

User Manual

SKY-8300

LIMITED WARRANTY STATEMENT

1. WHAT THIS WARRANTY COVERS:

SK offers you a limited warranty that the enclosed subscriber unit and its enclosed accessories will be free from defects in material and workmanship, according to the following terms and conditions:

- (1) The limited warranty for the product extends for 15 months beginning on the date of manufacture, as indicated on the date code on the product.
- (2) The limited warranty extends on to the original purchaser of the product and is not assignable or transferable to any subsequent purchaser/end user.
- (3) This warranty is good only to the original purchaser of the product during the warranty period as long as it is in the U.S., including Alaska, Hawaii, U.S. Territories and Canada.
- (4) The external housing and cosmetic parts shall not be covered under these limited warranty terms.
- (5) Upon request from SK, the consumer must provide information to reasonably prove the date of purchase.
- (6) The customer shall bear the cost of shipping the product to the Customer Service Department of SK. SK shall bear the cost of shipping the product back to the consumer after the completion of service under this limited warranty.

2. WHAT THIS WARRANTY DOES NOT COVER:

- (1) Defects or damages resulting from use of the product in other than its normal and customary manner.
- (2) Defects or damages from abnormal use, abnormal conditions, improper storage, exposure to moisture or dampness, unauthorized modifications, unauthorized connections, unauthorized repair, misuse, neglect, abuse, accident, alteration, improper installation, or other acts which are not the fault of SK, including damage caused by shipping blown fuses spills of food or liquid.
- (3) Breakage or damage to antennas unless caused directly by defects in material or workmanship.
- (4) That the Customer Service Department at SK was not notified by consumer of the alleged defect or malfunction of the product during the applicable limited warranty period.
- (5) Products which have had the serial number removed or made illegible.
- (6) The limited warranty is in lieu of all other warranties, express or implied either in fact or by operations law, statutory or otherwise, including, but limited to any implied warranty of marketability or fitness for a particular use.
- (7) Damage resulting from use of non-SK approved accessories.
- (8) All plastic surfaces and all other externally exposed parts that are scratched or damaged due to normal customer use.
- (9) Products operated outside published maximum ratings.
- (10) Products used or obtained in a rental program.
- (11) Consumables (such as fuses).

3. STATE LAW RIGHTS:

No other express warranty is applicable to this product. THE DURATION OF ANY IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTY OF MARKETABILITY, IS LIMITED TO THE DURATION OF THE EXPRESS WARRANTY HEREIN. SK INFOCOMM INC. SHALL NOT BE LIABLE FOR THE LOSS OF THE USE OF THE PRODUCT, INCONVENIENCE, LOSS OR ANY OTHER DAMAGES, DIRECT OR CONSEQUENTIAL, ARISING OUT OF THE USE OF, OR INABILITY TO USE, THIS PRODUCT OR FOR ANY BREACH OF ANY EXPRESS OR IMPLIED WARRANTY, INCLUDING THE IMPLIED WARRANTY OF MARKETABILITY APPLICABLE TO THIS PRODUCT. Some states do not allow the exclusive of imitation of incidental or consequential damages or limitations on how long an implied warranty lasts; so these limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

SUBJECT

The phone SKY-8300 has been designed to operate on the latest digital mobile communication technology, Code Division Multiple Access (CDMA). The phone SKY-8300 supports fully Multimedia color LCDs, 64poly Audio, 2.0M pixels Digital Camera, MPEG-4, Photo album, etc.

This phone is supporting triband- 800Mhz CDMA, US PCS, GPS.

