



**MOTOROLA**

# Level 1 and 2 Service Manual

6809505A65-A

## MOTOFONE™ F3

### Digital Wireless Telephone



GSM 900/1800 or GSM 850/1900 MHz  
GPRS

MOTOROLA and the Stylized M Logo are registered in the US Patent & Trademark Office.  
All other product or service names are the property of their respective owners.

© Motorola, Inc. 2006.  
All rights reserved.

Mobile Devices Business,  
Sawgrass International Concourse  
789 International Parkway  
Room S2C  
Sunrise, FL 33325-6220

# Contents

<b>Introduction</b> .....	<b>5</b>
Product Identification .....	5
Product Names .....	5
Product Changes .....	5
Regulatory Agency Compliance .....	5
Computer Program Copyrights .....	6
About This Service Manual .....	6
Warranty Service Policy .....	7
Parts Replacement .....	7
<b>Specifications</b> .....	<b>9</b>
<b>Product Overview</b> .....	<b>11</b>
Features .....	11
<b>General Operation</b> .....	<b>12</b>
Controls, Indicators, and Input/Output (I/O) Connectors .....	12
Battery Information .....	13
Operation .....	17
<b>Tools and Test Equipment</b> .....	<b>23</b>
<b>Disassembly</b> .....	<b>24</b>
Removing and Replacing the Battery Cover .....	25
Removing and Replacing the Battery .....	26
Removing and Replacing the Subscriber Identity Module (SIM) .....	27
Removing and Replacing the Rear Housing .....	28
Removing and Replacing the Transceiver Board Assembly .....	30
Removing the Keypad Lens .....	33
<b>Subscriber Identity Module (SIM) and Identification Label</b> .....	<b>34</b>
SIM .....	34
Identification .....	34
<b>Troubleshooting Chart</b> .....	<b>36</b>
Programming: Software Upgrade and Flexing .....	37
<b>Part Numbers</b> .....	<b>37</b>
Exploded View Diagram .....	38
Exploded View Parts List .....	39
Accessories .....	39
<b>Index</b> .....	<b>1</b>



## 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.

## 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
- 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

Using this service manual and the suggestions contained in it assures proper installation, operation, and maintenance of F3 telephones. Refer questions about this manual to the nearest Customer Service Manager.

### Audience

This document aids service personnel in testing and repairing F3 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

The scope of this document is to provide the reader with basic information relating to F3 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 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` or `ALERTS`.

## Warranty Service Policy

The product will be sold with the standard 12 months 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 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). 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 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)**

Order replacement parts, test equipment, and manuals from AAD.

#### **U.S.A.**

Phone: 800-422-4210

FAX: 800-622-6210

Website: <http://businessonline.motorola.com>

#### **Outside U.S.A.**

Phone: 847-538-8023

FAX: 847-576-3023

#### **EMEA**

Phone: +49 461 803 1404

Website: <http://emeaonline.motorola.com>

#### **Asia**

Phone: +65 648 62995

Website: <http://asiaonline.motorola.com>

## Specifications

General Function	Specification
Frequency Range GSM 850	824-849 MHz Tx 869-894 MHz Rx
Frequency Range GSM 900	880-915 MHz Tx (with EGSM) 925-960 MHz Rx
Frequency Range DCS 1800	1710-1785 MHz Tx 1805-1880 MHz Rx
Frequency Range PCS 1900	1850-1910 MHz Tx 1930-1990 MHz Rx
Channel Spacing	200 kHz
Channels	174 EGSM, 374 DCS, 374 PCS, 124 GSM 850 carriers with 8 channels 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, 80 MHz PCS
Frequency Stability	± 0.10 ppm of the downlink frequency (Rx)
Operating Voltage	+3.0V dc to +4.2V dc (cell) +4.4V dc to +6.6V dc (external charger jack with 2.4 K ohm resistor)
Average Transmit Current	300 mA max
Average Stand-by Current	4.0 mA max (DRX2), 2.0 mA max (DRX9)
Dimensions	47mm x 114mm x 9.1mm (1.96 inches x 4.17 inches x 0.66 inches)
Size (Volume)	50 cc (4.8 in <sup>3</sup> )
Weight	70 g (3.52 oz) with cell
Temperature Range	-10° C to +55° C (+15° F to +130° F)
Battery Life, 880 mAh Li Ion Battery	Talk time 500 minutes  Standby time 300 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 Specification	
RF Power Output	33 dBm nominal GSM 850 33 dBm nominal GSM 900 30 dBm nominal GSM 1800 30 dBm nominal PCS 1900
Output Impedance	50 ohms nominal
Spurious Emissions	-36 dBm from 0.1 to 1 GHz, -30 dBm from 1 to 4 GHz

Receiver Specification	
Receive Sensitivity	-106 dBm GSM 850, -106 dBm GSM 900, -104 dBm GSM 1800, -104 dBm PCS 1900
RX bit error rate (100k bits) Type II	< 2%
Channel Hop Time	500 microseconds

---

Receiver Specification	
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's MOTOPHONE F3 mobile telephones feature global system for mobile communications (GSM) air interface. The mobile telephone uses a simplified icon-based user interface (UI) for easy operation, allows short message service (SMS) text messaging. The F3 is a dual band phone that allows roaming within the GSM 900MHz, and DCS 1800 MHz bands, or the GSM 850MHz, and PCS 1900MHz bands, depending on factory programming.

F3 telephones are made of polycarbonate plastic. The display and speaker, as well as the transceiver printed circuit board (PCB), microphone, charger/ headphone connectors, and buttons are contained within the 9.1mm slim candy bar form-factor housing. The 700 mAh Lithium Ion (Li Ion) battery provides up to 500 minutes of talk time with up to 300 hours of standby time<sup>1</sup>. The phone accepts 3V and 1.8V mini subscriber identity module (SIM) cards, which fit into the SIM holder under the rear housing cover. These telephones feature an EPD (Electrophoresis display) and an internal antenna.

