MOTOROLA

Level 1 and 2 Service Manual

E365

Dual Band Wireless Telephone

E365
GSM 900/1800MHz

Contents

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 included in Product Family 0C85 (E365) telephones 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.

Regulatory Agency Compliance

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

1. This device may not cause any harmful interference, and
2. 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

About this Service Manual

Using this service manual and the suggestions contained in it assures proper installation, operation, and maintenance of E365 telephones. Refer questions about this manual to the nearest Customer Service Manager.

A product family is the group of products having the same Account Product Code (APC). To locate the APC on a device, refer to “Mechanical Serial Number (MSN)” later in this manual.

Audience

This manual aids service personnel in testing and repairing E365 telephones. Service personnel should be familiar with electronic assembly, testing, and troubleshooting methods, and with the operation and use of associated test equipment.

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

Scope

The scope of this document is to provide the basic information relating to E365 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, are used in this manual to emphasize certain types of information.

Note: Emphasizes additional information pertinent to the subject matter.

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

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

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

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

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

Warranty Service Policy

The product comes 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 will bear the costs of early life failure.

Product Support

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

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

U.S.A.	Outside U.S.A.
Phone: 800-422-4210	Phone: 847-538-8023
FAX: 800-622-6210	FAX: 847-576-3023

For EMEA spare parts call +44 131 479 1274.

For Asia spare parts call +65 648 62995.

Specifications

General Function	Specification
Frequency Range GSM	880-915 MHz Tx (with EGSM) 925-960 MHZ Rx
Frequency Range DCS	1710-1785 MHz Tx 1805-1880 MHz Rx
Channel Spacing	200 kHz
Channels	174 EGSM, 374 DCS carriers with 8 ch. per carrier
Modulation	GMSK at BT = 0.3
Transmitter Phase Accuracy	5 Degrees RMS, 20 Degrees peak
Duplex Spacing	45 MHz GSM, 95 MHz DCS
Frequency Stability	± 0.10 ppm of the downlink frequency (Rx)
Operating Voltage	+3.0V dc to +5.1V dc (battery) +4.4V dc to +6.5V dc (external connector)
Average Transmit Current	300 mA max
Average Stand-by Current	7 mA max
Dimensions	107 mm x 45 mm x 19.5 mm (4.2 inches x 1.7 inches x 0.76 inches)
Size (Volume)	80 cc (4.8 in^3)
Weight	93 gm (2.9 oz)
Temperature Range	-10° C to +55° C (+15° F to +130° F)
Battery Life, 740 mAh Li Ion Battery	Talk time up to 640 minutes Standby time up to 150 hours
	All talk and standby times are approximate and depend on network configuration, signal strength, and features selected. Standby times are quoted as a range from DRX=2 to DRX=9. Talk times are quoted as a range from DTX off to DTX on.

Transmitter Function	Specification
RF Power Output	32 dBm nominal GSM 900 29 dBm nominal GSM 1800 30 dBm nominal DCS
Output Impedance	50 ohms nominal
Spurious Emissions	-36 dBm from 0.1 to 1 GHz, -30 dBm from 1 to 4 GHz

Receiver Function	Specification
Receive Sensitivity	-107 dBm GSM 900, -106 dBm GSM 1800, -105 dBm DCS
RX bit error rate (100k bits) Type II	< 2%
Channel Hop Time	500 microseconds
Time to Camp	Approximately 5-10 seconds

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

Product Overview

Motorola E365 mobile telephones feature global system for mobile communications (GSM) air interface, general packet radio service (GPRS) transport technology, and wireless application protocol (WAP) Internet browser. The mobile telephone uses a simplified icon and graphical-based user interface (UI) for easier operation, allows short message service (SMS) text messaging, and include clock, alarm, datebook, calculator, and caller profiling personal management tools. The E365 is a dual band phone that allows roaming within the GSM 900 MHz and digital cellular system (DCS) 1800 MHz bands.

E365 telephones support GPRS and SMS in addition to traditional circuit switched transport technologies. GPRS, where available, provides substantial increases in mobile data communications performance and the efficient use of radio spectrum. Data transmission rates for GSM networks can potentially increase from the current rate of 9.6 kbps up to a theoretical maximum of 171.2 kbps. An increased data rate is by no means the only benefit provided by GPRS. A key advantage is the provision of a permanent virtual connection to the network. This “always on” connection is possible because GPRS uses packet data transfer so that, for example, email can be downloaded in “background mode.” There is no need for the user to re-connect before requesting a service, eliminating connection set-up delays and adding convenience and immediacy to data services access. The “virtual” nature of this connection means that network resources are not consumed during periods when a user is not actually sending or receiving data.

The telephones are made of polycarbonate plastic with a metal enclosure. The display and speaker, as well as the 16-key keypad, transceiver printed circuit board (PCB), microphone, charger and headphone connectors, and power button are contained within the candy bar form-factor housing. The user-replaceable 740 mAh Lithium Ion (LiIon) battery provides up to 640 minutes of talk time with up to 150 hours of standby time[1]. The phone accepts 3V mini subscriber identity module (SIM) cards which fit into the SIM holder next to the battery. These telephones feature a 128 x 160 pixel high-resolution color graphics display and an internal antenna.

Features

E365 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:

- Lower voltage technology that provides increased standby and talk times
- Extended GSM (EGSM) channels
- Tri-coder/decoder (CODEC) that allows full rate, half rate, and enhanced full rate modes of transmission
- Supports SMS, concatenated SMS, MMS, QICQ and cell broadcast messages[2]
- Supports GPRS, circuit switched, and SMS networks[2]
- WAP 2.0 compliant[2]

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

- 128 X 160 pixel 65K color graphical display with 4 lines of text, 1 line of icons, and 1 line of prompts
- Embedded VGA Camera
- Display animation
- VibraCall® vibrating alert
- 4-Way navigation key
- Downloadable wallpaper, icons, animations and MIDI ring tones[3]
- Polyphonic speaker supporting 128 different instruments
- Menu Shortcuts, Voice activation for phone book entries
- Simplified text entry using iTAP™ predictive text entry
- Caller line identification (CLI) [3]
- Supports call diverting for incoming voice calls[3]
- Supports 3V SIM cards
- SIM Toolkit™ Class 2 (STK)[3]
- Personal management tools calculator with currency converter, real time clock with date, reminders, and caller profiling
- Phase II Unstructured Supplementary Service Data (USSD)[3]
- Hearing Aid Telephone Interconnection System (HATIS) support
- Chat messaging via WAP over GPRS[3]
- Multiple destination SMS
- TrueSync™ Multi-Point Synchronization Capability

Speaker Dependant Voice Activation

The voice dialing feature allows the user to recall pre-programmed voice numbers simply by pressing the Voice/Ok key and speaking the desired voice tag. Up to 10 voice tags can be stored.

