



MOTOROLA

Level 1 and 2 Service Manual

V975/V980

Digital Wireless Telephone



UMTS 2100, GSM 900/1800/1900 GPRS

DRAMA

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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 allow 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 a label usually located under the battery. 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, and so on.

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
- This device 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

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. Refer questions about this manual to the nearest Customer Service Manager.

Audience

This manual aids service personnel in testing and repairing V975 and V980 telephones. Service personnel should be familiar with electronic assembly, testing, and troubleshooting methods, and with the operation and use of associated test equipment.

Scope

This manual provides basic information relating to V975 and V980 telephones, and also provides procedures and processes for repairing the phones 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

The following special characters and typefaces, 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 which may result in equipment damage.



Warning: Emphasizes information about actions which 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 displays on the screen. For example, **ALERTS** or **ALERTS**.

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

Warranty Service Policy

The product is sold 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. Return customer units that fail very early on after the date of sale to Manufacturing for root cause analysis, to guard against epidemic criteria. Manufacturing to 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). Motorola High Tech 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 is available through the local Motorola Support Center.

Parts Replacement

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

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)

Order replacement parts, test equipment, and manuals 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

For EMEA spare parts call +49 461 803 1638.

For Asia spare parts call +65 648 62995.

Specifications

Function	Specification
Frequency Range EGSM	TX: 880 - 915 MHz Frequency (MHz) = $890 + (0.2 \times n)$ where: $0 \leq n \leq 124$ Frequency (MHz) = $890 + (0.2 \times (n - 1024))$ where: $955 \leq n \leq 1023$ RX: 925 - 960 MHz Frequency (MHz) = $935 + (0.2 \times n)$ where: $0 \leq n \leq 124$ Frequency (MHz) = $935 + (0.2 \times (n - 1024))$ where: $955 \leq n \leq 1023$
Frequency Range DCS	TX: 1710 to 1785 MHz Frequency (MHz) = $1710.2 + (0.2 \times (n - 512))$ where: $512 \leq n \leq 885$ RX: 1805.2 to 1879.8 MHz Frequency (MHz) = $1805.2 + (0.2 \times (n - 512))$ where: $512 \leq n \leq 885$
Frequency Range PCS	TX: 1850 to 1910 MHz Frequency (MHz) = $1850.2 + (0.2 \times (n - 512))$ where: $512 \leq n \leq 810$ RX: 1930 to 1990 MHz Frequency (MHz) = $1930.2 + (0.2 \times (n - 512))$ where: $512 \leq n \leq 810$
Frequency Range UMTS	TX: 1920 to 1980 MHz Frequency (MHz) = $UARFCN^1 + 5$, where: $9612 \leq UARFCN^1 \leq 9888$ UARFCN ¹ in increments of 25 RX: 2110 to 2170 MHz Frequency (MHz) = $UARFCN^1 + 5$, where: $10562 \leq UARFCN^1 \leq 10838$ UARFCN ¹ in increments of 25
Channel Spacing	200 kHz (GSM, DCS, PCS), 5MHz UMTS
Channels	174 EGSM, 374 DCS, 274 PCS carriers with 8 ch. Per carrier, 11 UMTS
Duplex Spacing	45 MHz GSM, 95 MHz DCS, 80 MHz PCS, 190 MHz UMTS
Modulation	GMSK AT BT = 0.3 (GSM, DCS, PCS), QPSK (UMTS)
Transmitter Phase Accuracy	5 degrees RMS, 20 Degrees peak
Frequency Error	± 0.1 ppm
Input/Output Impedance	50 ohms (nominal)
Nominal Operating Voltage	3.6 Vdc $\pm 10\%$ (battery) +4.4 Vdc $\pm 10\%$ (external connector)
Size	105 cc
Weight	140 g
Display	Main Display: 65k color TFT, 176 x 220, 1.9" CLI Display: 4k color STN, 96x80, 1"
Battery Life (820mAh) ²	GSM: Up to 215 min (Talk Time), up to 220 to 260 hours (Standby) WCDMA Video Talk Time: Up to 70 min
Nominal Operating Temperature Range	-10° C to +55° C

GSM System Functions	Specification
Speech Coding Type	Regular Pulse excitation / linear predictive coding with long term prediction (RPE LPC with LTP)
Bit Rate	13.0 kbps
RF Power Output	32 dBm nominal GSM, 28.5 dBm nominal DCS / PCS
Receive Sensitivity	-102 dBm GSM, -102 dBm DCS / PCS
RX Bit Error Rate	< 2%

UMTS System Functions	Specification
Speech Coding Type	Adaptive Multirate (AMR)
RF Power Output	21 dBm
Error Vector Magnitude	< 17.5%
PN9 Bit Error Rate (VER)	0.1% @ 12.2k, -106.7 dBm
ACLR	-33 dBm @ ± 5 MHz , -43 dBm @ ± 10 MHz

Product Overview

Motorola V975 and V980 telephones deliver 3G features in a smaller and lightweight package. These global system for mobile communications (GSM) general packet radio service (GPRS) wireless application protocol (WAP)-enabled mobile phones incorporate an icon based interface (UI) for easier operation, allows short message service (SMS) text messaging, multi-media messaging services (MMS), and includes personal information manager (PIM) functionality. V975 and V980 are tri-band phones that allow roaming within the GSM 900 MHz, (DCS) 1800 MHz digital cellular system, the GSM 850 MHz, and PCS 1900 MHz bands, in addition to the UMTS WCDMA 2100 MHz band.

V975 and V980 telephones have a clam form factor. They feature an externally viewable 96 x 80 4K Color STN CLI Display for caller identification with date/time, an internal 167 x 220 65K TFT color display, located in the flip. The bottom part of the clam (front housing) contains the keypad, transceiver printed circuit board (PCB), microphone, flex connection, external accessory connector, smart button, volume buttons, and voice button. The standard 820 mAh Lithium Ion (Li Ion) battery fits behind a removable back cover.

The phone accepts both 3V subscriber identity module (SIM) cards which fit into the SIM holder underneath the battery. The antenna is a fixed stub type antenna. Inexpensive direct connection to a computer or handheld device via USB for data and fax calls, and for synchronizing phonebook entries with Motorola Phone Tools software, can be accomplished by using the optional data cable and soft modem.

Features

V975 and V980 telephones use advanced, self-contained, sealed, custom integrated circuits to perform the complex functions required for GSM GPRS communication. Aside from the space and weight advantage, microcircuits enhance basic reliability, simplify maintenance, and provide a wide variety of operational functions.

Features available in this family of telephones include:

- WCDMA 2100 MHz, GSM/GPRS 900/1800/1900 MHz
- Volume 105cc
- 176 x 220, 1.9", 65K TFT color display
- 96 x 80, 1", 4K Color STN CLI Display
- VGA Image capture w/ 4X zoom and Lighting solution
- CIF Camera for Video Conferencing
- 5 Way navigation key
- Dedicated Camera key
- Accepts removable TransFlash memory (16, 32 64, 128 or 256MB) modules
- Talk Time: up to 215 minutes (WCDMA, CS)
- Standby Time: up to 260 hours
- Video Clip Playback
- 2MB User Memory-V980
- 8MB User Memory-V975

Speaker Dependant Voice Activation and Voice Note Recording

Voice tags can be used for voice dialing up to 20 phone numbers in the phone book and for creating up to 5 voice shortcuts for menu items. The phone must be "trained" by the voice tag being read into the phone's memory twice before it is recognized.

You can add voice tags to the phone's memory using the usual name addition methods (i.e., via the phone book menu structure or with the shortcut editor).



You cannot place or receive calls while adding voice tags to the phone's memory.



Because the GSM standard does not provide the option to store voice tags onto the SIM card, voice tags are added to the phone's memory.

V975 and V980 telephones also include a voice note recorder that allows up to 2 minutes of personal messages to be recorded. This feature has a complete set of record, playback, and management tools that make it easy to store and maintain a list of personal memos.

Wireless Access Protocol (WAP) 2.0 Compliancy

In the WAP environment, access to the Internet is initiated in wireless markup language (WML), which is derived from hypertext markup language (HTML). The request is passed to a WAP gateway which retrieves the information from the server in standard HTML (subsequently filtered to WML) or directly in WML if available. The information is then passed to the mobile subscriber via the mobile network.



Bitmap image data will download as text. If the image is larger than the screen, only part of the image will display.



When the user receives a call while in browser mode, the browser will pause and allow the user to resume after completing the call.

SIM Application Toolkit™ - Class 2

SIM Application Toolkit is a value-added service delivery mechanism that allows GSM operators to customize the services they offer their customers, from the occasional user who requests sports news and traffic alerts, to a high call time business user who receives stock alerts and checks flight times. Operators can now create their own value-added services menu quickly and easily in the phone. The customized menu will appear as the first menu and may be updated over-the-air with new services when customers request them.

Simplified Text Entry

There are three different ways to enter text using the phone keypad:

- iTAP™ predictive text entry. Press a key to generate a character and a dynamic dictionary uses this to build and display a set of word or name options. The iTAP™ feature may not be available on the phone in all languages.
- Tap. Press a key to generate a character.
- Numeric. The keypad produces numeric characters only. For some text areas this is the only method available; for example, phone numbers.

