MOTOROLA

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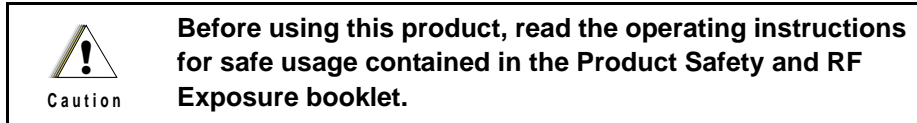| HT750	MTX850	MTX8250
HT1250	MTX850•LS	MTX8250•LS
HT1250•LS	HT1250•LS+	MTX950
HT1550•XLS		MTX9250

Portable Radios

Professional Radio

Basic Service Manual

Foreword

This manual provides sufficient information to enable qualified service technicians to troubleshoot and repair CDM Series mobile radios to the component level.

Product Safety and RF Exposure Compliance

⚠ **Caution**	**Before using this product, read the operating instructions for safe usage contained in the Product Safety and RF Exposure booklet.**

ATTENTION!

This radio is restricted to occupational use only to satisfy FCC RF energy exposure requirements. Before using this product, read the RF energy awareness information and operating instructions in the Product Safety and RF Exposure booklet (Motorola Publication part number 68P81095C98) to ensure compliance with RF energy exposure limits.

For a list of Motorola-approved antennas, batteries, and other accessories, visit the following web site which lists approved accessories: http://www.motorola.com/cgiss/index.shtml.

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Chapter 1

Introduction

1.1 Scope of Manual

This manual is intended for use by service technicians familiar with similar types of equipment. It contains service information required for the equipment described and is current as of the printing date. Changes which occur after the printing date may be incorporated by a complete Manual revision or alternatively as additions.

1.2 Warranty and Service Support

Motorola offers support which includes: full exchange and/or repair of the product during the warranty period; and service/repair or spare parts support out of warranty. Any "return for exchange" or "return for repair" to an authorized Motorola Dealer must be accompanied by a Warranty Claim Form. Warranty Claim Forms are obtained by contacting an Authorized Motorola Dealer. (See section 1.2.4 on page 1-3.)

1.2.1 Warranty Period and Return Instructions

The terms and conditions of warranty are defined fully in the Motorola Dealer or Distributor or Reseller contract. These conditions may change from time to time, and the following subsections are for guidance purposes only.

In instances where the product is covered under a "return for replacement" or "return for repair" warranty, a check of the product should be performed prior to shipping the unit back to Motorola. This is to ensure that the product has been correctly programmed or has not been subjected to damage outside the terms of the warranty.

Prior to shipping any radio back to the appropriate Motorola warranty depot, please contact Customer Resources (Please see page 2 and page 3 in this chapter.). All returns must be accompanied by a Warranty Claim Form, available from your Customer Resources representative. Products should be shipped back in the **original packaging**, or correctly packaged to ensure that no damage occurs in transit.

1.2.2 After Warranty Period

After the Warranty period, Motorola continues to support its products in two ways:

1. Motorola's Radio Parts and Service Group offers repair service to users and dealers at competitive prices.
2. The Motorola Customer Care and Services Division (CCSD) supplies individual parts and modules that can be purchased by dealers who are capable of performing fault analysis and repair.

1.2.3 Piece Parts Availability

Some replacement parts, spare parts, and/or product information can be ordered directly.

If...	It Means That...
A complete Motorola part number is assigned to the part, and it is not identified as Depot ONLY	**The part is available from the Customer Care and Services Division (CCSD).***
No part number is assigned	**The part is not normally available from Motorola.**
The part number is appended with an asterisk	**The part is serviceable by a Motorola Depot only.**
A parts list is not included	**Generally, no user-serviceable parts are available for that kit or assembly.**

*The Customer Care and Services Division (CCSD) was formerly known as the Accessories and Aftermarket Division (AAD).

Motorola Online:

Motorola Online users can access our online catalog at

https://www.motorola.com/businessonline

To register for online access, please call 800-814-0601.

Mail Orders:

Send written orders to the following addresses:

Replacement Parts/ Test Equipment/Manuals/ Crystal Service Items:	**Federal Government Orders:**	**International Orders:**
Motorola Inc. Customer Care and Services Division* (United States and Canada) Attention: Order Processing 1307 E. Algonquin Road Schaumburg, IL 60196	Motorola Inc. U.S. Federal Government Markets Division Attention: Order Processing 7230 Parkway Drive Landover, MD 21076	Motorola Inc. Customer Care and Services Division* (United States and Canada) Attention: Order Processing 1307 E. Algonquin Road Schaumburg, IL 60196

Telephone Orders

Customer Care and Services Division*
7:00 AM to 7:00 PM (Central Standard Time)
Monday through Friday (Chicago, U.S.A.)
1-800-422-4210
1-847-538-8023 (International Orders)

U.S. Federal Government Markets Division (USFGMD)
1-800-826-1913 Federal Government Parts - Credit Cards Only
8:30 AM to 5:00 PM (Eastern Standard Time)

Fax Orders

Customer Care and Services Division*
1-800-622-6210
847-576-3023 (International)

USFGMD
(Federal Government Orders)
1-800-526-8641 (For Parts and Equipment Purchase Orders)

Parts Identification

Customer Care and Services Division*
(United States and Canada)
1-800-422-4210, menu 3

Product Customer Service

Customer Response Center
(Non-technical Issues)
1-800-247-2346
FAX:1-800-247-2347

*The Customer Care and Services Division (CCSD) was formerly known as the Accessories and Aftermarket Division (AAD).

1.2.4 Technical Support

Technical support is available to assist the dealer/distributor in resolving any malfunction which may be encountered. For service, contact the Service Depot in your area. If your area does not have a depot, please contact your Business Development Manager, Distributor, or contact Motorola Technical Support. When contacting Motorola Technical Support, keep the product **model number** and the unit's **serial number** handy.

For service, contact one of the following Depots. Please call and confirm your return before sending the unit to the depot for service.

Motorola Radio Support Center

2200 Galvin Dr.
Elgin, IL 60123
1-800-227-6772

Motorola Toronto Service Center

3900 Victoria Avenue
North York, Ontario, Canada M2H 3H7
1-800-543-3222
1-416-756-5841
1-888-331-9872 (Fax)

Motorola U.S. Federal Government Depot

4395 Nicole Drive
Lanham, MD 20706
1-800-969-6680
1-301-731-6676

1.3 Radio Model Information

The model number and serial number are located on a label attached to the back of your radio. You can determine the RF output power, frequency band, protocols, and physical packages. The example below shows one portable radio model number and its specific characteristics.

Table 1-1:Radio Model Number (Example: AAH25KDC9AA3AN)

	Type of Unit	Model Series	Freq. Band	Power Level	Physical Packages	Channel Spacing	Protocol	Feature Level	Model Revision	Model Package
AA or LA **A or LA** = Motorola Internal Use →	**H** ↑ **H** = Portable	**25**	**K** VHF (136-174 MHz)	**C** 1-3.9W	**C** HT750 MTX850 MTX850•LS MTX950 (no display)	**9** Programma-ble	**AA** Conventional	**3** HT750 MTX850 MTX850•LS MTX950 (non-keypad)	**A**	**N**
			R UHF1 (403-470 MHz)	**D** 4-5W	**H** HT1250 HT1250•LS MTX8250 MTX8250•LS MTX9250 (1-Line Display)	**6** 25 kHz	**DU** LTR	**5** HT1250 HT1250•LS$^+$ Limited Keypad		
			S UHF2 (450-512 MHz)	**E** 5.1-6W	**N** HT1550•XLS (4-Line Display)	**4** 12.5 kHz	**DP** PassPort	**6** HT1250 HT1250•LS$^+$ MTX8250 MTX8250•LS MTX9250 Full Keypad		
			B Low Band, R1 (29.7-42.0 MHz)				**CK** MPT	**7** HT1250•LS$^+$ Limited Keypad MDC on Conv.		
			C Low Band, R2 (35.0-50.0 MHz)				**GB** Privacy Plus	**8** HT1550•XLS		
			U 800 MHz (806-821) (851-866)					**9** HT1250•LS$^+$ Full Keypad MDC on Conv.		
			W 900 MHz (896-902) (935-941)							

Chapter 2

Intrinsically Safe Radio Information

2.1 FMRC Approved Equipment

Anyone intending to use a radio in a location where hazardous concentrations of flammable materials exist (hazardous atmosphere) is advised to become familiar with the subject of intrinsic safety and with the National Electric Code NFPA 70 (National Fire Protection Association) Article 500 (hazardous [classified] locations).

An Approval Guide, issued by Factory Mutual Research Corporation (FMRC), lists manufacturers and the products approved by FMRC for use in such locations. FMRC has also issued a voluntary approval standard for repair service ("Class Number 3605").

FMRC Approval labels are attached to the radio to identify the unit as being FM Approved for specified hazardous atmospheres. This label specifies the hazardous Class/Division/Group along with the part number of the battery that must be used. Depending on the design of the portable unit, this FM label can be found on the back or the bottom of the radio housing. The FM Approval mark is shown below.

> **WARNING**
>
> - **Do not operate radio communications equipment in a hazardous atmosphere unless it is a type especially qualified (for example, FMRC Approved) for such use. An explosion or fire may result.**
> - **Do not operate an FMRC Approved Product in a hazardous atmosphere if it has been physically damaged (for example, cracked housing). An explosion or fire may result.**
> - **Do not replace or charge batteries in a hazardous atmosphere. Contact sparking may occur while installing or removing batteries and cause an explosion or fire.**
> - **Do not replace or change accessories in a hazardous atmosphere. Contact sparking may occur while installing or removing accessories and cause an explosion or fire.**
> - **Turn a radio off before removing or installing a battery or accessory.**
> - **Do not disassemble an FMRC Approved Product unit in any way that exposes the internal electrical circuits of the unit.**

Radios must ship from the Motorola manufacturing facility with the Intrinsically Safe, hazardous atmosphere capability and FM Approval labeling. Radios will not be "upgraded" or converted to Intrinsically safe, and or labeled in the field, after it has been shipped from the manufacturing location.

Modifications can only be made by the original product manufacturer (Motorola) at one of its FM audited manufacturing facilities.

> ⚠️ **WARNING**
> - **Failure to use an FMRC Approved portable radio unit with an FMRC Approved battery or FMRC Approved accessories specifically Agency approved for that product may result in the dangerously unsafe condition of an unapproved radio combination being used in a hazardous location.**
> - **Unauthorized or incorrect modification of an FMRC Approved Product unit will negate the Approval rating of the product.**

2.2   Repair of FMRC Approved Products

REPAIRS FOR MOTOROLA PRODUCTS WITH FMRC APPROVAL ARE THE RESPONSIBILITY OF THE USER.

You should not repair or relabel any Motorola- manufactured communication equipment bearing the FMRC Approval label ("FMRC Approved Product") unless you are familiar with the current FMRC Approval standard for repairs and service ("Class Number 3605"). Repairs and service to be done FM audited locations.

> ⚠️ **WARNING**
> - **Incorrect repair or relabeling of any FMRC Approved Product unit could adversely affect the Approval rating of the unit.**
> - **Use of a radio that is not intrinsically safe in a hazardous atmosphere could result in serious injury or death.**

The following are key definitions, from the FMRC's Approval Standard Class Number 3605, 1994.

2.2.1 Repair

A repair constitutes something done internally to the unit that would bring it back to its original condition-Approved by FMRC. A repair should be done in an FMRC audited facility. Items not considered as repairs are those in which an action is performed on a unit which does not require the outer casing of the unit to be opened in a manner which exposes the internal electrical. You do not have to be an FMRC audited Repair Facility to perform these actions.

2.2.2 Relabeling

The repair facility shall have a method by which the replacement of FMRC Approval labels are controlled to ensure that any relabeling is limited to units that were originally shipped from the Manufacturer with an FM Approval label in place. FMRC Approval labels shall not be stocked by the repair facility. An FMRC Approval label shall be ordered from the original manufacturer, as needed, to repair a specific unit. Replacement labels may be obtained and applied by the repair facility, provided there is satisfactory evidence that the unit being relabeled was originally an FMRC Approved unit. Verification may include, but is not limited to: a unit with a damaged Approval label, a unit with a defective housing displaying an Approval label, or a customer invoice indicating the serial number of the unit and purchase of an FMRC Approved model.

2.2.3 Do Not Substitute Options or Accessories

The Motorola communications equipment certified by Factory Mutual is tested as a system and consists of the FM Approved portable, FM Approved battery, and FM Approved accessories or options, or both. This FM Approved portable and battery combination must be strictly observed. There must be no substitution of items, even if the substitute has been previously Approved with a different Motorola communications equipment unit. Approved configurations are listed in the FM Approval Guide published by FMRC, or in the product FM product listing. This FM product listing is shipped from the manufacturer with the FM Approved radio and battery combination.

Notes

Chapter 3

Maintenance

3.1   Introduction

This chapter provides details about the following:

l   Preventive maintenance (inspection and cleaning)
l   Safe handling of CMOS and LDMOS devices
l   Disassembly and reassembly of the radio
l   Installation of Optional Retrofit Kit
l   Installation of Option Boards

3.2   Preventive Maintenance

The radios do not require a scheduled preventive maintenance program; however, periodic visual inspection and cleaning is recommended.

3.2.1   Inspection

Check that the external surfaces of the radio are clean, and that all external controls and switches are functional. It is not recommended to inspect the interior electronic circuitry.

3.2.2   Cleaning Procedures

The following procedures describe the recommended cleaning agents and the methods to be used when cleaning the external and internal surfaces of the radio. External surfaces include the front cover, housing assembly, and battery case. These surfaces should be cleaned whenever a periodic visual inspection reveals the presence of smudges, grease, and/or grime.

> **NOTE:**   **Internal surfaces should be cleaned only when the radio is disassembled for service or repair.**

The only recommended agent for cleaning the external radio surfaces is a 0.5% solution of a mild dishwashing detergent in water. The only factory recommended liquid for cleaning the printed circuit boards and their components is isopropyl alcohol (70% by volume).

⚠ Caution   **CAUTION: Certain chemicals and their vapors can have harmful effects on certain plastics. Avoid using aerosol sprays, tuner cleaners, and other chemicals.**

Cleaning External Plastic Surface

Apply the 0.5% detergent-water solution sparingly with a stiff, non-metallic, short-bristled brush to work all loose dirt away from the radio. Use a soft, absorbent, lintless cloth or tissue to remove the solution and dry the radio. Make sure that no water remains entrapped near the connectors, cracks, or crevices

Cleaning Internal Circuit Boards and Components

Isopropyl alcohol (70%) may be applied with a stiff, non-metallic, short-bristled brush to dislodge embedded or caked materials located in hard-to-reach areas. The brush stroke should direct the

dislodged material out and away from the inside of the radio. Make sure that controls or tunable components are not soaked with alcohol. Do not use high-pressure air to hasten the drying process since this could cause the liquid to collect in unwanted places. After completing of the cleaning process, use a soft, absorbent, lintless cloth to dry the area. Do not brush or apply any isopropyl alcohol to the frame, front cover, or back cover.

> **NOTE:** **Always use a fresh supply of alcohol and a clean container to prevent contamination by dissolved material (from previous usage).**

3.3   Safe Handling of CMOS and LDMOS Devices

Complementary metal-oxide semiconductor (CMOS) devices are used in this family of radios, and are susceptible to damage by electrostatic or high voltage charges. Damage can be latent, resulting in failures occurring weeks or months later. Therefore, special precautions must be taken to prevent device damage during disassembly, troubleshooting, and repair.

Handling precautions are mandatory for CMOS circuits and are especially important in low humidity conditions. DO NOT attempt to disassemble the radio without first referring to the following CAUTION statement.

> ⚠️
> **Caution**
>
> **CAUTION: This radio contains static-sensitive devices. Do not open the radio unless you are properly grounded. Take the following precautions when working on this unit:**
>
> l   Store and transport all CMOS devices in conductive material so that all exposed leads are shorted together. Do not insert CMOS devices into conventional plastic "snow" trays used for storage and transportation of other semiconductor devices.
>
> l   Ground the working surface of the service bench to protect the CMOS device. We recommend using the Motorola Static Protection Assembly (part number 0180386A82), which includes a wrist strap, two ground cords, a table mat, and a floor mat.
>
> l   Wear a conductive wrist strap in series with a 100k resistor to ground. (Replacement wrist straps that connect to the bench top covering are Motorola part number RSX-4015.)
>
> l   Do not wear nylon clothing while handling CMOS devices.
>
> l   Do not insert or remove CMOS devices with power applied. Check all power supplies used for testing CMOS devices to be certain that there are no voltage transients present.
>
> l   When straightening CMOS pins, provide ground straps for the apparatus used.
>
> l   When soldering, use a grounded soldering iron.
>
> l   If at all possible, handle CMOS devices by the package and not by the leads. Prior to touching the unit, touch an electrical ground to remove any static charge that you may have accumulated. The package and substrate may be electrically common. If so, the reaction of a discharge to the case would cause the same damage as touching the leads.

3.4   Repair Procedures and Techniques — General

Parts Replacement and Substitution

When damaged parts are replaced, identical parts should be used. If the identical replacement part is not locally available, check the parts list for the proper Motorola part number and order the part from the nearest Motorola Communications parts center listed in the "Piece Parts" section of this manual (See page 1-2).

Rigid Circuit Boards

This family of radios uses bonded, multi-layer, printed circuit boards. Since the inner layers are not accessible, some special considerations are required when soldering and unsoldering components. The printed-through holes may interconnect multiple layers of the printed circuit. Therefore, exercise care to avoid pulling the plated circuit out of the hole.

When soldering near the 20-pin and 40-pin connectors:

ı Avoid accidentally getting solder in the connector.

ı Be careful not to form solder bridges between the connector pins.

ı Examine your work closely for shorts due to solder bridges.

Flexible Circuits

The flexible circuits are made from a different material than the rigid boards, and require different soldering techniques. Excessive prolonged heat on a flexible circuit can damage the material. Therefore, avoid excessive heat and excessive bending.

For parts replacement, use the ST-1087 Temperature-Controlled Solder Station with a 600-700 degree tip, and use small diameter solder such as ST-633. The smaller size solder will melt faster and require less heat to be applied to the circuit.

To replace a component on a flexible circuit:

1. Grasp with seizers (hemostats) the edge of the flexible circuit near the part to be removed.

2. Pull gently.

3. Apply the tip of the soldering iron to the component connections while pulling with the seizers.

> **NOTE:** **Do not attempt to puddle-out components. Prolonged application of heat may damage the flexible circuit.**

3.5   Disassembling and Reassembling the Radio — General

Since these radios may be disassembled and reassembled with the use of only four (board to casting) screws, it is important to pay particular attention to the snaps and tabs, and how parts align with each other.

The following tools are required for disassembling the radio:

ı 3/16" flat blade screwdriver

ı Penknife-size screwdriver

ı TORX™ T6 screwdriver

If a unit requires more complete testing or service than is customarily performed at the basic level, send this unit to a Motorola Authorized Service Center. (See Chapter, section 1.2.4 Technical Support on page 1-3 for a list of authorized service centers.)

