



MOTOROLA

Level 1 and 2 Service Manual

V150

Dual Band Wireless Telephone



GSM 900/DCS 1800MHz with GPRS

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Introduction

Motorola® Inc. maintains a worldwide organization that is dedicated to provide responsive, full-service customer support. Motorola products are serviced by an international network of company-operated product care centers as well as authorized independent service firms.

Available on a contract basis, Motorola Inc. offers comprehensive maintenance and installation programs which enable customers to meet requirements for reliable, continuous communications.

To learn more about the wide range of Motorola service programs, contact your local Motorola products representative or the nearest Customer Service Manager.

Product Identification

Motorola products are identified by the model number on the housing. Use the entire model number when inquiring about the product. Numbers are also assigned to chassis and kits. Use these numbers when requesting information or ordering replacement parts.

Product Names

Product names included in V150 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.

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:

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

The Motorola products described in this manual may include Motorola computer programs stored in semiconductor memories or other media that are copyrighted with all rights reserved worldwide to Motorola. Laws in the United States and other countries preserve for Motorola, Inc. certain exclusive rights to the copyrighted computer programs, including the exclusive right to copy, reproduce, modify, decompile, disassemble, and reverse-engineer the Motorola computer programs in any manner or form without Motorola's prior written consent. Furthermore, the purchase of Motorola products shall not be deemed to grant either directly or by implication, estoppel, or otherwise, any license or rights under the copyrights, patents, or patent applications of Motorola, except for a nonexclusive license to use the Motorola product and the Motorola computer programs with the Motorola product.

About This Service Manual

Using this service manual and the suggestions contained in it assures proper installation, operation, and maintenance of V150 Series telephones. Refer questions about this manual to the nearest Customer Service Manager.

Audience

This document aids service personnel in testing and repairing V150 telephones. Service personnel should be familiar with electronic assembly, testing, and troubleshooting methods, and with the operation and use of associated test equipment.

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

Scope

This document provides basic information relating to V150 Series telephones, and also provides 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 Enter 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.

Phone: 800-422-4210

FAX: 800-622-6210

Outside U.S.A.

Phone: 847-538-8023

FAX: 847-576-3023

To order spare parts in the EMEA region call +44 131 479 1274.

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

Specifications

| General Function | Specification |
|--------------------------------------|---|
| 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 |
| Channel Spacing | 200 kHz |
| Channels | 174 EGSM, 374 DCS, 124 GSM |
| 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 +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 w/Slim LI Battery | 82 mm x 43 mm x 26 mm (3.2 inches X 1.7 inches X 1.0 inches) |
| Size (Volume), w/Slim LI Battery | 69 cc (4.1 cubic inches) |
| Weight | 106 gm (3.74 oz) with cell |
| Temperature Range | -10° C to +55° C (+15° F to +130° F) |
| Battery Life, 600 mAh Li Ion Battery | Talk time up to 300 minutes Standby time up to 300 hours |
| | All talk and standby times are approximate and depend on network configuration, signal strength, and features selected. Standby times are quoted as a range from DRX=2 to DRX=9. Talk times are quoted as a range from DTX off to DTX on. |

| Transmitter Specification | |
|---------------------------|---|
| RF Power Output | 33 dBm nominal GSM 900 30 dBm nominal GSM 1800 |
| 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) |

| Speech Coding Function | Specification |
|----------------------------|---|
| 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 V150 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 V150 is a dual band phone that allows roaming within the GSM 850, GSM 900 MHz and digital cellular system (DCS) 1800 MHz and 1900 PCS bands.

V150 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 18-key keypad, transceiver printed circuit board (PCB), microphone, charger and headphone connectors, and power button are contained within the flip-phone form-factor housing. The 600 mAh Lithium Ion (Li Ion) battery provides more than 300 minutes of talk time with up to 300 hours of standby time¹. The phone accepts 3V mini subscriber identity module (SIM) cards which fit into the SIM holder under the rear housing cover. These telephones feature a 96 x 64 pixel 900 square millimeter high-resolution graphics display and external antenna.

Features

V150 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 messages²
- Supports GPRS, circuit switched, and SMS networks²
- WAP 1.2.1 compliant²
- 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.

- 96 X 65 pixel color graphical display with 4 lines of text, 1 line of icons, and 1 line of prompts
- Display zoom
- Display animation
- VibraCall® vibrating alert
- 4-Way navigation key
- Downloadable wallpaper and ring tones³
- Voice activation for phone book entries
- Simplified text entry using iTAP™ predictive text entry
- Calling line identification³
- Supports call diverting for incoming voice calls³
- 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 GPRS³
- 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.



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 V150 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 V150 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).

The V150 phone allows the user to change covers and keypads. The phone cover may not appear exactly as the phone images pictured throughout this manual. All key locations, sequences, and functions remain the same with any of the various covers.



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

Menu Navigation

V150 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 V150 menu structure. A 4-way navigation key allows you to move easily through menus.

Liquid Crystal Display (LCD)

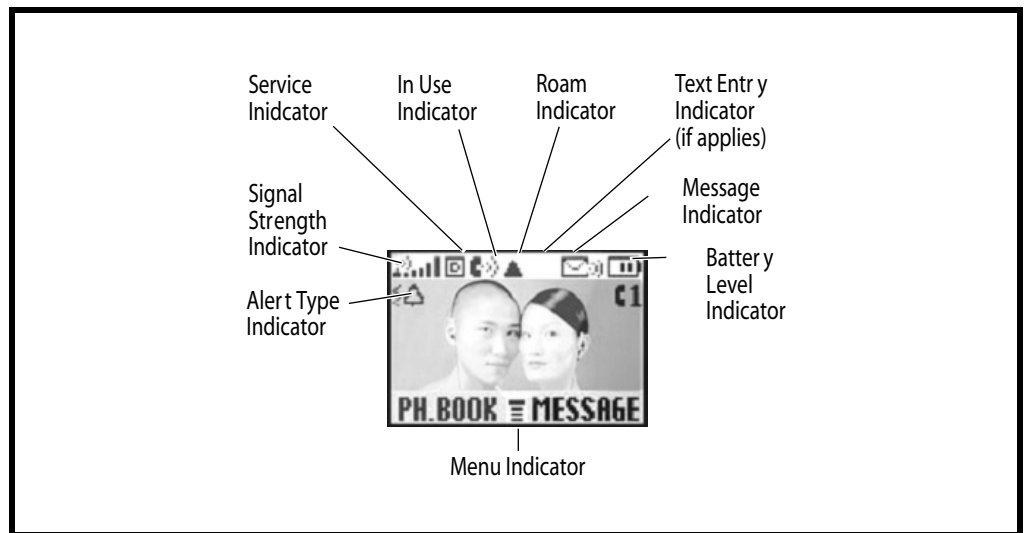
The LCD provides an 900 square millimeter color display with user-adjustable contrast settings for optimum readability in all light conditions. The large bit-mapped 96 x 65 pixel display includes up to 4 lines of text, 1 line of icons, and 1 line of prompts.

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.



0201580

Figure 2. Display Icon Indicators

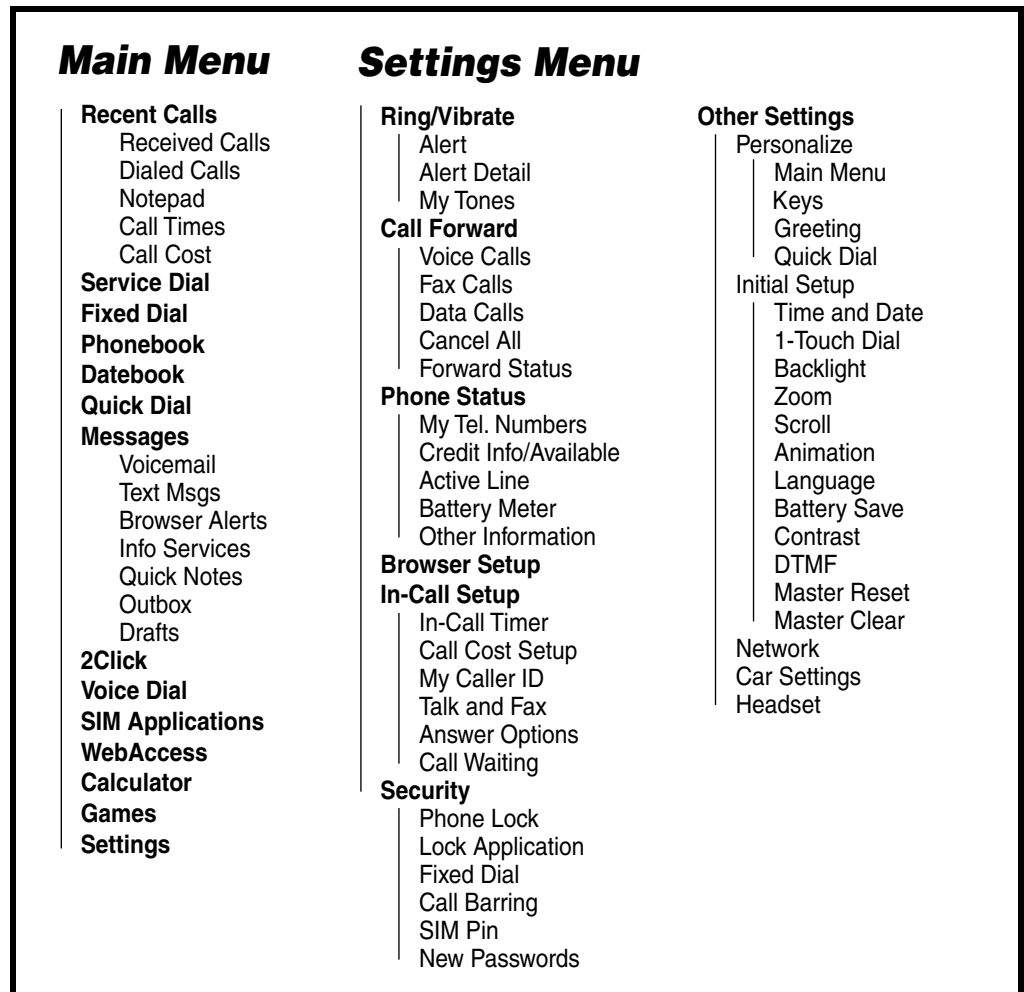
1. **Signal Strength** shows the strength of the phone's connection with the network. Calls cannot be sent or received when the "no signal" indicator is displayed.
2. **In Use Indicator** icon indicates a call in progress.
3. **Roam Indicator** icon appears when the phone uses another network system outside the user's home network. When leaving the home network area, the phone roams, or seeks, another network.
4. **Message Waiting Indicator**⁴ appears when the phone receives a text message.
5. **Voice Message Waiting Indicator**⁴ icon indicates when the phone receives a voicemail message.
6. **Battery Level Indicator** shows the amount of charge left in the battery.
7. **Real Time Clock** shows the current time.
8. **Menu Indicator** provides access to the phone's main menu.

