



Level 1 and 2 Service Manual

A760

Dual Band Wireless Telephone



GSM 900/1800 MHz & GPRS Technologies

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Introduction

Motorola® Inc. maintains a worldwide organization that is dedicated to provide responsive, full-service customer support. Motorola products are serviced by an international network of company-operated product care centers as well as authorized independent service firms.

Available on a contract basis, Motorola Inc. offers comprehensive maintenance and installation programs that enable customers to meet requirements for reliable, continuous communications.

To learn more about the wide range of Motorola service programs, contact your local Motorola products representative or the nearest Customer Service Manager.

Product Identification

Motorola products are identified by the model number on the housing. Use the entire model number when inquiring about the product. Numbers are also assigned to chassis and kits. Use these numbers when requesting information or ordering replacement parts.

Product Names

Product names are listed on the front cover. Product names are subject to change without notice. Some product names, as well as some frequency bands, are available only in certain markets.

Product Changes

When electrical, mechanical or production changes are incorporated into Motorola products, a revision letter is assigned to the chassis or kit affected, for example: -A, -B, or -C.

The chassis or kit number, complete with revision number is imprinted during production. The revision letter is an integral part of the chassis or kit number and is also listed on schematic diagrams and printed circuit board layouts.

Regulatory Agency Compliance

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

- This device may not cause any harmful interference, and
- must accept interference received, including interference that may cause undesired operation.

This class B device also complies with all requirements of the Canadian Interference-Causing Equipment Regulations (ICES-003).

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Computer Program Copyrights

The Motorola products described in this manual may include Motorola computer programs stored in semiconductor memories or other media that are copyrighted with all rights reserved worldwide to Motorola. Laws in the United States and other countries preserve for Motorola, Inc. certain exclusive rights to the copyrighted computer programs, including the exclusive right to copy, reproduce, modify, decompile, disassemble, and reverse-engineer the Motorola computer programs in any manner or form without Motorola's prior written consent. Furthermore, the purchase of Motorola products shall not be deemed to grant either directly or by implication, estoppel, or otherwise, any license or rights under the copyrights, patents, or patent applications of Motorola, except for a nonexclusive license to use the Motorola product and the Motorola computer programs with the Motorola product.

About this Service Manual

Using this service manual and the suggestions contained in it assures proper installation, operation, and maintenance of A760 telephones. Refer questions about this manual to the nearest Customer Service Manager.

Audience

This manual aids service personnel in testing and repairing A760 telephones. Service personnel should be familiar with electronic assembly, testing, and troubleshooting methods, and with the operation and use of associated test equipment.

Use of this manual assures proper installation, operation, and maintenance of Motorola products and equipment. It contains all service information required for the equipment described and is current as of the printing date.

Scope

The scope of this document is to provide the basic information relating to A760 telephones, and also to provide procedures and processes for repairing the units at Level 1 and 2 service centers including:

- Unit swap out
- Repairing of mechanical faults
- Basic modular troubleshooting
- Testing and verification of unit functionality
- Initiate warranty claims and send faulty modules to Level 3 or 4 repair centers

Conventions

Special characters and typefaces, listed and described below, are used in this manual to emphasize certain types of information.



Note: Emphasizes additional information pertinent to the subject matter.




Caution: Emphasizes information about actions that may result in equipment damage.



Warning: Emphasizes information about actions that may result in personal injury.



Keys to be pressed are represented graphically. For example, instead of “Press the Menu key”, you will see “Press ”.

Information from a screen is shown in text as similar as possible to what appears in the display. For example, **ALERTS** or `ALERTS` or *ALERTS*.

Information that you need to type is printed in **boldface type**

Revisions

Any changes that occur after manuals are printed are described in publication revision bulletins (PMRs). These bulletins provide change information that can include new parts listing data, schematic diagrams, and printed circuit board layouts.

Warranty Service Policy

The product comes with the standard 12-month warranty terms and conditions. Accidental damage, misuse, and extended warranties offered by retailers are not supported under warranty. Non warranty repairs are available at agreed fixed repair prices.

Out of Box Failure Policy

The standard out of box failure criteria applies. Customer units that fail very early on after the date of sale, are to be returned to Manufacturing for root cause analysis, to guard against epidemic criteria. Manufacturing will bear the costs of early life failure.

Product Support

Customer's original units will be repaired but not refurbished as standard. Appointed Motorola Service Hubs will perform warranty and non-warranty field service for level 2 (assemblies) and level 3 (limited PCB component). The Motorola High Technology Centers will perform level 4 (full component) repairs.

Customer Support

Customer support is available through dedicated Call Centers and in-country help desks. Product Service training should be arranged through the local Motorola Support Center.

Ordering Replacement Parts

Only centers authorized to carry out repairs can purchase spare parts. Orders for spare parts from hubs and Hi-Tech Centers should be placed with the regional Motorola Parts Distribution Center.

Parts Replacement

When ordering replacement parts or equipment, include the Motorola part number and description used in the service manual or supplement.

When ordering crystals or channel elements, specify the Motorola part number, description, crystal frequency, and operating frequency desired.

When the Motorola part number of a component is not known, use the product model number or other related major assembly along with a description of the related major assembly and of the component in question.

In the U.S.A., to contact Motorola, Inc. on your TTY, call: 800-793-7834

Accessories and Aftermarket Division (AAD)

Replacement parts, test equipment, and manuals can be ordered from AAD.

U.S.A.

Phone: 800-422-4210

FAX: 800-622-6210

Outside U.S.A.

Phone: 847-538-8023

FAX: 847-576-3023

To order spare parts in EMEA region call +44 131 479 1274.

To order spare parts in Asia region call +65 648 62995.

Specifications

General Function	Specification
Frequency Range GSM	880-915 MHz Tx (with EGSM) 925-960 MHz Rx
Frequency Range DCS	1710-1785 MHz Tx 1805-1880 MHz Rx
Channel Spacing	200 kHz
Channels	174 EGSM, 374 DCS carriers with 8 ch. per carrier
Modulation	GMSK at BT = 0.3
Transmitter Phase Accuracy	5 Degrees RMS, 20 Degrees peak
Duplex Spacing	45 MHz GSM, 95 MHz DCS
Frequency Stability	± 0.10 ppm of the downlink frequency (Rx)
Operating Voltage	+3.0V dc to +5.1V dc (battery) +4.4V dc to +6.5V dc (external connector)
Transmit Current	Typically 350 mA average, 1.0 Amps peak
Stand-by Current	Typically 5.0 mA (DRX2), 8.3 mA (DXR9)
Dimensions	101 mm x 53 mm x 21 mm (3.9 inches X 2.1 inches X 0.8 inches)
Size (Volume)	95 cc (5.79 in ³)with battery
Weight	118 gm (4.1 oz) with battery
Temperature Range	-10° C to +55° C (+15° F to +130° F)
Battery Life, 800 mAh Lithium Ion Battery	Talk Time 180 to 300 minutes Standby 95 to 160 hours All talk and standby times are approximate and depend on network configuration, signal strength, and features selected. Standby times are quoted as a range from DRX=2 to DRX=9. Talk times are quoted as a range from DTX off to DTX on.

Transmitter Function	Specification
RF Power Output	33 dBm nominal GSM, 30 dBm nominal DCS
Output Impedance	50 ohms nominal
Spurious Emissions	-36 dBm from 0.1 to 1 GHz, -30 dBm from 1 to 4 GHz

Receiver Function	Specification
Receive Sensitivity	-102 dBm GSM, -103 dBm DCS
RX bit error rate (100k bits) Type II	< 2%
Channel Hop Time	500 microseconds
Time to Camp	Approximately 5-10 seconds

Speech Coding Function	Specification
Speech Coding Type	Regular pulse excitation / linear predictive coding with long term prediction (RPE LPC with LTP)
Bit Rate	13.0 kbps
Frame Duration	20 ms
Block Length	260 bits
Classes	Class 1 bits = 182 bits; Class 2 bits = 78 bits
Bit Rate with FEC Encoding	22.8 kbps

Product Overview

Motorola A760 telephones are global system for mobile communications (GSM) general packet radio service (GPRS) wireless application protocol (WAP)-enabled mobile phones with full-featured personal information manager (PIM) functionality. The A760 incorporates a large task-based touch screen user interface (UI) featuring handwriting recognition for email and short message service (SMS) text messaging. It is a tri-band phone that allows roaming within the GSM 900 MHz, and digital cellular system (DCS) 1800 MHz bands.

A760 telephones support GPRS, SMS, MMS in addition to traditional circuit switched transport technologies.

A760 telephones have a clam form factor. They are made of a polycarbonate plastic with the earpiece speaker located in the flip. The flip features a viewing window that allows a portion of the display to be seen with the flip is closed. The bottom part of the clam (front housing) contains the touch screen display, main printed circuit board (PCB), microphone, external accessory connector, infrared (IR) communications port, and headset jack. Also located in the front housing are the voice, volume, power, page up, page down, and menu buttons, as well as the battery, antenna, subscriber identity module (SIM) holder, and status light. A stylus, also located in the front housing, is provided to aid manipulating the touch screen UI.

The A760 features a High definition display with a fine pitch 320 x 240 pixel high color reflective TFT display to improve readability and useability.

