**LBI-33054A**

# *Operator's Manual*

AEGIS™ *FDMRTS M-PA*™
NARROWBAND 9600
PORTABLE RADIO

ERICSSON

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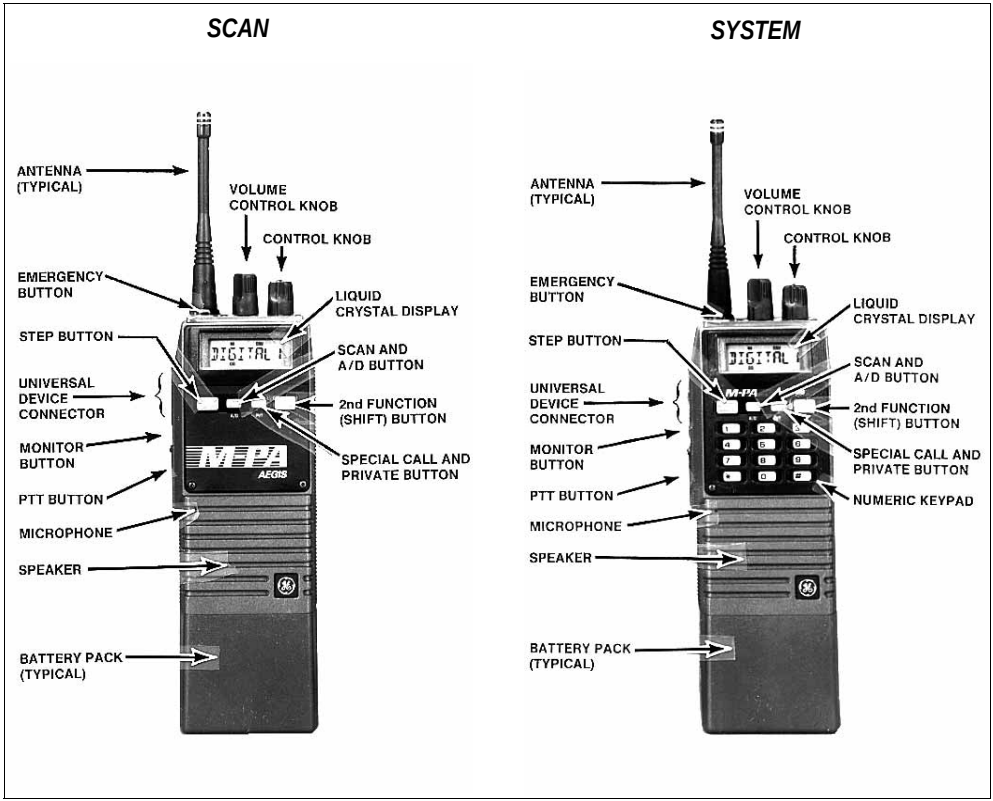


*Figure 1 - Aegis EDACS Model Radio*

## *INTRODUCTION*

*The Aegis M-PA System model portable radio is a high-performance two-way radio that provides clear voice (for test only), Aegis digital, and Aegis private communications. Personality programming allows maximum integration flexibility.*

*The radio must be equipped with the encrypt/decrypt option before operation in Aegis private mode is possible. This option allows the radio to communicate using highly secure state-of-the-art Aegis encryption and decryption technique.*

*Operating controls on the radio include a rotatable system/group/channel control knob, rotatable volume control, 16-button keypad (System Model only), push-to-talk, emergency and monitor buttons. The on/off power switch for the unit is located on the removable battery pack.*

*The 8-digit alphanumeric liquid crystal display (LCD) on the front of the radio displays the operating status of the radio. This backlit display also has sixteen status flags that indicate various operating conditions such as private communications enabled, transmitter on, scanning, or emergency mode enabled.*

*The exact operation of your radio will vary depending upon the mode of operation, the radio's programming, and the particular radio system. Consult your radio system's representative for particular features that are programmed into your radio.*

## *CONTROLS*

### *ON/OFF SWITCH*

*The ON/OFF SWITCH is located on the battery pack. Sliding this switch up will supply power to the radio from the battery pack. An audible click will be heard and the ON indicator will be exposed. When the radio is turned on, it will perform a power-up self test and then resume operation on the previous operating system, group or channel as displayed in the LCD. Sliding the switch down will turn the radio off.*

***VOLUME CONTROL KNOB***

*The VOLUME CONTROL KNOB is a rotatable control on the top of the radio used to adjust the receiver's audio level in the speaker. Rotating this knob in a clockwise direction will increase the audio level. Counter-clockwise rotation will decrease the audio level. Minimum levels may be programmed into the radio to prevent missed calls due to too low of a volume setting.*

***CONTROL KNOB***

*The rotatable 16-position CONTROL KNOB located on the top of the radio may be programmed to select trunked groups and conventional channels or it may be programmed to select systems. See* ***SYSTEM/GROUP/CHANNEL SELECTION*** *for details.*

*A stop plate may be installed under the knob to limit the maximum number of positions to less than sixteen (16). It is normally factory installed for fifteen (15) positions.*

***PTT BUTTON***

*Pressing the PTT BUTTON on the side of the radio will enable the radio's transmitter. The* ***TX*** *status flag in the display will turn on when the radio is transmitting. Releasing the PTT BUTTON will return operation to idle/receive mode.*

*When operating in a trunked system, the radio may be programmed to automatically transmit (without the operator pressing the PTT BUTTON) to maintain communication with the site controller. The* ***TX*** *status flag will turn on when the radio is transmitting.*

***MONITOR BUTTON***

***Trunked Mode***

*When operating in trunked mode, pressing the MONITOR BUTTON after an individual call has been received will return the radio to the group call mode. The radio will not respond on an individual basis, but will then transmit group calls when the PTT BUTTON is pressed. The radio will also automatically return to the group call mode after the programmed call-back time-out period expires.*

*Pressing the MONITOR BUTTON will also clear any digits entered from the numeric keypad and return the radio to the selected group display.*

*In addition, this button is used to toggle between group and regroup settings if the Dynamic Regrouping mode (with deselect capability) has been enabled by the site controller.*

***Conventional Mode***

*When the radio is operating in conventional mode the MONITOR BUTTON is used to unsquelch the receiver.*

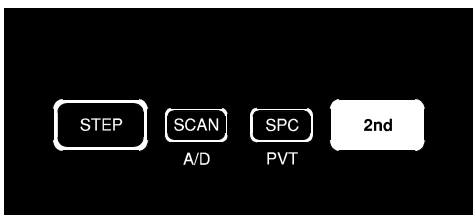


*Figure 2 - Scan Keypad*

***EMERGENCY BUTTON***

*When operating in trunked mode, pressing and holding the red EMERGENCY BUTTON on top of the radio for a programmable time period will initiate an emergency call with voice operation on the programmed home group. If no home group is programmed into the radio, voice operation will be on the selected group.*

