



SPH-N345 User's Manual



Please read this manual before operating your phone, and keep it for future reference.

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Important Safety Precautions

Read these guidelines before using your wireless phone. Failure to comply with them may be dangerous or illegal. For more detailed safety information, see “Health and Safety Information” on page 91.

Road Safety at All Times

Do not use a hand-held phone while driving; park the vehicle first.

Switching Off When Refueling

Do not use the phone at a refueling point (service station) or near fuels or chemicals.

Switching Off in Aircraft

Wireless phones can cause interference. Using them in aircraft is both illegal and dangerous.

Switching Off in Hospitals

Switch off your phone near medical equipment. Follow any regulations or rules in force.

Interference

All wireless phones may be subject to interference, which could affect their performance.

Special Regulations

Meet any special regulations in force in any area and always switch off your phone whenever it is forbidden to use it, or when it may cause interference or danger (in a hospital for example).

Important Safety Precautions

Appropriate Use

Use only in the normal position (held to the ear).
Avoid unnecessary contact with the antenna when the phone is switched on.

Accessories and Batteries

Use only Samsung-approved accessories and batteries.

Qualified Service

Only qualified service personnel may install or repair your phone.

CAUTION

RISK OF EXPLOSION IF BATTERY IS REPLACED
BY AN INCORRECT TYPE DISPOSE OF
USED BATTERIES ACCORDING TO
THE INSTRUCTIONS

Unpacking

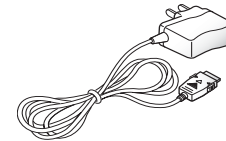
Your package contains the following items:



Handset



Battery



Travel Adapter



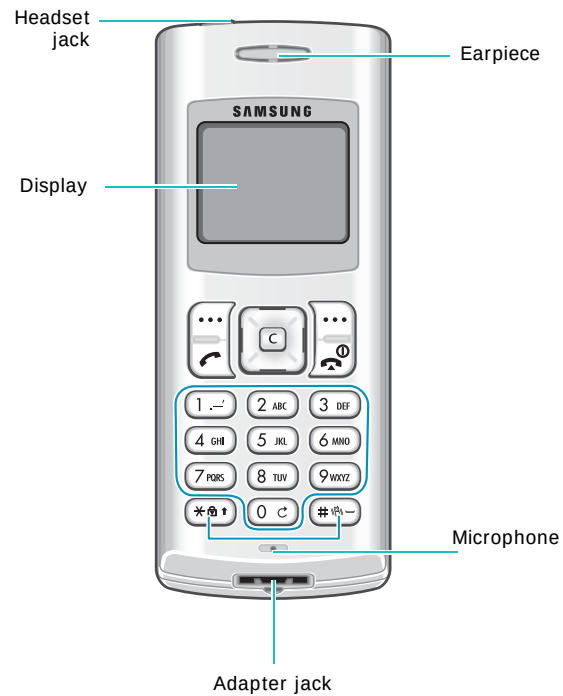
User's Manual

In addition, you can buy the following accessories for your phone from your local Samsung dealer:

- Standard battery
- Travel adapter
- PC data cable
- Car charger
- PC link CD
- Headset

Phone Layout

The following illustrations show the main elements of your phone.



Key

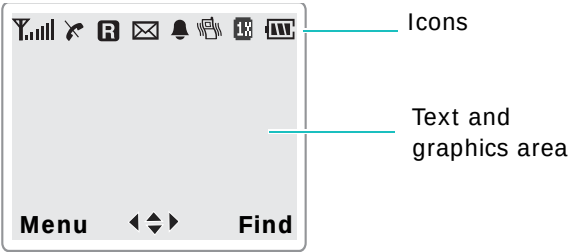
Key(s)	Functions
	Performs the functions indicated by the text above them, on the bottom line of the display.
	In Menu mode, scrolls through menu options. In Standby mode, quickly enters the following menus respectively: : Messages : Ringer Type : Scheduler : Calculator
	Deletes characters from the display. In Menu mode, returns to the previous menu level.
	Makes or answers a call. In Standby mode, retrieves the most recent numbers dialed, received, or missed. Redials the last number when pressed and held.
	Ends a call. Also switches on and off the phone when pressed and held. In Menu mode, cancels your input and returns the phone to Standby mode.

Key(s)	Functions (Continued)
  	Enters numbers, letters, and some special characters.
	In Standby mode, activates Key Lock mode when pressed and held. In the text entry mode, changes the case of letters.
	In Standby mode, enters or exits Silent mode on and off when held down. It can also be used when dialing special services, such as teleservices.

Display

Layout

The display comprises two areas; an upper line of fixed icons, and the lower text and graphic area.



Icons

Icon	Description
	Signal Strength: Shows the received signal strength. The greater the number of bars, the better the signal strength.
	Service: Appears when a call is in progress.
	No Service: Appears when you are outside a service area. When it appears, you cannot make or receive calls.
	Roaming: Appears when you are out of your registered coverage area and have registered onto a different network, when traveling in other countries, for example.

Icon	Description (Continued)
	New Message: Appears when a new text message or voice mail message are received.
	1X Mode: Appears when 1X system is engaged.
	Vibrator: Appears when the ringer volume for calls set to Vibrate , High+Vib , or when Silent mode is activated.
	Battery Status: Shows the level of your battery. The more bars you see, the more power you have left.

Another Icons

Icons	Description
	Ringer Off: Appears when you set the ringer volume for calls to Off .
	Auto Answer Mode: Appears when auto answer feature is activated.
	Alarm: Appears when you set an alarm to ring at a specified time.

Backlight

The display is illuminated by a backlight. When you press any key, the backlight comes on. It goes off if no keys are pressed within a given period of time, depending on the setting in the **Backlight** menu (**Menu 6-3**).

To specify the length of time for which the backlight is active, set the **Backlight** menu; see page 81 for further details.

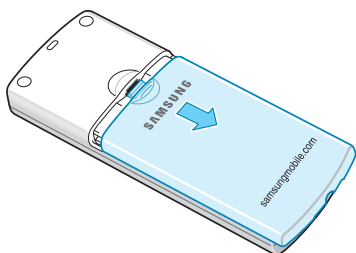
Getting Started

Installing the Battery

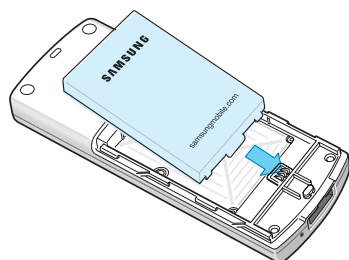
Your phone is powered by a rechargeable Li-ion battery. Use only approved batteries and chargers. Ask your local Samsung dealer for further details.

Note: You must fully charge the battery before using your phone for the first time. A discharged battery is fully recharged in approximately 180 minutes for a standard battery.

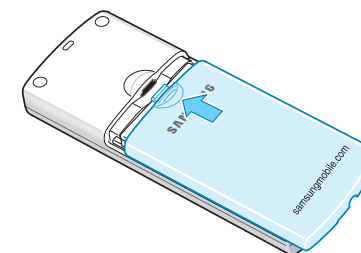
1. Remove the battery cover by pressing down the groove and then sliding the cover out.



2. Place the battery into the battery slot, making sure that the metal contacts are facing down.



3. Place the battery cover, as shown, and slide it toward the top of the phone until it clicks into place.

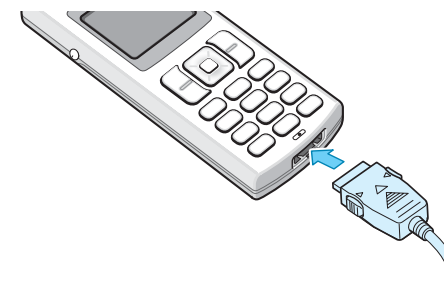


Charging the Battery

Your phone is powered by a rechargeable Li-ion battery. A travel adapter comes with your phone. Use only approved batteries and chargers. Ask your local Samsung dealer.

You can use the phone while the battery is being charged, but this will cause the battery to charge more slowly.

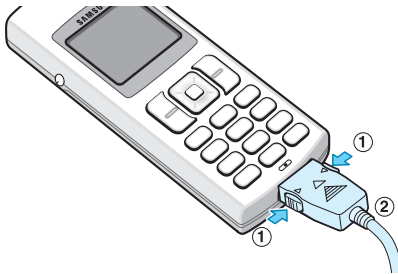
1. With the battery in position on the phone, plug the connector of the travel adapter into the adapter jack at the bottom of the phone.



2. Plug the adapter into a standard AC wall outlet.

The Battery Strength icon on the display repeats filling and emptying itself to indicate that the battery is charging.

3. When charging is finished, unplug the adapter from both the power outlet and the phone by pressing the buttons on both sides of the connector and pulling the connector out.



Note: Do not remove the battery from the phone without unplugging the adapter while it is charging. Otherwise, the phone may be damaged.

Low Battery Indicator

You can easily tell if your battery needs to be recharged by checking the battery strength icon () at the upper-right corner of your phone's display. The presence of all three bars indicates a full charge, two bars indicates a smaller charge and one bar indicates an even smaller charge. No bars (the battery icon is empty) means your battery must be charged.

When the battery charge level gets low, the battery sensor blinks an empty battery icon () and sounds a warning tone. If the battery level gets too low, the phone will automatically turn off. Unfortunately, if this happens, you'll lose whatever you are doing, and your phone call will cut off. Watch the battery strength icon and make sure your battery is adequately charged.