The battery and battery door are integrated into a single unit to minimize overall phone thickness. The phone accepts both 3V and 5V mini SIM cards which fit into the SIM holder beneath the battery. The antenna is a fixed stub type antenna.

Features

Features available include:

- Phone first: looks and performs like a phone
- Linux OS
- J2ME™ MIDP 2.0
- Hands free speakerphone
- 65k color TFT touchscreen
- Touchscreen pen-based input with handwriting recognition
- Secure OTA synchronization of PIM & email to enterprise servers
- Supports MMS, high definition audio codecs (MIDI, AMR, MP3) in addition to traditional SMS, concatenated SMS, cell broadcast messages, and 2D/3D animation
- Polyphonic ringer tones (16 voice, 22kHz)
- Embedded MP3 player
- Embedded camera
- Embedded Bluetooth™
- MPEG4 playback
- 200 MHz processor
- 32 MB flash memory
- Embedded PIM and email clients with excellent UI and performance
- Tri-coder/decoder (CODEC) that allows full rate, half rate, and enhanced full rate modes of transmission
- Integrated camera for still picture captures
- Expansion slot for IrDA, Bluetooth, Smart Module SD/MMC
- Supports GPRS, circuit switched, and SMS networks
- WAP 1.1.2 compliant
- 240 x 320 pixel touch screen color display
- Voice recorder personal memo feature

General Operation

Controls, Indicators, and Input/Output (I/O) Connections

The A760 telephone's controls are located on the front of the device (see Figure 1). Controls on the front of the phone include a Power ON/OFF button, Home Key, and a Up/Down key Soft Menu key on the left and right side. Indicators, in the form of icons, are displayed on the LCD. Service status is indicated by a tri-color light emitting diode (LED) (not shown) located on top of the phone. Additionally, I/O connectors consisting of a headset jack and an accessory port are located on the top and bottom of the phone, respectively. See Figure 1.



020035-o

Figure 1. Controls, Indicators, and I/O

Color Display

The color display provides a high resolution 240x320 touch screen display for easy readability in all light conditions (see Figure 2).

The screen displays the main menu icons and all of the function group icons. You can navigate around the touch screen using the stylus to select the desired functions.



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Figure 2. Sample Menu Display




Display animation makes the phone's menus move smoothly as the user scrolls up and down.



Whether a phone displays all indicators depends on the programming and services to which the user subscribes.

Table 1 shows some common icons displayed on the LCD.

Table 1. Icon Indicators and Description

Icon	Description
	Signal Strength Indicator. Shows the strength of the phone's connection with the network.
	GPRS Indicator. Appears when the phone is in GPRS mode.
	Bluetooth Indicator. Appears when a bluetooth accessory or device is wirelessly connected.
	GPRS Indicator. Appears when the phone is in GPRS mode.
	Battery Level Indicator. Shows the amount of charge left in the battery. The more segments visible, the greater the charge. Recharge the battery as soon as possible when the Low Battery warning message appears.
12:26	Clock. Shows the current time. This is a network-dependent feature.

Menu Navigation

A760 telephones are equipped with a new user-friendly interface that employs 6 main menus.

- Communication
- Organize
- Play
- Tools
- Extras
- Personal

Icons along the top row of the display provide quick access to selected applications. Select each menu or application by tapping the icon on the screen. Each menu contains application icons that make up a function group.

Communication	Extras
Phone	World time
Address book	Alarm clock
Message Center	Calculator
Recent Calls	
Email	
Browser	
STK	
Organize	
Calendar	
Tasks	
Note pad	
File manager	
Play	
Camera	
Media Player	
Drawing/Ani pad	
Voice Recorder	
Personal	
Tools	
Network connection	
Sync	
Modem	
Bluetooth	
VPN	
Security	
Car kit	
System setup	

Figure 3. Menu Navigation

Alert Settings

A760 telephones include up to 32 preset alert tones and vibrations that can be applied to all alert events at the same time.



Pressing either volume key will mute the alert.

Battery Function

Battery Gauge

The telephone displays a battery level indicator icon in the idle screen to indicate the battery charge level. The gauge shows four levels: 100%, 66%, 33%, and Low Battery.

Battery Removal

Removing the battery causes the device to immediately shut down and any pending work (for example, partially entered phone book entries or outgoing messages) is lost.



To ensure proper memory retention, turn OFF the phone before removing the battery. Immediately replace the old battery with a fresh battery.



If the battery is removed while receiving a message, the message will be lost.

Operation

For detailed operating instructions, refer to the appropriate User Guide listed in the Related Publications section toward the end of this manual.

Tools and Test Equipment

The following table lists tools and test equipment recommended for disassembly and reassembly of A760 telephones. Use either the listed items or equivalent.

Table 2. General Test Equipment and Tools

Motorola Part Number ¹	Description	Application
RSX4043-A	Torque Driver	Used to remove and replace screws
—	Torque Driver Bit T-6 Plus, Apex 440-6IP Torx Plus or equivalent	Used with torque driver
See Table 6	Charger	Used to charge battery and to power device
0180386A82	Antistatic Mat Kit (includes 66-80387A95 antistatic mat, 66-80334B36 ground cord, and 42-80385A59 wrist band)	Provides protection from damage to device caused by electrostatic discharge (ESD)
6680388B67	Disassembly tool, plastic with flat and pointed ends	Used during assembly/disassembly of device
6680388B01	Tweezers, plastic	Used during assembly/disassembly
— ²	Tweezers, stainless steel, Type 2 pointed blade, Plato part number TZF-401-2 or equivalent	Used for flip removal.
— ³	Digital Multimeter, HP34401A	Used to measure battery voltage
8102430Z04	GSM / DCS Test SIM Card	Used to enable manual test mode

1. To order in North America, contact Motorola Aftermarket and Accessories Division (AAD) at (847) 538-8000; Internationally, AAD can be reached by calling +1 847 5388023 or faxing +1 847 5763023.

2. Not available from Motorola. To order, contact Plato Products, Inc. at (626) 965-8044.

3. Not available from Motorola. To order, contact Hewlett Packard at (800) 452-4844.

Disassembly

The procedures in this section provide instructions for the disassembly of a A760 telephone. Tools and equipment used for the phone are listed in Table 2, preceding.



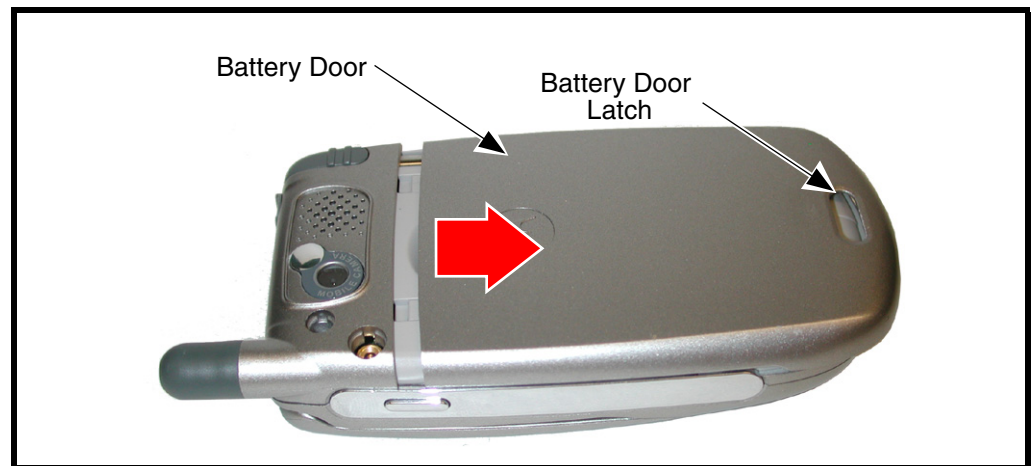
Many of the integrated devices used in this equipment are vulnerable to damage from electrostatic discharge (ESD). Ensure adequate static protection is in place when handling, shipping, and servicing the internal components of this equipment.



Avoid stressing the plastic in any way to avoid damage to either the plastic or internal components.

Removing and Replacing the Battery Door

1. Ensure the phone is turned off.
2. Press the battery door release latch on the rear of the phone at the bottom end (see Figure 4).
3. Slide the battery door toward the bottom end of the phone.
4. Lift the battery door up and away from the phone.



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Figure 4. Removing and Replacing the Battery Door

5. To replace, align the battery door with the rear housing.
6. Lower the battery door onto the rear housing and slide the battery door toward the antenna to lock. The battery door latch will snap into position.