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

9. **GPRS Indicator**⁴ indicates when the phone is currently functioning in GPRS mode.
10. **Alert Setting Indicator** indicates the phones current ringer alert setting.

User Interface Menu Structure

Figure 3 shows the V150 telephone menu structure.



0201590

Figure 3. Menu Structure

Alert Settings

In addition to preset ring tones, V150 telephones allow the user to download additional ring tones via SMS to your PC. (Availability is carrier and Network dependant).

Motorola V150 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. Immediately replace the old battery with a fresh 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 |
| 1G | 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 | LP043041A |
| 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

The following tables list the tools and test equipment used on the V150 telephone. Use either the listed items or equivalents.

Table 1. Product-Specific Test Equipment and Tools

| Motorola Model Number | | | |
|-----------------------|-------------------|-----------------------------|--|
| Americas ¹ | EMEA ² | Description | Application |
| — | 0-00-00-30004 | EMEA case opening fixture | Used to open device housing |
| — | 0-00-00-30006 | EMEA antenna torque tool | Used to install the socket insert for a new stubby antenna |
| — | 0-00-00-30007 | EMEA antenna tool | Used to remove the stubby antenna |
| — | 0-00-00-30003 | EMEA LED removal tool | Used to remove the status LED light guide |
| — | 0-00-00-30002 | EMEA Flexprint removal tool | Used to disconnect the flex |

1. To order in North America, contact Motorola Aftermarket and Accessories Division at (847)538-8000.
2. To order in EMEA region, contact Motorola GmbH, International Service Engineering Group web site <http://212.112.205.178/>

Table 2. General Test Equipment and Tools

| Motorola Model Number | | | |
|-----------------------|-------------------|---|---|
| Americas ¹ | EMEA ² | Description | Application |
| 0180386A82 | 0180386A82 | Antistatic Mat Kit (includes 66-80387A95 antistatic mat, 66-80334B36 ground cord, and 42-80385A59 wrist band) | Provides protection from damage to device caused by electrostatic discharge (ESD) |
| 6680388B67 | 0-00-00-30005 | Disassembly tool, plastic with flat and pointed ends (manual opening tool) | Used during assembly/disassembly of device |
| 6680388B01 | — | Delrin [®] Tweezers | Used during assembly/disassembly |
| HP34401A ³ | HP34401A | Digital Multimeter | Used to measure battery voltage |

1. To order in North America, contact Motorola Aftermarket and Accessories Division at (847)538-8000.
2. To order in EMEA region, contact Motorola GmbH, International Service Engineering Group web site <http://212.112.205.178/>
3. Not available from Motorola. To order, contact Hewlett Packard at 1-800-452-4844.

Disassembly

The procedures in this section provide instructions for the disassembly of a V150 telephone. Tools and equipment used for the phone are listed in Tables 1 and 2, under Tools and Test Equipment in the preceding section.



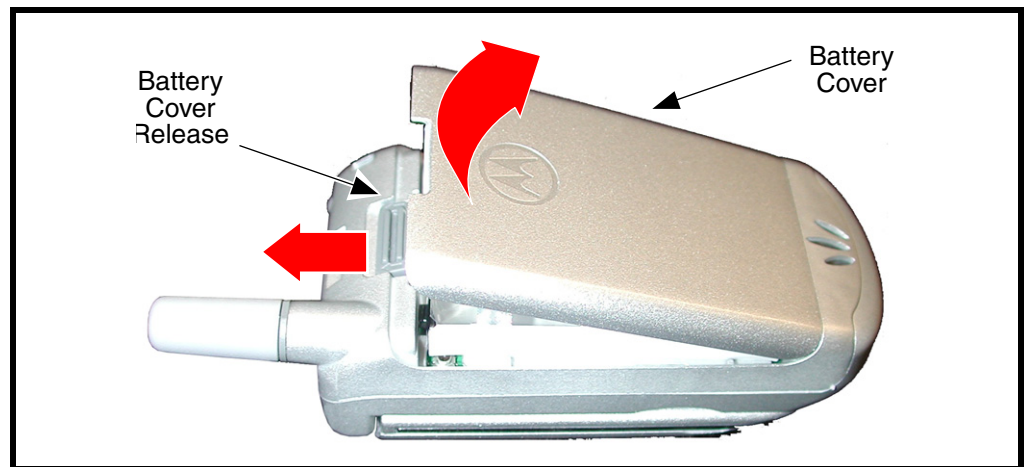
Many of the integrated devices used in this equipment are vulnerable to damage from electrostatic discharge (ESD). Ensure adequate static protection is in place when handling, shipping, and servicing the internal components of this equipment.



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

Removing the Battery Cover and Battery

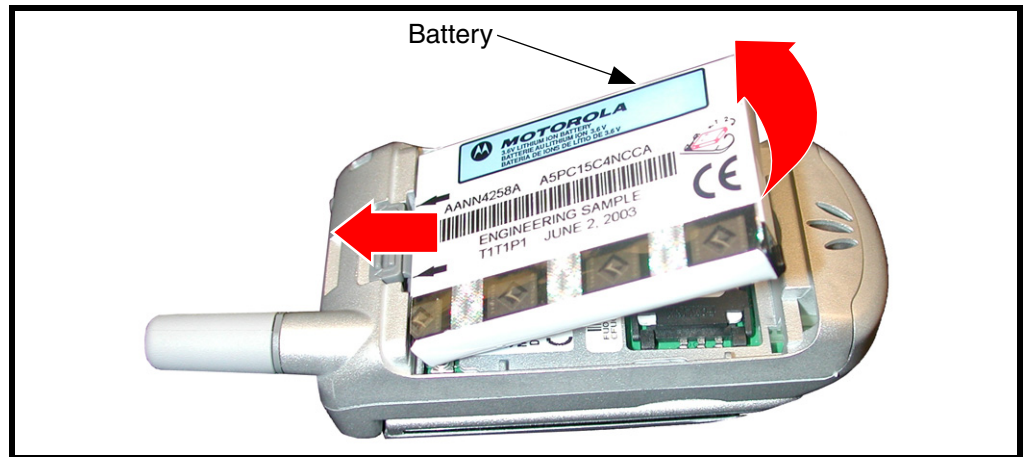
1. Ensure the phone is turned off.
2. Slide the battery cover release in the direction of the arrow (see Figure 4).



010044-O

Figure 4. Removing the Battery Cover

3. Lift the end of the cover and remove it completely.



001075-O

Figure 5. Removing the Battery

4. As shown in Figure 5, remove the battery by gently pushing the battery in the direction of the arrow and lifting it from the battery compartment as shown.

Replacing the Battery and Battery Cover

1. Align the battery with the battery compartment so the contacts on the battery match the battery contacts in the phone.



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.

2. Mate the two prongs on top of the battery with the receptacles molded into the housing, then press the bottom end of the battery securely into the battery compartment.
3. Align the bottom end of the battery cover with the notches in the battery compartment and rotate the top of the compartment downward towards the battery cover release.
4. Snap the cover firmly in place.

Removing the SIM Card

1. Remove the battery cover and battery as described in the procedures.
2. As shown in Figure 6, slide the SIM holder in the direction of arrow (A) to unlock.
3. Rotate the SIM holder upward as shown in Figure 6 arrow (B) and slide out the SIM card as shown by arrow (C).