Switching the Phone On / Off

1. Hold down  until the power-on animation is displayed to switch the phone on.

When the system locates services, the greeting message displays along with the current date and time. You can now place and receive calls.

If your phone is out of service, the No Service icon () appears on the display. In this case, you cannot make and receive calls. You can try again later when service is available.

Note: You can change the LCD language using the **Language** menu option (**Menu 7-5**); for further details, refer to page 84.

2. When you wish to switch the phone off, hold down  until the power-off animation is displayed.

Your Phone's Mode

Standby Mode

Standby is the most basic state of your phone. The phone goes into Standby mode after you turn it on, or whenever you briefly press . When your phone is in Standby mode, you will typically see the greeting message and current date and time. If you enter a phone number, you can press  to dial it or press  to save it in the internal Contacts.

Press  at any time to return to Standby mode. Be careful; if you are on a call when you press , you will disconnect the call and return to Standby mode. Press  several times or hold it down to return to Standby mode without ending the call.

The main menu can be accessed when you are in Standby mode.

Talk Mode

You can place and answer calls only when your phone is turned on. During a call, the phone is in Talk mode. While you are in Talk mode, pressing  gives you a list of options. See page 31 for details on the options.

Power Save Mode

Your phone comes with a Power Save feature that will automatically be activated if your phone is unable to find a signal after 15 minutes of searching. While this feature is active, the phone's battery charge is conserved. The phone will automatically recheck for a signal periodically. To manually force the phone to recheck for a signal, press any key. A message on the display lets you know when your phone is operating in Power Save mode.

Key Lock Mode

You can lock the keypad by pressing and holding  in Standby mode. By doing this, you can prevent accidental key pressing.

To unlock the keypad, press  and then . The Key Lock icon () displays in the display.

When you have an incoming call or the alarm goes off while in Key Lock mode, the mode is automatically deactivated and the phone goes to Standby mode.

Note: You can set the phone to automatically lock the keypad after a specified period of time, in the **Auto Key Lock** menu (**Menu 7-1**). See page 83.

Call Functions

Making a Call

In Standby mode, key in the area code and phone number and press .

When entering a number, pressing  allows you to insert a pause or a hyphen. For more details about pause dialing, see page 27.

Note: If you have activated **Auto Retry** menu (**Menu 7-4**), the phone will automatically retry to make the call when the line is busy or the remote person does not answer you.

Correcting the Number

To clear the	Press
last digit displayed	 .
whole display	 for more than one second.

Ending a Call

When you want to finish your call, briefly press .

The call time, the length of the call, displays briefly and the phone returns to Standby mode.

Redialing the Last Call

To redial the last call you made, press  twice in Standby mode.

Your phone stores the last 20 incoming, outgoing and missed calls. To recall any of these numbers:

1. If there are any characters on the display, press  to return to Standby mode.
2. Press . The list of the call logs is displayed.
3. Use  or  to scroll through the list until you select the required name or number.
4. Press  to dial the number.

Making a Call from your Contacts list

You can store the phone numbers called regularly in memory, which is called Contacts list. You then simply recall the number to dial. For further information on the Contacts feature, refer to page 51.

Emergency Dialing

You can place an emergency call from your emergency number list, even if your phone is locked or all outgoing calls are restricted. For further information on emergency numbers, refer to page 88.

Prepend Dialing

The **Prepend** option lets you add digits, such as area codes and network feature activation codes to a phone number that is in your internal Contacts or call logs.

To prepend existing phone numbers in the Contacts or call logs:

1. Access a call log entry referring to in page 24 or a Contacts entry referring to in page 51.
2. When the desired phone number displays, press  to access the option menu.
3. Use  or  to scroll through the list until **Prepend** option is highlighted.
4. Press .
5. Enter the area code or feature code.
6. Press  to dial the number.

Speed Dialing

Once you have stored phone numbers in the Contacts memory, you can dial them easily by pressing a few keys.

One-Touch Dial

Memory locations 001 through 009 are special one-touch locations. You can dial the phone numbers stored in those memory locations simply by pressing one number key.

Press and hold the third digit of the memory location.

For example: Location no. 009
Press  and hold.

The number (and name) stored is displayed, then dialed.

Two-Touch Dial

Memory locations 010 through 099 are special two-touch locations.

Press the second digit briefly, then hold down the third digit of the memory cell.

For example: Location no. 023
Press  briefly and hold down .

The number (and name) stored is displayed, then dialed.

Three-Touch Dial

Memory locations 100 through 999 are special three-touch locations.

Press the first and the second digit briefly, then hold down the third digit of the memory cell.

For example: Location no. 123
Press  and  briefly, then hold down .

The number (and name) stored is displayed, then dialed.

Note: When several numbers are saved in one location, only the phone number which is specified with the **Speed Dial** label category will be automatically dialed. For details, refer to page 53.

Pause Dialing

When you call automated systems, like banking services, you are often required to enter a password or account number. Instead of manually entering the numbers each time, you can store them in your Contacts, separated by special characters which are called pauses.

Storing Pauses in a Contacts Entry

To store a number in your Contacts that contains pauses:

1. Enter the phone number you want to store, such as the bank's teleservice phone number.
2. Press  to display the menu options.

3. Press  or  to highlight the desired pause type.
 - **P Pause:** The letter “P” displays within the number, meaning that a hard pause will occur at that point in the calling sequence.
 - **T Pause:** The letter “T” displays in the number, meaning that a timed (2-second) pause will occur at that point in the calling sequence.
4. Press  to enter a pause. Continue entering numbers and using  to enter pauses.
5. Store the number in your Contacts as you normally would by pressing  and following the screen prompts.

Pause Dialing from a Stored Contacts Entry

1. Dial the number from the Contacts.
2. If you stored the number using “T” pause, simply call the number from the Contacts.

If you stored the number using “P” pause, wait for the appropriate prompt for the number, such as a credit card number or a bank account number.
3. When prompted, press  to send the DTMF (Dual-Tone Multi-Frequency) number that follows your pause.

Manual Pause Dialing

You can enter pauses manually during the dialing process.

1. Enter the phone number of the service you want to connect to, such as a bank's teleservice phone number.
2. Press  to display the menu options.
3. Press  or  to highlight the desired pause type.
4. Press  to enter a pause. Continue entering numbers and using  to enter pauses.
5. When you finish entering the numbers, press  to dial the number.

Answering a Call

When somebody calls you, the phone rings and the phone icon is displayed in the middle of the display.

The caller's phone number, or name if stored in Contacts, displays.

1. To answer a call, press . Your phone is preset to answer a call when the key is pressed via the **Call Answer** menu (**Menu 7-3**).

If the menu is set to **Any Key**, you can answer a call by pressing any key except for . When you set the menu to **SEND Key**, you must press  to answer a call. For details about the menu, see page 84.

2. End the call by pressing .

Note: You can answer a call while using the Contacts or menu features. The current operation will be interrupted.

Options During a Call

Your phone provides a number of functions that you can use during a call. As many of these options are network services, you may not be able to use all of them at all times.

Press  during a call to access the following options:

Mute / Quit: allows you to switch your phone's microphone off, so that the other person cannot hear you.

Example: You wish to say something to another person in the room but do not want the other person to hear you.

Calls: allows you to access the Calls menu. For details, see page 48

Phone Book: allows you to access the Contacts menu. For details, see page 51.

Silent / Quit: does not transmit the key tones. It allows you to press keys without hearing annoying key tones during a call.

Send Tel #: send your telephone number to the other party.

My Phone #: displays own number.

Version: allows you to view the software and hardware version of your phone.

Send DTMF (Dual Tone Multi Frequency):

Sends DTMF tones from the displayed number. DTMF tones can be used to control e-services, such as telebanking or voice mail. During a call, input the digits you wish to send as DTMF tones, for instance, your bank account number and password. Subsequently select the Send DTMF option.

Using the Caller ID

This feature tells you who is calling you by displaying the caller's number when the phone rings. If a caller's name and number are stored in the Contacts, the corresponding name is also displayed. If you call someone who has this feature, your phone number will be displayed on the their phone.

Note: Contact your service provider to set up the Caller line identification service.

Viewing Missed Calls

Your phone keeps a list of calls that you do not answer when the phone is on and service is available. The phone indicates a missed call by displaying a text notification on the screen. Additionally, if caller information is available, the screen displays the phone number of the most recent missed call.

Press  to call the displayed number.

Quickly Switching to Silent Mode

Silent mode disables all sounds on the phone. This feature is best used in situations where the phone might disturb others, such as in a meeting, in a library or at the theater. Your phone can be set to Silent mode with one press of a key.

To enter Silent mode, press and hold down  until "Entering Silent Mode" and the Vibration icon () appear.

Pressing and holding down  once again Exits Silent Mode. The Vibration icon is no more displayed.

Call Forwarding

This feature provides the option of forwarding incoming calls to another phone number, even while your phone is turned off. Activating Call Forwarding does not affect outgoing calls made from this phone. Contact your service provider to activate Call Forwarding.

Call Waiting

Call Waiting lets you receive a second call during conversation. Your phone notifies you of a call waiting by beeping and displaying “Call Waiting.”