The following disassembly procedures should be performed only if necessary:

section 3.6.2 Chassis Assembly/Disassembly on page 3-6

section 3.6.3 Keypad, Display, and Keypad/PassPort/Option Board Disassembly on page 3-6

section 3.6.4 Speaker, Microphone, and Universal Connector Flex Disassembly on page 3-8

section 3.6.5 PTT Disassembly on page 3-9

section 3.6.6 Control Top Disassembly on page 3-9

section 3.7.7 DTMF Retrofit Kit Procedure (Optional Upgrade Procedure) on page 3-12

section 3.7.8 Option Board Installation on page 3-13

3.6   Detailed Radio Disassembly

3.6.1   Front Cover from Chassis Disassembly

1.   Turn off the radio.

2.   Remove the battery:

   a.   Pull down on the two battery-release buttons.

   b.   With the buttons pulled down, the top of the battery will fall from the radio.

   c.   Remove the battery completely from the radio.
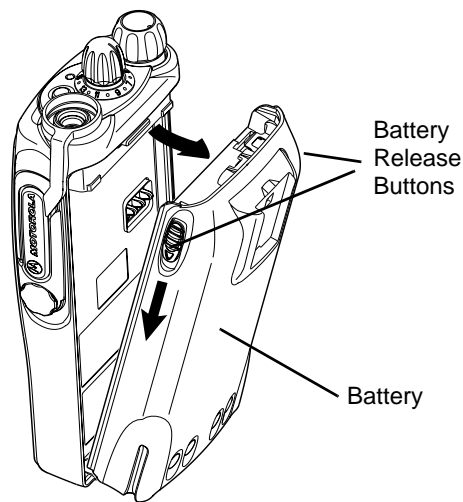
Figure 3-1: Battery Removal

3.   Remove the antenna.

3.   Pull the volume and channel selector knobs off their shafts.

   NOTE: **Both knobs slide on and off. However, they are supposed to fit very tightly on their shafts.**
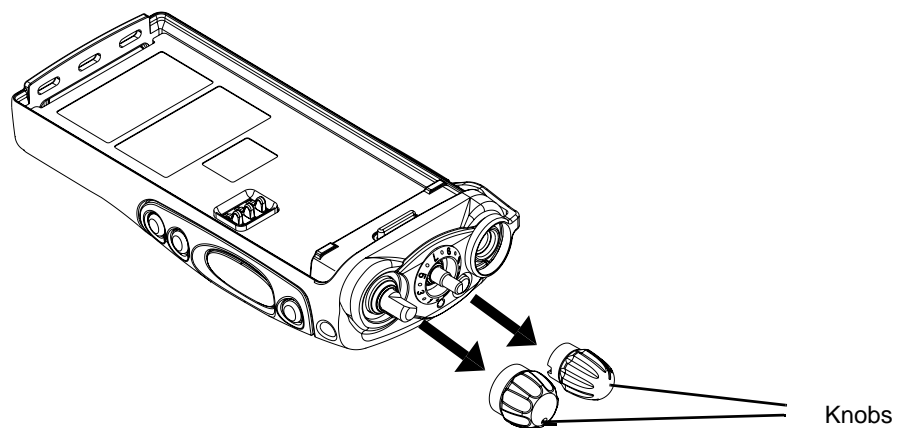
Figure 3-2: Knob Removal

4. Separate the chassis from the internal electronics front cover assembly as follows:

  a. Insert a small, 3/16" flat-blade screwdriver, or similar instrument, in between the thin remaining wall and the chassis at the bottom of the radio. Do not mar the O-ring sealing area on the housing.

  b. Slowly pry the bottom of the chassis from the cover by pushing the 3/16" flat-blade screwdriver down, and rotating the handle of the tool over and behind the base of the radio. This prying action forces the thin inner plastic wall toward the base of the radio, releasing the two chassis base tabs.
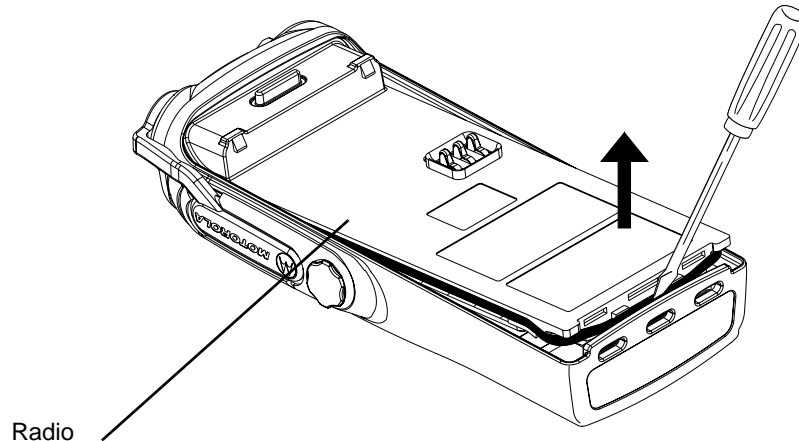
Radio

Figure 3-3: Chassis Removal

⚠ Caution **CAUTION: Marring the front cover O-ring sealing area will prevent the radio from sealing properly.**

6. Lay the chassis down. Rotate the front cover backward and slightly away from the chassis.

NOTE: **Flexible ribbon circuits (flexes) connecting the front cover assembly and the chassis prevent you from completely separating the two units. Display radios and radios with option boards have two flexes.**

5. Lift the latches on the main circuit board to release the flexes from their connectors.

Latches
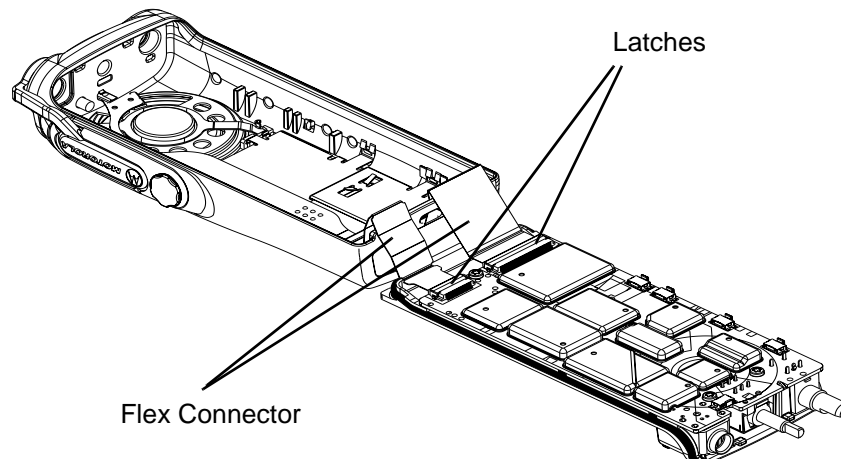
Flex Connector

Figure 3-4: Unlatch Flex Connectors

NOTE: **At this point, if necessary, the DTMF Retrofit Kit Procedure can be performed.
        (See section 3.7.7 DTMF Retrofit Kit Procedure (Optional Upgrade Procedure) on page
        3-12).**

3.6.2 Chassis Assembly/Disassembly

1. If disassembly of the chassis or the main board is required, then use a TORX™ screwdriver with
    a T6 head to remove the four screws holding the main board to the chassis.
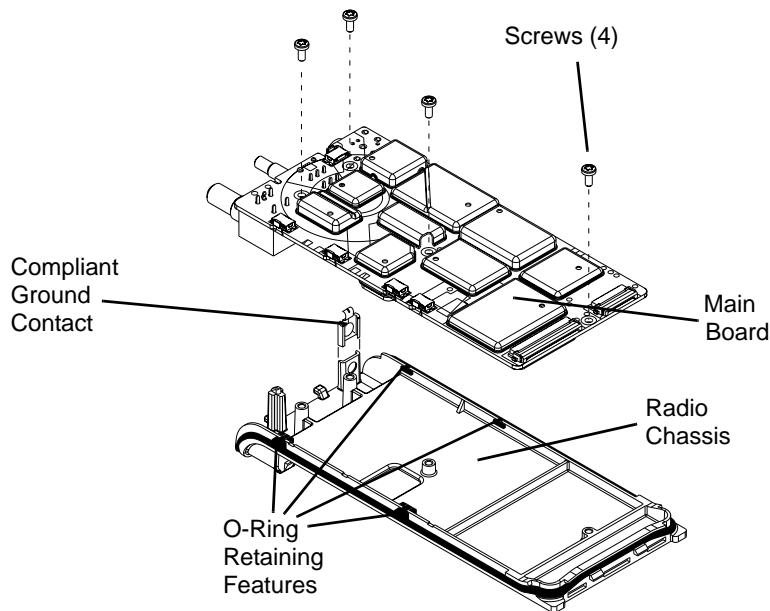
Figure 3-5: Remove Main Board from Chassis

**CAUTION: Refer to the CMOS CAUTION in paragraph on page 3-2 before removing
the main board. Be sure to use electrostatic discharge (ESD) protection when
handling circuit boards.**

2. Lift the main board from the chassis (refer to Figure 3-5).

3. Remove the small O-ring retainers from their slots in the chassis. Note the alignment of the
    retainers for reassembly.

4. Remove the O-ring.

5. If required in disassembly, slide off the ground contact from the top corner boss of the radio
    chassis.

3.6.3 Keypad, Display, and Keypad/PassPort/Option Board Disassembly

1. If the disassembly of the keypad or the keypad printed circuit board, is required, lift the
    microphone flex circuit up, and carefully remove the microphone and its boot from the front cover
    pocket. (See Figure 3-6 on page 3-7).

2. Lay this flex circuit to one side.

3. To remove the keypad retainer shield:

   a. Insert the tip of a "penknife size," flat blade screwdriver in the opening at the end of the keypad retainer arm tab.

   b. Pry the tab away from the side of the front cover until it moves past the ledges on the side wall. Repeat this procedure for the four remaining retainer arm tabs.
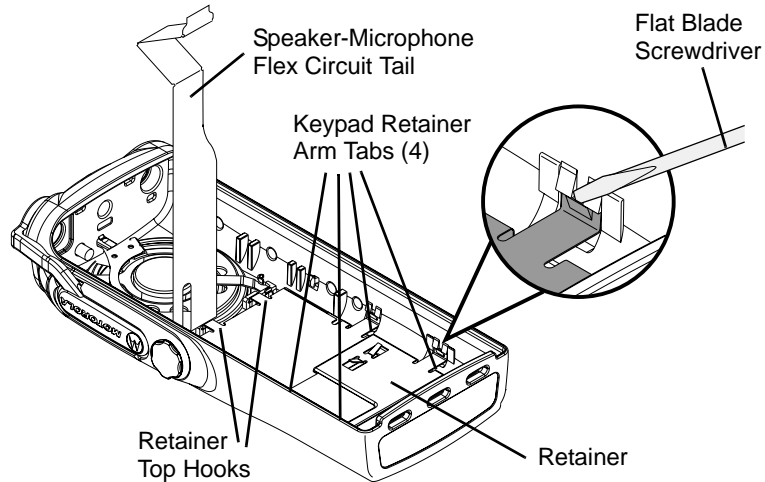
Figure 3-6: Remove Retainer

4. Note that the two "top hooks" are still held underneath the front cover—right below the speaker. Lift the keypad retainer out of the front cover, then lift and pivot the two hooks out of the front cover.

5. If disassembly involves the removal of the display module, disconnect the display flex from the keypad option board connector by lifting the latch on the connector. (This is similar to the process for releasing the flexes.) (see page 3-5.)

6. The display module is attached to the front cover with a double-sided adhesive pad. Carefully pull up on the display module, using a small screwdriver, if necessary, and remove it from the front cover. Use a new piece of double-sided adhesive to re-mount the display to the cover.

> ⚠ **CAUTION Take care not to damage the display. Do not cut, bend, or pinch the heat seal. Display modules contain CMOS devices. Be sure to use ESD protection.**
> Caution

7. The keypad/PassPort/option board can be removed without the use of tools.

Retainer

Display
Module

Keypad
Option
Board
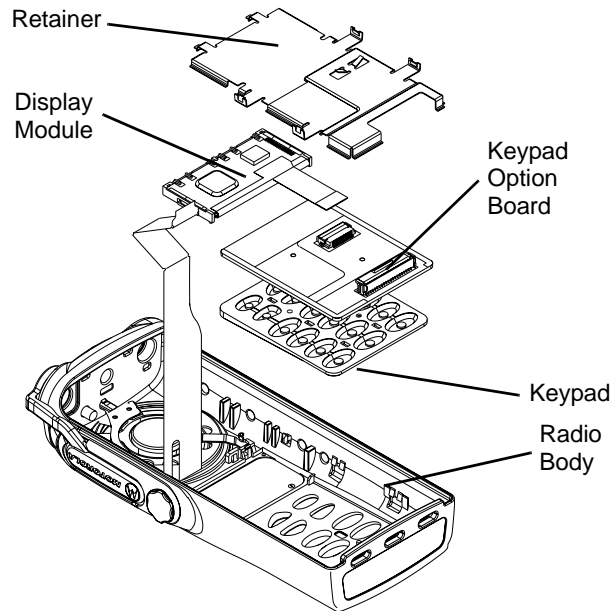
Keypad

Radio
Body

Figure 3-5: Removing the Keypad Retainer and Other Boards from the Radio

> **NOTE:** **At this point, the Option Board Installation Procedure should be performed, if necessary. (See page 3-13)**

3.6.4 Speaker, Microphone, and Universal Connector Flex Disassembly

1. If disassembly of the speaker-microphone assembly is necessary, remove the dustcover by turning the screw at the bottom of the dustcover counterclockwise with your fingers. Lift the dustcover out of its pocket.

> **NOTE:** **The dustcover must be removed to remove the speaker-microphone assembly flex circuit. The speaker is held in place with a two-legged retainer bracket. The bracket legs are secured by the front cover slots. Be careful not to damage the speaker when removing the retainer bracket.**

2. Using a screwdriver, push down on the portion of the speaker retainer bracket pointing toward the bottom of the radio. Then, remove the retainer by slightly pushing it toward the top of the radio until you slide it past the front cover slot.

3. Pull the rubber microphone boot from its seated position. Unless you are replacing the microphone, leave it in the boot.

> **NOTE:** **The speaker-microphone assembly flex circuit goes through the front cover wall to the outside wall. To replace this assembly, you must peel-off the universal connector escutcheon label. The existing escutcheon cannot be reassembled; a new part must be used. (See item number 10 on the exploded view drawing on page 3-15).**

4. Peel-off the universal connector flex circuit escutcheon (label).

5. Pry the flex circuit (adhesive held) backer board away from the front cover, and remove the universal connector tail of the speaker-microphone assembly through its opening in the front cover.

6. After the universal connector tail of the speaker-microphone assembly is removed, the assembly can be completely removed. If it is necessary to replace the speaker or microphone, or both, do it while the flex circuit is removed from the front cover. When reassembling the microphone in its boot, make sure the microphone port faces the round hole in the bottom of the boot.
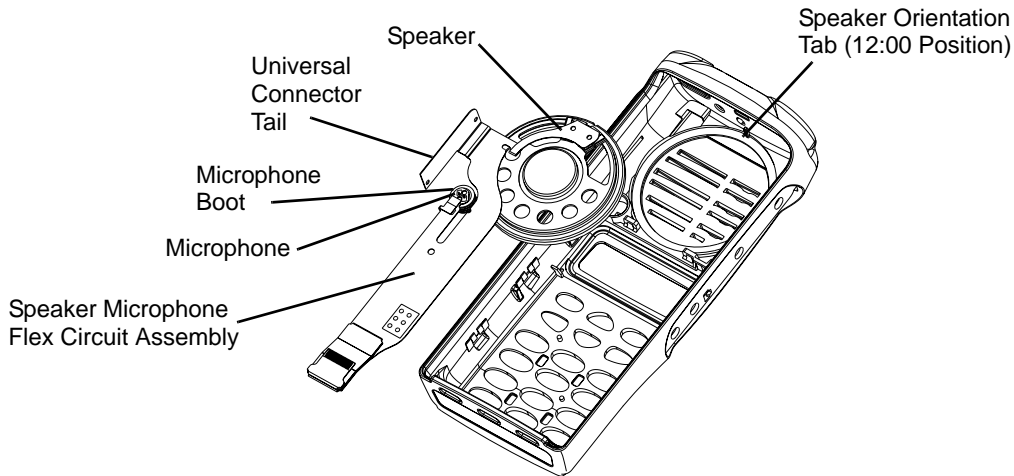
Figure 3-6: Removal Speaker-Microphone Assembly

3.6.5 PTT Disassembly

If required, the PTT bezel and the PTT seal assembly can be disassembled using a small screwdriver as follows:
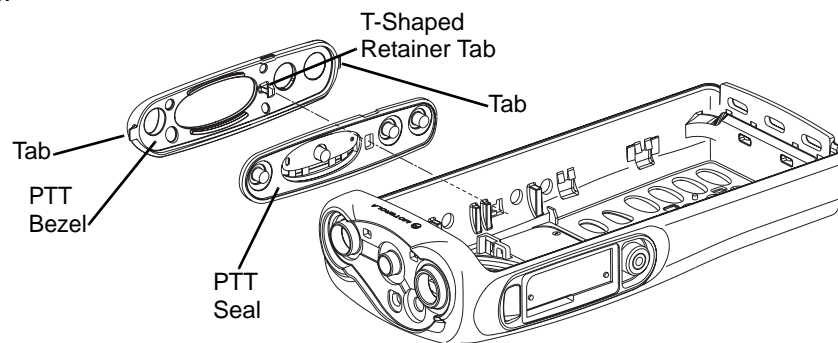
Figure 3-7: PTT Removal

1. Pry back the T-tab found inside the front cover (in between the four buttons on the PTT assembly).

2. Remove the PTT bezel by slightly bowing it until the top and bottom tabs are released from the slots in the front cover.

3. The PTT seal can be easily lifted from the bezel without the use of tools.

3.6.6 Control Top Disassembly

1. To remove the control top assembly, place a screwdriver next to the antenna boss, then pry it against the control top escutcheon. This lifts the control top escutcheon away from its double-sided adhesive. Grab the double-sided adhesive near the volume potentiometer, then lift it away.

2. Remove the integrated control top seal, emergency button, and transmit light pipe.

3.7   Detailed Radio Reassembly

3.7.1   Control Top Reassembly

1. Replace transmit light pipe and control top seal.

2. Peel off the liners from a new control top escutcheon and place it in the recess in the front cover. Press the control top escutcheon firmly against the adhesive.

3.7.2   PTT Reassembly

1. Put the PTT seal in the PTT bezel.

2. Place the bezel top tab in the top slot inside the front cover PTT opening. Slightly bow the bezel so that the bottom tab can fall inside the bottom slot.

3. Press the PTT assembly against the front cover opening.

    NOTE: **Look inside the front cover to make sure the T-tab is fully engaged with the front cover. If necessary, press the T-tab toward the top of the radio until it becomes fully engaged.**

3.7.3   Speaker, Microphone, and Universal Connector Flex Reassembly

1. Feed the universal connector tail of the speaker-microphone flex assembly through the opening in the side wall of the front cover.

2. Peel-off the adhesive liner on the back of the universal connector tail of the flex circuit. Attach the flex tail to the front cover using the guide pins for correct alignment.

3. Replace the universal connector escutcheon. Make sure that all the connector openings align with the gold pads on the flex circuit.

4. Align the notch in the speaker at the twelve o'clock position with the tab on the front cover as shown in Figure 3-8.

5. Place the speaker retainer bracket into the hole on the top of the front cover, and bend the retainer down to fit underneath the boss below the speaker.

6. If display, keypad, or keypad option board are not involved, reinsert the microphone and boot into the pocket in the front cover

3.7.4   Keypad, Display, and Keypad/PassPort/Option Board Reassembly

1. If you are replacing the display, use a new double-sided adhesive display pad (item number 17 on the exploded view diagram in paragraph 3-8).

2. Replace the keypad, and the keypad/option board. Make sure the display module flex tail is connected to the connector on the keypad/option board.

3. Insert the "top hooks" of the keypad retainer into the slots below the speaker (above the display) in the front cover. Snap all four of the retainer arm tabs in place in the front cover.

    NOTE: **Pull the speaker-microphone flex circuit out of the way during reassembly.**

4. Reinsert the microphone and boot into the pocket in the front cover.

5. Lay the speaker-microphone flex on top of keypad/PassPort/option board retainer.
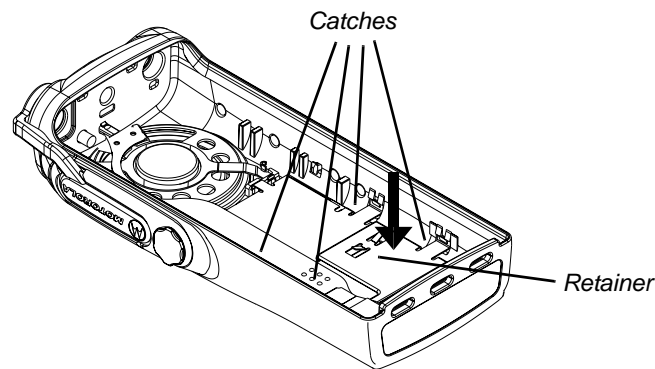
Figure 3-8: Lock Retainer Catches to the Radio's Body

3.7.5 Chassis Assembly Reassembly

1. Slide on the ground contact (if it was removed) on the top corner boss of the chassis.

2. Replace the O-ring. The tabs on the O-ring should reach into the chassis and point down.

3. Stretch the O-ring to place it into the retaining pocket at the bottom end of the chassis.

   NOTE: **When properly assembled, the retainers on the O-ring should align with the slots on the chassis. If this is not the case, remove and replace the O-ring until it is aligned with the chassis and completely seated in place around the perimeter.**

4. Ensure that the antenna nut insulator is correctly replaced by pushing it all the way to the top of the antenna nut.

5. Replace the battery contact seal (if necessary) surrounding the battery contact.

6. Place the main circuit board straight down on top of the chassis.

   NOTE: **Be sure the battery contact seal protrudes through the chassis and is not pinched under the chassis.**

7. Use the T6 TORX screwdriver to fasten the screws holding the main board to the chassis.

3.7.6 Chassis and Front Cover Reassembly

1. Align the chassis assembly end-to-end with the front cover assembly.

2. Insert the tails of the flex circuits into their respective connectors at the bottom of the front cover.

3. Push down the latches on the connectors to hold the flex circuits to the main board.

4. Slide the volume potentiometer and frequency switch shafts into their respective holes in the front cover.

5. Push the chassis assembly completely into the top of the front cover until it settles in place.

6. Be sure the O-ring is properly seated.

7. Snap the bottom of the chassis into the front cover.

8. Reassemble the knobs, dust cover, antenna, and battery.

Radio
Chassis
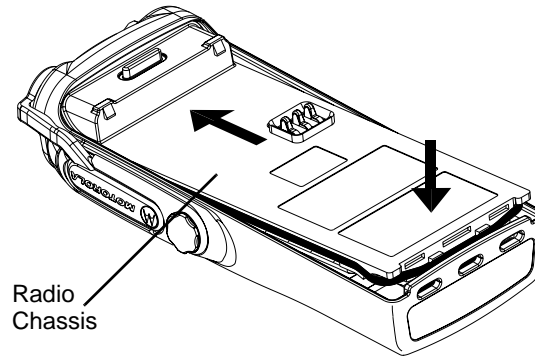
Figure 3-9: Fastening the Chassis

3.7.7 DTMF Retrofit Kit Procedure (Optional Upgrade Procedure)

If you are performing an upgrade from a basic model to a DTMF model, replace the existing front cover kit with kit number HLN9984 and follow the reassembly steps to reassemble the upgraded radio. (See paragraph 3.7 for details about reassembly.)