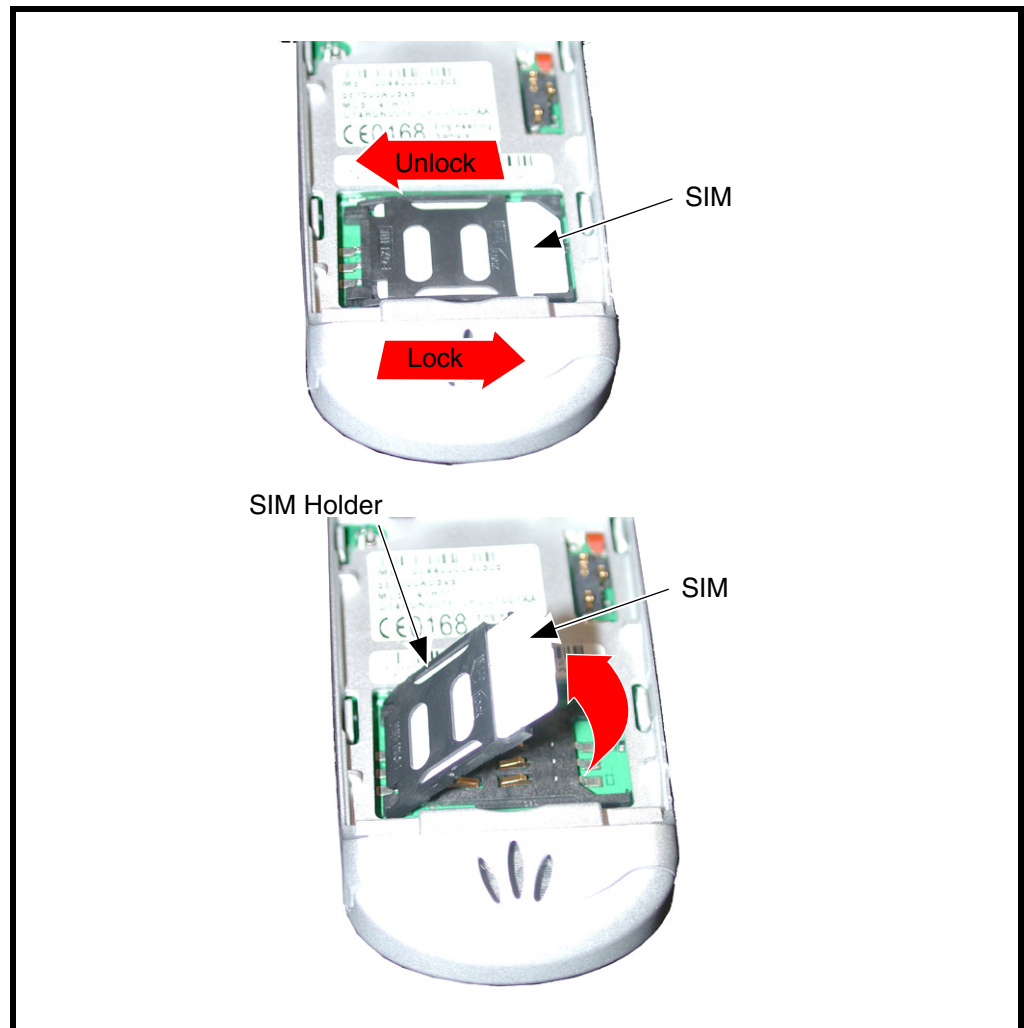


Figure 6. Removing the SIM card

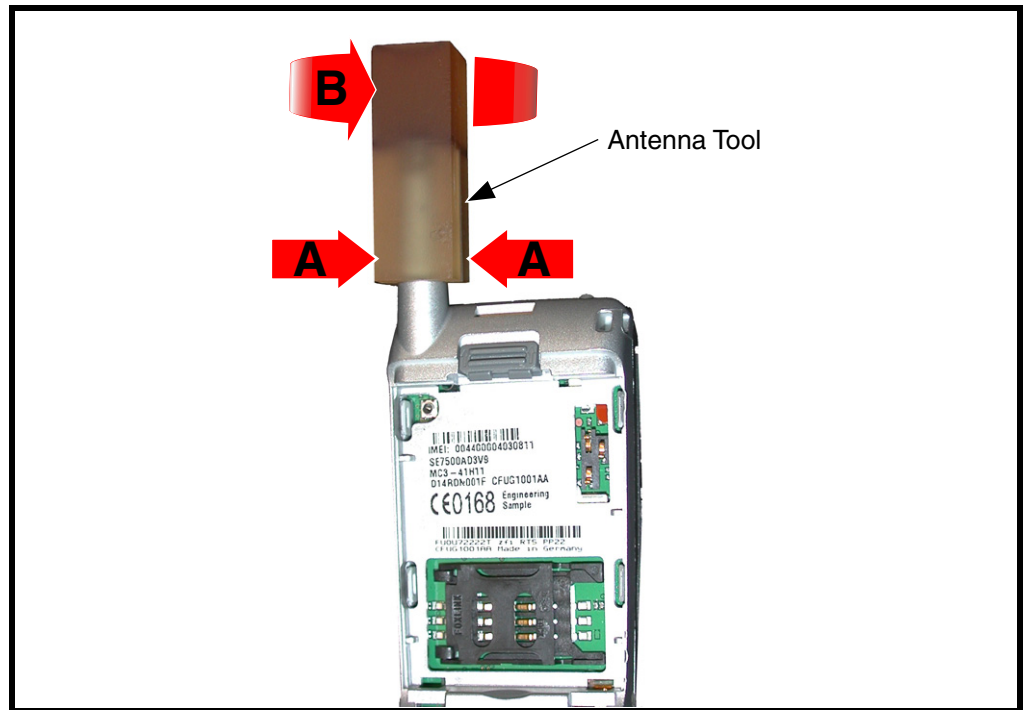
001086-O

Replacing the SIM Card

1. Carefully insert the SIM card into the slot in the holder. Be sure the SIM is correctly positioned to contact the socket when closed.
2. Close the holder and slide to lock in place.
3. Replace the battery and battery door as described in the procedures.

Removing and Replacing the Antenna

1. Remove the battery cover and battery as described in the procedures.
2. Slide the antenna tool over the antenna until it stops. As shown in Figure 7, while squeezing the tool as shown by (A), rotate the tool and antenna counter-clockwise (B) until loose.



001073-O

Figure 7. Removing the Antenna

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



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

4. To replace, insert the threaded end of the antenna carefully into the housing and, after ensuring the threads are properly engaged, press down and tighten firmly with the tool.



New antennas are supplied as a set of two parts: the stubby antenna and the antenna socket.

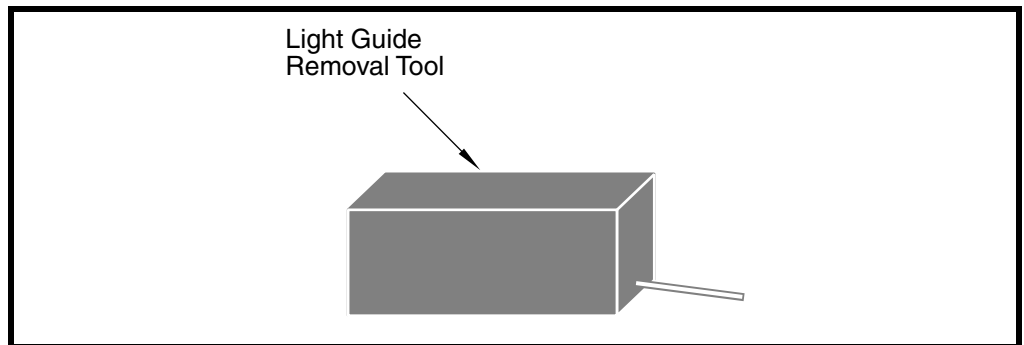
5. To install a new antenna, insert the threaded end of the antenna socket carefully into the housing and, after ensuring the threads are properly engaged, tighten using an antenna torque tool. Snap the stubby antenna into the socket by pushing straight in until fully seated.

Removing and Replacing the Light Guide

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

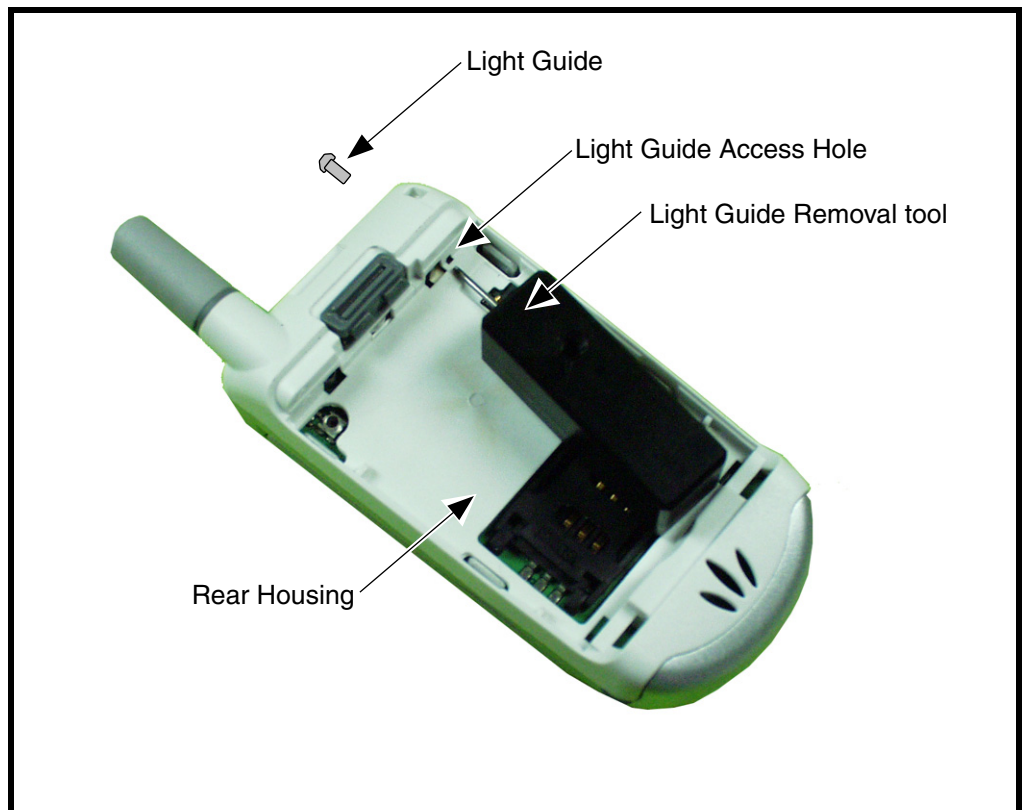


Use extreme care when removing the light guide to prevent damage to the transceiver board ZIF connector.