Your phone provides the option of turning the Call Waiting feature on and off if you have subscribed to the service. Call Waiting is on by default in the phone. If you choose to have an undisturbed conversation, simply turn off the feature for the current call.

Note: Contact your service provider to activate the Call Waiting service.

To answer a waiting call:

1. To answer the call, press . The phone connects the calling party and places the current party on hold.
2. Press  again to switch between the two parties.

Note: If you do not respond to a Call Waiting notification, the phone will forward the call to voicemail or another number that you have set up. Contact your service provider for more information.

Three-way Calling

This feature enables you to conduct conference calls with two separate parties at the same time. The phone records each party into the Outgoing calls log. Also, You are billed airtime for each outgoing call separately.

Note: Contact your service provider to activate Three-way Calling.

To place a Three-way call:

1. During a conversation, enter the phone number for the third party, and then press . The phone places the other party on hold and dials the third party.
2. When you are connected to the third party, press  again to begin your three-way call.

If one of the callers (not you) hangs up, you and remaining caller stay connected. If you initiated the call and you hang up first, all three parties are disconnected.

Entering Text

At many times when using your phone, you will need to enter text; for example, when storing a name in the Contacts, creating your personal greeting or scheduling events in your calendar. You can enter alphanumeric characters into your phone using your phone's keypad.

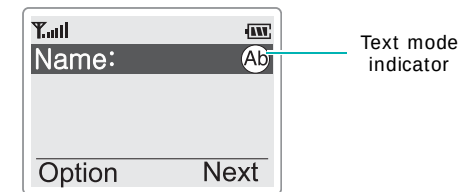
Your phone has the following text input modes:

- **T9 Word:** This mode allows you to enter words with only one key press per letter. Each key on a keypad has more than one letter; for example, pressing **5 JK** can enter J, K, or L. However, T9 mode automatically compares the series of keystrokes you make with an internal linguistic dictionary to determine the word, thus requiring far fewer keystrokes than the traditional Alphabet mode.
- **ABC:** This mode allows you to enter letters by pressing the key labeled with the desired letter once, twice, or three times until the letter appears on the display.
- **Symbol:** This mode allows you to enter special characters.
- **123:** This mode allows you to enter numbers.

Changing the Text Input Mode

When you are in a field that allows characters entry, you should notice the text input mode indicator on the display.

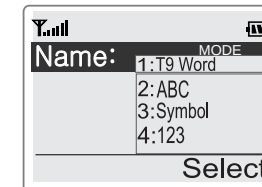
Example: Entering a name for a Contacts entry



You can change the text input mode by pressing

To change to another text input mode:

1. Press .



2. Scroll to the desired mode by pressing or .

Note: If you want to exit the menu without changing to a new mode, press .

3. To select the highlighted mode, press .
4. You will find the selected text input mode indicator on the display.

T9 Mode

To type a word, press the keys corresponding to the letters you need. Remember the following as you are typing:

1. Press the keys on the phone just once per desired letter. For example, to enter “Hello,” press **4 GH**, **3 DEF**, **5 JKL**, **5 JKL**, and **6 MNO**.
2. The word you are typing appears on the display. It may change with each key press.
3. Type to the end of the word before editing or deleting any keystrokes.
4. Put a space between each word by pressing **# 0**.

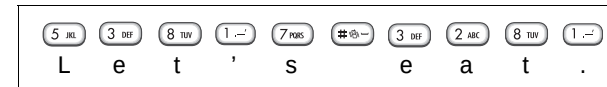
If the word doesn’t display correctly, press **0 C** one or more times to display alternative word choices for the keys you have typed.

Example: Both “Of” and “Me” use the **6 MNO** and **3 DEF** keys. The phone displays the most commonly used choice first.

5. Continue entering the next word.

Smart Punctuation

Periods, hyphens, and apostrophes are available by pressing **1 -**. T9 applies rules of grammar to insert the correct punctuation. Notice that **1 -** is used twice in this example to display two punctuation marks.



Including a Number

You can include a number between letters without exiting the T9 input mode. Press and hold the desired number key.

Changing the Case

Your phone offers three cases;

- **T9**: initial letter is capitalized
- **T9**: all letters are capitalized
- **t9**: all letters are lower case

Press *** 0 +** one or more times to display the appropriate case indicator, and begin typing normally.

Erasing Letters and Words

Press **C** one or more times to erase letters to the left. Press and hold **C** to erase all.

ABC Mode

When typing in ABC mode, you should press the keys labeled with the required letter:

- Once for the first letter
- Twice for the second letter
- And so on.

This method is called multi-tap typing.

For example, you press **2 ABC** three times quickly to display the letter “C” and **5 JKL** two times quickly to display the letter “K.”

The cursor moves to the right when you press a different key. When entering the same letter twice or a different letter on the same key, just wait for a few seconds for the cursor to move to the right automatically, and then enter the next letter.

Refer to the table below for further details about available characters:

Key	Characters in the Order Displayed
1 .,-	1 . @ , : ? - ; ' / () ! # % & * < > _ + = " \ { } \$ []
2 ABC	A B C 2
3 DEF	D E F 3
4 GHI	G H I 4
5 JKL	J K L 5
6 MNO	M N O 6
7 PQRS	P Q R S 7
8 TUV	T U V 8
9 WXYZ	W X Y Z 9
0 ↵	0

(Caps Lock mode)

Changing the Case

Your phone offers three cases;

- **Ab**: initial letter is capitalized
- **AB**: all letters are capitalized
- **ab**: all letters are lower case

Press ***⌂*** one or more times to display the appropriate case indicator and begin typing normally.

Inserting a Space

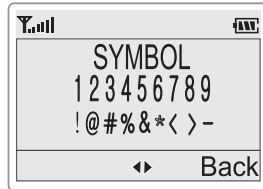
Press **#⌂←** to put a space between each word.

Erasing Letters and Words

Press **C** one or more times to clear letters to the left. Press and hold **C** to erase all.

Symbol Mode

Symbol mode enables you to enter symbols.



Press  or  to display more symbols.

Press the keys corresponding to the desired symbols. The phone automatically switches back to the text input mode used just prior to selecting Symbol mode.

123 Mode

123 mode enables you to enter numbers. Press the keys corresponding to the desired digits, and manually switch back to text entry mode of choice.

Using the Menus

The phone offers a range of functions that allow you to tailor the phone to your needs. These functions are arranged in menus and submenus.

The menus and submenus can be accessed by scrolling or by using the shortcuts.

Accessing a Menu Function by Scrolling

1. In Standby mode, press  to access Menu mode.
2. Press the Navigation keys to reach the main menu; for example, **Setup**. Press  to enter the menu.
3. If the menu contains any submenus: for example, **Language**, find the one you want by pressing the Navigation keys. Press  to enter the submenu.

If the menu you selected contains submenus, repeat this step.

4. Scroll with  or  to find the setting of your choice. Press  to confirm the chosen setting.

Notes:

- You can return to the previous menu level by pressing .
- You can exit the menu without changing the menu settings by pressing .

Using Shortcuts

The menu items (menus, submenus, and setting options) are numbered and can be accessed quickly by using their shortcut numbers.

Note: The numbers assigned to each menu function are indicated on the list on page 45.

1. In Standby mode, press  to access Menu mode.
2. Enter the first digit of the shortcut number. Repeat this for each digit of the shortcut number.

Example: Changing the ringer type for voice calls Press , , and .

5 for **Sounds**, **2** for **Ringer Type**, and **1** for **Calls** menu function.

3. Find the setting of your choice pressing  or  and then press  to confirm the chosen setting.

List of Menu Functions

1. Calls (see page 48)

- 1.1 Outgoing
- 1.2 Incoming
- 1.3 Missed
- 1.4 Erase History
- 1.5 Air Time
 - 1.5.1 Last Call
 - 1.5.2 Total
 - 1.5.3 Life Time
 - 1.5.4 Erase Total

2. Contacts (see page 51)

- 2.1 Find By Name
- 2.2 Add New Entry
- 2.3 Find By Entry
- 2.4 Find By Group
- 2.5 Add E-mail
- 2.6 My Phone #
- 2.7 Memory

3. Messages (see page 57)

- 3.1 New Message
- 3.2 Voice
- 3.3 Inbox
- 3.4 Sent
- 3.5 Draft
- 3.6 Erase Msg
 - 3.6.1 Voice
 - 3.6.2 Old Inbox
 - 3.6.3 New Inbox
 - 3.6.4 Sent
 - 3.6.5 Draft
 - 3.6.6 All Messages
- 3.7 Msg Setting
 - 3.7.1 General
 - 3.7.2 New Message

4. Planner (see page 66)

- 4.1 Today
- 4.2 Scheduler
- 4.3 Task List
- 4.4 Memo Pad
- 4.5 Alarm
- 4.6 Calculator
- 4.7 World Time
- 4.8 Count Down
- 4.9 Set Time

5. Sounds (see page 75)

- 5.1 Ringer Volume
 - 5.1.1 Calls
 - 5.1.2 Messages
 - 5.1.3 Alarm/Schedule
- 5.2 Ringer Type
 - 5.2.1 Calls
 - 5.2.2 Messages
 - 5.2.3 Alarm/Schedule
- 5.3 Key tone
 - 5.3.1 Type
 - 5.3.2 Volume
- 5.4 Alerts
 - 5.4.1 Minute
 - 5.4.2 Service
 - 5.4.3 Connect
 - 5.4.4 Disconnect
 - 5.4.5 Fade
 - 5.4.6 Roam
 - 5.4.7 Privacy
- 5.5 Voice Volume
- 5.6 Roam Ringer
- 5.7 Tone Length
- 5.8 Power On/Off

6. Display (see page 80)

- 6.1 Menu Style
- 6.2 Wallpaper
- 6.3 Backlight
- 6.4 Banner
- 6.5 Contrast

7. Setup (see page 83)

- 7.1 Auto Key Lock
- 7.2 Auto Answer
- 7.3 Call Answer
- 7.4 Auto Retry
- 7.5 Language
- 7.6 Select NAM
- 7.7 Set System
- 7.8 Version

8. Security (see page 87)

- 8.1 Lock Phone
- 8.2 Change Lock
- 8.3 Restriction
- 8.4 Emergency #
- 8.5 Erase Contacts
- 8.6 Reset Phone
- 8.7 Voice Privacy

You can use the **Calls** menu to:

- view and dial the last outgoing, incoming, or missed numbers.
- erase the numbers in the call log memory.
- view the duration of calls.

