MOTOROLA

Level 1 and 2 Service Manual

C380

Quad-Band Wireless Telephone

GSM 850/900/1800/1900 MHz
GPRS

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

About This Service Manual

Using this service manual and the suggestions contained in it assures proper installation, operation, and maintenance of C380 telephones. Refer questions about this manual to the nearest Customer Service Manager.

Audience

This document aids service personnel in testing and repairing C380 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 C380 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.

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

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

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

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)

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

To order spare parts in the EMEA region call +49 461 803 1638.

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

Specifications

General Function	Specification
Frequency Range GSM 850	824-848 MHz Tx 869-893 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	107mm x 46.69mm x 22.04mm (4.21 inches x 1.83 inches x 0.86 inches)
Size (Volume)	82 cc (5.0 in^3)
Weight	90 gm (3.175 oz) with cell
Temperature Range	-10° C to +55° C (+15° F to +130° F)
Battery Life, 650 mAh Li Ion Battery	Talk time 180 - 250 minutes Standby time 92 -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 Specification	
RF Power Output	33 dBm nominal GSM 900 30 dBm nominal GSM 1800 30 dBm nominal PCS
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 900, -104 dBm GSM 1800, -104 dBm PCS
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 C380 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, allow short message service (SMS) text messaging, and include clock, alarm, datebook, calculator, and caller profiling personal management tools. The C380 is a quad band phone that allows roaming within the GSM 850 MHz, DCS 1800 MHz, and PCS 1900 MHz bands, or GSM 900, DCS 1800 MHz and PCS 1900 MHz bands depending on how the unit is flexed.

These 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. The display and speaker, as well as the 18-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 650 mAh Lithium Ion (Li Ion) battery provides 180 to 250 minutes of talk time with 92 to 150 hours of standby time[1]. 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 a 128 x 128 pixel 65K Color Super-twist Nematic (CSTN) display and an internal antenna.

Features

C380 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, and cell broadcast messages[2]
- Supports GPRS, circuit switched, and SMS networks[2]
- WAP 1.2.1 compliant[2]
- Super enhanced sound engine

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 128 pixel 65K color display
- Display animation
- VibraCall® vibrating alert
- 5-Way navigation key
- Downloadable wallpaper and ring tones[3]
- Voice activation for phone book entries
- Simplified text entry using iTAP™ predictive text entry
- Calling line identification[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) 1.2 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 C380'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.

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

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

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 C380 telephone contains a built in calendar with date book reminders and phonebook that can be synchronized easily to a computer or PDA.

General Operation

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

The C380 telephones' controls are located on the front 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).

You can change covers and keypads on the C380 phone. The phone may not appear exactly as the phone image below. Note that all key locations, sequences, and functions remain the same with any of the covers.

040275o

Figure 1. Telephone Controls and Indicators Locations

Menu Navigation

C380 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 Table 1 for details of the C380 menu structure. A 5-way navigation key allows you to move easily through menus.

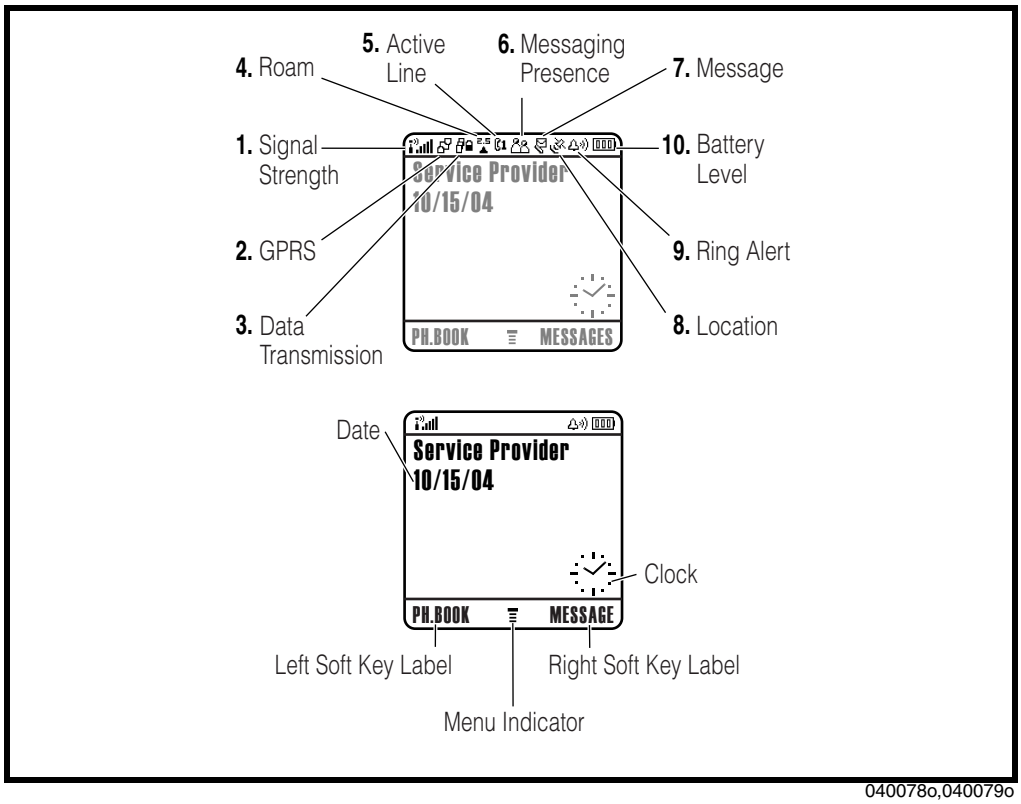
Liquid Crystal Display (LCD)

The LCD provides an 900 square millimeter color display with user-adjustable contrast settings for optimum readability in all light conditions. The large 128 x 128 pixel display provides room for text, graphics, icons, and 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.



040078o,040079o

Figure 2. Display Icon Indicators

User Interface Menu Structure

Table 1 shows the C380 telephone menu structure.