Caller Line Identification

Upon receipt of a call, the calling party's phone number is compared to the phone book. If the number matches a phone book entry, that name will be displayed. If there is no phone book entry, the incoming phone number will be displayed. In the event that no caller identification information is available, the Incoming Call message is displayed.



User must subscribe to a caller line identification service through their service provider.

Other Features

Detailed descriptions of these and the other V975 and V980 features can be found in the appropriate V975 and V980 telephone user's guide listed in the "Related Publications" section toward the end of this manual.

General Operation

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

The V975 and V980 telephone's controls are located on the sides of the device and on the keypad. Indicators, in the form of icons, are displayed on the LCD (see Figure 2). V975 and V980 phones have an audible alert transducer on the top and I/O connectors, consisting of a headset jack and an accessory port, located on the side and bottom of the phone. See Figure 1.



0316290

Figure 1. Telephone Controls, indicators, and I/O

Main Display

The main display provides a 65k color backlit display for easy readability in all light conditions. The 176 x 220 display provides room for text, graphics, icons, and prompts.

Display animation makes the phone's menus move smoothly as the user scrolls up and down. Turn animation off to conserve the battery.

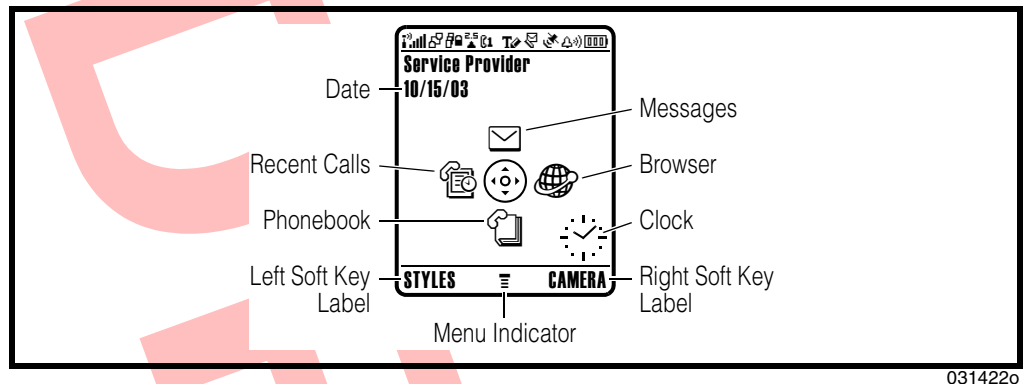


Figure 2. Icon Indicators

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

Figure 2 shows some common icons displayed on the LCD.

- **Signal Strength Indicator.** Shows the strength of the phone's connection with the network. Calls cannot be sent or received when the "no signal" indicator is displayed.
- **In Use Indicator.** Appears when a call is in progress.
- **Roam Indicator.**⁵ Appears when the phone uses another network system outside the user's home network. When leaving the home network area, the phone roams, or seeks another network.
- **Message Waiting Indicator.**⁵ Appears when the phone receives a text message. This is a network-dependent feature.
- **Voice Message Waiting Indicator.**¹ Appears when a voicemail message is received. This is a network-dependent feature.
- **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.
- **Clock.** Shows the current date and time.
- **Menu Indicator.** Indicates the user can press the menu soft key to open a menu.
- **Alert Setting Indicator.** Shows the current selected alert. The default alert setting is a ringer.

1. Network, subscription and SIM card or service provider dependent feature. Not available in all areas.

Alert Settings

V975 and V980 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's 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 V975 and V980 telephones. Use either the listed items or equivalents.

Table 1. General Test Equipment and Tools

Motorola Part Number ¹	Description	Application
RSX4043-A	Torque Driver	Used to remove and replace screws
--	#0 Cross Point Screwdriver	Used to remove cross point screws in the flip assembly
—	Torque Driver Bit T-6 Plus, Apex 440-6IP Torx Plus or equivalent	Used with torque driver
See Table 7	Rapid 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 (manual opening tool)	Used during assembly/disassembly of device
6680388B01	Tweezers, plastic	Used during assembly/disassembly
—	Digital Multimeter, HP34401A ²	Used to measure battery voltage
8102430Z04	GSM / DCS Test SIM	Used to enable manual test mode

1. To order in North America, contact Motorola Aftermarket and Accessories Division (AAD) at (800) 422-4210 or FAX (800) 622-6210; Internationally, AAD can be reached by calling (847) 538-8023 or faxing (847) 576-3023.

2. 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 V975 and V980 telephones. Tools and equipment used for the phone are listed in Table 1, 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 Cover and 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.

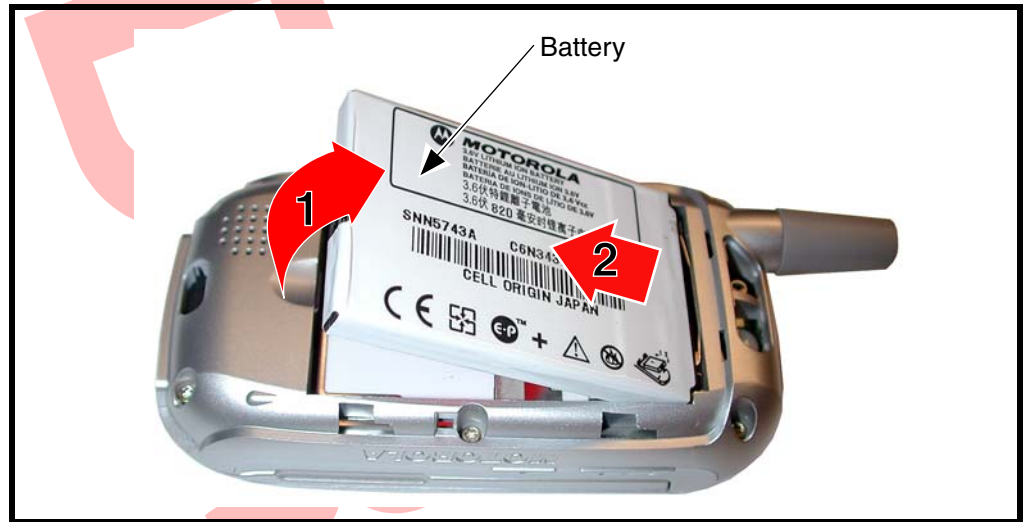
1. Ensure the phone is turned off.
2. Slide the battery cover as shown in Figure 1 and lift it completely off the phone.



0409390

Figure 1. Removing the Battery Cover

3. Lift the bottom end of the battery first and then lift the battery out the phone. See Figure 2.



040940o

Figure 2. Removing the battery

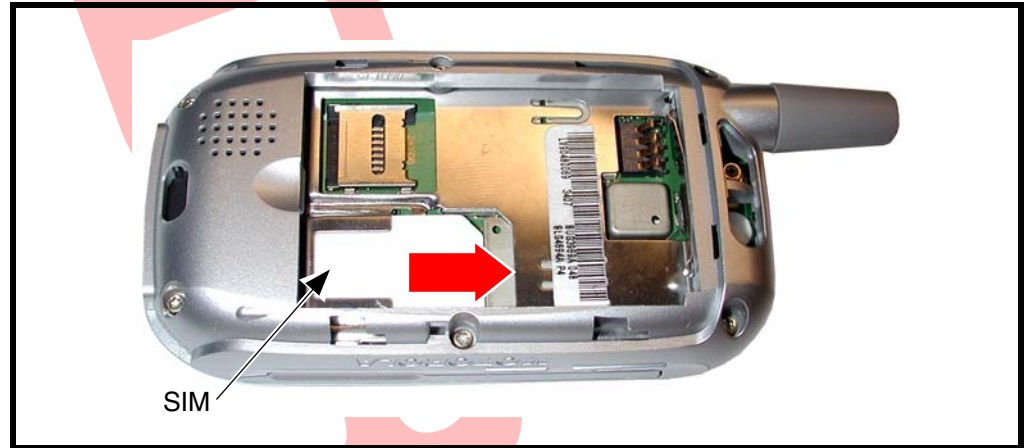


There is a danger of explosion if the Lithium Ion battery is replaced incorrectly. Replace only with the same type of battery or equivalent as recommended by the battery manufacturer. Dispose of used batteries according to the manufacturer's instructions.

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 battery, top end first, into the battery compartment and push down.
6. Insert the bottom edge of the battery housing into the base of the phone, then slide the battery cover over the battery and snap it into place.

Removing and Replacing the Subscriber Identity Module (SIM)

1. Remove the battery door and battery as described in the procedures.



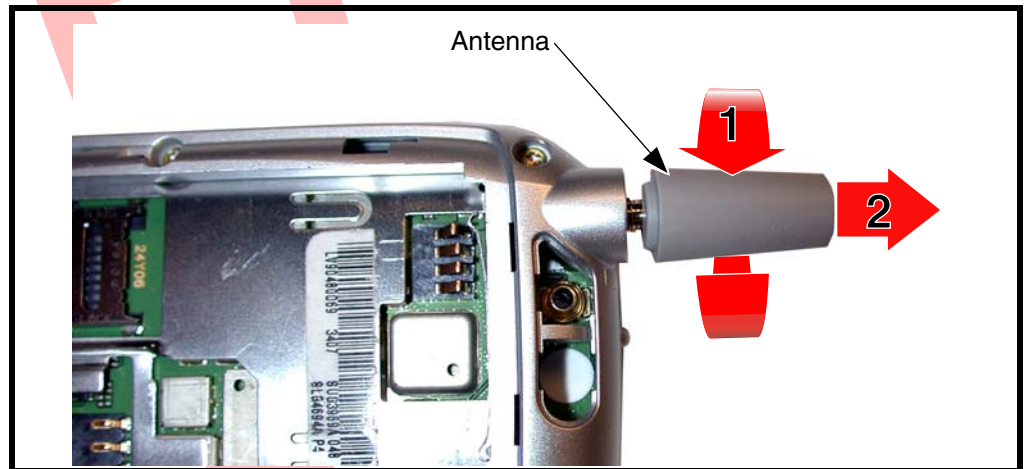
0409410

Figure 3. Removing the SIM

2. Slide the SIM out of the SIM holder as shown in Figure 3.
3. Carefully lift the SIM out of the phone.
4. To replace, slide the SIM into the holder, ensuring the keyed corner of the SIM aligns with the notch molded into the holder.
5. Replace the battery and battery cover as described in the procedures.