Removing and Replacing the Battery Door

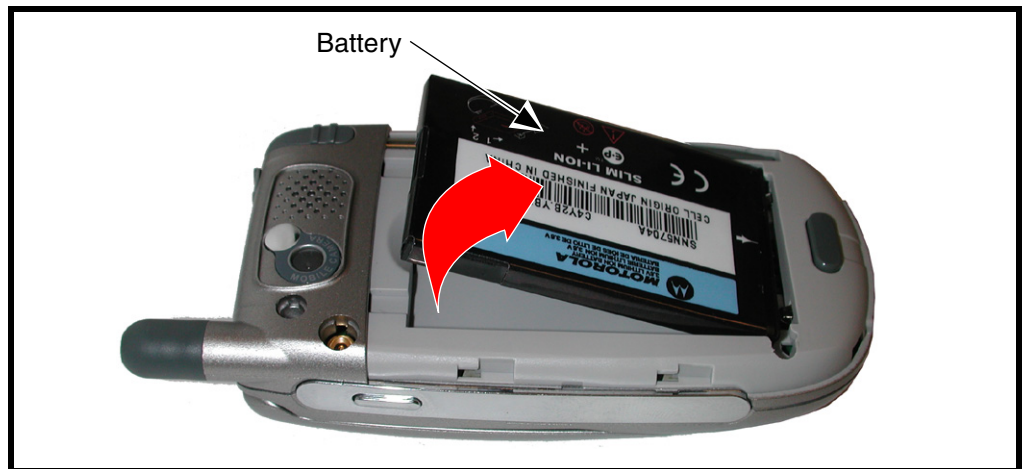
1. Remove the Battery door by pushing down on battery door latch and sliding battery door down and away from the phone (see Figure 5).
- 2.

Removing and Replacing the Battery



All batteries can cause property damage and / or bodily injury such as burns if a conductive material such as jewelry, keys, or beaded chains touch exposed terminals. The conductive material may complete an electrical circuit (short circuit) and become quite hot. Exercise care in handling any charged battery, particularly when placing it inside a pocket, purse, or other container with metal objects.

1. Ensure the phone is turned off.
1. Press down on the top of the battery to compress the battery contacts
2. Pull up and away from rear Housing.
3. lift the end of the battery and remove it completely. See Figures 5-2 and 5-3.



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Figure 5. Removing the battery

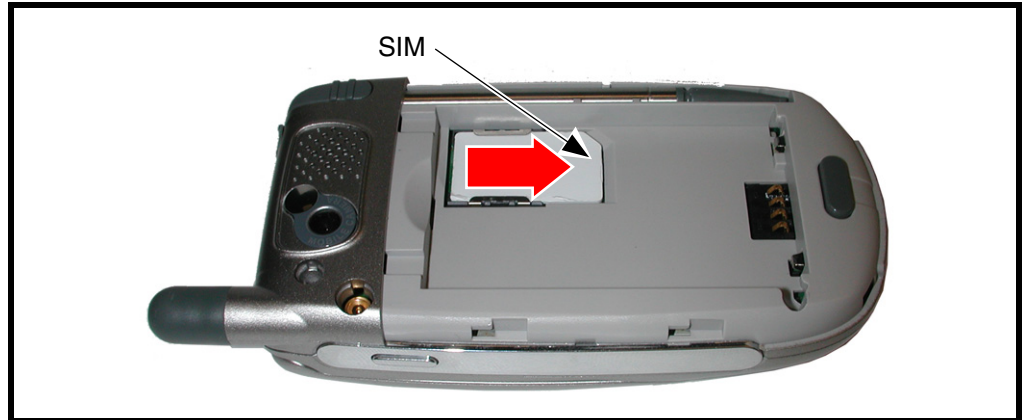


There is a danger of explosion if the Lithium Ion battery is replaced incorrectly. Replace only with the same type of battery or equivalent as recommended by the battery manufacturer. Dispose of used batteries according to the manufacturer's instructions.

4. To replace, align the battery with the battery compartment so the contacts on the battery match the battery contacts in the phone.
5. Insert the tabs at the base of the battery into the slots at the bottom of the battery compartment.
6. Push the top of the battery down until it snaps into place.

Removing and Replacing the Subscriber Identity Module (SIM)

1. Remove the battery door, and battery as described in the procedures.
2. Slide the SIM in the direction of the arrow (see Figure 6) to remove the SIM.
3. To replace, insert the SIM into the holder, ensuring the keyed corner of the SIM aligns with the notch molded into the holder.



031712o

Figure 6. Removing the SIM

4. To replace, insert the SIM into the holder, ensuring the keyed corner of the SIM aligns with the notch molded into the rear housing.
5. Replace the battery, and battery door as described in the procedures.

Removing and Replacing the Stylus

1. Grasp the stylus and pull it straight out of the top of the telephone as shown in Figure 7.

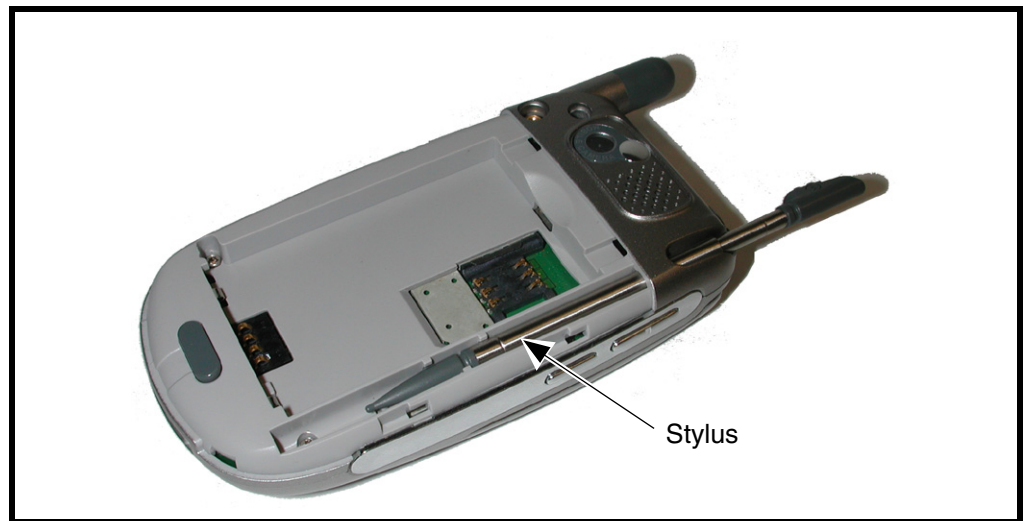


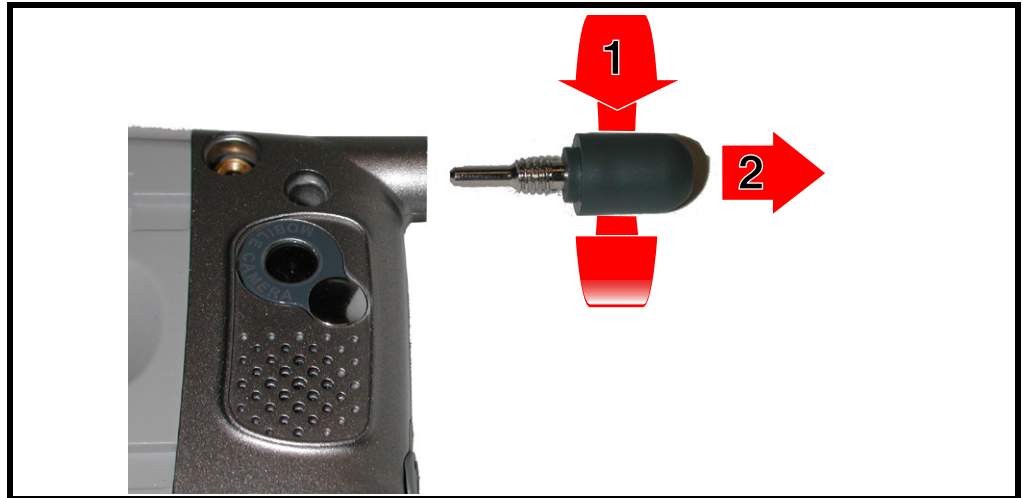
Figure 7. Removing the stylus

0317130

2. To replace, insert the stylus, pointed end first, into the styles holder on the top of the telephone. Push until fully seated in the holder.

Removing and Replacing the Antenna

1. Remove the battery door, and battery as described in the procedures.
2. By hand, rotate the antenna counterclockwise until loose as shown in Figure 8-1.



0317140

Figure 8. Removing the antenna

3. When the antenna threads are completely disengaged, pull the antenna straight out of the phone housing to remove. Figure 8-2.



Ensure antenna threads are properly engaged before tightening to prevent damage to the antenna or housing.

4. To replace, insert the threaded end of the antenna carefully into the housing and, after ensuring the threads are properly engaged, rotate clockwise. Tighten firmly by hand.
5. Replace the battery, and battery door as described in the procedures.

Removing and Replacing the Rear Housing



This product contains static-sensitive devices. Use anti-static handling procedures to prevent electrostatic discharge (ESD) and component damage.

1. Remove the battery door, stylus, battery, SIM, and antenna as described in the procedures.



In addition to 4 screws, the rear housing is fastened with 2 plastic catches. The catches are fragile and should be handled with care.

2. Using a Torx driver with a T-6 bit, remove the 4 screws from the rear housing. See Figure 9A.
3. With the flat end of the disassembly tool, carefully press the 2 housing catches inward on each side of the phone to release the rear housing. See Figure 9B.

