



MOTOROLA

Basic Service Guide

Minitor IV TM Tone and Voice Pager

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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 a network of company-operated product care centers as well as authorized independent service firms.

To learn more about the wide range of Motorola service programs, contact your local Motorola representative.

Minitor IV pagers covered under the standard one-year warranty or by an Express Service Plus plan must be returned to one of the Motorola Repair Centers listed below:

Customers in the United States:

Motorola Service Center
45-E Butterfield Trail
El Paso, TX 79906

Customers in Canada:

Motorola Canada Ltd.
8133 Warden Avenue
Markham, Ontario, L6G 1B3
Tel: 1-800-543-3222
Fax: 1-888-331-9872 or 1-905-948-5970

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 Changes

When electrical, mechanical or production changes are incorporated into Motorola paging products, a revision letter is assigned to the chassis or kit affected, for example; -A, -B, or -C, and so on.

The part number, including the revision letter, is imprinted on the chassis or kit during production. The revision letter is an integral part of the chassis or kit number and is also listed on the 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. This device must accept interference received, including interference that may cause undesired operation.

This device complies with RSS-210 of Industry and Science Canada. Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Computer Software Copyrights

The Motorola products described in this guide might include copyrighted Motorola computer software stored in semiconductor memories and other media. Laws in the United States and other countries preserve for Motorola certain exclusive rights for copyrighted computer programs, including the exclusive right to copy or reproduce in any form the copyrighted computer software.

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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 damages

Parts Replacement

When ordering replacement parts or equipment, include the Motorola part number and description used in the service manual or supplement.

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

Specifications—Low Band

	STANDARD
Model Series¹ 1 Channel: 2 Channel:	A01KUS7238_C A01KUS7239_C
Frequency:	33 – 49 MHz
Max Freq Separation (2 Channel Model Only)	4 MHz
Weight (with batteries)	4.9 oz. (139g)
Dimensions	3.52" x 2.4" x .85"
Sensitivity Alerting	7.5 uV/m Splits B and C 6.5 uV/m Splits A and D
Selectivity	> 60 dB @ 20 kHz
Spurious Image Rejection	> 55dB
Audio Output (Alert/Voice)	93 dB / 90 dB @ 12 inches
Frequency Stability	± .0015%
Channel Spacing	20 kHz
Power Supply	Two "AAA" NiCad or Alkaline Batteries
Battery Life²	Selective Call: > 30 hrs (NiCad) > 150 hrs (Alkaline) Monitor: > 20 hrs (NiCad) (2% duty cycle)>100 hrs (Alkaline)
¹ The "_ " in the model numbers varies depending on version level (A, B, C, etc.) ² When used in the Selective Call mode, battery life is based upon receiving five 30-second calls per 8-hour period. When used in the Monitor Mode, battery life depends upon the amount of voice traffic present on the channel.	

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Specifications—VHF

	STANDARD	STORED VOICE
Model Series¹ 1 Channel: 2 Channel:	A03KUS7238_C A03KUS7239_C	A03KUS9238_C A03KUS9239_C
Frequency:	143 - 174 MHz	
Max Freq Separation (2 Channel Model Only)	8 MHz (A, B, C splits) 7 MHz (D split)	
Weight (with batteries)	4.9 oz. (139g)	
Dimensions	3.52" x 2.4" x .85"	
Sensitivity Alerting	7.5 uV/m (5.5 uV/m typical)	
Selectivity	> 60 dB @ 30 kHz	
Spurious Image Rejection	> 55dB	
Audio Output (Alert/Voice)	93 dB / 90 dB @ 12 inches	
Frequency Stability	± .0015%	
Channel Spacing	30 kHz	
Power Supply	Two "AAA" NiCad or Alkaline Batteries	
Battery Life²	Selective Call: > 40 hrs (NiCad) > 195 hrs (Alkaline) Monitor: > 30 hrs (NiCad) (2% duty cycle)>145 hrs (Alkaline)	
¹ The "_" in the model numbers varies depending on version level (A, B, C, etc.) ² When used in the Selective Call mode, battery life is based upon receiving five 30-second calls per 8-hour period. When used in the Monitor Mode, battery life depends upon the amount of voice traffic present on the channel.		