STEP ***KEY***

*The* STEP *key located on the keypad may be programmed to select trunked groups and conventional channels or it may be programmed to select systems. See* ***SYSTEM/GROUP/CHANNEL SELECTION*** *for details.*

STEP *is also used to scroll through the programmed special call table when the special call mode is enabled.*

SCAN ***KEY***

*Pressing the* SCAN *key on the keypad will toggle scan operation on and off (for radios which have this feature). When the radio is scanning, the* ***SCN*** *status flag in the display will show and*

*all groups in the scan list in the current system will be scanned.*

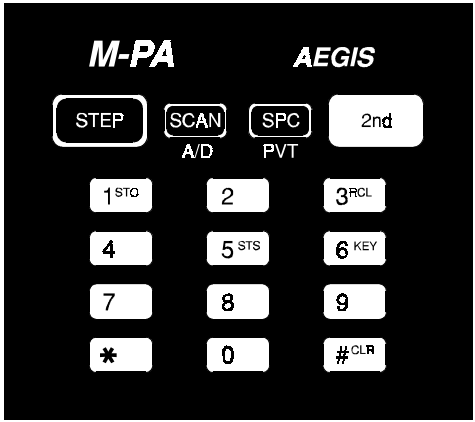


*Figure 3 - System Keypad*

### *SPECIAL CALL KEY*

*When operating in trunked mode, pressing* SPC *will switch operation from the group select mode to the special call mode. The last selected special call will be displayed.*

*While in special call mode, the next programmed special call may be selected by pressing* STEP*. Pressing* 2nd *then* STEP *will select the previous programmed special call.*

*The caller's ID of the last received individual call is selectable by pressing the special call* SPC *key. See* ***Special Calls*** *for details.*

### *2nd FUNCTION KEY*

*On the Scan Model, two(2) of the keys on the keypad are dual-function keys. Press and release the blue function key to shift keypad selection to the* ***A/D*** *and* ***PVT*** *keys.*

*Seven (7) of the keys on the System model keypad are dual-function keys. Press and release the blue* 2nd *function key to shift keypad selection to the A/D, PVT, STO, RCL, CLR, KEY or STS keys. The following paragraphs describe operation of the shifted buttons.*

***ADD/DELETE KEY (Shifted SCAN Key)***

*When in trunked mode, pressing and releasing* [2nd] *and then pressing* ***A/D*** *(shifted* [SCAN] *key) will add the selected group to the scan list if it is not already on the list. Repeating this sequence will delete the group from the list. When the selected group is on the scan list, the* ***S*** *status flag will show in the display.*

> ***NOTE***
>
> *Do not use in Conventional mode.*

*Scan must be turned off before groups can be added to or deleted from the scan list. See* [SCAN] ***KEY*** *for details.*

***PRIVATE BUTTON (Shifted SPC Key)***

*Private transmit mode is enabled or disabled by pressing and releasing* [2nd] *and then pressing* ***PVT*** *(shifted* [SPC] *key). When enabled, the* ***PVT*** *status flag in the display will turn on.*

*If the radio is programmed for forced private operation,* ***FRCD PVT*** *will be displayed when* [2nd] ***PVT*** *is pressed; private transmit mode is not disabled. If the selected group or channel is not programmed for private operation,* ***PVT DIS*** *will momentarily show in the display when* [2nd] ***PVT*** *is pressed; the radio will not change to private mode. See* ***PRIVATE COMMUNICATIONS*** *for additional details.*

***STORE KEY(Shifted)***

[1 STO] *(shifted digit 1) allows ten (10) telephone numbers and ten (10) radio ID numbers to be stored and later recalled with the RCL button.*

*Store a telephone number by entering the number (up to 29 digits) followed by an asterisk (*). Next, enter the storage location (1-10) and press and release* [2nd] *and then press* [1 STO]. ***STORED*** *will be displayed for two seconds.*

*Store individual radio ID numbers by entering the ID number (1 - 16382) followed by a pound sign (#). Next enter the storage location (1-10) and press and release* [2nd] *and then press* [1 STO]. ***STORED*** *will be displayed for two seconds.*

***RECALL KEY (Shifted Digit 3)***

*3 RCL allows the previously stored telephone or radio ID numbers to be recalled. To recall a number first enter an * or # (* for telephone number, # for radio ID number) and then enter the storage location (1-10). Next press and release 2nd and then press 3 RCL and the number will be displayed.*

***CLEAR KEY (Shifted # )***

*To clear the last digit entered, press and release 2nd and then press # CLR (shifted # button). Holding CLR down will repetitively clear previous digits. The radio will return to the last operating state when all entered digits are cleared.*

***KEY KEY (Shifted)***

*Pressing and releasing 2nd and then pressing 6 KEY will display the current operating cryptographic number. See* ***PRIVATE COMMUNICATIONS*** *for details.*

***STATUS KEY***

*The 5 STS key is not currently used.*

***KEYPAD LOCK FEATURE***

*To prevent accidental activation of the keys on the keypad, press and release the 2nd function key followed by pressing the MONITOR button to lock the keypad;* ***LOCKED*** *will be displayed momentarily. To unlock the keypad, press and release the 2nd function key followed by pressing the MONITOR button a second time;* ***UNLOCKED*** *will be displayed momentarily.*

***INDICATORS***

*The radio's liquid crystal display (LCD) located on the front panel has eight (8) alphanumeric characters and sixteen (16) status flags. This display provides indications of the current operating system, group or channel and it displays various other messages such as special call ID names or numbers, and telephone interconnect numbers.*

*LCD backlighting will turn on for 2 seconds anytime an active key or button is pressed or the CONTROL KNOB is rotated. Backlighting may be programmed to remain off at all times.*

*The sixteen (16) status flags located along the top and bottom of the display indicate operating modes and conditions as follows:*

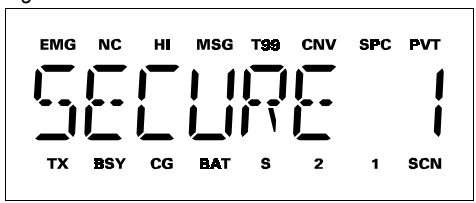


*Figure 4 - Liquid Crystal Display*

***EMG*** *EMerGency mode - On indicates an emergency call has been initiated by the user. Flashing indicates an emergency call has been received.*

***NC*** *No Control channel - On indicates the radio is not receiving the trunked control channel. Flashing indicates the trunked system is in a failsoft condition (supervisory radios only).*