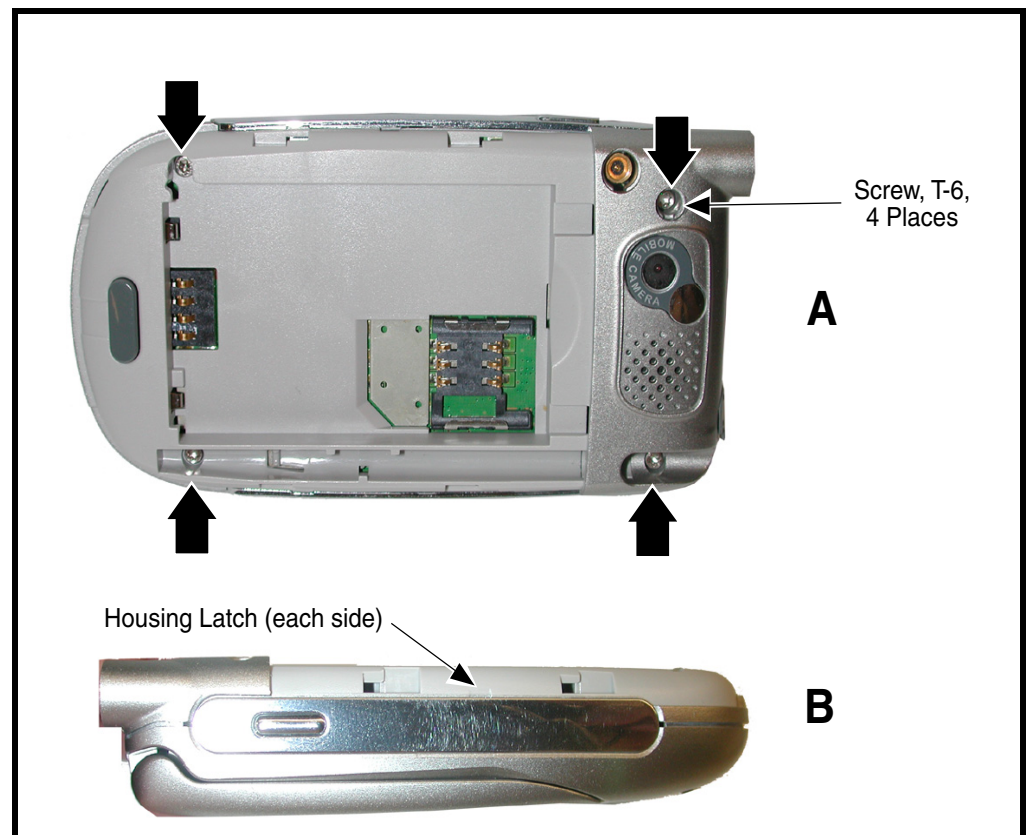
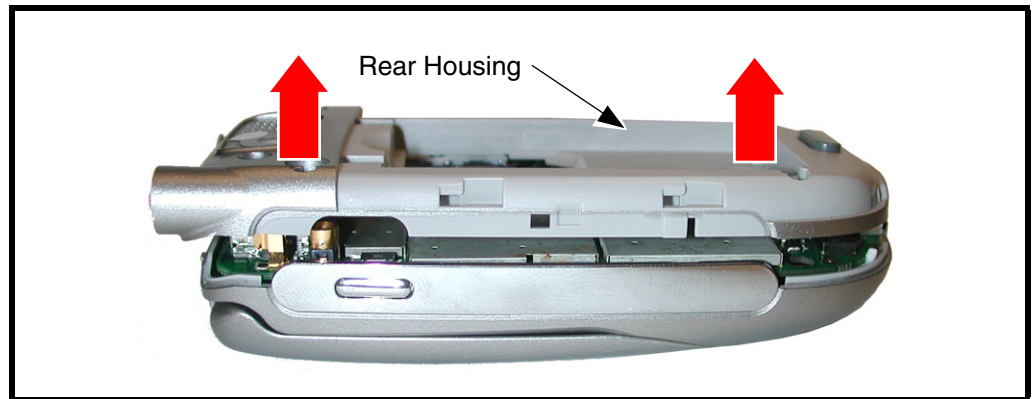


Figure 9. Removing the Rear Housing Screws

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4. Lift the rear housing away from the front housing as shown in Figure 10.



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Figure 10. Removing the Rear Housing

5. To replace, align the housing catches then press the rear housing down until the 2 housing catches engage. Press the housings together until the catches snap into place.
6. Replace the 4 screws and tighten securely. Do not over tighten. Reinsert the rubber screw cap in the screw location near the antenna.
7. Replace the stylus, antenna, SIM, battery, and battery door as described in the procedures.

Removing and Replacing the Transceiver Board



This product contains static-sensitive devices. Use anti-static handling procedures to prevent electrostatic discharge (ESD) and component damage.

1. Remove the battery door, battery, SIM, stylus, antenna, and rear housing as described in the procedures.
2. Use the metal tweezers to disconnect the speaker wire connector from the transceiver board (see Figure 11).
3. Carefully lift the transceiver board away from the rear housing.

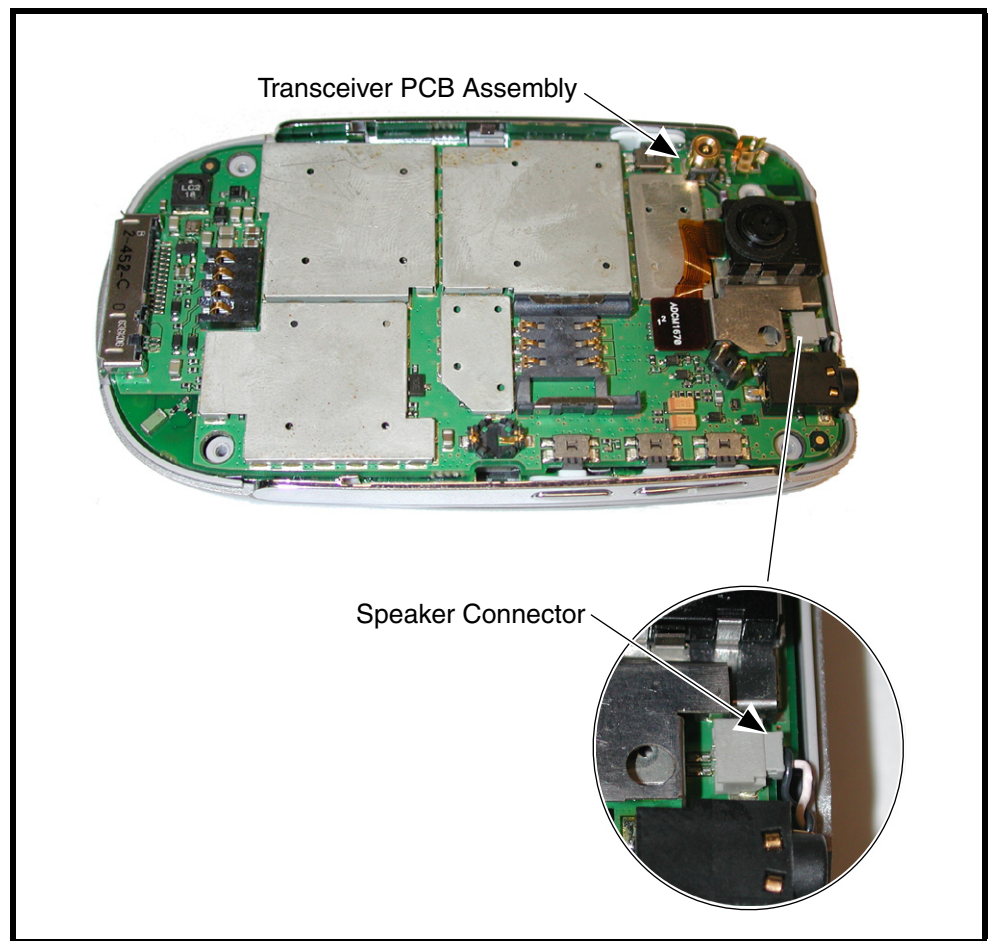


Figure 11. Removing the Transceiver Board

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4. To replace, insert the transceiver board assembly into the front housing with the flex connector on top. Be sure the main board assembly is properly seated on the 4 front housing posts

Removing and Replacing the Camera Assembly

1. Remove the battery door, battery, SIM, antenna, stylus, rear housing, and transceiver board as described in the procedures..



The flexible printed cable (FPC or flex) is easily damaged. Exercise extreme care when handling.

2. Use the disassembly tool to unseat the camera flex connector from its socket on the transceiver PCB assembly (see Figure 11).
3. Using the metal tweezers, release the two camera assembly latches on each side of the camera assembly.
4. Lift the camera assembly up and away from the transceiver board.