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Specifications—UHF

	STANDARD	Stored Voice
Model Series¹		
1 Channel:	A04KUS7238_C	A04KUS9238_C
2 Channel:	A04KUS7239_C	A04KUS9239_C
Frequency:	406 - 430 MHz 450 - 512 MHz	
Max Freq Separation (2 Channel Model Only)	8 MHz (A2-A5 splits) 6 MHz (A6-A14 splits)	
Weight (with batteries)	4.9 oz. (139g)	
Dimensions	3.52" x 2.4" x .85"	
Sensitivity Alerting	10 uV/m (8.5 uV/m typical)	
Selectivity	> 60 dB @ 25 kHz	
Spurious Image Rejection	> 50dB	
Audio Output (Alert/Voice)	93 dB / 90 dB @ 12 inches	
Frequency Stability	± .0005%	
Channel Spacing	30 kHz	
Power Supply	Two "AAA" NiCad or Alkaline Batteries	
Battery Life²	Selective Call: > 35 hrs (NiCad) > 170 hrs (Alkaline) Monitor: > 25 hrs (NiCad) (2% duty cycle)>120 hrs (Alkaline)	
¹ The "_" in the model numbers varies depending on version level (A, B, C, etc.) ² When used in the Selective Call mode, battery life is based upon receiving five 30-second calls per 8-hour period. When used in the Monitor Mode, battery life depends upon the amount of voice traffic present on the channel.		

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

General Description

The Motorola Minitor IV pager is an easy-to-use, compact alert monitor, powered by two rechargeable Nickel-Cadmium or two alkaline "AAA" size batteries. The pager can operate on selected Low Band, VHF and UHF frequencies.



Caution: Do not place pager in the charger when alkaline batteries are installed.

The Minitor IV pager uses the most advanced self-contained, sealed, and custom-integrated circuits to perform the complex functions involved in radio paging. The pager is housed in a high-impact resistant case that offers excellent protection against dust intrusion, vibration, and shock. Lightweight and small in size, the unit can be carried comfortably in a pocket or purse, or clipped onto a belt.

The pager offers the following models:

- Single Frequency with Vibrator
- Two-Frequency with Vibrator
- Single Frequency Stored Voice with Vibrator
- Two-Frequency Stored Voice with Vibrator



Note: Low Band models are not available with the stored voice feature;

On/Off Switch and Volume Control

The combined single control on the top of the pager applies power to the receiver when the control knob is turned a few degrees in the clockwise direction. An audio beep is sounded to indicate that the pager is turned on. Rotating the control in the clockwise direction, increases the volume level of received messages.

Rotating the control in the counterclockwise direction reduces the audio level and turns the pager off.

Audible/Visual Alert Indicators

When the pager is initially turned on, both the red and amber light emitting diodes (LEDs) on the control panel light and an alert tone is sounded until the decoder circuit power-up is complete. Thereafter, whenever a properly encoded message is received, the red LED flashes and an audio alert is sounded.

The amber LED is on when an unread message is played back. If the battery voltage falls below the level required for reliable operation, a low-battery pulse tone sounds and the red LED flashes. Following any subsequent audio message, the momentary low-battery pulse tone is repeated until the batteries are replaced or re-charged.



Caution: Do not place pager in the charger when alkaline batteries are installed.

If the function switch is set to a vibrate position, the red LED flashes to indicate a low-battery state and the audible low-battery alert is generated.

Operating Modes

Depending on the model, the following modes are available for the pager:

- Monitor
- Monitor Tone Alert
- Monitor Vibrate
- Select Call Tone Alert
- Select Call Vibrate
- Scan or Priority Scan

Any 'monitor' mode allows voice communication on the selected channel to be heard through the speaker.

'Select call' modes require tone detection to automatically receive voice communication.

Priority scan mode monitors two channels. The amber LED blinks fast to indicate a transmission on F1 channel and at a slower rate for transmission on F2 channel. F1 is always the priority channel and will override channel activity on F2.

Reset Button

Pressing and releasing the reset button returns the pager to the standby mode. The reset button activates channel monitoring when pressed and held.

Stored Voice

The playback button is centered in the function switch. When pressed, it allows playback of up to two minutes of messages.