***HI*** *HIgh power transmit - On indicates the selected system or channel has been programmed for high power transmit operation. Off indicates low power transmit.*

***MSG*** *MeSsaGe - Flashing indicates an individual call has been received (trunked mode).*

***CNV*** *CoNVentional mode - On indicates the radio is operating in the conventional mode.*

***SPC*** *SPecial Call mode - On indicates the special call mode has been enabled (trunked mode).*

***PVT*** *PriVaTe mode - On indicates private mode is enabled and the radio will transmit encrypted messages on the selected group or channel. Flashing indicates an encrypted message is being received.*

***TX*** *Transmitter enabled - On when the radio is transmitting.*

***BSY*** *BuSY - When in trunked mode, on indicates the radio is receiving a call; flashing indicates a call has been queued. In conventional mode, on indicates a carrier is being received.*

***BAT*** *BATtery low - On indicates the battery pack's charge is low.*

***S*** *Scan list - On indicates the selected group/channel is on the scan list.*

***SCN*** *SCaN mode - On indicates the radio is scanning (for radios which have this feature).*

### *UNIVERSAL DEVICE CONNECTOR*

*The Universal Device Connector (UDC) is located on the side of the radio just above the PTT and MONITOR BUTTONS. This connector provides connections for the external accessories such as a headset, a speaker-mike, or an emergency lanyard. When the radio is locked in a vehicular charger/repeater the UDC provides the audio and control connections between the radio and the vehicular charger/repeater. The UDC is also used by the maintenance personnel when the radio is programmed.*

**NOTE**

*Anytime there is a device change to the UDC, the radio should be turned off and then back on again.*

### *ALERT TONES*

*The radio sounds five (5) basic alert tones or "beeps" to indicate various operating conditions. Alert tones may be programmed to remain off at all times.*

- *500 Hz Tone* – *trunked failure tone - sounds when a trunked failure has occurred (call denied, failed confirmation).*
  – *low battery - sounds when the battery pack's charge is low.*
- *800 Hz Tone* – *private mode disabled - on a conventional channel, sounds when the PTT BUTTON is pressed if private transmit mode has previously been disabled.*
- *1000 Hz Tone* – *alert tone - sounds when a button is pressed and a status change occurs*
  – *channel access tone - sounds when a trunked channel has been assigned and it is clear to talk.*

- *1200 Hz Tone – private mode channel access tone - sounds when the radio is in the private transmit mode, a trunked channel has been assigned and it is clear to talk.*
- *2500 Hz Tone – call queued tone - sounds when a trunked call is queued.*

## *OPERATION*

### *POWER-UP*

*After the battery pack and antenna have been installed, turn the radio on by sliding the ON/OFF SWITCH on the battery pack up. After the radio has completed a power-up self-test, it will begin operation on the last operating state as displayed in the LCD. If programmed on, the power-up alert tone (beep) will be heard.*

*If the radio was previously operating in a trunking system and communication with this system's control channel cannot be established, the* ***NC*** *status flag will turn on. This may occur if, for example, the radio is out of range of the previous trunking site. It may be necessary move to another location, select another trunking system, or a conventional channel.*

### *SYSTEM/GROUP/CHANNEL SELECTION*

*The radio may be programmed with one of two different system/group/ channel selection modes as follows:*

- *Systems are selected with the* STEP *key; groups and channels are selected with the CONTROL KNOB.*

*or*

- *Systems are selected with the CONTROL KNOB; groups and channels are selected with the* STEP *key.*

***STEP Key Programmed For System Selection***
***CONTROL KNOB Programmed For Group/Channel Selection***

***System Selection***

*Press and release [STEP] to select the next system programmed into the radio as indicated in the display. To select the previous system, press and release [2nd] and then press [STEP]. Holding down [STEP] will cause the radio to automatically scroll through the system list.*

*Upon reaching an end of the system list, the radio may be programmed to stop selection or wrap around (go from one end to the other).*

***Group/Channel Selection***

*After the desired system is selected with the [STEP] key, rotate the CONTROL KNOB to the desired trunked group or conventional channel as indicated in the display. A stop-plate may be placed under the knob which will limit the maximum positions to less than sixteen (16).*

***CONTROL KNOB Programmed For System Selection***
***STEP Key Programmed For Group/Channel Selection***

***System Selection***

*Rotate the CONTROL KNOB to the desired system as indicated in the display. A stop-plate may be placed under the knob which will limit the maximum positions to less than sixteen (16).*

***Group/Channel Selection***

*After the desired system is selected with the CONTROL KNOB, press and release [STEP] to select the next trunked group or conventional channel programmed into the radio as indicated in the display. To select the previous group or channel, press and release [2nd] and then press [STEP]. Holding down [STEP] will cause the radio to automatically scroll through the group/channel list.*

*Upon reaching an end of the group/channel list, the radio may be programmed to stop selection or wrap around (go from one end to the other).*

## *VOICE MODES*

*Aegis programmed systems have three (3) different voice modes: clear (for test only), digital and private.*

*The voice modes are programmed on a per-group basis (for group calls) and on a per-system basis (for individual, telephone interconnect, system all and dynamic regroup calls) for trunked systems. Voice modes are programmed on a per-channel basis for conventional system.*

### *Clear Modes*

*In Aegis clear mode the radio transmits and receives only clear (analog) voice signals. These analog signals are non-digitized and non-encrypted. Clear mode transmissions can be easily monitored by unauthorized persons. Groups and channels programmed for clear operation cannot transmit or receive Aegis digital or private messages. Clear mode is for test only.*

## *TRANSMIT/RECEIVE MODE COMPATIBILITY FOR AEGIS OPERATION*

| *GROUP/CHANNEL PROGRAMMING (TRANSMIT)* | *RECEIVE CAPABILITY* | | |
|---|---|---|---|
| | *CLEAR* | *DIGITAL* | *PRIVATE* |
| *CLEAR* | *Yes* | *No* | *No* |
| *DIGITAL* | *Yes* | *Yes* | *No* |
| *PRIVATE* | *Yes* | *No* | *Yes ** |

** Assumes the proper cryptographic key is loaded.*

### *Aegis Digital Mode*

*Aegis digital mode allows the radio to transmit and receive digitized voice signals. Aegis digital signals provide improved weak signal performance and they cannot be easily monitored with a standard receiver. Groups and channels programmed for Aegis digital operation transmit only digital signals and they can receive clear and digital signals. In other words, with a certain group or channel selected, the operator cannot change from the digital transmit mode but the radio will*

*receive clear or digital signals. Private (encrypted) messages cannot be received when the radio is in Aegis digital mode.*