The user 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.

Wireless Access Protocol (WAP) 1.1 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.

The E365's microbrowser can be configured for baud, idle timeout, line type, phone number, and connection type.

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

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

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

Simplified Text Entry

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.

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, an incoming call message is displayed.

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

SIM 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.

Network Based Chat Messaging

The chat messaging feature provides a constant WAP connection through GPRS to carrier, service center, or factory flexed WAP site. The specific site can also be entered by the user. Chat messaging is a carrier option.

Personal Information Management

The E365 telephone contains a built in calendar with date book reminders and phonebook that can be synchronized easily to a computer or PDA.

Camera

The E365 Telephone contains a built-in camera. You can take photos to view and send as Multimedia Messaging Service (MMS) messages.

Other Features

Detailed descriptions of the other features can be found in the appropriate E365 telephone user guides listed in the Related Publications section toward the end of this manual.

General Operation

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

The E365 telephones' controls are located on the front and side of the device, and on the keyboard as shown in Figure 1. Indicators, in the form of icons, are displayed on the LCD (see Figure 2).

Figure 1. E365 Telephone Controls and Indicators Locations

Menu Navigation

E365 telephones are equipped with a simplified icon and graphical-based user interface. The phone also features a user-definable Quick Access menu that is accessed by holding down the MENU key. See Figure 3 for details of the E365 menu structure. A 4-way navigation key allows you to move easily through menus. The 4-way navigation key functions as a speaker volume up/down key only during a call. The 4-way navigation key when pressed UP provides a shortcut to the Quick Access list. When the 4-way navigation key is pressed DOWN, provides a shortcut to voice commands.

Liquid Crystal Display (LCD)

The LCD provides an 832 square millimeter multicolor backlit color display with user-adjustable contrast settings for optimum readability in all light conditions. The large bit-mapped 128 x 96 pixel display includes up to 4 lines of text, 1 line of icons, and 1 line of prompts.

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

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

Figure 2 shows some common icons displayed on the LCD.

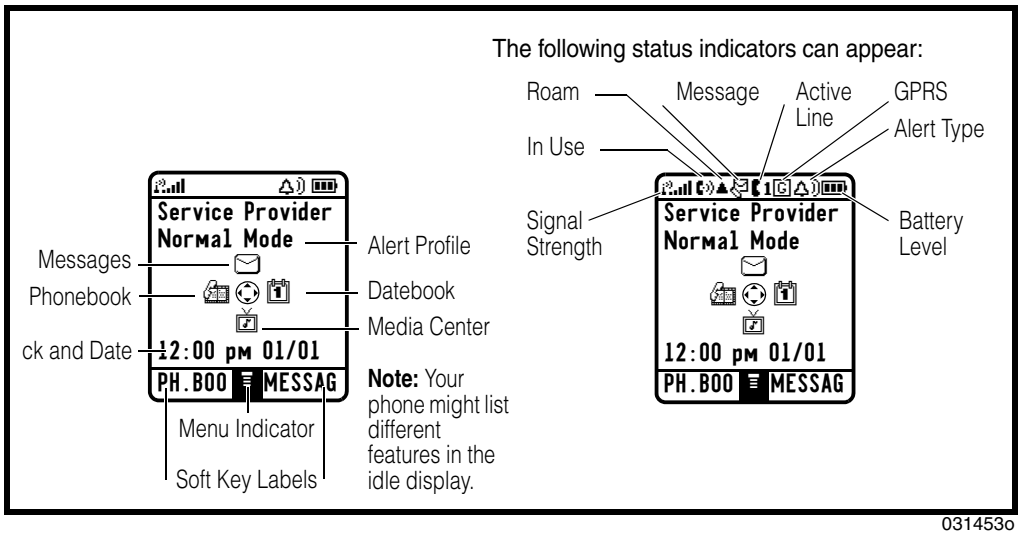

Figure 2. E365 Display Icon Indicators

- **Signal Strength** 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** icon indicates a call in progress.
- **Roam Indicator** icon 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**[4] appears when the phone receives a text message.
- **Voice Message Waiting Indicator**[4] icon indicates when the phone receives a voicemail message.
- **Battery Level Indicator** shows the amount of charge left in the battery.
- **Real Time Clock** shows the current time.
- **Menu Indicator** provides access to the phone's main menu.
- **GPRS Indicator**[4] indicates when the phone is currently functioning in

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

GPRS mode.

- **Alert Setting Indicator** indicates the phones current ringer alert setting.

User Interface Menu Structure

Figure 3 shows a portion of the E365 telephone menu structure.

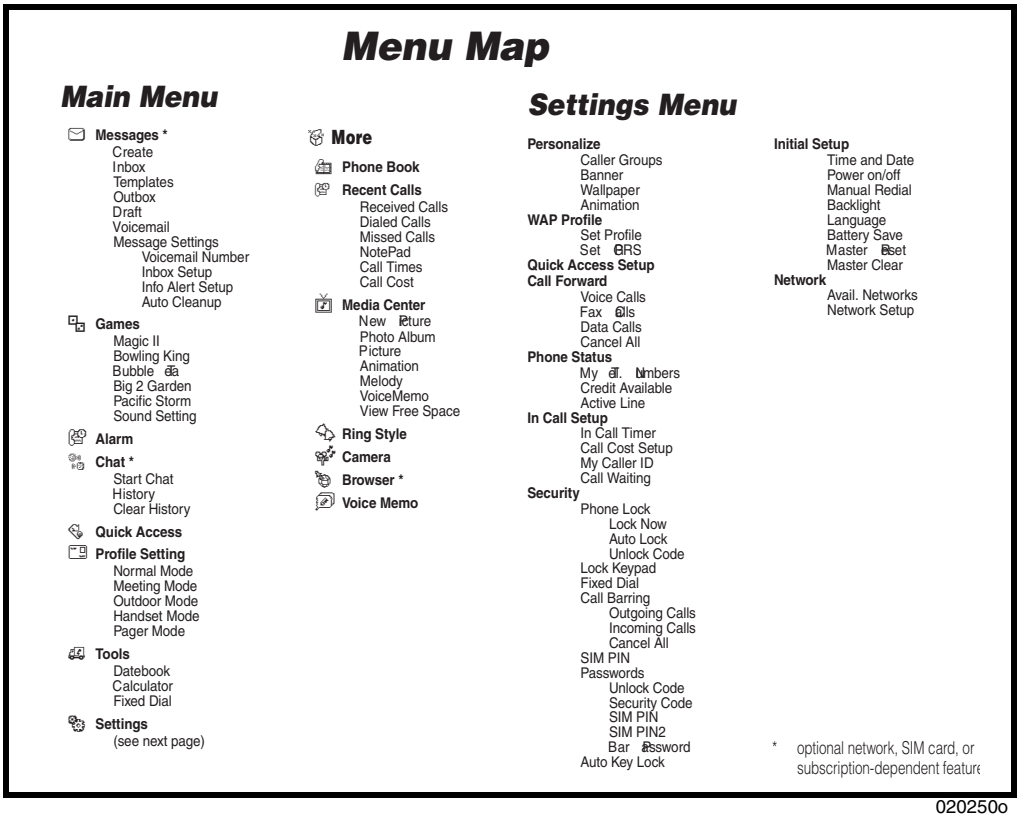

Figure 3. E365 Menu Structure

Alert Settings

In addition to 11 preset ring tones, E365 telephones allow the user to download 2 additional ring tones via SMS to your PC. (Availability is carrier and Network dependant).