## Features

F3 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 the F3 include:

- GSM dual band phone, 900/1800MHz or 850/1900MHz.
- Ultra low cost.
- Ultra thin, 9.1 mm in thickness.
- New display technology, EPD display
- Uses only one speaker for both receiver and ring-tone speaker.

---

1. 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.

## General Operation

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

The F3 controls are located on the front of the device, as shown in Figure 1.



0615560

Figure 1. Telephone Controls and Indicators

## Electrophoretic Display (EPD)

The large display supports extra large characters for easy readability as well as dedicated space for status and action icons.



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

Figure 2 shows the main screen display.



061557o

Figure 2. Main Screen Display

## Battery Information

### Battery Charge Indicator

The telephone displays a battery charge indicator icon in the idle screen to indicate the battery charge level. The gauge shows five levels: 100%, 60%, 40%, 20%, and Low Battery.

### Battery Removal

Removing the battery causes the device to immediately shut down, and any pending work (partially entered phone book entries or outgoing messages, for example) is lost. Any text or image displayed on the screen at the time the battery is removed, will remain visible on the screen. The screen will refresh as soon as it is turned on again.



*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.

### Battery Date Code

The battery date code is a 15 position alphanumeric code that provides backend manufacture site information, year and week of manufacture date, cell type and vendor information.

The battery date code is used for cell phone batteries that were manufactured beginning in March 2003. The following paragraphs provide more detail about the battery date code.

#### 1. Backend Pack Manufacturing Site (first position of battery code)

A = Motorola Penang	J= ESG, Chihuahua	S = T.D.I Scotland
B = T.D.I. Mexico	K= T.D.I. Romeoville	T = T.D.I Downers Grove T = TWS
C = Motorola China	L = Motorola Lawrenceville	U = T.D.I. Hungary
D = T.D.I. Shanghai, China	M =TDI, Malaysia M = J Power	V =
E = ESG, Evadin, Brazil	N = TDI, Manau, Brazil	W = ESG, Sung Woo
F = ESG, Propower, Korea	O =	X = ESG, Foxlink, China
G =	P = Intesys Arizona	Y = P&K (G.E.T.) Systems, Korea
H = Motorola Harvard	Q =	Z =
I = Motorola Ireland	R = Foxlink, Tianjin	

#### 2. Cell code and vendor (second and third position of battery code): 2 alpha characters.

Cell Reference Designator	Vendor	Size	Part Number
IA	A&TB	6.6x30x48	LGQ633048C
1B	A&TB	6.6x30x48	LGQ633048D
1C	A&TB	6.6x30x47.2	LGQ633048P
1D	A&TB	8.8x34x48	LGQ863448C
1E	A&TB	8.8x34x47.3	LGQ8634481-1
1F	A&TB	18x65	LGR18650E
IG	A&TB	7.5x14.5x48	TH750F5

Cell Reference Designator	Vendor	Size	Part Number
1H	A&TB	10.5x43.6	TH550AAA
3F	Toshiba	7.5x14.5x48	TH900F5
3G	Gold Peak	1/3A	GPZSAFK
3H	Toshiba	4.4x34x56	LA8423456A
3J	Saft	AA	VHAA1200
3K	Maxell	5.5x30x48	ICP053048G
3L	NEC-Moli	6.7x30x47.3	MK11-2293
3M	Mitsubishi	4.4x34x56	Lipmo001
3N	Toshiba	6.6x34x50	LGQ633450R
3P	Panasonic	6x34x50	CGP34506
3R	Toshiba	3.9x34x56	LAB363456A
3S	NEC-Moli	6.5x22x65	MK11-2300
3T	BYD	6.6*9.8x47.9	LP063048A
3U*	Panasonic	LL-AAAA	HHR70QAB4
3V	Sanyo (Toshiba)	6mm NiMH	THF6M
3W	LG Chemical	6x30x48	ICP633048
3X	BYD	5.4x30.1x48.2	LP053048A
3Y	BYD	6x34x50	LPO53048A
3Z*	Panasonic	6.2x35.2x16.	HF6OSS
4A	Peacebay- Manual	6mm NiMH	F6MG
4B	BYD	4x30x48	F6MG
4C	Peacebay-Auto	6.4x16.34	F6MP
4D	Sanyo	6mm NiMH	HFC1U
4E	BYD	8x3 x47.5	LP083448SH
4F	Sony	34x67	UP423467A4H
4G	LG Chemical	8.6x34x48	ICP863448
4H	LG Chemical	6.3x 34x50	ICP633450
4J*	BYD	4x30x41	LP043041A
4K	GS Melcotec	4.6x29.5x41	LP423041A
4L	LG Chemical	4.2x30x48	ICP423048

Cell Reference Designator	Vendor	Size	Part Number
4M	Toshiba	5.5x30x48	LGQ553048U
4N	Sanyo	3.8x34x50	UF383450P
4P	Toshiba	4.4x34x50	LGQ443450U
4R	Toshiba	4.4x30x48	LGQ443048U
4S	Lishen	06x30x48	LP0601AE
4T	Panasonic	AAAALL	HHR70QAB4
8E	NEC S14	-	ICP043443B(-M)
8L	Maxwell L08	-	ICP463443ARM

3. Cell date code (fourth fifth and sixth position of battery code) consisting of characters as stated on cell pack by cell manufacturer. If a 3 digit code is not used, place a period (.) in the sixth position.
4. Protection Circuit Module (PCM) code (seventh and eighth positions of battery code) FF = 0164086T01
5. Year of battery manufacture (ninth position of battery code)