The red LED turns on if the memory contains any unread messages. The pager will also generate a reminder alert approximately every two minutes when an unread message exists.

If there are no messages in memory, a 'memory empty' tone is generated while the playback button is pressed.

Programmable Function Switch Options

Depending on the model, the function switch can be programmed with the following options:

<u>Option</u>	<u>Number Description</u>
0	Monitor F1 Tone Alert
1	Monitor F2 Tone Alert
2	Selective Call F1 Tone Alert
3	Selective Call F2 Tone Alert
4	Vibrate Alert F1 Monitor Mode
5	Vibrate Alert F2 Monitor Mode
6	Vibrate Alert F1 Selective Call Mode
7	Vibrate Alert F2 Selective Call Mode
8	Address Off Duty F1 Tone Alert Selective Call Mode
9	Address Off Duty F2 Tone Alert Selective Call Mode
10	Address Off Duty F1 Vibrate Alert Selective Call Mode
11	Address Off Duty F2 Vibrate Alert Selective Call Mod
12	Scan with Tone Alert only
13	PTL - Vibrate Alert Audio Off After Alert F1 Selective Call
14	PTL - Address Off Duty F1 Vibrate Alert Audio Off After Alert F1 Selective Call

Maintenance

The procedures in this section provide instructions for the disassembly of the Minitor IV pager.



Caution: This product contains static-sensitive devices. Use anti-static handling procedures to prevent electrostatic discharge and component damage.

Removing Back Cover



Caution: Once the front housing and back cover are disassembled, the UL Intrinsic Safety Rating is voided. To maintain UL Intrinsic Safety Rating repair work must be performed by a UL approved repair facility. The unit must be resealed during re-assembly in order for the unit to maintain the UL Intrinsic Safety Rating for Hazardous Locations. Instructions for applying a new gasket are included in this manual.



Caution: Failure to follow the service instructions will nullify the Hazardous Locations Approval

To remove the back cover, do the following:

1. Turn volume control to off position.
2. Use a 1.5 mm Allen wrench to remove the back cover lock screw.
3. Remove batteries.
4. Slide the back cover apart from the front housing as follows:



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- a. Holding housing with thumbs on the bottom of the speaker grill and index fingers on top of belt clip. Slide the front housing and back cover apart.



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- b. Remove back cover from front housing completely.

Removing the Decoder Board and Receiver Assembly

After removing the back cover as described in the procedure, remove the decoder board and receiver assembly (Figure 1) as follows:



Caution: The decoder board and receiver are removed as one assembly, and then separated later. When removing the assembly, take care not to break the wires connecting the decoder board and the speaker.

1. Gently pull the decoder board/receiver assembly out of the front housing at the battery end of the housing. Pull from the bottom of the decoder board/receiver assembly, lift up and gently wiggle the assembly.
2. The receiver is attached to the decoder by two eight-pin miniature connectors located at each end of the receiver. Turn the assembly over and remove the receiver by lifting it upward off the decoder board.