Motorola E365 phones incorporate the VibraCall® discreet vibrating alert that helps to avoid disturbing others when a ringing phone is unacceptable.

Alerts can be set to ring only, vibrate only, vibrate then ring, or no ring or vibrate

Additionally, the profiling feature allows users to identify incoming calls by a specific ringer tone.

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 shut down immediately and loose any pending work (partially entered phone book entries or outgoing messages, for example).

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 is 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 toward the end of this manual.

Tools and Test Equipment

Table 1 list the tools and test equipment used on E365 telephones. Use either the listed items or equivalents.

Table 1. General Test Equipment and Tools

Motorola Part Number[1]	Description	Application
See Table 6	Charger	Used to charge battery and 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
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
HP34401A[2]	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 by fax (847) 576-3023.
2. Not available from Motorola. To order, contact Hewlett Packard at (800) 452-4844.

Disassembly

This section describes how to disassemble an E365 telephone. Tools and equipment used are listed in Table 1, preceding.

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

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. Press the sides of the battery cover near the top of the battery cover to release the battery cover latches.
3. Slide the battery cover in the direction of the arrow, and lift the cover away from the phone (see Figure 4).

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Figure 1. Removing the Battery Cover

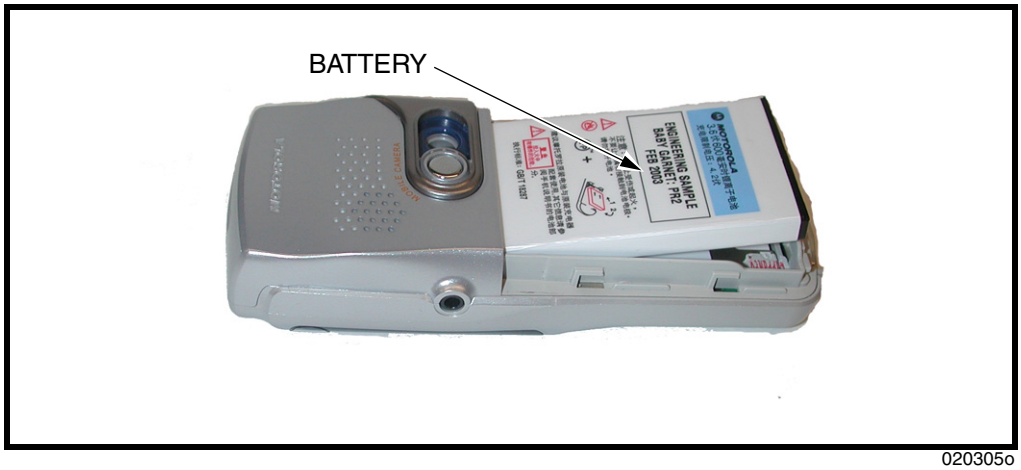

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Figure 2. Removing the Battery

4. Remove the battery by lifting its bottom end from the battery compartment and sliding it up and away from the compartment as shown in Figure 5.

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.

5. To replace, align the battery with the battery compartment so the terminals on the battery match the battery contacts in the phone.
6. Slide the top of the battery into the receptacle molded into the housing, then press the bottom end of the battery securely into the battery compartment.
7. Line up the battery cover with the rear housing, then slide it forward until it snaps into place.

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 it's holder by sliding it in the direction of the arrow as shown in Figure 6.

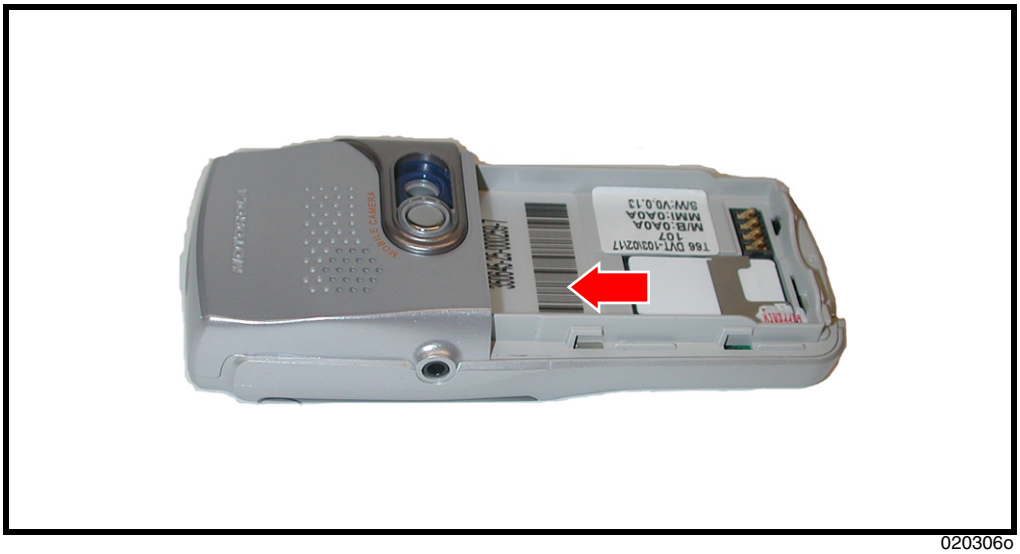

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Figure 3. Removing the SIM

3. To replace, carefully slide the SIM into position in its socket. The latch secures the SIM when correctly positioned over the terminals in the phone.
4. Replace the battery and battery cover as described in the procedures.

Removing and Replacing the Front Housing

1. Remove the battery cover, battery, and SIM as described in the procedures.
2. Use the disassembly tool to release the 3 housing latches on each side of the phone as shown in Figure 9
3. Lift the bottom end of the housing away from the phone.
4. Insert the disassembly tool into the top end of the housing to disengage the two latches at the top of the phone. Avoid damaging the two latches at the top end of the phone.
5. Carefully lift the front housing away from the phone.