1990 = A	1997 = H	2004 = O	2011 = V
1991 = B	1998 = I	2005 = P	2012 = W
1992 = C	1999 = J	2006 = Q	2013 = X
1993 = D	2000 = K	2007 = R	2014 = Y
1994 = E	2001 = L	2008 = S	2015 = Z
1995 = F	2002 = M	2009 = T	
1996 = G	2003 = N	2010 = U	

6. Week of manufacture (tenth and eleventh positions of battery code).

A=0	C=2	E=4	G=6	I=8
B=1	D=3	F=5	H=7	J=9

7. Front end corepack manufacturing site (twelfth position of battery code (see step 1)).

Example of a battery date code: **A1V90311JCCC...**

position 1 = A = Motorola Penang.t (Backend Pack)

position 2 & 3 = 1V = Panasonic, AAA, HHR55B2

position 4, 5 & 6 = 903 = cell date code (from manufacturer)

position 7 & 8 = 11 = (TBD by supplier.Example: Line one of the first shift.)

position 9 = J = 1999 = Year of battery pack manufacture

position 10 & 11 = CC = week twenty two. (backend pack)

- position 12 = C = Motorola, China. (Frontend Core Pack)  
 position 13, 14 & 15 = placeholders (...) to indicate pack has not been relabeled.
8. Re-label position (thirteenth position of battery code). A period (.) is to be added if not relabeled. If relabeled, add the original date code year per step 5.
  9. Line & shift manufactured (optional)/relabel (Fourteenth & Fifteenth position of battery code) If not relabeled, consists of a two character combination either alpha or numeric to be determined by the cell pack manufacturer for representing the line and shift. All unused positions shall be marked with a period (.). If relabeled, consists of the original date code week positions per step 6."
  10. Batteries sold in China have an additional character date code:  
 Example: **Y Y Y Y M M D D A B C X X X X**  
 Where YYYYMMDD is the actual battery manufacturing date  
 A is the line number  
 B is the shift number (A,C is day shift; B, D is night shift)  
 C is a serial number from A to Z  
 XXXX is a sequence number
  11. Embedded battery packs use a 6 character date code:  
 Position 1 is the manufacturing site:

Manufacturing Site	Code
BYD	a
ESG	b
GSMT China	c
GSMT Japan	d
LG China	e
LG Japan	f
Maxell China	g
Maxell Japan	h
TDI	i
Toshiba China	j
Toshiba Japan	k

Position 2 and 3 is cell code and vendor. See step 2.

Position 4, 5, and 6 is cell date code (year and week). See steps 5 and 6.

## 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

Table 1 lists the tools and test equipment used on F3 telephones. Use either the listed items or equivalents.

**Table 1. General Test Equipment and Tools**

Motorola Part Number <sup>1</sup>	Description	Application
See Table 5	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)	Provides protection from damage to phone caused by electrostatic discharge (ESD)
8102430Z04	GSM / DCS / PCS Test SIM	Used to enable manual test mode
6680388B67	Disassembly tool, plastic with flat and pointed ends (manual opening tool)	Used during assembly/disassembly of phone
6680388B01	Tweezers, plastic	Used during assembly/disassembly
RSX4043-A	Torque Driver	Used to remove and replace screws
—	Torque Driver Bit T-5 Plus, Apex 440-6IP Torx Plus or equivalent	Used with torque driver
	Size 0 Phillips head driver	Used to remove transceiver board screws
HP34401A <sup>2</sup>	Digital Multimeter	Used to measure battery voltage

1. To order in North America, contact Motorola Aftermarket and Accessories Division (AAD) by phone 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

This section describes how to disassemble a F3 telephone. Tools and equipment used 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.*

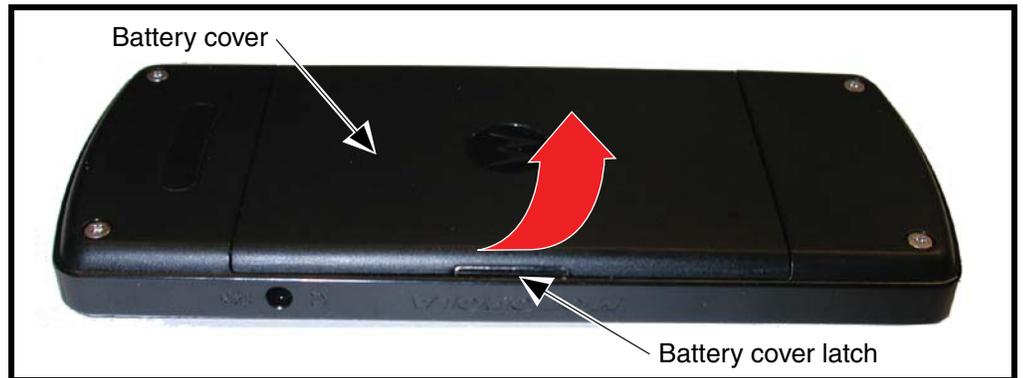


*Avoid stressing the plastic in any way to avoid damage to either the plastic or internal components.*

---

## Removing and Replacing the Battery Cover

1. Ensure the phone is turned off.
2. Press down on the battery cover latch on the back of the phone and lift it up in the direction of the arrow, then lift the battery cover away from the phone (see Figure 3).



061558o

**Figure 3. Removing the Battery Cover**

3. To replace, align the battery cover to the back of the phone.
4. Gently press the battery cover into position until the battery cover snaps into place.

## Removing and Replacing the Battery

Before handling the battery, please observe the battery cautions listed below.

