Operator's Manual

AEGIS™ M-PA™ PORTABLE RADIO

ERICSSON

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INTRODUCTION

The Aegis™ M-PA™ Select, Scan and System portable radios are high-performance two-way radios that provide clear voice, Aegis digital, and Aegis private communications. The Select, Scan and System radios are also compatible with Voice Guard® communication systems. Personality programming allows maximum integration flexibility into a public service radio system.

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 include a rotatable control knob, rotatable volume control, push-to-talk, emergency and monitor buttons. In addition, the Scan model includes an eight-button keypad while the System model includes a 16-button keypad. 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 provides twelve status flags (Scan and System) or eight status flags (Select) 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 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

Select Model

The rotatable 16-position CONTROL KNOB located on the top of the radio selects the operating channel. 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.

Scan and System Models

The rotatable 16-position CONTROL KNOB located on the top of the radio is programmed to select the operating channel, mode, or specific Channel Guard encode/decode tones. See ***MODE/CHANNEL/CG 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. Some radios may be programmed with this knob disabled.*

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.

MONITOR BUTTON

The MONITOR BUTTON is used to unsquelch the receiver. Momentarily pressing this button will disable squelch and the receiver noise will be heard in the speaker.

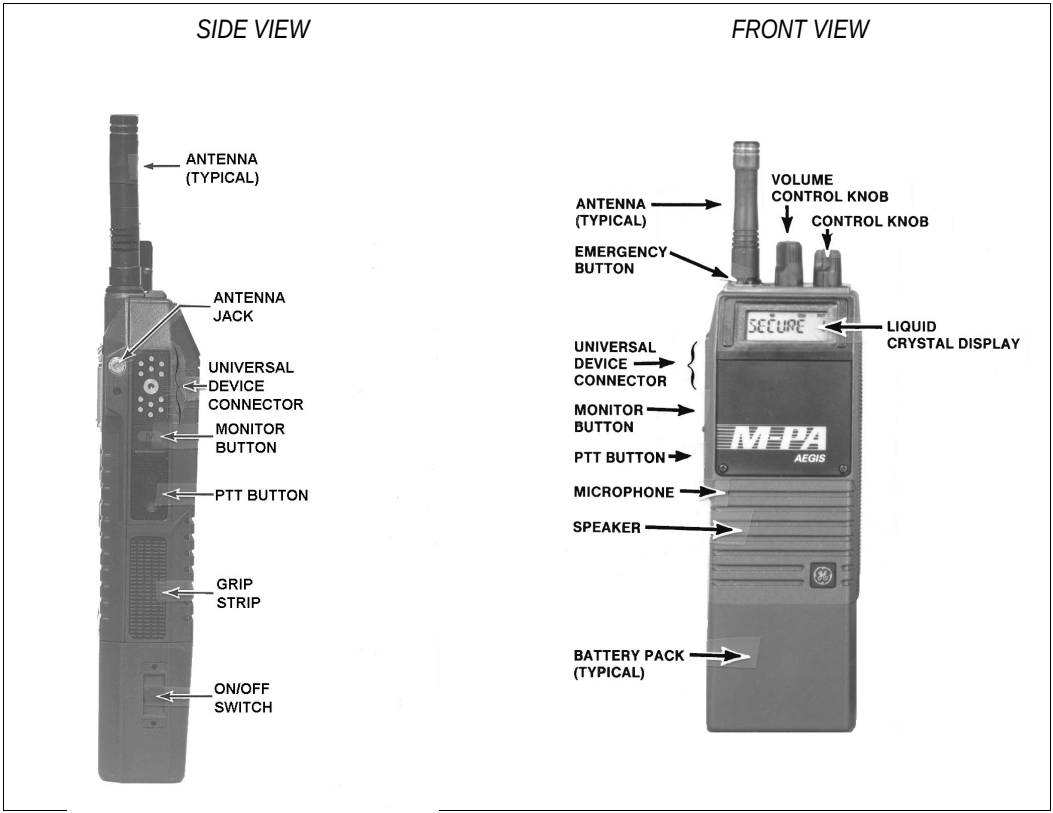

Figure 1 - Aegis M-PA Select Model Radio

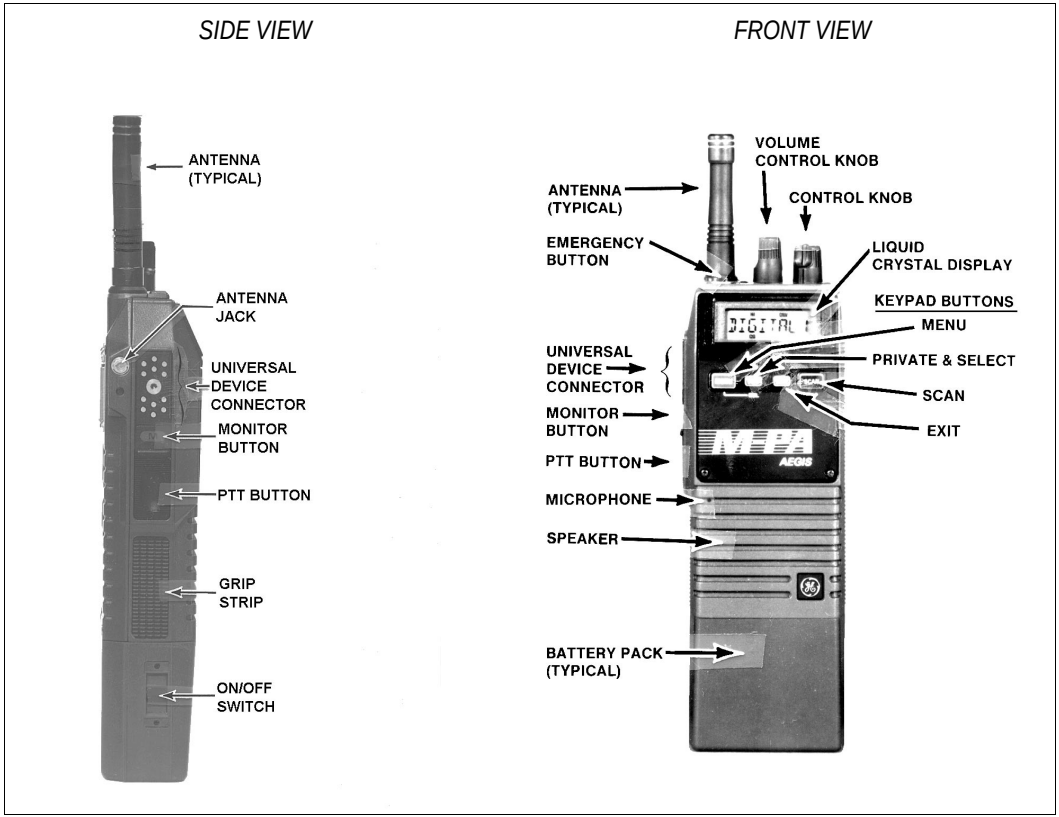

Figure 2 - Aegis M-PA Scan Model Radio

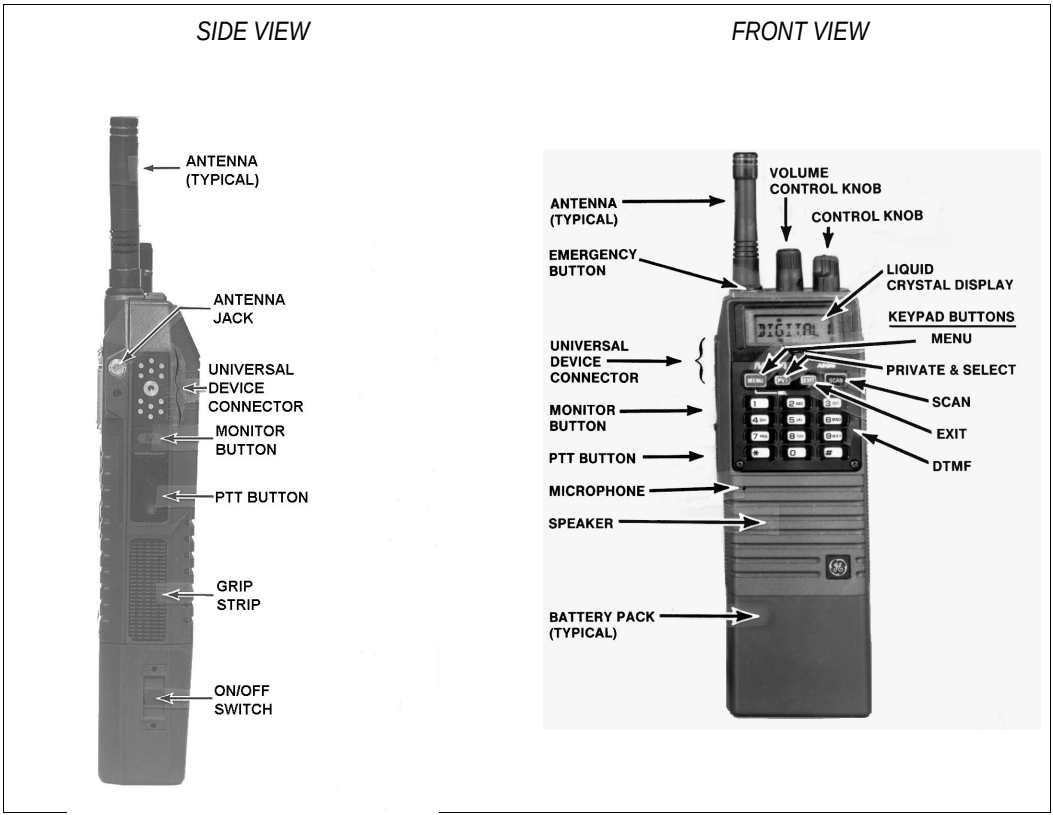

Figure 3 - Aegis M-PA System Model Radio

If programmed enabled for the selected channel, Channel Guard (CG) and/or Type 99 (T99) signalling will be enabled when the channel is selected. If CG and/or T99 are enabled, the appropriate status flag "CG" and/or "T99" will turn on. The MONITOR BUTTON may then be used to toggle CG and/or T99 between disabled and enabled by pressing and holding it for at least one (1) second; the appropriate status flag will toggle on or off. The MONITOR BUTTON is also used to reset T99 operation after a call is received.

EMERGENCY BUTTON

The EMERGENCY BUTTON is the small red button located on top of the radio near the antenna. If this button is programmed for emergency operation, pressing it for at least one (1) second will cause the radio to transmit GE-STAR emergency signalling. The "EMG" status flag will turn on. GE-STAR is transmitted according to one of several different programmable methods. See ***EMERGENCY OPERATION*** *for details.*

This button may also be programmed as an home mode button. If programmed in this manner, pressing it will switch operation to the programmed home mode.

MENU BUTTON (Scan and System Models)

Pressing the MENU button causes the radio to scroll through up to seven (7) different menus programmed into the radio. After the desired menu is displayed, the feature within the menu is selected with the SEL button. The menus that may be programmed are:

Menu Display	***Function Or Use***
"CHANNEL"	*The MENU and SEL buttons are programmed for channel selection. When this display appears, select the desired channel with the SEL button and then press EXIT.*
"MODE"	*The MENU and SEL buttons are programmed for mode selection. When this display appears, select the desired mode by pressing the SEL button and then press EXIT.*
"PHONE"	*Allows selection of one (1) of the ten (10) programmed or user entered telephone numbers for automatic dialling.*

"KEY LOCK" *Allows the keypad buttons to be locked or unlocked.*

"SCAN A/D" *Allows channels to be added to or deleted from the scan list for the current mode. The priority-one channel and the priority-two channel are also set within this menu.*

"ALERT" *Allows the alert tones to be disabled or enabled.*

"PHN EDIT" *(System Model) Allows editing of the telephone phone numbers programmed into the radio.*