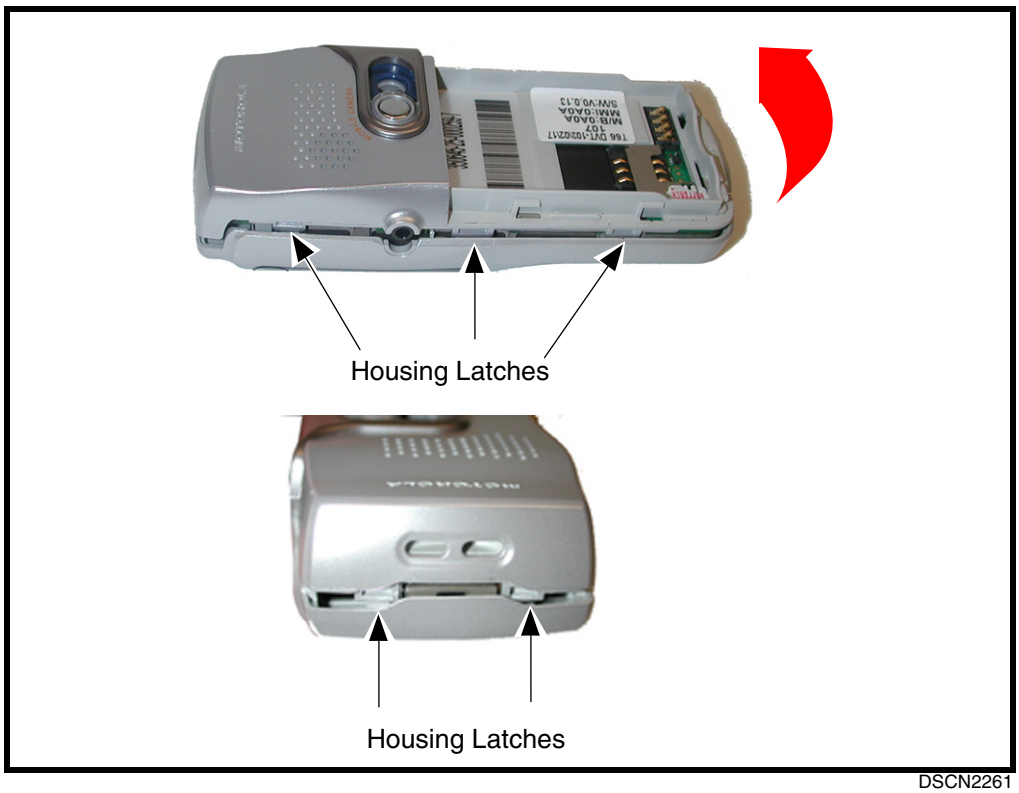

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Figure 4. Removing the Front Housing Cover

6. To replace, align the front housing to the phone.
7. Carefully engage the two latches at the top of the phone.
8. Gently lower the bottom end of the front housing into position onto the phone.
9. Press the front housing cover into place, allowing the housing latches on the side of the phone to snap into position.
10. Replace the SIM, battery, and battery cover as described in the procedures.

Removing and Replacing the Vibrator Motor

1. Remove the battery cover, battery, SIM, front housing, as described in the procedures.

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

2. Use the disassembly tool to remove the vibrator motor out of the housing as shown in Figure 8.

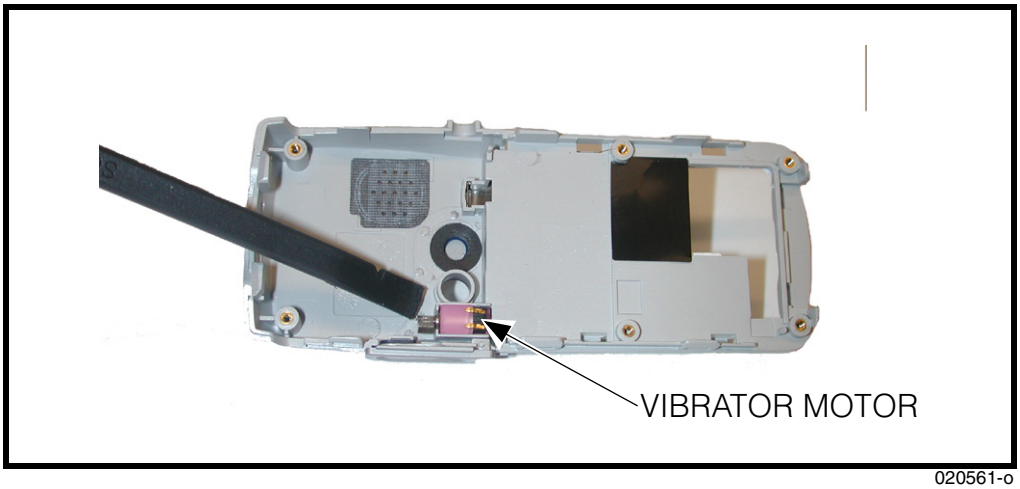

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Figure 5. Removing the Vibrator Motor

3. To replace, align the vibrator motor with its space in the rear housing.
4. Gently press the vibrator motor into position in the rear housing.
5. Replace the front transceiver board, front housing cover, faceplate, the SIM, battery, and battery cover as described in the procedures.

Removing and Replacing the Keypad

1. Remove the battery cover, battery, the SIM, and faceplate as described in the procedures.
2. Use the tweezers to lift the keypad up and away from the front housing as shown in Figure 9.

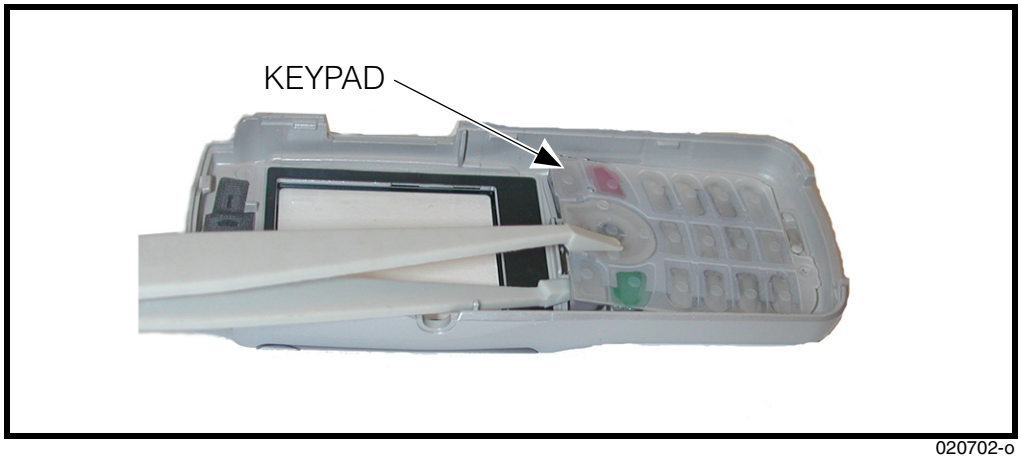

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Figure 6. Removing the Keypad

3. To replace, insert the keypad into the front housing. Ensure the keys align properly with the openings and the keypad is fully seated in the faceplate.
4. Replace the faceplate, the SIM, battery, and battery cover as described in the procedures.