Outgoing *(Menu 1-1)*

Note: You can also access this menu by pressing  in Standby mode.

The phone stores up to 20 outgoing calls you dialed. When you access this menu, a list of outgoing calls is displayed.

1. Scroll to the desired number (or name if saved in the Contacts).
2. Press  to select the highlighted number. The dialed number (and name if stored in the Contacts) is displayed.

To	Press
place a call to the displayed number	 .
use the menu options	 . For details about the options, see the following page.
exit the call log and return to Standby mode	 .

When you access the menu options, the following options are available:

Talk: dials the selected number.

Save: allows you to save the number in the Contacts.

Show Entry: (shown when the number is stored in your Contacts) displays the phone number and memory location number.

Prepend: allows to add an area code or feature code to the number before calling the number.

Incoming *(Menu 1-2)*

This option lets you view the last 20 calls received if you are subscribed to the caller ID service. When you access this menu, a list of the incoming calls is displayed.

For further information on scrolling through the list and accessing the call log, see “Outgoing” on the previous page.

Missed *(Menu 1-3)*

If Caller Line Identification is available (contact your service provider), your phone keeps a list of 20 missed calls that you failed to answer.

For further information on scrolling through the list and accessing the call log, see “Outgoing” on the previous page.

Erase History *(Menu 1-4)*

You can erase the entries stored in each of the three call logs; outgoing, incoming, or missed calls. You can also erase all three logs at one time.

When you see a confirming message, press  to erase the log. If you want to cancel, press .

Air Time *(Menu 1-5)*

Your phone records the amount of air time, or talk time, used. Using this option, you can view the number of the calls to or from your phone, and the air time for all calls. You can easily erase the air time record at any time.

Note: This feature is not intended to be used for billing purposes.

The following options are available:

Last Call: shows the air time of the last call.

Total: shows the number of all calls made to and the total duration of the calls since the air time counter was last set to zero by using the **Erase Total** option.

Life Time: shows the number and total duration of all calls made to or from your phone since the phone was shipped from the factory. The lifetime cannot be deleted even though you reset your phone using the **Reset Phone** or **Erase Contacts** feature.

Erase Total: allows you to erase the "Total" air time measurement and reset the air time counter.

Contacts

The Contacts allows you to store frequently used phone numbers and the associated names in your personal directory to make it easy for you to place a call without having to remember or enter the phone number. You can store up to 999 numbers, each having up to 7 different numbers.

Find By Name *(Menu 2-1)*

This option allows you to find an entry by entering a person's name.

1. Press  or  to scroll to the desired name.

Or enter the first few letters of the name you want to find. The phone shows the first entry matching your input.

2. When the desired entry is highlighted, press  to access the entry.

Note: All of the numbers assigned to an entry display, including numbers stored into different categories. Press  or  to find the number you want.

3. Press  to place a call.

If you press  with viewing the details, you can access the following options:

Talk: dials the number.

Add #: allows you to add a new entry or a number to the current entry.

Edit: allows you to edit the phone number, name, location number, category and so on.

Prepend: allows you to add digits, such as area codes and network feature activation codes to a phone number.

Erase: erases the number.

Name Ring: allows you to specify a unique tone or melody to alert you to an incoming call from the number.

E-mail address: allows you to store an e-mail address in the entry.

Add New Entry (Menu 2-2)

This menu allows you to store a number with a name in the Contacts. You can save a person's various numbers, such as workplace number, mobile number and fax number, into one entry. Using this feature, you can keep someone's information together. It also helps you to find numbers easily in the Contacts.

Creating a New Entry

1. When you are prompted to confirm adding a new entry, press .
2. Enter a phone number and press .
3. Highlight the desired option you want to customize by pressing  or . The following options are available:
 - **Name:** allows you to enter a name of up to 20 characters. For further information on how to enter text, see page 36.
 - **Entry:** the first available location displays. If necessary, enter the location number using the number keys.
 - **Secret Off/On:** allows you to set the number to secret. This prevents a number from being displayed when it is accessed or dialed by unauthorized users. Only a person with your phone's lock code can view the secret number.
 - **Speed Dial:** allows you to select the category of number to be stored. The available categories are **Home**, **Work**, **Mobile**, **Pager**, **Fax**, and **No Label**.
 - **Group:** allows you to select one of four predefined relation groups, where the entry is included. Grouping the entries enables you to locate only the numbers in the desired group.
 - **Inactive:** allows you to specify a unique ring type for the entry. By selecting different tones, incoming voice calls having a caller ID can be distinguished from those that do not.

4. To edit the option setting, press . Select the desired setting by pressing or , or enter the required name or number. Press to accept your input or selection.
5. Repeat steps 3 and 4 to customize another option.
6. Press to save the entry.

Storing Phone Numbers at Call's End

To store a phone number at the end of your call:

1. Press to end the call. The call time and the phone number display.
2. To store the phone number, press .
3. Follow the instructions in "Creating a New Entry" on page 53.

Find By Entry *(Menu 2-3)*

This option allows you to find an entry by entering its location number.

1. Enter the location by pressing the numeric keys.
2. When the desired entry highlighted, press to view the details, press to make a call to the number.

Note: All of the numbers assigned to an entry display, including numbers stored into different categories. Press or to find the number you want.

While viewing entry details, you can access the menu options by pressing . For further information on the options, refer to the **Find By Name** menu on page 51.

Find By Group *(Menu 2-4)*

This option allows you to find an entry by selecting its relation group.

1. Press or until the group containing the entry you want appears at the bottom of the display. The phone lists all entries in the selected group.
2. Scan through the list using or to find the desired entry.
3. Press to view the details or to make a call.

Add E-mail *(Menu 2-5)*

This option allows you to store an e-mail address instead of a number.

1. When the phone asks if you want to add a new entry, press .
2. Enter the e-mail address and press . For further information about entering text, see page 36.
3. Follow from step 3 in “Creating a New Entry” on page 53.

My Phone # *(Menu 2-6)*

This option shows your own phone number.

After viewing the number, pressing  returns to Standby mode.

Memory *(Menu 2-7)*

Using this menu option, you can check how many names and numbers are stored in the Contacts and how many free locations remain.

Messages

Your phone can receive voicemail messages, text messages, and pages. Also, your phone can send text messages and pages if your system supplier provides this service.

When the phone receives a message, an alert sounds, a text notification displays along with the name and phone number of the caller if available. The New Message icon () remains on the screen until you read the new text, numeric page, or until you listen to the new voicemail messages.

If you are on a conversation and you receive an incoming message, your phone automatically mutes the ringer. This is to avoid ringing in your ear while you are trying to converse.

Note: You can quickly access the **Messages** menu by pressing  in Standby mode.

Message-related Icons



Filed message: displays if a message has been filed.



Message sent: displays when outgoing messages are transmitted.



Message read: displays when you have read a message.



Message received: indicates that an incoming text, voicemail, page, or browser message has been received.



Urgent message: displays if a message is urgent.

New Message *(Menu 3-1)*

You can create short text messages and numeric pages, and then send them to other mobile numbers.

Note: Message transmission is only supported in digital networks and if service is provided by your service provider.

1. Enter a destination phone number using the numeric keys and press .

You can select a number from your Contacts by pressing .

2. Enter the message contents or a numeric page. For further details about how to enter text, see page 36.
3. When you finish entering the message, press .
4. Press  or  to select one of the following option and press  to edit your input or setting.

- **Send To:** edits the destination phone number you entered in step 1.
- **Msg:** edits the message contents you entered in step 2.
- **CB #:** edits the callback number. Enter the new number to replace the current number. The default call back number is your phone number.

- **Option:** allows you to change the message options. Press  or  to scroll to the required item and press  or  to change the setting.

- **Priority:** select the message priority.
- **Delivery Ack:** turn the delivery acknowledgment feature on or off. when this is activated, the network informs you of whether or not the message has been read by the recipient.
- **Message:** set if the phone will save the message in the Sent message box after transmission. When you select **Prompt Save**, the phone will ask if you want to save the message.
- **Draft:** stores the message in the **Draft** menu (**Menu 3-5**).

Note: The **Call Back #**, **Delivery Ack**, and **Message** options can be preset to default values in the **Msg Setting** menu (**Menu 3-7**).