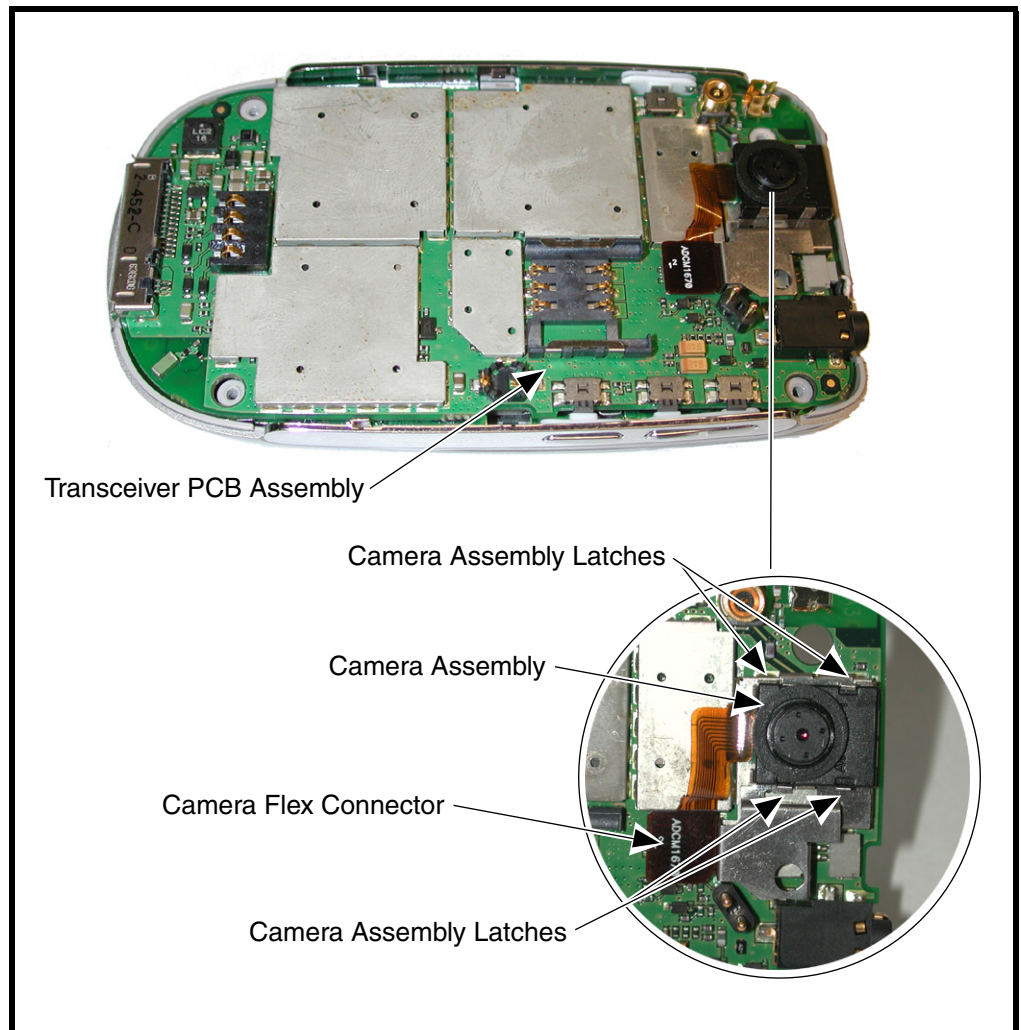


Figure 12. Removing the Camera Assembly

5. To replace, align the camera assembly to the transceiver PCB assembly.
6. Place the camera assembly onto the transceiver PCB assembly.
7. Use the metal tweezers to secure the camera latches on each side of the camera assembly.
8. Connect the camera flex connector to the socket on the transceiver PCB assembly.
9. Replace the transceiver PCB assembly, rear housing, antenna, stylus, SIM, battery, and battery door as described in the procedures.

Removing and Replacing the Real Time Clock (RTC) Battery

1. Remove the battery door, battery, SIM, stylus, antenna, rear housing, and transceiver board as described in the procedures.

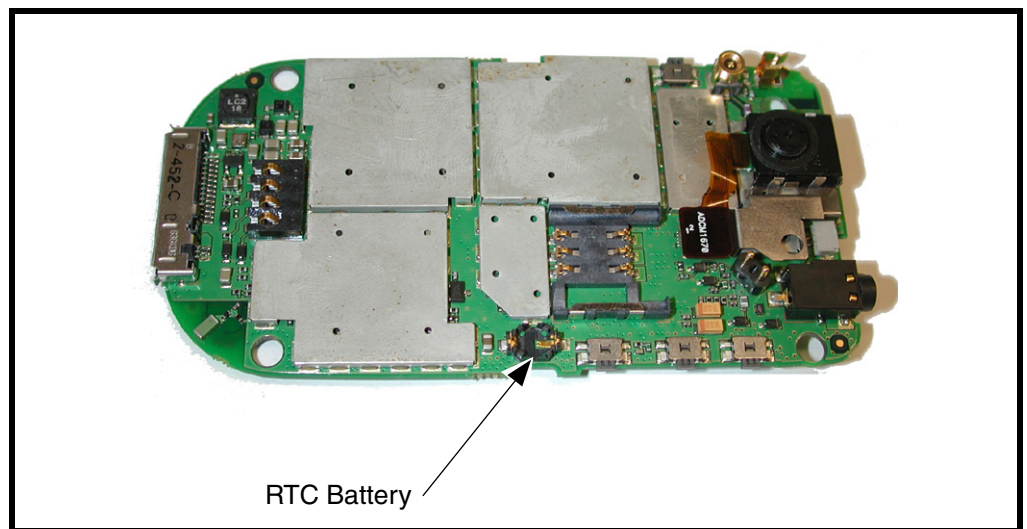


Figure 13. Removing the RTC battery

2. Using the flat end of the disassembly tool, gently pry the RTC battery from its socket on the transceiver board. See Figure 13.

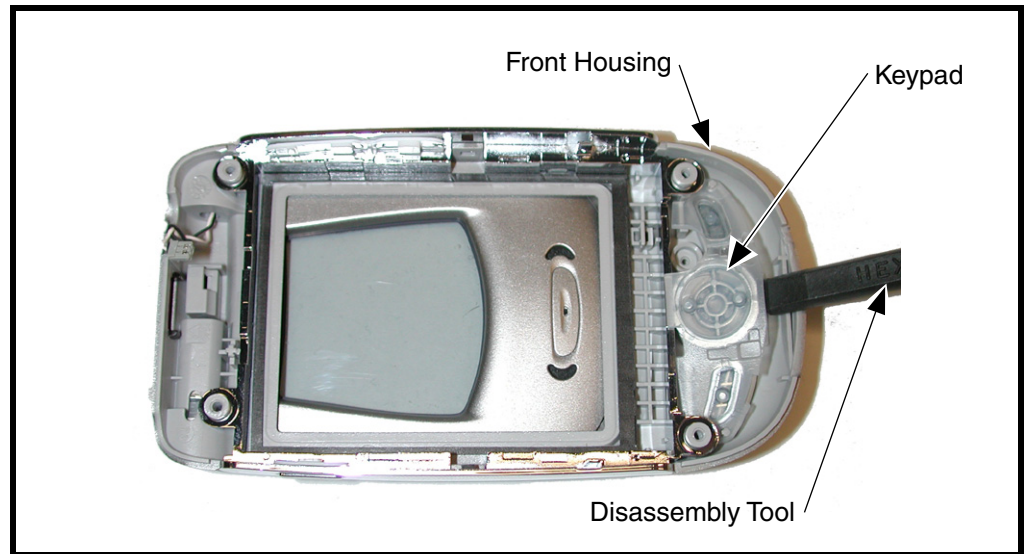


Use only non-conductive tools, such as the plastic disassembly tool and the plastic tweezers, when removing and replacing the RTC battery.

3. To replace, insert the new RTC battery into its socket on the main board. The plastic tweezers may be used to replace the RTC battery. Be sure the positive battery terminal is up (facing away from the board) and the battery is completely seated in its socket.
4. Replace the rear housing, antenna, SIM, and battery as described in the procedures.

Removing and Replacing the Keypad

1. Remove the battery, SIM, antenna, rear housing, and main board as described in the procedures.
2. Lift the keypad from the front housing as shown in Figure 14.



0317360

Figure 14. Removing the Keypad

3. To replace, insert the keypad into the front housing. Make sure they align properly with the openings in the front housing.
4. Replace the main board, rear housing, antenna, SIM, and battery as described in the procedures.
5. After reassembly, operate all the keypad keys to verify correct function.

Removing and Replacing the Touch Screen Display Assembly



This product contains static-sensitive devices. Use anti-static handling procedures to prevent electrostatic discharge (ESD) and component damage.

1. Remove the battery, SIM, antenna, rear housing, transceiver board, as described in the procedures.
2. Remove the switchdome PCB assembly as shown in Figure 15.