***Aegis Private Mode (Optional)***

*The Aegis private mode allows the radio to transmit and receive encrypted messages. To operate in this voice mode, the radio must be equipped with the optional encrypt/decrypt feature and the transmitting and receiving units must have identical cryptographic keys.*

*Cryptographic keys are transferred into the radio using a cryptographic Keyloader. Up to six (6) different cryptographic keys, numbered 1 - 6, can be transferred from a Keyloader and stored in the radio.*

*On trunked systems, individual keys are automatically selected from either the per-group cryptographic key (for group calls) or the per-system cryptographic key (for special and dynamic regroup calls).*

*VGE radios require a VGE Keyloader (option V4028 with software version 2.N or later). See LBI-31685 for operating details on the VGE Keyloader.*

*When operating on a group or channel programmed for private mode, all transmissions will be private transmissions and the radio will receive clear and private signals. The **PVT** status flag in the display turns on when the private mode is enabled. If the selected group or channel is programmed for autoselect capability, the mode may be toggled between private and clear using the* 2nd *- **PVT** keys (shifted* SPC*). Radios programmed for forced private operation do not allow a change of the transmit mode; the **PVT** key does not function.*

*If a forced private radio loses its keys, it will only be able to transmit on designated clear and digital groups/channels/special calls. It will not be able to transmit on designated private groups/channels/special calls.*

### *Transferring Keys Into The Radio*

> ***NOTE***
>
> *Before private messages can be sent or received, one or more cryptographic keys must be transferred into the radio from the Keyloader.*

*The following procedure outlines basic key transferring steps.*

1. *Turn the radio off.*
2. *Plug the modular connector of the Keyloader cable into the Keyloader's modular jack.*
3. *Connect the Keyloader cable to the UDC on the radio.*
4. *Press the PWR button on the Keyloader and wait for the Keyloader to display "MASTER MODE".*
5. *Press the TRN button on the Keyloader. If necessary, select a different cryptographic key to be transferred into the radio.*
6. *Turn the radio on. The display should read "KEY LOAD".*
7. *Press the EXE button on the Keyloader to transfer the key. The Keyloader will display "GOOD 1.x TRANSFER" where "x" is the selected cryptographic key number.*
8. *Disconnect the cable from the radio's UDC. A single beep will be heard from the radio's speaker if the power-up alert tone is enabled. The radio will change to the selected group or channel as indicated in the display.*

### *Key Zero*

*All cryptographic keys can be zeroed or "dumped" when the radio is on by simultaneously pressing the* STEP *and* 2nd *buttons for at least one second. When the key(s) have been zeroed, the radio will display* ***KEY ZERO*** *and it will emit a series of beeps. If the cryptographic key(s) are zeroed, one or more keys must be transferred into the radio from the Keyloader before private communications may continue.*

### *Displaying The Currently Used Cryptographic Key Number*

*To display the cryptographic key currently in use, press and release* [2nd] *and then press* [6 KEY] *One of the following messages will be displayed:*

- ***KEY x*** *- where "x" is the key number (1 - 6) currently in use.*
- ***NO KEY x*** *- where "x" is the key number (1 - 6) programmed for the selected group or channel. The selected group or channel has been programmed for private operation but the key has been zeroed or never transferred into the radio.*
- ***PVT DIS*** *- the selected group or channel is not programmed for private operation.*

### *Receiving An Encrypted Message*

*When receiving, the radio automatically switches between clear or private operation. If the transmission being received is an encrypted transmission, it will be decrypted, the* ***PVT*** *status flag will flash, the receiver will unsquelch, and the message will be heard in the speaker. For this to occur, the selected group or channel must be programmed for private operation and the correct cryptographic key must be loaded into the radio.*

### *Transmitting An Encrypted Message*

1. *Select the desired group, channel or Special Call.*

2. *Toggle operation to private transmit by pressing and releasing* [2nd] *and then pressing* ***PVT*** *(*[SPC]*). When private transmit mode is enabled, the* ***PVT*** *status flag in the display will turn on.*

   *If a group, channel or Special Call is not programmed for private mode operation,* ***PVT DIS*** *will momentarily show in the display if an attempt is made to enable private transmit mode. It is not possible to operate on this group/channel/Special Call in private mode.*

   *If the radio is programmed for forced private transmit operation,* ***FRCD PVT*** *will momentarily show in the display if an attempt is made to disable private trans-*

*mit mode. It is not possible to transmit on this group/channel in clear mode.*

**3.** *Continue with standard transmission procedures. In conventional mode, if a channel is programmed for private operation and private transmit mode has been disabled, the radio will sound an alert tone when the **PTT** key is pressed to warn of the clear (non-encrypted) transmit mode.*

***TRUNKED MODE OPERATION***

*Digital trunking provides fast communication access. In this mode the operator selects a communication system and group and the communication channel is allocated through digital signaling with the site. The following operation is applicable to clear, digital and private operation unless otherwise noted.*

***Receiving A Message***

**1.** *Slide the ON/OFF SWITCH on the battery pack to the ON position. The radio will initiate and complete the power-up self-test then the system's name and **NC** status flag will be displayed until a control channel is located. When the control channel is located, the **NC** status flag disappears and the group name is displayed.*

**2.** *Adjust the VOLUME CONTROL to an approximate mid-range position.*

**3.** *Select the desired system and group using the* STEP *key and CONTROL KNOB. See the **SYSTEM/GROUP/-CHANNEL SELECTION** operating procedures for details. The display indicates the selected group.*

**4.** *The radio is now ready to receive messages.*

**5.** *GROUP CALL - When a group call is received, the radio unsquelches on the assigned channel and the **BSY** status flag turns on. The group name or the originator's ID (depending on programming) is displayed. Adjust the volume as necessary.*

*INDIVIDUAL CALL - If an individual call (a call directed to only one radio) is received, the radio will unsquelch on the assigned channel and the **BSY** status flag will turn on. **INDV**, originators ID, or the caller's name (if programmed) is displayed and the **MSG** status flag flashes. Adjust the volume as necessary.*

*Responding to an individual call prior to the programmed call-back time-out will automatically direct the transmission to the originating unit on an individual basis.*

*The **MSG** status flag will remain flashing even after the individual call time-out period expires. Press the [SPC] key (SPecial Call) to call the originating unit back. The originator's ID or name will be displayed. Follow the procedures for sending a special call.*

*ENCRYPTED MESSAGE - If the transmission being received is an encrypted transmission and the selected group is programmed for private operation and the correct cryptographic key is loaded into the radio, then the receiver will unsquelch, the **PVT** status flag will flash and the private message will be heard in the speaker. The radio automatically switches between clear or private operation when it is receiving on a group or channel programmed for private operation.*

