing: This feature enables you to store your nine most frequently used numbers in your phone book in memory locations (1 through 9)

- For locations 1 through 9, you can use one-touch dialing by pressing and holding the corresponding key to the memory location to be dialed.

or

- Press a digit, then press  .

Two-Touch Speed Dialing: This feature enables you to dial numbers in your phone book through two keys (for locations 10 to 99.)

- 1) Press the first digit.
- 2) Press and hold the key of the second digit.

or

- 1) Press the first and second digit, then press  .

Caller ID

Caller ID lets you know who is calling by displaying the number of the person calling when your phone rings. If the caller's name and number are already stored in your phone book, the corresponding name appears with the number.


You should check with **your service provider** to find if they offer this feature.





3 Additional Functions

How to enter Text

Key Functions

The cursor can be moved by pressing  to modify existing text or to insert new text.



Pressing the **CLR** deletes a letter following the cursor at a time. If the cursor is followed by an empty space, the letter in front of the cursor will be deleted instead. (Pressing the **CLR** for an extended time will delete the whole text.)

In order to add space within existing text, press Soft Key 2 **Sym** + . In order to add space in front of an empty space, simply press the .

Pressing Soft Key 1 **eng** alternates between **eng** (lower case English), **ENG** (upper case English), **num** (numbers) and **Heb** (Hebrew) .


Pressing Soft Key 2 **Sym** enables **^^**(emoticon) mode.

Pressing Soft Key 2 **Sym** alternates between **Sym** and **^^** (emoticon) modes.

 ~  (Type Numbers): In Num mode, press once to enter numbers.





CLR (Clear): Press to delete a single space or character. Press and hold to delete entire words.

How to Select various symbols and ^.^(emoticon)

Select either Sym(symbol) or ^.^ by pressing Soft Key 2 **Sym** or Soft Key 2 ^.^ . Move the cursor to the desired symbol or emoticon with  key, then select.

Example Using Text Input

For example, to write “**LG**”, follow these steps:

1. Press Soft Key 1 **eng** to change letter case to **ENG** mode.
2. Press     .
3. Display : **LG**

Phone Book Features



You can store up to 500 entries in your phone book with easy access to your most frequently dialed phone numbers.

Personal Phone Book Memory

The phone has 500 personal phone book memory locations where you can store up to 4 phone numbers with 32 digit capacity for each phone number.


Saving Numbers in Your Personal Phone Book


Memory locations 1 through 99 should be used for speed dialing for your most frequently used phone numbers.

1. Input the phone number that you want to save (up to 32 digits).
2. Press Soft Key 2 **Save**.
3. Select your desired label types Mobile, Home, Office, Etc. using .
4. Select Label on the sub-menu and press  **Sel**.
5. Enter a name for the phone number (up to 16 characters).

Find Entry (Soft Key 2 **Srch **)

To find phone numbers you have stored in the Phone Book.






1. Press Soft Key 2 **Srch**.
2. The display prompts you to enter the entry name on the display screen. You can select **By Name**, **By Number** or **By Group** by using .
3. If you press Soft Key 2 **Srch** without entering an entry, you will view a list of all entries in your phone book.

NOTE At any entry, you may move to another entry by pressing the . If you press Soft Key 2 **Edit** or Soft Key 1 **Del** you can save or erase or edit.



4 Menu Features



General Guidelines

1. Press Soft Key 1 **Menu**. Six menu items will appear on the display screen.
2. Press  to go through the list of menu features.
3. Press the appropriate number key corresponding to the menu item that you want to select. The sub-menu list will then appear on the screen.
4. Press the appropriate number key corresponding to the sub-menu you want to access.
5. Use  to select your preferred setting. Press  to go back one step while accessing the menu or selecting a setting.
6. Press  to save the settings or press  to cancel without saving.

Phone Book (Menu 1@)


You can store up to 500 entries in your phone book with easy access to your most frequently dialed phone numbers.