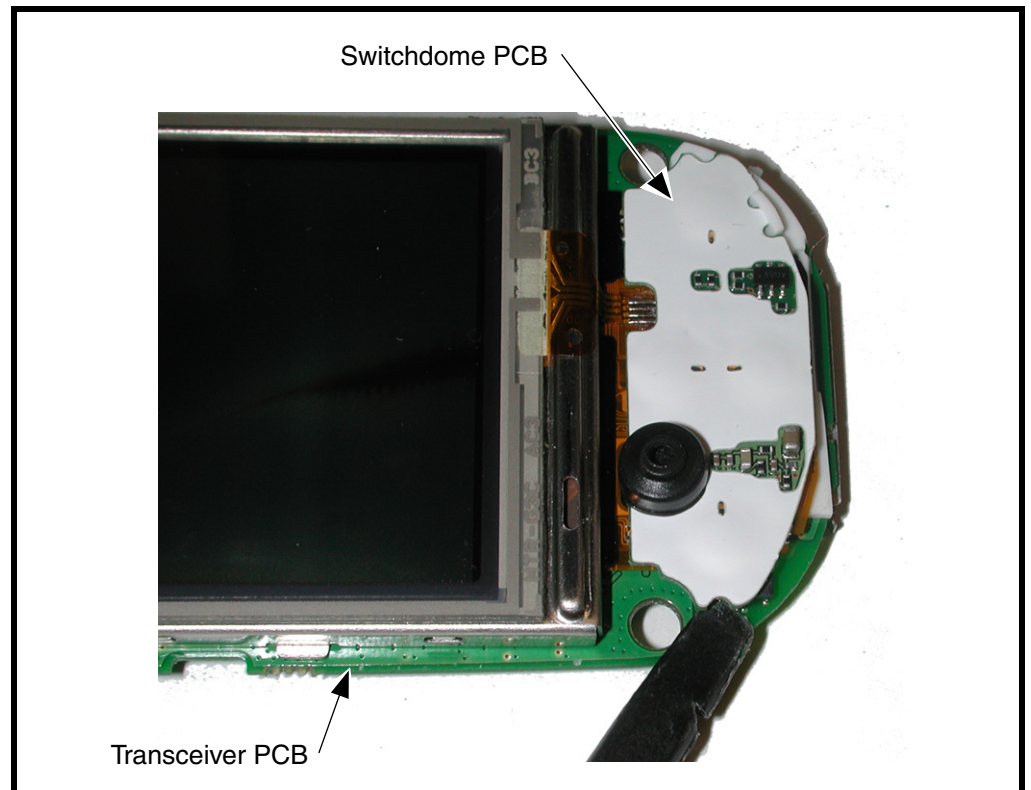


Figure 15. Removing the Switchdome PCB

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3. Use the plastic tweezers to move the snubber away from the PCB.

4. Use the disassembly tool to unseat the display flex connector from its socket on the transceiver board (see Figure 16).

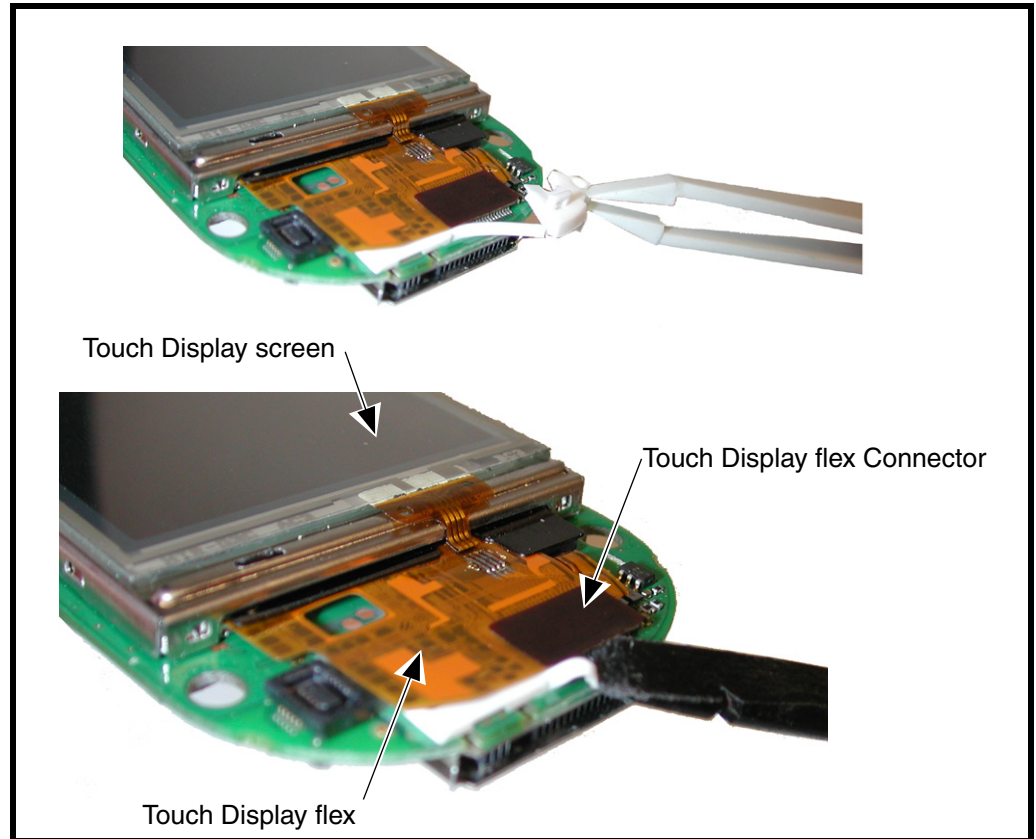
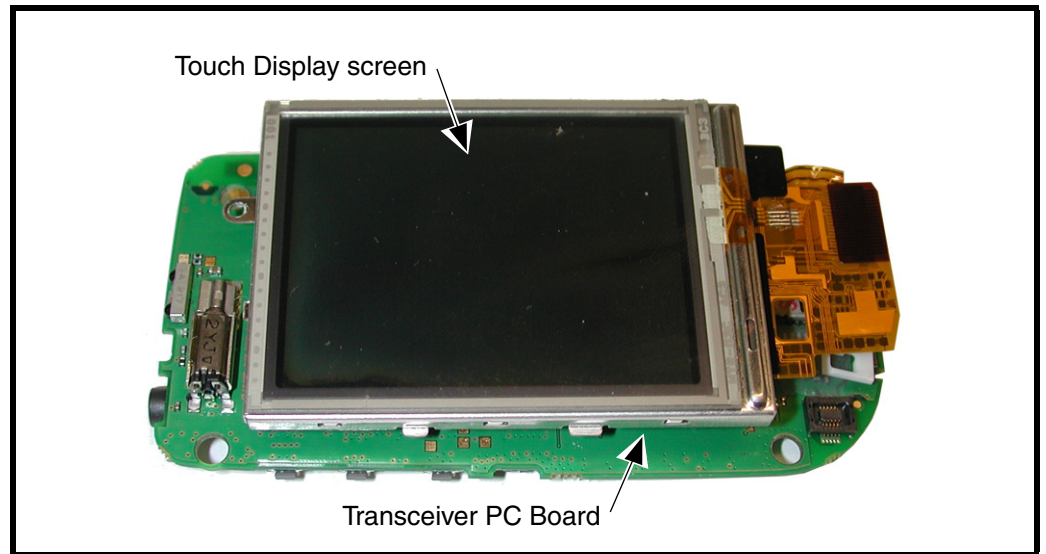


Figure 16. Removing the Touch Screen Display Flex

5. Carefully lift the touch screen display assembly straight up and away from the front housing as shown in Figure 15.



The touch screen display is fragile. Do not twist, pry, or drop the assembly during removal and reassembly.



031740o

Figure 17. Removing the Touch Screen Display

6. To replace, lower the touch screen display onto the transceiver board.
7. Align the touch screen display flex connector with the flex connector socket and carefully press the flex connector into the socket. into 4 posts inside the front housing and set in place.
8. Place the snubber between the touch screen display flex and the transceiver board.
9. Place the switchdome PCB onto the transceiver board. Carefully press the board socket connector into the connector socket
10. Replace the keypad, transceiver board, rear housing, antenna, SIM, battery, and battery door as described in the procedures.

Removing and Replacing the Microphone

1. Remove the battery door, battery, SIM, antenna, rear housing, main board, and switchdome PCB as described in the procedures.

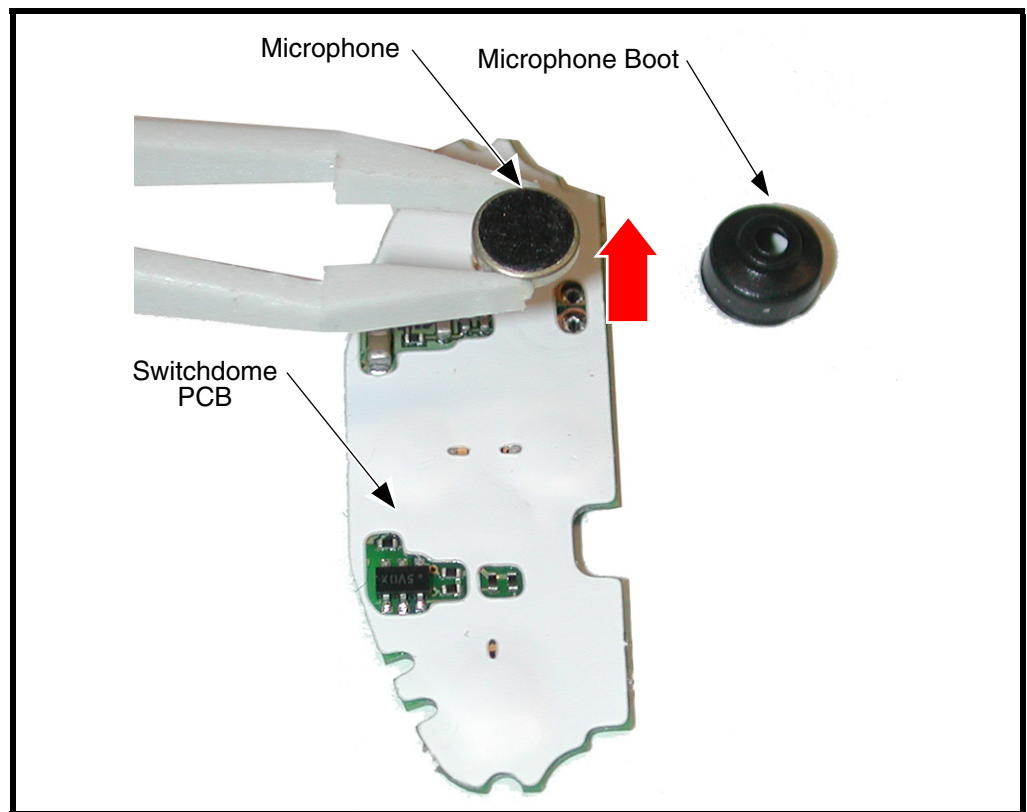


Figure 18. Removing the microphone

0317510

2. Lift the microphone boot off of the microphone.
3. Observe the orientation of the microphone before removing.
4. Using the plastic tweezers, carefully pull the microphone straight out of the switchdome PCB as shown in Figure 18.

