



MOTOROLA

Level 1 and 2 Service Manual

E1000

Wireless Telephone

2nd Draft



E1000: GSM 900/1800/1900 and WCDMA 2100 MHz

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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 which 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, 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.

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 E1000 telephones. Refer questions about this manual to the nearest Customer Service Manager.

Audience

This document aids service personnel in testing and repairing E1000 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 document 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

This document provides basic information, 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

Special characters and typefaces, listed and described below, are used in this publication 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.

Information from a screen is shown in text as similar as possible to what appears in the display. For example, 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. Customer phones 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 to bear the costs of early life failure.

Product Support

Customer's original phones 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.

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.

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

To order parts online, visit:

<https://servicelink3.motorola.com>.

(contact the EMEA Service Parts Group for the password required)

You can contact the EMEA Service Parts Group at:

+49 461 803 1638.

Specifications

Table 1. Specifications

General Function	Specification
Frequency Range GSM 850 (Model A845 Only)	TX: 824.2 - 848.8 MHz Frequency (MHz) = $824.2 + (0.2 \times n - 128)$ where: $128 \leq n \leq 251$ RX: 869.2-893.8 MHz Frequency (MHz) = $869.2 + (0.2 \times (n - 128))$ where: $128 \leq n \leq 251$
Frequency Range EGSM	TX: 876 - 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: 921 - 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) = $1710 + (0.2 \times (n - 511))$ where: $512 \leq n \leq 885$ RX: 1805.2 to 1879.8 MHz Frequency (MHz) = $1805 + (0.2 \times (n - 511))$ where: $512 \leq n \leq 885$
Frequency Range PCS	TX: 1850 to 1910 MHz Frequency (MHz) = $1850 + (0.2 \times (n - 511))$ where: $512 \leq n \leq 810$ RX: 1930 to 1990 MHz Frequency (MHz) = $1930 + (0.2 \times (n - 511))$ where: $512 \leq n \leq 810$
Frequency Range UMTS	TX: 1920 to 1980 MHz Frequency (MHz) = $UARFCN^1 \div 5$, where: $9612 \leq UARFCN^1 \leq 9888$ UARFCN ¹ in increments of 25 RX: 2110 to 2170 MHz Frequency (MHz) = $UARFCN^1 \div 5$, where: $10562 \leq UARFCN^1 \leq 10838$ UARFCN ¹ in increments of 25
Frequency Range UMTS Band II (Model A845 only)	TX: 1850 -1910 MHz Frequency (MHz) = $UARFCN^1 \div 5$, where: $9262 \leq UARFCN^1 \leq 9538$ Additional channels: 1852.5, 1857.5, 1862.5, 1867.5, 1872.5, 1877.5, 1882.5, 1887.5, 1892.5, 1897.5, 1902.5, 1907.5 MHz RX: 1930 -1990 MHz Frequency (MHz) = $UARFCN^1 \div 5$, where: $9662 \leq UARFCN^1 \leq 9938$ Additional channels: 1932.5, 1937.5, 1942.5, 1947.5, 1952.5, 1957.5, 1962.5, 1967.5, 1972.5, 1977.5, 1982.5, 1987.5 MHz
Channel Spacing	200 kHz (GSM, DCS, PCS), 5MHz UMTS
Channels	174 EGSM, 374 DCS, 274 PCS carriers with 8 ch. Per carrier, 12 UMTS maximum
Duplex Spacing	45 MHz GSM, 95 MHz DCS, 80 MHz PCS, 80 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)
Dimensions (Volume)	135 x 53 x 24.2 (mm), 5.3 x 2.1 x 0.95 (in)
Volume	138 cc
Weight	157 g, 5.54 oz

Table 1. Specifications

General Function	Specification
Display	TFT active full-color display (64k colors) 176 x 220 pixel EL Backlighting 5 row x 15 character: SMS & Phonebook
Battery Life (800mAh) ²	GSM: Up to 460 min (Talk Time), up to 300 hours (Standby) WCDMA: Up to 140 min (Talk Time), up to 300 hours (Standby)
Nominal Temperature Range	-20° C to +50° C

¹UTRA Absolute Radio Frequency Channel Number (UARFCN)

²All talk time and standby times are approximate and depend on network configuration, signal strength, and features selected

Table 2. GSM System

General Function	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, 30 dBm nominal DCS / PCS
Receive Sensitivity	-107 dBm GSM, -105 dBm DCS / PCS
RX Bit Error Rate	< 2%

Table 3. UMTS System

General Function	Specification
Speech Coding Type	Adaptive Multirate (AMR)
RF Power Output	21 dBm
Error Vector Magnitude	< 15%
PN9 Bit Error Rate (VER)	0.1% @ 12.2k, 0.1% @ 64k, 0.1% @ 384k
ACLR	-33 dBm @ ±5 MHz, -43 dBm @ ±10 MHz

Product Overview

The E1000 is a 3G (3rd generation) devices that will deliver on the “promise” of 3G by providing high speed network access and rich multimedia content all in a superior voice-centric unit. A video camera and Assisted GPS provide additional value by offering unique business and entertainment solutions.

The mechanical architecture features a 320 x 240 pixel, 0.198mm pitch TFT active color display, a built-in speaker phone, and a removable Li-Polymer battery. The architecture enables full postponement of the front housing and battery door cover by allowing the transceiver brick assembly, keypad, display, microphone, and earpiece speaker to be fully assembled and retained within the rear housing chassis.

Front covers may then be snapped in at distribution based on specific orders. Front housing branding is accomplished through thermal transfer decals.

As a 3G product, the E1000 complies with all key specifications as defined by the 3GPP. Key product features are:

- UMTS: WCDMA 2100, GSM 900/1800 and 1900-MHz Tri-band technology,
- GPRS High speed packet data (64kbps UL, 384 kbps DL)
- 320 x 240 TFT Active Color, 260K colors
- 256MB Integrated Flash Memory
- Integrated Bluetooth
- MP3 Player
- Enhanced Multimedia Capability (Audio/Video, Games, MMS)
- Unique 5-way Navigation Key
- New graphical user interface
- Enhanced internet browser (XHTML)
- Full Personal Information Manager (PIM) with SyncML Synchronization (OTA, Desktop)
- Integrated Camera 1.2 Mega pixel and GPS
- Voice Recognition Driven Dialing and Menu Shortcuts
- Voice Note Voice Recorder
- Polyphonic Speakerphone
- Programmable (J2ME)
- iTAP™ Predictive Text Entry
- Integrated Stereo Headset Jack

Note: The listed features may be Network, subscription, or service provider dependent. Not available in all areas.