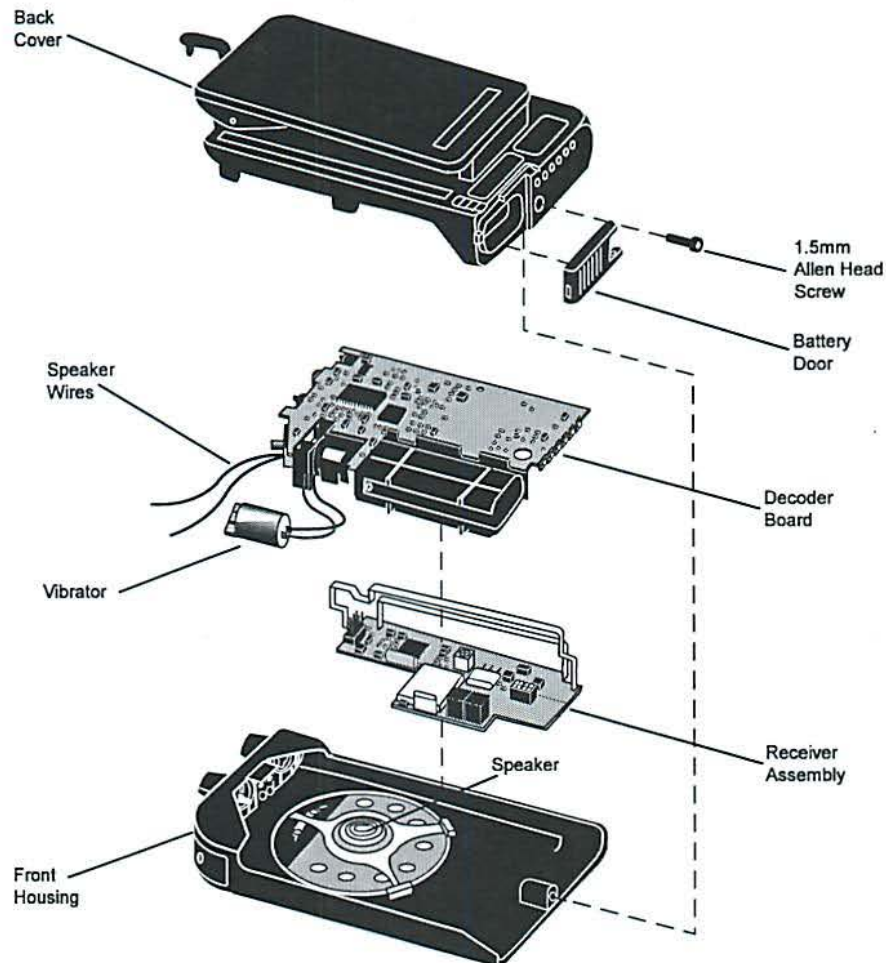
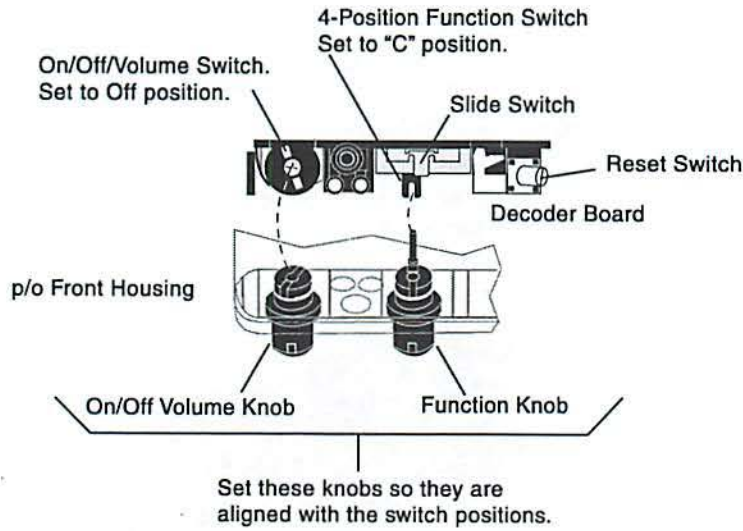


Figure 1. MINITOR IV - Major Components

Replacing the Decoder Board and Receiver Assembly

The assembly of the decoder board/receiver assembly is the reverse of disassembly. When reinstalling the decoder board/receiver assembly into the front housing, ensure that the function and on/off knobs are in alignment with the switch positions on the decoder board (Figure 2).



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Figure 2. Front Panel Knob/Decoder Board Switch Position Alignment

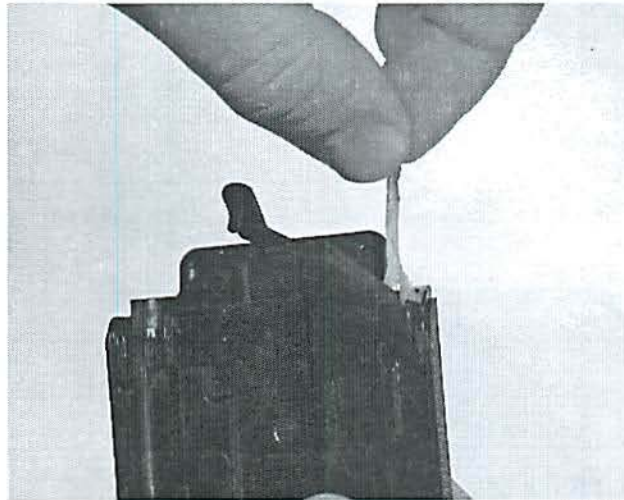
Reassembly and Resealing of the Front Housing and Back Cover



Caution: To maintain UL Intrinsic Safety Rating, this procedure must be performed by a UL approved repair facility

After the decoder/receiver board assembly had been reassembled into the front housing, the gasket material must be applied to the back cover. Apply the gasket material as follows:

1. Before applying any new gasket material, all old material must be removed from the front housing and back cover. Simply remove by gently pulling gasket material away from the plastic.