► *The microphone connector pins are easily bent or broken. Exercise care when replacing the microphone.*

5. To replace, insert the microphone connector pins into the switchdome PCB socket and press until the microphone is seated flat against the board. Be sure to observe proper orientation when replacing the microphone.
6. Replace the switchdome PCB, main board, rear housing, antenna, SIM, and battery, and battery door as described in the procedures.

SIM Cards and Identification

SIM Card

A SIM card is required to access the existing local GSM network and remote networks when traveling.

The SIM card contains:

- All the data necessary to access GSM services.
- The ability to store user information such as phone numbers.
- All information required by the network provider to provide access to the network.

Personality Transfer

A personality transfer is required when a phone is Express Exchanged or when the main board is replaced. Personality transfers reproduce the customer's original personalized details such as menu and stored memory such as phone books, or even just program a unit with basic user information such as language selection.

▶ *Personality transfers performed at levels 1 and 2 service centers include only the information stored on the SIM.*

Identification

Each Motorola GSM device is labeled with a variety of identifying numbers. The following information describes the current identifying labels.

Mechanical Serial Number (MSN)

The Mechanical Serial Number (MSN) is an individual unit identity number and remains with the unit throughout the life of the unit.

The MSN can be used to log and track a unit on Motorola's Service Center Database.

The MSN is divided into 4 sections as shown in Figure 19.

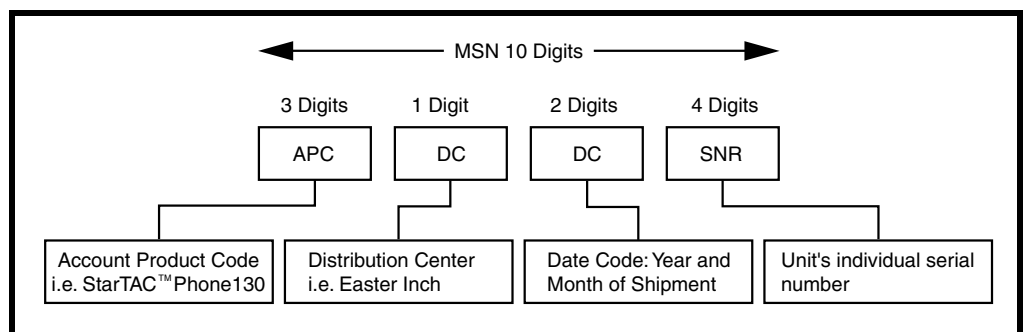


Figure 19. MSN Label

000807a

International Mobile Station Equipment Identity (IMEI)

The International Mobile station Equipment Identity (IMEI) number is an individual number unique to the PCB and is stored within the unit's memory.

The IMEI uniquely identifies an individual mobile station and thereby provides a means for controlling access to GSM networks based on mobile station types or individual units. The full IMEI structure is listed in Table 3.

Table 3. IMEI Number Breakdown

TAC	Serial Number	Check Digit
NNXXXX YY	ZZZZZZ	A

Where

TAC Type Allocation Code, formerly known as Type Approval Code

NN Reporting body identifier

XXXX Type Identifier

YY YY is set to 00 from 01/01/2003 until 31/03/2004

ZZZZZZ Individual unit serial number

A Phase 1 = 0.

Phase 2 = check digit defined as a function of all other IMEI digits

Other label number configurations present are:

- **TRANSCIVER NUMBER:** Identifies the product type. Normally the SWF number. (i.e. V100).
- **PACKAGE NUMBER:** Identifies the equipment type, mode, and language in which the product is shipped.

Troubleshooting

Manual Test Mode

Motorola A760 telephones are equipped with a manual test mode capability. This allows service personnel to verify functionality and perform fault isolation by entering keypad commands.

To enter the manual test command mode, a GSM/DCS test SIM must be used.

1. Press **Ⓞ** to turn the phone OFF.
2. Remove the battery as described in the procedures.
3. Remove the customer's SIM card from the phone as described in the procedures.
4. Insert the test SIM into the SIM slot.
5. Replace the battery as described in the procedures.
6. Press **Ⓞ** to turn the phone ON.

Press and hold the # button for approximately 3 seconds until TEST displays on the screen. The phone may now be issued test commands listed in Table 4.

Manual Test Mode Commands

Table 4. Test Commands

Test Command	Test Function/Name
Press and hold # for 2 seconds	Enter manual test mode
01#	Exit manual test mode
07x#	Mute RX audio path
08#	Unmute RX audio path
09#	Mute TX audio path
10#	Unmute TX audio path
15x#	Generate tone
1590#	Vibrate Mode
1591#	Ringer Mode
16#	Mute tone generator
19#	Display software version number of Call Processor
20#	Display software version number of Modem
36#	Initiate acoustic loopback
360#	Full Rate
361#	Enhanced Full Rate
362#	Half Rate
37#	Stop test
38#	Activate Mini SIM
39#	Deactivate Mini SIM
43x#	Change audio path
47x#	Set audio volume
51#	Enable sidetone

Table 4. Test Commands (Continued)

Test Command	Test Function/Name
52#	Disable sidetone
54#	Show service indicator LED (0 - Off, 1 - Red, 2 - Green, 3 - Amber) (flip must be closed)
57#	Initialize non-volatile memory
58#	Display security code
58xxxxx#	Modify security code
59#	Display lock code
59xxx#	Modify lock code
60#	Display IMEI
980#	DCS Mode (PF B95 only)
981#	GSM Mode (PF B95 only)
962#	PCS Mode (PF C21 only)
99#	Display all pixels

Troubleshooting Chart

Table 5. Product Family 0C45 Telephone: Level 1 and 2 Troubleshooting Chart

SYMPTOM	PROBABLE CAUSE	VERIFICATION AND REMEDY
1. Telephone will not turn on or stay on.	a) Battery either discharged or defective.	Measure battery voltage across a 50 ohm (>1 Watt) load. If the battery voltage is <3.25 Vdc, recharge the battery using the appropriate battery charger. If the battery will not recharge, replace the battery. If battery is not at fault, proceed to b.
	b) Battery connectors open or misaligned.	Visually inspect the battery connectors on both the battery and the telephone. Realign and, if necessary, either replace the battery or refer to a Level 3 Service Center for the battery connector replacement. If battery connectors are not at fault, proceed to c.
	c) Main board assembly defective.	Remove the main board assembly. Substitute a known good assembly and temporarily reassemble the unit. Depress the PWR button; if unit turns on and stays on, disconnect the dc power source and reassemble the telephone with the new main board assembly. Verify that the fault has been cleared.
2. Telephone exhibits poor reception or erratic operation such as calls frequently dropping or weak or distorted audio.	a) Antenna assembly defective.	Check to make sure that the antenna pin is properly connected to the main board assembly. If connected properly, substitute a known good antenna. If the fault is still present, proceed to b.
	b) Main board assembly defective.	Replace the main board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new main board assembly.
3. Display is erratic, or provides partial or no display.	a) Main board connections faulty.	Remove rear housing from unit, check general condition of flexible printed cable (flex). If the flex is good, check that the flex connector is properly locked. If faulty connector, replace the main board assembly. If connector is not at fault, proceed to b.