Table 1. Menu Structure

Main Menu

Phonebook

Recent Calls
- Received Calls
- Dialed Calls
- Notepad
- Call Times
- Call Cost
- Data Times
- Data Volumes

Messages
- Create Message
- Message Inbox
- Voicemail
- Browser Msgs
- Info Services
- Quick Notes
- Outbox
- Drafts
- MMS Templates

Office Tools
- SIM Tool Kit Apps *
- Calculator
- Datebook
- Shortcuts
- Alarm Clock
- Chat
- Dialing Services
  - Voice Dial
  - Fixed Dial
  - Quick Dial
  - Service Dial *

Games & Apps

Web Access
- Browser
- Web Shortcuts
- Stored Pages
- History
- Go To URL
- Browser Setup
- Web Sessions

Multimedia
- Themes
- Pictures
- Sounds
- MotoMixer

IM
- Log In
- Offline Convs.
- Offline Settings
- Help

Settings
- (see next page)

* optional features

This is the standard main menu layout. Menu organization and feature names may vary on your phone. Not all features may be available on your phone.

Settings Menu

Personalize
- Home Screen
- Main Menu
- Color Style
- Greeting
- Wallpaper
- Screen Saver
- Quick Dial

Ring Styles
- Style
- style Detail

Call Forward
- Voice Calls
- Fax Calls
- Data Calls
- Cancel All
- Forward Status

In-Call Setup
- In-Call Timer
- Call Cost Setup
- My Caller ID
- Talk and Fax
- Answer Options
- Call Waiting

Initial Setup
- Time and Date
- 1-Touch Dial
- Display Timeout
- Backlight
- TTY Setup
- Scroll
- Language
- Contrast
- DTMF
- Master Reset
- Master Clear

Phone Status
- My Tel. Numbers
- Credit Info/Available *
- Active Line
- Battery Meter
- Other Information

Headset
- Auto Answer
- Voice Dial

Car Settings
- Auto Answer
- Auto Handsfree
- Power-Off Delay
- Charger Time

Network
- New Network
- Network Setup
- Available Networks
- My Network List
- Service Tone
- Call Drop Tone

Security
- Phone Lock
- Lock Keypad
- Lock Application
- Fixed Dial
- Call Barring
- SIM PIN
- New Passwords

Java Settings
- Java App Loader
- Java System
- Delete All Apps
- App Vibration
- App Volume
- App Priority
- App Backlight
- Set Standby App
- DNS IP

* optional features

Alert Settings

In addition to preset ring tones, C380 telephones allow the user to download additional ring tones via SMS to your PC. (Availability is carrier and Network dependant).

Motorola C380 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 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 four levels: 100%, 66%, 33%, 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.

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, back end 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 2000. 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
C = Motorola China	L = Motorola Lawrenceville	U = T.D.I. Hungary
D = T.D.I. Shanghai, China	M = TDI, Malaysia	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 =	

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
1H	A&TB	10.5x43.6	TH550AAA
3F	Toshiba	7.5x14.5x48	TH900F5
3G	Gold Peak	1/3A	GPZSAFK
3H	Toshiba	4.4x34x56	LA8423456A

Cell Reference Designator	Vendor	Size	Part Number
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	LP043O41A
4K	GS Melcotec	4.6x29.5x41	LP423041A
4L	LG Chemical	4.2x30x48	ICP423048
4M	Toshiba	5.5x30x48	LGQ553048U
4N	Sanyo	3.8x34x50	UF383450P
4P	Toshiba	4.4x34x50	LGQ443450U
4R	Toshiba	4.4x30x48	LGQ443048U

Cell Reference Designator	Vendor	Size	Part Number
4S	Lishen	06x30x48	LP0601AE
4T	Panasonic	AAAALL	HHR70QAB4

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. Line and shift manufactured (optional) (seventh and eighth positions of battery code)
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. Batteries sold in China have a 16 character date code:

Example: **YYYYMMDDABCXXXX**

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

9. 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 2 list the tools and test equipment used on C380 telephones. Use either the listed items or equivalents.

Table 2. General Test Equipment and Tools

Motorola Part Number[1]	Description	Application
See Table 7	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-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 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 C380 telephone. Tools and equipment used are listed in Table 2, preceding.

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

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

Removing and Replacing the Rear Housing Cover

1. Ensure the phone is turned off.
2. Press down on the rear housing cover latch on the top end of the phone, gently lift the rear housing cover away from the latch and slide the rear housing cover in the direction of the arrow, and lift the rear housing cover away from the phone (see Figure 3).

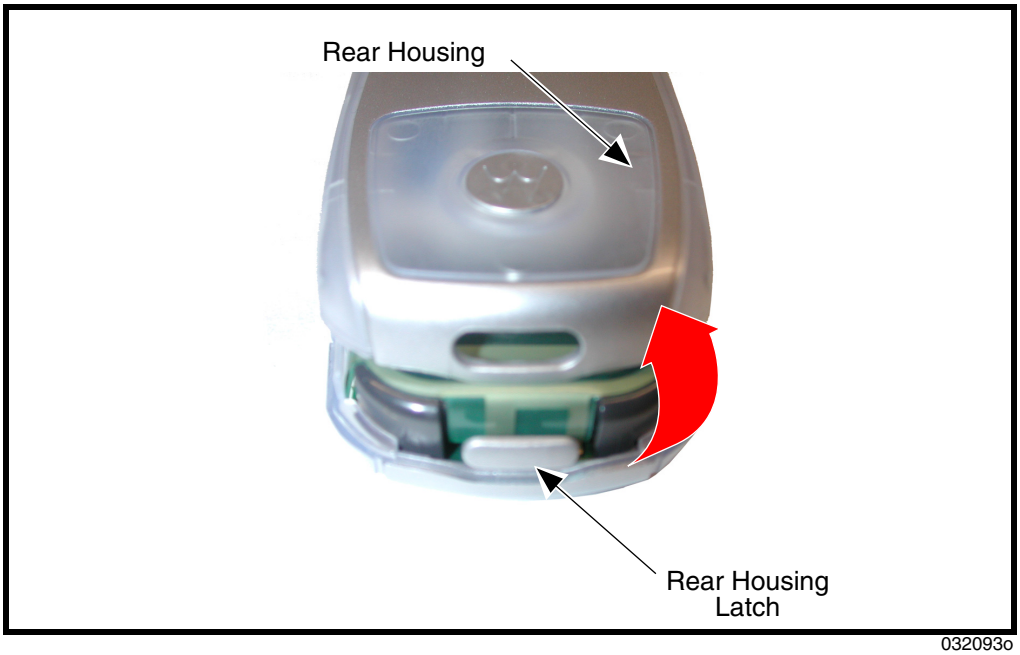


Figure 3. Removing the Rear housing Cover

3. To replace, align the rear housing cover to the front housing.
4. Gently press the rear housing cover into position onto the front housing until the rear housing cover snaps into place.