Removing and Replacing the Antenna

1. Remove the battery cover and battery as described in the procedures.
2. By hand, rotate the antenna counterclockwise until loose. See Figure 4.



0409420

Figure 4. Removing the Antenna

3. When the antenna threads are completely disengaged, pull the antenna straight out of the phone to remove.



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

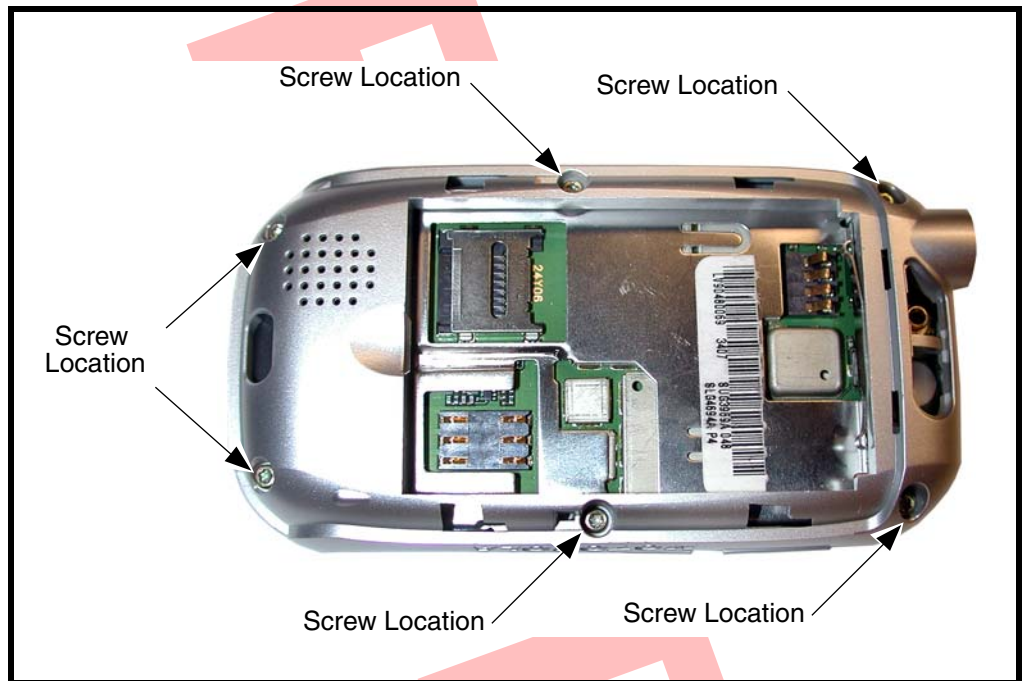
4. To replace, insert the threaded end of the antenna carefully into the housing and, after ensuring the threads are properly engaged, rotate clockwise. Tighten firmly by hand.
5. Replace the SIM, battery and battery cover as described in the procedures.

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.

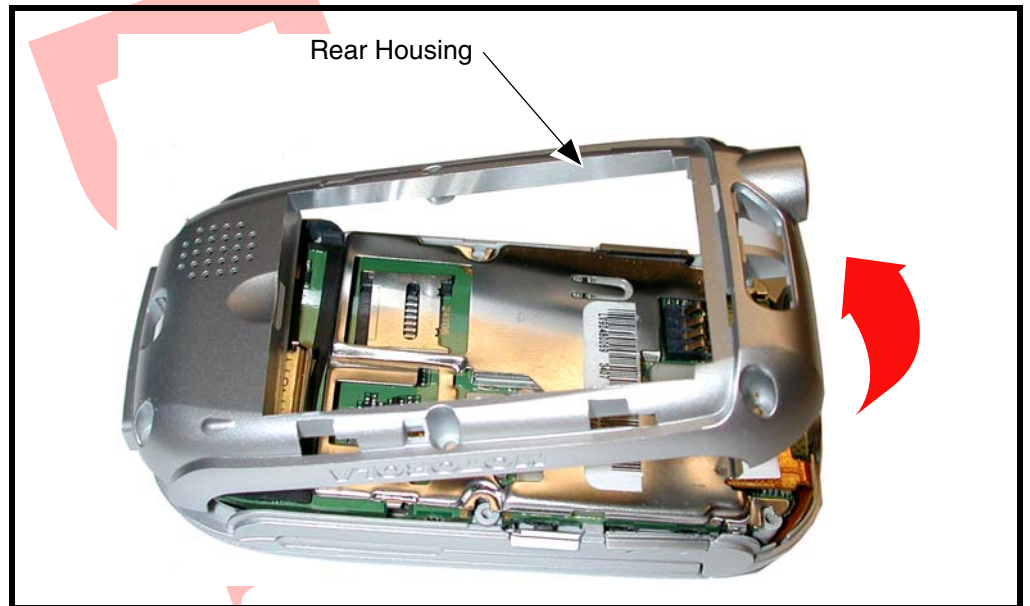
1. Remove the battery cover, battery, SIM, and antenna as described in the procedures.
2. Using a Torx driver with a T-6 bit, remove the 6 screws along the sides of the rear housing. See Figure 5.



040943o

Figure 5. Removing the rear housing screws

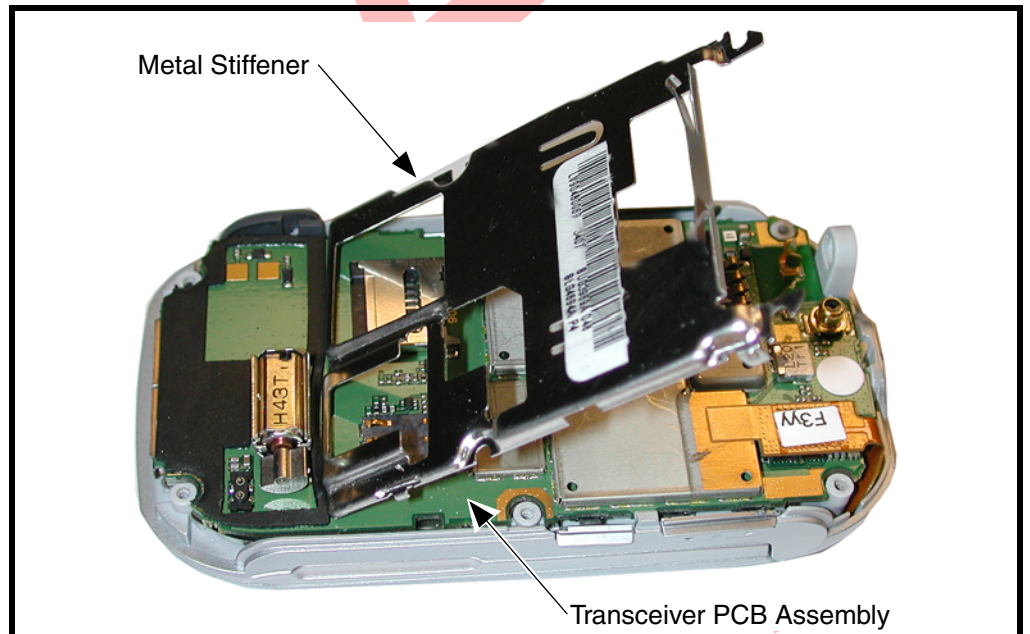
3. Carefully lift the rear housing away from the phone as shown in Figure 6.



0316380

Figure 6. Removing the rear housing

4. Lift the metal stiffener away from the transceiver PC board.



0316380

Figure 7. Removing the rear Metal stiffener

5. To replace, place the metal stiffener onto the transceiver board. Ensure the screw holes are aligned to the screw holes on the transceiver PCB assembly.

6. Lower the rear housing onto the phone. Ensure the screw holes are aligned to the transceiver PCB assembly.
7. Insert the 6 housing screws and tighten to a torque setting of 1.5 inch pounds or ?? N/cm (Newton/centimeters). Do not over tighten.
8. Replace the antenna, SIM, battery, and battery cover as described in the procedures.