CDMA Standard	Designator	Description
Basic air interface	TIA/EIA-95A TSB-74 ANSI J-STD-008 TIA/EIA-IS2000	CDMA Dual -Mode Air Interface 14.4kbps radio link protocol and Inter-band operations IS-95 adapted for PCS frequency band CDMA2000 1xRTT Air Interface
Network	TIA/EIA/IS-634 TIA/EIA/IS-651 TIA/EIA/IS-41-C TIA/EIA/IS-124	MAS-BS PCSC-RS Intersystem operations Nom-signaling data comm.
Service	TIA/EIA/IS-96-B TIA/EIA/IS-99 TIA/EIA/IS-637 TIA/EIA/IS-657 IS-801	Speech CODEC Assign data and fax Short message service Packet data Position Determination Service(gpsOne)
Performance	TIA/EIA/IS-IS-97 TIA/EIA/IS-98 ANSI J-STD-018 ANSI J-STD-019 TIA/EIA/IS-125	Cellular base station Cellular mobile station PCS personal station PCS base station Speech CODEC
EVDO	TIA/EIA/IS-856 TIA/EIA/IS-878 TIA/EIA/IS-866 TIA/EIA/IS-890	CDMA2000 High Rate Packet Data Air Interface 1xEV-DO Inter-Operability Specification for CDMA2000 Access Network Interfaces Recommended Minimum Performance Standards for CDMA2000 High Rate Packet Data Access Terminal Test Application Specification(TAS) for High Rate Packet Data Air Interface

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

Introduction

Important Information

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

Safety Instructions

WARNING! To reduce the electric shock, do not expose your phone in high humidity areas, such as the bathroom, swimming pool.

IMPORTANT! Please read the **Precautions** on page 4 prior to using your phone.







FCC RF Exposure Information

WARNING! Read this information before operating the phone









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

Precautions




Please read the precautions carefully in order to prevent damages. Read this user's manual and keep it for a future reference.




	Using the phone while driving a car may cause traffic accident and may give an influence to the electronic parts in the car. If you are to use the phone while driving, make sure to use a safety device such as an ear-microphone.
	Make sure to turn off the phone while you are in an airplane or at the hospital. Using the phone in the restricted area may cause an accident of the transportation or may cause an accident of the medical devices. (Please follow the instructions of the place on use of cellular phones.)
	Using a cell phone where inflammable gas such as propane or gasoline erupts may cause explosion or fire. Make sure to turn off the phone at the gas station or in areas where it may cause fire or explosion.
	Using the phone with cardiac pacemakers at the same time Be aware of the potential interference with your phone and pacemaker. If you have any reason to suspect that interference is taking place, switch off your phone immediately. Please keep the phone more than 6 inches (15cm) from a pacemaker when the phone is switched on. Do not carry the phone in a breast pocket.
	Using the phone with hearing aids at the same time Some digital wireless phones may interfere with some hearing aids. If that interference happens, contact your hearing aid manufacturer to discuss alternatives.
	Using the phone with other medical devices at the same time If you use any other medical devices consult the manufacturer of your device to determine if it is adequately from external RF energy.

? Be careful of safety accident.




	<p>Avoid shock. Impact on the phone may cause excessive heat or fire.</p>
	<p>Be careful when using the phone in the rain. Be careful not to have the phone wet in the rain, and do not use the phone when lightening flashes.</p>
	<p>Avoid metal products. If a conductible material (aluminum foil, needle, necklace, metal chain, coin, key and etc.) meets the bottom of the battery, the bottom of the phone or the metal part of the charger, the phone may generate excessive heat, fire, electric shock or explosion. (Do not put the phone and the battery on the bag or in the pocket with metal products. The phone may be deformed, damaged or broken.)</p>
	<p>When using the flash Be careful not to impair the vision by throwing the flash light on the eyes directly.</p>
	<p>Too loud ringer~ You may be startled at sudden vibration or ringer. Set the vibration and ringer to an appropriate level. Keep your ears away from the speakers of the phone, or you may be startled or your hearing may fall at sudden ringer.</p>
	<p>If you have a hand strap or a neck strap attached to the phone~ You may get injured if the trap is pulled or caught by something. Be careful not to run against something or tumble down with the phone inside the pocket.</p>
	<p>Long time calling may increase the surface temperature of the cell phone.</p>
	<p>Using the phone beside high-voltage electric pole may cause electric shock or an explosion of the battery.</p>