Removing and Replacing the Battery

Battery date codes are explained in the Battery Date Code section on page 17

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 rear housing, as described in the procedures.
2. Slide the battery in the direction of the arrow as shown in Figure 5.
3. Lift the top of the battery near the alert speaker out of the battery compartment as shown in Figure 5.

040282o

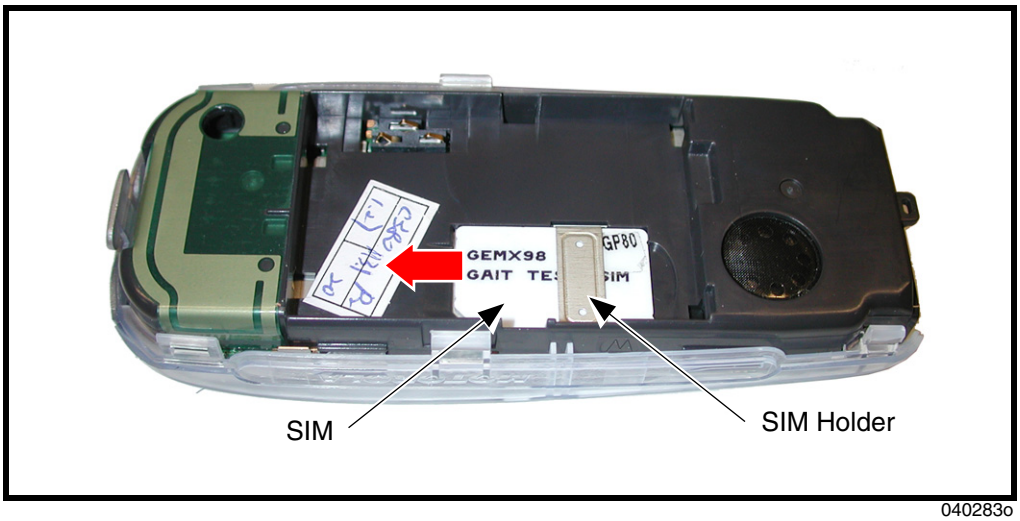
Figure 4. Removing and Replacing the Battery

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 of the battery into the battery compartment with contacts facing downward as shown in Figure 5B.
5. Press the top of the battery into the battery compartment.
6. Replace the rear housing cover as described in the procedures.

Removing and Replacing the Subscriber Identity Module (SIM)

1. Remove the rear housing and battery as described in the procedures.
2. Remove the SIM by sliding it in the direction indicated in Figure 5.
3. Lift the SIM out of the phone.



040283o

Figure 5. Removing the SIM

4. To replace, carefully slide the SIM into position under the SIM holder.
5. Observe the notched corner when inserting the SIM.
6. Replace the battery and the rear housing as described in the procedures.

Removing and Replacing the Endo Assembly

Other C380 phone housings appear differently. The endo housing removal procedure is essentially the same for each type of housing.

1. Remove the rear housing, battery, and SIM as described in the procedures.
2. On each side of the front housing, bend the housing latch outward slightly (see Figure 6) to release the endo assembly.