New Entry (Menu 1@ 1@)

1. Press , **1@**, **1@**.
2. Enter name and press  to add **Group, Memo, E-Mail, Mobile, Home, Office, Etc., Secret, Character.**
3. Enter the phone number, then press **OK** **Save.**

Speed Dial (Menu 1@ 2ABC)

Speed Dial allows you to make a call faster by just pressing a corresponding number.

1. Press , **1@**, **2ABC**.
2. To register, use Soft Key 2 **Set** to find information you want, then press **OK** **Set.**

NOTE To delete, select Press Soft Key 1 **Del**, then press **OK** **Yes.**

Call Duration (Menu 1 @ 3 DEF)

Allows you to keep track of the time you spend for calls. You may check the duration time of calls.

Last call

Displays the duration of the last call made.

All calls



Keeps a running count of the time spent making all calls, either inside or outside your area. Resetting the call time is not available.

Dialed calls

Allows you to keep a running count of the time you spend making calls since last reset.



Clear History (Menu 1 @ 4 GHI)

Deletes all the information or data stored in call history list.

1. Press , **1 @**, **4 GHI**.
2. Enter the four-digit Lock code. (Default value is '0000')
3. Select **Yes** or **No** by using , then press **OK**.




Delete All (Menu 1 @ 5 JKL)

To erase all the entries stored in the Phone Book.

1. Press , **1 @**, **5 JKL**.
2. Enter the four-digit Lock code. (Default value is '0000')
3. Select **Yes** or **No** by using , then press **OK**.



Volume/Ringer (Menu **2_{ABC}** or)

Select Ringer (Menu **2_{ABC}** **1_@**)

1. Press , **2_{ABC}**, **1_@**.
2. Select the item of choice with  then press **OK**.
- ▶ Incoming Call / Power On / Power Off
3. Use  to select the melody of choice, then press **OK**.



Melody Box (Menu **2_{ABC}** **2_{ABC}**)

It is only selectable when downloaded melody.

1. Press , **2_{ABC}**, **2_{ABC}**.
2. Select melody you desire by using , then press **OK**.



Ring/Vibrate (Menu **2_{ABC}** **3_{DEF}**)

To select a Ringer Type.

1. Press , **2_{ABC}**, **3_{DEF}**.
2. Select one of seven ringer types **Ringer sound**, **Crescendo**, **Vibrator**, **Vib+Ring**, **Vib→Ring** and **Lamp+Mute** with .
3. Then press **OK** to save the ringer type.



Ring Volume (Menu 2^{ABC} 4^{GHI})

To select a Ringer Volume.

1. Press , **2^{ABC}**, **4^{GHI}**.
2. Adjust the volume of the ringer with .
3. Then press **OK** to save the ringer volume.



Key Tone (Menu 2^{ABC} 5^{JKL})

To select a Key Tone.

1. Press , **2^{ABC}**, **5^{JKL}**.
2. Select one of two key tones **Drop** and **Xylophone** with .
3. Then press **OK** to save the key tone.

Flip Tone (Menu 2^{ABC} 6^{MNO})

To select a Flip Tone.

1. Press , **2^{ABC}**, **6^{MNO}**.
2. Select one of three flip tones **Deactivate**, **Sound 1~3** with .
3. Then press **OK** to save the key tone.

Connect Alert (Menu 2^{ABC} 7^{PQRS})

This is a function to alert you that the call connection has been established.

1. Press , **2^{ABC}**, **7^{PQRS}**.
2. Select **Deactivate/Activate** by using , then press **OK** to save.

Service Alert (Menu **2**^{ABC} **8**^{TUV})

This is a function to alert you when service changes.

1. Press , **2**^{ABC}, **8**^{TUV}.
2. Select **Deactivate/Activate** by using , then press  to save.

1 Min Alert (Menu **2**^{ABC} **9**^{WXYZ})

Every time you use an additional 1 minute during a call, this function warns you 10 seconds before the next minute starts by making a beep sound.

