Operator's Manual

AEGIS™ *EDACS*® *M-PA*™
SYSTEM MODEL
PORTABLE RADIO

ERICSSON

Table of Contents

INTRODUCTION 5
CONTROLS 5
INDICATORS 10
OPERATION 13
POWER-UP 13
SYSTEM/GROUP/CHANNEL SELECTION 14
VOICE MODES 15
Clear Modes 15

Table of Contents (Cont.)

Aegis Digital Mode 16
Aegis Private And Voice Guard Private Modes 16
TRUNKED MODE OPERATION . . . 20
Receiving A Message 20
Sending A Message 21
Emergency Operation (Trunked Mode) 23
Dynamic Regrouping 23
Wide Area System Scanning . . 24
Scanning Trunked Groups 24
Special Calls 26
Manually Dialed Telephone Interconnect Calls 29
STATUS MESSAGE OPERATION . . 30
CONVENTIONAL MODE OPERATION 30
Receiving A Message 30
Sending A Message 31
Emergency Operation (Conventional Mode) 33
Scanning Conventional Channels 33

Table of Contents (Cont.)

OPERATING TIPS 34
OPERATING RULES AND REGULATIONS 35
BATTERY PACKS 36
INSTALLING THE BATTERY PACK . 36
REMOVING THE BATTERY PACK . . 36
CHARGING THE BATTERY PACK . S38
RECHARGEABLE BATTERY PACK DISPOSAL 38
SWIVEL MOUNT REMOVAL AND REPLACEMENT 38
GLOSSARY 39
WARRANTY 44
NICKEL-CADMIUM BATTERY WARRANTY 45

PRODUCT SPECIFICATION FOR CE MARKED EQUIPMENT

The M-PA Portable conforms to the following Product Specifications.

EUROPEAN STANDARDS:

Safety:	*Not applicable*
EMC:	*prETS 300 279 (August 1995)*
TTD:	*Not applicable*

SUPPLEMENTARY INFORMATION

At this time, the M-PA portable radio may not be operated while in a vehicular charger in the European Community since it has not been evaluated for operation in this mode.

The M-PA portable radio may be used in both trunked and conventional applications.