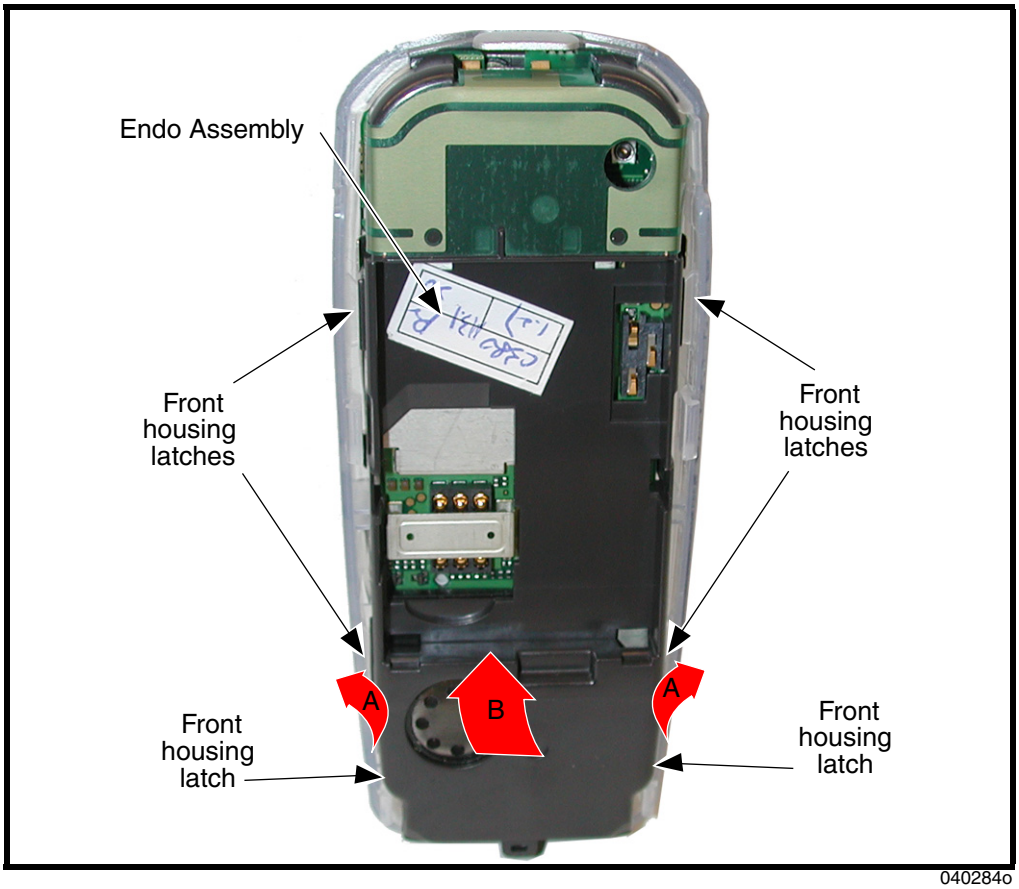
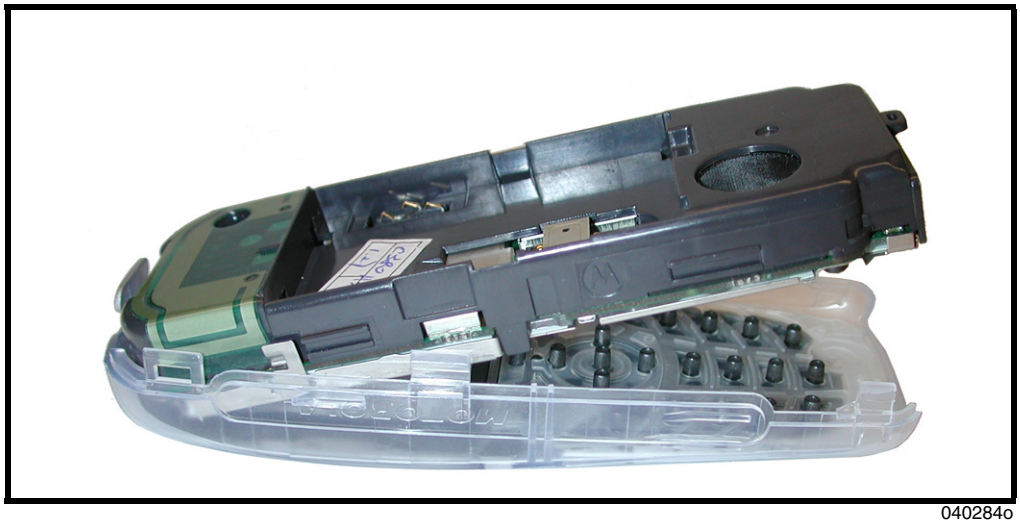


Figure 6. Endo Assembly Latches

3. Lift the endo housing out of the front housing as shown in Figure 7



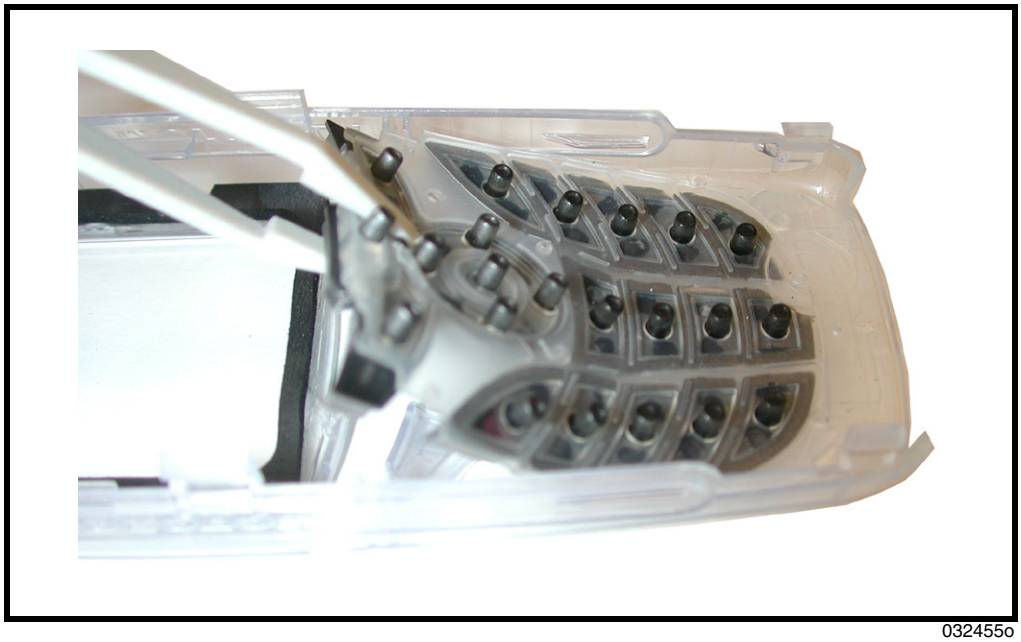
040284o

Figure 7. Removing the Endo Assembly

4. To replace, align the endo housing with the front housing.
5. Carefully and gently slide the endo housing into the front housing until the latches in each corner and along the sides of the front housing snap into position.
6. Replace the SIM, Battery, and rear housing as described in the procedures.

Removing and Replacing the Keypad Assembly

1. Remove the rear housing, battery, SIM, and endo assembly as described in the procedures.
2. Use the plastic tweezers to lift the keypad assembly from the front housing as shown in Figure 8.



0324550

Figure 8. Removing the Keypad Assembly

3. To replace, lower the keypad onto the front housing. Ensure the keys align properly with the openings and the keypad is fully seated in the front housing.
4. Replace the endo assembly, SIM, battery, and rear housing cover, as described in the procedures.

Removing and Replacing the Front Endo Assembly

1. Remove the rear housing cover, battery, SIM, endo assembly as described in the procedures.
2. Using the Torx driver and a T-6 bit, remove the 4 screws shown in Figure 9. Set the screws aside for reuse.