Removing the Antenna/Speaker/Camera Assembly

1. Remove the battery cover, battery, SIM, front housing, as described in the procedures.
2. Use the disassembly tool to unhook one latch on each side of the transceiver board under the antenna/speaker/camera assembly (See Figure 14).
3. Rotate the Antenna/Speaker/Camera Assembly away from the transceiver board to expose the flex cable and flex connector socket.
4. Gently lift open the connector socket and remove the flex cable from the socket.

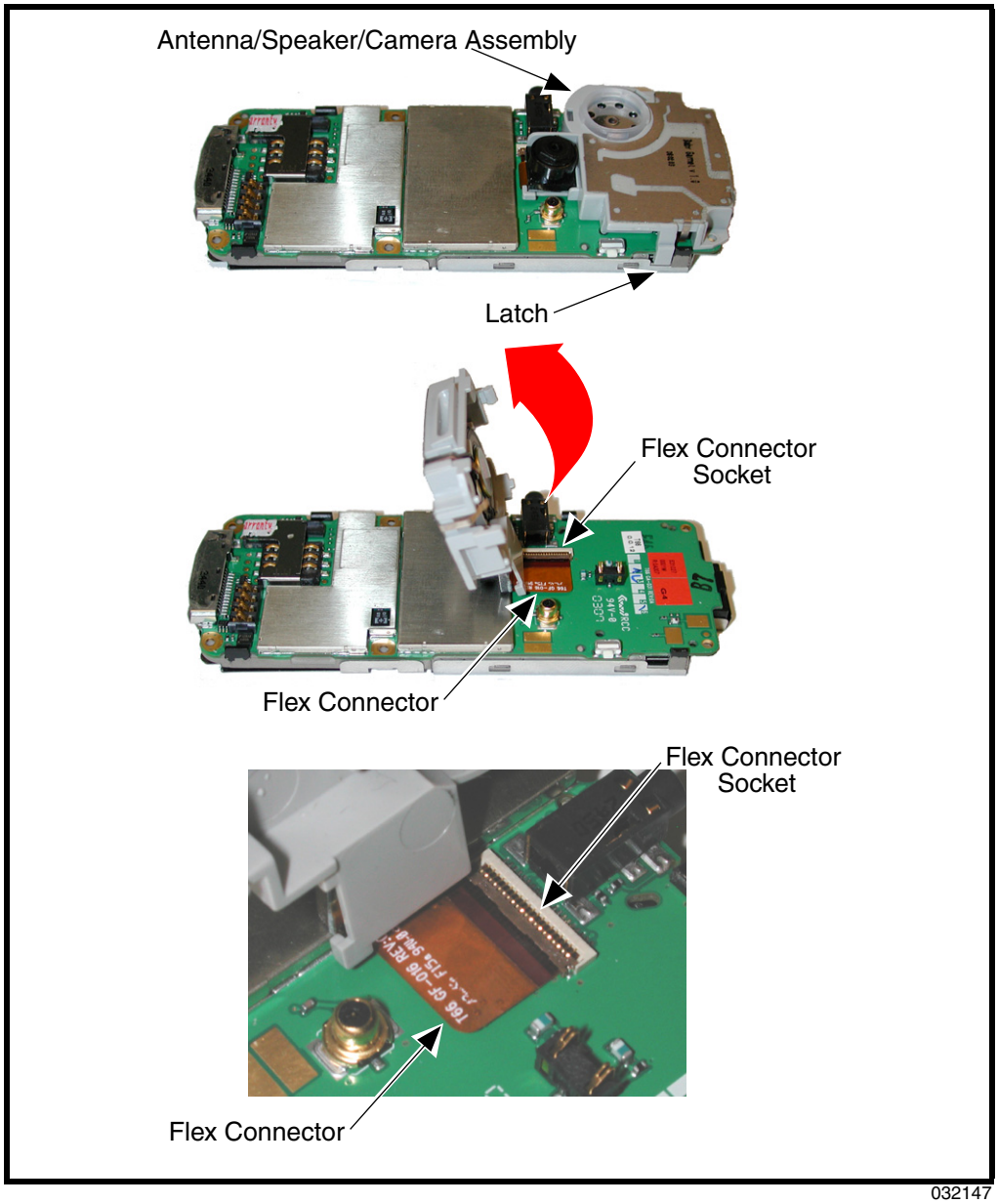

Figure 7. Removing the Antenna.Speaker Holder Assembly

5. To replace, align the Antenna/speaker/camera assembly to the transceiver board.
6. Open the flex connector socket and insert the Flex into the flex connector socket.
7. Close the flex connector to secure the flex to the connector socket.
8. Rotate the antenna/speaker/camera assembly down onto the transceiver board.
9. Gently press the assembly to the transceiver board until the latch on each side of the antenna/speaker/camera assembly snaps into position. Ensure that the antenna/speaker/camera assembly is correctly seated on the transceiver board.
10. Replace the transceiver pc board assembly, front and rear housings, SIM, battery and battery cover as described in the procedures.

Removing and Replacing the LCD Display Bracket

1. Remove the battery cover, battery, SIM, and front housing cover as described in the procedures.
2. Using the flat end of the disassembly tool to gently release the 5 latches that secure the LCD bracket to the transceiver pc board (See Figure 11).
3. Carefully lift the LCD display bracket from the front housing. Be careful not to bend or crease the bracket.