5. Press  to send the message.

Voice *(Menu 3-2)*

When a new voice message is received, the voicemail notification displays. If multiple new voicemails are received but not reviewed, only the last received voicemail information will be displayed. The display information will include time/date stamp, the total number of the new voicemails, and the callback number.

Press  and the sender's callback number, if available, or the voice server number is displayed. To listen to the message, press  again to connect to the voice server and follow the voice prompt.

Press  to access the following options:

Listen: allows you to listen to the voice message. The phone automatically dials the number of your voice mail center.

Clear Icon: clears the New Message icon and resets the counter for a new voice message, if necessary. The system resets the counter automatically after you listen to all of the new messages.

Inbox *(Menu 3-3)*

Your phone can store up to 98 pages and text messages all together in the Inbox, Sent, and Draft message box. If the message memory is full, a warning message is displayed and the phone rejects additional messages until you erase the old ones.

Press  or  to scroll to one of the messages in the list and press . The phone displays the message contents. If necessary, press  or  to scan through the contents.

You can dial the callback number of the message by pressing  twice.

While viewing a message, if you send a reply message to the sender, press  and press  to access the following options:

Reply: allows you to send a reply message to the sender.

Forward: allows you to send the message to another person.

Delete: deletes the message from the Inbox.

Talk: places a call to the callback number.

Save : allows you to save the sender's phone number into the Contacts. For further information about storing a number, see page 52.

Extract #'s: allows you to extract a number of more than 7-digits from the text message so that you can dial the number or save it in your Phonebook.

Sent *(Menu 3-4)*

Your phone can store up to 98 pages and text messages all together in the Inbox, Sent, and Draft message box. You can review or resend the messages stored in the Sent message box, if needed.

Press  or  to scroll to the desired message and press . The display shows the time and date when the message is created, the designated number (and name if saved in the Contacts) and the message contents. If necessary, press  or  to scan through the contents.

While reviewing a message, press  to access the following options:

Re-send: allows you to resend the message. For further information about sending a message, see page 58.

Delete: deletes the message from the Sent message box.

Draft *(Menu 3-5)*

Your phone can store draft messages that are yet to be sent in the filed message folder. You can access this folder at a later time to edit and send the message.

To store a message to the Draft message box:

1. Follow the process of writing a new message on page 58.
2. When you finish inputting the message, press  for options.
3. Select **Draft**, and press . The message is stored in the Draft box.

When you access the **Draft** menu, the list of the stored messages appears. Press  or  to scroll to one of the messages in the list and press .

While viewing a message, press  to access the following options:

Resend: allows you to edit and send the message.

Delete: deletes the message.

Erase Msg *(Menu 3-6)*

Using this menu option, you can erase all messages in each message box separately; **Voice**, **Old Inbox**, **New Inbox**, **Sent**, and **Draft** message box. You can also erase all of the messages at one time by selecting the **All Messages** option.

Msg Setting *(Menu 3-7)*

Using this menu, you can set up various options for messages.

General *(Menu 3-7-1)*

You can set up the following options for incoming messages.

Auto Scroll : If an incoming message is too long for the display, the phone displays it by scrolling the screen automatically. You can set the screen to scroll automatically or not.

- **1~5 Seconds**: set how often the phone scrolls to the next screen.

- **Off**: you need to scroll to the next screen manually using  or .

Msg Reminder: when a message is received, the phone alerts you by sounding the selected ringer. You can set how often this will happen.

- **Off:** the phone doesn't alert you.
- **Once:** the phone alerts you just once.
- **Every 2 Min:** the phone alerts you every 2 minutes.

Voice Mail #: You can view the number of the voice mail center. If necessary, edit the number and press .

New Message *(Menu 3-7-2)*

You can set up the default settings of following options for creating a new message.

Callback #: allows you to set the call back number. Your phone number is preset at the factory.

Save Message: allows you to set whether you want the transmitted message to be saved in the Sent message box or not.

- **Do Not Save:** the phone does not save the message.
- **Prompt Save:** the phone asks you if you want to save it or not.
- **Auto Save:** the phone saves the message automatically.

Entry Method: allows you to select the text input mode between **T9 Word** and **Alphabet** (ABC).

Delivery Ack: allows you to activate or deactivate the delivery acknowledgement feature. Select **Yes** to turn on the feature or **No** to turn it off.

Auto Erase: allows you to set whether or not the phone will automatically erase the oldest message when the phone's memory is full and a new message is received.

Canned Msg.: allows you to edit 10 canned messages and make up to 20 new canned messages. You can use the messages when writing a message.

The Planner feature enables you to:

- keep track of important dates and events and view the calendar.
- create a list of things to do.
- check the current time in another part of the world.
- use the phone as a calculator.
- set an alarm to ring at a specified time, for example, to remind you of an appointment.

Today *(Menu 4-1)*

You can schedule up to 9 events for the current day indicating each event's start and end time. You can be alerted by a schedule alarm before an event commences. Events scheduled for future dates automatically appear on your Today events schedule on that day.

Scheduling an Event

1. Enter your event contents.

You can enter up to 32 characters. For more information about entering characters, see page 36.

2. Press  to accept your input.

3. Enter the start time using the numeric keys and press .

You can move to each input field using  and . You must enter the hour in a 12-hour format. Press  for **A** (AM) or press  for **P** (PM).

4. Enter the end time and date using the numeric keys and press .
5. Select when the alarm will inform you of your event by pressing  or . Selecting **No alarm** means that the phone will not ring the alarm.
6. Press  to save your event.

Viewing an Event

The first event of the current day is displayed when you select the **Today** menu option. Press  or  to select the event you want to view.

To scroll through the event details, press  or .

While viewing an event, the following options are available when you press .

Add New: allows you to add a new event.

Edit: allows you to edit the current event.

Erase: allows you to erase the current event.

Erase All: allows you to erase all of the events.

Scheduler *(Menu 4-2)*

This option allows you to view the current month as well as the past or future month in calendar format. In this option, the current date is automatically highlighted on the calendar. Days with scheduled events are underlined.

Note: You can quickly access this menu by pressing  in Standby mode.

Scrolling through the Calendar

- You can move right or left one day by pressing  or .
- You can move up or down one week by pressing  or .

On the calendar, the following options are available when you press .

View: allows you to view the scheduled events of the selected day.

Add New: allows you to add a new event on the selected day.

Creating a New Event

You can store up to 20 events total in the scheduler.

- Select a day from the calendar, referring to “Scrolling through the Calendar” above and press .
- Schedule a new event, following from step 1 on page 66.

Viewing an Event

Days with scheduled events are indicated by a underline on the calendar when you access the **Scheduler** menu. Select one of them, and press . The first event of the day is displayed.

If necessary, when an event is displayed, press  to access the options. For further details on the options, refer to “Today” on page 66.

Task List *(Menu 4-3)*

This feature allows you to enter up a list of tasks to be done and assign both a priority and a deadline to each task.

Creating a Task Item

You can store up to 20 events total in the task list.

- Enter the first task.

You can enter up to 32 characters. For further details on how to enter characters, see page 36.

- Press  to confirm your input.

- Enter your deadline using the numeric keys, and press .

You can move to each input field using  and . You must enter the hour in a 12-hour format. Press  for **A** (AM) or press  for **P** (PM).

- Select high or low priority using  or  and then press  to store the task.

Viewing a Task Item

The first task is displayed with the deadline and the associated priority (for High or - for Low) when you select the **Task list** menu.

Scroll to the task you want to view by pressing  or .

While viewing a task, the following options available when you press .

Add New: allows you to add a new task.

Edit: allows you to edit the current task.

Erase: allows you to erase the current task.

Erase All: allows you to erase all of the tasks.

Memo Pad *(Menu 4-4)*

This menu allows you to write down memos about anything you need to remember.

Writing a New Memo

You can store up to 10 memos total in the memo pad.

1. Enter the memo.

For further details on how to enter characters, see page 36.

2. Press  to store the memo.

Viewing a Memo

The list of your memos displays when you access the **Memo Pad** menu.

While viewing the memo list, press  to use the following options:

Add New: allows you to add a new memo.

Edit: allows you to edit the memo.

Erase: allows you to erase the selected memo.

Erase All: allows you to erase all of the memos.

To view details, press the Navigation keys to scroll to a memo and press . You can use the options above by pressing .

Alarm *(Menu 4-5)*

This option allows you to set an alarm to ring at a specific time or release it.

To set an alarm, access the **Alarm** menu option **(MENU 4-5)** and select **Set**.

1. Select the alarm frequency option by pressing  or  and press .
 - **Once:** the alarm rings only once and is then deactivated.
 - **Daily:** the alarm rings every day at the same time.
2. Enter the required time for the alarm to ring using the numeric keys.

You can move to each input field using  and . You must enter the hour in a 12-hour format. Press  for **A** (AM) or  for **P** (PM).
3. Press  to save the setting.

To stop the alarm when it rings, press any key.

To release the alarm, access the **Alarm** menu option **(MENU 4-5)** and select **Release**.

Calculator (Menu 4-6)

Using this feature, you can use the phone as a calculator. The calculator provides the basic arithmetic functions: addition, subtraction, multiplication, and division.

Note: You can quickly access this menu by pressing  in Standby mode.