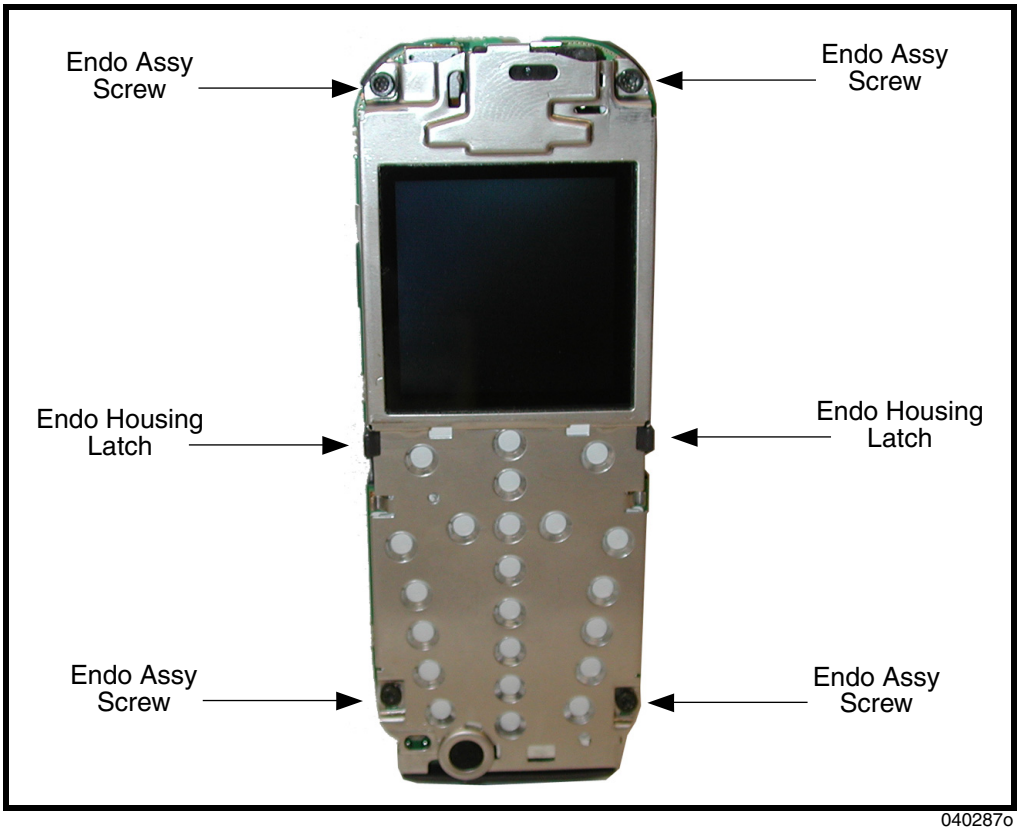


Figure 9. Removing the Front Endo Assembly

3. Using the disassembly tool, release the latches along each side of the phone as shown in Figure 10.

4. Carefully separate the LCD/Keypad bezel from the rear endo housing.

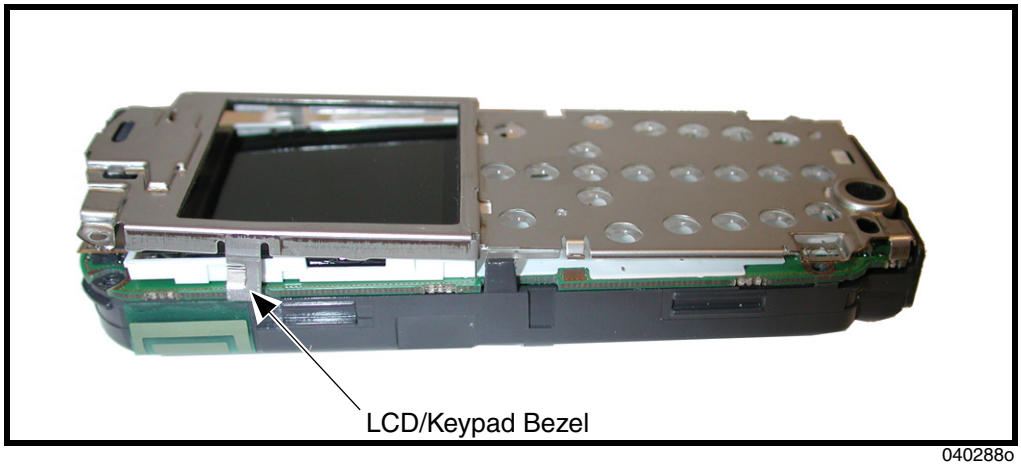


Figure 10. Removing the Keypad/LCD Bezel

5. To replace, align the LCD/Keypad bezel to the rear endo housing.
6. Carefully and gently press the front and rear endo housing together until the latches snap into position.
7. Insert and tighten the 6 screws to a torque setting of 2.0 kgf. Do not overtighten.
8. Replace the endo housing, battery, SIM, and rear housing covers as described in the procedures.

Removing and Replacing the Display Assembly

1. Remove the rear housing cover, battery, SIM, endo assembly, keypad assembly, and camera assembly as described in the procedures.
2. Use the disassembly tool to release the display assembly connector as shown in Figure 11.