? How to use the phone much longer~



	<p>Keep the rubber caps plugged Keep the rubber caps plugged to protect the phone against foreign substance except when you need to remove the caps for intended purpose.</p>
	<p>Do not disassemble or remodel the phone at your own discreet. Please contact the authorized service center for repair.</p>
	<p>Keep the phone away from a magnet. Carrying or storing the phone with any magnetic material may cause malfunction. You may suffer loss of money if you lose information on the magnetic cards (credit cards, bank cards, transportation cards).</p>

	<p>The phone is sensitive to radio wave. The phone performance may be deteriorated if you use an unauthorized antenna or accessory, or if you place the phone on any material that may interrupt radio wave (steel desk, computer, microwave range and etc.). Do not put the phone or the battery in a microwave range. It may explode.</p>
	<p>Keep the phone clean. The battery may not be recharged if the metal part on the charger or the battery is stained. Wipe out the foreign substance with soft cloth or towel, and never use a chemical solution.</p>
	<p>Be careful not to drop the phone. Do not move violently or run with the phone hung on your neck with ear microphone or neck strap. Do not sit on with the phone put in the rear pocket. The phone may be broken or deformed.</p>


? Avoid water, fire or moisture.

	<p>Avoid water!! If the phone, battery, charger or other optional accessory is wet, the label inside the product changes color, and electric shock, damage or heat may be resulted in. If the phone is wet, leave the power off, remove the battery, and contact the nearest service center.</p>
	<p>Watch out of fire!! The phone and the battery may explode in the fire.</p>
	<p>Avoid excessive heat, cold weather, or where temperature changes severely. The phone and the battery left in severe heat, under direct sunray, or inside the car in summer time may result in explosion or fire. Performance and durability of the phone can be deteriorated if it is stored in low temperature. Do not place the phone in front of the air conditioner since high humidity and sudden temperature change may result in corrosion and damage.</p>










? Keep away from children or pets.


	<p>Keep the phone dry. Foreign substance or water in the phone, battery, charger or other optional accessories may result in mechanical trouble or injury of children.</p>
	<p>Keep the phone out of reach of the children. Make sure that the children should not swallow the parts including rubber caps (in stereo ear microphone and bottom contact of the phone). Teach the children how to use the phone, and check if they are using the phone properly.</p>

? Use the antenna properly.





	<p>How to use the antenna. For clearer sound quality, do not hold or touch the antenna during the calls. Also, waving or twirling the antenna may damage the antenna. When the antenna is damaged while in use, there is the risk of electric shock or injuries. In this case, change the antenna immediately. Only the antennas approved by our company can be used. Use of other antennas may cause malfunctions.</p>
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? Use the battery properly.

	<p>Make sure to use the genuine battery. Using unauthorized battery may result in damage or explosion of the phone and the battery.</p>
	<p>Do not give impact to the battery. Avoid excessive impact by dropping or throwing the battery. Disassembling or repairing the battery by unauthorized person may result in fire or explosion.</p>
	<p>Do not apply excessive force or give damage with a sharp tool. Applying excessive force or boring battery with an awl or a pin may result in fire or explosion.</p>
	<p>If the battery leaks~, Wash your skin with running water. If the solution runs into an eye, wash the eye with clean water and see the doctor immediately. It cause your eyesight fall.</p>
	<p>When not in use for a long time~, If the phone is left unused with the battery installed, although the power is off, the battery may leak and disable the phone. If you don't use the phone for a long time, take the battery apart from the phone. If you use the phone again (and when you first use the phone after purchasing), charge the battery fully.</p>
	<p>Turn the power off first. If you remove the battery while the phone is on, the phone or the LCD screen may be damaged.</p>
	<p>Replace the battery. Purchase a new battery if running time reduces by half. Because the battery is a consumable part, repeated charging/discharging results in reduction of unning time. Make sure the battery contains the recyclable metal, to be disposed in the designated place.</p>
	<p>Check the contact points before charging the battery. If the battery is mounted on the charger with incorrect polarity, the battery can be damaged or exploded.</p>
	<p>Charge the battery where it is well ventilated. Covering the charger and the battery with cloth may result in fire</p>