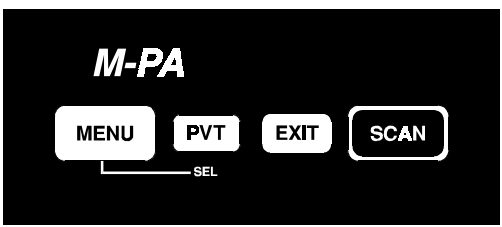

Figure 4 - M-PA Scan Model Keypad

PRIVATE BUTTON

The optional private transmit mode is enabled or disabled by pressing and releasing the PVT button (when the menu mode is not selected). When private transmit mode is enabled, the "PVT" status flag in the display will turn on. The radio is programmed for switched or forced private operation. In the switched configuration, the PVT button is operational. In the forced configuration, the button is not operational.

If the radio is programmed for forced private operation and the selected channel is programmed for private operation, "FRCD PVT" will be displayed when PVT is pressed; private transmit mode cannot be disabled. If the radio is programmed for forced private operation and the selected channel is not programmed for private operation, "PVT DIS" will momentarily show in the display when PVT is pressed; the radio will not change to private mode. If the encrypt/decrypt option is not installed, the PVT button has no function.

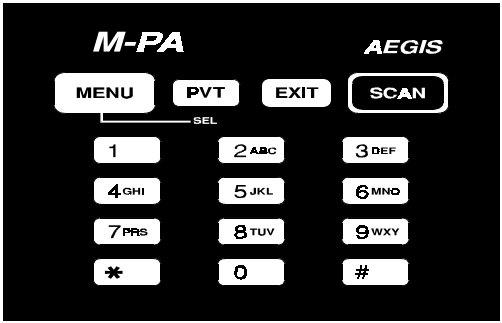

Figure 5 - Keypad

EXIT BUTTON

Pressing the EXIT button will cause the radio to exit the current menu display and return operation to the channel currently selected. If the menu mode is not enabled when the button is pressed, pressing this button will turn the display and keypad backlighting on for thirty (30) seconds if the backlight is programmed on.

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 channels on the scan list will be scanned. See **SCANNING CHANNELS** for additional details.*

SELECT BUTTON

Selecting different features within each menu is accomplished with the SEL button. First, the menu mode must be enabled and the desired menu must be chosen by pressing and releasing the MENU button until the desired menu appears in the display. After the menu is chosen, the desired function or feature is selected by pressing the SEL button. For example, to disable or enable the alert tones, press MENU until "ALERT" is displayed then press SEL to select "ENABLED" or "DISABLED", as desired. Next, press the EXIT button.

DTMF KEYPAD (System Model)

*Telephone interconnect calls can be made using the 12-button DTMF keypad. This keypad is enabled when a channel programmed for DTMF operation is selected. See **TELEPHONE INTERCONNECT CALLS** for details*

INDICATORS

The LCD on the Select model has eight alphanumberic characters and eight status flags.

The LCD on the Scan and System models has eight alphanumeric characters and twelve status flags. This display indicates the current operating channel and various other messages. Menu information is also displayed on the Scan and System Models when enabled.

The System model also displays 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.

On the Scan and System models pressing the EXIT button when the menu mode is not enabled will turn display and keypad backlighting on for thirty (30) seconds (if backlight programming is on).

The status flags located along the top and bottom of the display indicate operating status as follows:

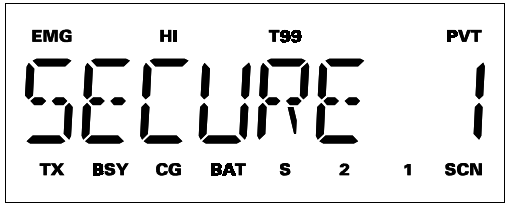

Figure 6 - Liquid Crystal Display

EMG *EMerGency mode - On indicates emergency GE-STAR signalling has been initiated by the user.*

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

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

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

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

BSY *BuSY - On indicates a carrier is being received (the channel is busy). Note that if the selected channel is programmed for Channel Guard (CG), Digital Channel Guard (DCG), or Type 99 (T99) tone decode operation, the radio may not unsquelch if a valid tone(s) is not received; the BSY status flag will be on.*