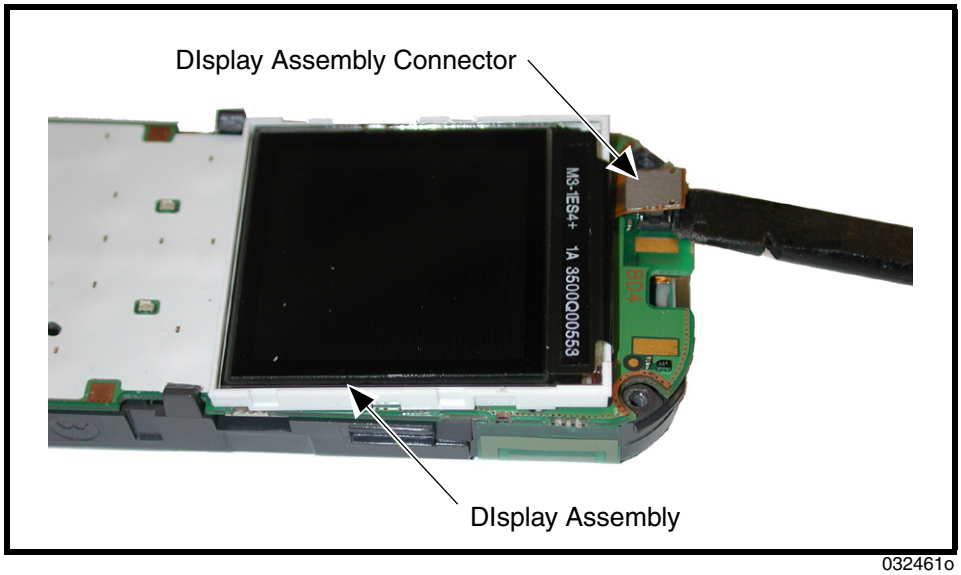


Figure 11. Removing the Display Assembly Connector

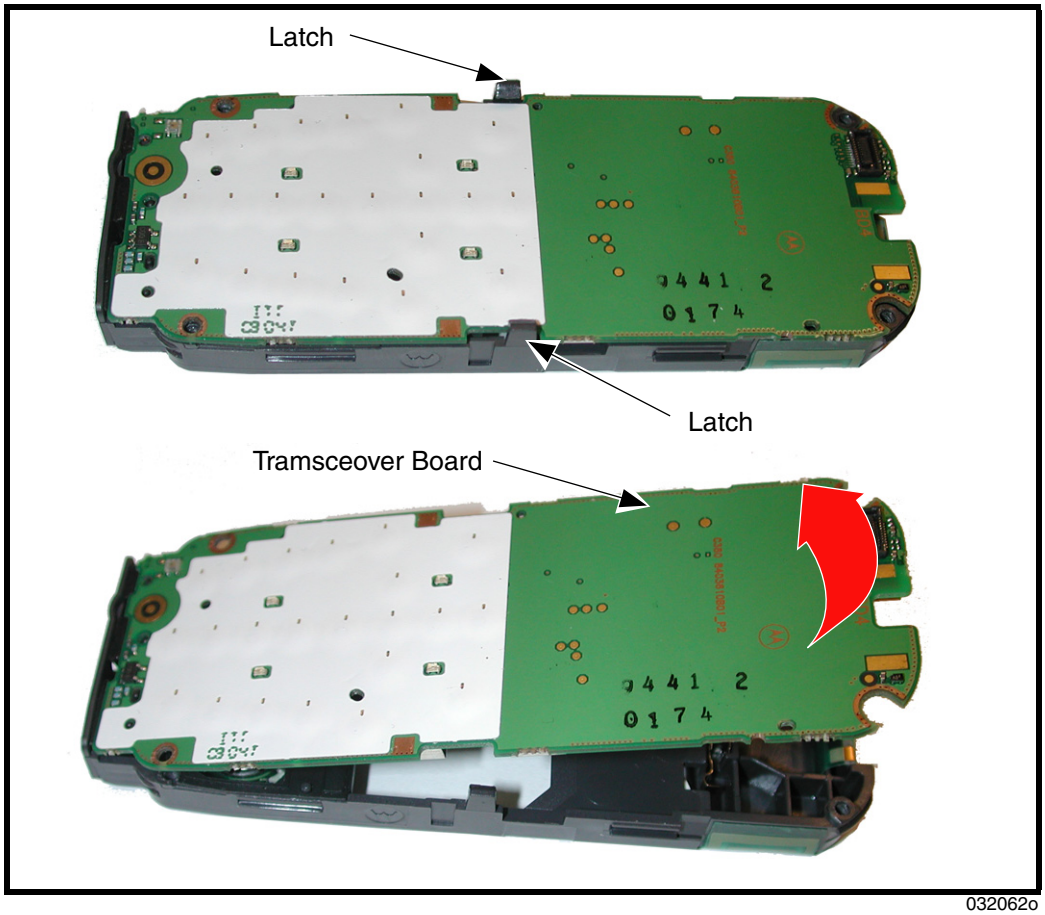
3. Carefully lift the display assembly away from the transceiver board.
4. To replace, align the display assembly with the printed circuit board.
5. Place the display assembly on the transceiver board.
6. Align the display assembly connector to it's socket on the transceiver board.
7. Gently press the display assembly connector into its socket.
8. Replace the front endo housing, endo assembly, SIM, battery, rear housing cover as described in the procedures.

Removing and Replacing the Transceiver Board

1. Remove the rear housing cover, battery, SIM, endo assembly, antenna, front endo housing, display assembly and , 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 release the two latches that secure the transceiver board to the endo housing.
3. Lift one end of the transceiver board away from the display assembly as shown in Figure 12.