010089-O

Figure 8. LED Removal Tool Modification



001084-O

Figure 9. Removing the Light Guide

2. As shown in Figure 9 (A), align the right side of the removal tool with the lip of the battery compartment.
3. As shown in Figure 9, carefully insert the tip of the removal tool (B) into the light guide access hole near the top of the rear housing.
4. Gently push the shaft of the tool straight into the housing until resistance is felt. Observe the depth as indicated by the mark on the tool.
5. If resistance is felt at a depth of 9.6 mm or less, as indicated by the depth mark on the tool, the tool has contacted the edge of the transceiver board ZIF connector. Raise the tool slightly to clear the connector.
6. Resistance felt at a depth greater than 9.6 mm means the tool is clear of the ZIF connector and has properly contacted the light guide.
7. When the tool is in contact with the light guide, carefully push to expose the light guide enough to grasp with pliers for removal from the housing.
8. To replace, insert the light guide straight into the opening in the top of the rear housing and push until fully seated.

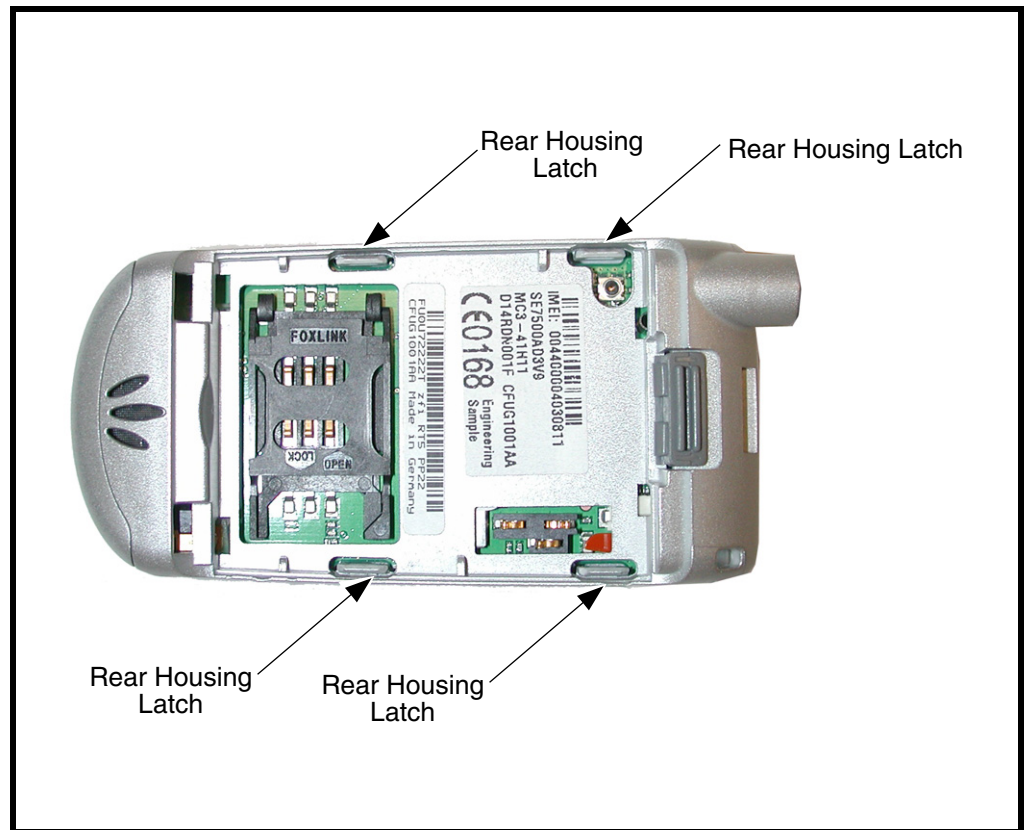
Removing the Rear Housing



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



The phone has no screws to hold it together. The housing is fastened with plastic catches. These are delicate and should be parted using utmost care.



0317320

Figure 10. Unlocking the Rear Housing Latches

1. Remove the battery cover, battery, antenna, and light guide as described in the procedures.
2. Using the flat end of the disassembly tool, carefully pry each of the 4 front housing latches inward to release the rear housing as shown in Figure 10.
3. Use the disassembly tool to disconnect the flex cable from its socket as shown in Figure 11.

4. Lift the rear housing from the front housing as shown in Figure 11.

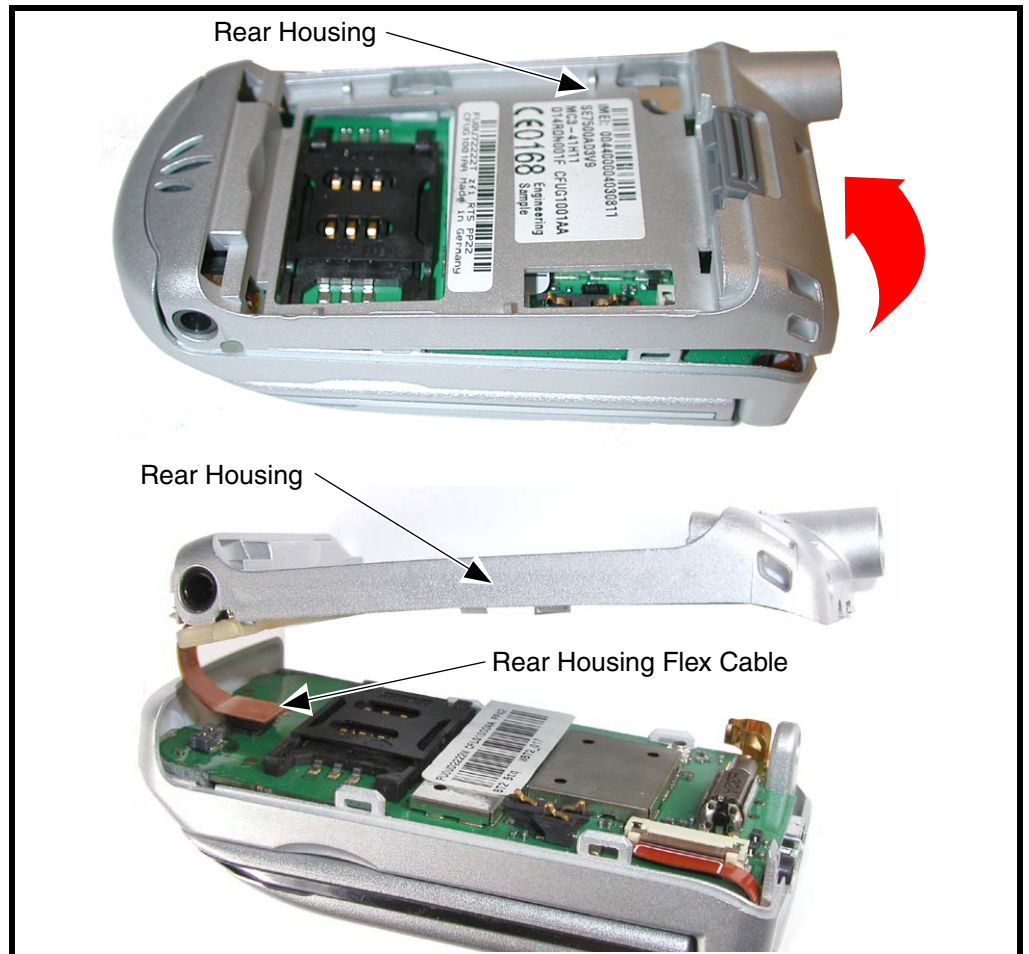


Figure 11. Removing the Rear Housing

031753o

Replacing the Rear Housing

1. Connect the flex cable connector to its socket on the transceiver board.
2. Align the 4 front housing catches with the matching slots in the rear housing then firmly press the rear housing to the front housing until the catches engage and the housings are properly assembled.
3. Replace the light guide, antenna, battery, and battery cover as described in the procedures.