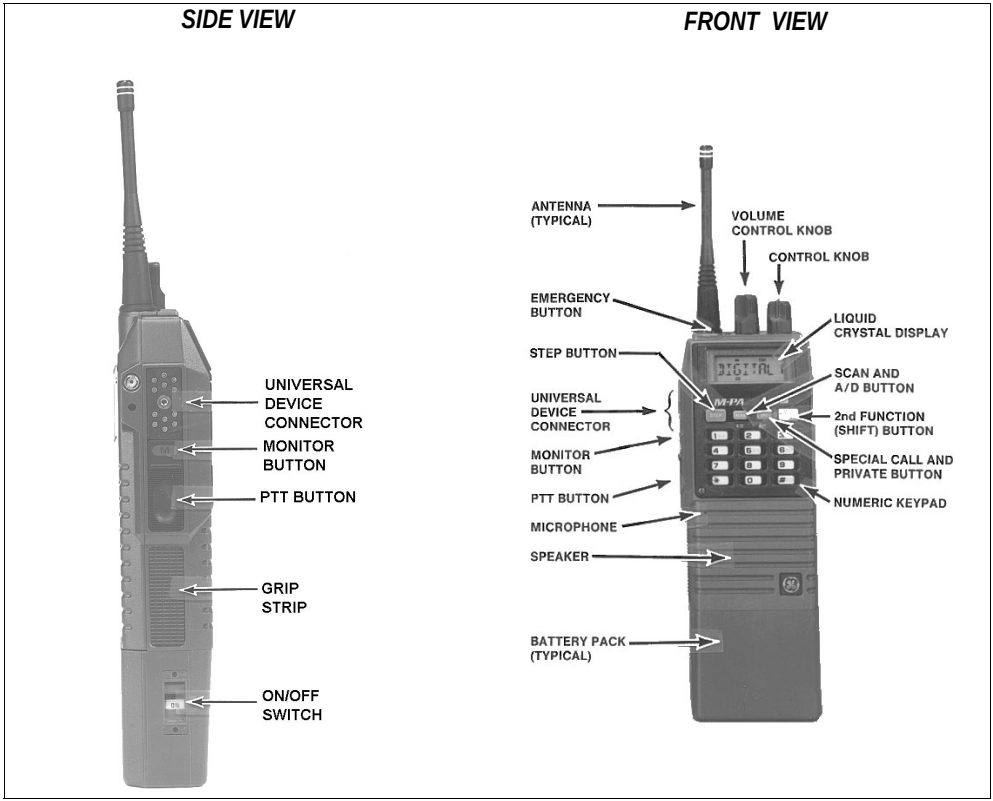

Figure 1 - Aegis EDACS M-PA System Model Radio

INTRODUCTION

The Aegis™ EDACS M-PA™ System model portable radio is a high-performance two-way radio that provides clear voice, Aegis digital, and Aegis private communications. The radio is also compatible with Voice Guard® communication systems. Personality programming allows maximum integration flexibility into EDACS and conventional radio systems.

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

Operating controls on the radio include a rotatable system/group/channel control knob, rotatable volume control, 16-button keypad, 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 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. If programmed for the selected channel, it will also toggle Channel Guard (CG) and/or Type 99 (T99) signaling on and off.

Momentarily pressing the MONITOR BUTTON will unsquelch the receiver. If programmed, pressing and holding the button for at least one (1) second will toggle CG and/or T99 signaling on or off. After a T99 call has been received, pressing the MONITOR BUTTON will reset the radio for the next call. Note: Selecting another channel will turn CG and T99 signaling back on if programmed for the channel.

EMERGENCY BUTTON

When operating in trunked mode, pressing and holding the red EMERGENCY BUTTON on top of the radio for approximately one (1) second 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.

In conventional mode, initiating an emergency call by pressing the EMERGENCY BUTTON will cause the radio to transmit GE-STAR signaling on the programmed emergency channel. If no emergency channel is programmed, GE-STAR will be transmitted on the selected channel.

STEP BUTTON

The STEP button 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 BUTTON

Pressing the SCAN button on the keypad will toggle scan operation on and off. When the radio is scanning, the "SCN" status flag in the display will show and all groups/channels on the scan list in the current system will be scanned.

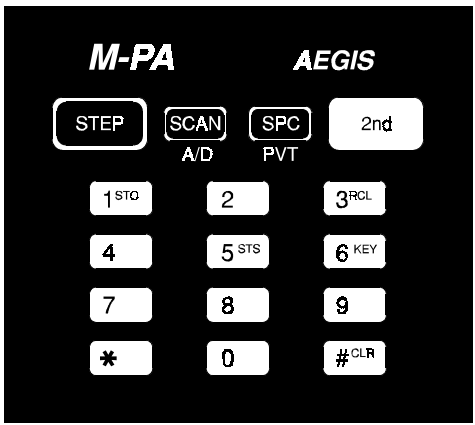

Figure 2 - Keypad

SPECIAL CALL BUTTON

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 and the last received group call on the selected group are also selectable using this method. See ***Special Calls*** *for details.*

2nd FUNCTION BUTTON

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

ADD/DELETE BUTTON (Shifted SCAN Button)

When in trunked mode, pressing and releasing 2nd and then pressing A/D (shifted SCAN button) 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.

In conventional mode, pressing and releasing 2nd and then pressing A/D will scroll the selected channel's scan priority between non-priority scan ("S" status flag), priority-two scan ("2" status flag), priority-one scan ("1" status flag) and no scan (no status flags).

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

PRIVATE BUTTON (Shifted SPC Button)

Private transmit mode is enabled or disabled by pressing and releasing 2nd and then pressing PVT (shifted SPC button). 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 BUTTON (Shifted Digit 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 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 STO. "STORED" will be displayed for two seconds.