Removing and Replacing the Transceiver Board Assembly



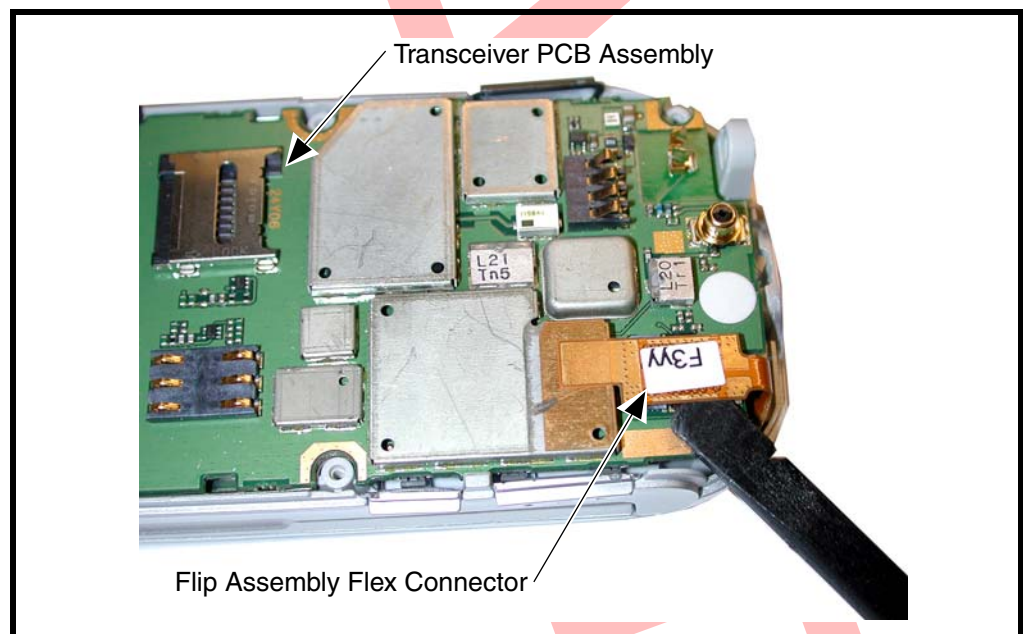
This product contains static-sensitive devices. Use anti-static handling procedures to prevent electrostatic discharge (ESD) and component damage.

1. Remove the battery cover, battery, SIM, antenna, and rear housing as described in the procedures..



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

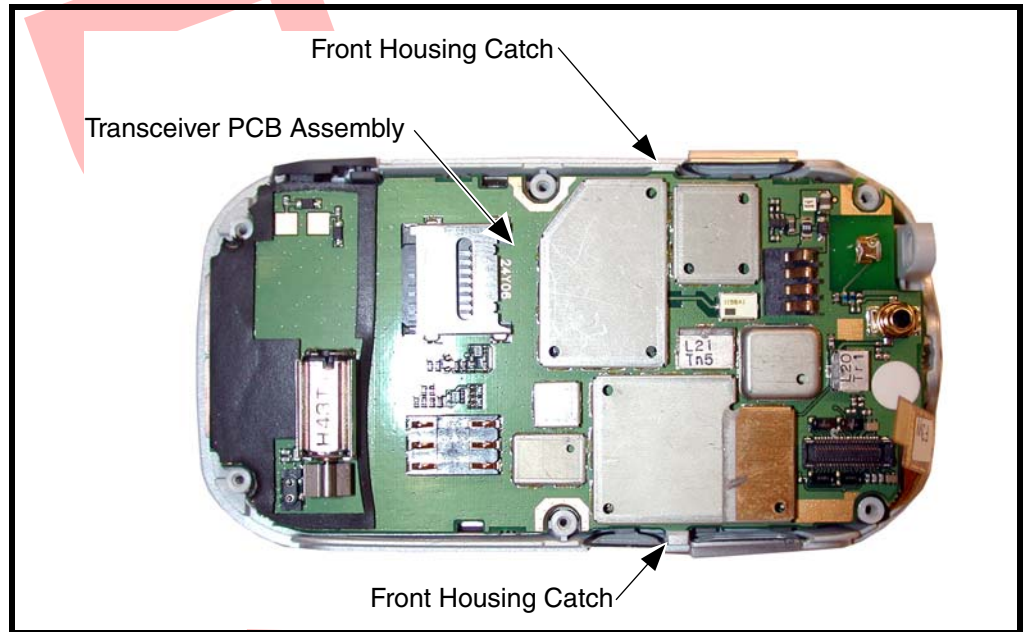
2. Carefully work the flat end of the disassembly tool under the flex connector and unseat the connector from its socket the transceiver board. See Figure 8.



0409470

Figure 8. Disconnecting the flex from the transceiver board

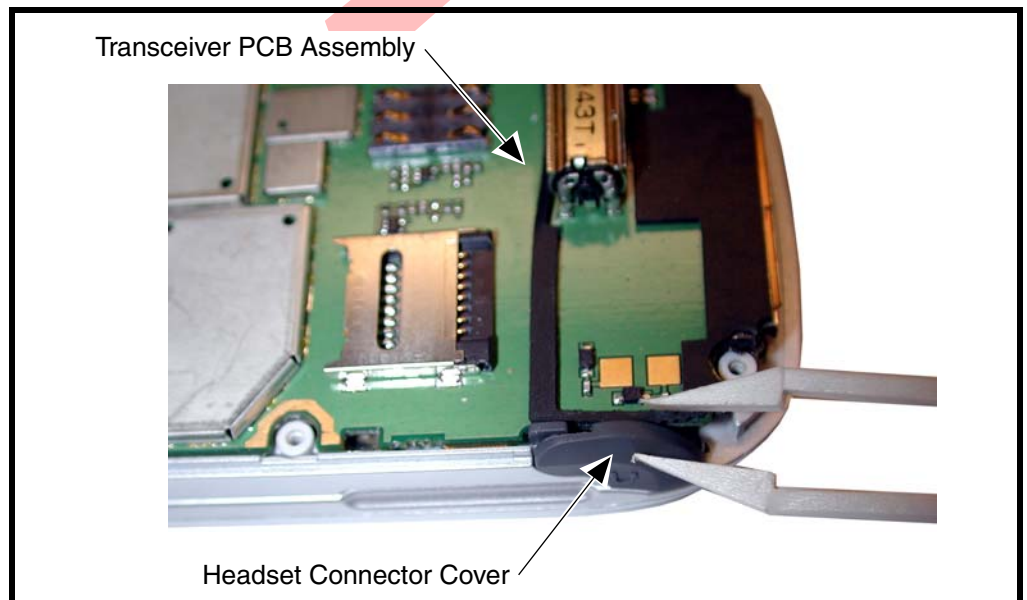
3. Flex the front housing outward slightly to release the housing catch on each side of the transceiver PCB assembly (see Figure 9).



040948o

Figure 9. Disconnecting the flex from the Transceiver Board

4. Use the plastic tweezers to remove the headset connector cover from the front housing (see Figure 10).



040948o

Figure 10. Removing the Headset Connector Cover

5. Lift the transceiver board assembly and the keypad switchdome assembly out of the front housing. See Figure 11.

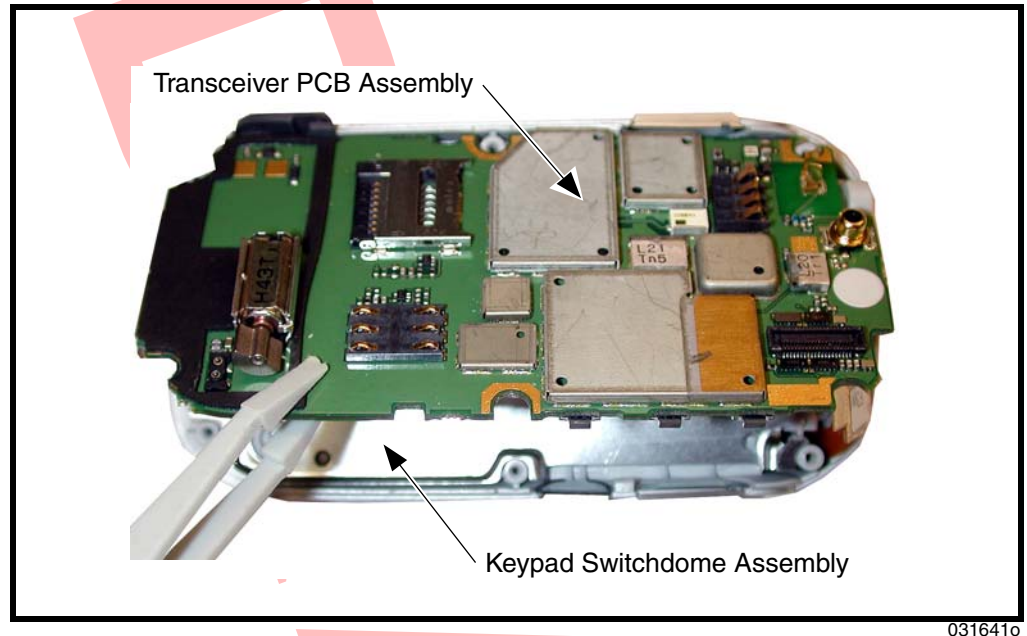
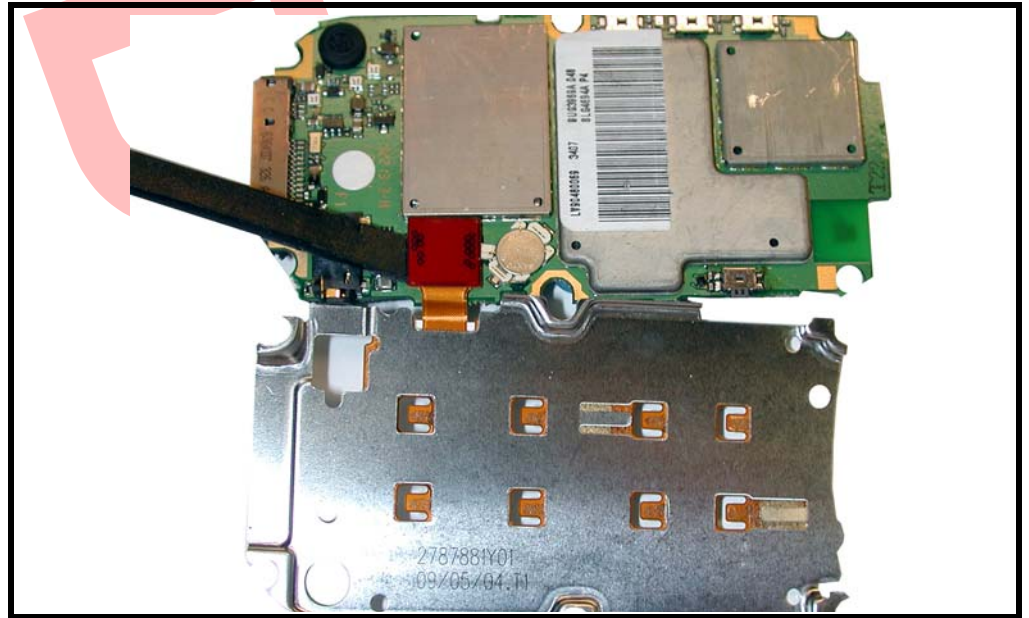