## *Sending A Message*

1. *Turn the radio on, set the receive audio level and select the desired system and group.*

2. *When private transmit mode is enabled, the **PVT** status flag in the display will turn on. Toggle transmit operation to private or clear, as desired, by pressing and releasing [2nd] and then pressing **PVT** (shifted [SPC]).*

3. *Observe the display for the absence of the **BSY** status flag to ensure no one is transmitting on the selected group.*

4. *Press and hold the PTT BUTTON. The radio will perform the necessary signaling required to obtain a communication channel.*

5. *When the channel has been acquired, the **TX** and **BSY** status flags are displayed and the channel access alert tone (one beep) is heard.*

6. *Hold the radio approximately three inches from your mouth and speak into the microphone in a normal voice.*

7. *Release the PTT BUTTON when the transmission is complete. If the transmission exceeds the programmed Carrier Control Timer limit, the radio will unkey and an alert tone will sound.*

8. *Listen for a reply.*

***NOTES***

*If a group is not programmed for private mode operation, **PVT DIS** will momentarily show in the display if an attempt is made to enable private transmit mode. It is not possible to operate on this group in private mode*

*If the radio is programmed for forced private operation, **FRCD PVT** will momentarily show in the display if an attempt is made to disable private transmit mode. It is not possible to transmit on this group in clear mode.*

*If a group/special call programmed for private operation has been selected, and there is no key in the radio for the selected group/special call, **NO KEY x** (where "x" is the key number) will appear in the display for approximately two seconds when private mode is enabled. Afterwards the display will return to the selected group/special call. If a private mode transmission is attempted, **NO KEY x** will appear in the display and the radio will emit a series of beeps without transmitting.*

## *Emergency Operation (Trunked Mode)*

### *Receiving An Emergency Call*

*If the radio receives an Emergency Channel Assignment in trunked mode, an alert tone sounds and the **EMG** status flag starts flashing. Follow standard emergency procedures.*

### *Sending An Emergency Call*

1. *To enable an emergency transmission, press and hold the EMERGENCY BUTTON (small red button near antenna) for the programmed time period. The radio transmits an emergency message until an Emergency Channel Assignment is received. Upon receipt, the **EMG** status flag turns on and the radio begins operation on the selected group or the home group, depending upon programming.*

2. *Press the PTT BUTTON and speak into the microphone in a normal voice.*

3. *Release the PTT BUTTON when the transmission is complete and listen for a reply.*

### *Clearing An Emergency*

*If programmed for supervisory capabilities, the M-PA can clear an emergency declared by it or another radio. To clear an emergency on the selected talk group, press [2nd], then [# CLR] then press the red EMERGENCY BUTTON near the antenna. The M-PA will then send a clear emergency message, lighting the **TX** flag. The **BSY** status flag will come on briefly after the **EMG** status flag goes out.*

## *Group ID Entry (System Model Only)*

*The group ID can be selected from the numeric keypad (System Model only). First enter the group ID that you want to select. Then press and release the [2nd] key and press the [2 ] key. The entered group ID takes the place of the first group position. It can be selected now at group position 1 like any other group.*

***Dynamic Regrouping***

*Dynamic Regrouping is a feature which allows the System Manager to dynamically program new groups into selected radios. Upon development of the regrouping plan, the site controller sends each radio the regroup plan number, knob setting(s), and activate/deactivate commands.*

*When the radio is regrouped, it will alert the user and the display will indicate* ***REGRP nn*** *(nn = 01 - 08 depending upon the CONTROL KNOB setting).*

*If the regroup plan has deselect capability active on the selected system, press the MONITOR BUTTON to toggle between the group and regroup modes.*

*Private mode Dynamic Regrouping operates as follows:*

- *When the radio is regrouped, all regroups will initially operate in clear mode.*
- *When regrouped, the operator may toggle between private and clear mode by pressing* 2nd *and* ***PVT****. There is no forced private regroup mode.*
- *Regroup operation always uses the selected system's cryptographic key .*
- *If the radio is programmed for deselect capability, pressing the MONITOR BUTTON will return operation to the programmed groups in the radio, and to private or clear mode as the radio is programmed. Pressing the MONITOR BUTTON a second time will return operation to the regroup mode and private or clear mode as the radio was previously operating.*

***Wide Area System Scanning***

*M-PA radios may be programmed for wide area system scan operation for multi-site applications. Upon the loss of the currently selected system's control channel, radios may be programmed to automatically scan the control channels of up to six other systems. If a new control channel is found, the radio will switch to the new system and sound an alert tone. Group selection may change upon switching to the new system.*

*The radio may also be programmed for priority wide area system scan. A priority system may be assigned to each system programmed into the radio. Radios programmed in this manner will scan the priority trunked system's control channel once every one, two, three or four minutes (programmable). This priority scan timer is reset each time the PTT BUTTON is pressed.*

***Scanning Trunked Groups***

*Groups which have been previously added to the scan list on a per system basis may be scanned (for radios which have this feature). Each system's scan list is retained in memory when the radio is turned off or when the battery pack is removed.*

*The radio will not scan when the emergency mode is enabled (**EMG** status flag is on).*

*The following procedures outline scan operations for trunked groups. See the conventional mode operating procedures for specific procedures on conventional channel scanning.*

***Adding Groups To And Deleting Groups From The Scan List***

1. *Scan must be off to add groups to and delete groups from the scan list. The **SCN** status flag will be on if scan is on. If necessary, toggle scan operation off by pressing SCAN.*

2. *Select the desired group to be added to or deleted from the scan list. The **S** status flag will be on if the group is presently on the scan list.*

3. *Toggle the **S** status flag on or off, as desired, by pressing 2nd and then **A/D** (shifted SCAN). When the **S** status flag is on, the group is on the scan list. When the **S** status flag is off, the group has been deleted from the list and will not be scanned.*

***Using Scan***

1. *Toggle scan operation on by pressing SCAN. The **SCN** status flag will turn on*

*when the radio is scanning (for radios which have this feature).*

**2.** *When a group on the scan list receives a channel assignment, the radio unsquelches on the assigned channel and the group name is displayed.*

*The radio will continue scanning if a new group is selected when scan is on.*

*Pressing the PTT BUTTON when scan is on will cause the radio to transmit on the selected group.*

*A "nuisance" group can be deleted from the scan list by pressing* 2nd ***A/D*** *while the radio is receiving the "nuisance" call. The group will be deleted from the scan list. Add the group back to the scan list by turning the radio off and back on or by turning scan off, selecting the group, and pressing* 2nd ***A/D****.*

**3.** *Toggle scan operation off by pressing* SCAN*. The radio will resume operation on the selected group.*

***Special Calls***

*Special calls include individual and telephone interconnect calls. Up to 99 different special calls can be programmed into the radio and selected for transmission.*