To activate the retrofit using the radio software, follow these steps:

1. Start the Customer Programming Software (CPS).

2. Read the codeplug data by clicking on the READ icon in the menu bar, or by selecting READ DEVICE in the pulldown menu.

3. Open the *Radio Configuration* dialog box. (See Figure 3-10.)
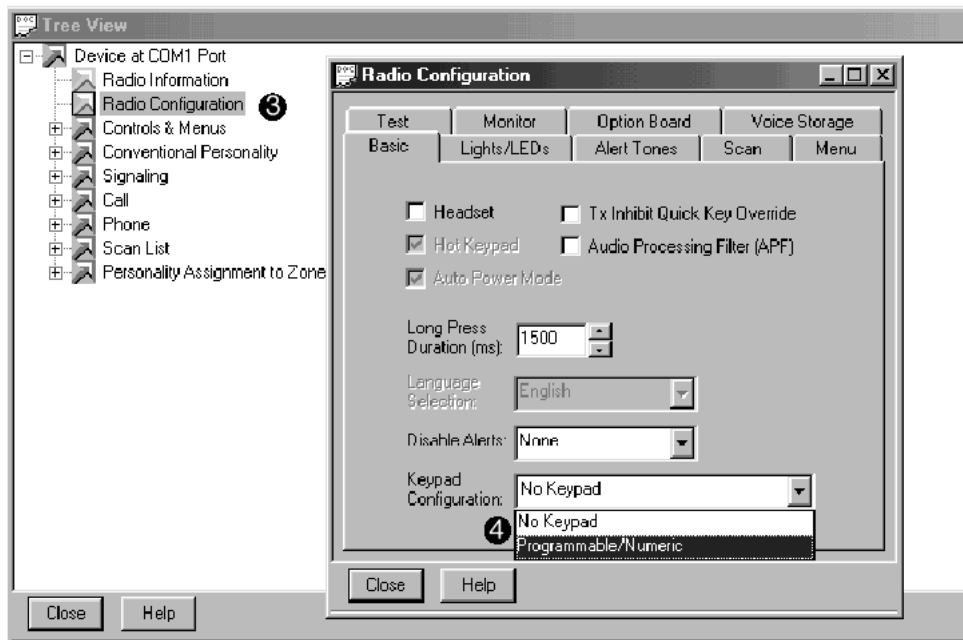
Figure 3-10: Activating the Retrofit

4. Change the *Keypad Configuration* from "No Keypad" to "Programmable/Numeric".
   (See Figure 3-10.)

5. Write the codeplug back to the radio by clicking on the WRITE icon in the menu bar, or by selecting WRITE DEVICE in the pulldown menu.

NOTE: **The CPS may display a warning dialog box when you attempt to write the codeplug back to the radio. It is safe to ignore this warning. Press the OK button.**

3.7.8 Option Board Installation

1. With the keypad retainer removed the keypad backer board can be removed without the use of tools.

2. Remove the jumper flex from the connector on the keypad board. Notice the orientation of the flex to the connector. Arrows on the jumper flex point to the correct way of inserting the flex into the connector.

3. Discard the keypad backer board.

4. The "breakaway" tab at the top of all option boards contains an extra row of keys and is used to accommodate other radio models.

5. Break-off and discard the option board tab, taking care not to damage the option board. Trim any tab fragments that may remain on the option board.
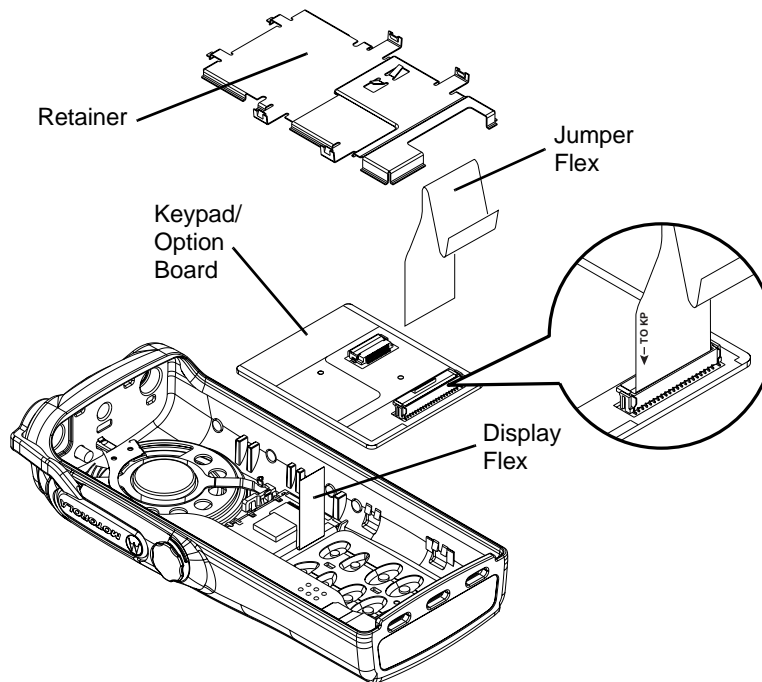
Figure 3-11: Changing Keypad/PassPort Board /Option Boards

6. Reassemble the option board to the front cover assembly.

7. Insert the display flex circuit into the connector on the option board.

8. Insert the jumper flex circuit into the connector on the option board. Notice the orientation of the flex circuit. Arrows on the jumper flex point to the correct way of inserting the flex into the connector.

9. Replace the retainer by placing the two top hooks into the slots below the speaker in the front cover; then, pivot the retainer into the front cover. Ensure that all four tab arms snap correctly into the front cover.

10. With the keypad option board, display, and retainer correctly in place, the front cover assembly can now be reassembled per paragraph 3.7.6.

Notes

3.8.15 HT1550•XLS Exploded View
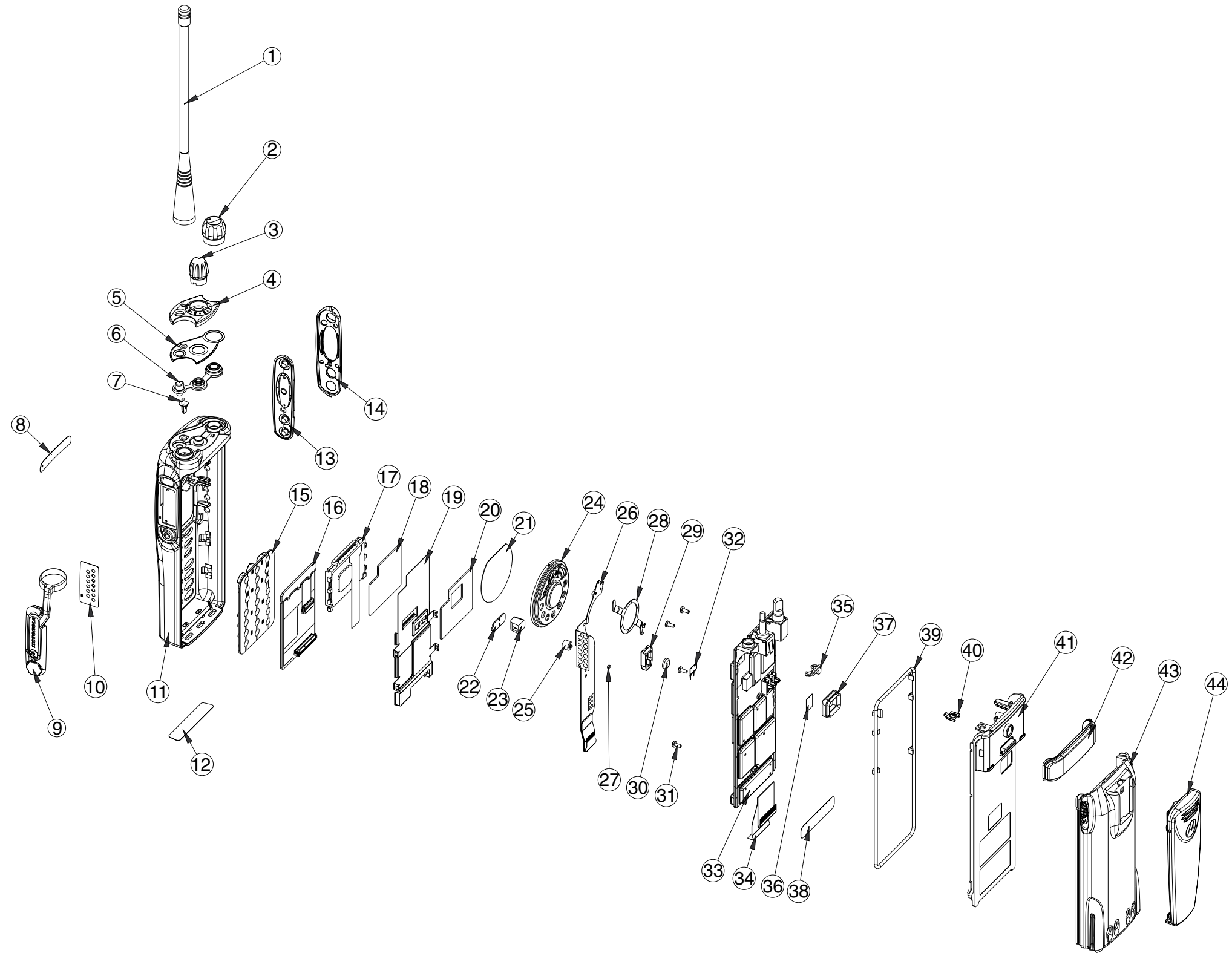
Figure 3-19: HT1550•XLS Exploded View

3.8.16 HT1550•XLS Exploded View Parts List

Table 3-8. HT1550•XLS Parts List

Item	Motorola Part Number	Description
1	See Section 7 in manual	Antenna
2	3280529Z01	Knob, Volume
3	3280530Z01	Knob, Frequency
4	1380525Z03	Escutcheon, Top (Dotted)
5	3380644Z01	Escutcheon, Adhesive
6	3280533Z01	Seal, Control Top
7	6180527Z01	Litepipe, Tx
8	HKLN4011A	Nameplate, HT1550•XLS
9	1586059A01	Dust Cover, Univ Conn
10	1386058A01	Escutcheon, Univ Flex
11	1580666Z02	Front Cover DTMF
12	Not Field Replaceable	Escutcheon, FM
13	7580532Z01	Keypad, Side Control
14	1380528Z01	Bezel, Side Control
15	7585745Z03	Keypad
16	0104008J38	Keypad Board Assembly
17	5105385Y57	LCD Module
18	7585659Z01	Pad, Retainer Front
19	4285660Z01	Retainer, Keypad Board
20	7585659Z02	Pad, Retainer Back
21	3586057A01	Felt, Speaker
22	3586170A01	Felt, Mic
23	1405368W01	Boot, Mic
24	5085738Z03	Speaker
25	5005227J08	Microphone
26	8480549Z01	Flex, Univ Conn
27	2113740A41	Cap, 33pF
28	4280504Z01	Retainer, Speaker
29	1480503Z01	Boot, Backup Battery

Table 3-8. HT1550•XLS Parts List (Continued)

Item	Motorola Part Number	Description
30	6062884K01	Backup Battery
31	0304726J04	Screw
32	3980667Z01	Contact, Finger (For UHF)
33	Typical	Ctrl/RF Board Assembly
34	8485615Z01	Flex, Keypad/Controller
35	1480652Z01	Insulator, Antenna
36	7580556Z01	Pad, Thermal
37	3280534Z01	Seal, Contact
38	3380564Z01	Label, Warning
39	3280536Z02	Gasket, O-Ring
40	3980698Z01	Contact, Ground (For VHF)
41	2780518Z02	Chassis
42	1586178A01	Shroud, Chassis
43	See Section 7 in manual	Battery
44	HLN9714	Beltclip

3.9 Service Aids

Table 3-11 lists service aids recommended for working on the HT750/HT1250/HT1250•LS/
HT1250•LS⁺/HT1550•XLS/MTX850/MTX950/MTX850•LS/MTX8250/MTX9250/MTX8250•LS radios.

NOTE: **While all of these items are available from Motorola, most are standard shop
equipment items, and any equivalent item capable of the same performance may be
substituted for the item listed.**

Table 3-11:Service Aids

Motorola Part No.	Description	Application
RLN4460	Portable Test Set	Enables connection to audio/accessory jack. Allows switching for radio testing.
HVN9025	Customer Programming Software (CPS Plus) CD ROM. Includes PPCPS (PassPort Customer Programming Software, Global tuner, Reflashing tool, tutorial, frequency finder and frequency table).	Programs customer option and channel data. Tunes hardware parameters, front end, power, deviation, etc. Conventional, LTR, and PassPort products.
HVN9067	Customer Programming Software (CPS).	Same as above (Privacy Plus protocol products).
AARKN4075	Programming Cable	Includes radio interface box (RIB) capability.
AARKN4074	Programming Cable/Test Cable	Connects radio to RIB (RLN4008B).
AARKN4073	Radio to Radio Cloning Cable	Allows radio to be duplicated from a master radio by transferring programmed data from the master radio to the other.
RLN4008	Radio Interface Box	Enables communications between radio and computer's serial communications adapter.
HHLN4134	BNC Adaptor	Adapts radio antenna port to BNC cabling of equipment (VHF and UHF, B1 only).
5880313B69	SMA to BNC adapter	Adapts radio antenna port to BNC cabling of equipment (800 MHz radios).
RLN4510	Battery Eliminator 7.5V Regulator	Works in combination with Shop Battery Block, 0180305G54.
AA0180305G54 AA8180384F68	Shop Battery Block Bench Test Housing Eliminator	Interconnects radio to power supply. Provides for troubleshooting of radio when housing is removed.
0180357A57	Wall-Mounted Power Supply (120 VAC)	Used to supply power to RIB.
0180358A56	Wall-Mounted Power Supply (220 VAC; 2-prong)	Used to supply power to RIB.
3080369B72	Computer Interface Cable	Connects computer's serial communications adapter to RIB (RLN4008B).

3.10 Test Equipment

Table 3-12 lists test equipment required to service the HT750/HT1250/HT1250•LS/HT1250•LS[+]/
HT1550•XLS/MTX850/MTX950/MTX850•LS/MTX8250/MTX9250/MTX8250•LS radios.

Table 3-12:Recommended Test Equipment

Motorola Part No.	Description	Characteristics	Application
R2000, R2600 R2400, or R2001 with trunking option	Service Monitor	This monitor will substitute for items listed below with an asterisk *	Frequency/deviation meter and signal generator for wide-range troubleshooting and alignment
*R1049	Digital Multimeter		Two meters recommended for AC/DC voltage and current measurements
*S1100	Audio Oscillator	67 to 200Hz tones	Used with service monitor for injection of PL tones
*S1053, *SKN6009, *SKN6001	AC Voltmeter, Power Cable for meter, Test leads for meter	• 1 mV to 300 V • 10 MΩ input impedance	Audio voltage measurements
R1053	Dual-trace Oscilloscope	20 MHz bandwidth, 5 mV/cm - 20 V/cm	Waveform measurements
*S1350, *ST1215 (VHF) *ST1223 (UHF) *T1013	Wattmeter, Plug-in Elements (VHF & UHF), RF Dummy Load	• 50 Ω • ±5% accuracy 10 W, max. 0-1000 MHz, 300 W	Transmitter power output measurements
S1339	RF Millivolt Meter	100 µV to 3 VRF, 10 kHz to 1.2 GHz	RF level measurements
*R1013	SINAD Meter		Receiver sensitivity measurements
S1347 or S1348 (prog)	DC Power Supply	0-20 Vdc, 0-5 Amps	Bench supply for 7.5Vdc

3.11 Configuring and Wiring the Programming/Test Cable
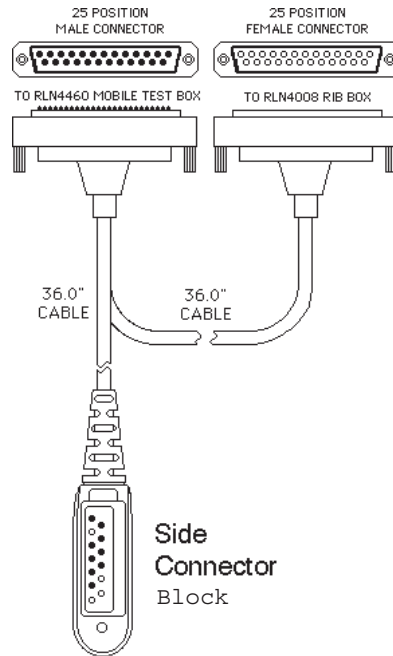
Figure 3-22: Programming/Test Cable AARKN4074

Figure 3-23: Pin Configuration of the Cable Side Connector
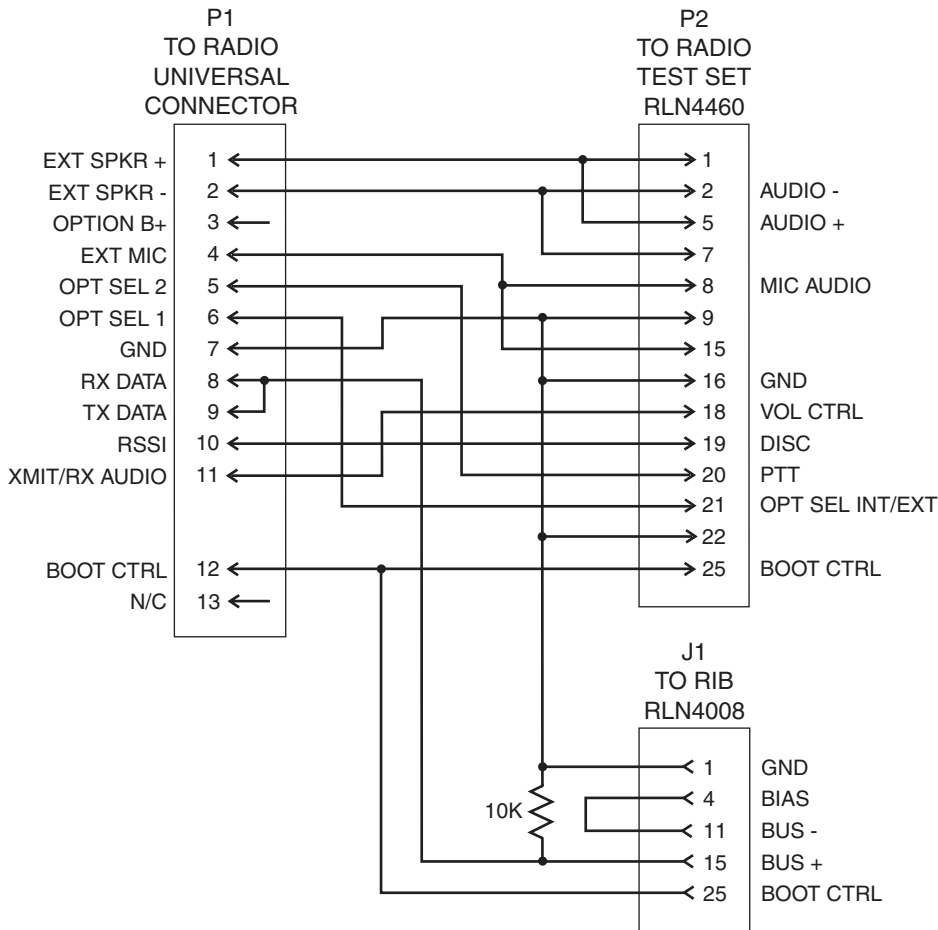
FL0830062O

Figure 3-24: Programming/Test Cable Schematic

Chapter 4

Transceiver Performance Testing

4.1 General

These radios meet published specifications through their manufacturing process by utilizing high accuracy laboratory-quality test equipment. The recommended field service equipment approaches the accuracy of the manufacturing equipment with few exceptions. This accuracy must be maintained in compliance with the manufacturer's recommended calibration schedule.