	<p>Pay attention to the power cord. Do not pull the power cord of the charger, and do not place a heavy object on the power cord. Damaged power cord may cause fire. Do not plug in the power with a wet hand to prevent shock.</p>
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? Using and storing the charger

	<p>Do not use the phone while charging the battery. Using the phone while charging the battery may result in electric shock. Make sure to remove the phone from the charger.</p>
	<p>If you switch on the phone in 5 seconds after power off, the power key can be disabled. Wait for 5 seconds before switching on the phone.</p>
	<p>Using and storing the accessories. Use only SK-produced and approved accessories. Using inappropriate accessories may cause an explosion or damage on the phone. In no case will SK be liable for the problems followed by the use of inappropriate accessories.</p>
	<p>Disposal of used batteries This battery is not subject to be recycled. Do not dispose of batteries in a waste box.</p>

CAUTION

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

Body-worn Operation

This device was tested for typical body-worn operations with the back of the phone kept 1 inch from the body. To comply with FCC RF exposure requirements, a minimum separation distance of 1 inch must be maintained between the user's body and the back of the phone, including the antenna, whether extended or retracted. Third-party belt-clips, holsters and similar accessories containing metallic components should not be used. Body-worn accessories that cannot maintain 1 inches separation distance between the user's body and the back of the phone, and have not been tested for typical body-worn operations may not comply with FCC RF exposure limits and should be avoided. If you do not use a body-worn accessory, ensure the antenna is at least 0.59inches (1.5cm) from your body when transmitting.

For more information about RF exposure, visit the FCC Website at www.fcc.gov.

Vehicle Mounted External Antenna (optional, if available.)

A minimum separation distance of 7.9 inches (20cm) must be maintained between the user/bystander and the vehicle mounted external antenna to satisfy FCC RF exposure requirements.

For more information about RF exposure, please visit the FCC website at www.fcc.gov

FCC Part 15 Class B Compliance

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

Caution for Battery Use

- ? Do not disassemble.
- ? Do not short-circuit.
- ? Do not exposure to high temperature : 140°F (60°C)
- ? Do not incinerate.

Caring for Battery Use

- ? Must be recycled or disposed of properly

Caution for Adapter (Charger) Use

? Using the wrong battery charger could cause damage to your phone and void your warranty may burst causing injury to person and damage.

? The charger or adapter is intended for indoor use only.

? The charger or adapter is intended for indoor use only.

Do not expose the battery charger or adapter to direct sunlight nor use it in any place of high humidity, such as the bathroom.

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Getting Started

Installing and Removing the Battery

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

To remove the battery, push up the catch toward the top of the phone and lift the battery away.

Turning Your Phone On or Off

To turn your phone on, press and hold the On/Off button. Your phone performs a short self-test before letting you know it is operational.

If your phone is not turned on, make sure the battery is installed correctly and is adequately charged or has external power (via the Travel Charger, Vehicle Power Charger to Hands-Free Car Kit). To turn your phone off, press and hold the On/Off button again.

Main Menu

When your phone acquires Service, the Greeting (a banner of text), the current time and date and the Main Menu are displayed. If you are in authorized analog cellular provider's service area, you are ready to send and receive calls.

Power Save Mode

When the phone is in an area without service for 15 minutes, it stops searching for service and enters into the power Save Mode. When your phone activates this feature, Power Save is displayed on your screen.

The phone automatically checks for service periodically or you can check manually by pressing any key.

Signal Strength

The quality of each call you make or receive depends on the signal strength on your area. The number of bars in the Signal Strength icon informs you of the current strength. The more bars, the stronger the signal.

When the phone is turned on, check the Signal Strength icon to see if you are in a Service Area or authorized service provider's area.

Battery Capacity

Your SKY-8300 is equipped with Li-polymer battery. It allows you to recharge your battery before it is fully drained.

Note: Long backlight settings affect the battery's talk and standby times.

When the battery reaches 5% of its capacity, the battery icon blinks. When there is about one minute of talk time left, the phone sounds an audible alert every 30 seconds and then powers off.

It is not necessary to let the battery completely run down before recharging.

To charge your batteries, use only approved charging accessories.