***Receiving An Individual Call***

*When an individual call (a call directed to only one radio) is received, the radio will unsquelch on the assigned channel and the* ***BSY*** *status flag will turn on.* ****INDV****, *originators ID, or the caller's name (if programmed) is displayed and the* ***MSG*** *status flag flashes. Adjust the volume as necessary.*

*Responding to an individual call prior to the programmed call-back time-out will automatically direct the transmission to the originating unit. Follow the instructions for sending a special call.*

*If the call is not answered, the "****MSG****" status flag will remain flashing even after the individual call time-out period expires. Press* SPC *(SPecial Call) to call the originating unit back. The originator's ID or name will be displayed.*

### *Sending A Special Call*

*Use the following procedure to send one of the special calls programmed into the radio or to respond to the last received individual or group caller.*

1. *Select a special call by following step a (Scan and System Models) or b (System Model only):*

   a. *Press* SPC. *The radio enters special call mode as indicated by the* ***SPC*** *status flag. The last selected special call will be displayed. Scroll through the special call table by pressing* STEP *or* 2nd-STEP *until the desired special call name appears in the display.*

   b. *Using the numeric keypad, enter the special call's table location number and then press* SPC. *The radio enters special call mode.*

2. *Press and hold the PTT BUTTON. The radio performs the necessary signaling required to obtain a communications channel. When the signaling is complete the* ***TX*** *status flag turns on and the channel access tone sounds. Speak into the microphone in a normal voice. If the call was programmed for private mode, it will be transmitted in private mode (****PVT*** *status flag on).*

3. *Release the PTT BUTTON when the transmission is complete. Listen for a reply and repeat step 2 as necessary.*

4. *When the call is completed, the radio remains in the special call menu for a programmed amount of time. To return to group selection, press and release* SPC *or the MONITOR BUTTON. The radio will switch to the previously selected group.*

### *Manual Individual Call From Keypad (Sysem Model Only)*

1. *Using the numeric keypad, enter the radio's individual identification number or recall a previously stored number. The*

*number is displayed in the LCD. If currently in private mode, the call will be sent in private mode.*

**2.** *Press and hold the PTT BUTTON. The radio performs the necessary signaling required to obtain a communication channel. When the channel is obtained, the **TX** status flag will turn on and the channel access tone sounds.*

**3.** *Hold the PTT BUTTON depressed and speak into the microphone in a normal voice.*

**4.** *Release the PTT BUTTON when the transmission is completed and listen for a reply. Repeat transmissions as necessary.*

**5.** *When the call is completed, the display will continue to show the radio's ID until the special call time-out expires. To return to group selection, press and release* [SPC] *or the MONITOR BUTTON. The radio will return to the previously selected group.*

***Telephone Interconnect Calls***

*Telephone calls programmed into the radio can be placed using the special call feature as follows:*

**1.** *Press* [SPC]*. The radio enters special call mode as indicated by the* [SPC] *status flag. The last selected special call is displayed.*

**2.** *Scroll through the special call table by pressing* [STEP] *or* [2nd]-[STEP] *until the desired special call name appears in the display.*

**3.** *Press and release the PTT BUTTON. The radio will perform the necessary signaling required to obtain a communication channel. When the channel is obtained, the **TX** and **BSY** status flags will turn on and the DTMF tones will be heard in the speaker. The radio enters receive mode.*

**4.** *When the called party answers, press the PTT BUTTON and speak into the*

*microphone. Unlike a regular telephone, you may not talk and listen at the same time. The call is sent in clear or private mode, depending upon programming.*

**5.** *When the call is completed, press the* SPC *or MONITOR BUTTON to hang-up. The radio will return to the group display.*

***Manually Dialed Telephone Interconnect Calls (System Model Only)***

**1.** *Using the numeric keypad, enter the telephone number. Up to a maximum of 18 digits can be entered, with the last eight (8) being displayed. Alternately, recall a previously stored number using the recall feature. If currently in private mode, the call will be sent in private mode.*

**2.** *Enter an asterisk (*) from the keypad. This indicates to the radio that the call will be an interconnect type.*

**3.** *Press and release the PTT BUTTON to initiate the call. The radio will perform the necessary signaling required to obtain a communication channel. When the channel is obtained, the **TX** and **BSY** status flags will turn on and the DTMF tones will be heard in the speaker. The radio enters receive mode.*

*If interconnect signaling is not successful, the radio will return to the idle mode with the telephone number displayed until the time-out expires or another group or system is selected.*

**4.** *When the called party answers, press the PTT BUTTON and speak into the microphone, Unlike a regular telephone, you may not talk and listen at the same time.*

**5.** *When the call is completed, press the* SPC *or MONITOR BUTTON to hang-up. The radio will return to the group display.*

## *CONVENTIONAL MODE OPERATION*

*The procedures that follow describe conventional mode operation. Follow these procedures if operating in a conventional system. Each conventional channel many have one or more features programmed when the channel is selected. The following operation is applicable to clear, digital and private operation unless otherwise noted. Conventional mode operation should only be used for talkaround or testing purposes only.*

### *Receiving A Message*

1. *Slide the ON/OFF SWITCH on the battery pack to the on position. The radio will initiate and complete the power-up self-test and beep if the power-up alert tone is programmed on.*

2. *Using the CONTROL KNOB and* STEP *key, select a conventional test channel. See the* ***SYSTEM/GROUP/CHANNEL SELECTION*** *operating procedures for details. The display will indicate the selected channel's name.*

3. *Press the MONITOR BUTTON to disable squelch and adjust the VOLUME CONTROL for the approximate desired speaker audio level.*

### *Sending A Message*

1. *Turn the radio on, set the receive audio level and select the desired channel.*

2. *Ensure no one is transmitting on the selected channel by pressing the MONITOR BUTTON to disable squelch or observing the display for the absence of the* ***BSY*** *status flag. If the Channel Busy Lockout feature is programmed for the selected channel, the radio will not transmit when the channel is busy.*

3. *Press and hold the PTT BUTTON. If the selected channel is programmed for operation and clear mode has been selected, an alert tone (low-pitched beep) will be heard in the speaker when the PTT BUTTON is pressed as a warning that the radio is not in private mode. The* ***TX*** *status flag is displayed.*

4. *Hold the radio approximately three inches from your mouth and speak into the microphone in a normal voice.*

5. *Release the PTT BUTTON when the transmission is complete. If the transmission exceeds the programmed Carrier Control Timer limit, the radio will unkey and an alert tone will sound.*