1. Press , **2**^{ABC}, **9**^{WXYZ}.
2. Select **Deactivate/Activate** by using , then press  to save.

Voice Guide (Menu **2**^{ABC} **0**^{NEXT})







This is a function informs Internet access, Internet disconnection, and short battery status by announcing through a voice guidance.

1. Press , **2**^{ABC}, **0**^{NEXT}.
2. Select **Deactivate/Activate** by using , then press  to save.

Display (Menu)







Display Theme (Menu)

Allows you to select a picture on your mobile phone display.

1. Press , , .
2. Select the item of your choice by using .
 - ▶ Off / Power-On / Power-Off / Incoming call / Idle screen / WWW
3. Select the picture of your choice by using , then press  **Sel** to save the display theme.






Banner (Menu)

Allows you to enter or change the 16-character field displayed on the first line of your phone's display screen in standby mode.

1. Press , , .
2. Select the item of your choice by using , then select **Align/Font/Color/Bgcolor** for the letters you entered by using .
3. After selecting **Enter Text** with , enter characters.
4. Press .






Num Setting (Menu

Allows you to adjust the size of numbers displayed on the screen when placing a call.

1. Press , , .
2. Select **Size/Color** of choice and the item of choice with .
 - ▶ **Size** : Large / Small
 - ▶ **Color** : Color / Black
3. Then press  to save.






Standby Clock (Menu

You can select the clock on the initial LCD banner screen.

1. Press , , .
2. Select the item of your choice by using , then press  **Sel.**
 - ▶ **Deactivate/Analog1~2/Digital/Theme+Digital/Analog+Digital**



Menu Theme (Menu

Allows you to select the background color on the menu screen.

1. Press , , .
2. Select the item of your choice by using , then press .
 - ▶ **Blue/Green/Pink/Violet**

Backlight (Menu **3** DEF **6** MNO)



Display and buttons are lighted for a designated length of time, allowing you to use your mobile phone in the dark with convenience.

1. Press , **3** DEF, **6** MNO.
4. Select the item of your choice by using , then press **OK**.

▶ Auto / Manual

Contrast (Menu **3** DEF **7** PQRS)

Allows you to set the contrast level of the backlight.

1. Press , **3** DEF, **7** PQRS.
 2. Control contrast by using , then press **OK**.
- Contrast is adjusted at the interval of 3~4% each.

PIMS (Menu **4.GHI**)

Scheduler (Menu **4.GHI 1 @**)





Scheduler Functions

Scheduler keeps your agenda convenient and easy to access. Simply store your appointments and your phone alerts you with a reminder of your appointment. You can also take advantage of the **wake-up** feature.

NOTE If transmitting message or during a call or using internet applications, at the preset time, it does not ring. After exiting, it will ring the reminder.

NOTE Handset time is taken from Network time settings.








How to use buttons

-  Moves cursor to the left.
-  Moves cursor to the right.
-  Moves to the previous week.
-  Moves to the next week.
- 1 @** Moves to the previous year.
- 3 DEF** Moves to the next year.
- 7 PQRS** Moves to the previous month.
- 9 WXYZ** Moves to the next month.
- 5 JKL** Moves to today.












New Schedule (Menu   )

Allows you to input your schedule.

If you input the time and memo, an alarm rings at the set time.

1. Press , , , .
2. Select the date using your keypad, then press  **Sel.**
3. Select the item of your choice using   .
▶ **Schedule / Reservecall / Anniv. / Memo**

To Add Schedule,

4. Press the Soft Key 1 **Add.**
5. Enter the time with number keys (Select **AM/PM** with Soft Key 1 **PM**, and select Hour/Minute with  ).
6. Select "**Repeat**" with  (Select **None/Weekly/Monthly** with  ).
7. Select "**Remind**" with  (You may set the alarm from 0 hours 00 minutes to 99 hours 59 minutes.).
8. Enter the time with Soft Key 1 **Set** (Select **H/M** with  ).
9. Edit with  (You must enter any character).
10. Press , .