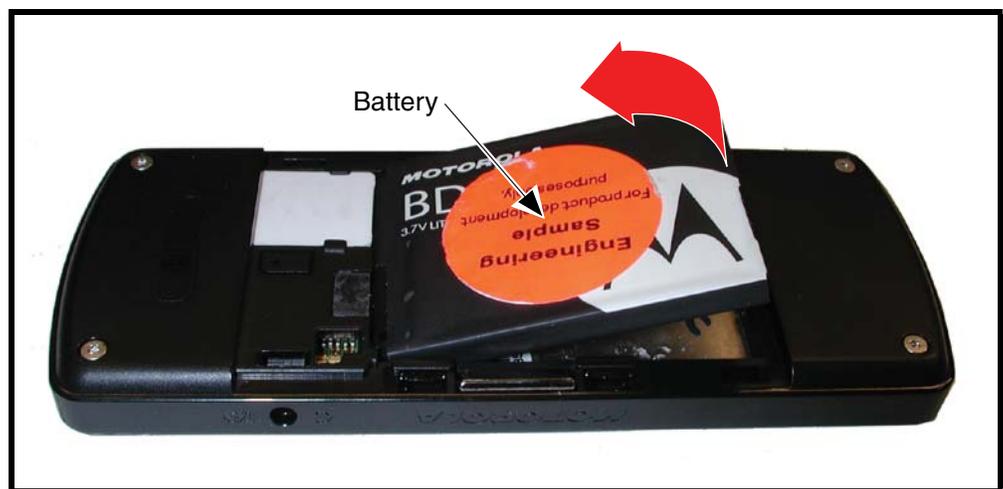


*Do not handle batteries with wet or sweaty hands.*

*Do not short the positive or negative terminals.*

*Non conductive tweezers or grasping tools are to be used for battery connector manipulation, assembly, and disassembly.*

1. Remove the battery cover, as described in the procedures.
2. Lift the end of the battery, as shown in Figure 4.
3. Lift the battery out of the battery compartment.



0615590

**Figure 4. Removing and Replacing the Battery**



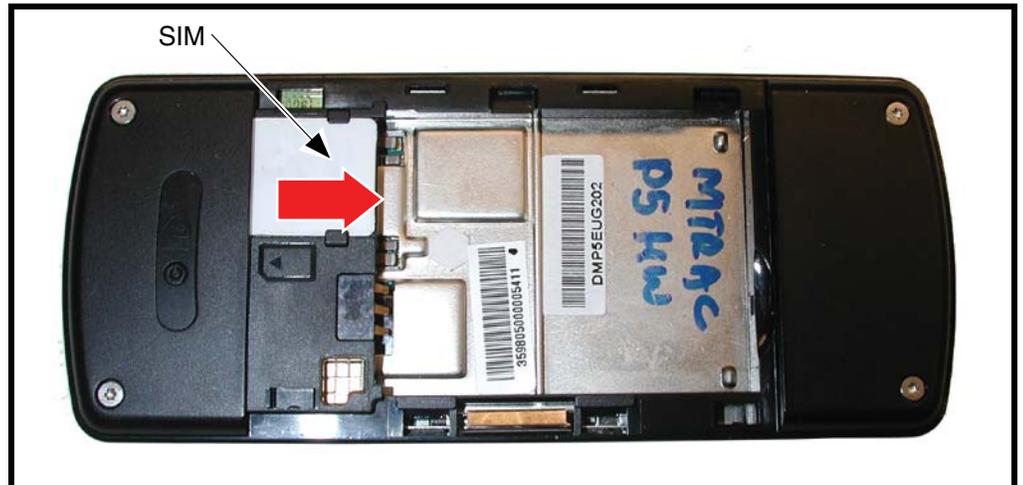
*There is a danger of explosion if the Lithium ion battery is replaced incorrectly. Replace only with the same type of battery or equivalent as recommended by the battery manufacturer. Dispose of used batteries according to the manufacturer's instructions.*

4. To replace, insert the bottom end of the battery into the battery compartment with contacts facing downward.
5. Press the top of the battery into the battery compartment.
6. Replace the battery cover as described in the procedures.

---

## Removing and Replacing the Subscriber Identity Module (SIM)

1. Remove the battery cover, and battery as described in the procedures.
2. Remove the SIM from the phone by sliding it in the direction indicated, as shown in Figure 5.



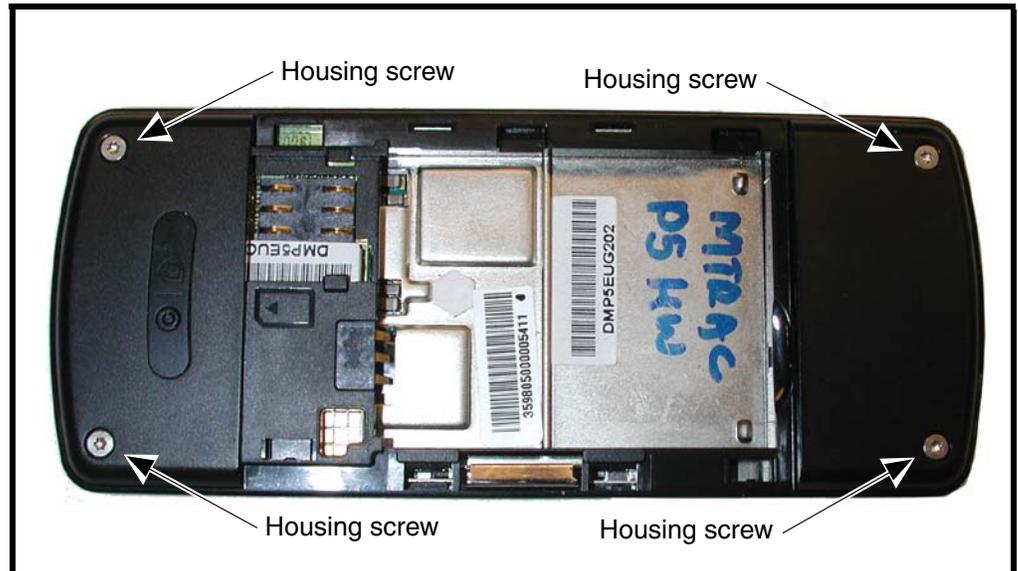
0615600

**Figure 5. Removing the SIM**

3. To replace, carefully slide the SIM all the way into the SIM holder. Observe the notched corner when inserting the SIM.
4. Replace the battery and the battery cover as described in the procedures.