6. *Listen for a reply.*

***NOTES***

*If a channel is not programmed for private mode operation, **PVT DIS** will momentarily show in the display if an attempt is made to enable private transmit mode. It is not possible to operate on this channel in private mode.*

*If the radio is programmed for forced private operation, **FRCD PVT** will momentarily show in the display if an attempt is made to disable private transmit mode. It is not possible to transmit on this channel in clear mode.*

*If a channel programmed for private operation is selected and there is no key in the radio for the selected channel **NO KEY x** (where "x" is the key number) in the display for approximately two seconds when private mode is enabled. If a private mode transmission is attempted, **NO KEY x** will appear in the display and the radio will emit a series of beeps without transmitting.*

*If a channel programmed for Aegis digital operation is selected, all transmissions will be digital transmissions and the radio will receive clear and digital signals.*

### *OPERATING TIPS*

*Antenna location and condition is important when operating a portable radio. Operating the radio in low areas of terrain, under power lines or bridges, inside of a vehicle or in a metal or steel framed building can severely reduce the range of the unit. Mountains and buildings can also reduce the range of the unit.*

*In areas where transmission or reception is poor, some improvement may be obtained by insuring that the antenna is vertical. Moving a few yards in another direction or moving to a higher elevation may also improve communication. Vehicular operation can be aided with the use of an externally mounted antenna.*

*Battery condition is another important factor in the trouble free operation of a portable radio. Always properly charge the batteries.*

### *OPERATING RULES AND REGULATIONS*

*Two-way FM radio systems must be operated in accordance with the rules and regulations of the country. As an operator of two-way radio equipment, you must be thoroughly familiar with the rules that apply to your particular type of radio operation. Following these rules will help eliminate confusion, assure the most efficient use of the existing radio channels, and result in a smoothly functioning radio network.*

*When using your two-way radio, remember these rules:*

1. *It is a violation to interrupt any distress or emergency message. As your radio operates in much the same way as a telephone "party line", always listen to make sure that the channel is clear and/or observe the display for the absence of the **BSY** status flag before transmitting. Emergency calls have priority over all other messages. If someone is sending an emergency message - such as reporting a fire or asking for help in an accident - KEEP OFF THE AIR!*

2. *The use of profane or obscene language is prohibited.*

3. *Do not send false call letters, or false distress or emergency messages.*

4. *Keep conversations brief and confine them to business. To save time, use coded messages whenever possible.*

5. *Send only those messages that are essential for the operation of your business.*

6. *Do not repeat or otherwise make known anything you overhear on your radio. Conversations between others sharing your channel must be regarded as confidential.*

7. *Identify yourself at certain specific times by means of your call letters. Refer to the rules that apply to your particular type of operation for the proper procedure.*

8. *No changes or adjustments shall be made to the equipment except by an authorized or certified electronic technician.*

## BATTERY PACKS

### INSTALLING THE BATTERY PACK

1. *Ensure the ON/OFF SWITCH on battery pack is in the off position.*

2. *Hold the radio and battery pack with the back of them facing you.*

3. *Align the battery pack and radio slide grooves. See Figure 4.*

4. *Slide the battery pack fully into the radio until the battery release latch clicks into place.*

### REMOVING THE BATTERY PACK

1. *Ensure the ON/OFF SWITCH on the battery pack is in the off position.*

2. *Press down on the battery release latch and slide the battery pack out in the direction of the release latch. See Figure 5.*


*Figure 4 - Installing the Battery Pack*

*Figure 5 - Removing the Battery Pack*

***CHARGING THE BATTERY PACKS***

*After receiving a new rechargeable battery pack from the factory, it should be fully charged before placing it into service. This also applies to rechargeable batteries that have been stored for long periods. When the battery pack requires charging the radio will signal the operator with an alert tone and the **BAT** status flag will turn on.*

*Chargers are available with nominal charge times of 1 hour (rapid) and 14 hours (standard). Combinations include single (1) and multi (5) position, standard and rapid charge units. In addition, the vehicular chargers/repeaters simultaneously charge the battery packs while the radio is operating. For specific instructions refer to the applicable charger Operating Manual.*

*The rechargeable batteries used with the radio can develop a reduced capacity condition sometimes called the "Memory Effect". This condition can occur when a battery is continuously charged for long periods or when a regularly performed duty cycle allows the battery to expend only a limited portion of its capacity. The battery pack may show a severe decrease in its ability to deliver full capacity for an extended period. Any rechargeable battery pack showing signs of reduced capacity should be returned to a qualified service center for inspection.*

### *RECHARGEABLE BATTERY PACK DISPOSAL*

Ni-Cd

*The product you have purchased contains a rechargeable battery. The battery is recyclable. At the end of its useful life under various state and local laws it may be illegal to dispose of this battery into the municipal waste stream. Check with your local solid waste officials for details concerning recycling options or proper disposal in your area. Call Toll Free 1-800-822-9362 for information and/or procedures for returning rechargeable batteries in your state.*

### *SWIVEL MOUNT REMOVAL AND REPLACEMENT*

*To remove the swivel mount, slide a flat blade screwdriver underneath the spring retainer and twist. While twisting, slide the swivel mount out from under the holder.*

*To replace the swivel mount, place the end of the swivel in the grooves in the radio and slide the mount up until it snaps in place.*

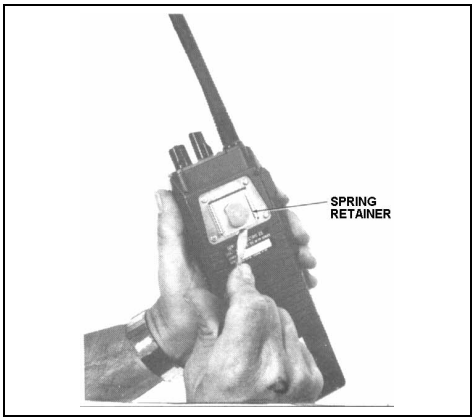


*Figure 6 - Swivel Mount Removal and Replacement*

## *GLOSSARY*

*clear mode -* *communicating in an analog format which is non-digitized and non-encrypted.*

*control channel -* *a radio channel in a trunked system that is used to digitally communicate with the radios operating on the system when they are not engaged in active voice communications.*

*conventional channel -* *a radio channel (transmit/receive) that is allocated for conventional (non-trunked) use and may be manually selected by the operator.*

*conventional mode -* *communicating on radio channels allocated for conventional use.*

*cryptographic key -* *the number or code used by the encryption and decryption circuitry to encode and decode a signal.*

*CCT -* *Carrier Controlled Timer - a programmable timer that will disable a transmission if the timer length is exceeded.*

*decryption -* *the process of decoding or descrambling a signal according to a predetermined algorithm.*