RECALL BUTTON (Shifted Digit 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 RCL and the number will be displayed.*

CLEAR BUTTON (Shifted # Button)

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 BUTTON (Shifted Digit 6)

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

STATUS BUTTON

The STS button will be used for future status operations.

KEYPAD LOCK FEATURE

To prevent accidental activation of the buttons on the keypad, simultaneously press SCAN and SPC to lock the keypad; "LOCKED" will be displayed momentarily. To unlock the keypad, press SCAN and SPC 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 a short period anytime an active 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:

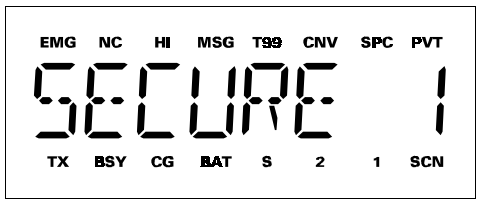

Figure 3 - Liquid Crystal Display

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).*

T99 *Type 99 tone decode - On indicates Type 99 tone decoding is enabled on the selected conventional channel. Flashing indicates a T99 selective call has been received and the radio must be reset to receive another T99 call.*

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.*

CG *Channel Guard - On indicates Channel Guard encode/decode is enabled on the selected conventional channel.*

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.*

1 *priority 1 - On indicates the selected conventional channel is designated as the priority-one scan channel.*

2 *priority 2 - On indicates the selected conventional channel is designated as the priority-two scan channel.*

SCN *SCaN mode - On indicates the radio is scanning.*

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.

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 button; 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 button.*

STEP Button 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).

Systems may also be selected by entering the system number from the numeric keypad and then pressing STEP. If a number out of the programmed range is entered, "RANGE" will be displayed.

Group/Channel Selection

After the desired system is selected with the STEP button, 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 Button 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).

Groups or channels may also be selected by entering the group/channel number from the numeric keypad and then pressing STEP. If a number out of the programmed range is entered, "RANGE" will be displayed.

VOICE MODES

Each system (trunked or conventional) in the radio is programmed for either Aegis or Voice Guard communications. Aegis programmed systems have three (3) different voice modes: clear, digital and private. Voice Guard systems have two (2) voice modes: clear and private. The voice modes are programmed on a per-group basis within each trunked system and on a per-channel basis within each conventional system. A radio must be equipped with the encrypt/decrypt option before it will operate in Aegis private or Voice Guard modes.

Clear Modes

Aegis clear and Voice Guard clear modes are identical voice modes in which 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.

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 **

TRANSMIT/RECEIVE MODE COMPATIBILITY FOR VOICE GUARD OPERATION

GROUP/CHANNEL PROGRAMMING (TRANSMIT)	*RECEIVE CAPABILITY*	
	CLEAR	*PRIVATE*
CLEAR	*Yes*	*No*
PRIVATE	*Yes*	*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 And Voice Guard Private Modes (Optional)

The Aegis private and Voice Guard private modes allow the radio to transmit and receive encrypted messages. To operate in these voice modes, the radio must be equipped with the optional encrypt/decrypt feature and the transmitting and receiving units must have identical cryptographic keys.

Aegis transmissions cannot be received by a radio set to receive a Voice Guard transmission. Accordingly, a Voice Guard transmission cannot be received by a radio set to receive an Aegis transmission.

Cryptographic keys are transferred into the radio using a cryptographic Keyloader. Up to seven (7) different cryptographic keys, numbered 1 - 7, can be transferred from a Keyloader and stored in the radio. An individual key is automatically selected on a per-group/channel basis according to the radio's programming. Groups and channels within Aegis systems can be programmed for keys 1 - 6. Groups and channels within Voice Guard systems can be programmed for keys 1 - 7.

DES radios require a DES Keyloader (option V4025). Operating details on the DES Keyloader are contained in LBI-31541. VGE radios require a VGE Keyloader (option V4028). 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 buttons (shifted SPC). Radios programmed for forced private operation do not allow a change of the transmit mode; the PVT button does not function.