## Removing and Replacing the Rear Housing

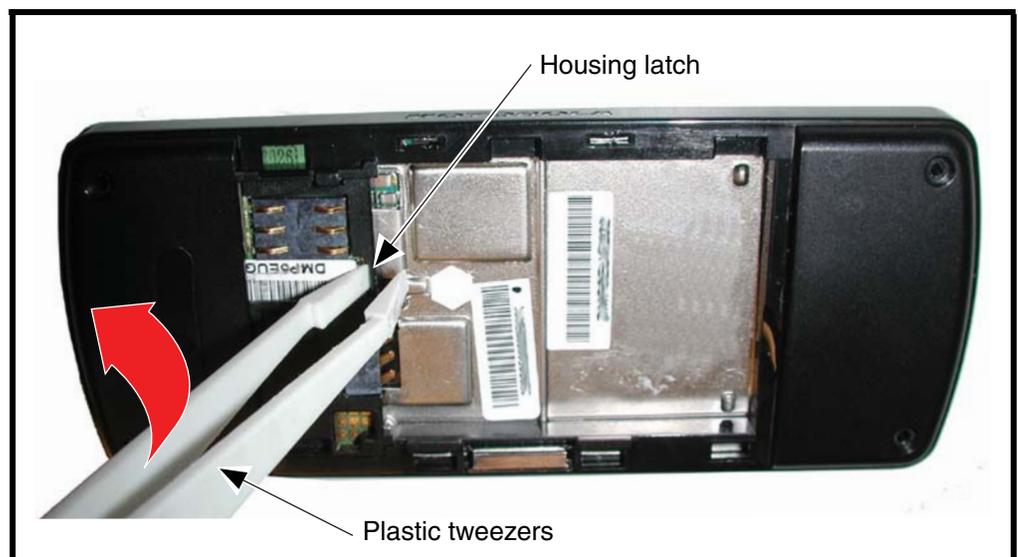
1. Remove the battery cover, battery, SIM, as described in the procedures.
2. Use a T5 driver to remove 4 housing screws (see Figure 6). Set the screws aside for reuse.



0615610

Figure 6. Housing Screw Locations

3. Use the plastic tweezers to release the housing latch next to the battery contacts, under the rear housing (see Figure 7).



0616040

Figure 7. Releasing the Housing Latch

4. Apply outward pressure to the left and right sides of the battery compartment to release the housing latches on the sides of the phone (see Figure 8).



0615620

**Figure 8. Releasing the Side Housing Latches**

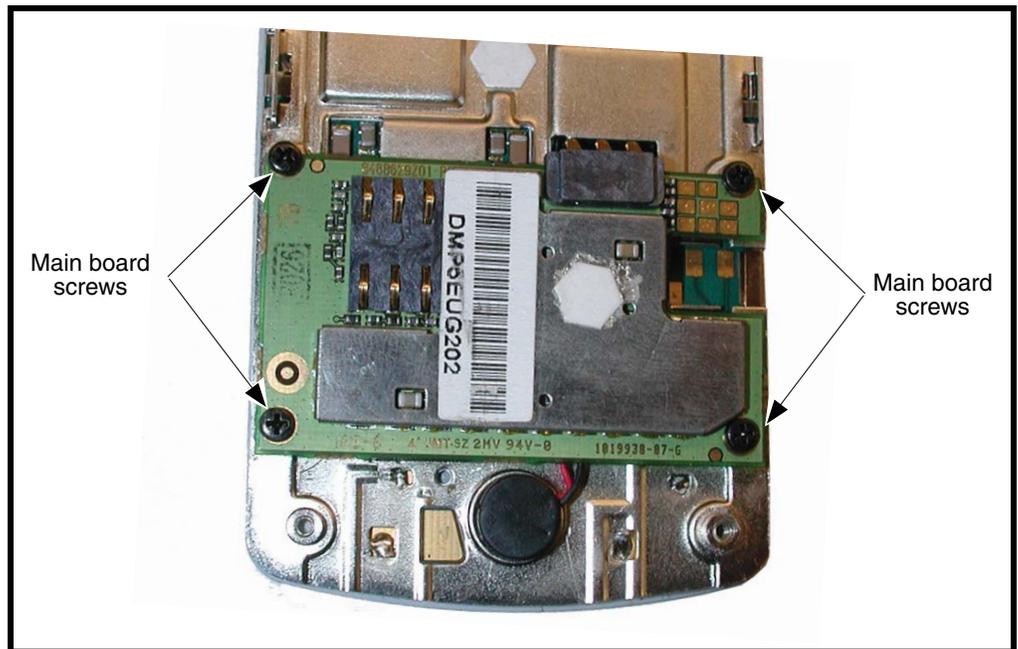
5. Carefully lift the rear housing from the phone.
6. To replace, align the rear housing to the phone.
7. Lower the rear housing onto the phone.
8. Gently press the rear housing onto the phone to engage the latches on the sides of the phone.
9. Engage the housing latch in the center of the phone by gently pressing on the rear housing near the battery contacts.
10. Insert and tighten the 4 housing screws using the T5 driver. Tighten to 8.9Ncm +/- 0.55. Do not overtighten.
11. Replace the SIM, battery, 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.*