E1000: Video Camera and Location Solutions

Video Camera Features:

- JPEG Image Capture @ VGA Resolution
- MPEG4 Video Capture @ QCIF Resolution
- Streaming Video
- Tightly Coupled, Ergonomic Design
- Initial User Applications:
 - Sending captured Video Clips and Pictures through MMS, Email, or Internet channels
 - Simultaneous Voice/Data – Take a picture or video clip and send while you’re on the phone

- Future Capabilities:
 - Video Conferencing (2-Way Video Telephony)

Location (AGPS) Applications:

- Get to specific location, with appropriate choices of destinations and routes and guidance to destination
- Identify local places of interest for hotels, taxi companies, restaurants, theatres, sightseeing, and shopping
- Receive information through alerts or display on map ahead of traffic congestion.
- Receive roadside assistance, with rescue service network and location information from the cellular network used to complement any information the pedestrian/driver is able to separately give.
- E911 Services: When roaming on a 2-2.5G GSM E-OTD-enabled network the mobile phone will respond to a request for location when making an emergency call.
- Push, Tracking & B2B Applications such as corporate tracking, routing, fleet management, and Buddy tracking (alert)

General Operation

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

The E1000 telephone controls are located on the front of the phone, and on the keyboard as shown. Indicators, in the form of icons, are displayed on the LCD (see “Color Display” on page 13).

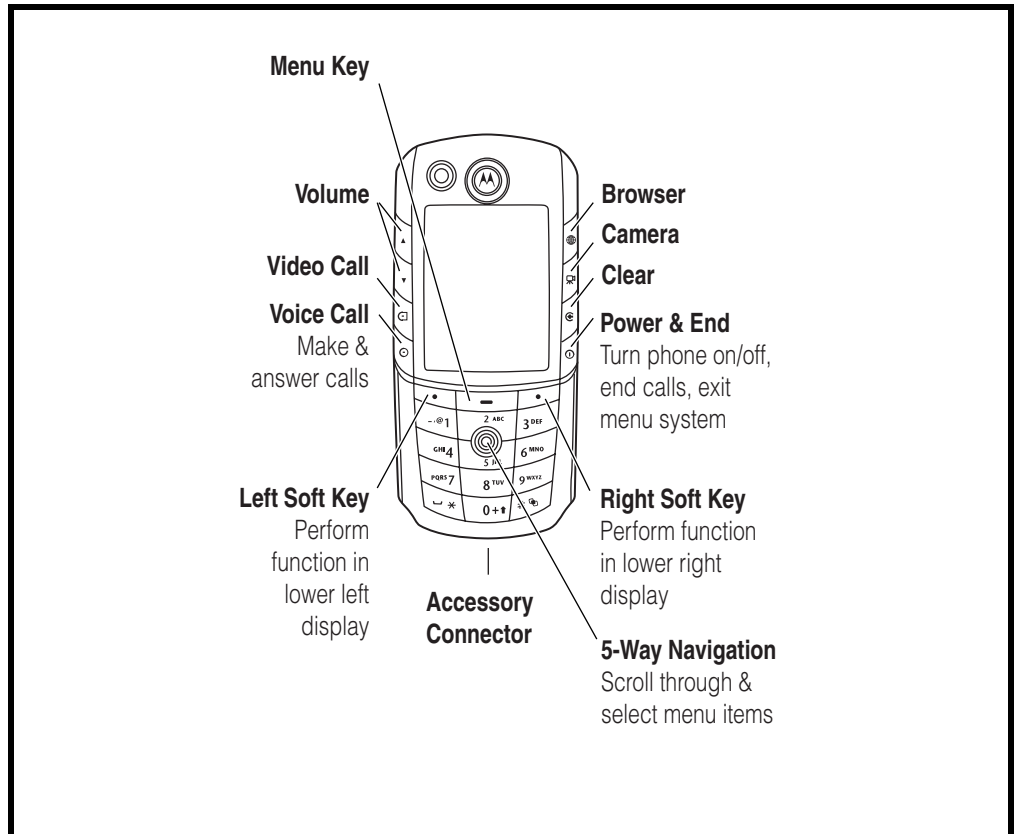


Figure 1. Controls and I/O

Color Display

The top section of the display shows phone status indicators. The following illustration shows some of the common indicators that you may see at the top of the display when using the phone.

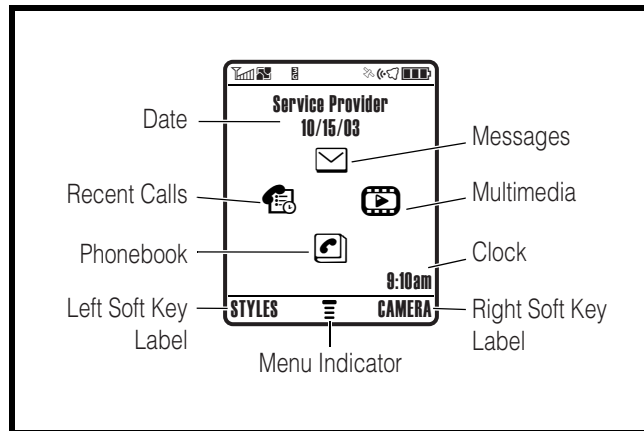



Figure 2. Typical Display

Messages, phone numbers, and menu options appear in the middle of the display. Text labels at the bottom corners of the display show the current soft key functions. A  (menu) indicator in the bottom center of the display indicates that you can open the main menu or a feature sub-menu to see more options.


Some of the phone functions described in this manual must be performed from the idle display. The term *idle display* refers to the standard display that you see when your phone is on and ready to use, when you are *not* on a call or using the menu system.

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

1 Signal Strength Indicator Shows the strength of the phone’s connection with the network.



You cannot make or answer calls when the “no signal” indicator is displayed.