Figure 11. Removing the transceiver board assembly

6. Turn the transceiver board assembly over to expose the switchdome keypad connector.

7. Use the disassembly tool to unseat the switchdome keypad connector from its socket (see Figure 12).



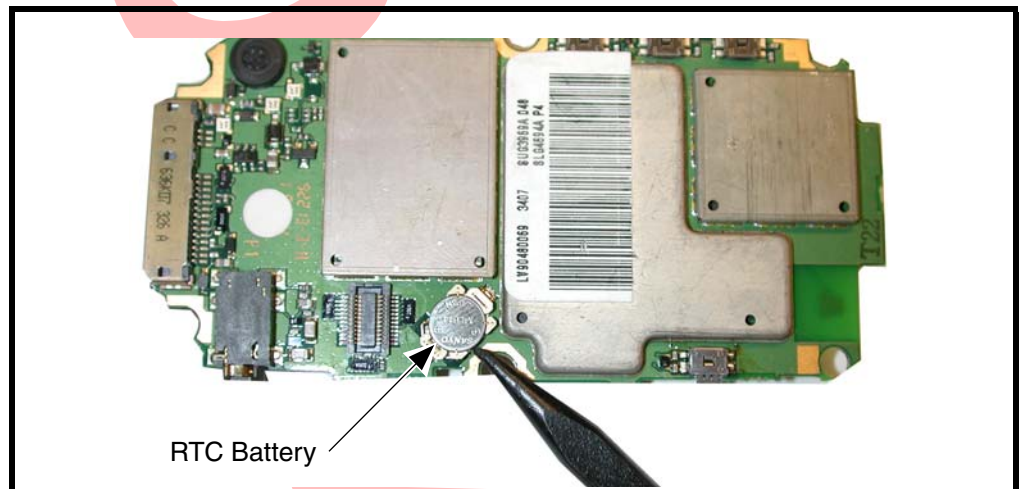
040951o

Figure 12. Removing the Switchdome Flex Connector

8. To replace, place the transceiver board assembly next to the switchdome assembly the flex connector on top.
9. Insert the switchdome flex connector squarely into its mating connector on the back of the transceiver board and press firmly until it snaps into place.
10. Carefully place the transceiver board and the switchdome assembly into the front housing.
11. Insert the headset speaker cover into its place on the front housing.
12. Insert the display flex connector squarely into its mating connector on the transceiver board and press firmly until it snaps into place.
13. Replace the rear housing, antenna, SIM, battery, and battery cover as described in the procedures.

Removing and Replacing the Real-Time Clock (RTC) Battery

1. Remove the battery cover, battery, SIM, antenna, rear housing, and transceiver board assembly as described in the procedures.
2. Use the disassembly tool to pry the RTC battery out of its socket on the transceiver board (see Figure 13).
3. Remove the RTC battery, while making not of the polarity



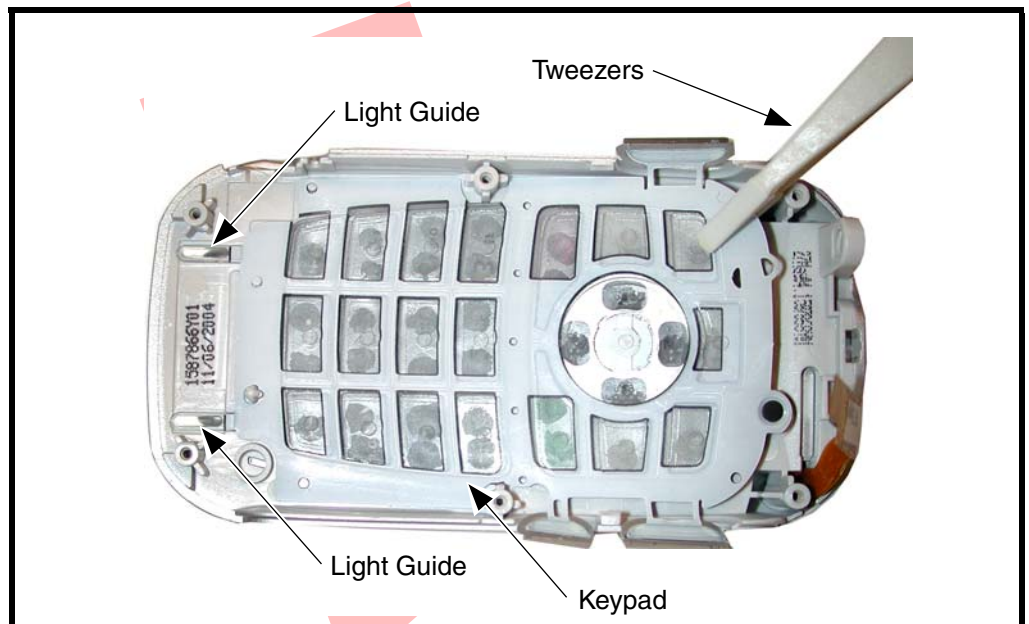
040952o

Figure 13. Removing the RTC Battery

4. To replace, align the RTC battery with it's socket on the transceiver board.
5. Press the RTC battery into its socket.
6. Replace the transceiver board assembly, rear housing, antenna, SIM, battery, and battery cover as described in the procedures.

Removing and Replacing the Keypad, Volume/Smart and Voice Buttons

1. Remove battery cover, battery, SIM, antenna, rear housing, and transceiver board assembly as described in the procedures.
2. Using the plastic tweezers, lift the top part of the keypad assembly, which includes the volume/smart buttons, and voice button away from the transceiver board assembly (see Figure 14).
3. Observe the bottom end of the keypad assembly. There are two light guides. Carefully remove the light guides and the keypad assembly from the transceiver board with extreme caution.



0409540

Figure 14. Removing the Keypad, volume/smart, and voice buttons

4. To replace, carefully insert the light guides into their slots on the front housing. Avoid damage to the light guides while inserting them.
5. Carefully set the keypad volume/smart buttons and voice button assembly onto the metal switchdome assembly. Ensure the volume/smart key keypads will contact the switchdome assembly on the transceiver board when installed.
6. Insert the keypad into the front housing, ensuring the keys align properly with the openings in the front housing.
7. Replace the transceiver board assembly, display flex connector, rear housing assembly, antenna, SIM, battery, and battery cover as described in the procedures.