Removing the Transceiver Board



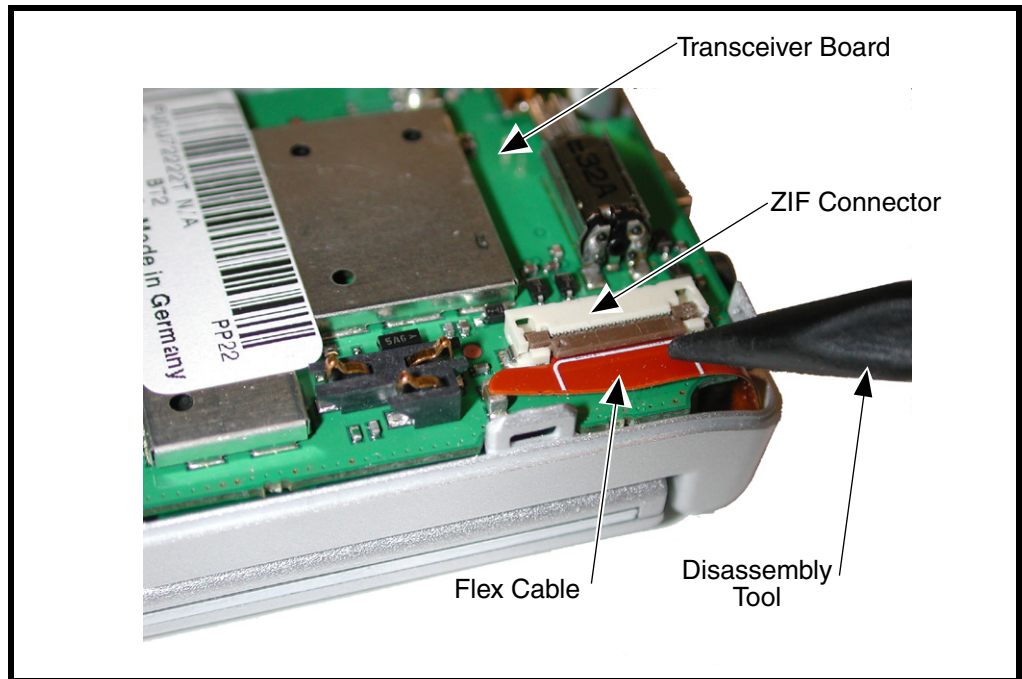
This product contains static-sensitive devices. Use anti-static handling procedures to prevent electrostatic discharge (ESD) and component damage.

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



The flex cable is easily damaged. Exercise care when handling.

2. Using the flat end of the disassembly tool, carefully lift the ZIF connector latch on the transceiver board to unlock the flex (see Figure 12).



0317990

Figure 12. Disconnecting the Flex from the Transceiver Board

3. Remove the flex from the ZIF connector to disconnect from the transceiver board. The Delrin tweezer or EMEA flexprint removal tool may be used to assist with disconnecting the flex, if necessary, as shown in Figure 12.

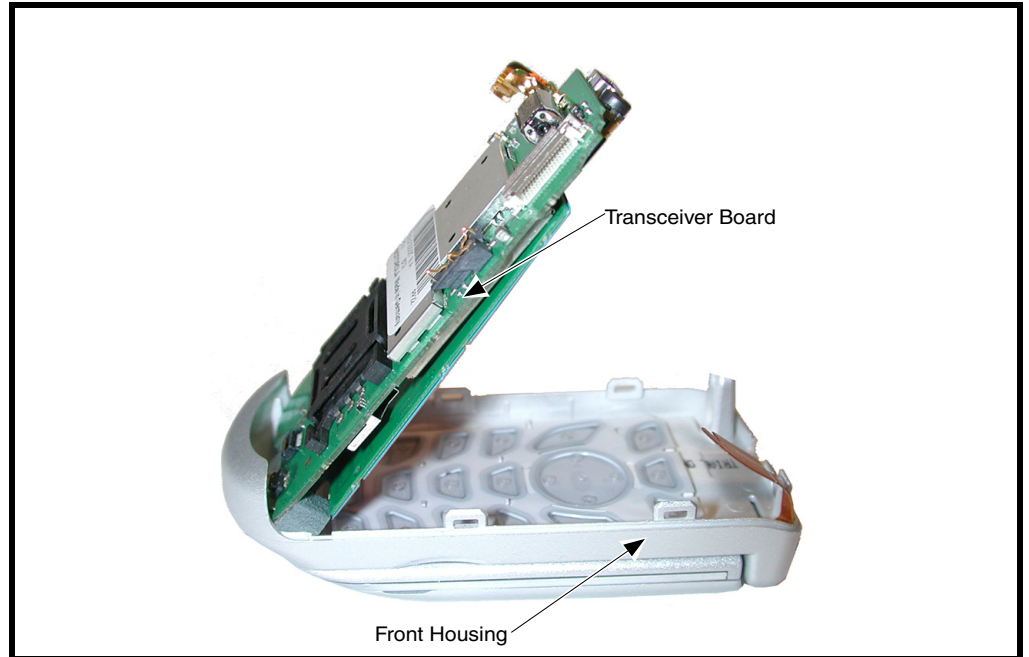


Figure 13. Removing the Transceiver Board

0317330

4. Carefully lift the transceiver board from the front housing as shown in Figure 13.

Replacing the Transceiver Board



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

1. Insert the transceiver board into the front housing with the ZIF connector on top. Ensure the keypad PCB is properly aligned with the keypad.
2. Insert the flex squarely into the ZIF connector on the transceiver board and close the connector latch until it locks into position.
3. Replace the rear housing, light guide, antenna battery, and battery cover as described in the procedures.

Removing and Replacing the Microphone and Microphone Grommet



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

1. Remove the battery cover, battery, antenna, light guide, rear housing, and transceiver board as described in the procedures.

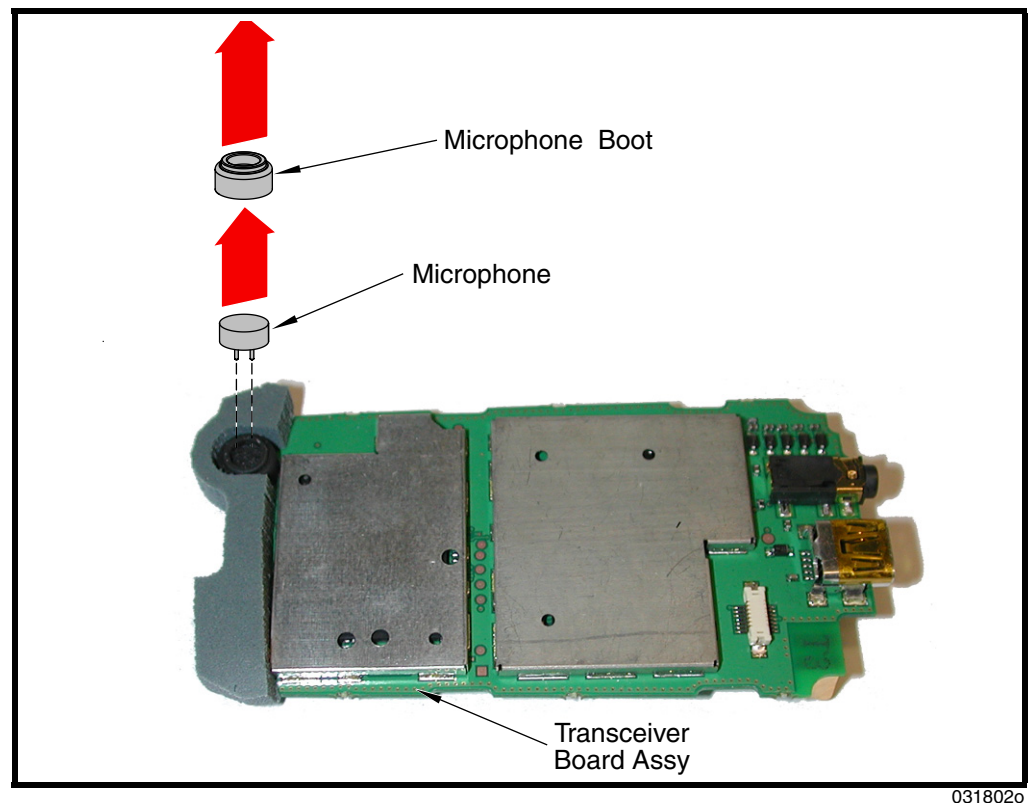


Figure 14. Removing the Microphone and Microphone Grommet

2. As shown in Figure 14, pull the microphone assembly straight out of its socket on the transceiver board.



Do not bend the microphone connector pins or damage the microphone case when removing or replacing the microphone.