 **2 Service Indicator** Shows when a GPRS connection is available. Your service provider may indicate that a GPRS packet data connection is active. This type of connection may be used by the service provider to allow faster data transfer speeds. The GPRS indicator does not mean that you are on a call; it indicates only that you are registered on the network through a GPRS connection.

3 Signal Security Indicator Shows when you have a secure connection for packet data transfers, embedded application connections, or circuit switch data calls.



4 Roam Indicator Shows when the phone uses the home network (📶) or another network (🌐). When the phone leaves the home network area, it *roams* or seeks another network.

5 Current Line Indicator Shows when Voice Privacy is on, a call is in progress, or Call Forwarding is on. This icon also indicates which line is active (if a call is on hold), and whether Caps Lock, Numeric Entry, or Symbol Entry is switched on (when entering text).

6 Text Entry Indicator Indicates your Text Entry Method whenever you are in a text editor (Tap, iTap, etc.).



7 Message Indicator Indicates when a new voice or text message is waiting.

8 Location Privacy Indicator Shows when Location Privacy is on or off, or when there is an Active Busy line.

9 Alert Type Indicator Shows the currently selected alert profile. The default alert setting is a ringer.

🔔 = loud ring

🔔 = soft ring

🔔 = vibrate

🔔 = ring and vibrate

🔔 = silent

10 Battery Level Indicator Shows the amount of charge left in the battery. The more bars visible, the greater the charge.

High Empty









User Interface Menu Structure






Menu Navigation

E1000 telephones are equipped with a simplified icon and list-based user interface.

Menu Map

Main Menu











-  **Messages**
 - Message Inbox
 - Create Message
 - Email Msgs
 - Voicemail
 - Browser Msgs
 - Quick Notes
 - Outbox
 - Drafts
 - MMS Templates
 - Info Services *
-  **Browser**
-  **Recent Calls**
 - Received Calls
 - Dialed Calls
 - Notepad
 - Call Times
 - Call Cost *
 - Data Times *
 - Data Volumes *
-  **Games & Apps**
-  **Multimedia**
 - Camera
 - Record Video
 - Pictures
 - Videos
 - Sounds
 - Themes
-  **Datebook**
-  **Phonebook**
-  **Settings**
 - (see next page)

-  **IM**
-  **Tools**
 - Shortcuts
 - Calculator
 - Alarm Clock
 - Dialing Services
 - Fast Menu *
 - SIM Apps *
-  **Web Access**
 - Browser
 - Bookmarks
 - Enter URL
 - Browser Settings
 - History
 - Web Sessions
 - Stored Pages
-  **Personalize**
 - Home Screen
 - Main Menu
 - Color Style
 - Greeting
 - Wallpaper
 - Screen Saver
-  **Ring Styles**
 - Style
 - style Detail
 - My Tones

Menu organization and features may vary on your phone.

* Indicates network or subscription-dependant features

Settings Menu

-  **Connection**
 - Bluetooth Link
 - Sync
-  **Call Forward**
 - Voice Calls
 - Video Calls
 - Cancel All
 - Forward Status
-  **In-Call Setup**
 - In-Call Timer
 - Call Cost Setup *
 - My Caller ID
 - Answer Options
 - Call Waiting
 - Msg Alert
-  **Initial Setup**
 - Time and Date
 - 1-Touch Dial
 - Auto Redial
 - Display Timeout
 - Backlight
 - TTY Setup *
 - Scroll
 - Spatial Audio
 - Language
 - Battery Save
 - Brightness
 - DTMF
 - Master Reset
 - Master Clear
-  **Phone Status**
 - My Tel. Numbers
 - Credit Info/Available *
 - Active Line *
 - Battery Meter
 - Storage Devices
 - AGPS Service
 - Other Information
-  **Headset**
 - Auto Answer
 - Ringer Options
 - Voice Dial
-  **Car Settings**
 - Auto Answer
 - Auto Handsfree
 - Power-off Delay
 - Charger Time
-  **Network**
 - New Network
 - Network Setup
 - Available Networks
 - Service Tone
 - Call Drop Tone
-  **Security**
 - Phone Lock
 - Lock Keypad
 - Lock Application
 - Fixed Dial
 - Call Barring
 - SIM PIN
 - New Passwords
-  **Java Settings**
 - Java System
 - Delete All Apps
 - App Vibration
 - App Volume
 - App Priority
 - App Backlight
 - Set Standby App

* Indicates network or subscription-dependant features

Battery Function

Battery Charge Indicator

The telephone displays a battery charge 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 phone to immediately shut down and any pending work (partially entered phone book entries or outgoing messages, for example) is lost.



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.



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



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

Operation

For detailed operating instructions, refer to the appropriate user guide listed in the Related Publications section.

Tools and Test Equipment

Table 4 list the tools and test equipment used on E1000 telephones. Use either the listed items or equivalents.

Table 4. General Test Equipment and Tools

Motorola Part Number ¹	Description	Application
---	Charger	Used to charge battery and to power phone
0180386A82	Antistatic Mat Kit (includes 66-80387A95 antistatic mat, 66-80334B36 ground cord, and 42-80385A59 wrist band)	Protects phone from damage caused by electrostatic discharge (ESD)
0-00-00-30005 ³	Disassembly tool, black plastic with flat and pointed ends	Used to assemble/disassemble phone
6680388B01	Tweezers, plastic	Used to assemble/disassemble phone
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
HP34401A ²	Digital Multimeter	Used to measure battery voltage

1. To order in North America, contact Motorola Aftermarket and Accessories Division (AAD) by phone (800) 422-4210 or fax (800) 622-6210; Internationally, you can reach AAD by phone (847) 538-8023 or fax (847) 576-3023.

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

3. Not available from Motorola. To order, contact:

AMS Software & Elektronik GmbH
 c/o Holger Grube
 Lise-Meitner-Straße 9
 D-24941 Flensburg Tel.: +49-461-90398-0
 Fax: +49-461-90398-50

Disassembly

This section describes how to disassemble the E1000 telephone. Refer to Table 4 for a list of tools and equipment used.



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



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 button and slide the battery door toward the bottom end of the phone.
3. Lift the battery door up and away from the phone.



Figure 3. Removing and Replacing the Battery Door

4. To replace, align the battery door the phone.
5. Lower the battery door onto the phone.
6. Slide the battery door toward the top of the phone to lock the battery door release

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.