Using the Travel Charger

To charge the battery, plug the Travel Charger into a standard wall outlet and connect it to the phone via the I/O Connector on the bottom of the phone. Alternatively, you can place the phone in the charging cradle provided with your phone and connect the Travel Charger to the back of the cradle.

If the phone needs to be recharged, an empty battery charge status icon will be displayed. When the battery is fully charged, full icon will be displayed.

Setup Menu

Lock/Password

Accessing Lock/Password Menu

You must enter your password to view the Lock/Password menu. If you forget your password, try using the last four digits of your Social Security number, the last four digits of your Phone Number or 0000.

Lock/Password Menu

To access the Lock/Password menu:

1. From the Main Menu, select Menu and press 4-2 (Control Panel – Lock/Password).
2. Enter your password.

Locking Your Phone

When your phone is locked, you can only make calls to 911, Customer Care and Special Numbers or receive incoming calls.

To lock your phone:

1. From the Lock/Password menu, highlight Phone Lock and press [OK].
 - Auto Lock mode is on

Unlocking Your Phone

1. Highlight Phone Lock and press [OK].
 - Auto Lock mode is off.

Changing the password

To change your password:

1. From the Lock/Password menu, highlight Set Password and press [OK].
2. Enter the current password.
3. Enter your new password.
4. Reenter your new password.

Safety Guideline

Provided herein is the TIA Safety Information for Wireless Handheld phones. Inclusion of this text in the terminal unit's owner's manual is required for CTIA Certification.

TIA Safety Information

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

EXPOSURE TO RADIO FREQUENCY SIGNALS

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

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

ANSI C95.1 (1992)*
NCRP Report 86 (1986)
ICNIRP (1996)

Those standards were based on comprehensive and periodic evaluations of the relevant scientific

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

literature. For example, over 120 scientists, engineers, and physicians from universities, government health agencies, and industry reviewed the available body of research to develop the ANSI Standard (C95.1). The design of your phone complies with the FCC guidelines (and those standards).

ANTENNA CARE

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

PHONE OPERATION

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

TIPS ON EFFICIENT OPERATION:

Internal antenna

SKY-8300 has adopted internal antenna, which keeps you from unintended quality deterioration of calling caused by dislodging the external antenna. If there is a problem with the antenna about call quality, do not try to disassemble the phone to find the internal antenna at your own discretion and contact your local dealer for replacement of the antenna.

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

DRIVING

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

- ? Give full attention to driving -- driving safely is your first responsibility;
- ? Use speaker-phone operation, if available;
- ? Pull off the road and park before making or answering a call if driving conditions so require.

ELECTRONIC DEVICES

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

Pacemakers

The Health Industry Manufacturers Association recommends that a minimum separation of 6 inches (15.24cm) be maintained between a handheld wireless phone and a pacemaker to avoid potential interference with the pacemaker. These recommendations are consistent with the independent research by and recommendations of Wireless Technology Research.

Persons with pacemakers:

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

Hearing Aids

Some digital wireless phones may interfere with some hearing aids. In the event of such interference, you may want to consult your service provider. [or call the customer service line to discuss alternatives.] Optional for each phone manufacturer.

Hearing Aid Compatibility with Mobile Phones

When some mobile phones are used near some hearing devices (hearing aids and cochlear implants), users may detect a buzzing, humming, or whining noise. Some hearing devices are more immune than others to this interference noise, and phones also vary in the amount of interference they generate.

The wireless telephone industry has developed ratings for some of their mobile phones, to assist hearing device users in finding phones that may be compatible with their hearing devices. Not all phones have been rated. Phones that are rated have the rating on their box or a label on the box.

The ratings are not guarantees. Results will vary depending on the user's hearing device and hearing loss. If your hearing device happens to be vulnerable to interference, you may not be able to use a rated phone successfully. Trying out the phone with your hearing device is the best way to evaluate it for your personal needs.

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

T-Ratings: Phones rated T3 or T4 meet FCC requirements and are likely to be more usable with a hearing device's telecoil ("T Switch" or "Telephone Switch") than unrated phones. T4 is the better/higher of the two ratings. (Note that not all hearing devices have telecoils in them.)