3. Slip the grommet from the microphone.
4. To replace, slip the microphone into the microphone grommet as shown in the figure, then insert the assembly into the socket on the transceiver board. The

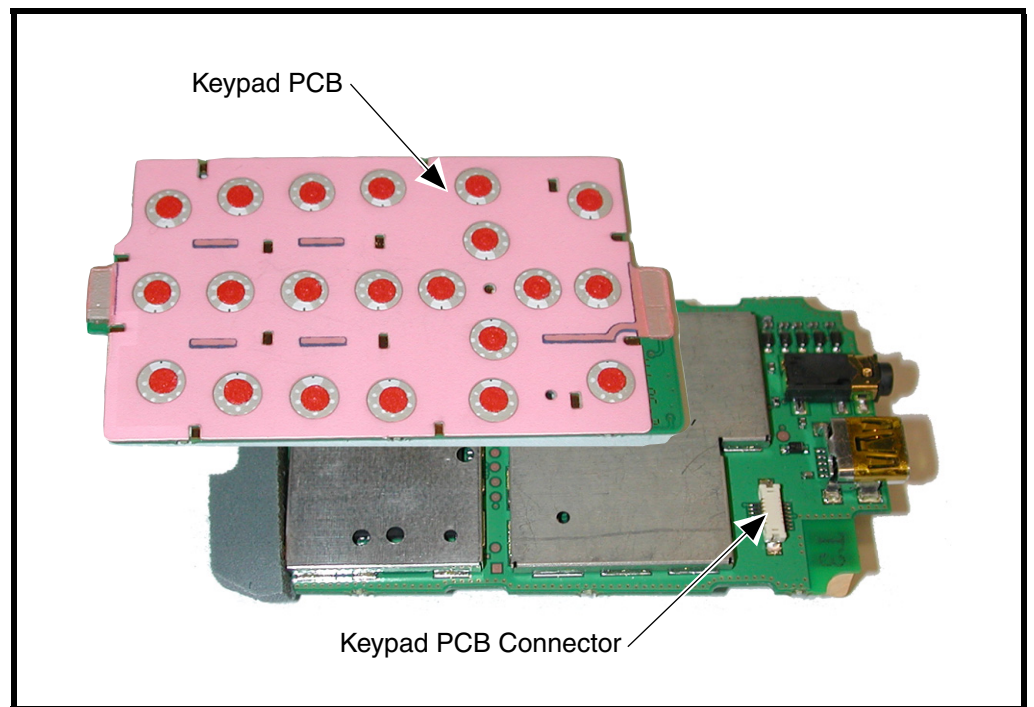
microphone will fit into the board only one way. Ensure the microphone assembly is fully seated against the PCB.



Do not force the microphone into its socket. The connector is keyed to fit only one way.

Removing and Replacing the Keypad PCB

1. Remove the battery cover, battery, antenna, light guide, rear housing, and transceiver board as described in the procedures.
2. While holding the transceiver board stationary, carefully pull the keypad PCB straight away from the transceiver board to disconnect as shown in Figure 15. The disassembly tool may be used to carefully pry the keypad PCB away from the transceiver board, if necessary.



031801o

Figure 15. Removing the Keypad PCB

3. To replace, align the connector on the keypad PCB with the mating connector on the transceiver board. Firmly press the two board assemblies together until the connectors snap into place.

Removing and Replacing the Keypad Keys

1. Remove the battery cover, battery, antenna, light guide, rear housing, and transceiver board as described in the procedures.
2. Lift the keypad keys from the front housing as shown in Figure 16.

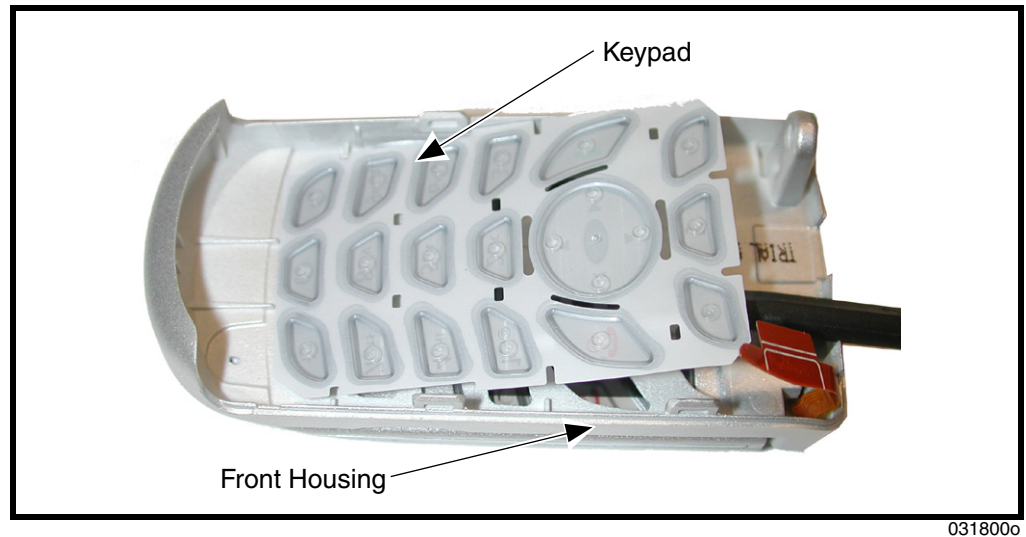


Figure 16. Removing the Keypad Keys

3. To replace, insert the keypad keys into the front housing, ensuring the keys align properly with the openings in the front housing.
4. Replace the transceiver board, rear housing, light guide, antenna battery, and battery cover as described in the procedures.

Removing the Flip Assembly



There are no Level 1 or 2 replaceable parts in the V150 telephone flip assembly. The flip assembly is not removable from the front housing at Level 1 and 2 Service Centers. Refer service to an authorized Level 3 or higher Center.

SIM Card and Identification

Live SIM Card

A SIM (Subscriber Identity Module) card 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.

Personality Transfer

A personality transfers is required when a phone is Express Exchanged or when the main board is replaced. Personality transfers reproduce the customer's original personalized details such as menu and stored memory such as phone books, or even just program a unit with basic user information such as language selection. There are two possible methods of transferring this information from unit to unit; normal transfer and master transfer.

- **Normal Transfer** - Used when the customer's original unit still powers up and, the customer's personalized menu selections and options are required to be transferred to the replacement unit.
- **Master Transfer** - Used when the faulty unit will not power up and the transfer is used to configure the replacement board to a set standard.

Listed below are the procedures to set up a master transfer card and to perform each method of transfer.

Normal Transfer

1. Remove the battery cover and battery from the customer's phone as described in the procedures.
2. Remove the customer's SIM card as described in the procedures.
3. Insert the transfer card into the 'donor' unit.
4. Replace the battery and battery cover as described in the procedures on page 25.
5. Press and hold **Ⓢ** until **Clone** displays on the screen.
6. Using the keypad buttons, type **021#** to upload the first block of data. **Please wait** displays on the screen.
7. When **Clone** displays on the screen, the transfer of the first data block is complete. Remove the battery cover, battery, and transfer SIM card.
8. Insert the transfer SIM card into the replacement unit, or the unit containing new main RF / Logic PCB.
9. Install the battery and battery cover as described in the procedures.
10. Press and hold **Ⓢ** until **Clone** displays on the screen.
11. Using the keypad buttons, type **03#**. **Please wait** displays while data is transferred.
12. When **Clone** displays on the screen, the transfer of the first data block is complete.

-
13. Repeat steps 1 - 10 but type **022#** at step 6 to transfer second block of data to the clone card.
 14. Repeat steps 1 - 10 but type **025#** at step 6 to transfer final block of data to the clone card.

Creating a Master SIM Card

1. Remove the battery cover and battery from the customer's one as described in the procedures on page 24.
2. Remove the customer's SIM card.
3. Insert the transfer SIM card into the customer's phone.
4. Replace the battery and battery cover as described in the procedures.
5. Press and hold **Ⓢ** until **Clone** displays on the screen.
6. Using the keypad buttons, type **024#** to copy the 'personality' from the unit to the transfer SIM card. **Please wait** displays on the screen.
7. When **Clone** displays on the screen, the transfer is complete and the Master Transfer card is created.

Master Transfer

1. Remove the battery cover and battery from the replacement unit as described in the procedures.
2. If required, remove the SIM card from the replacement unit.
3. Insert the Master Transfer Card into the replacement unit.
4. Replace the battery and battery cover as described in the procedures.
5. Press and hold **Ⓢ** until **Clone** displays on the screen.
6. Using the keypad buttons, type **03#** to download the data from the Master Transfer Card to the replacement unit. **Please wait** displays on the screen.
7. When **Clone** displays on the screen, the download is complete.

Identification

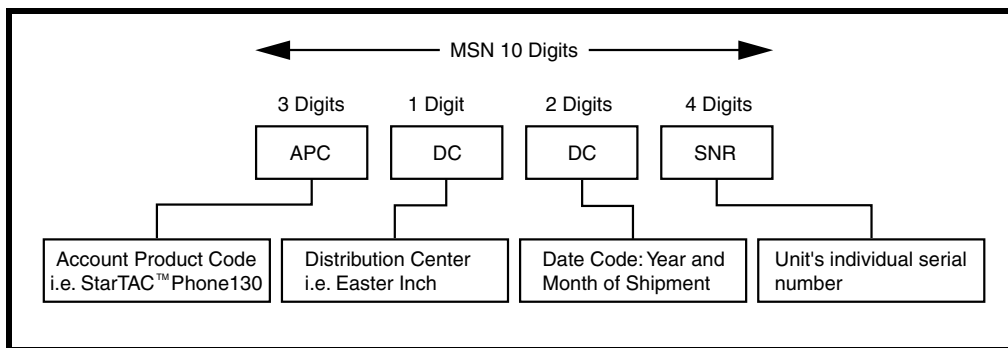
Each Motorola GSM device is labelled with a variety of identifying numbers. The following information describes the current identifying labels.

Mechanical Serial Number (MSN)

The Mechanical Serial Number (MSN) is an individual unit identity number and remains with the unit throughout the life of the unit.

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

The MSN is divided into 4 sections as shown in Figure 17.