We recommend that you store batteries in their protective cases when not in use.

To remove the battery

1. Ensure the phone is turned off.
2. Remove the battery door.
3. Grasp the bottom of the battery from the sides and lift it out of the phone, releasing it from the tab at the top of the battery compartment (see Figure 4).



Figure 4. Removing and Replacing the Battery

To replace the battery

1. If necessary, remove the battery from its protective clear plastic case.
2. Insert the battery (gold contacts side down), **under the tab** at the top of the battery compartment, then press the bottom of the battery into place.
3. Replace the battery door as described in the procedures.



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.

Removing and Replacing the SIM Card

To remove the SIM card

1. Ensure the phone is turned off.
2. Remove the battery door.
3. Remove the battery (see Figure 5).
4. Slide the SIM card sideways and lift it out of its holder.



Figure 5. Removing and Replacing the SIM Card

To replace the SIM card

1. Slid the SIM card into its holder with the cut corner of the SIM card as shown.
2. Insert the battery and battery door as described in the procedures.

Removing and Replacing the Front Housing

To remove the front housing

1. Follow the procedures in this section to remove the:
 - Battery door
 - Battery
 - SIM card
2. Using the Torx driver and T-6 bit, remove the 6 screws shown in Figure 6. Set the screws aside for reuse.
3. Use the disassembly tool to release the latches along both sides of the phone. Lift the front housing off the phone as shown in Figure 6.



Figure 6. Removing the Front Housing

To replace the front housing

1. Align the front housing with the rear housing and press it in place. .
2. Insert and tighten the 6 screws to a torque setting of 1.2 in/lbs, using the T-6 Torx driver. Do not overtighten.
3. Follow the procedures to replace the:
 - SIM card
 - Battery
 - Battery door

Removing and Replacing the Rear Housing

To remove the rear housing

1. Follow the procedures in this section to remove the:
 - Battery door
 - Battery
 - SIM card
 - Front housing
2. Lift the transceiver board from the bottom and out of the rear housing.

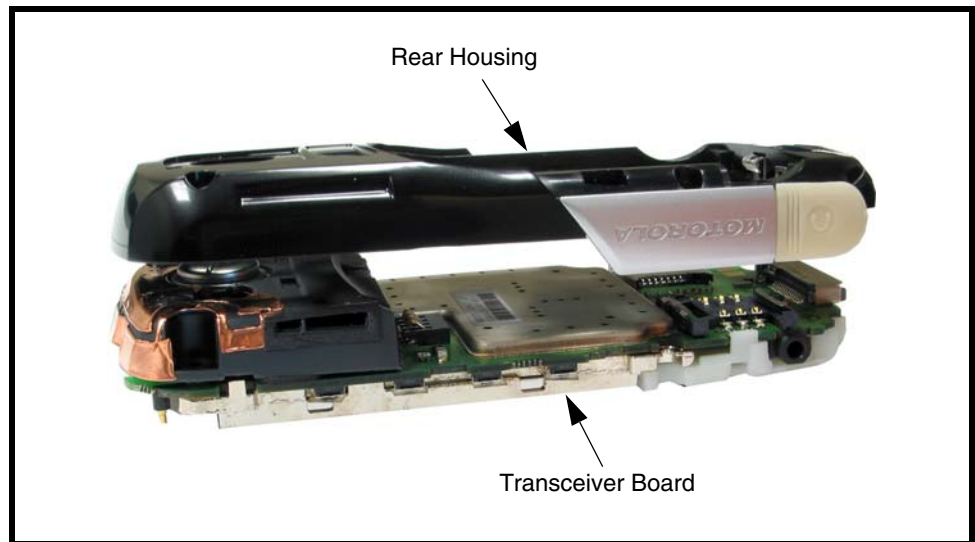


Figure 7. Rear Housing Removal

To replace the rear housing

1. Insert the front of the transceiver board into the rear housing and press it into place.
2. Follow the procedures to replace the:
 - front housing
 - SIM card
 - battery
 - battery door

Removing and Replacing the Battery Shield



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

To remove the battery shield

1. Ensure the phone is off.
2. Follow the procedures to remove the:
 - battery door
 - battery
 - SIM card
 - front housing
 - rear housing
3. Using tweezers, disengage the metal tab of the battery shield from the rear housing and snap the battery shield out the rear housing.



Figure 8. Removing the Battery Shield

To replace the battery shield

1. Align the battery shield with the rear housing and snap it into place.
2. Follow the procedures to replace the:
 - transceiver board
 - front housing
 - SIM card
 - battery
 - battery door

Removing and Replacing the Key Board

To remove the key board

1. Ensure the phone is off.
2. Follow the procedures to remove the:
 - battery door
 - battery
 - SIM card
 - front housing
3. Using the disassembly tool, disengage the 4 plastic clips securing the key board.