Hearing devices may also be measured for immunity to this type of interference. Your hearing device manufacturer or hearing health professional may help you find results for your hearing device. The more immune your hearing aid is, the less likely you are to experience interference noise from mobile phones.

Other Medical Devices

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

Turn your phone OFF in health care facilities when any regulations posted in these areas instruct you to do so. Hospitals or health care facilities may 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

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

AIRCRAFT

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

BLASTING AREAS

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

POTENTIALLY EXPLOSIVE ATMOSPHERES

Turn your phone OFF when in any area with a potentially explosive atmosphere and obey all signs and instructions. Sparks in such areas could cause an explosion or fire resulting in bodily injury or even death. Areas with a potentially explosive atmosphere are often, but not always marked clearly. Potential areas may include: fueling areas (such as gasoline stations); below deck on boats; fuel or chemical transfer or storage facilities; vehicles using liquefied petroleum gas (such as propane or butane); areas where the air contains

chemicals or particles (such as grain, dust, or metal powders); and any other area where you would normally be advised to turn off your vehicle engine.

For Vehicles Equipped with an Air Bag

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

FDA Consumer Update

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

1. Do wireless phones pose a health hazard?

The available scientific evidence does not show that any health problems are associated with using wireless phones. There is no proof, however, that wireless phones are absolutely safe. Wireless phones emit low levels of radiofrequency energy (RF) in the microwave range while being used.

They also emit very low levels of RF when in the 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.

2. 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 subject of the safety questions discussed in this document.

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

The term "wireless phone" refers here to 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 far below the FCC safety limits.

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

The research done thus far has produced conflicting results, and many studies have suffered from flaws in their research methods. Animal experiments investigating the effects of radiofrequency energy (RF) exposures characteristic of wireless phones have yielded conflicting results that often cannot be repeated in other laboratories. A few animal studies, however, have suggested that low levels of RF could accelerate the development of cancer in laboratory animals. However, many of the studies that showed increased tumor development used animals that had been genetically engineered or treated with cancer-causing chemicals so as to be pre-disposed to develop cancer in the absence of RF exposure.

Other studies exposed the animals to RF for up to 22 hours per day.

These conditions are not similar to the conditions under which people use wireless phones, so we don't know with certainty what the results of such studies mean for human health. Three large epidemiology studies have been published since December 2000. Between them, the studies investigated any possible association between the use of wireless phones and primary brain cancer, glioma, meningioma, or acoustic neuroma, tumors of the brain or salivary gland, leukemia, or other cancers. None of the studies demonstrated the existence of any harmful health effects from wireless phone RF exposures. However, none of the studies can answer questions about long-term exposures, since the average period of phone use in these studies was around three years.

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

A combination of laboratory studies and epidemiological studies of people actually using wireless phones would provide some of the data that are needed. Lifetime animal exposure studies could be completed in a few years. However, very large numbers of animals would be needed to provide reliable proof of a cancer promoting effect if one exists.

Epidemiological studies can provide data that is directly applicable to human populations, but 10 or more years' follow-up may be needed to provide answers about some health effects, such as cancer. This is because the interval between the time of exposure to a cancer-causing agent and the time tumors develop - if they do - may be many, many years. The interpretation of epidemiological studies is hampered by difficulties in measuring actual RF exposure during day-to-day use of wireless phones. Many factors affect this measurement, such as the angle at which the phone is held, or which model of phone is used.

6. What is 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.

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

All phones sold in the United States must comply with Federal Communications Commission (FCC) guidelines that limit radiofrequency energy (RF) exposures. FCC established these guidelines in consultation with FDA and the other federal health and safety agencies.

The FCC limit for RF exposure from wireless telephones is set at a Specific Absorption Rate (SAR) of 1.6 watts per kilogram (1.6 W/kg).

The FCC limit is consistent with the safety standards developed by the Institute of Electrical and Electronic Engineering (IEEE) and the National Council on Radiation Protection and Measurement. The exposure limit takes into consideration the body's ability to remove heat from the tissues that absorb energy from the wireless phone and is set well below levels known to have effects.