To change the Schedule,

1. After pressing + **4**CHI + **1**@ + **1**@, select the Date to change and press , and then select the **Schedule** to change by pressing .
2. After selecting the **Schedule** with + + , edit and press , .

To delete the Schedule






1. After pressing + **4**CHI + **1**@ + **1**@, select the Date to delete and press , and then select the **Schedule** to delete by pressing .
2. Press + + , .

To Add Reservecall, (follow the order 1~3 on page 47)








4. Press the Soft Key 1 **Add**.
5. Enter the time with number keys. (Select **AM/PM** with Soft Key 1 **PM**, and select Hour/Minute with)
6. After moving to with , enter the Phone Number (You must enter any phone number).
7. Enter characters with .
8. Press , .




To change the Reservecall,

1. After pressing + **4**CHI + **1**@ + **1**@, select the Date to change and press , and then select the **Reservecall** to change by pressing .







2. Select the **Reservecall** to change with  + 
+ , edit and press , .

To delete the Reservecall,

1. After pressing  + **4**CH + **1**@ + **1**@, select the Date to delete and press , and then select the **Reservecall** to delete by pressing .
2. Press  +  + , .

NOTE When it is the reserved time, message “<Reserved> Reserved Time” appears on LCD (When folder is open). If you want to call to the reserved number, press . You may move to the standby screen by pressing  or .

To Add Anniv. (Anniversary), (follow the order 1~3 on page 47)

4. Press the Soft Key 1 **Add**.
5. Select **Solar/Lunar** with Soft Key 1 **Lunar**.
6. After moving to with , select **None/Dday/D-1** with .
7. When **Dday/D-1** is selected, enter the time with number keys (Select **AM/PM** with Soft Key 1 )
8. Enter characters with  (You must enter any character).
9. Press , .

To change the Anniv.,

1. After pressing + **4**CHI + **1**@ + **1**@, select the Date to change and press , and then select the **Anniv.** to change by pressing .
2. After selecting the **Anniv.** with + + , edit and press , .

To delete the Anniv.,

1. After pressing + **4**CHI + **1**@ + **1**@, select the Date to delete and press , and then select the **Anniv.** to delete by pressing .
2. Press + + , .

To Add Memo, (follow the order 1~3 on page 47)

4. Press the Soft Key 1 **Add**.
5. After entering characters press , . (You must enter any character.)

To change the Memo,

1. After pressing + **4**CHI + **1**@ + **1**@, select the Date to change and press , and then select the **Memo** to change by pressing .
2. After selecting the **Memo** with + + , edit and press , .

To delete the Memo,

1. After pressing + **4GHI** + **1@** + **1@** + **OK** , select the Date to delete and press **OK** , and then select the **Memo** to delete by pressing .
2. Press + + **OK** , .

Find Schedule (Menu **4GHI 1@ 2ABC**)

Allows you to enter keyword to find a schedule or event for a certain day.

1. Press , **4GHI** , **1@** , **2ABC** .
 2. Select the item of your choice by using , then press .
- ▶ Schedule / Reservcall / Anniv. / Memo / All
3. Select the Year of your choice by using , then press .

NOTE You can search all years by pressing Soft Key 1 **All**.


4. Select the Month of your choice by using , then press .

NOTE You can search all months of a year by pressing Soft Key 1 **All**.

5. Enter Keyword or press Soft Key 2 **Srch**.



Delete Past (Menu 4.GHI 1.@ 3.DEF)

Can be used to delete old records which may not be useful anymore.

1. Press , **4.GHI**, **1.@**, **3.DEF**.
2. To delete information, use  to select, then press **OK Sel.**
3. Press Soft Key 1 **Del.**





BookMark (Menu 4.GHI 2.ABC)

Used to bookmark your favorite functions.