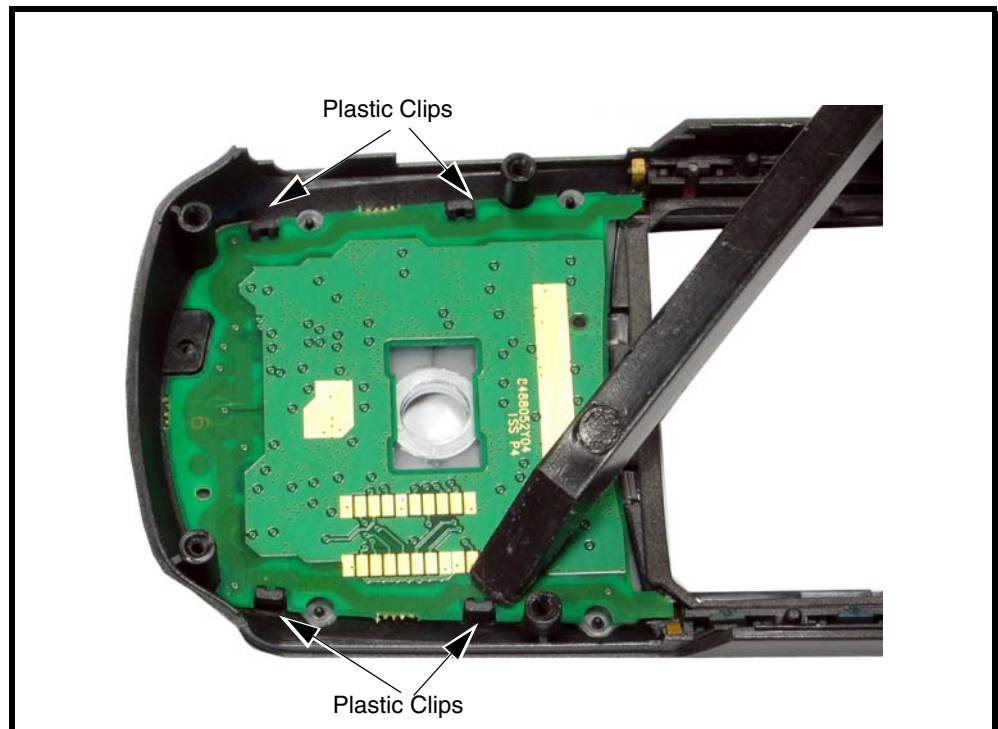


Figure 9. Removing the Key Board

To replace the key board

1. Align the key board with the plastic clips on the front housing and snap it into place.
2. Follow the procedures to replace the:
 - front housing
 - battery
 - SIM card
 - battery door

Removing and Replacing the Keypad

To remove the keypad

1. Follow the procedures to remove the:
 - Battery Door
 - Battery
 - SIM card
 - Front Housing
 - Key Board
2. Using plastic tweezers, carefully lift the keypad off of the front housing.



The flexible printed cable (FPC or flex) connecting the display assembly to the display board is easily damaged. Exercise extreme care when handling.



Figure 10. Removing the Keypad

To replace the keypad

1. Align the keypad with the front housing and press it into place.
2. Follow the procedures to replace the:
 - keyboard
 - front housing
 - battery
 - battery door

Removing and Replacing the Speaker Assembly

To remove the speaker assembly

1. Follow the procedures to remove the:
 - Battery door
 - Battery
 - SIM card
 - front housing
 - rear housing
2. Using a Torx driver with a T-6 bit, remove the 2 screws securing the speaker assembly to the transceiver board.
3. Lift the assembly off of the transceiver board.)

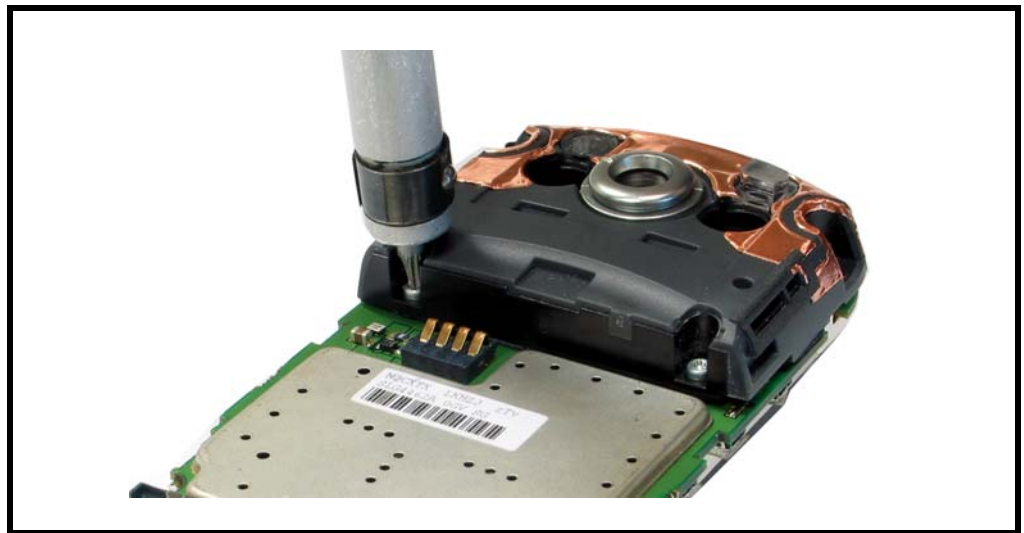


Figure 11. Removing the Speaker Assembly.

To replace the speaker assembly

1. Align the speaker assembly with the transceiver board and press it into place.
2. Insert and tighten the 2 screws to a torque setting of 1.2 in/lbs, using the T-6 Torx driver. Do not overtighten.
3. Follow the procedures to replace the:
 - rear housing
 - front housing
 - SIM card
 - battery
 - battery door

Removing and Replacing the Joystick Assembly

To remove the joystick assembly

1. Follow the procedures to remove the:
 - battery door
 - battery
 - SIM card
 - front housing
 - rear housing
2. Using the disassembly tool, disengage the 2 plastic latches on each side of the assembly.

3. Turn the transceiver board over and using the disassembly tool, disengage the joystick flex connector and lift it off of the transceiver board.