1. Enter the first number using the numeric keys.
2. Set the operation for your calculation by pressing the Navigation keys until the required arithmetic symbol appears: **+** (add), **-** (subtract), **x** (multiply), **÷** (divide).
3. Enter the second number.
4. To get the result, press .
5. Repeat steps 1 to 4 as many times as required.

Each time you change the operator, the previous calculation is performed and the result is displayed as the top number on the display.

Notes:

- To erase any mistakes or clear the display, press .
- Use  to enter a decimal point and  to change the sign of a number to a negative (-).

World Time (Menu 4-7)

This menu allows you to check the current time for 24 major cities around the world.

Select the city corresponding to your time zone by pressing the Navigation keys one or more times. The local date and time display.

To turn the DST (Daylight Saving Time) setting on:

1. After selecting the time zone you want to apply the DST, press .
2. When DST setting highlights, press .
3. Select On and press . The DST icon appears on the left of the time. To cancel the setting, select Off.

Count Down (Menu 4-8)

This menu allows you to check the current time for This menu help you know how much time it takes you to do something, or how many months, days, hours and minutes until a specific day arrives. You can create up to 20 Count Down timers using this menu.

Creating a Count Down Timer

1. Enter a name for your new Count down timer and press .

For further details about entering text, see page 36.

2. Enter the time and date that you want to count down from using the numeric keys.

You can move to each input field using  and . You must enter the hour in a 12-hour format.

Press  for **A** (AM) or press  for **P** (PM).

Note: You can enter a year between 1980 and 2099.

3. Press  to save the timer.

Viewing a Count Down Timer

The first Count Down timer is displayed when you select the **Count Down** menu.

Scroll to the timer you want to view by pressing  or .

While viewing a Count Down timer, the following options are available when you press .

Add New: allows you to create a new timer.

Edit: allows you to edit the current timer.

Erase: allows you to delete the current timer.

Erase All: allows you to delete all of the timers.

Set Time *(Menu 4-9)*

This option allows you to set the current time and date.

To set the time and date:

1. Enter the current time and date using the numeric keys.

The month, day, hour and minute must be entered with 2 digits. The year requires all four digits. You must enter the hour in a 12-hour format. Press  for **A** (AM) or  for **P** (PM).

2. When you finish entering the time and date, press  to save it.

If you enter a wrong time, the phone displays "Invalid time" and prompts you to enter again.

Sounds

You can use the **Sounds** menu to customize various sound settings, such as the:

- ringer volume, type and tone.
- key beep and voice volume.
- alert sounds and a ringer for the roaming calls.
- ringer which sounds when the phone is switched on or off.

Ringer Volume *(Menu 5-1)*

This menu option allows you to adjust the ringer volume for the following items:

Calls: allows you to adjust the ringer volume for incoming voice calls.

Messages: allows you to adjust the ringer volume for incoming messages.

Alarm / Schedule: allows you to adjust the ringer volume for alarm settings and schedule alarms.

you can select one of the following settings:

Level 1~5: you can adjust the volume level. The more bars you see, the louder the ringer.

Beep: the phone sounds a beep.

Vibrate: the phone switches to Vibration mode. An incoming call vibrates the phone.

Silent: the phone does not sound the ringer.

High + Vib: the phone rings in the highest volume level and then vibrates.

Ringer Type *(Menu 5-2)*

Note: You can quickly access this menu by pressing  in Standby mode.

This option allows you to set unique ringers for the following items:

Calls: allows you to set a unique ringer for incoming voice calls.

Messages: allows you to have a distinctive ringer type from 10 different tones for incoming each messages.

Alarm / Schedule: allows you to have a distinctive ringer for alarm settings and schedule alarms.

For Calls and Alarm/Schedule items, you can select a unique ringer type from 30 different tones or melodies.

Key Tone *(Menu 5-3)*

This option allows you to set up the sound and adjust the tone volume that the keypad generates each time you press a key.

The following options are available:

Type: allows you to select the type of key tones.

Volume: adjusts the volume using the Navigation keys.

Alerts *(Menu 5-4)*

Your phone gives audible alerts (beeps) at a specified time to inform you that certain things have happened. The alerts only occur in your earpiece so the other party does not hear them.

The available alerts are:

Minute: When this menu option is set to **On**, the phone sounds an alert 10 seconds before each elapsed minute to remind you of the length of the current call.

Service: When this menu option is set to **On**, the phone sounds an alert when you exit service area or when you return to a service area.

Connect: When this menu option is set to **On**, the phone sounds a connect tone when your call is connected to the system.

Disconnect: When this menu option is set to **On**, the phone sounds a disconnect tone when a call is disconnected.

Fade: When this menu option set is to **On**, the phone sounds an alert when a dropped call occurs during conversation in response to a signal fade.

Roam: When this menu option is set to **On**, the phone sounds an alert when your phone starts roaming.

Voice Volume *(Menu 5-5)*

This option enables you to adjust the voice volume of the earpiece.

The graphic shows the volume level; the more bars you see, the louder the sound.

Roam Ringer *(Menu 5-6)*

You can set the phone to use a distinctive ring for incoming roaming calls.

Press navigation keys to select **Ring1** or **Ring2** to turn the Ring on or **Off** to turn it off

Tone Length *(Menu 5-7)*

The tone length setting enables you to select **Long** or **Short** DTMF (Dual-Tone Multi-Frequency) tones. When you use a teleservice, such as accessing your bank account, and press the keys to enter numbers into the teleservice, you are sending DTMF tones. The system used by the bank or other service determines if you need short or long DTMF tones. If the service is digital, as most are, short DTMF will almost always work.

Power On/Off *(Menu 5-8)*

This option allows you to turn on or off the sound that the phone generates when it is switched on and off.

Press navigation keys to select **Sound1** or **Sound2** to turn the sound on or **Off** to turn it off

Display

The Display feature enables you to:

- change the display for Menu mode.
- create your own greeting, and select an animation to be displayed in Standby mode .
- set the length of time for the backlight.
- adjust the brightness of the LCD screen.

Menu Style *(Menu 6-1)*

This option allows you to set the style of showing the main menu list. The **Horizontal** and **Vertical** options are available.

Wallpaper *(Menu 6-2)*

You can select the background image (wallpaper) to be displayed in Standby mode. Select an image to be displayed by pressing the Navigation keys and press .

Backlight *(Menu 6-3)*

You have several options for setting how the LCD backlight operates. Remember that backlight use drains your battery faster.

The following options are available:

7/15/30 Seconds: the backlight comes on when you press a key or receive a call and switches off 7/15/30 seconds after the last key is pressed.

Always Off: the backlight is always off.

Banner *(Menu 6-4)*

This option allows you to set a banner message to be displayed at the bottom of the display in Standby mode.

To change the banner:

1. If necessary, press  repeatedly to delete each letter of the old greeting. Press are hold  to remove the whole greeting.
2. Enter your banner message of up to 12 characters by using the alphanumeric keys.
3. When you finish entering the message, press  to save the new banner.

Contrast *(Menu 6-5)*

This option allows you to see the LCD screen better in different lighting conditions. Scroll through the contrast settings to make the screen darker or brighter.

Setup

Many different features of your phone can be customized to suit your preferences.

Auto Key Lock *(Menu 7-1)*

This menu allows you to lock the keypad automatically after predefined time.

15 Seconds, **30 Seconds** and **1 minute** are available.

Select **Off** to unlock the phone.

Auto Answer *(Menu 7-2)*

With this menu option activated, the phone automatically answers calls after predefined time. This option is useful while driving, for instance.

To activate this feature, select how long your phone waits before answering an incoming call. Select one from **After 1 sec**, **After 3 sec** or **After 5 sec**.

When this menu is option set to **Off**, the phone does not answer an incoming call. If you do not answer the call, it is stored in the Missed call log (see page 49).

Call Answer *(Menu 7-3)*

This menu option allows you to select how to answer an incoming call.

The following options are available:

Any Key: the phone answers when you press any key except .

SEND Key: the phone answers only when you press .

Auto Retry *(Menu 7-4)*

With this menu option activated, your phone will automatically retry the call up to 10 times when a connection fails.

To activate this feature, select how often the phone will automatically retry the call; **10 seconds**, **30 seconds** and **60 seconds** are available.

Select **Off** to deactivate this feature.

Language *(Menu 7-5)*

You can change the language of voice prompts, menus and key-input.

Select the language from **English**, **Spanish**, and **Portuguese**.

Select NAM *(Menu 7-6)*

NAM stands for numerical assignment module, essentially your telephone number. Your Samsung phone can store two NAMs. This means you can have two phone numbers on your phone, and you can quickly and easily switch your service back and forth between the two numbers.

Select **NAM 1** or **NAM 2**. If you change the NAM, the phone will reboot and acquire service using the new NAM setting.

Set System *(Menu 7-7)*

The system selection feature of your phone enables you to choose how your phone will roam. Roaming is a feature which is only relevant in areas where there are usually at least two cellular service providers which are referred to as "A" and "B" and have valid roaming agreements. Your service provider will provide you information about this service or the best roaming methods for you.

The following options are available:

Home Only: with this setting, you cannot roam. If your home system is not available then your call will not be connected and the No Service icon () is displayed. In some service areas an operator may come on line asking you how you would like to pay for the call.

Standard: this option allows you to provide the best system automatically.

Version *(Menu 7-8)*

This option allows you to view the software and the hardware version of your phone. This feature is helpful if you need to call the customer care.