1. Press , **4.GHI**, **2.ABC**.
2. Press Soft key 1 **Add.**
3. Enter the name of the site.
4. After selecting **URL** with , enter URL.
5. Press **OK**.

Alarm Clock (Menu 4.GHI 3.DEF)









To change an event alarm time.

1. Press , **4.GHI**, **2.ABC**.
2. You can change the alarm mode using .
 - ▶ **Cancel / Once / Daily**
3. Use  to set alarm time, then press **OK Save.**
 - ▶ Select **AM/PM** with Soft Key 1 **PM**, and select Hour/Minute with .
4. Set the alarm mode for alarm and press **OK Save.**

NOTE Alarm is disabled when the mobile is switched off. Any alarms that have passed the set limits will automatically expire.

Wake-up Call (Menu










Alarm will sound at the time designated and the message “**time to wake up**” will be displayed on the screen. When you press the menu “confirm”, you may select either extend 5 minutes or release.

1. Press , , .
2. You can change the alarm mode using .
 - ▶ **Cancel / Once / Mon~Fri / Mon~Sat / Daily**
3. Use  to set alarm time and select Ringer, then press  **Save**.
 - ▶ Select **AM/PM** with Soft Key 1 **PM**, and select Hour/Minute with .
 - ▶ Press Soft Key 1 **Sel** for Select Ringer.
4. Set the alarm mode for alarm and press  **Save**.

NOTE Alarm is disabled when the mobile is switched off. Any alarms that have passed the set limits will automatically expire.

Calculator (Menu  )

Calculate simple mathematical computations.
(Can enter numbers up to the second decimal place.)

1. Press  ,  ,  .
4. Press  and  in order.
6. Select (multiplication) using  keys.
7. Press  ,  in order.
8. Press  .






You will see the result of the calculation **250**.

NOTE Calculation should be 32 characters (for example, 50+14-...).
Valid result is 2.14*E9.




Security (Menu)

Phone Lock (Menu)

Prevents unauthorized use of your phone.






1. Press , , .
2. Enter four-digit Lock code. (Default value is '0000')
3. Select the item of your choice by using , then press .

▶ Deactivate / Power-on / Now

NOTE In standby mode, to activate the lock mode quickly, press    (for 3 seconds).

Security Code (Menu)

Allows you to enter a new four-digit lock code number. For confirmation, your phone will prompt you to enter the new lock code twice.

1. Press , , .
2. Enter four-digit Lock code. (Default value is '0000')
3. Enter the new four digit Lock code, then press .
4. Re-enter Lock code, then press .

Settings (Menu)






לשון (Menu)

Set the Bilingual feature according to your preference, choose between English and Hebrew language.

1. Press , , .
2. Set **לשון / English** with  and then press .

Call Answer (Menu)






You may answer the calls by either opening the flip or by pressing the key.

1. Press , , .
2. Select the item of your choice by using , then press .

▶ **Open folder / Press key / SEND only**

Connection (Menu)

Setting the communication mode to use dial-up networking service with a desktop or a notebook computer for connecting to the internet backbone.

1. Press , , .
2. Select the item of your choice by using , then press .




▶ **115K / 230K / Modem/Fax**

By default it is set to **115K**. If you change this setting on the phone ensure that the PC baud rates are changed to match accordingly. The wireless phone will work with the PC / PDA properly only when the serial port settings on both the PC match with the baud rates set on the phone.

NOTE You need to purchase the Data Kit in order to be able to use the phone as modem. The data kit includes a suitable cable for connecting the phone to the PC. Please contact **your service provider** for further information.

Modem/Fax (Menu 6MNO 4GHI)

Setting the phone mode to receive the data from the other party.

1. Press  , **6MNO** , **4GHI** .
2. Select the item of your choice by using  , then press  .

▶ **Deactivate / Modem / Fax**


Phone Info (Menu 6MNO 5JKL)


Your phone number, configured date of software in your phone and current time are displayed on the screen.