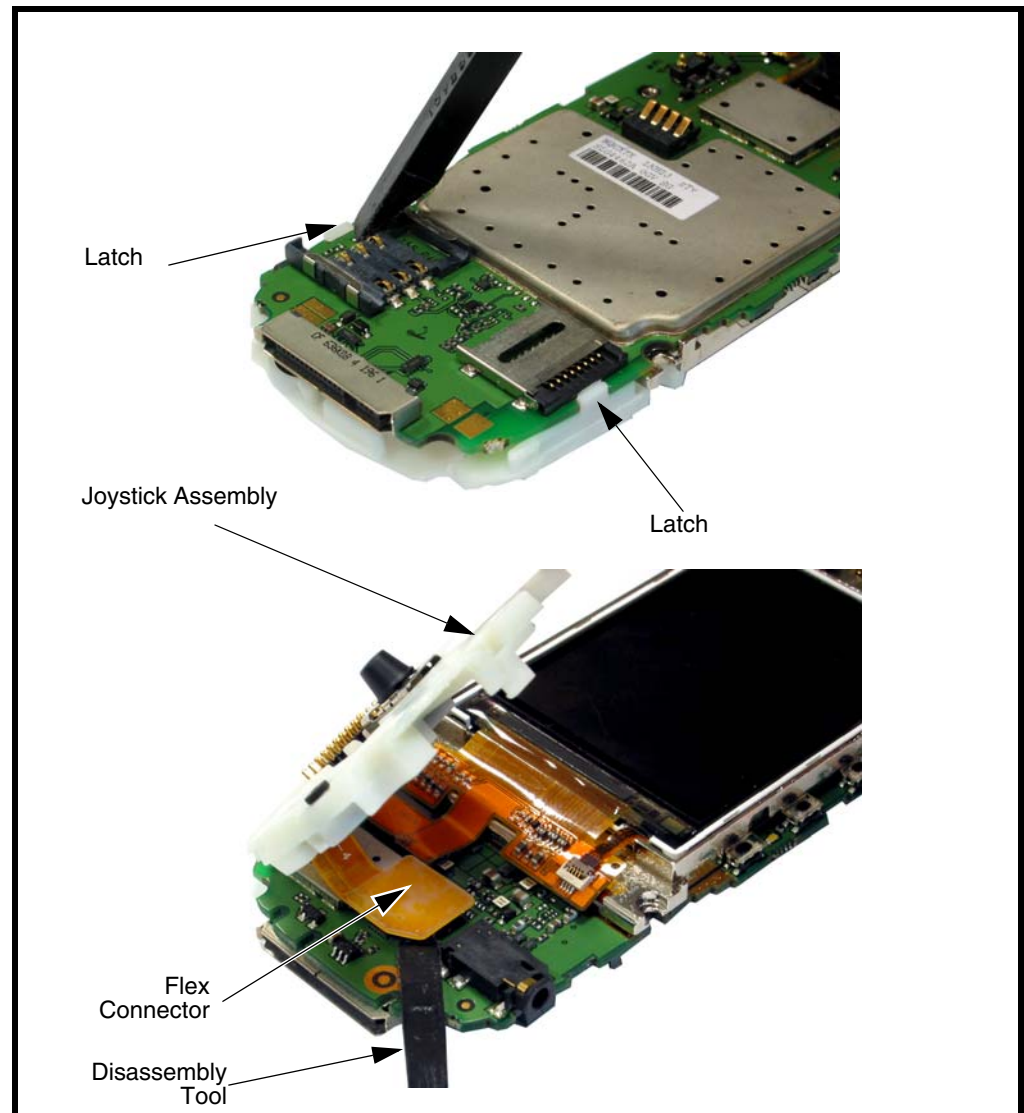


Figure 12. Removing the Joystick Assembly

To replace the joystick assembly

1. Align the joystick flex connector with the connector on the transceiver board and press it into place
1. Align the joystick assembly with the transceiver board and press it into place.
2. Follow the procedures to replace the:
 - rear housing
 - front housing
 - SIM card
 - battery
 - battery door

Removing and Replacing the Display Assembly



Use only non-conductive tools, such as the plastic disassembly tool and the plastic tweezers, display assembly.

To remove the Display Assembly

1. Follow the procedures to remove the:
 - Battery Door
 - Battery
 - SIM card
 - Front Housing
 - Rear Housing
 - Joystick Assembly
2. Use the disassembly tool to gently pry the display flex connector from its socket on the transceiver board.
3. Use the disassembly tool to disengage the 4 display latches and lift the display assembly away from the transceiver board.

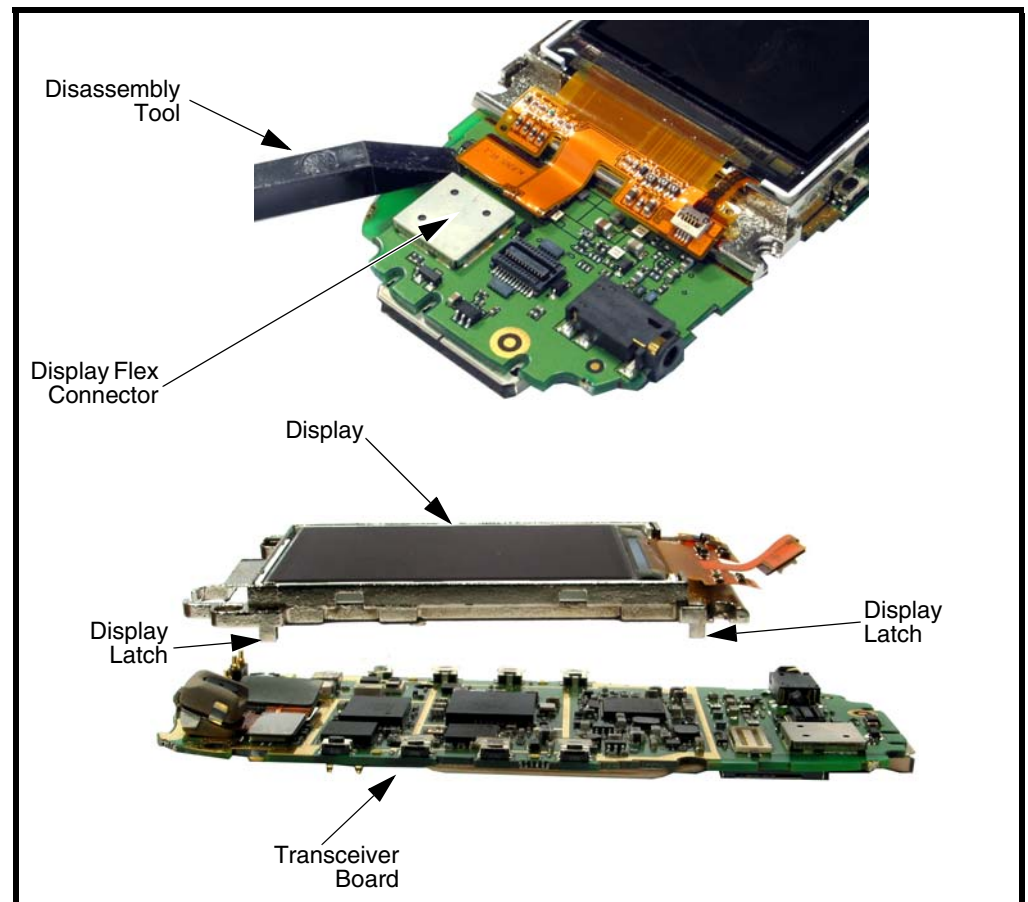


Figure 13. Removing the Display Assembly

To replace the Display Assembly

1. Align the display assembly with the transceiver board and press it into place.
2. Press the display flex connector on to its transceiver board connector.
3. Follow the procedures to replace the:
 - joystick Assembly
 - rear Housing
 - front Housing
 - SIM card
 - battery
 - battery Door

Removing and Replacing the Camera

To remove the camera

1. Follow the procedures to remove the:
 - Battery Door
 - Battery
 - SIM card
 - Front Housing
 - Rear Housing
 - Joystick Assembly
 - Display Assembly
2. Use the disassembly tool to gently pry the camera flex connector from its socket and remove the camera.