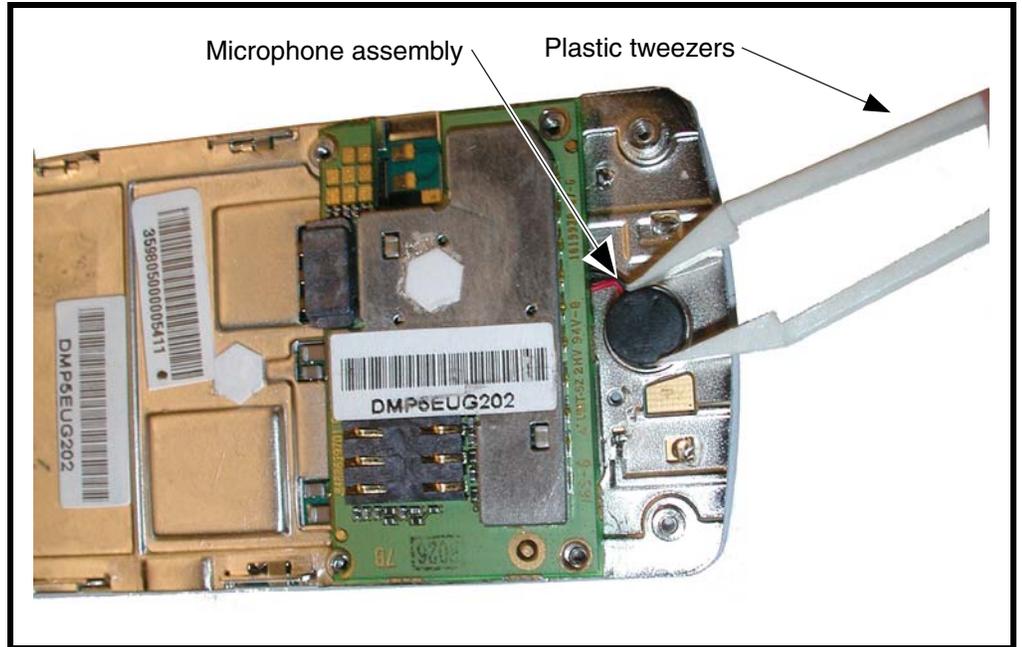
1. Remove the battery cover, battery, SIM, rear housing, as described in the procedures.
2. Use a size 0 Phillips screwdriver to remove the 4 main board screws (see Figure 9).



**Figure 9. Removing the Main Board Screws**

0615630

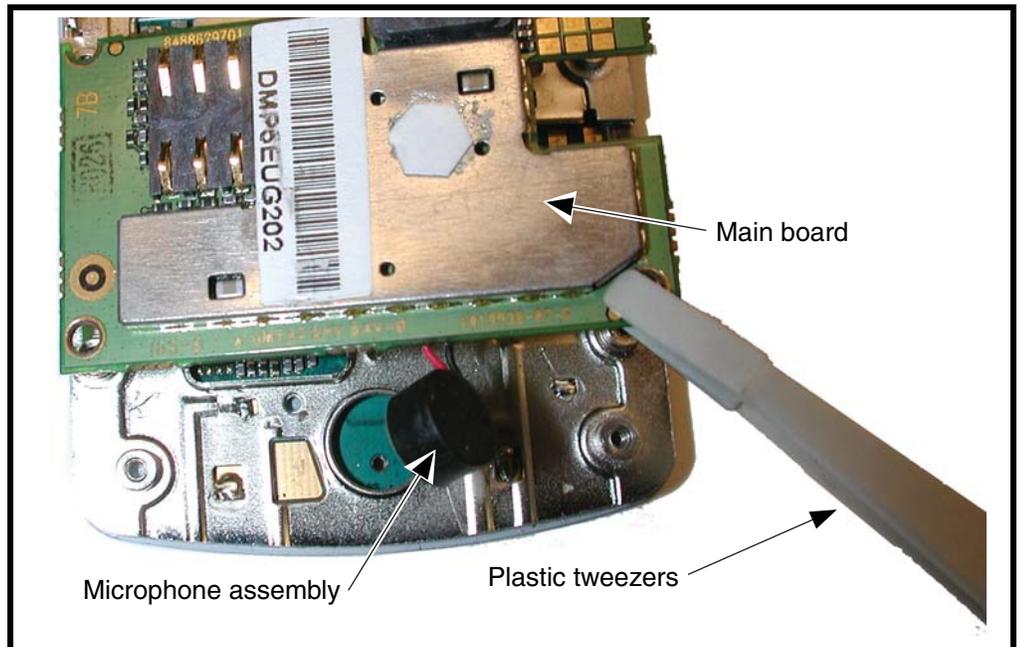
3. Use the plastic tweezers to lift the microphone assembly out of its place on the chassis. Avoid damage to the microphone wires.



061564o

Figure 10. Removing the Microphone Assembly

4. Carefully lift the main board from the front chassis.



061565o

Figure 11. Removing the Transceiver Board Assembly

5. To replace, align the main board assembly to the chassis.
6. Insert and tighten the 4 main board screws with the size 0 Phillips screwdriver.
7. Place the microphone assembly into the opening in the chassis. Avoid damage to the microphone wires.
8. Replace the rear housing, SIM, battery, and battery cover as described in the procedures.

---

## Removing the Keypad Lens



*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, rear housing, as described in the procedures.
2. Remove the keypad lens by carefully lifting one corner of the keypad lens by hand and peeling the entire keypad lens away from the chassis (see Figure 12).



0616140

**Figure 12. Removing the Keypad Lens**

## Subscriber Identity Module (SIM) and Identification Label

### SIM

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 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 information 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 13.