000807-A

Figure 17. 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

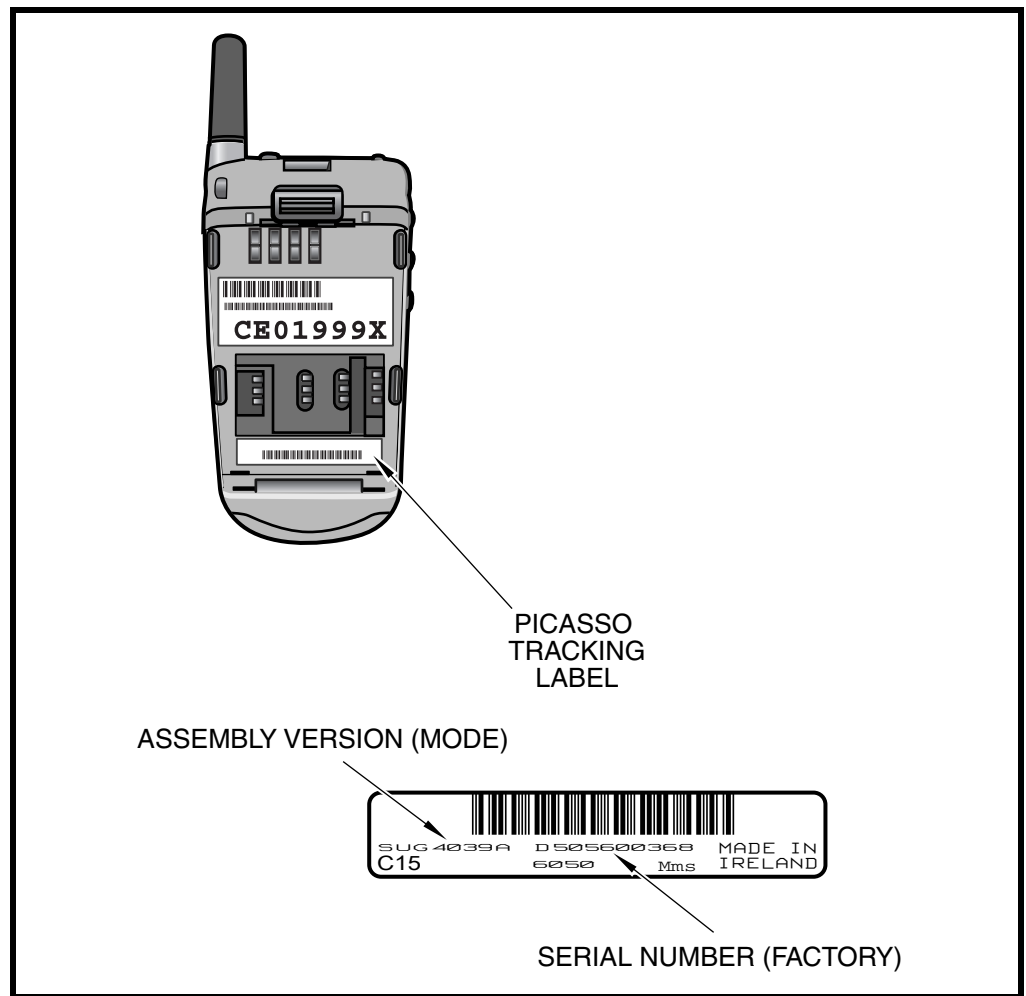
- TAC** Type Allocation Code, formerly known as Type Approval Code
- NN** Reporting body identifier
- XXXX** Type Identifier
- YY** YY is set to 00 from 01/01/2003 until 31/03/2004
- ZZZZZZ** Individual unit serial number
- A** Phase 1 = 0.
Phase 2 = check digit defined as a function of all other IMEI digits

Other label number configurations present are:

- **TRANSCIVER NUMBER:** Identifies the product type. Normally the SWF number. (i.e. V100).
- **PACKAGE NUMBER:** Identifies the equipment type, mode, and language in which the product is shipped.

Picasso Tracking Label

The number recorded on the Picasso label, when used with the MSN, allows precise identification of the device's origin. By tracking field failures back to the site, shift, and line of manufacture, failure trends can be quickly diagnosed and corrected at the source.



001157-O

Figure 18. Picasso Tracking Label

Troubleshooting

Manual Test Mode

The Motorola Product Family A28 telephone is equipped with a manual test mode capability. This capability allows service personnel to take control of the unit and make the unit perform desired functions by entering certain 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 cover and 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 and battery cover as described in the procedures.
6. Press **Ⓞ** to turn the phone ON.

Press and hold the # button for approximately 3 seconds until TEST displays on the screen. The phone may now be issued test commands listed in Table 4.

Manual Test Mode Commands

Table 4. Test Commands

| Test Command | Test Function/Name |
|--------------------------------|---|
| Press and hold # for 2 seconds | Enter manual test mode |
| 01# | Exit manual test mode |
| 07x# | Mute RX audio path |
| 08# | Unmute RX audio path |
| 09# | Mute TX audio path |
| 10# | Unmute TX audio path |
| 15x# | Generate tone |
| 1590# | Vibrate Mode |
| 1591# | Ringer Mode |
| 16# | Mute tone generator |
| 19# | Display software version number of Call Processor |
| 20# | Display software version number of Modem |
| 36# | Initiate acoustic loopback |
| 360# | Full Rate |
| 361# | Enhanced Full Rate |
| 362# | Half Rate |
| 37# | Stop test |
| 38# | Activate Mini SIM |
| 39# | Deactivate Mini SIM |
| 43x# | Change audio path |
| 47x# | Set audio volume |
| 51# | Enable sidetone |

Table 4. Test Commands (Continued)

| Test Command | Test Function/Name |
|--------------|---|
| 52# | Disable sidetone |
| 54# | Show service indicator LED (0 - Off, 1 - Red, 2 - Green, 3 - Amber) (flip must be closed) |
| 57# | Initialize non-volatile memory |
| 58# | Display security code |
| 58xxxxx# | Modify security code |
| 59# | Display lock code |
| 59xxx# | Modify lock code |
| 60# | Display IMEI |
| 980# | DCS Mode |
| 981# | GSM Mode |
| 99# | Display all pixels |

Troubleshooting Chart

Table 5. V150 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 connectors open or misaligned. | Visually inspect the battery connectors on both the battery and the telephone. Realign and, if necessary, either replace the battery or refer to a Level 3 Service Center for the battery connector replacement. If battery connectors are not at fault, proceed to c. |
| | c) Transceiver board assembly defective. | Remove the transceiver board assembly. Substitute a known good assembly and temporarily reassemble the unit. Depress the PWR button; if unit turns on and stays on, disconnect the dc power source and reassemble the telephone with the new transceiver board assembly. Verify that the fault has been cleared. If the fault has not been cleared then proceed to d. |
| | d) Keypad board assembly failure. | Replace the keypad board assembly. Temporarily connect a +3.6 Vdc supply to the battery connectors. Depress the PWR button. If unit turns on and stays on, disconnect the dc power source and reassemble with the new keypad board. If the fault is not cleared then proceed to e. |
| | e) Front housing assembly failure. | Disassemble unit and insert the transceiver board assembly into new front housing assembly. Insert a battery and depress PWR button. Ensure unit stays on. If fault has been cleared, reassemble unit in new front housing assembly. |

Table 5. V150 Telephone: Level 1 and 2 Troubleshooting Chart (Continued)

| SYMPTOM | PROBABLE CAUSE | VERIFICATION AND REMEDY |
|---|--|---|
| 2. Telephone exhibits poor reception or erratic operation such as calls frequently dropping or weak or distorted audio. | a) Antenna assembly defective. | Check to make sure that the antenna pin is properly connected to the transceiver board assembly. If connected properly, substitute a known good antenna. If the fault is still present, proceed to b. |
| | b) Transceiver board assembly defective. | Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board assembly. |
| 3. Display is erratic, or provides partial or no display. | a) Mating connections to or from front housing assembly faulty. | Remove rear housing from unit, check general condition of flex connector if the flex connector is good, check that the ZIF connector is fully pressed down and that the flex collars are flush with the plastic of the connector. If not, check ZIF to transceiver board assembly connections. If faulty connector, replace the transceiver board assembly. If connector is not at fault, proceed to b. |
| | b) Front housing assembly defective. | Substitute the good transceiver board assembly into a known good front housing. If the fault is cleared, rebuild with new front housing assembly. If the fault is not cleared, reinstall into the original front housing assembly and proceed to c. |
| | c) Transceiver board assembly defective. | Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board assembly. |
| 4. Incoming call alert transducer audio distorted or volume is too low. | a) Faulty transceiver board assembly. | Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board assembly. |
| 5. Telephone transmit audio is weak. (usually indicated by called parties complaining of difficulty in hearing voice). | a) Microphone connections to the transceiver board assembly defective. | Gain access to the microphone as described in the procedures. Check connections. If connector is faulty proceed to c; if the connector is not at fault, proceed to b. |
| | b) Microphone defective. | Gain access to microphone. Disconnect and substitute a known good microphone. Place a call and verify improvement in transmit signal as heard by called party. If good, reassemble with new microphone. If microphone is not at fault, reinstall original microphone and proceed to c. |
| | c) Transceiver board assembly defective. | Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board assembly. |
| 6. Receive audio from earpiece speaker is weak or distorted. | a) Connections to or from transceiver board assembly defective. | Gain access to the transceiver board assembly as described in the procedures. Check connection and the flex from the earpiece to the transceiver board assembly. If flex is at fault, replace front housing assembly. If ZIF connector is at fault, proceed to d. If connection is not at fault, proceed to b. |