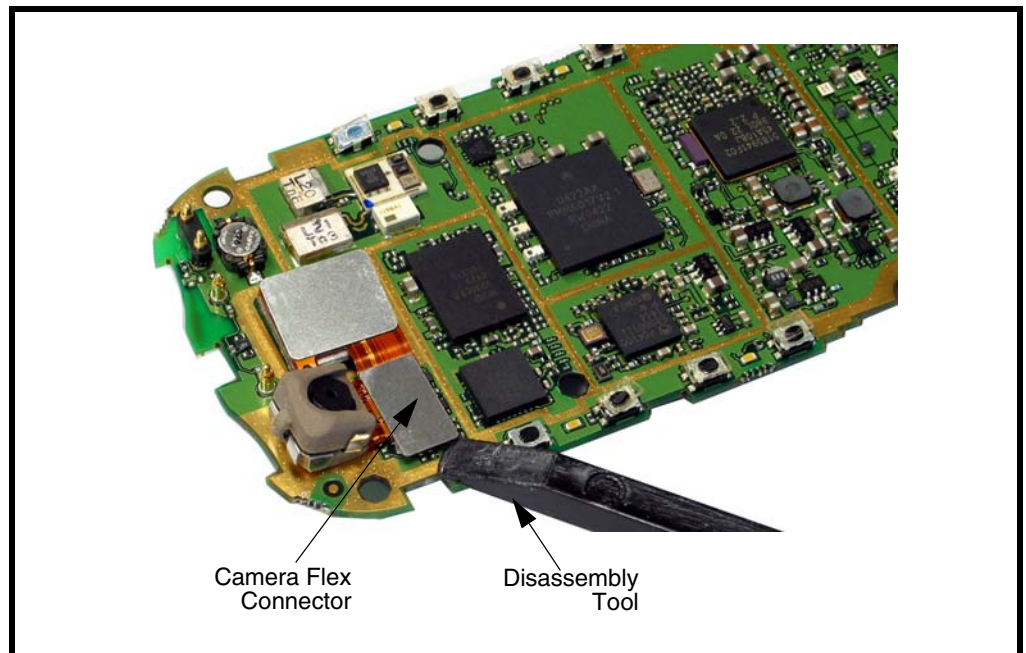


Figure 14. Removing the Camera

To replace the camera

1. Align the camera flex connector with its socket on the transceiver board and gently press it in until it's fully seated.
2. Follow the procedures to replace the:
 - display assembly
 - joystick Assembly
 - rear Housing
 - front Housing
 - SIM card
 - battery
 - battery Door

UMTS Subscriber Identity Module (USIM) Identification Label

USIM

A USIM 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 USIM 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

Identification

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

Mechanical Serial Number (MSN)

The MSN is an individual unit identity number and remains with the unit throughout its life.

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

The MSN is divided into 4 sections as shown in Figure 15.

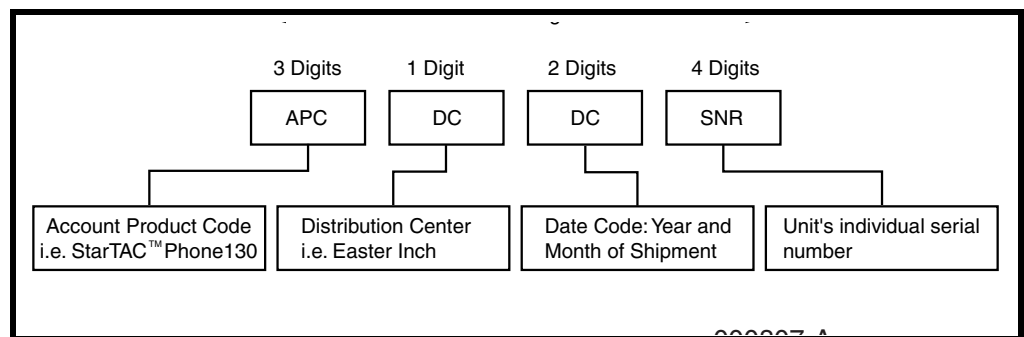


Figure 15. MSN Label Breakdown

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 5.

Table 5. 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:

- **TRANSCEIVER 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 6. PF 0B91 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 terminals open or misaligned.	Visually inspect the battery terminals on both the battery and the telephone. Realign and, if necessary, either replace the battery or refer to a Level 3 Service Center for battery connector replacement. If battery terminals are not at fault, proceed to c.
	c) Transceiver board defective.	Remove the transceiver board assembly. Substitute a known good transceiver board and temporarily reassemble the unit. Press the PWR button; if unit turns on and stays on, disconnect the dc power source and reassemble the phone with the new transceiver board. 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 defective	Check connection between the antenna and the transceiver board. If the connection is OK, substitute a known good antenna. If the fault is still present, proceed to b.
	b) Transceiver board defective.	Replace the transceiver board (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board.
3. Display is erratic, or provides partial or no display.	a) Mating connections to or from transceiver board faulty.	Check general condition of flex and flex connector. If the flex and connector are good, check that the display assembly mounting tabs are fully engaged. If connector is not at fault, proceed to b.
	b) Transceiver board defective.	Replace the transceiver board (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board.
4. Incoming call alert transducer audio distorted or volume is too low.	Faulty transceiver board.	Replace the transceiver board (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board.
5. Telephone transmit audio is weak. (usually indicated by called parties complaining of difficulty in hearing voice).	a) Microphone defective.	Replace the microphone as described in the procedures. If fault is not cleared, proceed to b.
	b) Transceiver board defective.	Replace the transceiver board (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board.
6. Receive audio from earpiece speaker is weak or distorted.	a) Connections to or from transceiver board defective.	Check connection from the earpiece to the transceiver board. If connection is not at fault, proceed to b.