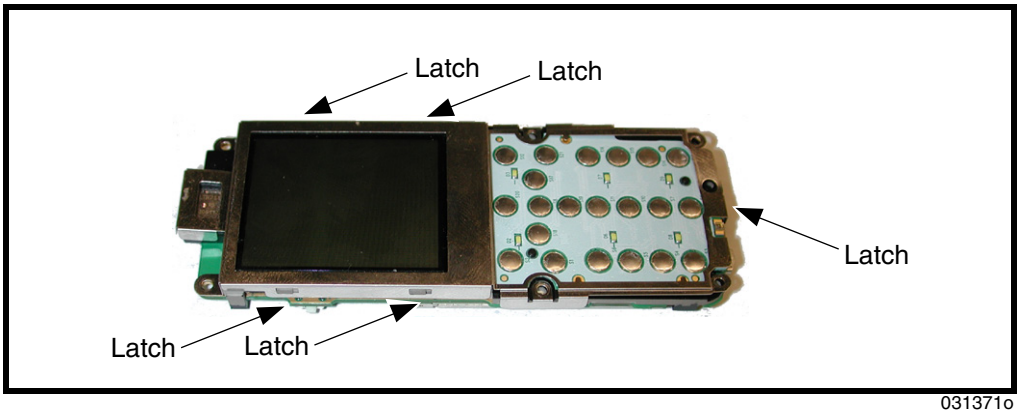

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Figure 8. Removing the LCD Display Bracket

4. To replace, align the LCD bracket to the transceiver board.
5. Gently press the LCD bracket into place.
6. Ensure all 5 latches snap securely into position.
7. Replace the front housing cover, transceiver board, rear housing, SIM, battery, and battery cover as described in the procedures.

Removing the Earpiece Speaker

1. Remove the battery cover, battery, SIM, front housing, PCB assembly, LCD bracket as described in the procedures.
2. Use the disassembly tool or the plastic tweezers to lift the speaker out of its socket in the plastic spacer (See Figure 12).

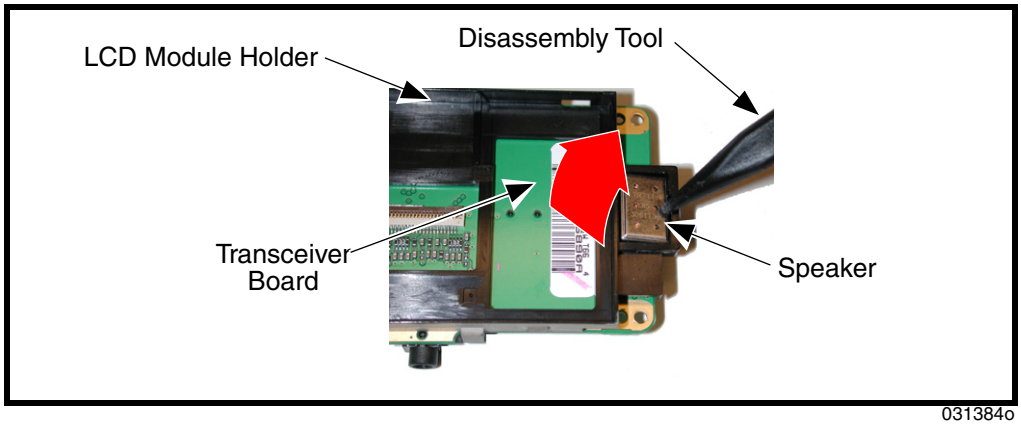
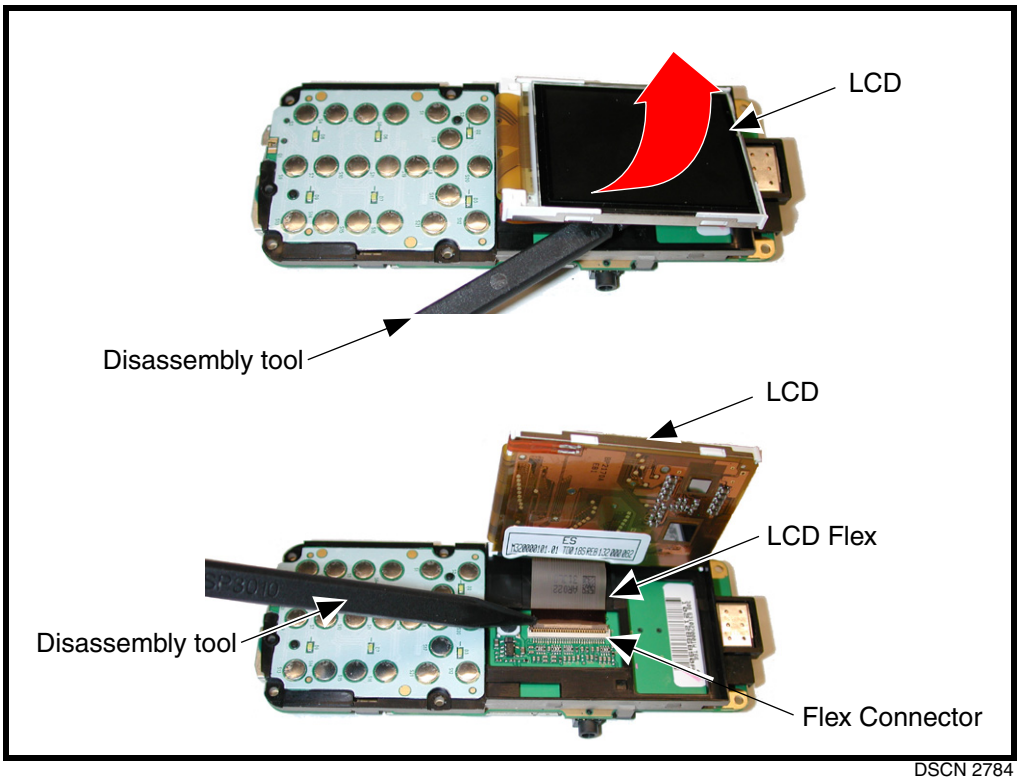


Figure 9. Removing the Earpiece Speaker

3. To replace, align the speaker to its socket on the Plastic spacer.
4. Place the speaker into the socket. Ensure that the speaker leads contact the transceiver board below it.
5. Replace the LCD bracket, PCB assembly, front housing, SIM, battery and battery cover as described in the procedures.

Removing the Color LCD Module

1. Remove the battery cover, battery, SIM, LCD bracket, LCD/keypad assembly as described in the procedures.
2. Use the disassembly tool to lift the side of the LCD module out of its socket on the plastic LCD display holder (See Figure 13).
3. Rotate the LCD Module up to expose the LCD flex cable and flex connector.
4. Use the disassembly tool to unlock the flex connector socket and release the LCD Flex from the flex connector socket.
5. Lift the LCD module away from the LCD module holder.



DSCN 2784

Figure 10. Removing the Color LCD Module

Removing and Replacing the plastic LCD module holder

1. Remove the battery cover, battery, SIM, rear housing, PCB assembly, antenna/speaker/camera, LCD bracket, LCD color module, and earpiece speaker as described in the procedures.
2. Use the disassembly tool to carefully pry the switch dome PC board out of its socket connector on the transceiver board. Remove the switch dome PC board.
3. Turn the assembly over and locate the 4 LCD module holder latches.
4. Use the plastic tweezer or disassembly tool to release the 4 latches that secure the LCD module holder to the transceiver board (See Figure 14.