4.2 RF Test Mode

When the radio is operating in its normal environment, the radio's microcontroller controls the RF channel selection, transmitter key-up, and receiver muting. However, when the unit is on the bench for testing, alignment, or repair, it is removed from its normal environment and cannot receive commands from its system. Therefore, the internal microcontroller does not key the transmitter or unmute the receiver. This prevents the use of a normal tuning procedure. To solve this problem, a special "test mode" is incorporated into the radio.

Note 1: On VHF/UHF, LTR models, the radio must be in either conventional or LTR mode.

Note 2: The test mode procedure that follows assumes that the Customer Programming Software Front Panel Access screen has both the FPA and RF TEST boxes selected. Select from the programming screen to enable or disable certain features of the radio RF test mode.

l FPA entry not selected blocks all test modes.

l FPA entry selected and RF TEST not selected blocks RF test mode.

l FPA entry selected and RF TEST selected enables all test modes.

To enter the test mode for a display radio:

1. Turn the radio on.

2. Within ten seconds after the self test is complete, press 'side button 2', shown in Figure 4-1 on page 4-3, five times in succession.

3. After "CSQ CHXX SP25" appears on the display, the radio is on channel XX (see **Note** on following page), carrier squelch mode, 25 kHz channel spacing. Each additional press of 'side button 2' (see Table 4-3 on page 4-5) scrolls to the next channel spacing, and a corresponding set of tones are sounded. Refer to Figure 4-4 on page 4-4 for test mode information for a four-line display radio.

4. Press 'side button 1' to scroll through the test environments listed in Table 4-1 on page 4-4.

5. Press 'side button 2' for 3 seconds to switch the radio to the control head test mode. 'LCD Test' appears on the display.

6. Press 'side button 1' to turn on all the dots of the first character. Another 'side button 1' press turns on all the dots of the next character, continuing until the last character is reached.

7. Press 'side button 1' at the end of the LCD test to activate the 'Icon Test'. The next 'side button 1' press turns on the first icon.

8. Press 'side button 1' at the end of the Icon Test to activate the button test. Pressing any side button (except 'side button 1'), or any keypad button during the LCD test or Icon test immediately activates this test. A good button press is verified by a chirp.

9. Press 'side button 2' for 3 seconds in the control head test mode to return the radio to the RF Test mode.

10. Turn radio off to exit test mode.

To enter the test mode for a non-display radio:

1. Turn the radio on.

2. Within ten seconds after the self test is complete, press 'side button 2' (Figure 4-1) five times in succession.

3. Press 'side button 1' the number of times listed in Table 4-1 to get the number of corresponding beeps.

4. Turn radio off to exit test mode.

5. To access all 14 test modes on a 4-channel radio, the frequency knob and mechanical stop sleeve must be removed (see paragraph 3-8 exploded view diagram).

Button Test (For models with "G" in location 10 of model number Example: AAH25RCH6**G**B6AN)

1. Press the orange button; "3/1" appears which indicates that switch 3 is in the closed condition.

2. Release the orange button; "3/0" appears which indicates that switch 3 is in the open condition.

3. Rotate the mode selector knob; "4/0"through "4/15" appears which indicates that knob 4 is in mode position 1 through 15.

4. Rotate the volume control; "2/0" through "2/255" appears.

5. Press SB1, view "96/1"; release, view "96/0".

6. Press SB2, view "97/1"; release, view "97/0".

7. Press SB3, view "98/1"; release view "98/0".

8. Press PTT button, view "1/1"; release view "1/0".

Keypad (For models with "G" in location 10 of model number Example: AAH25RCH6**G**B6AN)

1. Press 0, view "48/1"; release, view "48/0".

2. Press 1, view "49/1"; release, view "49/0".

3. Press 2, view "50/1"; release, view "50/0".

4. Press 3, view "51/1"; release, view "51/0".

5. Press 4, view "52/1"; release, view "52/0".

6. Press 5, view "53/1"; release, view "53/0".

7. Press 6, view "54/1"; release, view "54/0".

8. Press 7, view "55/1"; release, view "55/0".

9. Press 8, view "56/1"; release, view "56/0".

10. Press 9, view "57/1"; release, view "57/0".

11. Press *, view "58/1"; release, view "58/0".

12. Press #, view "59/1"; release, view "59/0".

13. Press <, view "128/1"; release, view "128/0".

14. Press HOME, view "129/1"; release, view "129/0".

15. Press >, view "130/1"; release, view "130/0".

16. Press Option Select1, view "135/1"; release, view "135/0".

17. Press Option Select2, view "136/1"; release, view "136/0".

18. Press Option Select3, view "137/1"; release, view "137/0".

19. Pressing SB2 for 3 seconds in the Control Head Test mode will cause the radio to return to the RF Test mode.
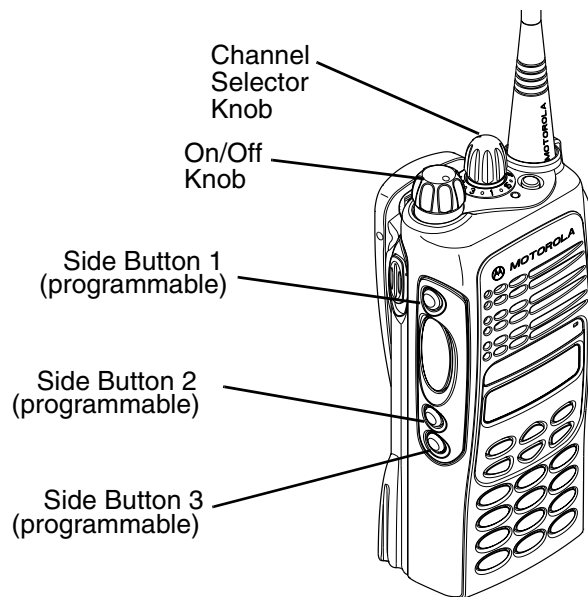
Figure 4-1: Radio Side Button Location
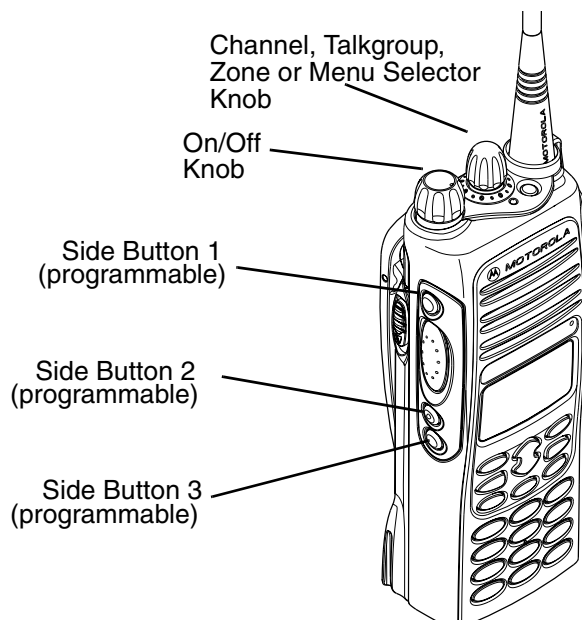
Figure 4-2: HT1550•XLS Radio Side Button Location
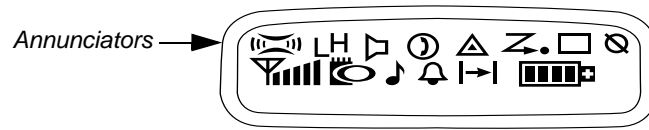
Figure 4-3: Two-Line Display
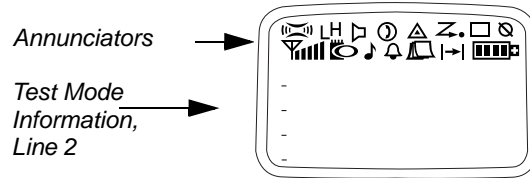
Figure 4-4: Four-Line Display (HT1550•XLS)

Table 4-1: Test Environments (Side Button 1)

Number of Side Button 1 Presses	No. of Beeps	Display Shows	Description	Function
Initial (No button presses required)	0	CSQ	Carrier Squelch	RX: if carrier detected TX: mic audio
1	1	TPL	Tone Private-Line	RX: unsquelch if carrier and tone (192.8Hz) detected TX: mic audio + tone (192.8Hz)
2	2	DPL	Digital Private-Line	RX: unsquelch if carrier and digital code (131) detected TX: mic audio + digital code (131)
3	3	DTMF	Dual-Tone Multiple Frequency	RX: unsquelch if carrier detected TX: selected DTMF tone pair
4	5	Open	Unsquelch	RX: constant unsquelch TX: mic audio
5	9	HSS	MDC1200	RX: unsquelch if carrier detected TX: 1500Hz tone
6	11	CMP	Compander	RX: if carrier detected TX: mic audio
7	12	LLE	Low-Level Expand	RX: if detected TX: mic audio

*Table 4-2: Test Environments (Models with "**G**" in location 10 of model number EX: AAH25RCH6**G**B6AN)*

Item No.	No. of Beeps	Description	Function
1	1 GKC	Carrier Squelch	RX: unsquelch if carrier detected TX: mic audio
2	1 BKC	Tone Private-Line	RX: unsquelch if carrier and tone (192.8Hz) detected TX: mic audio + tone (192.8Hz)
3	2 BKC	Digital Private-Line	RX: unsquelch if carrier and digital code (131) detected TX: mic audio + digital code (131)
4	3 BKC	Dual-Tone multiple frequency	RX: unsquelch if carrier detected TX: selected DTMF tone pair
5	5 BKC	Open squelch OSQ	RX: constant unsquelch TX: mic audio
6	8 BKC	Trunking Low Speed TLS	RX: unsquelch if carrier detected TX: mic audio + connect tone (105-8 MHz)
7	9 BKC	Trunking High Speed THS	RX: unsquelch if valid outbound signalling word (OSW) detected TX: 1500Hz tone
8	11 BKC	CMP	RX: unsquelch if carrier detected TX: mic audio
9	12 BKC	LLE	RX: unsquelch if carrier detected TX: mic audio

Table 4-3: Test Channel Spacing (Side Button 2)

Number of Low Tones	Channel Spacing
1	25/30 kHz
2	12.5 kHz
3	20 kHz

4.3   Test Frequencies for Display and Non-Display Radios

The radio channels and test frequencies are listed in Table 4-4. The channels are selected using the channel selector switch located on top of the radio, as shown in Figure 4-1 on page 4-3. The test environment and channel spacing for any particular frequency is selected using 'side buttons 1 and 2', as listed in Table 4-1 on page 4-4 and Table 4-2 on page 4-5. The display radio shows the selected parameters on the radio display, and sounds the corresponding number of beeps and tones listed in Table 4-1and Table 4-1. The non-display radio only sounds the beeps and tones.

Note: On UHF LTR models, radios must be in conventional or LTR modes.

Table 4-4: Test Frequencies (Using the Channel Selector Switch)

Channel Selector Switch Position	Test Channel	Low 1	Low 2	VHF	UHF 1	UHF 2	800
1 Low Power 8 High Power	TX #1 or #8 RX #1 or #8	29.740 29.740	35.040 35.040	136.025 136.025	403.025 403.025	450.025 450.025	806.025 806.075
2 Low Power 9 High Power	TX #2 or #9 RX #2 or #9	32.040 32.020	37.040 37.020	142.325 142.325	415.025 415.025	462.850 462.850	815.475 809.175
3 Low Power 10 High Power	TX #3 or #10 RX #3 or #10	34.040 34.020	39.040 39.020	148.625 148.625	425.025 425.025	475.675 475.675	824.925 812.325
4 Low Power 11 High Power	TX #4 or #11 RX #4 or #11	36.040 36.020	42.040 42.020	154.925 154.925	436.025 436.025	488.500 488.500	837.975 815.575
5 Low Power 12 High Power	TX #5 or #12 RX #5 or #12	38.040 38.020	45.040 45.020	161.225 161.225	449.025 449.025	501.325 501.325	851.025 818.675
6 Low Power 13 High Power	TX #6 or #13 RX #6 or #13	40.040 40.020	48.040 48.020	167.525 167.525	460.025 460.025	514.150 514.150	860.475 821.825
7 Low Power 14 High Power	TX #7 or #14 RX #7 or #14	42.040 42.020	50.040 50.020	173.825 173.825	469.975 469.975	526.975 526.975	869.975 824.975

4.4   Receiver Performance Tests

The receiver and transmitter performance tests are contained in Table 4-5 and Table 4-6 respectively. Refer to Chapter 5, Figure 5-1 on page 5-2, for test equipment setup. Note that all test measurements are taken at 77°F(25°C) and in conventional or trunked models.

Table 4-5: Receiver Performance Checks

Test Name	Service Monitor	Radio	Test Set	Comments
Reference Frequency	Mode: PWR MON 4th channel test frequency* Monitor: Frequency error Input at RF In/Out	TEST MODE, Test Channel 4 carrier squelch output at antenna	PTT to continuous (during the performance check)	Frequency error to be ±200 Hz VHF ±600 Hz UHF ±60 Hz Low Band
Rated Audio	Mode: GEN Output level: 1.0mV RF 4th channel test frequency* Mod: 1 kHz tone at 3 kHz deviation Monitor: DVM: AC Volts	TEST MODE Test Channel 4 carrier squelch	PTT to OFF (center), meter selector to Audio PA	Set volume control to 3.16Vrms
Distortion	As above, except to distortion	As above	As above	Distortion 3.0% Typical
Sensitivity (SINAD)	As above, except SINAD, lower the RF level for 12dB SINAD.	As above	PTT to OFF (center)	RF input to be 0.25µV
Noise Squelch Threshold (only radios with conventional system need to be tested)	RF level set to 1mV RF	As above	PTT to OFF (center), meter selection to Audio PA, speaker/load to speaker	Set volume control to 3.16Vrms
	As above, except change frequency to a conventional system. Raise RF level from zero until radio unsquelches.	out of TEST MODE; select a conventional system	As above	Unsquelch to occur at <0.25µV. Preferred SINAD = 9-10dB

* see Table 4-4

Table 4-6: Transmitter Performance Checks
(Models with "G" in location 10 of model number EX:AAH25RDH9**G**B6AN)

Test Name	Service Monitor	Radio	Test Set	Comments
Reference Frequency	Mode: PWR MON 4th channel test frequency* Monitor: Frequency error Input at RF In/Out	TEST MODE, Test Channel 4 carrier squelch	PTT to continuous (during the performance check)	Frequency error ±200 Hz VHF ±600 Hz UHF ±60 Hz Low Band
Power RF	As above	As above	As above	Refer to Specifications
Voice Modulation (internal)	Mode: PWR MON 4th channel test frequency* atten to -70, input to RF In/Out	TEST MODE, Test Channel 4 carrier squelch output at antenna	Remove modulation input	Press PTT switch on radio. Say "four" loudly into the radio mic. Measure deviation: VHF, UHF, 800 MHz, Low 1 and Low 2: ≥ 4.0 kHz but ≤ 5.0 kHz (25 kHz Ch Sp)
Voice Modulation	Mode: PWR MON 4th channel test frequency* atten to -70, input to RF In/Out Monitor: DVM, AC Volts Set 1 kHz Mod Out level for 0.025Vrms at test set, 80mVrms at AC/DC test set jack	As above	As above, meter selector to mic	Deviation: VHF, UHF, 800 MHz, Low 1 and Low 2 ≥ 4.0 kHz but ≤ 5.0 kHz (25 kHz Ch Sp) Global. 5 kHz (20 kHz Ch Sp) U.S. and Canada.
High-Speed Data Modulation***	As above	TEST MODE, Test Channel 4 high speed output at antenna	PTT to continuous (during the performance check).	Deviation: 800 MHz, VHF, UHF, Low 1 and Low 2: ≥ 2.5 kHz but ≤ 3.5 kHz (25 kHz Ch Sp)
Low-Speed Data Modulation 800,UHF	As above	TEST MODE, Test Channel 4 TLS output at antenna	PTT to continuous (during the performance check)	Deviation: VHF, UHF, 800MHz, : ≥500Hz but ≤ 1000Hz (25 kHz Ch Sp).
DTMF Modulation	As above, 4th channel test frequency*	TEST MODE, Test Channel 4 DTMF output at antenna	As above	Deviation: VHF, UHF, 800MHz, Low 1and Low 2: ≥ 3.05 kHz but ≤ 3.45 kHz (25 kHz Ch Sp)
PL/DPL Modulation	As above 4th channel test frequency* BW to narrow	TEST MODE, Test Channel 4 TPL DPL	As above	Deviation: VHF, UHF, 800MHz, Low 1 and Low 2: ≥500Hz but ≤ 1000Hz (25 kHz Ch Sp).

*** MDC
*   See Table 4-4

Chapter 5

Radio Tuning, Programming, Cloning, Lowband Antenna Cutting Procedure, PassPort Tone Options, and Diagnostic Functions

5.1 Introduction

This chapter provides an overview of the Customer Programming Software (CPS) and tuner program designed for use in a Windows® NT, Windows® 95, Windows® 98, Windows® 2000, and Windows® Millennium (ME), environment. These programs are available in separate kits as listed in the Table 5-1. An installation instruction manual is also included with each kit.

NOTE: Refer to the appropriate program on-line help files for the programming procedures.

Table 5-1: Software Installation Kits Radio Tuning Setup

Description	Kit Number
Conventional, LTR, PrivacyPlus, PassPort CPS Subscription Package (3 years)	H5177
CPS Plus (Conventional, LTR, PassPort)	HVN9025
CPS (Privacy Plus)	HVN9067
Installation Manual	6881089C70

5.2   Global Radio Tuning Setup

A personal computer (PC), Windows® 95/98, and a global tuner program are required to tune the radio. To perform the tuning procedures, the radio must be connected to the PC, radio interface box (RIB), and test equipment shown in Figure 5-1.
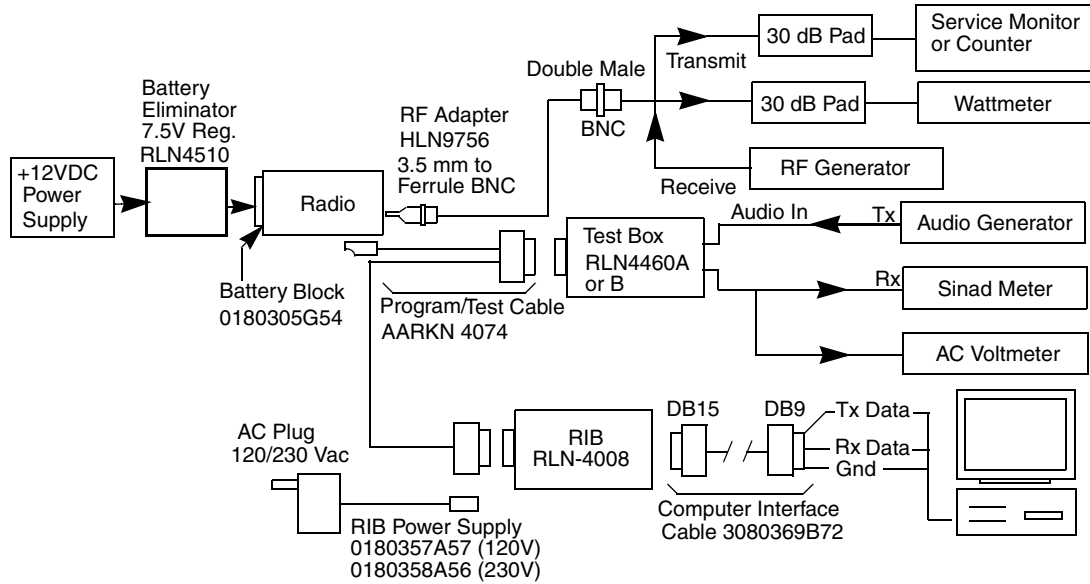
Figure 5-1: Radio Tuning Test Equipment Setup

5.2.1   Initial Test Equipment Setup

The supply voltage is connected to the radio using a Motorola battery eliminator, P/N AA0180305G54. The initial test equipment (Figure 5-1) control settings are listed in Table 5-2.