1. Press  , **6MNO** , **5JKL** .

▶ **Press Soft Key 2 PRL.**

Message


Text message, page and voice mailbox become available as soon as the power is on. You can access the above types of messages using the message Key .

In addition, you can make a call to the call back number by pressing  during a message check.



The phone can store up to 51 messages (1 voice message: 50 text messages) with 160 characters per message. Users may read and edit messages, saved in the outbox during transmission and send them.




However, you should check whether **your service provider** provides the above features.

Character limits: The PD820 supports up to 127 characters per message including header information. Limits to available characters per message may exist; please check with **your service provider** for system capabilities.

The information that is stored in the message is determined by phone mode and service capability. You can check types of messages by pressing the message Key .









Check with **your service provider** about the availability of this feature.

Note When a message arrives while the folder is closed, pressing  (Down Side Key) will display message content on the Caller LCD. Pressing  (Up Side Key) will return screen to the standby screen.





Note When multiple messages arrive, pressing  (Down Side Key) will display received messages in order. Pressing  (Up Side Key) will display content of the next unchecked message. If there are no unchecked messages, pressing  (Up Side Key) will return screen to the standby screen.

Outbox ()





Write New ()

1. Press  .
2. Press  **Write New**. (For using Text Input, refer to pages 33~34)
3. Enter destination number or find saved number in the phone book, then press  .
4. Enter message, then press  .
5. Use  to select **Yes/No** for saving message, then press  .
6. Select type of message by using  , then press  .
 - ▶ **Normal / Urgent / Express**

Received Msg ( )



1. Press .
2. Select  **Received Msg**.
3. After selecting the desired message with  press  **Sel.** Then follow the process for **Write New** (see page 59).
 - ▶ You may delete the selected draft message by pressing Soft 1 Key **Del**.

Sent Msg ( )

1. Press .
2. Select  **Sent Msg**.
3. After selecting the desired message with  press  **Sel.** Then follow the process for **Write New** (see page 59).
 - ▶ You may delete the selected draft message by pressing Soft 1 Key **Del**.





Draft ( )

Saves the message you have been working on in a standby display, if you have an incoming call or message.


1. Press .
2. Select  **Draft**.
3. You could sequentially write messages you have been working on. Then follow the process for **Write New** (see page 59).

Clear Outbox ( )

Allows you to delete all messages saved in the Outbox.

1. Press .
2. Select  **Clear Outbox**.
3. Use  to select **Yes/No**, then press .

SMS Info ( )

After selecting the desired message with  ; press

 **Sel.**

1. News

- ▶ News Headlines/Israel News/World News

2. Sport

- ▶ Sport/NBA league/Basketball lea./ToTo results

3. Entertainment

- ▶ Ent. News/Cinema

4. Fun

- ▶ Joke/Fortune cookie/Facts/Tarot Cards/
Today before

5. Finance

- ▶ Finances News/Stock exch./USD rate

6. Astrology

- ▶ Capricorn/Aquarius/Pisces/Aries/Taurus/Gemini/
Cancer/Leo/Virgo/Libra/Sorpion/Sagittarius

Inbox (,)

Text (,)

Received text messages and page messages may be searched, and the contents may be viewed. Received messages are sorted in an order of urgent messages, unread messages and read messages.

To view the list of the received messages.

1. Press , .

2. Select  **Text**.

 : Unread Message

 : Read Message

3. After selecting the desired message with ; press

 **Sel.**

- ▶ Press Softkey 1 **Menu** to select from **Move to List**, **Delete**, and **Move to Store**.





Select **Delete** to delete it and select **Move to Store** to save message.

Press Soft key 2 **Rply** to reply. Then follow the process for **Write New** (see page 59).

4. Press Soft Key 1 **Del** deletes the selected message from the Inbox.




Voice (,  **2**ABC)

Allows you to view the new voice messages recorded in the voice mail box. Once you exceed the storage limit, the old messages will be overwritten. When you have a new voice message, your phone will alert you.