Security

Your phone provides many security options, including a user-programmable lock code and call restriction features.

To access the security menu, you need to enter a four-digit lock code. The lock code is preset to “0000” or “1234” at the factory.

Note: Different code may apply for different service providers. Consult your local provider or vendor for details

Lock Phone *(Menu 8-1)*

In Lock mode, you cannot dial number, except for making an emergency call, or accessing menu options. You can receive incoming calls and messages, even though the phone is locked.

The following options are available:

Unlocked: the phone remains unlocked.

On Power-up: the phone locks automatically the next time you turn the phone on.

Lock Now: the phone locks immediately.

To place an emergency call, enter the number and then press . The phone recognizes standard emergency number, and three emergency numbers saved via the **Emergency #** menu (**Menu 8-4**); see page 88.

To unlock the phone, press  and enter the lock code.

Change Lock (Menu 8-2)

You can change your current lock code to a new one. The lock code is preset to “0000” or “1234” at the factory.

Note: Different code may apply for different service providers. Consult your local provider or vendor for details

Enter a new four-digit lock code, and your phone prompts you to enter the code again. Re-enter the lock code.

Note: Your phone does not allow viewing of the lock code for security reasons, so be sure to write the lock code down or memorize it if you have changed.

Restriction (Menu 8-3)

This feature allows you to restrict all your outgoing calls. You cannot make any call, except for emergency calls (see below).

Select **On** to use the call restriction feature or **Off** to release the feature.

Emergency # (Menu 8-4)

Your phone provides the option of storing emergency numbers. These numbers can be manually dialed at any time, even though your phone is locked or all outgoing calls are restricted. You can store up to three emergency numbers.

To store an emergency number:

1. Select a location using a numeric key,  or , followed by .
2. Enter the required number. Each number can be up to 32 digits long.

If there is a number already stored, delete the number using .

3. Press  to save the number.

To make an emergency call in Lock mode, simply enter a emergency number, then press .

Erase Contacts (Menu 8-5)

This menu allows you to erase all the numbers in the Contacts.

When a confirming message displays, press  to clear the memory.

Reset Phone (Menu 8-6)

Resetting the phone erases all of your saved options and information and returns them to the factory default settings, except for the Contacts entries and SMS messages.

When a confirming message displays, press  to reset the phone.

The phone turns itself off and back on, restores the default settings, and then returns to Standby mode.

Voice Privacy *(Menu 8-7)*

The Voice Privacy function, used only on digital networks, encrypts the voice channel in order to prevent third parties from listening to your conversation.

The following options are available:

Standard: Deactivates Voice Privacy. The phone will use a conventional line to make and receive calls.

Enhanced: Activates Voice Privacy. The phone will make and receive calls in a maximum security encrypted line.

Note: This function may not be available in all areas. For further details and availability, contact your service provider.

Health and safety information

Health and safety information

Exposure to radio frequency (RF) signals

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 the safety standards that were developed by independent scientific organizations through periodic and through 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 phones employs a unit of measurement known as Specific Absorption Rate (SAR). The SAR limit set by the FCC is 1.6W/kg.*

* In the U.S. 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.

SAR tests 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 the 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. This is because the phone is designed to operate at multiple power levels so as 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 of the phone.

Before a new model phone 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. While there may be differences between the SAR levels of various phones and at various positions, they all meet the government requirement.

The FCC has granted an Equipment Authorization for this model phone with all reported SAR levels evaluated as in compliance with the FCC RF exposure 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 printed in the label on the phone.

FCC certification information for this model phone is attached separation paper.

For body operation

To maintain compliance with FCC RF exposure requirements, use only belt-clips, holsters or similar accessories that maintain a 1.5 cm. separation distance between the user's body and the back of the phone, including the antenna. The use of belt-clips, holsters and similar accessories should not contain metallic components in its assembly. The use of accessories that do not satisfy these requirements may not comply with FCC RF exposure requirements, and should be avoided.

Non-compliance with the above conditions may violate FCC RF exposure guidelines.

For more Information concerning exposure to radio frequency signals, see the following websites:

Federal Communications Commission (FCC)

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

Cellular Telecommunications Industry Association (CTIA): <http://www.wow-com.com>

U.S.Food and Drug Administration (FDA)

<http://www.fda.gov/cdrh/consumer>

World Health Organization (WHO)

<http://www.who.int/peh-emf/en>

Precautions when using batteries

- Never use any charger or battery that is damaged in any way.
- Use the battery only for its intended purpose.
- If you use the phone near the network's base station, it uses less power; talk and standby time are greatly affected by the signal strength on the cellular network and the parameters set by the network operator.
- Battery charging time depends on the remaining battery charge, the type of battery, and the charger used. The battery can be charged and discharged hundreds of times, but it will gradually wear out. When the operation time (talk time and standby time) is noticeably shorter than normal, it is time to buy a new battery.
- If left unused, a fully charged battery will discharge itself over time.
- Use only Samsung-approved batteries and recharge your battery only with Samsung-approved chargers. When a charger is not in use, disconnect it from the power source. Do not leave the battery connected to a charger for more than a week, since overcharging may shorten its life.
- Extreme temperatures will affect the charging capacity of your battery: it may require cooling or warming first.

- Do not leave the battery in hot or cold places, such as in a car in summer or winter conditions, as you will reduce the capacity and lifetime of the battery. Always try to keep the battery at room temperature. A phone with a hot or cold battery may temporarily not work, even when the battery is fully charged. Li-ion batteries are particularly affected by temperatures below 0 °C (32 °F).
- Do not short-circuit the battery. Accidental short-circuiting can occur when a metallic object (coin, clip or pen) causes a direct connection between the + and – terminals of the battery (metal strips on the battery), for example when you carry a spare battery in a pocket or bag. Short-circuiting the terminals may damage the battery or the object causing the short-circuiting.
- Dispose of used batteries in accordance with local regulations. Always recycle. Do not dispose of batteries in a fire.

Road safety

Your wireless phone gives you the powerful ability to communicate by voice, almost anywhere, anytime. But an important responsibility accompanies the benefits of wireless phones, one that every user must uphold.

When driving a car, driving is your first responsibility. When using your wireless phone behind the wheel of a car, make sure that you are following the special regulations in a given area or country.

Operating environment

Remember to follow any special regulations in force in any area and always switch your phone off whenever it is forbidden to use it, or when it may cause interference or danger.

When connecting the phone or any accessory to another device, read its user's guide for detailed safety instructions. Do not connect incompatible products.

As with other mobile radio transmitting equipment, users are advised that for the satisfactory operation of the equipment and for the safety of personnel, it is recommended that the equipment should only be used in the normal operating position (held to your ear with the antenna pointing over your shoulder).

Electronic devices

Most modern electronic equipment is shielded from radio frequency (RF) signals. However, certain electronic equipment may not be shielded against the RF signals from your wireless phone. Consult the manufacturer to discuss alternatives.

Pacemakers

Pacemaker manufacturers recommend that a minimum distance of 15 cm (6 inches) be maintained between a wireless phone and a pacemaker to avoid potential interference with the pacemaker. These recommendations are consistent with the independent research and

recommendations of Wireless Technology Research.

Persons with pacemakers:

- Should always keep the phone more than 15 cm (6 inches) from their pacemaker when the phone is switched on
- Should not carry the phone in a breast pocket
- Should use the ear opposite the pacemaker to minimize potential interference

If you have any reason to suspect that interference is taking place, switch your phone off immediately.

Hearing aids

Some digital wireless phones may interfere with some hearing aids. In the event of such interference, you may wish to consult your hearing aid manufacturer to discuss alternatives.

Other medical devices

If you use any other personal medical devices, 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. Switch 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 be using 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

Switch your phone off in any facility where posted notices require you to do so.

Potentially explosive environment

Switch 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.

Users are advised to switch the phone off while at a refueling point (service station). Users are reminded of the need to observe restrictions on the use of radio equipment in fuel depots (fuel storage and distribution areas), chemical plants or where blasting operations are in progress.

Areas with a potentially explosive atmosphere are often but not always clearly marked. They include the areas below decks on boats, 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.

Emergency calls

This phone, like any wireless phone, operates using radio signals, wireless and landline networks as well as user-programed functions, which cannot guarantee connection in all conditions. Therefore, you should never rely solely on any wireless phone for essential communications (medical emergencies, for example).

Remember, to make or receive any calls the phone must be switched on and in a service area with adequate signal strength. Emergency calls may not be possible on all wireless phone networks or when certain network services and/or phone features are in use. Check with local service providers.

To make an emergency call:

1. If the phone is not on, switch it on.
2. Key in the emergency number for your present location. Emergency numbers vary by location.
3. Press .

If certain features are in use (call barring, for example), you may first need to deactivate those features before you can make an emergency call. Consult this document and your local cellular service provider.

When making an emergency call, remember to give all the necessary information as accurately as possible. Remember that your phone may be the only means of communication at the scene of an accident; do not end the call until given permission to do so.