NOTE: Refer to appropriate program on-line help files for the tuning procedures.

Table 5-2: Initial Equipment Control Settings

Service Monitor	Test Set	Power Supply
Monitor Mode: Power Monitor	Speaker set: A	Voltage: 7.5Vdc
RF Attenuation: -70	Speaker/load: Speaker	DC on/standby: Standby
AM, CW, FM: FM	PTT: OFF	Volt Range: 10V
Oscilloscope Source: Mod Oscilloscope Horizontal: 10mSec/Div Oscilloscope Vertical: 2.5 kHz/Div Oscilloscope Trigger: Auto Monitor Image: Hi Monitor BW: Nar Monitor Squelch: mid CW Monitor Volume: 1/4 CW		Current: 2.5A

5.3   CPS Programming Setup

The CPS programming setup, shown in Figure 5-2, is used to program the radio codeplug.

NOTE: Refer to appropriate program on-line help files for the codeplug programming procedures.
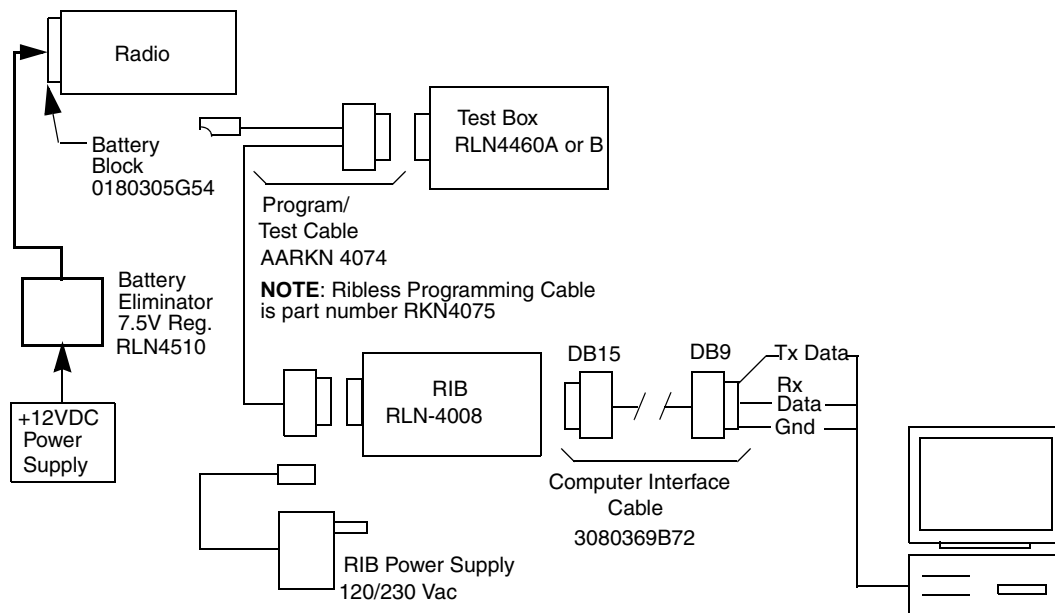
Figure 5-2: CPS Programming Setup

5.4   Cloning (Conventional and LTR)

Cloning is the same for both the Conventional and LTR radio. Cloning is the process of copying the content of one radio (source radio) into another radio (target radio). Radio content refers to system-type features such as frequency, squelch type options, trunking, etc.

NOTE: Cloning can be performed only on radios with identical model numbers and software options.

Radio functionality inherent in one radio cannot be cloned to another radio that does not contain the same functionality. Tuning and alignment information are not transferable and are not affected by cloning.

Signaling Identification Numbers (IDs) are duplicated in the cloning process. Unique IDs may be assigned with the CPS.

NOTE: Unsuccessful cloning attempts will not damage the radio.

Procedure:

1.   Turn source and target radios off.

2.   Connect cloning cable to side connector of both radios.

3.   Turn on target radio.

4.   On source radio, simultaneously press 'side buttons 1 and 2', shown in Figure 5-3, then turn radio on. Both radios produce a "clone-entry" tone and turn on their green LEDs. Display radios show "**Cloning To**" (source radio) and "**Program**" (target radio).

5.   Release both side buttons. The electronic transfer process begins and will take approximately one to three minutes.

6.   When cloning is completed, both radios reset themselves and turn their green LEDs off. The

source radio produces a "clone-exit" tone and displays "**Clone Complete**".

7. Turn both radios off.

8. Disconnect the cloning cable from both radios and turn them on for normal operation.
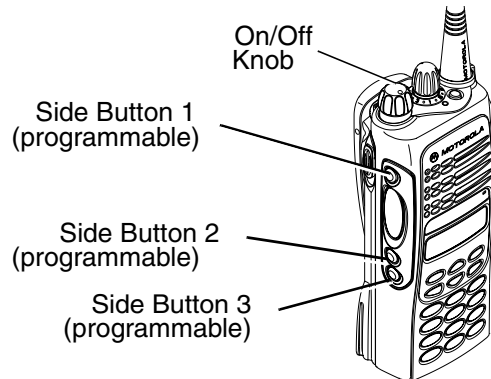
Figure 5-3: Radio Side Button Locations
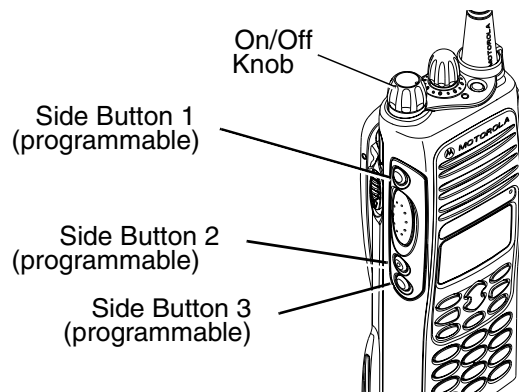
Figure 5-4: HT1550•XLS Radio Side Button Locations

5.4.1 Error Codes (Display Radios Only)

l **"ERR: Mismatch"** - The model numbers or the code plug versions are not the same for both radios. Cloning cannot be performed.

l **"ERR: Timeout"** - Communication between the two radios was not established or was disrupted during the cloning process. If this occurs, check the cloning cable and all connections. Repeat the cloning procedure.

5.5 Cloning (Privacy Plus)

This function is used to copy codeplug information from one radio to another. A radio and RIB must be properly connected to the computer and power turned on before you attempt the PROGRAM function. The time required to PROGRAM a codeplug will depend on the computer and the size of the codeplug you are programming. Only radios with the same model number, protocol option and codeplug version may be cloned. Trunked radios may not be cloned unless System Keys have been loaded for each trunking system ID. Tuning and alignment information are not transferable and are not affected by cloning. Signalling Identification are duplicated in the cloning process. Unique IDs may be assigned with the CPS.

> ⚠️ **WARNING**
>
> **WARNING: Do NOT turn off the radio or disconnect it from the computer while attempting to PROGRAM the codeplug. Interrupting the programming process WILL DESTROY the code-plug contents and completely DISABLE the radio**

Procedure:

1. Use the READ RADIO function to read the radio codeplug to be cloned. i.e. the "Source" code-plug.

2. If required, enter the Individual ID's for the new radio. Trunking system keys (or FTR Key) are required for cloning the Trunking System Data.

3. If required, go to the SDF merge screen, to merge SDF Trunking System Data.

4. Connect "Target" radio to the computer and press READ SERIAL NUMBER button to read the "Target" radio's serial number. This number must be different from the "Source" codeplug, or the cloning progress will fail.

5. Connect "Target" radio to the computer, and press the PROGRAM button to program the "Source" codeplug into the "Target" radio.

6. The CPS will validate the code plug.

7. If it fails a warning screen will be displayed informing of the incompatibility between the CPS and code plug, otherwise the information is written into the radio's code plug.

5.6   Cloning (PassPort)

Cloning of PassPort data in the HT1250•LS$^+$ may only be accomplished via the PPCPS. In order to "clone" the contents of one radio into another radio, the user must attach the first radio to the RIB cable and read the contents of the PassPort personality by pressing the "Read Device" icon on the toolbar (or by choosing "Read Device" from the file menu and selecting the proper COM port). The user should then select each PassPort zone and change the MIN for each zone. He/She may then attach the second radio to the RIB cable and write the personality into it by pressing the "Write Device" icon on the toolbar (or by choosing "Write Device" from the file menu and choosing the proper COM port). Alternatively, the information may be cloned to multiple radios by saving the personality data to a file. The file may, at a later time, be re-read and the MIN may be changed for each zone and then written to the radio through the procedure described above. Care must always be taken by the user to ensure that the MIN is unique for each radio to avoid undesirable results in the system.

5.7   Lowband Molded Antenna Cut Chart

This chart is for antenna NAB6064 used with professional radio series.

NOTE: The chart below is not drawn to scale. Obtain and use a standard ruler for marking of cutting measurements.
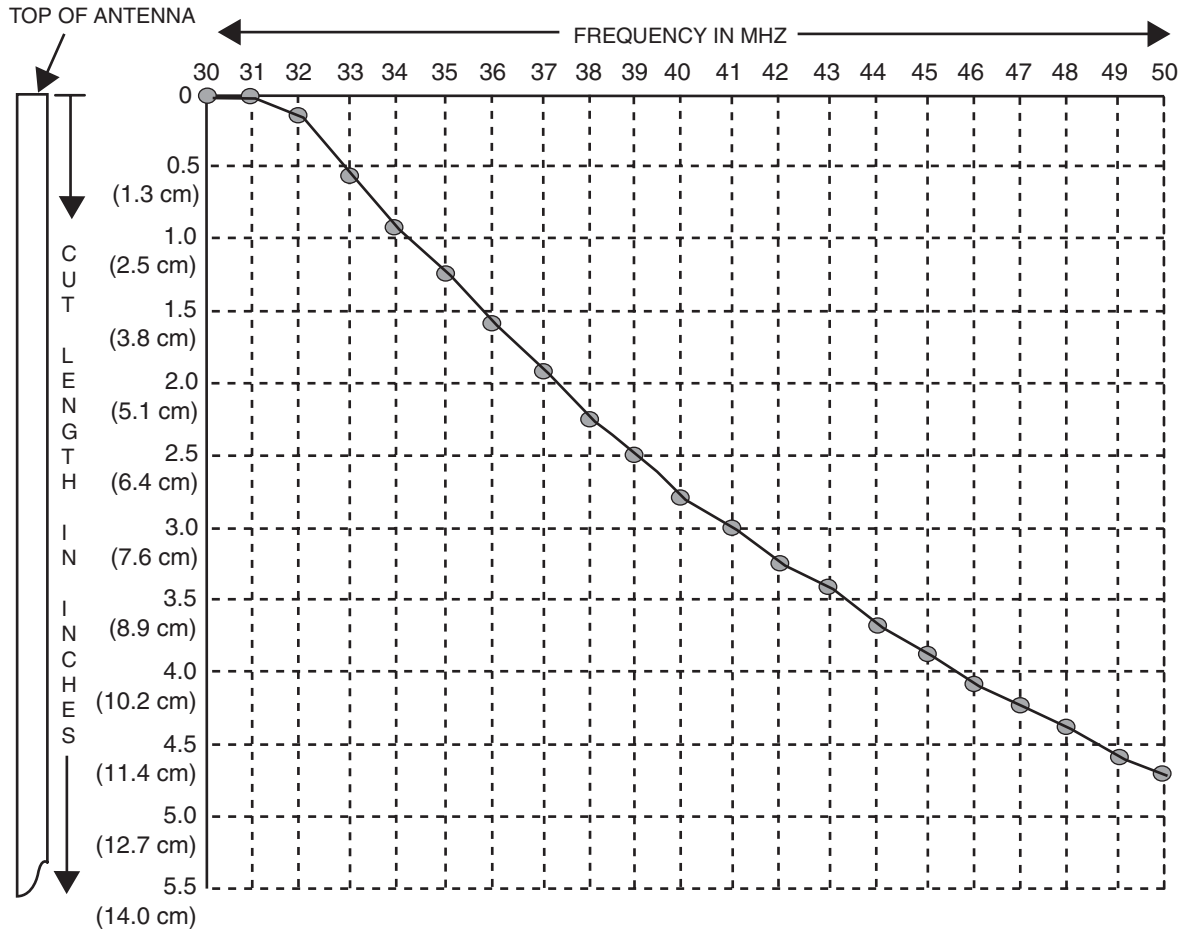
Frequency Verification Chart

This chart can be used to verify the length or frequency of an antenna already cut. DO NOT use it to make the actual cut.

Freq (MHz)	Final Antenna Length (Inches)
30	11 9/16 (29.369 cm)
32	11 7/16 (29.052 cm)
34	10 5/8 (26.988 cm)
36	10 (25.400 cm)
38	9 3/8 (23.813 cm)
40	8 7/8 (22.543 cm)
42	8 5/16 (21.114 cm)
44	7 7/8 (20.003 cm)
46	7 1/2 (19.050 cm)
48	7 3/16 (18.256 cm)
50	6 7/8 (17.463 cm)

NOTE:

Antenna length measured from top of antenna to bottom of rubber skirt.

Cutting Instructions

1. Remove cap from antenna.

2. Measure from top of antenna down to the desired length corresponding with the desired frequency.

3. Mark the antenna, then cut at that mark.

4. To replace the antenna cap, put a small bead of #414 Loctite™ (Motorola part number 1110019B59) around the inside walls of the antenna cap. Place the cap on top of the antenna and seat fully.

5.8   HT1250·LS⁺ PassPort Tone Options

In order to provide more detailed information about the radio's state to a user or service technician various Tones and Display options are available.

One Tone option is a short low pitched tone that sounds whenever the radio loses contact for any reason with its registered PassPort site and begins to search for another site. This Tone is enabled by the "Enable LOS Search start tone" option.

Service technicians who are determining system coverage and RSSI settings may want to be able to discriminate between the LOS (Loss of System) for complete loss of data from the site or when the site RSSI drops below required levels. A second Tone following the first LOS Tone indicating that LOS was caused by complete LOS of Passport data from the site and not low.

RSSI can be activated with the "Enable LOS CRC Search start tone" option.

Enable just the "Enable LOS Search start tone" option. Allow the radio to register. Turn off the Home repeater. The radio will sound a single tone and start to search. Turn on the Home repeater. Allow the radio to register. Remove the antenna. The radio will sound a single tone and start to search. Replace the antenna.

Enable the "Enable LOS CRC Search start tone" option also. Allow the radio to register. Turn off the Home repeater. The radio will sound two tones and start to search. Turn on the Home repeater. Allow the radio to register. Remove the antenna. The radio will sound a single tone and start to search.

5.9   HT1250·LS⁺ Special Diagnostic Functions

Some special diagnosis functions can be turned on "as needed" basis by accessing the "Service Menu". In order to enter this menu please proceed as follows

1) Press the Menu Key. (You don't need to be registered).

2) Quickly press the P1 then the P2 key.

3) Service Menu appears on the screen.

4) Press the Menu key to select it.

A series of functions then become available to you as you scroll up and down. They are as follows:

PassPort ESN: Enter the Service Menu and using the Up/Dn keys scroll to "**PassPort ESN**". Press the Select key. Use the Up/Dn and Select Keys to activate or deactivate this function. This function momentarily displays the radio's PassPort Electronic Serial Number.

PassPort Information Report - Enter the Service Menu and using the Up/Dn keys scroll to "Report". Press the Select key. The display will sequentially show, the search method preference, the number of NearNeighbors from the last registered site neighbor list, All Neighbors, the total number of unique stored Neighbor frequencies and then display the known list of Neighbor Frequencies. The report will complete and the radio will search and re-register.

Monitor - This Service Menu option defeats PassPort coded squelch and allows a technician to hear all transmissions on the system. This function can be enabled or disabled using the PassPort CPS (PPCPS).

Show RSSI - Enter the Service Menu and using the Up/Dn keys scroll to "**Show RSSI**". Press the Select key. Use the Up/Dn and Select Keys to activate or deactivate this function. This diagnostic momentarily displays the ASID and RSSI of all received site IDLE messages in the format "WXXX-YYY-ZZZ" where W is a "-" on an Idle channel and a "+" on a busy one, XXX is the ASID of the site, YYY is the RSSI of the message just received and ZZZ is the current running average RSSI. This can be helpful in determining RSSI roaming settings. Also while this feature is enabled and the radio is searching, each new search frequency is momentarily displayed in order to track the radio's progress through the known frequencies.

Search Freq-(Enter Search Frequencies): Enter the Service Menu and using the Up/Dn keys scroll to "**Search Freq**". Press the Select key. Using the numeric keys and Left (P1) key for backup/delete and

the "*" key for the decimal point, enter the desired Search Frequency in MHz. Press the Select key when the entry is complete or the Escape/Exit Key to exit the function without entering a search frequency. After pressing the Select key the radio will exit the Menu mode and begin searching the entered frequency for a period of time equal to twice the initial search delay. This utility allows a new radio or a radio with an empty Neighbor List Almanac to search an initial frequency other than its Home Frequency or a Seed List Frequency. This can be helpful when programming and delivering a new radio to a customer in an area not served by a site on his Home Frequency.

Clear Almanac – (Clear Neighbor list Almanac): Enter the Service Menu and using the Up/ keys scroll to "**Clear Almanac**". Press the Select key. The stored Neighbor frequencies will be erased. This utility allows clearing obsolete Neighbor frequencies collected.

Chapter 6

Power Up Self-Test

6.1   Error Codes - Conventional and LTR Radios

Turning on the radio starts a self-test routine that checks the RAM, ROM checksum, EEPROM hardware, and EEPROM checksum. If these checks are successful, the radio generates two high-pitched self-test pass tones, or a musical tone (selected in CPS). If the self-test is not successful, one low-pitched tone is heard. Radios with displays are able to display the error codes. The displayed error codes and related corrections are listed as follows:

Table 6-1: Power-up Display Codes - (Conventional Radios)

If the error code displayed is...	then, there is a...	To correct the problem...
"RAM TST ERROR"	RAM test failure.	Retest the radio by turning it off and turning it on again. If message reoccurs, replace RAM (U405).
"ROM CS ERROR"	Wrong ROM checksum.	Reprogram FLASH memory, then retest. If message reoccurs, replace ROM (U406).
"EEPRM HW ERROR"	Codeplug structure mismatch or non existence of codeplug.	Reprogram codeplug with correct version and retest radio. If message reoccurs, replace EEPROM (U407).
"EEPRM CS ERROR"	Wrong codeplug checksum.	Reprogram codeplug.
No Display	Bad display module connection or damaged display module.	Check connection between main board and display module or replace with new display module.

6.2   Error Codes - Privacy Plus

At power-up, the radio performs cursory tests to determine if its basic electronics and software are in working order. Problems detected during these tests are presented as error codes on the radio display. The presence of an error code should prompt the user that a problem exists and that a service technician should be contacted. Self-test errors are classified as either fatal or non-fatal. Fatal errors will inhibit user operation, non-fatal errors will not. Use Table 6-2: Power-up Display Codes to aid in understanding particular power-up error code displays.

Table 6-2: Power-up Display Codes

Failure Display	Type of Failure	Description	Possible Source
FAIL 01/81	FATAL	External ROM/Flash checksum error	Bad ROM data, Defective ROM
FAIL 01/82	FATAL	External EEPROM checksum error	Bad external codeplug data, Defective external EEPROM
ERROR 01/02	NON-FATAL	External EEPROM checksum error	Bad external codeplug data
FAIL 01/84	FATAL	External EEPROM checksum blank	Unprogrammed external code-plug data
FAIL 01/88	FATAL	External RAM error	Defective RAM
FAIL 01/90	FATAL	Hardware failure	Defective IC
FAIL 01/92	FATAL	Internal EEPROM checksum error	Bad internal codeplug data, Defective microcontroller
ERROR 01/12	NON-FATAL	Internal EEPROM checksum error	Bad internal codeplug data
FAIL 01/94	FATAL	Internal EEPROM checksum blank	Unprogrammed internal code-plug data
FAIL 01/98	FATAL	Internal RAM error	Defective microcontroller

NOTE: **Due to the nature of fatal ROM and RAM error, it may not be possible to present an error code on the display. In these cases, the radio will attempt to display the appropriate error code, generate an illegal mode tone for one second, and then reset its microcontroller.**

6.3 Error Codes - PassPort

For the purpose of this document the phrase "PassPort Trunking Controller Board" and its acronym "PTCB" are used.