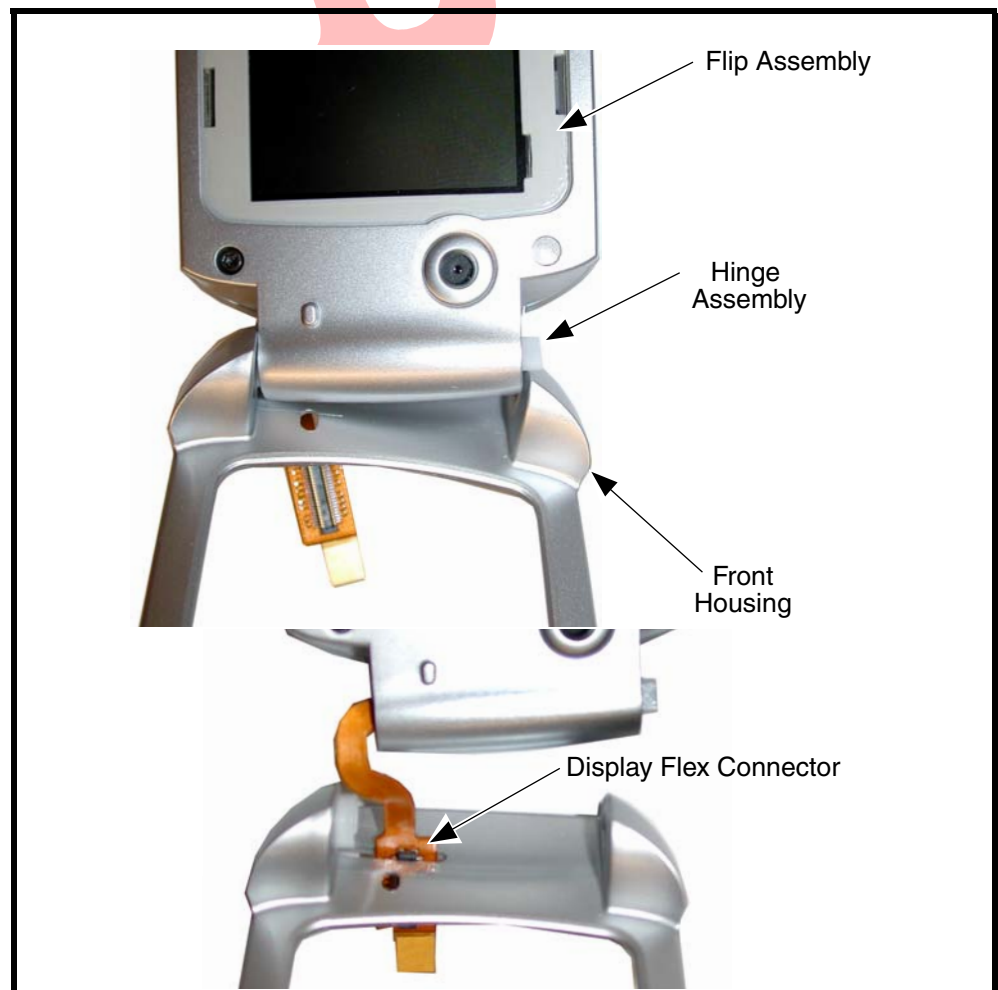
Removing and Replacing the Flip Assembly

1. Remove the battery cover, battery, SIM, antenna, rear housing, transceiver board assembly, and keypad assembly as described in the procedures.
2. Carefully flex the front housing downward to release the hinge assembly from the front housing (see Figure 15).
3. Carefully slide the display flex cable and connector through the housing assembly. Avoid damage to the flex cable.



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

4. Lift the housing assembly away from the flip assembly. Be careful not to damage the display flex cable.



0409550

Figure 15. Removing the Flip Assembly

5. To replace, carefully thread the display flex connector through the slot on the keypad housing assembly. Avoid damage to the flex cable.
6. Flex the front housing slightly and insert the hinge assembly into the front housing. Avoid damage to the flex cable and connector.
7. Replace the keypad assembly, transceiver board assembly, rear housing, antenna, SIM, battery, and battery cover as described in the procedures.

Removing and Replacing the Flip Cover

1. Remove the battery cover, battery, SIM, antenna, rear housing, transceiver board assembly, keypad assembly and flip assembly as described in the procedures.
2. Remove the 4 flip assembly screws (see Figure 18) located under the screw covers. Set the screws aside for re-use unless they are damaged.



Figure 16. Removing the Flip Cover Screws

040957o

3. Use the disassembly tool to release the 3 latches on each side of the flip assembly (see Figure 17).

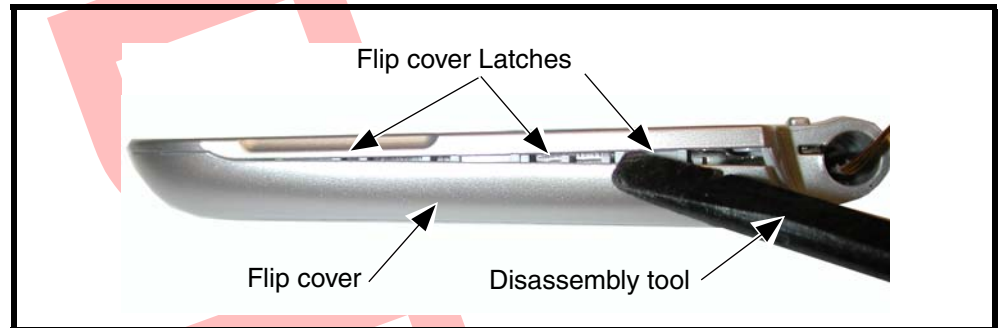


Figure 17. Removing the Flip Cover Latches

4. Carefully lift the flip cover away from the flip assembly. Avoid damage to the display flex cable and connector.
5. To replace, align the flip cover to the flip assembly. Press the flip cover onto the flip assembly until the 6 latches are fully engaged.
6. Replace the flip assembly, keypad assembly, transceiver board assembly, rear housing, antenna, SIM, battery, and battery cover as described in the procedures.

Removing and Replacing the Flip Display Assembly

1. Remove the battery cover, battery, SIM, antenna, rear housing, transceiver board assembly, keypad assembly, flip assembly, and flip cover as described in the procedures.
2. Use the metal tweezers to release the 2 latches on each side of the flip display shield (see Figure 18).
3. Lift the display shield away from the flip assembly. Do not reuse the display shield for reassembly.

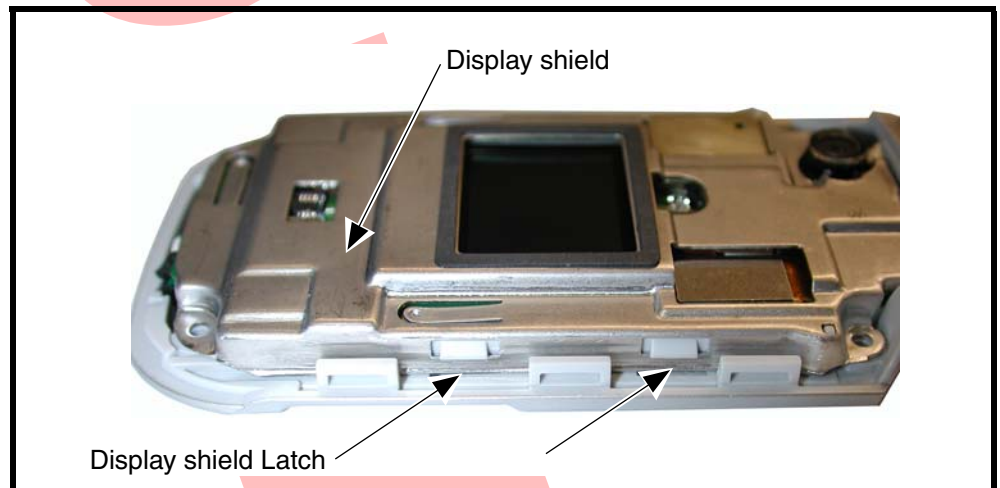


Figure 18. Removing the Flip Display Assembly Shield

040961o

4. Remove the display assembly shock pad from the display module assembly (see Figure 19).

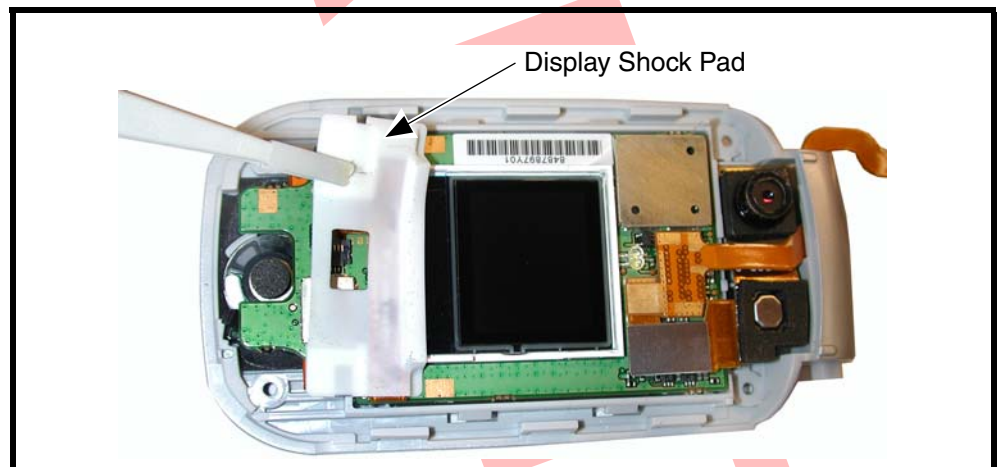


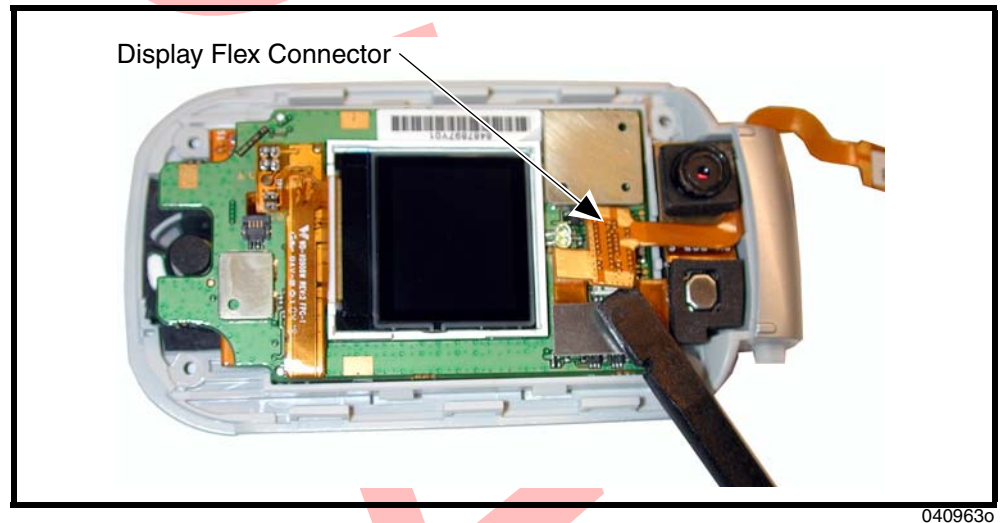
Figure 19. Removing the Flip Display Shock Pad