Table 5. Product Family 0C45 Telephone: Level 1 and 2 Troubleshooting Chart (Continued)

SYMPTOM	PROBABLE CAUSE	VERIFICATION AND REMEDY
	b) Touch screen display assembly defective.	Remove the touch screen display assembly as described in the procedures. Temporarily reassemble unit with a known good touch screen display assembly and verify proper operation. If fault is cleared, reassemble unit with the new assembly. If fault not cleared, proceed to c.
	c) Main board assembly defective.	Replace the main board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new main board assembly.
4. Incoming call alert transducer audio distorted or volume is too low.	Faulty alert transducer or main board assembly.	Replace the main board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new main board assembly.
5. Telephone transmit audio is weak. (usually indicated by called parties complaining of difficulty in hearing voice).	a) Microphone connections to the main board assembly defective.	Gain access to the microphone as described in the procedures. Check connections. If connector is faulty proceed to c; if the connector is not at fault, proceed to b.
	b) Microphone defective.	Gain access to microphone. Disconnect and substitute a known good microphone. Place a call and verify improvement in transmit signal as heard by called party. If good, reassemble with new microphone. If microphone is not at fault, reinstall original microphone and proceed to c.
	c) Main board assembly defective.	Replace the main board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new main board assembly.
6. Receive audio from earpiece speaker is weak or distorted.	a) Connections to or from main board assembly defective.	Gain access to the main board assembly as described in the procedures. Check the speaker leads and connector from the flip assembly to the main board assembly. If speaker leads are at fault, replace the flip assembly. If connector is at fault, proceed to d. If connection is not at fault, proceed to b.
	b) Earpiece speaker defective.	Replace the flip assembly as described in the procedures. Temporarily reassemble unit and verify proper operation. If fault has not been cleared, replace original flip assembly and proceed to proceed to c.
	c) Antenna assembly defective.	Check to make sure the antenna is installed correctly. If the antenna is installed correctly, substitute a known good antenna assembly. If this does not clear the fault, reinstall the original antenna assembly and proceed to d.
	d) Main board assembly defective.	Replace the main board assembly (refer to 1c). Verify that the fault has been cleared and reassemble with the new main board assembly.
7. Telephone will not recognize or accept SIM card.	a) SIM card defective.	Check the SIM card contacts for dirt. Clean if necessary and check if fault has been cleared. If the contacts are clean, insert a known good SIM card into the telephone. Power up the unit and confirm that the card has been accepted. If the fault no longer exists, replace the defective SIM card. If the SIM card is not at fault, proceed to b.

Table 5. Product Family 0C45 Telephone: Level 1 and 2 Troubleshooting Chart (Continued)

SYMPTOM	PROBABLE CAUSE	VERIFICATION AND REMEDY
	b) Connections between touch screen display assembly and main board assembly faulty.	Refer to remedy 3a and 3b. If fault has not been cleared, proceed to c.
	c) Touch screen display assembly defective.	Replace touch screen display assembly with a known good one. Temporarily reassemble unit and verify proper operation. If fault has not been cleared, replace original touch screen display assembly and proceed to d.
	d) Main board assembly defective.	Replace the main board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new main board assembly.
8. Phone does not sense when flip is opened or closed (usually indicated by inability to answer incoming calls by opening the flip, or inability to make outgoing calls).	a) Magnet in flip assembly missing or defective.	Replace flip assembly with known good one. Refer to the procedures. Place call to phone and verify ability to answer by opening flip. If fault is cleared, rebuild phone with new flip assembly. If fault is still present, replace original flip assembly and proceed to b.
	b) Sensor on main board defective.	Replace the main board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new main board assembly.
9. Vibrator feature not functioning.	Vibrator on main board defective.	Replace the main board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new main board assembly.
10. Internal Charger not working.	Faulty charger circuit on main board assembly.	Test a selection of batteries in the rear pocket of the desktop charger. Check LED display for the charging indications. If these are charging properly, then the internal charger is at fault. Replace the main board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new main board assembly.
11. Real Time Clock resetting when standard battery is removed.	Lithium Ion RTC battery on the main board may be depleted.	Replace the RTC battery as described in the procedures. Check RTC time does not reset.
12. No or weak audio when using headset.	a) Headset not fully pushed home.	Ensure the headset plug is fully seated in the jack socket.
	b) Faulty jack socket on main board assembly.	Replace the main board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new main board assembly.

Programming: Software Upgrade and Flexing

Contact your local technical support engineer for information about equipment and procedures for flashing and flexing.

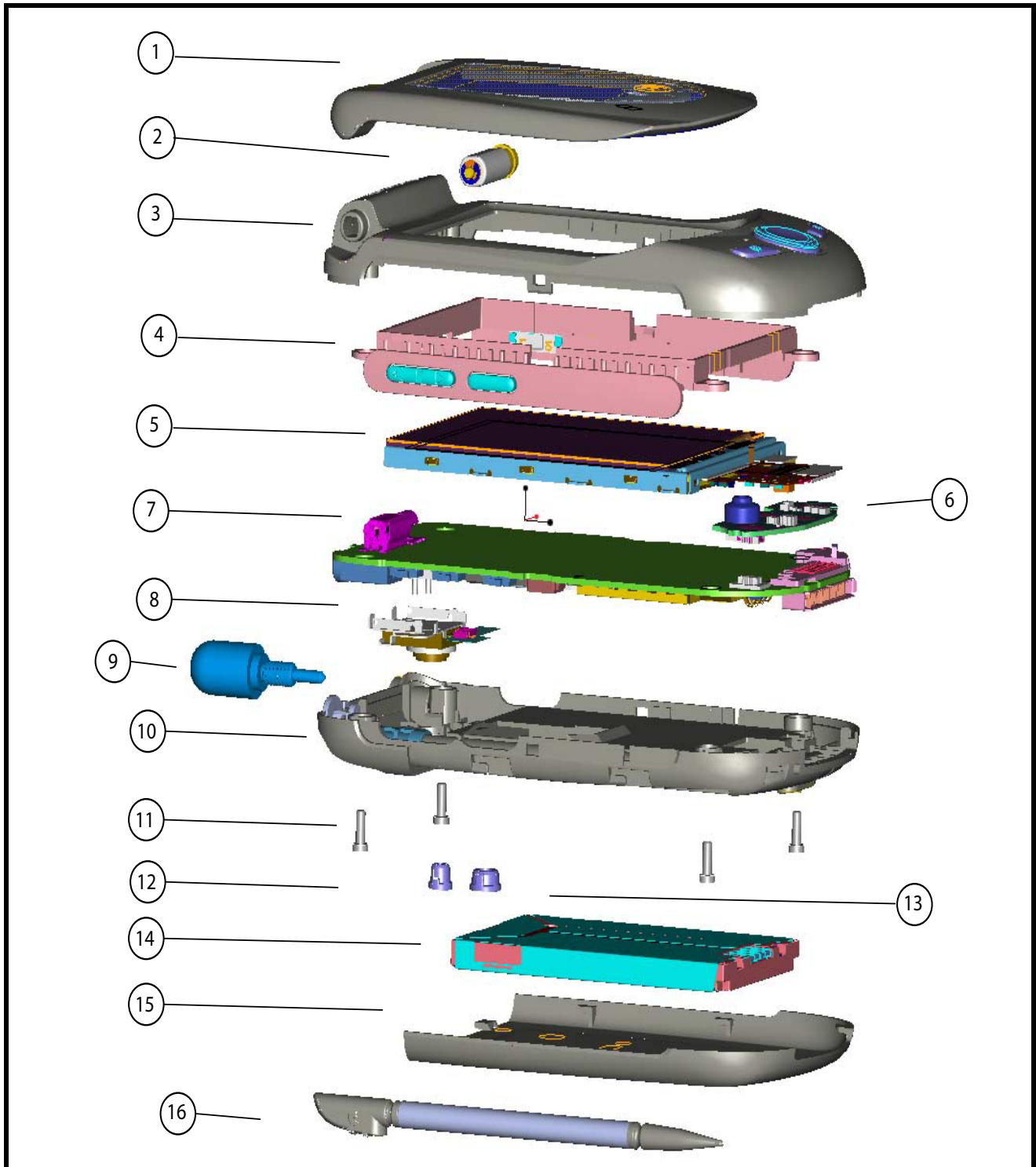
Part Number Charts

The following charts are provided as a reference for the parts associated with A760 telephones.

Related Publications

Motorola A760 Wireless Phone User Guide, Simple Chinese	6809455A38
Motorola A760 Wireless Phone User Guide, Traditional Chinese	6809455A28
Motorola A760 Wireless Phone User Guide, English	6809455A29
Motorola A760 Wireless Phone Quick Start Guide English	6802911J47

Exploded View Diagram



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Figure 20. Exploded view diagram

Exploded View Parts List

Table 6. Exploded View Parts List

Item Number	Motorola Part Number	Description
1	0104076R01	Flip Assembly
2	5504865R01	Hinge Assembly w/teflon
3	0104075R01	Front Housing Assembly
4	0164092E01	Center Band Assembly
5	7287603N01	TFT Color Display Assembly
6	5087974K02	Microphone
7	CHLF4369	Transceiver Main Board
8	0164099E01	Camera Assembly
9	8504802R01	Stub Antenna
10	1504787R01	Rear Housing
11	0364579E02	Screw (4)
12	0504864R01	Screw Cap
13	0504808R01	RF Cap
14	SNN5669	800 mAh Battery PRC
14	SNN5670	800 mAh Battery MULTL
15	1504790R01	Battery Door
16	0164089E01	Stylus Assembly

Note: 1. Not available as spares in EMEA Service markets.



There is a danger of explosion if the Lithium Ion battery is replaced incorrectly. Replace only with the same type of battery or equivalent as recommended by the battery manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Accessories

Table 7. Accessories

Part Description	Part Number
Rapid Charger, PRC	SPN5052
Rapid Charger, UK	SPN5051
Rapid Charger, US	SPN5049
Pouch	CHYN4459
Stereo customizable headset	SYN0384
Headset, earbud, with send/end key	SYN8419
Bluetooth Headset	SYN9006

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Personal Communications Sector,

789 International Parkway.

Sunrise, FL 33325-6220



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