Table 5. V150 Telephone: Level 1 and 2 Troubleshooting Chart (Continued)

| SYMPTOM | PROBABLE CAUSE | VERIFICATION AND REMEDY |
|---|---|--|
| | b) Earpiece speaker defective. | Remove the transceiver board assembly from housing and insert into known good front housing assembly. Ensure good flex connection. Place a call and verify improvement in earpiece audio. If fault is cleared, reassemble the phone with the good front housing assembly. If fault is not cleared, reinstall into the original housing and proceed to c. |
| | c) Antenna assembly defective. | Rephase the unit and recheck the symptom. If symptom is the same but unit rephases correctly, check to make sure the antenna is installed correctly. If the antenna is installed correctly, substitute a known good antenna assembly. If this does not clear the fault, reinstall the original antenna assembly and proceed to d. |
| | d) Transceiver board assembly defective. | Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble with the new transceiver board assembly. |
| 7. Telephone will not recognize or accept SIM 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 assembly defective. | Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board assembly. |
| 8. Phone does not sense when flip is opened or closed (usually indicated by inability to answer incoming calls by opening the flip, or inability to make outgoing calls). | a) Magnet or reed switch in front housing assembly defective. | Replace front housing assembly with known good one. Refer to the procedures. Place call to phone and verify ability to answer by opening flip. If fault is cleared, rebuild phone with new front housing assembly. If fault is still present, replace original front housing assembly and proceed to b. |
| | b) Keypad board assembly defective. | Replace the keypad board with a known good one. Place call to phone and verify that the fault has been eliminated. If not, proceed to c. |
| | c) Transceiver board assembly defective. | Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board assembly. |
| 9. Vibrator feature not functioning. | a) Vibrator in rear housing assembly defective. | Replace rear housing assembly. If fault still present, restore original rear housing assembly and proceed to b. |
| | b) Transceiver board assembly defective. | Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board assembly. |

Table 5. V150 Telephone: Level 1 and 2 Troubleshooting Chart (Continued)

| SYMPTOM | PROBABLE CAUSE | VERIFICATION AND REMEDY |
|---|--|---|
| 10. Internal Charger not working. | a) Faulty charger circuit on transceiver board assembly. | Test a selection of batteries in the rear pocket of the desktop charger. Check LED display for the charging indications. If these are charging properly, then the internal charger is at fault. Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board assembly. |
| 11. Real Time Clock resetting when standard battery is removed. | Lithium button cell in the front housing assembly may be depleted. | Remove the transceiver board assembly from the front housing assembly and insert into known good front housing assembly. Ensure good flex connection. Check RTC time does not reset. If fault is cleared, rebuild with new front housing assembly. If fault is still present, restore original front housing assembly. |
| 12. No or weak audio when using headset. | a) Headset not fully pushed home. | Ensure the headset plug is fully seated in the jack socket. |
| | b) Faulty jack socket on transceiver board assembly. | Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board assembly. |

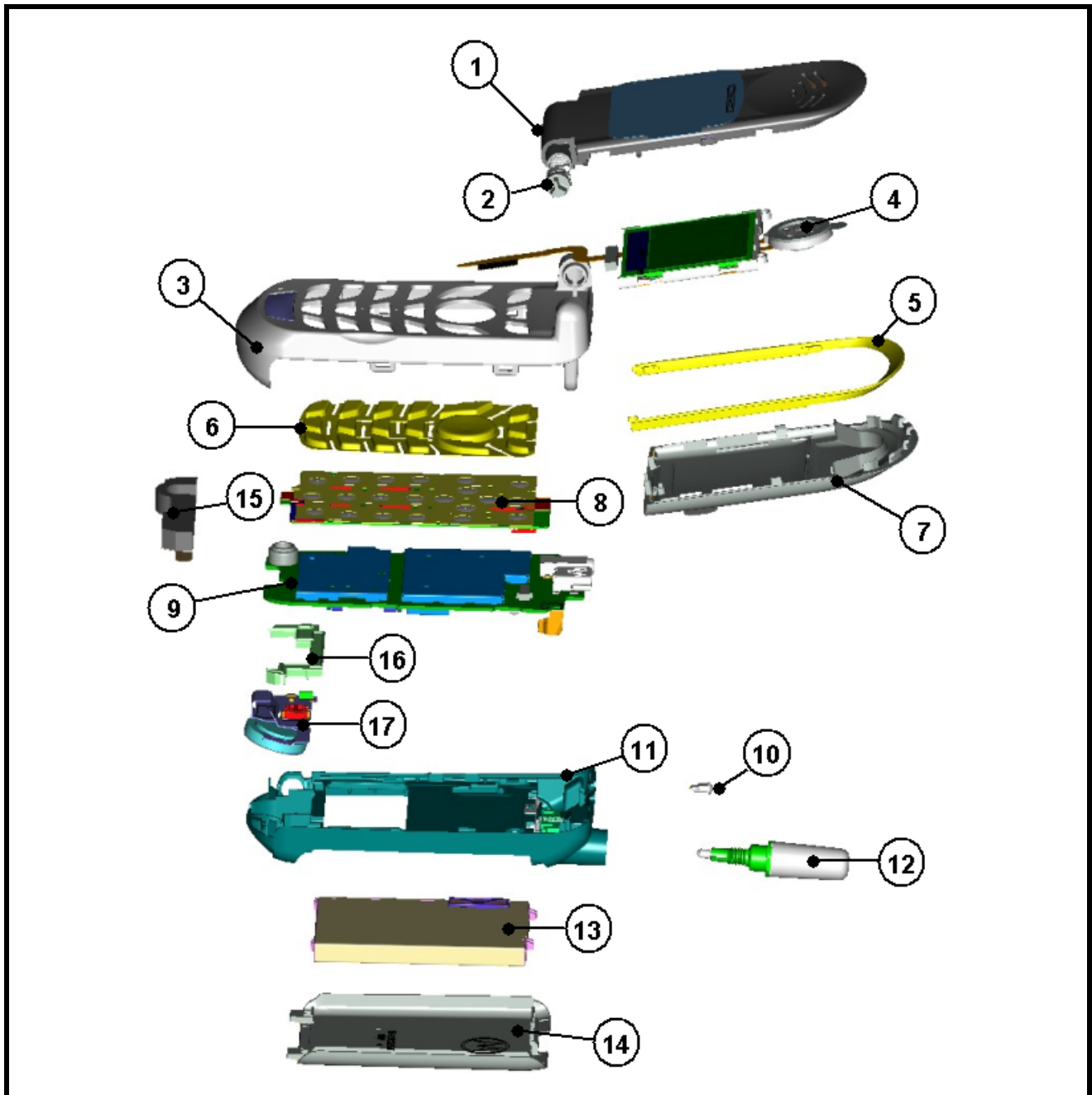
Programming: Software Upgrade and Flexing

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

Part Number Charts

The following charts are provided as a reference for the parts associated with V150 telephones.

Exploded View Diagram



0317410

Figure 19. Exploded View Diagram

Exploded View Parts List

Table 6. Exploded View Parts List

| Item Number | Motorola Part Number | Description |
|-------------|-------------------------|----------------------------------|
| 1 | 0185775K28 ¹ | Flip assembly |
| 2 | 5504765Z08 ¹ | Hinge Assembly |
| 3 | 1503546B01 ¹ | Front housing |
| 4 | 0185778K28 ¹ | LCD & Flip flex assembly |
| 5 | 1303638B01 ¹ | Flip ring |
| 6 | See Table 7 | Keypad |
| 7 | 0185779K19 | Flip rear housing |
| 8 | CFLG1001 | Keypad PCB & Dome array Assembly |
| 9 | CFLG1000 ² | Main PCB assembly |

| Item Number | Motorola Part Number | Description |
|-------------|----------------------|-------------------------|
| 10 | 6185635H04 | Light guide/housing pin |
| 11 | 0103559B02 | Rear housing assembly |
| 12 | 018622P02 | Antenna assembly |
| 13 | See Table 7 | Battery |
| 14 | 1509325T17 | Battery door |
| 15 | 3203558B01 | Acoustic chamber foam |
| 16 | 6185635H04 | Charger light pipe |
| 17 | 0103555B01 | Power flex |
| -- | 5009135L07 | microphone |
| -- | 0585699J01 | microphone grommet |

Notes: 1. Order next higher assembly.
 2. Not available as spares in EMEA Service markets.



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.

Model Dependant Part Numbers

Table 7. Model Dependant Part Numbers

| Item | Motorola Part Number | Description |
|------|----------------------|------------------|
| 6 | 3803554B01 | Keypad, English |
| 6 | 3803554B02 | Keypad, Cyrillic |
| 6 | 3803554B03 | Keypad, Hebrew |
| 6 | 3803554B04 | Keypad, Arabic |
| 13 | AANN4204 | Battery 4mm |
| 13 | AANN4258 | Battery 6mm |

Accessories and Related Publications

Table 8. Accessories

| Part Description | Part Number |
|---------------------------------------|--------------------|
| Battery, Slim, Lithium Ion, 500 mAh, | SNN5435 |
| Charger, Desktop | SHN7498 |
| Power Adapter | SPN4604 |
| Adapter Plug, UK | SYN7455 |
| Adapter Plug, Europe | SYN7456 |
| Adapter Plug, Australia / New Zealand | SYN8127 |
| Adapter Plug, India | SYN7461 |
| Vehicle Power Adapter | SYN4241 |
| Smart CELLect™ 2000 Cable | PCC7000 |
| Personal Handsfree System | SYN8390 |
| Leather Holster | SYN8089 |

V150 Dual Band Mobile Telephone User's Guide, English

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