040962o



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

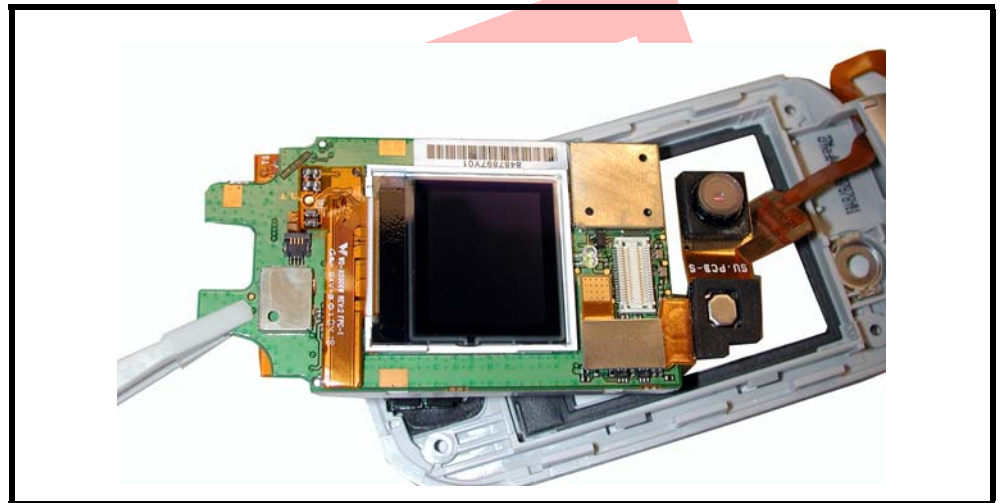
5. Use the disassembly tool to unseat the display assembly flex connector from its socket. (see Figure 20).



040963o

Figure 20. Removing the Display Assembly Flex Connector

6. Disconnect the flex connector from the display assembly PCB.
7. Lift the display assembly away from the flip assembly.



040964o

Figure 21. Removing the Display Assembly

8. To replace, align the display assembly to the flip assembly.



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

9. Carefully seat the display flex connector to socket on the flip assembly.
10. Align the display lens assembly to the flip assembly.
11. Carefully lower the display assembly onto the flip assembly. Be careful not to damage the display flex or flex connector while re-assembling the display lens assembly.
12. Place the rubber shock pad onto the display assembly.
13. Place a new display shield onto the display assembly. Do not reinstall the old display shield.
14. Replace the flip assembly cover, flip assembly, keypad assembly, transceiver board, rear housing, antenna, SIM, battery, and battery cover as described in the procedures.

Removing and Replacing the Camera Assembly

1. Remove the battery cover, battery, SIM, antenna, rear housing, transceiver board assembly, flip assembly, and flip CLI lens assembly as described in the procedures.



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

2. Use the disassembly tool to unseat the camera assembly flex connector from its socket (see Figure 22).

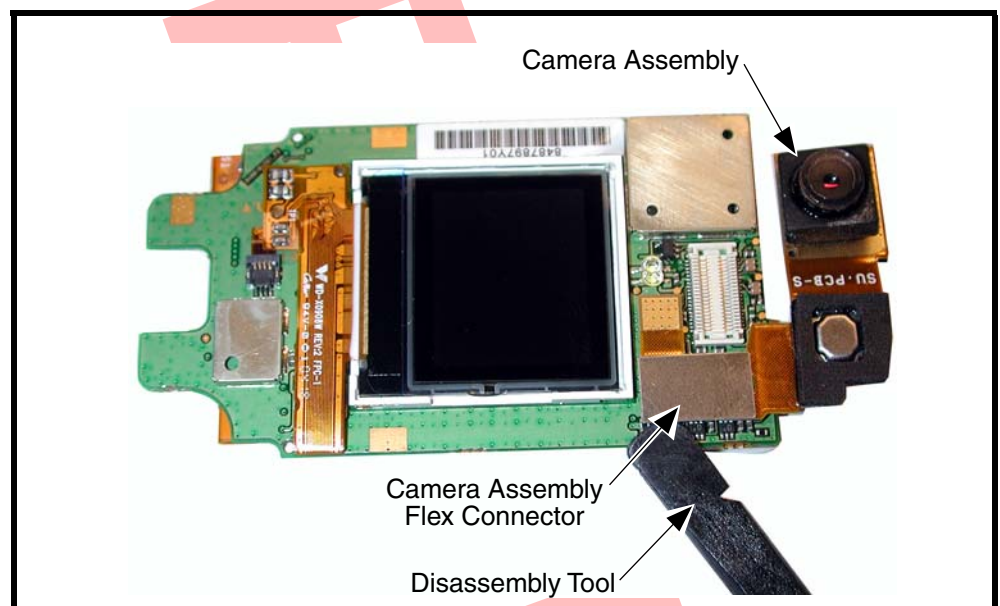


Figure 22. Camera Assembly Removal

3. Carefully lift the camera assembly away from the display assembly.
4. To replace, carefully press the camera assembly flex connector into its socket on the display assembly until fully seated.
5. Replace the flip display assembly, flip assembly, keypad, transceiver board assembly, rear housing, antenna, SIM, battery, and battery cover as described in the procedures.

Removing and Replacing the Display Module

1. Remove the battery cover, battery, SIM, antenna, rear housing, transceiver board assembly, flip assembly, and flip CLI lens assembly as described in the procedures.



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

Use the disassembly tool to unseat the CLI display connector from its socket on the display module (see Figure 23).

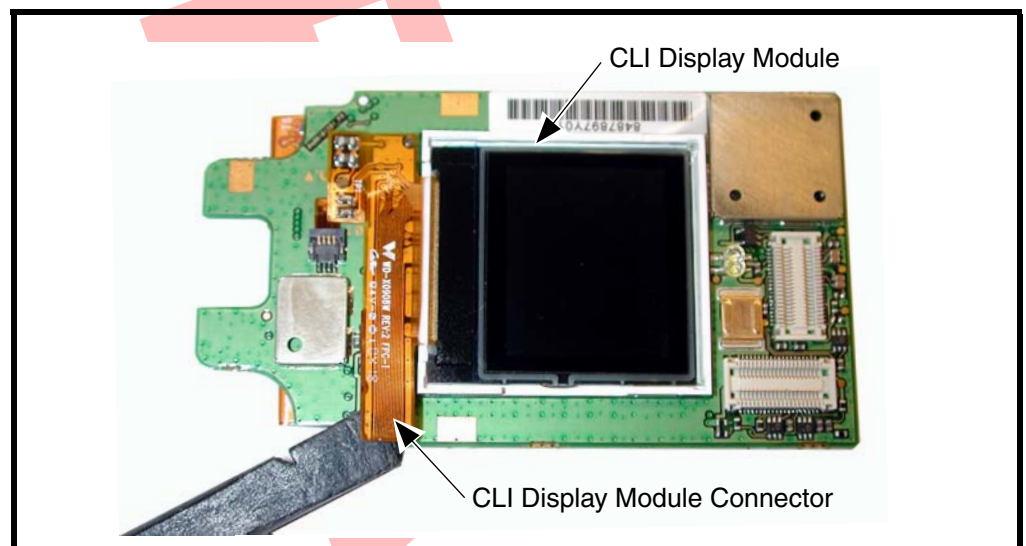


Figure 23. Removing the CLI Display Connector

- 2.

Subscriber Identity Module (SIM) and Identification

SIM Card

A SIM is required to access the existing local GSM network, or remote networks when traveling (if a roaming agreement has been made with the provider).

The SIM 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. V975 and V980 telephones use mobile Phone Tools® synchronization software to effect a personality transfer.

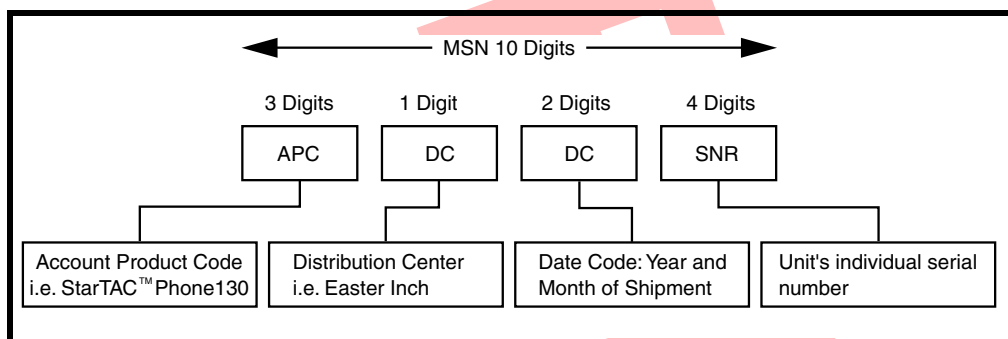
Identification

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 24.