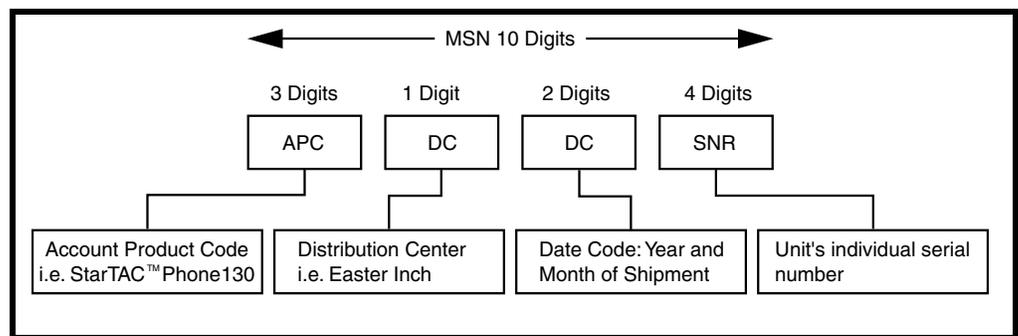


Figure 13. MSN label breakdown

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 2.

**Table 2. IMEI Number Breakdown**

TAC	Serial Number	Check Digit
NNXXXXXX	ZZZZZZ	A

Where

**TAC** Type Allocation Code, formerly known as Type Approval Code

**NN** Reporting body identifier

**XXXXXX** Type Identifier

**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 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 the voltage at TP_BATT+ with battery attached. If voltage is below 3.0V, attach a charger to the phone and ensure that the phone is charging. If the phone does not charge, change the battery and repeat the measurement charging procedure. If the phone still does not turn on, proceed to b).
	b) Transceiver board defective.	Forward unit to a level 3 service center for replacement.
2. Telephone exhibits poor reception or erratic operation such as calls frequently dropping or weak or distorted audio.	a) Speaker/antenna assembly defective	Check connection between the speaker/antenna assembly and the transceiver board. If the contact is intermittent visually, replace with a known good speaker/antenna assembly. If the fault is still present, proceed to b.
	b) Transceiver board defective.	Forward unit to a level 3 service center for replacement.
3. No display.	a) Connections between transceiver and display faulty.	Check connections between transceiver board and display. If display still does not come up, proceed to b.
	b) Display module defective.	Replace with a known good display module. Verify that the fault has been cleared with the new display module and reassemble the unit.
4. Incoming call alert transducer audio distorted or volume is too low.	a) Faulty antenna/speaker assembly.	Replace the antenna/speaker assembly with a known good antenna/speaker assembly. If the problem goes away, replace with a new antenna/speaker assembly. Else proceed to b.
	b) Transceiver board defective	Forward unit to a level 3 service center for replacement.
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	Forward unit to a level 3 service center for replacement.
6. Receive audio from earpiece speaker is weak or distorted.	a) Contacts between earpiece speaker and transceiver board faulty.	Replace the earpiece speaker with a known good one. Reassemble with a new front housing if the fault goes away. If the fault is still present, proceed to b.
	b) Transceiver board defective.	Forward unit to a level 3 service center for replacement.
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 goes away, replace the defective SIM card. If the SIM card is not at fault, proceed to b.
	b) Transceiver board defective	Forward unit to a level 3 service center for replacement.
8. No or weak audio when using headset.	a) Headset plug not pushed in fully.	Ensure the headset plug is fully seated in the jack.

---

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

Symptom	Probable Cause	Verification And Remedy
	b) Faulty jack on rear housing.	Replace the rear housing. Verify that the fault has been cleared and reassemble the unit with the new rear housing.

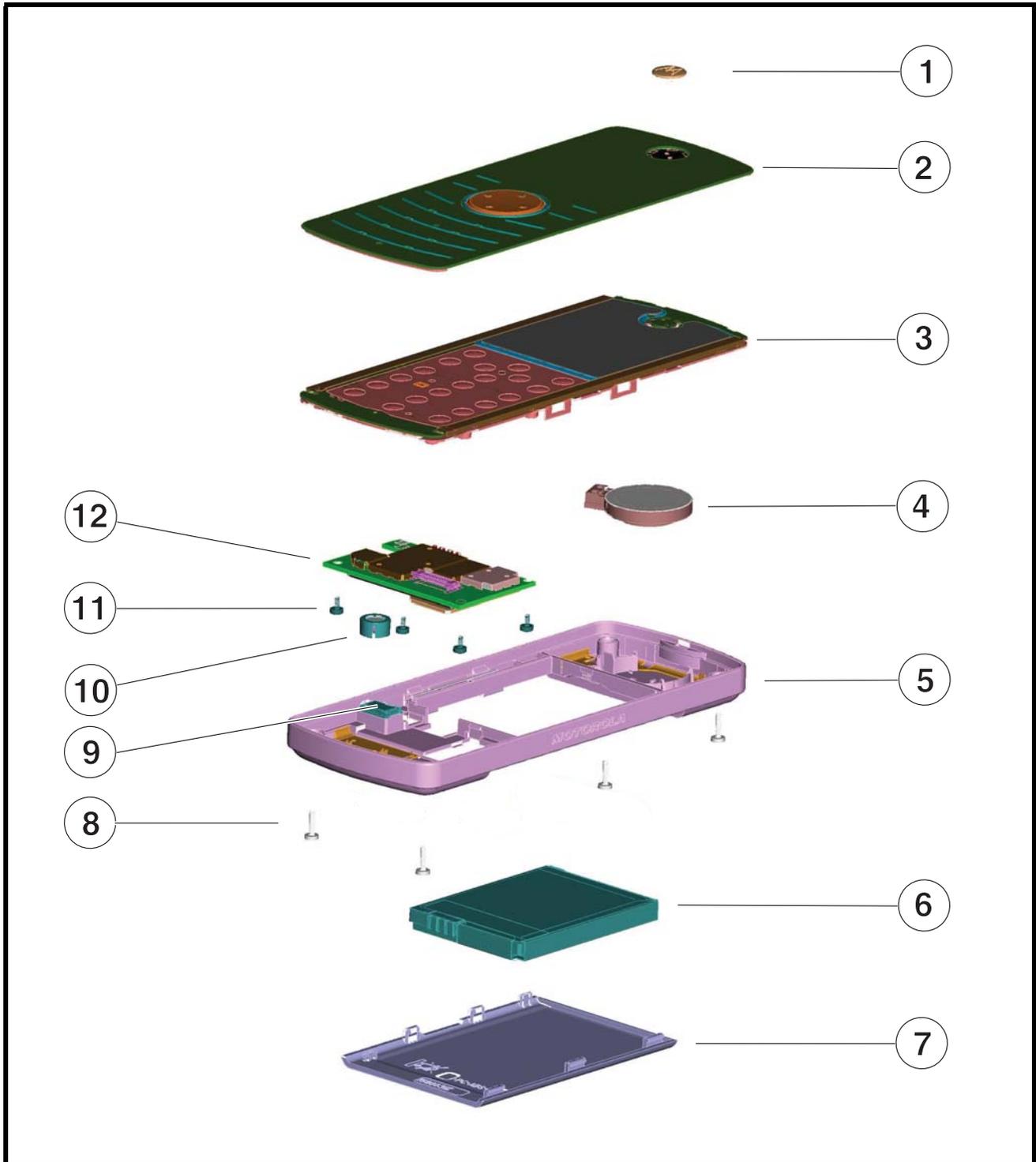
## Programming: Software Upgrade and Flexing