Table 6-3: Power-up Display Codes (PassPort Trunking Controller Board)

If the error code displayed is...	then, there is a...	To correct the problem...
ESN BAD	PTCB Defective.	Replace PTCB.
AppCode Fail	PTCB Firmware Defective.	Reprogram PTCB FLASH-ROM.
BackDoor		Turn radio off and restart.
ERR:Watchdog	Firmware Failure Resulted in Watchdog Timer Interrupt.	Restart radio.
Unprogrammed	Programming is not correct.	Use CPS and PPCPS to properly program radio and PTCB.
ERROR: NO PTG		Use PPCPS to program that Zone with a Primary Talk Group.

6.4 Operation Display Codes

During radio operation, the radio performs dynamic tests to determine if the radio is working properly. Problems detected during these tests are presented as error codes on the radio display. The presence of an error code should prompt a user that a problem exists and that service. technician should be contacted. Use Table 6-4: Operational Display Codes to aid in understanding particular operational error code displays.

Table 6-4: Operational Display Codes

Failure Code	Description	Possible Source
FAIL 001	Synthesizer out of lock.	Bad frequency data in codeplug, defective synthesizer.
FAIL 002	Selected Mode (Zone/Channel) codeplug checksum error.	Bad codeplug data.

Notes

Chapter 7

Accessories

7.1 HT750/HT1250/HT1250•LS/HT1250•LS⁺/HT1550•XLS/MTX850/ MTX950/MTX850•LS/MTX8250/MTX9250/MTX8250•LS Accessories

7.1.1 Antennas

VHF	136-174 MHz, Ferrule Connector
PMAD4012	136-155 MHz, Stubby
PMAD4013	155-174 MHz, Stubby
PMAD4014	14 cm. Helical, Standard Length - 136-155 MHz (Red Code)
PMAD4015	14 cm. Helical, Standard Length - 155-174 MHz (Black Code)
PMAD4023	14 cm. Helical, Standard Length -150-161 MHz
PMAD4025	150-161 MHz, Stubby
UHF 1	403-470 MHz, Ferrule Connector
PMAE4002	403-433 MHz, Stubby
PMAE4003	433-470 MHz, Stubby
NAE6483	403-520 MHz, Flexible Whip
UHF 2	450-520 MHz, Ferrule Connector
PMAE4006	465-490 MHz, Stubby
PMAE4007	490-527 MHz, Stubby
NAE6483	403-520 MHz, Whip
Lowband	
NAB6064	30-50 MHz Heliflex (trim to frequency)
800 MHz	806-825/851-870 MHz, SMA Connector
NAF5037	806-870 MHz, Half Wave Whip
900 MHz	896-902/935-941, SMA Connector
NAF5038	896-941 MHz, Whip
NAF5042	806-941 MHz, Quarter Wave Stubby

7.1.2 Carrying Accessories

All Models/All Battery Chemistries:

HLN9952	Carry Holder, Belt Clip-One size fits all
HLN9714	Spring 2-1/2" Belt Clip
HLN9701	Nylon Carry Case with Beltloop

7.1.3 Carry Cases

HT750, MTX850, MTX950, MTX850•LS (Standard Model Only)	Ultra-High and High Capacity Battery Carry Cases
HLN9665	Standard Leather Case, Beltloop
HLN9676	Standard Leather Case, Swivel
HT750 Keypad Models, HT1250, HT1250•LS, HT1250•LS$^+$, MTX8250, MTX9250, MTX8250•LS	Ultra-High and High Capacity Battery Carry Cases
HLN9689	Standard Leather Case, DTMF, Beltloop
HLN9694	Standard Leather Case, DTMF, Swivel
HT1250, HT1250•LS, HT1250•LS$^+$ Limited Keypad Models	Ultra-High and High Capacity Battery Carry Cases
HLN9946	Standard Leather Case, Beltloop
HLN9998	Standard Leather Case, Swivel
HT750 (Standard Model Only)	Lithium Ion Battery Carry Cases
HLN9652	Standard Leather Case, Beltloop
HLN9670	Standard Leather Case, Swivel
HT750 Keypad Models, HT1250, HT1250•LS, HT1250•LS$^+$, MTX8250, MTX9250, MTX8250•LS	Lithium Ion Battery Carry Cases
HLN9677	Standard Leather Case, DTMF, Beltloop
HLN9690	Standard Leather Case, DTMF, Swivel
HT1250, HT1250•LS, HT1250•LS$^+$ Limited Keypad Models	Lithium Ion Battery Carry Cases
HLN9945	Standard Leather Case, Beltloop
HLN9955	Standard Leather Case, Swivel
HT1550•XLS Models:	
HLN9695	Standard Leather, Belt Loop (Lithium Ion Battery)
HLN9698	Standard Leather, Belt Loop (Standard Battery)
HLN9699	Standard Leather, Swivel (Lithium Ion Battery)
HLN9700	Standard Leather, Swivel (Standard Battery)

7.1.4 Chargers

AAHTN3000	120V Rapid Rate Single Unit Charger Kit, U.S. 3-Prong Plug (includes Xfmr, pocket, spacer, model box, and NA/LA manual)
HTN9000	Rapid Rate Single Unit (Pocket Only)
25-04548T05	120V Transformer Only
AAHTN3003	120V Multi-Unit Rapid Rate Charger, U.S. 3-Prong Plug (includes line cord and NA/LA manual)
NLN7967	Wall Mount Kit for Multi-unit Charger

7.1.5 Vehicular Accessories

AAEN1007B	Vehicular Adapter-UHF (403-470 MHz) provides tri-chemistry charging. Includes microphone and can be used with a mobile antenna. (For HT Professional Series Conventional, LTR, and PassPort radios).
AAEN1006	Vehicular Adapter-VHF (136-174 MHz) provides tri-chemistry charging. Includes microphone and can be used with a mobile antenna. (For HT Professional Series Conventional and LTR radios).

7.1.6 Batteries

HNN9008	1500 mAH NiMH High Capacity Battery (Standard With Unit)
HNN9009	1900 mAH NiMH Ultra High Capacity Battery
HNN9010	1800 mAH NiMH Ultra High Capacity Battery Factory Mutual
HNN9011	1200 mAH Ni-Cd High Capacity Battery Factory Mutual
HNN9012	1300 mAH Ni-Cd High Capacity Battery
HNN9013	1200 mAH Lithium Ion High Capacity Battery

7.1.7 Adapters

AAHLN9716	GP300/P1225/P1225•LS Audio Accessory Adapter-FM Approved (not compatible with BDN6706 or BDN6646)

7.1.8 Miscellaneous

HLN9820	Dust Cover for Accessory Connector
HLN9793	Charger Insert Spacer - Compatible with "A" version chargers only
HLN9794	Charger Insert Spacer - Compatible with "B" version chargers only

7.1.9 Service Aids

H5177	Customer Programming Software (CPS) - 3 Years Subscription (Conventional, PrivacyPlus, LTR, and PassPort)
RKN4073	Cloning Cable, portable Professional Radio Only
AARKN4074	Programming/Test Cable (requires RIB box)
RKN4075	Programming cable (includes internal Rib)
0180305G54	Shop battery eliminator cable. Requires RLN4510A (7.5 volt source)
RLN4510	7.5 Volt Universal Battery Eliminator
AA8180384F68	Bench test housing eliminator/test fixture. Requires RLN4510A 7.5V
HHLN4134	Ferrule to BNC adapter
RLN4460	Test Box
HVN9025	Customer Programming Software (CPS Plus)-CD ROM (Conventional, LTR, PassPort)
HVN9067	Customer Programming Software -CD ROM (Privacy Plus)

7.1.10 Audio Accessories

AARMN4017	Ultra-Lightweight Headset with Microphone -FM Approved
AARMN4018	Lightweight Headset with Boom Microphone and In Line PTT - FM Approved
AARMN4019	Medium Weight Dual Muff Headset, Over the Head with Noise Cancelling Mic and IN Line PTT - FM Approved
AARMN4020	Heavy Duty Behind the Head Headset with Noise Cancelling Boom Microphone and PTT on Earcup - FM Approved Please Note: Not compatible with MTX850 and MTX8250
AARMN4021	Ear Piece without Volume Control (Beige) - FM Approved
AARMN4022	2 Wire Ear Piece with Microphone and PTT (Beige) - FM Approved
AARMN4028	Ear Piece without Volume Control (Black) - FM Approved
AARMN4029	2 Wire Ear Piece with Microphone and PTT (Black) - FM Approved

7.1.11 Option Boards* (All option boards below are not compatible with HT1550•XLS)

AAHLN9729*	DTMF Decode Option Board with Manual (Field Install Only)
6881088C24	DTMF Decode Installation Sheet
AAHLN9725	Voice Storage Option Board with Manual
6881088C22	Voice Storage User Manual
AAENLN4150*	Mandown board for HT1250

*All option boards include the installation user manual.

7.1.12 Remote Speaker Microphones

AAHMN9052	Remote Speaker Standard Microphone - FM Approved
AAHMN9053	Remote Speaker Noise Cancelling Microphone - FM Approved
AAHMN9054	UHF Public Safety Microphone Remote Speaker (450-470 MHz Only) - FM Approved
AAHKN9055	Replacement Cable for Standard and Noise Cancelling
AAHKN9057	VHF Public Safety Speaker Microphone with manual (148-174 MHz Only) - FM Approved
6881088C12	Remote Speaker Microphone Instruction Sheet
6881088C18	Public Safety Microphone Instruction Sheet
6881088C74	Public Safety Microphone Cable Instruction Sheet

7.1.13 Manuals

6881089C97	HT750 User Guide (French, and English)
6881088C37	HT1250 User Guide (French, and English)
6881088C42	HT1250•LS/HT1250•LS+ User Guide (French, and English)
6881093C95	HT1550•XLS User Guide (French, and English)
6881093C80	MTX850•LS User Guide (French, and English)
6881093C81	MTX8250•LS User Guide (French, and English)
6881093C89	MTX850/MTX950 User Guide (French, and English)
6881093C90	MTX8250/MTX9250 User Guide (French, and English)
6880906Z54	HT750/HT1250/HT1250•LS/HT1250•LS+/HT1550•XLS/ MTX850/MTX8250/MTX850•LS/MTX8250•LS Basic Service Manual English

7.1.14 Retrofit Front Cover Kits

HLN9984	DTMF Retrofit Kit (HT750 only) - 16 Channel Model Only

Notes

Chapter 8

Model Chart and Test Specifications

8.1 UHF 403–470 MHz (Conventional)

										HT Series, UHF, 403–470 MHz	
Model										**Description**	
AAH25RDC9AA2_N										HT750, 403-470 MHz, 4W, 4-Ch	
	AAH25RDC9AA3_N									HT750, 403-470 MHz, 4W, 16-Ch	
		AAH25RDG9AA4_N								HT750, 403-470 MHz, 4W, 16-Ch, DTMF	
			AAH25RDG9AA5_N							HT1250, 403-470 MHz, 4W, 128-Ch, Display	
				AAH25RDH9AA6_N						HT1250, 403-470 MHz, 4W, 128-Ch, DTMF, Display	
					AAH25RDC9AA2_NFD					HT750, 403-470 MHz, 4W, 4-Ch	
						AAH25RDC9AA3_NFD				HT750, 403-470 MHz, 4W, 16-Ch	
							AAH25RDG9AA4_NFD			HT750, 403-470 MHz, 4W, 16-Ch, DTMF	
								AAH25RDG9AA5_NFD		HT1250, 403-470 MHz, 4W, 128-Ch, Display	
									AAH25RDH9AA6_NFD	HT1250, 403-470 MHz, 4W, 128-Ch, DTMF, Display	
										Item	**Description**
X					X					PMLE4171	HT750 Back Cover Kit
	X					X				PMLE4130	HT750 Back Cover Kit
		X					X			PMLE4129	HT750 Back Cover Kit
			X					X		PMLE4131	HT1250 Back Cover Kit
				X					X	PMLE4109	HT1250 Back Cover Kit
X	X				X	X				PMLN4216	HT750 Front Housing Kit
				X					X	PMLN4199	HT1250 Front Housing Kit (Full Keypad)
		X					X			PMLN4217	HT750 Front Housing Kit (Keypad)
			X					X		PMLN4201	HT1250 Front Housing Kit (Limited Keypad)
X	X	X	X	X	X	X	X	X	X	NAE6483	Whip Antenna (403-520 MHz)
X	X	X			X	X	X			6881089C96	HT750 User Guide
			X	X				X	X	6881088C38	HT1250 User Guide

x = Indicates one of each is required.

Note: Models ending in FD are Federal Government Radios Only.

8.2   UHF 450–512 MHz (Conventional)

HT Series, UHF, 450–512 MHz

Model	Description
AAH25SDC9AA2_N	HT750, 450-512 MHz, 4W, 4-Ch
AAH25SDC9AA3_N	HT750, 450-512 MHz, 4W, 16-Ch
AAH25SDG9AA4_N	HT750, 450-512 MHz, 4W, 16-Ch, DTMF
AAH25SDG9AA5_N	HT1250, 450-512 MHz, 4W, 128-Ch, Display
AAH25SDH9AA6_N	HT1250, 450-512 MHz, 4W, 128-Ch, DTMF, Display
AAH25SDC9AA2_NFD	HT750, 450-512 MHz, 4W, 4-Ch
AAH25SDC9AA3_NFD	HT750, 450-512 MHz, 4W, 16-Ch
AH25SDG9AA4_NFD	HT750, 450-512 MHz, 4W, 16-Ch, DTMF
AAH25SDG9AA5_NFD	HT1250, 450-512 MHz, 4W, 128-Ch, Display
AAH25SDH9AA6_NFD	HT1250, 450-512 MHz, 4W, 128-Ch, DTMF, Display

AA2_N	AA3_N	AA4_N	AA5_N	AA6_N	AA2_NFD	AA3_NFD	AA4_NFD	AA5_NFD	AA6_NFD	Item	Description
X					X					PMLE4172	HT750 Back Cover Kit
	X					X				PMLE4118	HT750 Back Cover Kit
		X					X			PMLE4117	HT750 Back Cover Kit
			X							PMLE4120	HT1250 Back Cover Kit
				X						PMLE4119	HT1250 Back Cover Kit
								X		PMLE4154	HT1250 Back Cover Kit
									X	PMLE4151	HT1250 Back Cover Kit
X	X	X			X	X	X			PMLN4216	HT750 Front Housing Kit
				X					X	PMLN4199	HT1250 Front Housing Kit (Full Keypad)
			X					X		PMLN4201	HT1250 Front Housing Kit (Limited Keypad)
X	X	X	X	X	X	X	X	X	X	NAE6483	Whip Antenna (403-520 MHz)
X	X	X			X	X	X			6881089C96	HT750 User Guide
			X	X				X	X	6881088C38	HT1250 User Guide

x = Indicates one of each is required.

Note: Models ending in FD are Federal Government Radios Only.

8.3   UHF 403–470 MHz (LTR and PassPort)

HT Series, UHF, 403–470 MHz (LTR & PassPort)							
Model						**Description**	
AAH25RDH9DP7_N						HT1250•LS⁺, LTR/PassPort, LTD KPD, MDC/Conventional	
	AAH25RDH9DP9_N					HT1250•LS⁺, LTR/PassPort, DTMF, MDC/Conventional	
		AAH25RDH9DU5_N				HT1250•LS, LTR 4W, LTD KPD, Display	
			AAH25RDH9DU6_N			HT1250•LS, LTR, 4W, DTMF, Display	
				AAH25RDH9DP5_N		HT1250•LS⁺, LTR/PassPort, LTD KPD, Display	
					AAH25RDH9DP6_N	HT1250•LS⁺, LTR/PassPort, DTMF, Display	
						Item	**Description**
X						PMLE4250	HT1250•LS⁺, LTR/PassPort Back Cover Kit (Limited Keypad)
	X					PMLE4251	HT1250•LS⁺, LTR/PassPort Back Cover Kit (Full Keypad)
		X				PMLE4152	HT1250•LS, LTR Back Cover Kit (Limited Keypad)
			X			PMLE4149	HT1250•LS, LTR Back Cover Kit (Full Keypad)
				X		PMLE4203	HT1250•LS⁺, LTR/PassPort Back Cover Kit (Limited Keypad)
					X	PMLE4202	HT1250•LS⁺, LTR/PassPort Back Cover Kit (Full Keypad)
		X				PMLN4201	HT1250•LS, LTR Front Housing Kit (Limited Keypad)
			X			PMLN4199	HT1250•LS, LTR Front Housing Kit (Full Keypad)
X				X		PMLN4405	HT1250•LS⁺, LTR/PassPort Front Housing Kit (Limited Keypad)
	X				X	PMLN4404	HT1250•LS⁺, LTR/PassPort Front Housing Kit (Full Keypad)
X	X	X	X	X	X	NAE6483	Whip Antenna (403-520 MHz)
X	X	X	X	X	X	6881088C42	HT1250•LS/HT1250•LS⁺ User Guide

x = Indicates one of each is required.

8.4   UHF 450–512 MHz (LTR and PassPort)

HT Series, UHF, 450–512 MHz (LTR & PassPort)						
Model						**Description**
AAH25SDH9DP7_N						HT1250•LS+, LTR/PassPort, LTD KPD, MDC/Conventional
	AAH25SDH9DP9_N					HT1250•LS+, LTR/PassPort, DTMF, MDC/Conventional
		AAH25SDH9DU5_N				HT1250•LS, LTR 4W, LTD KPD, Display
			AAH25SDH9DU6_N			HT1250•LS, LTR, 4W, DTMF, Display
				AAH25SDH9DP5_N		HT1250•LS+, LTR/PassPort, LTD KPD, Display
					AAH25SDH9DP6_N	HT1250•LS+, LTR/PassPort, DTMF, Display
					Item	**Description**
X						PMLE4252	HT1250•LS+, LTR/PassPort Back Cover Kit (Limited Keypad)
	X					PMLE4523	HT1250•LS+, LTR/PassPort Back Cover Kit (Full Keypad)
		X				PMLE4154	HT1250•LS, LTR Back Cover Kit (Limited Keypad)
			X			PMLE4151	HT1250•LS, LTR Back Cover Kit (Full Keypad)
				X		PMLE4205	HT1250•LS+, LTR/PassPort Back Cover Kit (Limited Keypad)
					X	PMLE4204	HT1250•LS+, LTR/PassPort Back Cover Kit (Full Keypad)
		X				PMLN4201	HT1250•LS, LTR Front Housing Kit (Limited Keypad)
			X			PMLN4199	HT1250•LS, LTR Front Housing Kit (Full Keypad)
X				X		PMLN4405	HT1250•LS+, LTR/PassPort Front Housing Kit (Limited Keypad)
	X				X	PMLN4404	HT1250•LS+, LTR/PassPort Front Housing Kit (Full Keypad)
X	X	X	X	X	X	NAE6483	Whip Antenna (403-520 MHz)
X	X	X	X	X	X	6881088C42	HT1250•LS/HT1250•LS+ User Guide

x = Indicates one of each is required.

8.5 UHF 403–470 MHz (Conventional/LTR)

HT Series, UHF, 403–470 MHz (Conventional/LTR)	
Model	**Description**
AAH25RDN9DU8_N	**HT1550•XLS, 403-470 MHz, 4 Watt, 160 Channel**
Item	**Description**
X PMLE4215	HT1550•XLS Back Cover Kit (403-470 MHz)
X PMLN4218	HT1550•XLS Front Housing Kit
X NAE6483	Whip Antenna (403-520 MHz)
X 6881093C95	HT1550•XLS User Guide

x = Indicates one of each is required.

8.6   UHF 450–512 MHz (Conventional/LTR)

HT Series, UHF, 450–512 MHz (Conventional/LTR)	
Model	**Description**
AAH25SDN9DU8_N	**HT1550•XLS, 450-512 MHz, 4 Watt, 160 Channel**
Item	**Description**
X PMLE4216	HT1550•XLS Back Cover Kit (450-512 MHz)
X PMLN4218	HT1550•XLS Front Housing Kit
X NAE6483	Whip Antenna (403-520 MHz)
X 6881093C95	HT1550•XLS User Guide

x = Indicates one of each is required.