1. Press , .
2. Select **2**ABC **Voice**.
 - ▶ To delete information press Soft Key 1 **Del** and then press .
3. Press Soft key 2 Hear or  to listen to voice messages.




Store (,  **3**DEF)

Allows you to save messages

1. Press , .
2. Select **3**DEF **Store**.
3. After selecting the desired message with , press  **Sel**.




Clear Inbox (,  **4GHI**)

Read messages and all messages are divided and must be deleted separately.

1. Press , .
2. Select **4GHI Clear Outbox**.
3. Use  to select **Yes/No**, then press **OK**.




Clear Store (,  **5JKL**)

Allows you to delete all messages saved in the Store.

1. Press , .
2. Select **5JKL Clear Store**.
3. Use  to select **Yes/No**, then press **OK**.




Inbox Alert (,  **6MNO**)

Allows you to select the alert type for a new message.

1. Press , .
2. Select **6MNO Inbox Alert**.
3. Select the item of your choice by using , then press **OK**.
 - ▶ **Off / Once / Every 2 Mins / Every 5 Mins / Every 10 Mins / Every 30 Min / Every 1 Hours**




Alert Tone ( ,  **7** PORS)

Allows you to select the alert type for a new message.

1. Press  ,  .
2. Select **7** PORS **Alert Tone**.
3. Select the item of your choice by using  , then press **OK** .
▶ **Effect 1~4.**

Font Color ( ,  **8** TUY)

Allows you to select the font colour for a new message.

1. Press  ,  .
2. Select **8** TUY **Font Color**.
3. Select font colour by using  then press **OK** .






Services()

Internet Portal (or press)

The MiniBrowser feature allows you to view internet content especially designed for the mobile phone interface.



Access and selections within this feature are service provider dependent.

For specific information on MiniBrowser access through your phone, contact your service provider.

1. Press  ,  .
2. internet logo will be displayed followed by internet Data Services Menu.
3. Scroll through the menu using  and launch any Data Service by clicking on  .
4. To exit from Data Services any time, hold down  for a few seconds.

Note All Data Services may not be available to every subscriber. Please contact your service provider for further information.



Game&App ( )**Activate** ( ,  , )

Press  until you find the item you desire then press  .

Download ( ,  , )

Moves you to the Game site with wap.



Rings&Pics ( )**Activate Rings** ( ,  , )

Press  until you find the sound you desire then press  .

Download Rings ( ,  , )

Moves you to the Ring tone site with wap.

Activate Pics ( ,  , )

Press  until you find the pics you desire then press  .

Download Pics ( ,  , )

Moves you to the Animation site with wap.

Voice Portal ( 4GHI)

Pelephone *10 ( , 4GHI , 1@)

Used to make a call “    ”.

ESC *69 ( , 4GHI , 1@)

Used to make a call “    ”.

What's New ( 5JKL)

Moves you to the “What's New” site with wap.



5 Safety Guidelines

TIA Safety Information

The following is the complete TIA Safety Information for Wireless Handheld phones.

Exposure to Radio Frequency Signal

Your wireless handheld portable telephone is a low power 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 hand-held 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).

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.

Phone Operation

NORMAL POSITION: Hold the phone as you would any other telephone with the antenna pointed up and over your shoulder.

Tips on Efficient Operation:

For your phone to operate most efficiently:

Do not 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.

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

Driving

Check the laws and regulations on the use of wireless telephones 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 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 6 in 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
- 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.] Optional for each phone manufacturer.

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.

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 radiofrequency energy (RF) in the microwave range while being used. They also emit very low levels of RF when in the 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 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
- 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:

- o National Institute for Occupational Safety and Health
- o Environmental Protection Agency
- o Occupational Safety and Health Administration
- o 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 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 radio frequency 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 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 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 radio frequency 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/cdrh/phones/index.html>)

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.nrpb.org.uk/>)