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.

In addition, removing the battery pack for several minutes (typically three) or disassembling the front half of the radio from the rear half will also zero all keys. The radio does not have to be turned on to zero the key(s) using either of these procedures (DES versions only).

Displaying The Currently Used Cryptographic Key Number

To display the cryptographic key currently in use, press and release 2nd and then press KEY (shifted 6). One of the following messages will be displayed:

- *"KEY x" - where "x" is the key number (1 - 7) currently in use.*
- *"NO KEY x" - where "x" is the key number (1 - 7) 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. This message will periodically show in the display under this condition.*
- *"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 or channel.*

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

If a group or 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 group/channel 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 transmit 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 BUTTON 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 button 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 button (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 button).*

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 programmed for private operation has been selected and there is no key in the radio for the selected group, "NO KEY x" (where "x" is the key number) will periodically flash in the display. If a transmission is attempted, "NO KEY x" will show in the display and the radio will emit a series of beeps and will not transmit.

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 approximately one second. 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.

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-PVT. There is no forced private regroup mode.*
- *Regroup operation always uses cryptographic key 1.*
- *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. 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 button). 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.*

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 or b:*

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. Table location number 1 is the last received individual caller's ID number. Table location number 2 is the last received group caller's ID number on the selected group. Table locations 3 and higher allow access to the programmed special calls in the radio.*

If no individual calls or group calls have been received since the radio was turned on, these first two (2) locations will display "ID" and "GR" respectively (no number will follow).

If a table location number larger than the special call table is entered, "RANGE" will be displayed when the SPC button is pressed and the radio will then return to the group display.

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

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 communi-*

cation 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 BUTTONS to hang-up. The radio will return to the group display.*

Manually Dialed Telephone Interconnect Calls

1. *Using the numeric keypad, enter the telephone number. Up to a maximum of 31 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.*

STATUS MESSAGE OPERATION

When programmed for a "status" keypad instead of a "numeric" keypad, the M-PA can send data MESSAGEs or change the "polled" operator STATUS with a single keystroke. To change the polled STATUS simply press the digit corresponding to the desired STATUS. The name programmed into the personality for that particular STATUS will be transmitted. This new STATUS will be re-transmitted every time the M-PA is polled. To send a MESSAGE, press the "" key followed by the digit corresponding to the desired MESSAGE. The name programmed into the personality for that particular MESSAGE will appear on the display for approximately 3 seconds after which the MESSAGE will be transmitted. This STATUS and MESSAGE information can be logged using an RSM (Remote Status Monitor) terminal.*

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, such as Channel Guard, programmed when the channel is selected. 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 and beep if the power-up alert tone is programmed on.*

2. *Using the CONTROL KNOB and STEP button, select a conventional 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 CON-*

TROL for the approximate desired speaker audio level.

> ***NOTE***
>
> *Pressing the MONITOR BUTTON may affect Channel Guard and/or Type 99 tone signalling if programmed for the selected channel.*

4. *When a message is received (and the correct Channel Guard or Type 99 signal is decoded, if programmed and enabled), the receiver will unsquelch and the message will be heard in the speaker.*

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

5. *Adjust the volume as necessary.*

Sending A Message

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

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

3. *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.*

4. *Press and hold the PTT BUTTON. If the selected channel is programmed for Voice Guard 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" and "BSY" status flags are displayed.*

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

6. *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.*

7. *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) will periodically flash in the display. If a transmission is attempted, "NO KEY x" will show in the display and the radio will emit a series of beeps and will not transmit.

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.

Emergency Operation (Conventional Mode)

To enable an emergency transmission, press the EMERGENCY BUTTON for approximately one (1) second. If an emergency channel is programmed, the radio will switch to the emergency channel, turn on the "EMG" status flag and transmit GE-STAR emergency signaling. If no emergency channel is programmed, the radio will transmit GE-STAR emergency signaling on the selected channel.