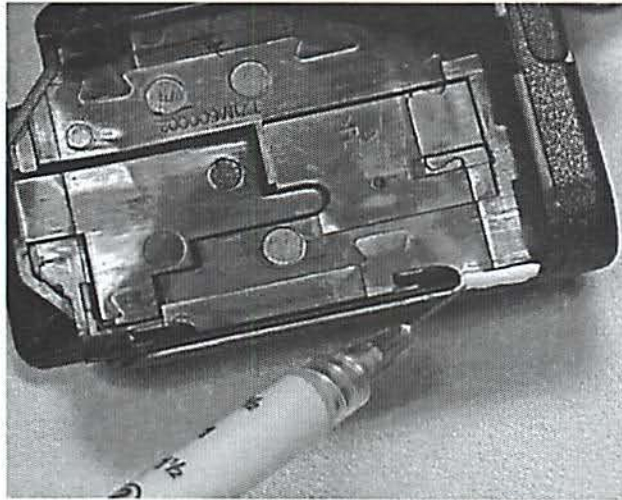
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2. Inspect the front and back housing for any cracks, scratches or nicks. If any are found, replace the entire enclosure.
3. After all old gasket material is removed from the front and back housing, a syringe must be used to apply the gasket material. The gasket material to be used is made by Kester®. The material is called Techform TC 533. Add TC 533 to material to the syringe by pulling out the plunger and squirting material into the syringe.

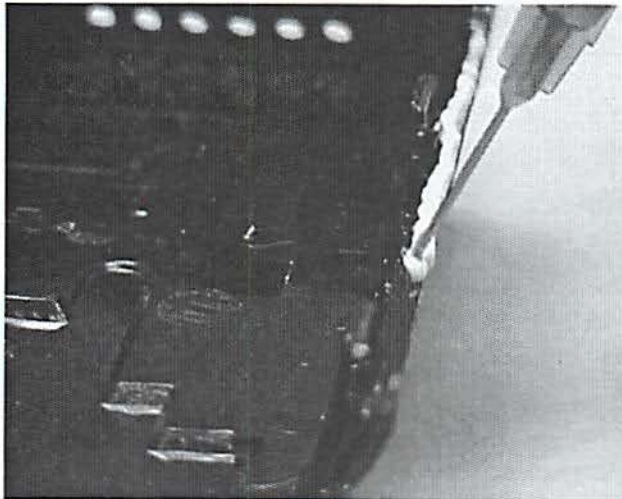


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4. When the syringe is ready, begin applying material to the ridge that runs around the edge of the back cover.