8.7   VHF 136–174 MHz

HT Series, VHF, 136–174 MHz

Model	Description
AAH25KDC9AA2_N	HT750, 136-174 MHz, 5W, 4 -Ch
AAH25KDC9AA3_N	HT750, 136-174 MHz, 5W, 16 -Ch
AAH25KDG9AA4_N	HT750, 136-174 MHz, 5W, 16 -Ch, DTMF
AAH25KDF9AA5_N	HT1250, 136-174 MHz, 5W, 128 -Ch
AH25KDH9AA6_N	HT1250, 136-174 MHz, 5W, 128 -Ch, DTMF, Display
AAH25KDC9AA2_NFD	HT750, 136-174 MHz, 5W, 4 -Ch
AH25KDC9AA3_NFD	HT750, 136-174 MHz, 5W, 16 -Ch
AAH25KDG9AA4_NFD	HT750, 136-174 MHz, 5W, 16 -Ch, DTMF
AAH25KDF9AA5_NFD	HT1250, 136-174 MHz, 5W, 128 -Ch, Display
AAH25KDH9AA6_NFD	HT1250, 136-174 MHz, 5W, 128 -Ch, DTMF, Display

AAH25KDC9AA2_N	AAH25KDC9AA3_N	AAH25KDG9AA4_N	AAH25KDF9AA5_N	AH25KDH9AA6_N	AAH25KDC9AA2_NFD	AH25KDC9AA3_NFD	AAH25KDG9AA4_NFD	AAH25KDF9AA5_NFD	AAH25KDH9AA6_NFD	Item	Description
X					X					PMLD4159	HT750 Back Cover Kit
	X					X				PMLD4109	HT750 Back Cover Kit
		X					X			PMLD4108	HT750 Back Cover Kit
			X					X		PMLD4111	HT1250 Back Cover Kit
				X					X	PMLD4110	HT1250 Back Cover Kit
		X					X			PMLN4217	HT750 Front Cover Kit (Keypad)
X	X				X	X				PMLN4216	HT750 Front Cover Kit
				X					X	PMLN4199	HT1250 Front Housing Kit (Full Keypad)
			X					X		PMLN4201	HT1250 Front Housing Kit (Limited Keypad)
X	X	X	X	X	X	X	X	X	X	PMAD4012	Antenna, 136-155 MHz Stubby
X	X	X	X	X	X	X	X	X	X	PMAD4013	Antenna, 155-174 MHz Stubby
X	X	X	X	X	X	X	X	X	X	PMAD4014	Antenna, 136-155 MHz 14 cm
X	X	X	X	X	X	X	X	X	X	PMAD4015	Antenna, 155-174 MHz 14 cm
X	X	X			X	X	X			6881089C96	HT750 User Guide
			X	X				X	X	6881088C38	HT1250 User Guide

x = Indicates one of each is required.

Note: Models ending in FD are Federal Government Radios Only

8.8   VHF 136–174 MHz (Conventional/LTR)

HT Series, VHF, 136–174 MHz (Conventional/LTR)						
Model						**Description**
AAH25KDF9DU5_N						HT1250•LS, 136-174 MHz, 5W, Limited Keypad (Ltd Kpd)
	AAH25KDF9DU7_N					HT1250•LS, 136-174 MHz, 5W, Ltd Kpd, MDC/Conventional
		AAH25KDH9DU6_N				HT1250•LS, 136-174 MHz, 5W, DTMF
			AAH25KDH9DU9_N			HT1250•LS, 136-174 MHz, 5W, DTMF, MDC/Conventional
				AAH25KDN9DU8_N		HT1550•XLS, 136-174 MHz, 5W, 160 Channels
					Item	**Description**
X					PMLD4200	HT1250•LS Back Cover Kit, MDC/LTR, Ltd Keypad
	X				PMLD4201	HT1250•LS Back Cover Kit, MDC/LTR/Conv., Ltd Keypad
		X			PMLD4202	HT1250•LS Back Cover Kit, MDC/LTR, DTMF
			X		PMLD4203	HT1250•LS Back Cover Kit, MDC/LTR/Conv., DTMF
X	X				PMLN4550	HT1250•LS Front Cover Kit, Limited Keypad
		X	X		PMLN4551	HT1250•LS Front Cover Kit, DTMF
X	X	X	X	X	PMAD4012	Antenna, 136-155 MHz Stubby
X	X	X	X	X	PMAD4013	Antenna, 155-174 MHz Stubby
X	X	X	X	X	PMAD4014	Antenna, 136-155 MHz 14 cm (Red coded)
X	X	X	X	X	PMAD4015	Antenna, 155-174 MHz 14 cm Helical (Black coded)
				X	PMAD4023	Antenna, 14 cm. Helical, Standard Length — 150-161 MHz
				X	PMLD4188	HT1550•XLS Back Cover Kit (136-174 MHz)
				X	PMLN4218	HT1550•XLS Front Housing Kit
X	X	X	X		6881088C42	HT1250•LS/HT1250•LS+ User Guide
				X	6881093C95	HT1550•XLS User Guide

x = Indicates one of each is required.

8.9   VHF, 136–174 MHz (LTR & PassPort)

HT Series, VHF, 136–174 MHz (LTR & PassPort)					
Model				**Description**	
AAH25KDF9DP5_N				HT1250·LS⁺, 136-174 MHz, 5W, 16CH Limited Keypad	
	AAH25KDF9DP7_N			HT1250·LS⁺, 136-174 MHz, 5W, 32CH Limited Keypad w/MDC	
		AAH25KDH9DP6_N		HT1250·LS⁺, 136-174 MHz, 5W, 16CH Full Keypad	
			AAH25KDH9DP9_N	HT1250·LS⁺, 136-174 MHz, 5W, 32CH Full Keypad w/MDC	
				Item	**Description**
X				PMLD4284	HT1250·LS+, LTR/PassPort Back Cover Kit (16ch Ltd Keypad)
	X			PMLD4285	HT1250·LS+, LTR/PassPort Back Cover Kit (32ch Ltd Keypad)
		X		PMLD4286	HT1250·LS+, LTR/PassPort Back Cover Kit (16ch Full Keypad)
			X	PMLD4287	HT1250·LS⁺, LTR/PassPort Back Cover Kit (32ch Full Keypad)
X	X			PMLN4405	HT1250.LS+, LTR/PassPort Front Housing Kit (Limited Keypad)
		X	X	PMLN4404	HT1250.LS+, LTR/PassPort Front Housing Kit (Full Keypad)
X	X	X	X	PMAD4012	Antenna, 136-155 MHz Stubby
X	X	X	X	PMAD4013	Antenna, 155-174 MHz Stubby
X	X	X	X	PMAD4014	Antenna, 136-155 MHz 14 cm (Red coded)
X	X	X	X	PMAD4015	Antenna, 155-174 MHz 14 cm Helical (Blk coded)
X	X	X	X	PMAD4023	Antenna, 150-161 MHz Whip
X	X	X	X	PMAD4025	Antenna, 150-161 MHz Stubby
X	X	X	X	NAD6502	Antenna, 146-174 MHz Heliflex
X	X	X	X	NAD6579	Antenna, 148-161 MHz Whip
X	X	X	X	HAD9742	Antenna, 151-159 MHz Stubby
X	X	X	X	HAD9743	Antenna, 162-174 MHz Stubby
X	X	X	X	8504762J01	Antenna, 136-155 MHz Whip
X	X	X	X	8504762J02	Antenna, 155-174 MHz Whip
X	X	X	X	6881088C42	HT1250.LS/HT1250.LS+ User Guide

x = Indicates one of each is required.

8.10 LowBand 29.7–42/35–50 MHz

HT Series, Lowband, 29.7–42/35–50 MHz

Model	Description
AAH25BEC9AA3_N	HT750, 29.7-42 MHz, 6W, 16 -Ch
AAH25CEC9AA3_N	HT750, 35-50 MHz, 6W, 16 -Ch
AAH25BEF9AA5_N	HT1250, 29.7-42 MHz, 6W, 128-Ch, Display
AAH25CEF9AA5_N	HT1250, 35-50 MHz, 6W, 128-Ch, Display
AAH25BEC9AA3_NFD	HT750, 29.7-42 MHz, 6W, 16 -Ch
AAH25CEC9AA3_NFD	HT750, 35-50 MHz, 6W, 16 -Ch
AAH25BEF9AA5_NFD	HT1250, 29.7-42 MHz, 6W, 128-Ch, Display
AH25CEF9AA5_NFD	HT1250, 35-50 MHz, 6W, 128-Ch, Display

1	2	3	4	5	6	7	8	Item	Description
X				X				PMLB4001	HT750 Back Cover Kit 29.7-42 MHz 6W
	X				X			PMLB4010	HT750 Back Cover Kit 35-50 MHz 6 W
		X				X		PMLB4003	HT1250 Back Cover Kit 29.7-42 MHz 6W
			X				X	PMLB4008	HT1250 Back Cover Kit 35-50 MHz 6 W
X	X			X	X			PMLN4216	HT750 Front Housing Kit
		X	X			X	X	PMLN4201	HT1250 Front Housing Kit (Limited Keypad)
X	X	X	X	X	X	X	X	PMLN4012	Antenna, 29.7-42/35-50 MHz Stubby
X	X	X	X	X	X	X	X	PMLN4013	Antenna, 29.7-42/35-50 MHz Stubby
X	X	X	X	X	X	X	X	PMLN4014	Antenna, 29.7-42/35-50 MHz 14 cm
X	X	X	X	X	X	X	X	PMLN4015	Antenna, 29.7-42/35-50 MHz 14 cm
X	X			X	X			6881089C96	HT750 User Guide
		X	X			X	X	6881088C38	HT1250 User Guide

x = Indicates one of each is required.

Note: Models ending in FD are Federal Government Radios Only

8.11 800 MHz (LTR)

MTX Series, 806–866 MHz (LTR)				
Model			**Description**	
AAH25UCH6DU9_N			MTX8250•LS, 2.5W, MDC/Conventional (Display)	
	AAH25UCC6DU3_N		MTX850•LS, 2.5W, 16-Ch (Non-Display)	
		AAH25UCH6DU6_N	MTX8250•LS, 2.5W, 190-Ch (Display)	
			Item	**Description**
X			PMUF1125	MTX8250•LS Back Cover Kit (MDC/Conventional)
	X		PMLF4012	MTX850•LS Back Cover Kit
		X	PMLF4013	MTX8250•LS Back Cover Kit
	X		PMLN4216	MTX850•LS Front Housing Kit
X		X	PMLN4199	MTX8250•LS Front Housing Kit (Full Keypad)
X	X	X	NAF5037	Antenna, 800 MHz, 1/2 Wave, Whip, 806-870 MHz
X	X	X	NAF5042	Antenna, Quarter Wave, Stubby, 806-870 MHz
	X		6881093C80	MTX850•LS User Guide
X		X	6881093C81	MTX8250•LS User Guide

x = Indicates one of each is required.

8.12 800 MHz (Privacy Plus)

MTX Series, 806–866 MHz (Privacy Plus)			
Model		**Description**	
AAH25UCC6GB3_N		MTX850, 2.5W, 16-Ch (Non-Display)	
	AAH25UCH6GB6_N	MTX8250, 2.5W, 160-Ch (Display)	
		Item	**Description**
X		PMLF4016	MTX850 Back Cover Kit 800 MHz 2.5W
	X	PMLF4017	MTX8250 Back Cover Kit 800 MHz 2.5W
X		PMLN4216	MTX850 Front Housing Kit (Non-keypad)
	X	PMLN4373	MTX8250 Front Housing Kit (Full Keypad)
X	X	NAF5037A	Antenna, 800MHz, 1/2 Wave, Whip, 806-870 MHz
X	X	NAF5042AR	Antenna, Quarter Wave, Stubby, 806-870 MHz
X		6881093C89	MTX850 User Guide
	X	6881093C90	MTX8250 User Guide

x = Indicates one of each is required.

8.13 900 MHz (Privacy Plus)

MTX Series, 896–941 MHz (Privacy Plus)			
Model			**Description**
AAH25WCC4GB3_N			MTX950, 2.5W, 16-Ch (Non-Display)
	AAH25WCH4GB6_N		MTX9250, 2.5W, 160-Ch (Display)
		Item	**Description**
X		PMLF4018	MTX950 Back Cover Kit 900 MHz 2.5W
	X	PMLF4019	MTX9250 Back Cover Kit 900 MHz 2.5W
X		PMLN4216	MTX950 Front Housing Kit (Non-keypad)
	X	PMLN4373	MTX9250 Front Housing Kit (Full Keypad)
X	X	NAF5038	Antenna, 800 MHz, 1/2 Wave, Whip, 806-941 MHz
X	X	NAF5042	Antenna, Quarter Wave, Stubby, 806-941 MHz
X		6881093C89	MTX950 User Guide
	X	6881093C90	MTX9250 User Guide

x = Indicates one of each is required.

8.14 Specifications, HT750 Radio

General			
Specification	**Lowband**	**VHF**	**UHF**
Model Numbers:	AAH25BEC AAH25CEC	AAH25KDC AAH25KDG	AAH25RDC AAH25RDG AAH25SDC AAH25SDG
Frequency Range:	29.7 - 42.0 MHz 35.0- 50.0 MHz	136-174 MHz	403-470 MHz 450-512 MHz
Frequency Stability: (-30°C to +60°C, 25°C Ref.)	±10 PPM	±5 PPM @ 25 kHZ ±2.5 PPM @ 12.5 kHZ	
Channel Capacity:	16 Channels	4 or 16 Channels	
Channel Spacing:	20/25 kHz	12.5/20/25 kHz	
Power Supply:	7.5 volts rechargeable battery		
Dimensions: H x W x D With NiMH High Capacity Battery: With NiMH Ultra-High Capacity Battery: With NiCd Battery: With LiIon Battery:	5.40 in. x 2.26 in. x 1.50 in. (137mm x 57.5 mm x 37.5mm) 5.40 in. x 2.26 in. x 1.60 in. (137mm x 57.5 mm x 40mm) 5.40 in. x 2.26 in. x 1.60 in. (137mm x 57.5 mm x 40mm) 5.40 in. x 2.26 in. x 1.30 in. (137mm x 57.5 mm x 33mm)		
Weight: With NiMH High Capacity Battery: With NiMH Ultra-High Capacity Battery: With NiCd Battery: With LiIon Battery:	15.0 ounces (420 grams) 17.5 ounces (500 grams) 15.8 ounces (450 grams) 12.5 ounces (350 grams)		
Average Battery Life @ 5-5-90 Duty Cycle*: With NiMH High Capacity Battery: With NiMH Ultra-High Capacity Battery: With NiCd Battery: With LiIon Battery:	Low Power High Power 11 hours 8 hours 14 hours 11 hours 12 hours 8 hours 11 hours 7 hours	Low Power High Power 11 hours 8 hours 14 hours 11 hours 12 hours 9 hours 11 hours 8 hours	
Sealing:	Passes rain testing per IP54 and MIL-STD 810E		
Shock:	Meets MIL-STD-810-C,D & E and TIA/EIA 603		
Vibration:	Meets MIL-STD-810-C,D & E and TIA/EIA 603		
Dust:	Meets MIL-STD-810-C,D & E and IP54		
Humidity:	Meets MIL-STD-810-C,D & E and TIA/EIA 603		

* 5% receive, 5% transmit, 90% standby

Transmitter			
Specification	**Lowband**	**VHF**	**UHF**
Power Output NiMH @ 7.5V:	1-6 W	1-5 W	1-4 W
Spurs/Harmonics:	-36 dBm < 1GHz -30 dBm > 1 GHz		
Audio Response: (from 6 dB/oct. Pre-Emphasis, 300 to 3000Hz)	+1 to -3 dB		
Audio Distortion: @ 1000 Hz, 60% Rated Max. Dev.	3% Typical		
Modulation Limiting:	±5.0 kHz @ 20 kHz	±2.5 kHz @ 12.5 kHz ±4.0 kHz @ 20 kHz ±5.0 kHz @ 25 kHz	
Conducted/Radiated Emissions:	66 dBw		
FM Hum and Noise:	-40 dB		

Receiver			
Specification	**Lowband**	**VHF**	**UHF**
Sensitivity (12 dB SINAD) EIA:	0.30 µV Typical	0.35 µV Typical	
Sensitivity (20 dB SINAD) ETS:	0.5 µV Typical		
Intermodulation per EIA:	-65 dB		
Adjacent Channel Selectivity ETS:	60 dB @ 12.5 kHz 70 dB @ 25 kHz		
Spurious Rejection:	70 dB		
Rated Audio:	0.5 W		
Audio Distortion @ Rated Audio:	3% Typical		
Hum and Noise (with LLE enabled):	-45 dB @ 20/25 kHz	-45 dB @ 12.5 kHz/-50 dB @ 25 kHz	
Audio Response (0.3 - 3 kHz):	+1 to -3 dB		
Conducted Spurious Emission per FCC Part 15:	-57 dBm <1 Ghz -47 dBm >1 Ghz		

Specifications subject to change without notice. All electrical specifications and methods refer to EIA/TIA 603 standards.
Professional Series radios meet or exceed requirements of MIL STD 810 C, D, E.

8.15 Specifications, HT1250 Radio

General			
Specification	**Lowband**	**VHF**	**UHF**
Model Numbers:	AAH25BEF AAH25CEF	AAH25KDF AAH25KDH	AAH25SDC AAH25SDH AAH25RDF AAH25RDH
Frequency Range:	29.7 - 42.0 MHz 35.0- 50.0 MHz	136-174 MHz	403-470 MHz 450-512 MHz
Frequency Stability: (-30°C to +60°C, 25°C Ref.)	±10 PPM	±5 PPM @ 25 kHZ ±2.5 PPM @ 12.5 kHZ	
Channel Capacity:	128 Channels		
Channel Spacing:	20/25 kHz	12.5/20/25 kHz	
Power Supply:	7.5 volts rechargeable battery		
Dimensions: H x W x D With NiMH High Capacity Battery: With NiMH Ultra-High Capacity Battery: With NiCd Battery: With LiIon Battery:	5.40 in. x 2.26 in. x 1.50 in. (137mm x 57.5 mm x 37.5mm) 5.40 in. x 2.26 in. x 1.60 in. (137mm x 57.5 mm x 40mm) 5.40 in. x 2.26 in. x 1.60 in. (137mm x 57.5 mm x 40mm) 5.40 in. x 2.26 in. x 1.30 in. (137mm x 57.5 mm x 33mm)		
Weight: With NiMH High Capacity Battery: With NiMH Ultra-High Capacity Battery: With NiCd Battery: With LiIon Battery:	15.0 ounces (420 grams) 17.5 ounces (500 grams) 15.8 ounces (450 grams) 12.5 ounces (350 grams)		
Average Battery Life @ 5-5-90 Duty Cycle*: With NiMH High Capacity Battery: With NiMH Ultra-High Capacity Battery: With NiCd Battery: With LiIon Battery:	Low Power High Power 11 hours 8 hours 14 hours 11 hours 12 hours 8 hours 11 hours 7 hours	Low Power High Power 11 hours 8 hours 14 hours 11 hours 12 hours 9 hours 11 hours 8 hours	
Sealing:	Passes rain testing per IP54 and MIL-STD 810E		
Shock:	Meets MIL-STD-810-C,D & E and TIA/EIA 603		
Vibration:	Meets MIL-STD-810-C,D & E and TIA/EIA 603		
Dust:	Meets MIL-STD-810-C,D & E and IP54		
Humidity:	Meets MIL-STD-810-C,D & E and TIA/EIA 603		

* 5% receive, 5% transmit, 90% standby

Transmitter			
Specification	**Lowband**	**VHF**	**UHF**
Power Output NiMH @ 7.5V:	1-6 W	1-5 W	1-4 W
Spurs/Harmonics:	-36 dBm < 1GHz -30 dBm > 1 GHz		
Audio Response: (from 6 dB/oct. Pre-Emphasis, 300 to 3000Hz)	+1 to -3 dB		
Audio Distortion: @ 1000 Hz, 60% Rated Max. Dev.	3% Typical		
Modulation Limiting:	±5.0 kHz @ 20 kHz	±2.5 kHz @ 12.5 kHz ±4.0 kHz @ 20 kHz ±5.0 kHz @ 25 kHz	
Conducted/Radiated Emissions:	66 dBw		
FM Hum and Noise:	-40 dB		

Receiver			
Specification	**Lowband**	**VHF**	**UHF**
Sensitivity (12 dB SINAD) EIA:	0.30 µV Typical	0.25 µV Typical	
Sensitivity (20 dB SINAD) ETS:	0.5 µV Typical		
Intermodulation per EIA:	70 dB		
Adjacent Channel Selectivity ETS:	60 dB @ 12.5 kHz 70 dB @ 25 kHz		
Spurious Rejection:	70 dB		
Rated Audio:	0.5 W		
Audio Distortion @ Rated Audio:	3% Typical		
Hum and Noise:	-45 dB @ 20/25 kHz	-45 dB @ 12.5 kHz/-50 dB @ 25 kHz	
Audio Response (0.3 - 3 kHz):	+1 to -3 dB		
Conducted Spurious Emission per FCC Part 15:	-57 dBm <1 Ghz -47 dBm >1 Ghz		

Specifications subject to change without notice. All electrical specifications and methods refer to EIA/TIA 603 standards. Professional Series radios meet or exceed requirements of MIL STD 810 C, D, E.