Scanning Conventional Channels

In conventional mode, the M-PA may be programmed for non-priority scan, dual-priority scan, or scan operation may be disabled. Scan programming options include a front keypad entered scan list or a fixed scan list. Priority scan programming options include a fixed priority-one channel or the selected channel as the priority-one channel.

Scan rate will vary depending upon the number of channels on the scan list and whether or not the radio is programmed to scan for Channel Guard. Fewer channels will result in a faster scan rate. All scan functions are retained in memory when the battery pack is removed.

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

Adding Channels To And Deleting Channels From The Scan List

1. *Scan must be off to add channels to or delete channels from the scan list. If the "SCN" status flag is on, press SCAN to turn scan off.*

2. *Select the desired channel using the CONTROL KNOB and/or STEP button. If the selected channel is currently on the list, the "S" status flag will be on.*

3. *Press the 2nd then A/D repetitively (or hold the A/D key down after pressing 2nd) until the desired priority indicator appears: "S" for non-priority, "2" for priority-two, "1" for a priority-one, or no indicator to remove the channel from the scan list. If a new priority channel is selected the previous corresponding pri-*

ority channel will become a non-priority scan channel. One of the following messages may be momentarily displayed:

- *"SCAN DIS" – The radio is not programmed to scan.*
- *"FIXED P1" – A priority-one channel has been programmed into the radio. A new priority-one channel cannot be selected.*
- *"FIXD LST" – A fixed scan list is programmed into the radio. It is not possible to change the list without reprogramming the radio.*

4. *To add or delete additional channels, repeat steps 2 and 3.*

Using Scan

Toggle scan on or off by pressing SCAN. The "SCN" status flag turns on when the radio is scanning.

If programmed for dual-priority scan operation, the priority-one, priority-two and the remaining channels will be scanned. Once a carrier is detected and if programmed, the correct Channel Guard is decoded, the display will indicate the channel. Scanning of the priority-one and priority-two channels will continue. Should a priority-one or two channel carrier, regardless of Channel Guard, be detected while a non-priority channel is being received, the display name is updated, the applicable status indicator, "1" or "2" lights, and the channel is switched to the priority channel. Scanning of the priority-one channel will continue if a message is being received on the priority-two channel.

If programmed for non-priority scan operation, once a carrier is detected, and if programmed, the correct Channel Guard is decoded, the display will indicate the detected channel. Scanning will stop and the radio will remain on the channel until the carrier ceases. Scanning will then resume with the selected channel's name displayed.

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.

Always observe all of the Federal Communication Commission's rules and regulations.

OPERATING RULES AND REGULATIONS

Two-way FM radio systems must be operated in accordance with the rules and regulations of the Federal Communications Commission (FCC). 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 of FCC rules 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 by Federal law.*

3. *It is against the law to send false call letters, or false distress or emergency messages.*

4. *The FCC requires that you keep conversations brief and confine them to business. To save time, use coded messages whenever possible.*

5. *Using your radio to send personal messages (except in an emergency) is a violation of FCC rules. You may send only those messages that are essential for the operation of your business.*

6. *It is against Federal law to repeat or otherwise make known anything you overhear on your radio. Conversations between others sharing your channel must be regarded as confidential.*

7. *The FCC requires that you 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.*

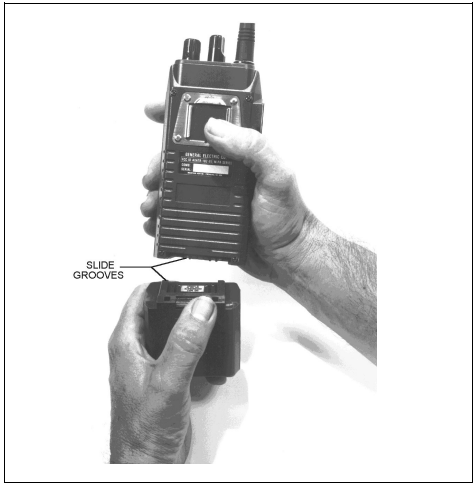

Figure 4 - Installing the Battery Pack

Figure 5 - Removing the Battery Pack

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

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

The product you have purchased contains a rechargeable, recyclable battery. 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 1-800-8-BATTERY 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