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

## Part Numbers

The following section provides a reference for the parts associated with F3 telephones.

### Exploded View Diagram



061549o

Figure 14. Exploded View Diagram

## Exploded View Parts List

Part numbers are provided only for reference. Contact your local Motorola parts organization for current part number information.

**Table 4. Exploded View Parts List**

Item Number	Motorola Part Number	Description
1	3388674Z01	Medallion
2		Keypad Lens assembly
2a	0188045Z06	US/Euro GREY
2b	0188045Z14	US/Euro RED
2c	0188045Z15	US/Euro BLUE
3		Keypad PCB Assembly
	CHLG4610	Euro Band
	CHLG4617	US Band
4	5088767Z02	Speaker/Vibrator Transducer
5		Rear Housing Assembly
	0164078T01	Euro Band
	0164078T02	US Band
6	SNN5796	Battery Pack
7	1588631Z01	Battery Door
8	0388668Z01	Screw M1.4x6 (4pcs)
9	0988673Z05	DC/Headset Jack
10	5088694Z01	Mic Assembly
11	0388691Z01	Screw M1.4x2.6 (4pcs)
12		PWA, Main PCB Assembly
	CHLG4614	Euro Band
	CHLG4616	US Band



*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.*

For information on ordering parts please contact EMEA at +49 461 803 1404.

## Accessories

**Table 5. Accessories**

Accessory Description	Kit Number
<b>Audio &amp; Connectivity</b>	
Mono Wired Headset (2.75mm barrel)	SYN1839A
TTY Adapter	SKN6242A
<b>In-Vehicle Solutions</b>	
Vehicle Power Adapter	SYN1829A
<b>Power Solutions</b>	

**Table 5. Accessories (Continued)**

Battery	SNN5796A
Travel charger (F3 only) - Argentina	SPN5326A
Travel charger (F3 only) - Australia	SPN5323A
Travel charger (F3 only) - BRAZIL	SPN5320A
Travel charger (F3 only) - EURO	SPN5324A
Travel charger (F3 only) - INDIA	SPN5322A
Travel charger (F3 only)- MEXICO	SPN5319A
Travel charger (F3 only) - PRC	SPN5318A
Travel charger (F3 only) - TWN	SPN5321A
Travel charger (F3 only) - UK/HK	SPN5325A
Travel charger (F3 only) - US ENG	SPN5317A

---

# Index

**A**

antenna, removing and replacing 26

**B**

battery

charge indicator 13

function 13

battery cover, removing and replacing 25

battery, removing and replacing 26

**C**

Canadian Interference-Causing Equipment regulations 5

changes

product 5

copyrights

computer software 6

**D**

disassembly 24

**E**

Electrophoretic Display (EPD) 13

EPD 13

exploded view diagram 38

exploded view parts list 39

**F**

FCC rules 5

**I**

identification

international mobile station equipment identity 35

mechanical serial number 34

product 5

identification, labels 34

IMEI 35

Introduction 5

**M**

microphone, removing and replacing 34

MSN 34

**N**

names

product 5

**O**

operation 12

battery 13

controls, indicators, and I/O connectors 12

overview, product 11

**P**

part numbers

accessories 39

parts

exploded view diagram 38

exploded view parts list 39

replacement parts 37

product

changes 5

identification 5

names 5

product overview 11

features 11

**R**

Rear Housing, removing and replacing 28

regulatory agency compliance 5

removing

antenna 26

battery 13, 26

battery cover 25

microphone 34

Rear Housing 28

SIM 27

transceiver board 34

Transceiver Board Assembly 30

replacement parts

ordering 7

replacing

antenna 26

battery 26

battery cover 25

microphone 34

Rear Housing 28

SIM 27

transceiver board 34

Transceiver Board Assembly 30

**S**

- serial number
  - mechanical 34
- service manual
  - about 6
  - audience 6
  - conventions 7
  - scope 6
- service policy 7
  - customer support 7
  - out of box failure 7
  - product support 7
- shut down
  - upon battery removal 13
- SIM, description 34
- SIM, removing and replacing 27
- specifications 9
- subscriber identity module (SIM) 34
- support
  - customer 7
  - product 7

**T**

- test equipment 23
- tools, disassembly 23
- Transceiver Board Assembly, removing and replacing 30
- transceiver board, removing and replacing 34
- troubleshooting
  - troubleshooting chart 36

**W**

- warranty service 7





**MOTOROLA**