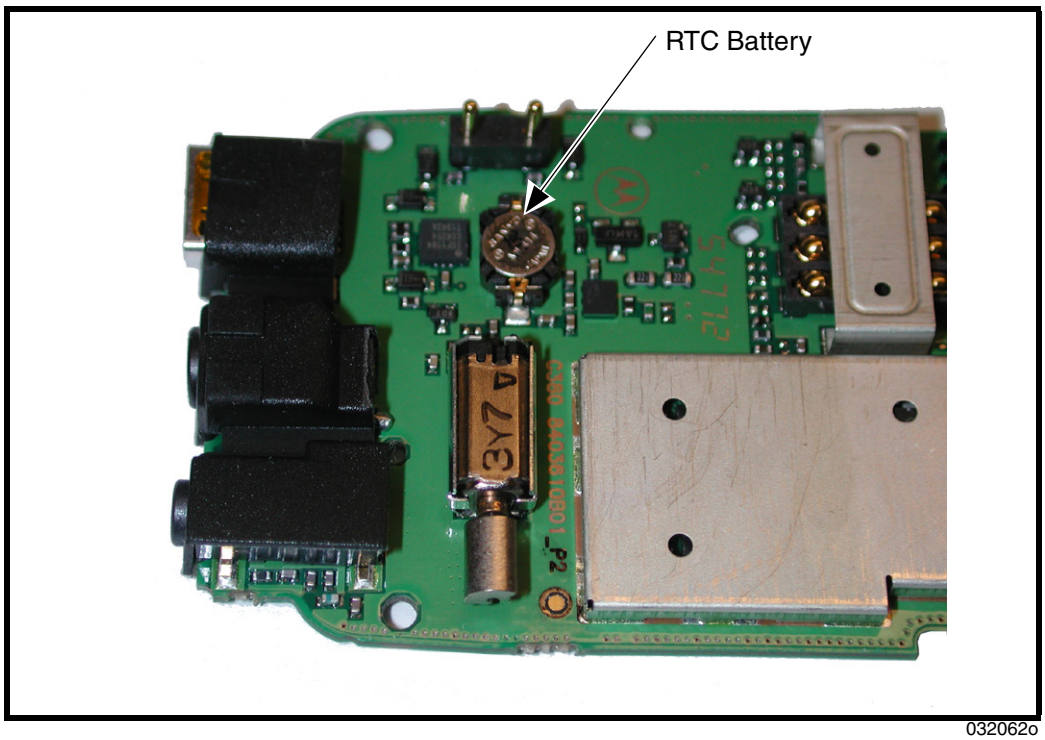
032062o

Figure 12. Removing the Transceiver Board

4. To replace, align the transceiver board with the display assembly.
5. Carefully lower the transceiver board onto the front housing.
6. Secure the 2 latches to the transceiver board.
7. Replace the display assembly, battery, front endo housing, endo assembly, SIM, and rear housing cover, as described in the procedures.

Removing and Replacing the Real Time Clock (RTC) Battery

1. Remove the rear housing cover, battery, SIM, endo assembly, front endo housing, display assembly, and transceiver board as described in the procedures.
2. Turn the transceiver board over so the component side is facing up.
3. Make a note of battery polarity before removing the RTC battery.
4. Use the pointed end of the disassembly tool to pry the RTC battery out of its socket.



032062o

Figure 13. Removing the RTC Battery

5. To replace, insert a fresh battery into the RTC battery holder. Ensure positive terminal is facing up.
6. Replace the transceiver board, display assembly, battery, front endo housing, endo assembly, SIM, and rear housing 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 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 14.

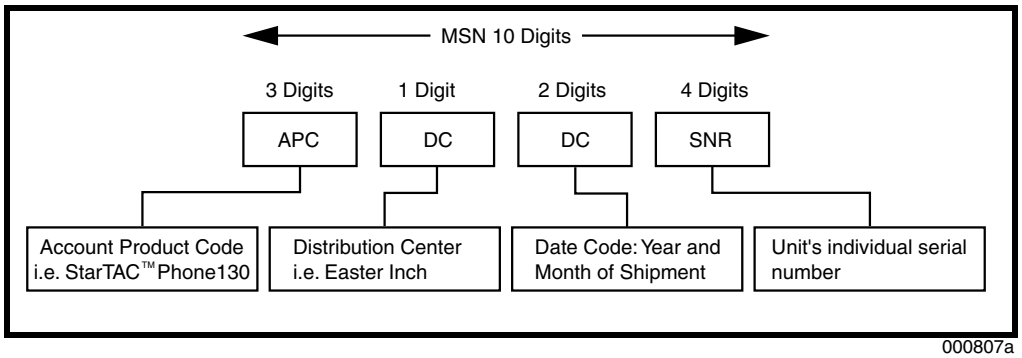


Figure 14. MSN label breakdown

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 3.

Table 3. IMEI Number Breakdown

TAC	Serial Number	Check Digit
NNXXXX YY	ZZZZZZ	A

Where

TAC Type Allocation Code, formerly known as Type Approval Code

NN Reporting body identifier

XXXX Type Identifier

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

ZZZZZZ Individual unit serial number

A Phase 1 = 0.
Phase 2 = check digit defined as a function of all other IMEI digits

Other label number configurations present are:

- **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 C380 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 4. 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*0*124	Select tone 1 KHz	
0*0*125	Select tone 2 KHz	
0*0*126	Select tone 3 KHz	
0*0*127	Select tone 4 KHz	
0*1*X	Disable tone X	
3*0*1	Enable vibrator	
3*0*0	Disable vibrator	
4*3*1	Enable speech coder full rate	Audio loopback
4*3*0	Disable speech coder full rate	
4*4*1	Enable speech coder enhanced full rate	
4*4*0	Disable speech coder enhanced full rate	

Table 4. Manual Test Commands (Continued)

Key Sequence	Test Function/Name	Remarks
4*5*1	Enable speech coder half rate	
4*5*0	Disable speech coder half rate	
5*0*0	Set audio level 0	Audio level
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	
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)	
20*X*0	Load Channel number X	Select Channel (Used for debugging Rx mode)
20*1*0	Load channel number 1 GSM Low channel	
20*62*0	Load channel number 62 GSM Mid channel	
20*124*0	Load channel number 124 GSM High channel	
20*512*0	Load channel number 512 DCS Low channel	
20*700*0	Load channel number 700 DCS Mid channel	
20*885*0	Load channel number 885 CDS High channel	
20*512*0	Load channel number 512 PCS Low channel	
20*661*0	Load channel number 661 PCS Mid channel	
20*810*0	Load channel number 810 PCS High channel	
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	

Table 4. Manual Test Commands (Continued)

Key Sequence	Test Function/Name	Remarks
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 5. 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.	Replace the faulty board with a known good transceiver board. If the phone powers up after replacement, reassemble the phone with a new transceiver board. Verify that the fault is fixed.
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 contact is intermittent visually, replace with a known good back Endo. If the fault is still present, proceed to b.
	b) Transceiver board defective.	Replace with a known good transceiver board (refer to 1c). Verify that the fault has been cleared with the new transceiver board and reassemble the unit.
3. No display.	a) Connections between transceiver and front Endo 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 back Endo.	Replace the back Endo with a known good back Endo. If the problem goes away, replace with a new back Endo. Else proceed to b.
	b) Transceiver board defective	Replace with a known good transceiver board (refer to 1c). Verify that the fault has been cleared with a new transceiver board.
5. Telephone transmit audio is weak. (usually indicated by called parties complaining of difficulty in hearing voice).	a) Microphone defective on the front Endo.	Replace the microphone or the front Endo 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) Spring contacts between front Endo earpiece speaker and transceiver board faulty.	Replace the front Endo with a known good one. Reassemble with a new front Endo if the fault goes away. If the fault is still present, proceed to b.