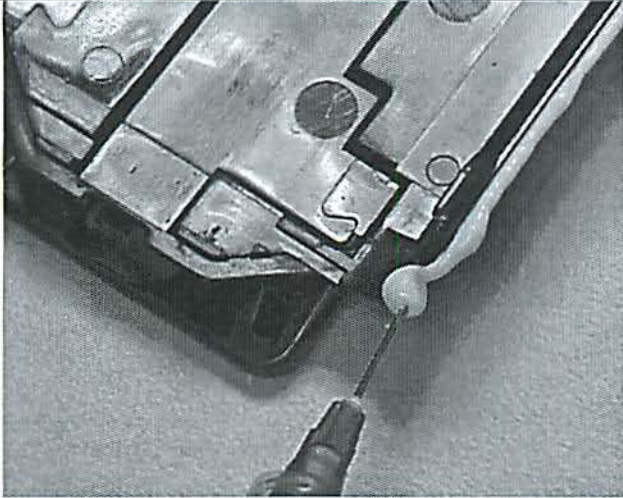


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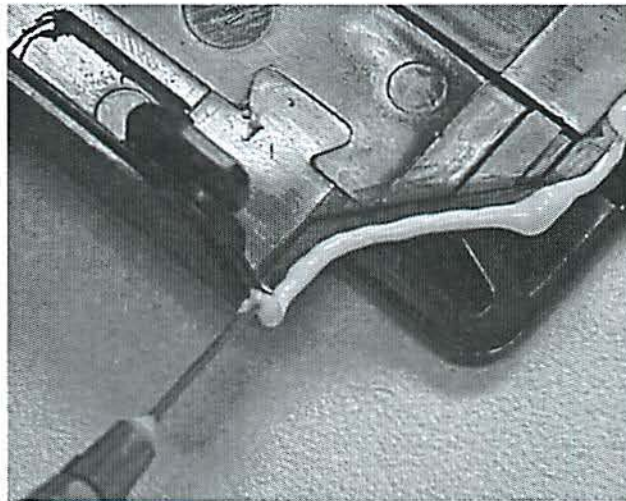
Apply the material to the top of the "tongue" feature as shown above.



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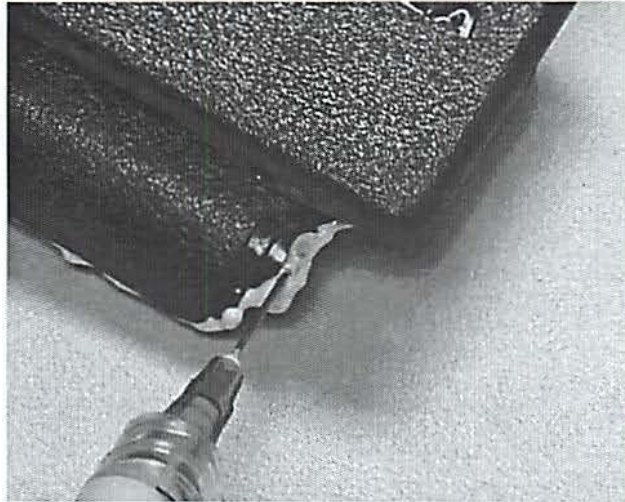


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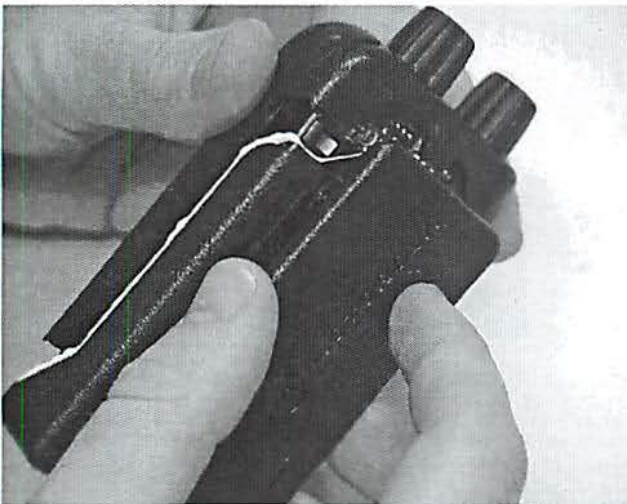
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5. When the gasket material has been applied to the entire "tongue" feature on the back cover, some material must also be added to the outside surface of the "flap" feature on the upper corner, opposite the side of the battery door.



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6. After the gasket material application process has been completed, it is time to assemble the back housing to the front housing. Drop the back housing onto the front housing and slide into place.