Other important safety information

- Only qualified personnel should service the phone or install the phone in a vehicle. Faulty installation or service may be dangerous and may invalidate any warranty applicable to the device.
- Check regularly that all wireless phone equipment in your vehicle is mounted and operating properly.
- Do not store or carry flammable liquids, gases or explosive materials in the same compartment as the phone, its parts or accessories.
- For vehicles equipped with an air bag, remember that an air bag inflates with great force. Do not place objects, including both installed or portable wireless equipment in the area over the air bag or in the air bag deployment area. If wireless equipment is improperly installed and the air bag inflates, serious injury could result.
- Switch your phone off before boarding an aircraft. The use of wireless phones in an aircraft may be dangerous to the operation of the aircraft, and is illegal.
- Failure to observe these instructions may lead to the suspension or denial of telephone services to the offender, or legal action, or both.

Care and maintenance

Your phone is a product of superior design and craftsmanship and should be treated with care. The suggestions below will help you fulfill any warranty obligations and allow you to enjoy this product for many years.

- Keep the phone and all its parts and accessories out of the reach of small children's.
- Keep the phone dry. Precipitation, humidity and liquids contain minerals that will corrode electronic circuits.
- Do not use the phone with a wet hand. Doing so may cause an electric shock to you or damage to the phone.
- Do not use or store the phone in dusty, dirty areas, as its moving parts may be damaged.
- Do not store the phone in hot areas. High temperatures can shorten the life of electronic devices, damage batteries, and warp or melt certain plastics.
- Do not store the phone in cold areas. When the phone warms up to its normal operating temperature, moisture can form inside the phone, which may damage the phone's electronic circuit boards.
- Do not drop, knock or shake the phone. Rough handling can break internal circuit boards.
- Do not use harsh chemicals, cleaning solvents or strong detergents to clean the phone. Wipe it with a soft cloth slightly dampened in a mild soap-and-water solution.

- Do not paint the phone. Paint can clog the device's moving parts and prevent proper operation.
- Do not put the phone in or on heating devices, such as a microwave oven, a stove or a radiator. The phone may explode when overheated.
- Use only the supplied or an approved replacement antenna. Unauthorized antennas or modified accessories may damage the phone and violate regulations governing radio devices.
- If the phone, battery, charger or any accessory is not working properly, take it to your nearest qualified service facility. The personnel there will assist you, and if necessary, arrange for service.

Acknowledging special precautions and the FCC and industry canada notice

Cautions

Modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC compliance information

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.

Information to user

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. If this equipment does cause harmful interference to radio 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.

Appendix A: CERTIFICATION INFORMATION (SAR)

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 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 safety 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(SAR). The SAR limit set by the FCC is 1.6 W/kg. SAR Tests are conducted using standard operating positions accepted by the FCC with the phone transmitting at its highest certified power level in all tested frequency bands. Although the 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. This is because the phone is designed to operate at multiple power levels so as 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 new model phone 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 values for this model phone as reported to the FCC are Head:1.45W/Kg, Body-worn:1.03W/Kg. Body-worn operations are restricted to Samsung-supplied, approved or none Samsung designated accessories that have no metal and must provide at least 1.5cm separation between the device, including its antenna whether extended or retracted, and the user's body. None compliance to the above restrictions may violate FCC RF exposure guidelines.

The FCC has granted an Equipment Authorization for this model phone with all reported SAR levels evaluated as in compliance with the FCC RF exposure 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 A3LSPHN345.

Appendix B: GUIDE TO SAFE AND RESPONSIBLE WIRELESS PHONE USE

Cellular Telecommunications & Internet

Association

“Safety is the most important call you will ever make.”

A Guide to Safe and Responsible Wireless Phone Use

TENS OF MILLIONS OF PEOPLE IN THE U.S. TODAY TAKE ADVANTAGE OF THE UNIQUE COMBINATION OF CONVENIENCE, SAFETY AND VALUE DELIVERED BY THE WIRELESS TELEPHONE. QUITE SIMPLY, THE WIRELESS PHONE GIVES PEOPLE THE POWERFUL ABILITY TO COMMUNICATE BY VOICE-ALMOST ANYWHERE, ANYTIME-WITH THE BOSS, WITH A CLIENT, WITH THE KIDS, WITH EMERGENCY PERSONNEL OR EVEN WITH THE POLICE. EACH YEAR, AMERICANS MAKE BILLIONS OF CALLS FROM THEIR WIRELESS PHONES, AND THE NUMBERS ARE RAPIDLY GROWING.

But an important responsibility accompanies those benefits, one that every wireless phone user must uphold. When driving a car, driving is your first responsibility. A wireless phone can be an invaluable tool, but good judgment must be exercised at all times while driving a motor vehicle-whether on the phone or not.

The basic lessons are ones we all learned as teenagers. Driving requires alertness, caution and courtesy. It requires a heavy dose of basic common sense-keep your head up, keep your eyes on the road, check your mirrors frequently and watch out for other drivers. It requires

obeying all traffic signs and signals and staying within the speed limit. It means using seatbelts and requiring other passengers to do the same.

But with wireless phone use, driving safely means a little more. This brochure is a call to wireless phone users everywhere to make safety their first priority when behind the wheel of a car. Wireless telecommunications is keeping us in touch, simplifying our lives, protecting us in emergencies and providing opportunities to help others in need. When it comes to the use of wireless phones, safety is your most important call.

Wireless Phone "Safety Tips"

Below are safety tips to follow while driving and using a wireless phone which should be easy to remember.

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 grab it without removing your eyes from the road. If you get an

incoming call at an inconvenient time, if possible, let your voice mail 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 note to do a list while driving a car, you are not watching where you are going. It's 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 9-1-1 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 9-1-1 or other local emergency number, as you would want others to do for you.

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

Since 1984, the Cellular Telecommunications Industry Association and the wireless industry have conducted educational outreach to inform wireless phone users of their responsibilities as safe drivers and good citizens. As we approach a

new century, more and more of us will take advantage of the benefits of wireless telephones. And, as we take to the roads, we all have a responsibility to drive safely.

"The wireless industry reminds you to use your phone safely when driving"

Cellular Telecommunications & Internet Association. For more information, please call 1-888-901-SAFE.

For updates: <http://www.wowcom.com/consumer/issues/driving/articles.cfm?ID=85>

Appendix C: Consumer Update on Wireless Phones

U.S. Food and Drug Administration

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

The term wireless phone refers here to hand-held 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 Federal Communications Commission safety guidelines that were developed with the advice of 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 well within the FCC's compliance limits.

2. 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 stand-by 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.

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

Under the law, 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, 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, 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.

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
Federal Communications Commission
Occupational Safety and Health Administration
National Telecommunications and Information Administration

The National Institutes of Health participates in some interagency working group activities, as well. 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. FCC relies on FDA and other health agencies for safety questions about wireless phones.

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 primary subject of the safety questions discussed in this document.

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

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).

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.

FDA and the Cellular Telecommunications & Internet Association (CTIA) have a formal Cooperative Research and Development Agreement (CRADA) to do research on wireless phone safety. FDA provides the scientific oversight, obtaining input from experts in government, industry, and academic organizations. CTIA-funded research is conducted through contracts to 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.

5. 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.

6. 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.

7. Do hands-free kits for wireless phones reduce risks from exposure to RF emissions?

Since there are no known risks from exposure to RF emissions from wireless phones, there is no reason to believe that hands-free kits reduce risks. Handsfree kits can be used with wireless phones for convenience and comfort. These systems reduce the absorption of RF energy in the head because the phone, which is the source of the RF emissions, will not be placed against the head. On the other hand, if the phone is mounted against the waist or other part of the body during use, then that part of the body will absorb more RF energy. Wireless phones marketed in the U.S. are required to meet safety requirements regardless of whether they are used against the head or against the body. Either configuration should result in compliance with the safety limit.

8. Do wireless phone accessories that claim to shield the head from RF radiation work?

Since there are no known risks from exposure to RF emissions from wireless phones, there is no reason to believe that accessories that claim to shield the head from those emissions reduce risks. Some products that claim to shield the user from RF absorption use special phone cases, while others involve nothing more than a metallic accessory attached to the phone. Studies have shown that these products generally do not work as advertised. Unlike "hand-free" kits, these so-called "shields" may interfere with proper operation of the phone. The phone may be forced to boost its power to compensate, leading to an increase in RF absorption. In February 2002, the Federal Trade Commission (FTC) charged two companies that sold devices that claimed to protect wireless phone users from radiation with making false and unsubstantiated claims.

According to FTC, these defendants lacked a reasonable basis to substantiate their claim.

9. What about wireless phone interference with medical equipment?

Radiofrequency energy (RF) from wireless phones can interact with some electronic devices. For this reason, 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 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.

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.

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

10. 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.

11. 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.

12. Which other federal agencies have responsibilities related to potential RF health effects?

Additional information on the safety of RF exposures from various sources can be obtained from the following organizations.

FCC RF Safety Program:

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

Environmental Protection Agency (EPA):

<http://www.epa.gov/radiation/>

Occupational Safety and Health Administration's (OSHA):

<http://www.oshaslc.gov/>

[gov/SLTC/radiofrequencyradiation/index.html](http://www.fda.gov/SLTC/radiofrequencyradiation/index.html)

National Institute for Occupational Safety and Health (NIOSH):

<http://www.cdc.gov/niosh/emfpg.html>

World health Organization (WHO):

<http://www.who.int/peh-emf/>

International Commission on Non-Ionizing Radiation Protection:

<http://www.icnirp.de>

National Radiation Protection Board (UK):

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

Updated 4/3/2002: US Food and Drug Administration

<http://www.fda.gov/cellphones>