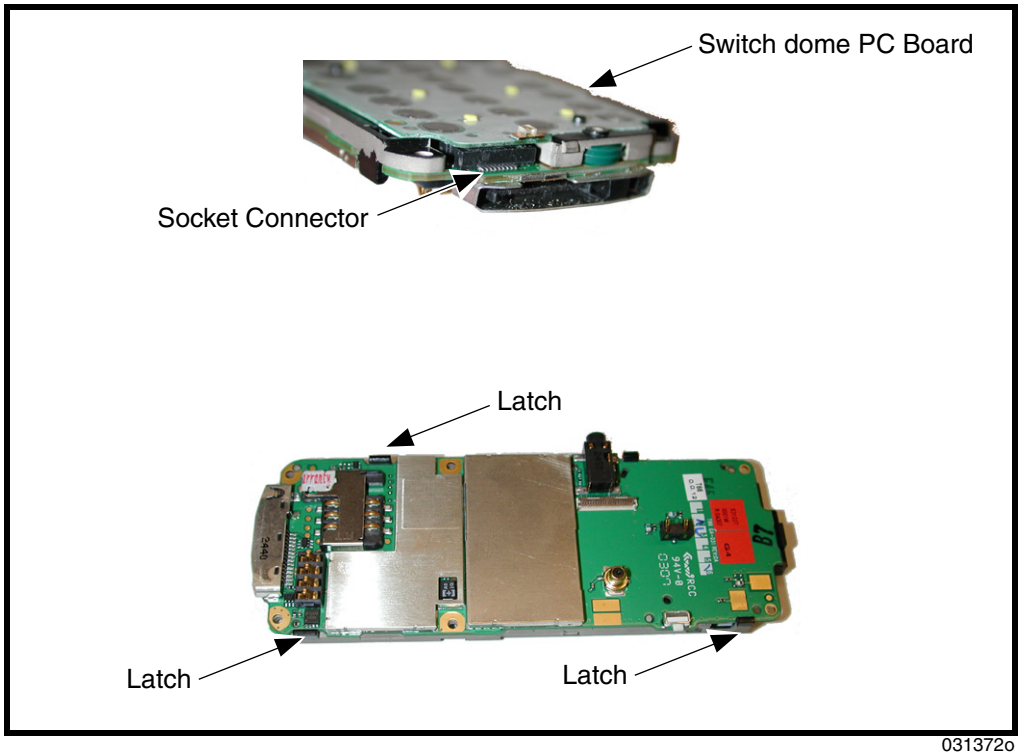


Figure 11. Removing LCD Module Holder

5. To replace, align the LCD module holder to the transceiver board.
6. Gently lower the LCD module holder onto the transceiver board.
7. Press the 4 latches so that they snap into position to secure the LCD module holder.
8. Press the switch dome PC board connector into the socket connector.
9. Replace the Color LCD module, earpiece speaker, LCD bracket, front housing, SIM, battery, and battery cover as described in the procedures.

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 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 15.

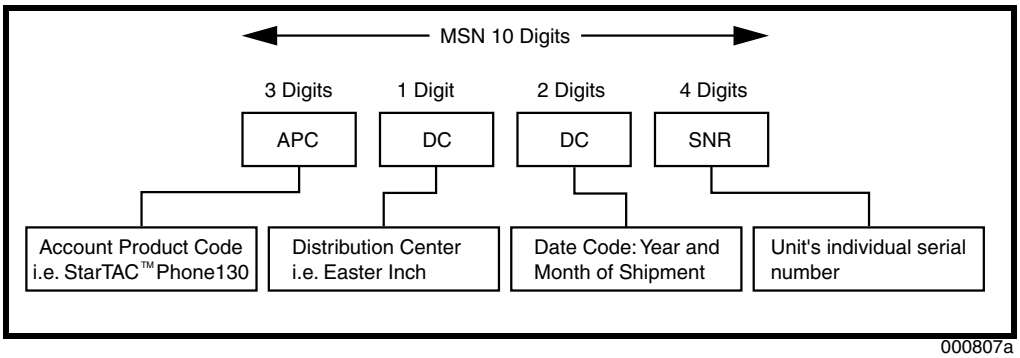


Figure 12. MSN label breakdown

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

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 & 2+= check digit and is 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

Manual Test Mode

Motorola E365 telephones are equipped with a manual test mode capability. This allows service personnel to verify functionality and perform fault isolation by entering keypad commands.

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

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

Manual Test Mode Commands

Table 3. Manual Test Commands

Key Sequence	Test Function/Name	Remarks
<Menu>048263*	Enter manual test mode	
"End" Key	Exit manual test mode	
54*	Suspend	Required for all Test Mode Operations
0*0*0	Select tone 0	
0*0*1	Select tone 1	
0*0*2	Select tone 2	
0*0*3	Select tone 3	
0*0*4	Select tone 4	
0*0*5	Select tone 5	
0*0*6	Select tone 6	
0*0*7	Select tone 7	
0*0*8	Select tone 8	
0*0*9	Select tone 9	
0*1*X	Disable tone X	
3*0*1	Enable vibrator	
3*0*0	Disable vibrator	
5*0*0	Set audio level 0	
5*0*1	Set audio level 1	
5*0*2	Set audio level 2	
5*0*3	Set audio level 3	
5*0*4	Set audio level 4	
5*0*5	Set audio level 5	
5*0*6	Set audio level 6	
5*0*7	Set audio level 7	

Table 3. Manual Test Commands (Continued)

Key Sequence	Test Function/Name	Remarks
5*0*8	Set audio level 8	
5*0*9	Set audio level 9	
5*0*10	Set audio level 10	
5*0*11	Set audio level 11	
5*0*12	Set audio level 12	
5*0*13	Set audio level 13	
5*0*14	Set audio level 14	
5*0*15	Set audio level 15	
6*2*2*0*0	Set Audio Path. Int Mic, IntSpk, RX unmute, TX unmute	
6*4*6*0*0	Set Audio Path. Boom Mic, Boom Spk, RX unmute, TX unmute	
10*0*3	Set band GSM 900	
10*0*4	Set band DCS 1800	
10*0*5	Set band PCS 1900	
10*0*6	Set dual band GSM 900 / 1800	
10*1*0	Read band	3= GSM 4= DCS 5= PCS 6 =GSM/DCS
18*0	Initialize non-volatile memory (Master Reset)	
18*1	Initialize Non-volatile memory (Master Clear)	
55*2*001	Test Display. All pixels ON	
55*2*000	Test Display. All pixels OFF	
55*2*002	Test Display. Checkerboard pattern A	
55*2*003	Test Display. Checkerboard pattern B	
55*2*004	Test Display. Border pixels ON	
*#06#	IMEI Check	No Test Mode Required
Phone Set up --> Phone Status --> Other Information	Flex Version / Technology / S-W Version / Readiness Status	No Test Mode Required

Troubleshooting Chart

Table 4. PF 0C27 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 4. PF 0C27 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 SIM card.	a) SIM card defective.	Check the SIM card contacts for dirt. Clean if necessary, and check if fault has been cleared. If the contacts are clean, insert a known good SIM card into the telephone. Power up the unit and confirm that the card has been accepted. If the fault no longer exists, replace the defective SIM card. If the SIM card is not at fault, proceed to b.
	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 E365 telephones.