Table 6. PF 0B91 Telephone: Level 1 and 2 Troubleshooting Chart (Continued)

Symptom	Probable Cause	Verification And Remedy
	b) Earpiece speaker defective.	Temporarily replace the speaker with a known good speaker. Ensure good connection. Place a call and verify improvement in earpiece audio. If fault is cleared, reassemble the phone with the good transceiver board. If fault is not cleared, proceed to c.
	c) Transceiver board defective.	Replace the transceiver board (refer to 1c). Verify that the fault has been cleared and reassemble the phone with the new transceiver board.
7. Telephone will not recognize or accept USIM card.	a) USIM card defective.	Check the USIM card contacts for dirt. Clean if necessary, and check if fault has been cleared. If the contacts are clean, insert a known good USIM 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 USIM card. If the USIM card is not at fault, proceed to b.
	b) Transceiver board defective.	Replace the transceiver board (refer to 1c). Verify that the fault has been cleared and reassemble the phone with the new transceiver board.
8. Vibrator feature not functioning.	a) Vibrator defective.	Replace vibrator as described in the procedures. If the fault has not been cleared, proceed to b.
	b) Transceiver board defective.	Replace the transceiver board (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board.
9. Internal Charger not working.	Faulty charger circuit on transceiver board.	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.
10. No or weak audio when using headset.	a) Headset plug not pushed in fully.	Ensure the headset plug is fully seated in the jack.
	b) Faulty jack on transceiver board.	Replace the transceiver board (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board.

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 section provides a reference for the parts associated with E1000 telephones.

Related Publications

Motorola E1000 Wireless Phone User Guide

68XXXXXX53

Exploded View Parts List

Table 7. Parts List

Item	Motorola Part No.	Description
1	3888127Y03	keypad module assembly
2	1587912Y08	front housing assembly
3	1588080Y08	joystick assembly
4	7289344N01	display assembly
5	0188152Y02	camera module assembly
6	SLG4470AA	main PCB assembly
7	1587914Y03	main antenna/acoustic module assembly
8	0389896K02	screws, machine (x2)
9	0387340	screws, thread forming (x6)
10	1587913Y02	rear housing
11	0188391P01	battery
12	1587915Y01	battery door

You may use the following web link to order parts online (Password is required):

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

For information on ordering parts in EMEA region call +49 461 803 1638.

Exploded View Diagram

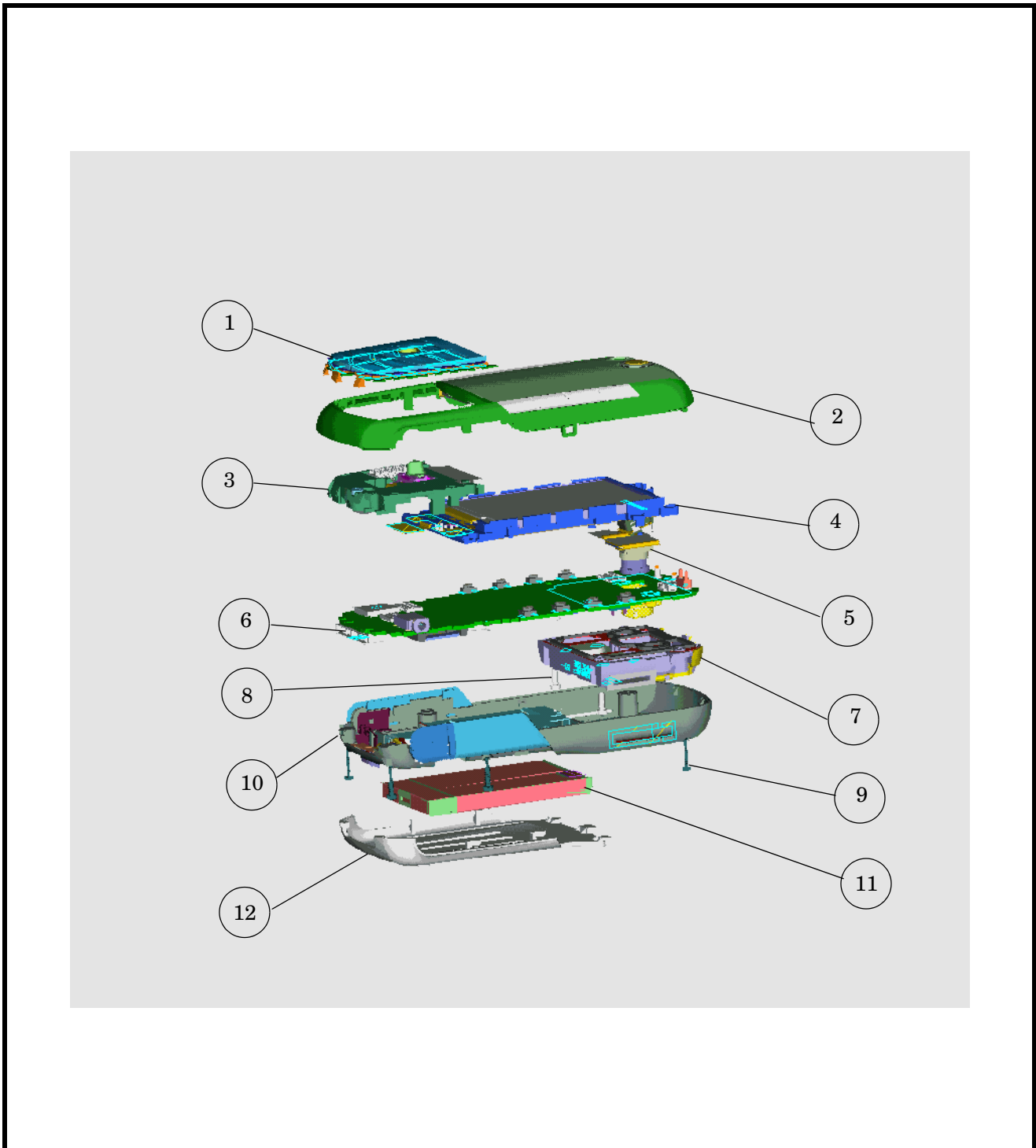


Figure 16. Exploded View Diagram

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