8.16 Specifications, HT1250•LS⁺ Radio

General		
Specification	**UHF**	**VHF**
Model Numbers:	AAH25SDH AAH25RDH	AAH25KDF AAH25KDH
Frequency Range:	403-470 MHz 450-512 MHz	136-174 MHz
Frequency Stability: (-30°C to +60°C, 25°C Ref.)	±5 PPM @ 25 kHZ ±2.5 PPM @ 12.5 kHZ	
Channel Capacity:	Trunking zone 15 Trunking talkgroup 16 Conventional Channels 16	
Channel Spacing:	12.5/20/25 kHz	
Power Supply:	7.5 volts rechargeable battery	
Dimensions: H x W x D With NiMH High Capacity Battery: With NiMH Ultra-High Capacity Battery: With NiCd Battery: With LiIon Battery:	5.40 in. x 2.26 in. x 1.50 in. (137mm x 57.5 mm x 37.5mm) 5.40 in. x 2.26 in. x 1.60 in. (137mm x 57.5 mm x 40mm) 5.40 in. x 2.26 in. x 1.60 in. (137mm x 57.5 mm x 40mm) 5.40 in. x 2.26 in. x 1.30 in. (137mm x 57.5 mm x 33mm)	
Weight: With NiMH High Capacity Battery: With NiMH Ultra-High Capacity Battery: With NiCd Battery: With LiIon Battery:	15.0 ounces (420 grams) 17.5 ounces (500 grams) 15.8 ounces (450 grams) 12.5 ounces (350 grams)	
Average Battery Life @ 5-5-90 Duty Cycle*: With NiMH High Capacity Battery: With NiMH Ultra-High Capacity Battery: With NiCd Battery: With LiIon Battery:	Low Power High Power 11 hours 8 hours 14 hours 11 hours 12 hours 9 hours 11 hours 8 hours	
Sealing:	Passes rain testing per IP54 and MIL-STD 810E	
Shock:	Meets MIL-STD-810-C,D & E and TIA/EIA 603	
Vibration:	Meets MIL-STD-810-C,D & E and TIA/EIA 603	
Dust:	Meets MIL-STD-810-C,D & E and IP54	
Humidity:	Meets MIL-STD-810-C,D & E and TIA/EIA 603	

* 5% receive, 5% transmit, 90% standby

Transmitter	
Specification	**UHF / VHF**
Power Output NiMH @ 7.5V:	1-4 W / 1-5W
Spurs/Harmonics:	-36 dBm < 1GHz -30 dBm > 1 GHz
Audio Response: (from 6 dB/oct. Pre-Emphasis, 300 to 3000Hz)	+1 to -3 dB
Audio Distortion: @ 1000 Hz, 60% Rated Max. Dev.	3% Typical
Modulation Limiting:	±2.5 kHz @ 12.5 kHz ±4.0 kHz @ 20 kHz ±5.0 kHz @ 25 kHz
FM Hum and Noise:	-40 dB

Receiver	
Specification	**UHF/VHF**
Sensitivity (12 dB SINAD) EIA:	0.25 µV Typical
Sensitivity (20 dB SINAD) ETS:	0.5 µV Typical
Intermodulation per EIA:	70 dB
Adjacent Channel Selectivity ETS:	60 dB @ 12.5 kHz 70 dB @ 25 kHz
Spurious Rejection:	70 dB
Rated Audio:	0.5 W
Audio Distortion @ Rated Audio:	3% Typical
Hum and Noise:	-45 dB @ 12.5 kHz/-50 dB @ 25 kHz
Audio Response (0.3 - 3 kHz):	+1 to -3 dB
Conducted Spurious Emission per FCC Part 15:	-57 dBm <1 Ghz -47 dBm >1 Ghz

Specifications subject to change without notice. All electrical specifications and methods refer to EIA/TIA 603 standards. Professional Series radios meet or exceed requirements of MIL STD 810 C, D, E.

8.17 Specifications, HT1550•XLS Radio

General	
Specification	**VHF/UHF**
Model Numbers:	AAH25KDN9DU8 (VHF) AAH25RDN9DU8 (UHF1) AAH25SDN9DU8 (UHF2)
Frequency Range:	136-174 MHz (VHF) 403-470 MHz (UHF1) 450-512 MHz (UHF2)
Channel Capacity:	Trunking zones 15 Trunking talkgroups 16 Conventional Channels 160
Channel Spacing:	12.5/20/25 kHz
Power Supply:	Rechargeable battery 7.5v
Dimensions: H x W x D With Standard High Capacity NiMH Battery: With Ultra High Capacity NiMH Battery: With NiCD Battery: With LiIon Battery:	Height excluding knobs 5.98 in. x 2.26 in. x 1.47 in. (152 x 57.5 x 37.5 mm) 5.98 in. x 2.26 in. x 1.57 in. (152 x 57.5 x 40.0 mm) 5.98 in. x 2.26 in. x 1.57 in. (152 x 57.5 x 40.0 mm) 5.98 in. x 2.26 in. x 1.29 in. (152 x 57.5 x 33.0 mm)
Weight: With Standard High Capacity NiMH Battery: With Ultra High Capacity NiMH Battery: With NiCD Battery: With LiIon Battery:	16.2 ounces (460 grams) 18.9 ounces (535 grams) 17.1 ounces (485 grams) 13.8 ounces (390 grams)
Average Battery Life @5/5/90 Duty Cycle: With Standard High Capacity NiMH Battery: With Ultra High Capacity NiMH Battery: With NiCD Battery: With LiIon Battery:	Low Power High Power 11 hours 8 hours 14 hours 11 hours 12 hours 9 hours 11 hours 8 hours
Sealing:	Withstands rain testing per MIL STD 810 C/D /E and IP54
Shock and Vibration:	Protection provided via impact resistant housing exceed-ing MIL STD 810-C/D /E and TIA/EIA 603
Dust and Humidity:	Protection provided via environment resistant housing exceeding MIL STD 810 C/D/E and TIA//EIA 603

Transmitter	
Specification	**VHF/UHF**
Frequency Stability: (-25°C to +55°C, +25° Ref.)	±2.5 ppm
Power:	VHF: 1-5W UHF: 1-4W
Modulation Limiting:	±2.5 @ 12.5 kHz ±4.0 @ 20 kHz ±5.0 @ 25 kHz
FM Hum & Noise:	-40 dB typical
Conducted/Radiated Emission:	-66 dBw
Adjacent Channel Power:	-60 dB @ 12.5 kHz -70 dB @ 20/25 kHz
Audio Response: (300 - 3000 Hz)	+1 to -3 dB
Audio Distortion:	3%

Receiver	
Specification	**VHF/UHF**
Frequency Stability: (-25°C to +55°C, +25° Ref.)	±2.5 ppm
Sensitivity (12 dB SINAD) EIA: Sensitivity (20 dB SINAD) ETS:	.25 µV typical .50 µV typical
Intermodulation EIA:	70 dB
Adjacent Channel Selectivity:	60 dB @ 12.5 kHz / 70 dB @ 20/25 kHz
Spurious Rejection:	70 dB
Rated Audio:	0.5W
Audio Distortion @ Rated Audio:	3% typical
Hum & Noise:	-45 dB @ 12.5 kHz -50 dB @ 20/25 kHz
Audio Response: (300 - 3000 Hz)	+1 to -3 dB
Conducted Spurious Emission per FCC Part 15:	-57 dBm <1 GHz -47 dBm >1 GHz

Specifications subject to change without notice. All electrical specifications and methods refer to EIA/TIA 603 standards. Professional Series radios meet or exceed requirements of MIL STD 810 C, D, E.

8.18 Specifications, MTX850/MTX8250 (800 MHz), MTX950/MTX9250 (900 MHz) Radios

General		
Specification	**800 MHz**	**900 MHz**
Model Numbers: MTX850 MTX8250 MTX950 MTX9250	AAH25UCC6GB3AN AAH25UCH6GB6AN	AAH25WCC4GB3AN AAH25WCH4GB6AN
Frequency:	806-821, 851-866 MHz	896-902, 935-941 MHz
Channel Capacity: MTX850/MTX950: MTX8250/MTX9250:	16 Trunked Talkgroups &Conventional Channels/9 Trunked Systems 160 Trunked Talkgroups & Conventional Channels Combined/15 Trunked Systems	
Power Supply:	7.5 Volts	
Dimensions: H x W x D With NiMH High Capacity Battery: With NiMH Ultra-High Capacity Battery: With NiCd Battery: With LiIon Battery:	5.40 in. x 2.26 in. x 1.50 in. (137mm x 57.5 mm x 37.5mm) 5.40 in. x 2.26 in. x 1.60 in. (137mm x 57.5 mm x 40mm) 5.40 in. x 2.26 in. x 1.60 in. (137mm x 57.5 mm x 40mm) 5.40 in. x 2.26 in. x 1.30 in. (137mm x 57.5 mm x 33mm)	
Weight: With NiMH High Capacity Battery: With NiMH Ultra-High Capacity Battery: With NiCd Battery: With LiIon Battery:	15.0 ounces (420 grams) 17.5 ounces (500 grams) 15.8 ounces (450 grams) 12.5 ounce (350 grams)	
Average Battery Life @ 5-5-90 Duty Cycle*: With NiMH High Capacity Battery: With NiMH Ultra-High Capacity Battery: With NiCd Battery: With LiIon Battery:	Low Power 9 hours 14 hours 9 hours 9 hours	High Power 8 hours 11 hours 8 hours 8 hours
Sealing:	Passes rain testing per IP54	
Shock:	Meets MIL-STD-810-C,D & E and TIA/EIA 603	
Vibration:	Meets MIL-STD-810-C,D & E and TIA/EIA 603	
Dust:	Meets MIL-STD-810-C,D & E and IP54	
Humidity:	Meets MIL-STD-810-C,D & E and TIA/EIA 603	

* 5% receive, 5% transmit, 90% standby

Transmitter		
Specification	**800 MHz**	**900 MHz**
Frequency Range: Transmit Talkaround	806-821 MHz 851-866 MHz	896-902 MHz 935-941 MHz
Power Output:	2.5W @ (806-821 MHz) 2W @ (851-866 MHz)	2.5W @ (896-902 MHz) 2.5W @ (935-941 MHz)
Channel Spacing:	25 kHz	12.5 kHz
Freq. Stability (-30°C to +60°C, 25° Ref.)	±2.5 ppm	±1.5 ppm
Emission (Conducted & Radiated):	-13 dBm per FCC	
FM Modulation:	16 KOF3E	
Audio Response: (from 6 dB/oct. Pre-Emphasis, 300 to 3000Hz)	+1 to -3 dB	
Audio Distortion:	3% Typical	
Modulation Limiting:	±5 kHz @ 806-821 MHz	±2.5 kHz
FM Hum & Noise (Companion Receiver):	-40 dB	-45 dB*

*with Hear Clear

Receiver		
Specification	**800 MHz**	**900 MHz**
Frequency Range	851-866 MHz	935-941 MHz
Sensitivity 12dB EIA SINAD:	.35 µV	
Channel Spacing	25 kHz	12.5 kHz
Intermodulation ETS	-70 dB	-65 dB
Adjacent Channel Selectivity ETS	-70 dB	-60 dB
Spur Rejection:	-70 dB	
Rated Audio:	0.5 W	
Audio Distortion@Rated Audio	3% Typical	
Audio Response: (from 6 dB/oct. De-Emphasis, 300 to 3000Hz)	+1 to -3 dB	
Hum and Noise:	-45 dB	-45 dB*
Conducted Spurious Emmission:	-57 dBm	

Specifications subject to change without notice. All electrical specifications and methods refer to EIA/TIA 603 standards. Professional Series radios meet or exceed requirements of MIL STD 810 C, D, E.

*with Hear Clear

8.19 Specifications, MTX850•LS and MTX8250•LS (800 MHz) Radios

General		
Specification	**800 MHz**	
Frequency:	806-821, 851-866 MHz	
Channel Capacity: MTX850•LS: AAH25UCC6DU3_N MTX8250•LS: AAH25UCH6DU6_N MTX8250•LS: AAH25UCH6DU9_N	1 Trunking Zone/16 Trunking Talkgroups/16 Conventional Channels 15 Trunking Zones/16 Trunking Talkgroups/16 Conventional Channels 15 Trunking Zones/16 Trunking Talkgroups/128 Conventional Channels	
Power Supply:	7.5 Volts	
Dimensions: With NiMH High Capacity Battery: With NiMH Ultra-High Capacity Battery: With NiCd Battery: With LiIon Battery:	5.40 in. x 2.26 in. x 1.50 in. (137mm x 57.5 mm x 37.5mm) 5.40 in. x 2.26 in. x 1.60 in. (137mm x 57.5 mm x 40mm) 5.40 in. x 2.26 in. x 1.60 in. (137mm x 57.5 mm x 40mm) 5.40 in. x 2.26 in. x 1.30 in. (137mm x 57.5 mm x 33mm)	
Weight: With NiMH High Capacity Battery With NiMH Ultra-High Capacity Battery: With NiCd Battery: With LiIon Battery:	15.0 ounces (420 grams) 17.5 ounces (500 grams) 15.8 ounces (450 grams) 12.5 ounce (350 grams)	
Average Battery Life @ 5-5-90 Duty Cycle*: With NiMH High Capacity Battery: With NiMH Ultra-High Capacity Battery: With NiCd Battery: With LiIon Battery:	Low Power 9 hours 14 hours 9 hours 9 hours	High Power 8 hours 11 hours 8 hours 8 hours
Sealing:	Passes rain testing per IP54	
Shock:	Meets MIL-STD-810-C,D & E and TIA/EIA 603	
Vibration:	Meets MIL-STD-810-C,D & E and TIA/EIA 603	
Dust:	Meets MIL-STD-810-C,D & E and IP54	
Humidity:	Meets MIL-STD-810-C,D & E and TIA/EIA 603	

* 5% receive, 5% transmit, 90% standby

Transmitter		
Specification	**800 MHz**	
Frequency Range: Transmit: Talkaround:	806-821 MHz 851-866 MHz	
Power Output:	2.5W @ (806-821 MHz)	2W @(851-866 MHz)
Channel Spacing:	25 kHz	
Freq. Stability: (-30°C to +60°C)	±2.5 ppm	
Spurs/Harmonics:	-47 dBc	
Adjacent Channel Power:	-70dBc @ 25 KHz	
Audio Response: (from 6 dB/oct. Pre-Emphasis, 300 to 3000Hz)	+1 to -3 dB	
Audio Distortion: @ 1000 Hz, 60% Rated Max. Dev.	3% Typical	
Modulation Limiting:	±5 kHz @ 806-821 MHz	
FM Noise:	-40 dB	

Receiver	
Specification	**800 MHz**
Frequency Range:	851-866 MHz
Sensitivity 12dB EIA SINAD:	-0.35 μV
Channel Spacing:	25 kHz
Intermodulation ETS:	70 dB
Adjacent Channel Selectivity ETS:	70 dB
Spur Rejection:	70 dB
Rated Audio:	0.5 W
Audio Distortion@Rated Audio:	3% Typical
Audio Response (0.3-3 kHz):	+1 to -3 dB
Hum and Noise:	-45dBm
Conducted Spurious Emmission:	-57dBm

Specifications subject to change without notice. All electrical specifications and methods refer to EIA/TIA 603 standards.
Professional Series radios meet or exceed requirements of MIL STD 810 C, D, E.

Glossary

Term	Definition
ALC	Automatic Level Control: a circuit in the transmit RF path that controls RF power amplifier output, provides leveling over frequency and voltage, and protects against high VSWR (voltage standing wave ration).
ASF IC	Audio Signaling Filter Integrated Circuit with voice compander.
CD	Compact Disk.
CMP	Compression.
CPS	Customer Programming Software.
CSQ	Carrier Squelch.
DTMF	Dual-Tone Multifrequency.
DPL	Digital Private-Line.
EEPROM	Electronically Erasable/Programmable Read-Only Memory: used by the radio to store its personality.
Firmware	Software, or a software/hardware combination of computer programs and data, with a fixed logic configuration stored in a read-only memory. Information cannot be altered or reprogrammed.
FGU	Frequency Generation Unit.
GaAs	Gallium Arsenide: a type of crystalline material used in some semiconductors.
ISW	Inbound Signalling Word: data transmitted on the control channel from a subscriber unit to the central control unit.
LCD	Liquid Crystal Display: a module used to display the radio's current operating channel or system and scan status.
LDMOS	Lateral Diffusion MOS.
LH DATA	Longhorn Data: a bidirectional 0-5V, RS-232 line that uses the microcontroller's integrated RS-232 asynchronous serial communications interface (SCI) peripheral.
LLE	Low Level Expander: slight amount of volume expansion; used to improve the signal to noise ratio.
LSH	Low-Speed Handshake: 150 baud digital data sent to the radio during trunked operation while receiving audio.
LTR	Trunked signaling protocol using low speed data. Registered trademark of E.F. Johnson Company.
MDC	Motorola Digital Communication.

MRTI	Motorola Radio-Telephone Interconnect: a system that provides a repeater connection to the Public Switched Telephone Network (PSTN). The MRTI allows the radio to access the telephone network when the proper access code is received.
MSK	Minimum-Shift Keying.
OMPAC	Over-Molded Pad-Array Carrier: a Motorola custom package, distinguished by the presence of solder balls on the bottom pads.
OSW	Outbound Signalling Word: data transmitted on the control channel from the central controller to the subscriber unit.
PassPort™	Enhanced trunking protocol developed by Trident Micro Systems that links wide area dispatch networking.
PC Board	Printed Circuit Board.
PL	Private-Line® tone squelch: a continuous sub-audible tone that is transmitted along with the carrier.
PLL	Phase-Locked Loop: a circuit in which an oscillator is kept in phase with a reference, usually after passing through a frequency divider.
PPM	Parts Per Million.
PTT	Push-To-Talk: the switch located on the left side of the radio which, when pressed, causes the radio to transmit.
RAM	Random Access Memory: the radio's RAM is loaded with a copy of the EEPROM data.
Registers	Short-term data-storage circuits within the microcontroller.
Repeater	Remote transmit/receive facility that retransmits received signals to improve communications coverage.
RESET	Reset line: an input to the microcontroller that restarts execution.
RF PA	Radio Frequency Power Amplifier.
RIB	Radio Interface Box.
ROM	Read Only Memory.
RSSI	Received Signal-Strength Indicator: a dc voltage proportional to the received RF signal strength.
RPT/TA	Repeater/Talk-Around.
Softpot	Software Potentiometer: a computer-adjustable electronic attenuator.
Software	Computer programs, procedures, rules, documentation, and data pertaining to the operation of a system.
SPI (clock and data lines)	Serial Peripheral Interface: how the microcontroller communicates to modules and ICs through the CLOCK and DATA lines.
Squelch	Muting of audio circuits when received signal levels fall below a pre-determined value.

Standby Mode	An operating mode whereby the radio is muted but still continues to receive data.
System Central Controller	Main control unit of the trunked dispatch system; handles ISW and OSW messages to and from subscriber units (see ISW and OSW).
System Select	The act of selecting the desired operating system with the system-select switch (also, the name given to this switch).
TOT	Time-Out Timer: a timer that limits the length of a transmission.
TPL	Tone Private-line.
µC	Microcontroller.
UHF	Ultra High Frequency.
µP	Microprocessor.
VCO	Voltage-Controlled Oscillator: an oscillator whereby the frequency of oscillation can be varied by changing a control voltage.
VCOBIC	Voltage-Controlled Oscillator Buffer Integrated Circuit.
VHF	Very High Frequency.
VSWR	Voltage Standing Wave Ratio.

Notes

MOTOROLA

6880906Z54-D