Related Publications

Motorola E365 Wireless Phone User Guide	6809444A38

Exploded View Diagram

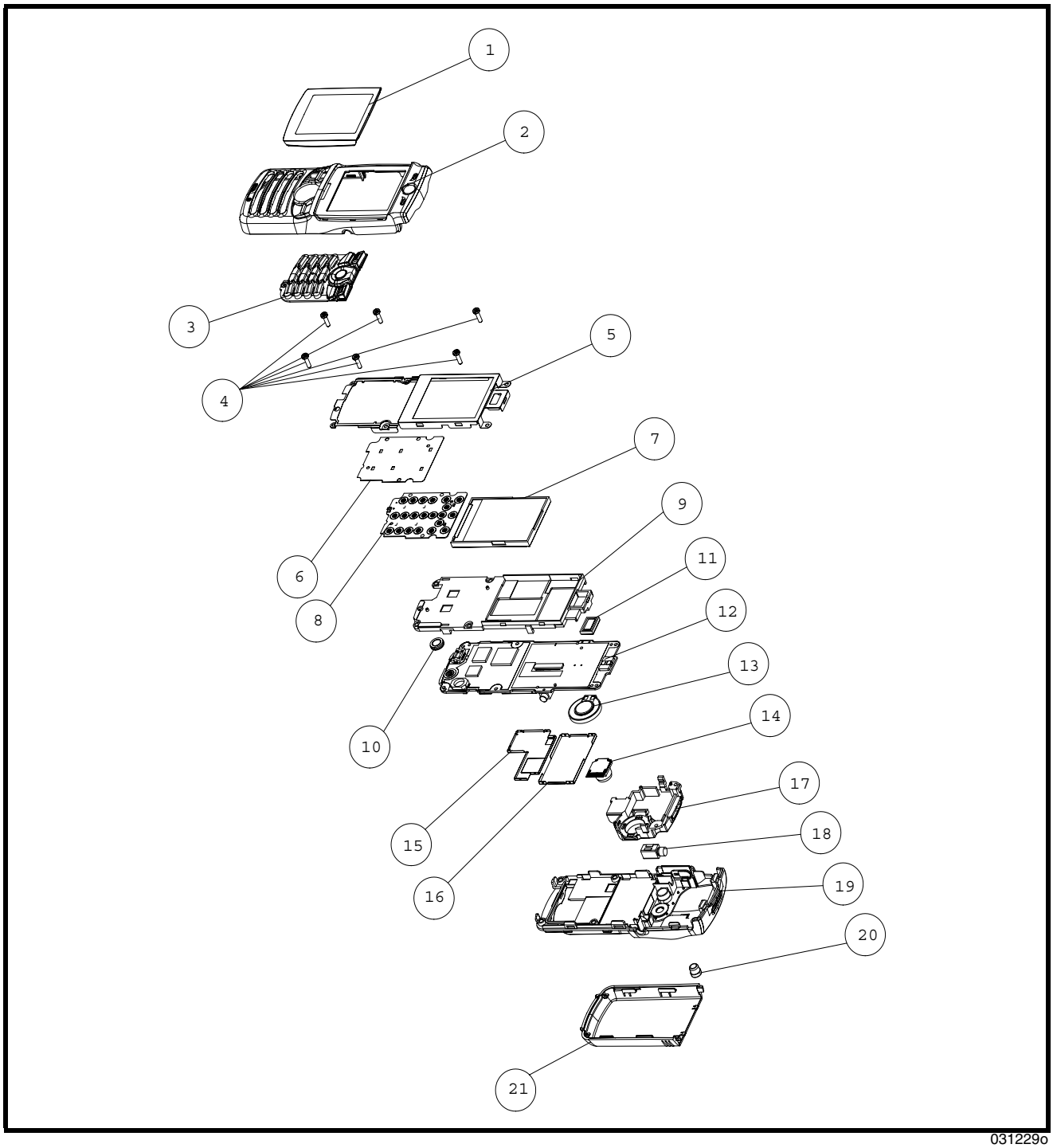


Figure 13. E365 Exploded View Diagram

Exploded View Parts List

Table 5. Exploded View Parts List

Item Number	Part Number	Description
1	2541T66001W	Display lens
2	2511T66001W	Upper Housing Assembly
3	3104T66601W	Keypad
4	3501655202W	Screw
5	3012T66001W	Display Bracket
6	3109T66602W	Metal Switch Domes
7	7630029004W	Color LCD Module
8	21T66021A1W	Keypad PC board
9	2531T66001W	Inter-board Snubber
10	2222312101W	Microphone
11	2240117001W	Speaker
12	21T66010D1W	Transceiver PC Board

Item Number	Part Number	Description
13	2240711001W	Alert Transducer
14	7650764511W	Camera
15	3012T66001W	Shield
16	3052TV1004W	Shield
17	23A1T66001W	Camera/Speaker/Antenna Assy
18	3930408901W	Motor/Vibrator
19	2512T66001W	Lower Housing Assembly
20	3028T66001W	RF Cover
21	252AT66001W	Battery Cover

Notes:

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 +44 131 479 1274.

Accessories

Table 6. List of Accessories

Description	Part Number
Power Solutions	
Battery 740 mAh LiIon (English label)	SNN5679
Battery 740 mAh LiIon (PRC label)	SNN5680
Linear Charger - PRC with fixed blades	SPN5133
Switchmode charger - US plug	SPN5134
Switchmode charger - UK plug	SPN5136
Switchmode charger - Euro plug	SPN5135
Switchmode charger - Aus/NZ plug	SPN5137
In-Vehicle Solutions	
Vehicle power adapter	SYN7862
Audio & Connectivity	
One Touch Headset	SYN8419
Over the ear headset	SYN8908
Black mono headset	SYN8390
Retractable headset	SYN8284
Consumer Personalization	
Grey lanyard	SYN8392
Silver lanyard	AAYN4402
SIlver wristyard	AAYN4403

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