Table 5. Level 1 and 2 Troubleshooting Chart (Continued)

Symptom	Probable Cause	Verification And Remedy
	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.
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.	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.	Transceiver board defective.	Replace the transceiver board with a known good transceiver board (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board.
9. 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 with a known good 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 Numbers

The following section provides a reference for the parts associated with C380 telephones.

Related Publications

Motorola C380 Wireless Phone User Guide (English)	**6809482A68**

Exploded View Diagram

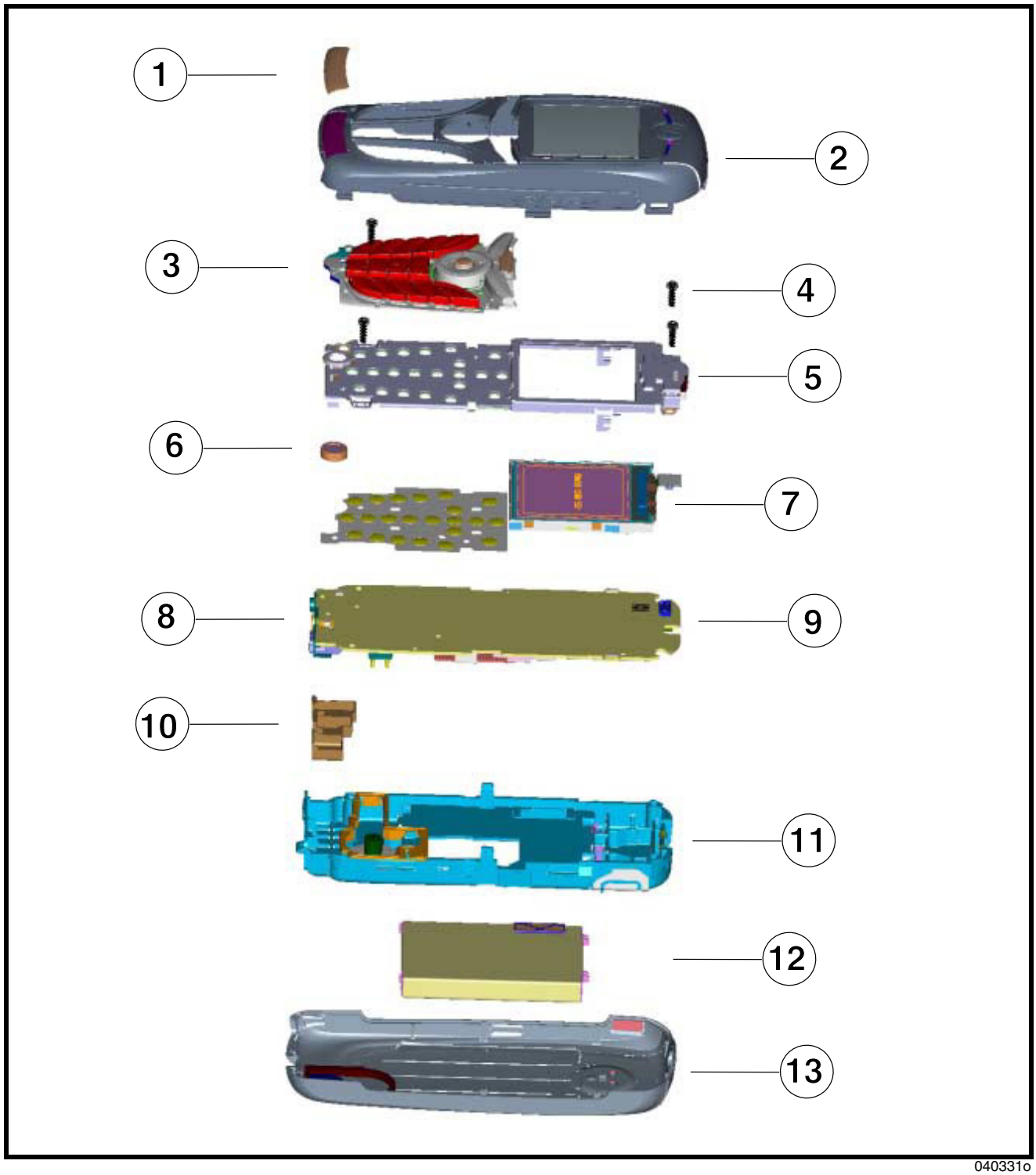


Figure 15. Exploded View Diagram

Exploded View Parts List

Table 6. Exploded View Parts List

Item Number	Motorola Part Number	Description
1	1388161Z01	Escutcheon
2	CFHN9028A	Front Housing Assembly
3	CFYN1001AA	Keypad
4	0309315B21	Screw (4)
5	0788166Z01	Front Endo Assembly
6	5089725K04	Microphone
7	0186861P01	Display Assembly
8	4088177Z01	Mylar Dome Array
9	CFLG1008AA CFLG1012AA	Main PCB Main PCB (US)
10	0503646B01	I/O Connector Rubber Grommet
11	0188175Z01	Rear Endo Assembly
12	AANN4258A AANN4285A	Battery (820mAh) Battery
13	CFHN9029A	Rear Housing Assembly

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 +49 461 803 1638.

Accessories

Table 7. List of Accessories

Description	Part Number
Travel Charger, US	SPN4681
Travel Charger, UK	SPN4680
Travel Charger, PRC	SPN4677
Emergency Battery Charger	SPN5026
Easy Install Car Kit	SYN8543
Optional External Mic	SYN5708B
Vehicle Power Adapter	SYN8087
FreeCharge Emergency Power Source	SPN4999
Headset, Retractable	SYN8284
Headset, 2nd Generation, Retractable	SYN9050
Headset, Over the ear	SYN8908
Neck loop	SYN7875
Headset, One touch	SYN8419
Headset, Universal Customizable	SYN9350

Personal Communications Sector,
789 International Parkway.
Sunrise, FL 33325-8292

6809485A73-O