*digital mode -* *communicating using digitized voice signals.*

*encryption -* *the process of encoding or scrambling a signal according to a predetermined algorithm.*

*private mode -* *communicating in an encrypted format (scrambled).*

*queuing -* *the process that occurs when all channels in a trunked system are busy and calls must be addressed on a priority basis.*

*site controller -* *the computer controlled radio equipment at the repeater site that controls a trunking system.*

*System Manager -* *a computer that performs the data basing and system monitoring for the site controller.*

*trunked group -* *a radio communications path shared by two or more users*

*trunked radio system -* *a radio system in which a limited number of radio channels is dynamically allocated to groups of people for communication purposes.*

*trunked system -* *a set of one or more trunked groups.*

*VGE -* *an Ericsson proprietary encryption/decryption algorithm used to scramble or descramble a signal.*

*working channel -* *a radio channel (transmit/receive) that is automatically assigned by the site controller for voice or data communications.*

*RADIO TYPE* _____

*FREQUENCY BAND* _____

*OPERATOR'S NAME* _____

*EMERGENCY GROUP* _____

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**C=Clear, D=Digital, P=Private*

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**C=Clear, D=Digital, P=Private*

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**C=Clear, D=Digital, P=Private*

## *WARRANTY*

A. *Ericsson In. (hereinafter "Seller") warrants to the original purchaser for use (hereinafter "Buyer") that Equipment manufactured by Seller shall be free from defects in material, workmanship and title, and shall conform to its published specifications. With respect to any Equipment not manufactured by Seller (except for integral parts of Seller's Equipment to which the warranties set forth above shall apply). Seller gives no warranty, and only the warranty, if any, given by the manufacturer shall apply. Batteries are excluded from this warranty but are warranted under a separate Nickel-Cadmium Battery Warranty.*

B. *Seller's obligations set forth in Paragraph C below shall apply only to failures to meet the above warranties (except as to title) occurring within the following periods of time from date of sale to the Buyer and are conditioned on Buyer's giving written notice to Seller within thirty (30) days of such occurrence:*

1. *for fuses, incandescent lamps, vacuum tubes and non-rechargeable batteries, operable on arrival only.*
2. *for parts and accessories (except as noted in B.1) sold by Seller's Service Parts Operation, ninety (90) days.*
3. *for all other Equipment of Seller's manufacture, one (1) year.*

C. *If any Equipment fails to meet the foregoing warranties, Seller shall correct the failure at its option (i) by repairing any defective or damaged part or parts thereof, or (ii) by making available at Seller's factory any necessary repaired or replacement parts. Any repaired or replacement part furnished hereunder shall be warranted for the remainder of the warranty period of the Equipment in which it is installed. Where such failure cannot be corrected by Seller's reasonable efforts, the parties will negotiate an equitable adjustment in price. Labor to perform warranty service will be provided at no change only for the Equipment covered under Paragraph B.3, and only during the first three (3) months following the date of sale to the Buyer. Thereafter, labor will be charged at prevailing rates. To be eligible for no-charge labor, service must be performed by an Authorized Service Center or other Servicer approved for these purposes either at its place of business during normal business hours, for mobile or personal equipment, or at the Buyer's location, for fixed location equipment. Service on fixed location equipment more than thirty (30) miles from the Service Center or other approved Servicer's place of business will include a charge for transportation. Equipment located off-shore is not eligible for no-charge labor.*

D. *Seller's obligations under Paragraph C shall not apply to any Equipment, or part thereof, which (i) has been modified or otherwise altered other than pursuant to Seller's written instructions or written approval or, (ii) is normally consumed in operation or, (iii) has a normal life inherently shorter than the warranty periods specified in Paragraph B, or (iv) is not properly stored, installed, used, maintained or repaired, or, (v) has been subjected to any other kind of misuse or detrimental exposure, or has been involved in an accident.*

E. *The preceding paragraphs set forth the exclusive remedies for claims (except as to title) based upon defects in or nonconformity of the Equipment, whether the claim is in contract, warranty, tort (including negligence), strict liability or otherwise, and however instituted. Upon the expiration of the warranty period, all such liability shall terminate. The foregoing warranties are exclusive and in lieu of all other warranties, whether oral, written, expressed, implied or statutory. NO IMPLIED OR STATUTORY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE SHALL APPLY. IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, SPECIAL, INDIRECT OR EXEMPLARY DAMAGES.*

*This warranty applies only within the United States.*

*1-800-528-7711 (Outside USA, 804-528-7711)*

*ECX-362S*

## *NICKEL-CADMIUM BATTERY WARRANTY*

*A.* *Ericsson Inc. (hereinafter "Seller") warrants to the original purchaser for use (hereinafter "Buyer") that nickel-cadmium batteries supplied by Seller shall be free from defects in material and workmanship, and shall conform to its published specifications for a period of twelve (12) months from the date of purchase.*

*B.* *For purposes of this warranty, batteries shall be deemed defective if (1) the battery capacity is less than 80% of rated capacity, or (2) the battery develops leakage.*

*C.* *If any battery fails to meet the foregoing warranty, Seller shall correct the failure by issuing a replacement battery upon receipt of the defective battery at an Authorized Service Center (ASC). To obtain in the name and address of a ASC, ask your salesperson, consult the Yellow Pages, or call the number printed at the bottom of this page.*

*D.* *Replacement batteries shall be warranted only for the remaining unexpired warranty period of the original battery. This warranty becomes void if:*

*(1) The battery has been subjected to any kind of misuse, detrimental exposure, or has been involved in an accident.*

*(2) The battery is used in equipment or service other than the radio equipment for which it is specified.*

*E.* *The preceding paragraphs set forth the exclusive remedies for claims (except as to title) based upon defects in or non-conformity of any battery, whether the claim is in contract, warranty, tort (including negligence), strict liability or otherwise, and however instituted. Upon the expiration of the warranty period, all such liability shall terminate. The foregoing warranties are exclusive and in lieu of all other warranties, whether oral, written, expressed, implied or statutory. NO IMPLIED OR STATUTORY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE SHALL APPLY. IN NO EVENT SHALL THE COMPANY BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, SPECIAL, INDIRECT OR EXEMPLARY DAMAGES.*

*This warranty applies only within the United States.*
*1-800-528-7711 (Outside USA, 804-528-7711).*

*ECX-841C*

## *EMERGENCY NUMBERS*

*Police*

*State Police*

*Fire*

*Poison Control*

*Ambulance*

*Life Saving and Rescue Squad*

***Ericsson Inc.***
*Private Radio Systems*
*Mountain View Road*
*Lynchburg,Virginia 24502*
*1-800-528-7711 (Outside USA, 804-528-7711)*

*Printed in U.S.A.*