Manufacturers of wireless phones must report the RF exposure level for each model of phone to the FCC. The FCC website (<http://www.fcc.gov/oet/rfsafety>) gives directions for locating the FCC identification number on your phone so you can find your phone's RF exposure level in the online listing.

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

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

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

If there is a risk from these products--and at this point we do not know that there is--it is probably very small. But if you are concerned about avoiding even potential risks, you can take a few simple steps to minimize your exposure to radiofrequency energy (RF). Since time is a key factor in how much exposure a person receives, reducing the amount of time spent using a wireless phone will reduce RF exposure.

? If you must conduct extended conversations by wireless phone every day, you could place more distance between your body and the source of the RF, since the exposure level drops off dramatically with distance. For example, you could use a headset and carry the wireless phone away from your body or use a wireless phone connected to a remote antenna.

Again, the scientific data do not demonstrate that wireless phones are harmful. But if you are concerned about the RF exposure from these products, you can use measures like those described above to reduce your RF exposure from wireless phone use.

10. What about children using wireless phones?

The scientific evidence does not show a danger to users of wireless phones, including children and teenagers. If you want to take steps to lower exposure to radiofrequency energy (RF), the measures described above would apply to children and teenagers using wireless phones. Reducing the time of wireless phone use and increasing the distance between the user and the RF source will reduce RF exposure.

Some groups sponsored by other national governments have advised that children be discouraged from using wireless phones at all. For example, the government in the United Kingdom distributed leaflets containing such a recommendation in December 2000. They noted that no evidence exists that using a wireless phone causes brain tumors or other ill effects.

Their recommendation to limit wireless phone use by children was strictly precautionary; it was not based on scientific evidence that any health hazard exists.

11. What about wireless phone interference with medical equipment?

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.

12. Where can I find additional information?

For additional information, please refer to the following resources:

- ? FDA web page on wireless phones
(<http://www.fda.gov/cdrh/phones/index.html>)
- ? Federal Communications Commission (FCC) RF Safety Program
(<http://www.fcc.gov/oet/rfsafety>)
- ? International Commission on Non-Ionizing Radiation Protection
(<http://www.icnirp.de>)
- ? World Health Organization (WHO) International EMF Project
(<http://www.who.int/emf>)
- ? National Radiological Protection Board (UK)
(<http://www.nrpb.org.uk/>)

Consumer Information on SAR (Specific Absorption Rate)

THIS MODEL PHONE MEETS THE GOVERNMENT'S REQUIREMENTS FOR EXPOSURE TO RADIO WAVES.

Your wireless phone is a radio transmitter and receiver. It is designed and manufactured not to exceed the emission limits for exposure to radiofrequency (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 standards that were developed by independent scientific organizations through periodic and thorough evaluation of scientific studies. The standards include a substantial safety margin designed to assure the safety of all persons, regardless of age and health.

The exposure standard for wireless mobile phones employs a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6W/kg. *Tests for SAR are conducted using standard operating positions specified by the FCC with the phone transmitting at its 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 phone model is available for sale to the public, it must be tested and certified to the FCC that it does not exceed the limit established by the government-adopted requirement for safe exposure. The tests are performed in positions and locations (e.g., at the ear and worn on the body) as required by the FCC for each model.

[Labeling Committee note: if applicable, if body-worn SARs are required]. While there may be differences between the SAR levels of various phones and at various positions, they all meet the government requirement for safe exposure.

The FCC has granted an Equipment Authorization for this model phone with all reported SAR levels evaluated as in compliance with the FCC RF emission guidelines. SAR information on this model phone is on file with the FCC and can be found under the Display Gant section of <http://www.fcc.gov/oet/fccid> after searching on FCC ID OL6SKY-8300.

Additional information about Specific Absorption Rates (SAR) can be found on the Cellular Telecommunications Industry Association (CTIA) web-site at <http://www.wow-com.com>.

*In the United States and Canada, the SAR limit for mobile phones used by the public is 1.6watts/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.