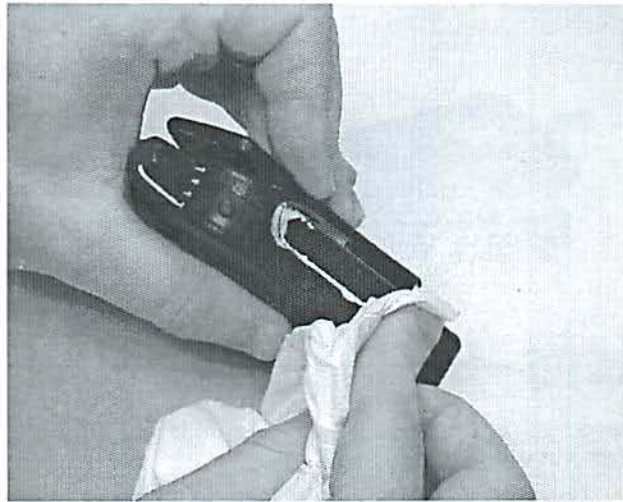


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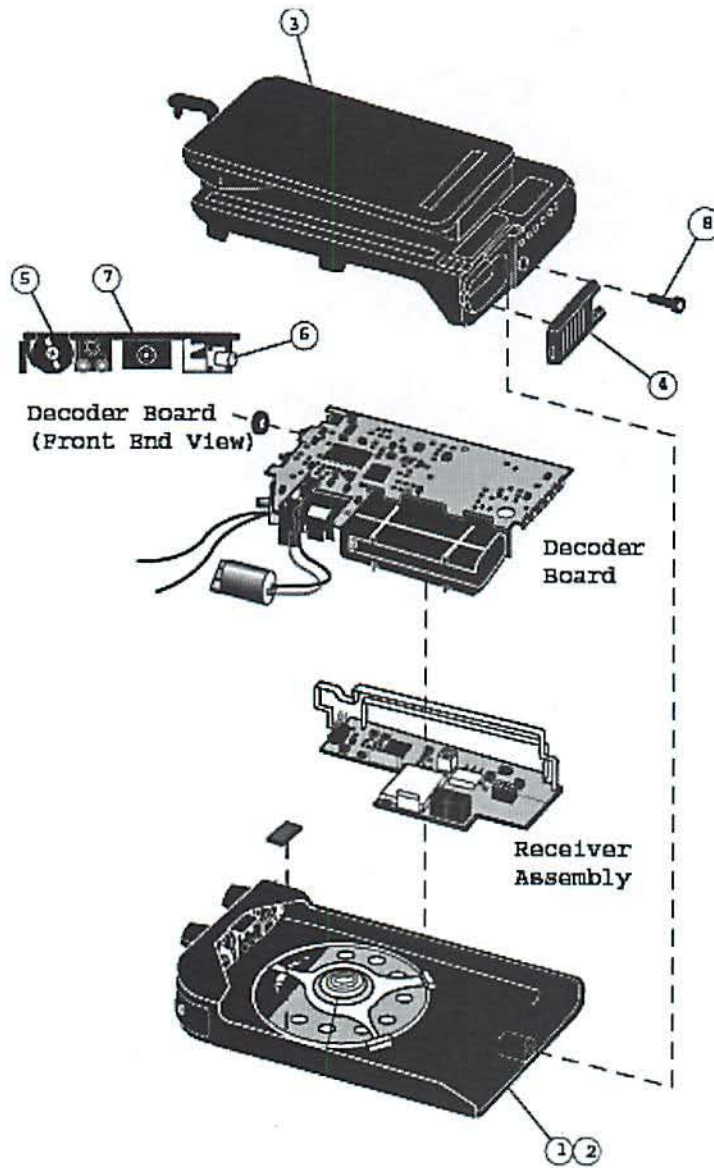
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7. Once the pager has been reassembled and the screw has been inserted, wipe away excess gasket material.



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Exploded View



Exploded View Parts List

Table 11. Replacement Parts

REF. NO.	MOTOROLA PART NUMBER	DESCRIPTION
1	1580384N36	Front Housing, Non-Stored Voice ¹
2	1580384N37	Front Housing, Stored Voice ¹
3	1580384N38	Back Cover
4	RLN5594A	Battery Door
5	4080384N34	Volume Control, On/Off Switch
6	4080384N33	Reset Switch, Push Button
7	4080384N35	Function Select Switch, Rotary
8	0380384N40	Screw
NR	1580384N73	Belt Clip
NR	2280384N74	Belt Clip Pin
NR	4180384N75	Belt Clip Spring
NR	3880384N76	Audio Jack Plug
NR	1180384S18	TC533 Latex Peelable Mask (1/2 Pint)
NR	6680334F40	Syringe Assembly
NR	6680334F41	Syringe Tips

¹ Includes speaker grill cloth, reset button, volume control, and battery lock.

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Commercial, Government and Industrial Solutions Sector
1313 E. Algonquin Rd., Schaumburg, IL 60196-1081.

Printed in U.S.A. 06/02



6880309M80-O