000807a

Figure 24. MSN Label breakdown

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 2.

Table 2. 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

Troubleshooting Chart

Table 3. 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) Transceiver board assembly defective.	Remove the transceiver board assembly. Substitute a known good assembly and temporarily reassemble the unit. Press and hold the PWR button; if unit turns on and stays on, disconnect the dc power source and reassemble the telephone with the new transceiver board assembly. Verify that the fault has been cleared. If the fault has not been cleared then proceed to d.
	d) keyboard assembly failure.	Replace the keyboard assembly. Temporarily connect a +3.6 Vdc supply to the battery connectors. Press and hold the PWR button. If unit turns on and stays on, disconnect the dc power source and reassemble with the new keyboard assembly.
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 transceiver board assembly. If connected properly, substitute a known good antenna. If the fault is still present, proceed to b.
	b) Transceiver board assembly defective.	Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board assembly.
3. Display is erratic, or provides partial or no display.	a) Transceiver board connections faulty.	Remove rear chassis assembly from unit, check general condition of flexible printed cable (flex). If the flex is good, check that the flex connector is fully pressed down. If not, check connector to transceiver board connections. If faulty connector, replace the transceiver board assembly. If connector is not at fault, proceed to b.
	b) Flip assembly defective.	Temporarily replace the flip assembly with a known good assembly. If fault has been cleared, reassemble with the new flip assembly. If fault not cleared, proceed to c.

Table 3. Level 1 and 2 Troubleshooting Chart (Continued)

SYMPTOM	PROBABLE CAUSE	VERIFICATION AND REMEDY
	c) Transceiver board assembly defective.	Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board assembly.
4. Incoming call alert transducer audio distorted or volume is too low.	Faulty transceiver board assembly.	Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board assembly.
5. Telephone transmit audio is weak. (usually indicated by called parties complaining of difficulty in hearing voice).	a) Microphone connections to the transceiver 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) Transceiver board assembly defective.	Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board assembly.
6. Receive audio from earpiece speaker is weak or distorted.	a) Connections to or from transceiver board assembly defective.	Gain access to the transceiver board assembly as described in the procedures. Check flex and the flex connector from the flip assembly to the transceiver board assembly. If flex is at fault, replace flip assembly. If flex connector is at fault, proceed to d. If connection is not at fault, proceed to b.
	b) Flip assembly defective.	Temporarily replace the flip assembly with a known good assembly. If fault has been cleared, reassemble with the new flip assembly. If fault not cleared, 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) Transceiver board assembly defective.	Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble with the new transceiver board assembly.
7. Telephone will not recognize or accept SIM.	a) SIM defective.	Check the SIM contacts for dirt. Clean if necessary and check if fault has been cleared. If the contacts are clean, insert a known good SIM into the telephone. Power up the unit and confirm that the SIM has been accepted. If the fault no longer exists, replace the defective SIM. If the SIM is not at fault, proceed to b.
	b) Flip assembly defective.	Temporarily replace the flip assembly with a known good assembly. If fault has been cleared, reassemble with the new flip assembly. If fault not cleared, proceed to c.
	c) Transceiver board assembly defective.	Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board assembly.

Table 3. Level 1 and 2 Troubleshooting Chart (Continued)

SYMPTOM	PROBABLE CAUSE	VERIFICATION AND REMEDY
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) Flip assembly defective.	Temporarily replace the flip assembly with a known good assembly. If fault has been cleared, reassemble with the new flip assembly. If fault not cleared, proceed to b.
	b) Transceiver board assembly defective.	Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board assembly.
9. Vibrator feature not functioning.	Transceiver board assembly defective.	Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board assembly.
10. Internal Charger not working.	Faulty charger circuit on transceiver 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 transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board assembly.
11. Real Time Clock resetting when standard battery is removed.	Lithium button cell in the display board may be depleted.	Refer service to a Level 3 service center for replacement.
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. If fault not cleared, proceed to b.
	b) Faulty jack socket on transceiver board assembly.	Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver 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

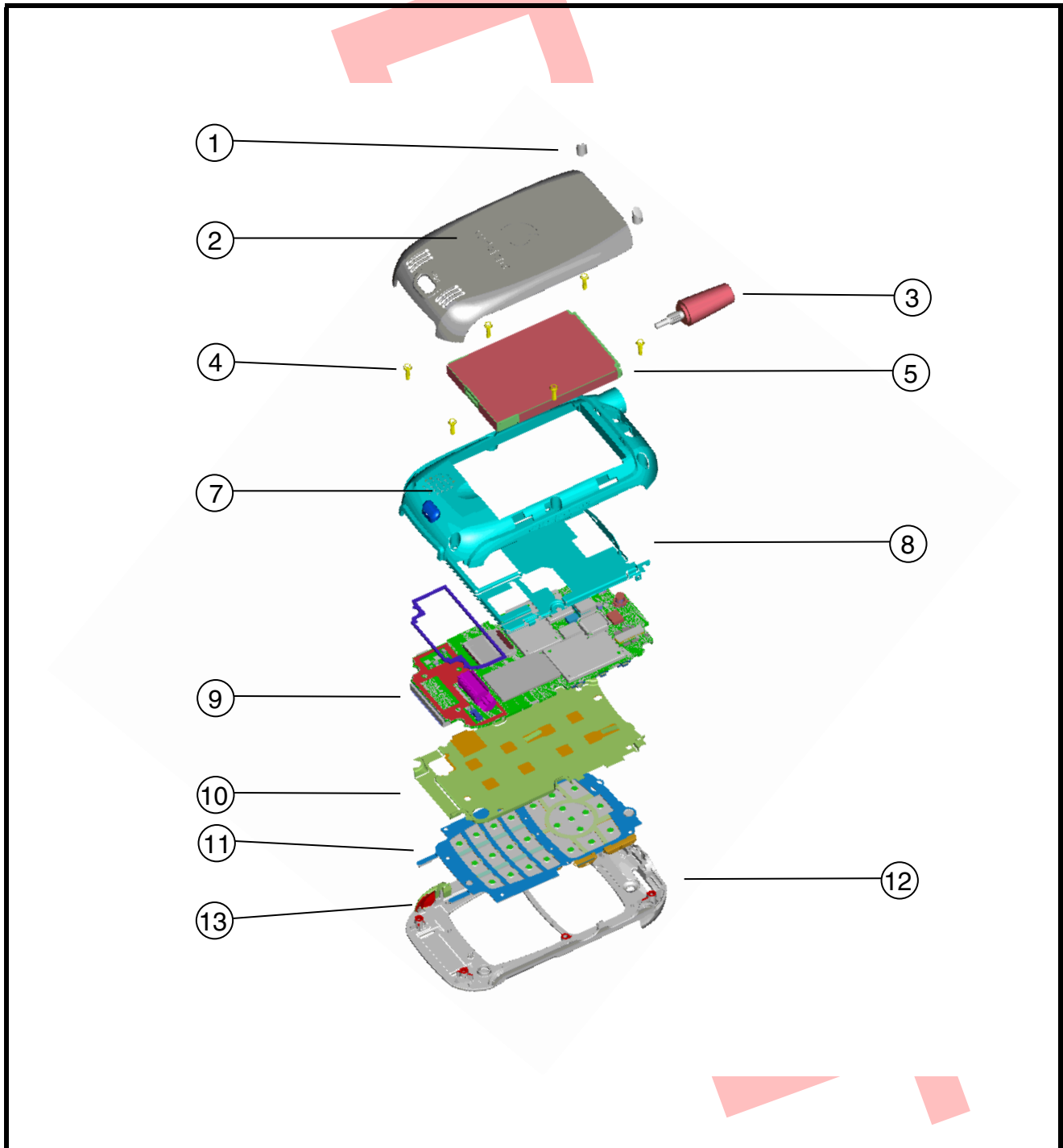
The following charts are provided as a reference for the parts associated with V975 and V980 telephones.

Related Publications

Motorola V975 User's Guide, English

TBD

Exploded View Diagram



0409670

Figure 25. Exploded view diagram

Exploded View Parts List

Table 4. Exploded View Parts List

Item Number	Part Number	Description	Item Number	Part Number	Description
1	0587862Y01	Grommet, Screw Cap (2x)	11	3887900Yxx	Keypad, Vodafone
2	SHN8674B	Assy, Battery Door	12	1587866Yxx	Assy, Flip/XCVR Front Housing
3	8588136Y02	Antenna	13	0588145Y02	Grommet, Headset
4	0387791L01	Screw (6x)			
5	SYN5743A	Battery			
6	0587863Y01	Grommet, RF (not shown)			
7	1587870Y04	Assy, Rear Housing			
8	2788184Y06	Assy, Battery Deck			
9	SLG4718xx	PCB, Main			
	1486604K01	Boot, Microphone			
	2688506Y02	Shield Harmony, Cover			
	5087974K01	Microphone			
	5485042F01	Label, Water Detection			
	6004462R01	Battery, RTC			
10	8487895Y06	Assy, Keyboard Flex			



There is a danger of explosion if the Lithium Ion battery pack 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.

To order parts please use the following Link:

https://wissc.motorola.com/wissc_root/main/BrowserOK.html

(Password is Required)

For information on ordering parts please contact EMEA at +49 461 803 1638.

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