INTRINSICALLY SAFE USAGE

Selected portable radios with appropriate factory installed F4 Options are certified as Intrinsically Safe by the Factory Mutual Research Corporation. Intrinsically Safe approval includes Class I, II, Ill, Division 1 hazardous locations in the presence of Groups C, D, E, F and G atmospheres. Non-Incendive approval includes Class I, Division 2 hazardous locations in the presence of Groups A, B, C and D atmospheres.

Hazardous locations are definedin the National Electrical Code. Useful standards NFPA 437A and NFPA 437M for the classifications of hazardous areas can be ordered from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

BATTERY PACKS

Only battery packs identified with a green latch shall be used with a portable radio that is rated and labeled as Factory Mutual Intrinsically Safe. Use of nonspecified battery packs voids Factory Mutual approval. The following battery pack options are approved for use in intrinsically safe radios.

PAPA1F	*Rechargeable Battery Pack, Extra High Capacity (Tall Case)*
PAPA1G	*Rechargeable Battery Pack, High Capacity (Short Case)*

ACCESSORIES

The accessories that follow are approved for use with intrinsically safe radios. Use of accessories other than those listed voids Factory Mutual approval.

PAAB1A	*Headset/Microphone*
PAAC1J	*EarpieceKit*
PAAC1B	*GE-STAR Lanyard*
PAAE3R	*Speaker/Microphone*
PAAE1B	*Speaker/Microphone with GE-STAR Lanyard*
PAAE3T	*Speaker/Microphone/Antenna*
PANC1B	*Antenna, 136- 151 MHz, Helical*
PANC1F	*Antenna, 440-470MHz, Helical*
PANC1L	*Antenna,378-440MHz, Whip*
PANC1N	*Antenna,440-512MHz, Whip*
PANC1H	*Antenna, 806 - 870 MHz, Elevated Feed*
PANC1K	*Antenna, 806-870MHz, Flex*
PANC1U	*Antenna, 378-440MHz, Helical*
PANC1Z	*Antenna,896-941MHz, Whip*
PAHC1C	*Belt Clip*
PAHC1D	*Swivel Mount with Belt Loop*
PAHC3W	*Case, Leather, with Belt Loop (Short Case)*
PAHC1K	*Shoulder Strap, Leather, with Mounting Plate*
PAHC5R	*Holster, Plastic.*

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.*

CG - *Channel Guard - a method of controlling squelch with a tone or digital code (Channel Guard is GE's trade name for coded squelch).*

DES - *Data Encryption Standard - a Federally accepted encryption/decryption algorithm used to scramble or descramble a signal.*

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 proprietary encryption/decryption algorithm used to scramble or descramble a signal.*

T99 - *Type 99 - a method of opening squelch for selective page operations using sequential tones.*

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 _____

SYSTEM NUMBER	*SYSTEM NAME*	*TRK/ CNV*	*GRP/CHN NUMBER*	*GRP/CHN NAME*	*VOICE MODE**	*USE*

**C=Clear, D=Digital, P=Private, V=Voice Guard Private*

SYSTEM NUMBER	*SYSTEM NAME*	*TRK/ CNV*	*GRP/CHN NUMBER*	*GRP/CHN NAME*	*VOICE MODE**	*USE*

**C=Clear, D=Digital, P=Private, V=Voice Guard Private*

SYSTEM NUMBER	*SYSTEM NAME*	*TRK/ CNV*	*GRP/CHN NUMBER*	*GRP/CHN NAME*	*VOICE MODE**	*USE*

**C=Clear, D=Digital, P=Private, V=Voice Guard Private*

WARRANTY

A. *Ericsson Inc. (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 charge 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. .*

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 the name and address of an 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)

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.