CG *Channel Guard - On indicates tone Channel Guard (CG) or Digital Channel Guard (DCG) encode/decode is enabled on the selected channel.*

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

> ***NOTE***
>
> *The remaining status flags are provided on the Scan and System models only.*

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

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

2 *priority 2 - On indicates the selected 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 M-PA uses alert tones or "beeps" to indicate various operating conditions. The alert tones may be disabled when the radio is programmed. on the Scan and System models, The alert tones may be enabled or disabled via the menu mode if the "ALERT" feature is programmed. See ***"ALERT" MENU*** *for details.*

CARRIER CONTROL TIMER

This feature, programmable on a per channel basis, prevents unnecessary channel traffic and radio damage in the event of a "stuck" mic. If the programmed timer times-out during a transmission the radio will sound an alert tone and disable the transmission. The beeping tone will continue until the PTT BUTTON is released. Releasing the PTT BUTTON resets the timer.

CHANNEL BUSY

If the radio is receiving a signal when the PTT BUTTON is pressed, an alert tone will warn the operator that the radio is receiving a carrier and the transmission will not occur. "RX BUSY" is displayed and the alarm is sounded as long as the PTT BUTTON is pressed. This feature is programmable on or off on a per channel basis.

RECEIVE ONLY CHANNEL

If the selected channel is programmed as receive only the radio will sound an alert tone if a transmission is attempted. "RX ONLY" is displayed.

RADIO/CHANNEL FAILURE

If the synthesizer is unable to lock correctly on the selected channel, or another radio failure occurs, an alert tone will sound. If incorrect programming is detected or the synthesizer fails to lock, the display flashes "NO LOCK" then the selected channel's name.

PRIVATE MODE DISABLED (Scan and System Models)

If the selected channel is programmed for private operation and private transmit mode has been disabled using the PVT button, the radio will sound a low-pitched beep when the PTT button is pressed. This warns the operator that the radio is transmitting clear (non-encrypted) audio.

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.

MODE/CHANNEL/CG SELECTION (Scan and System Models)

Aegis M-PA radios may be programmed with up to 160 different radio channels. A maximum of 10 modes of 16 channels each or 16 modes of 10 channels each may be programmed into the radio (10 x 16 = 160). Select the desired mode (bank of channels) and channel, or channel and Channel Guard (CG), according to the radio's programming as follows:

MENU And SEL Selects Mode
CONTROL KNOB Selects Channel (And CG)

1. *Press the MENU button until "MODE" appears in the display.*
2. *Press the SEL button to select the desired mode. The selected mode's name will appear in the display.*
3. *Press the EXIT button to switch radio operation to the selected mode and exit the menu.*
4. *Select the desired channel by rotating the CONTROL KNOB until the desired channel's name appears in the display.*

CONTROL KNOB Selects Mode
MENU And SEL Selects Channel (And CG)

1. *Select the correct mode by rotating the CONTROL KNOB until the desired mode's name appears in the display.*
2. *Press the MENU button until "CHANNEL" appears in the display.*
3. *Press the SEL button until the desired channel's name appears in the display.*
4. *Press the EXIT button to switch radio operation to the displayed channel and exit the menu.*

MENU and SEL Selects Modes And Channels
CONTROL KNOB Selects Channel Guard

1. *Press the MENU button until "MODE" appears in the display.*

2. *Press the SEL button until the desired mode's name appears in the display.*

3. *Press the MENU button until "CHANNEL" appears in the display.*

4. *Press the SEL button until the desired channel's name appears in the display.*

5. *Press the EXIT button to switch radio operation to the new mode and channel, and exit the menu.*

6. *Select the desired Channel Guard using the CONTROL KNOB. The "CG" status flag will turn on if the selected position has CG programmed. Position fifteen (15) is a non-CG position; it may not be programmed with a Channel Guard. Position sixteen (16) is a default channel CG position; selecting it will switch CG to the CG programmed for the selected channel.*

VOICE MODES

Each mode (bank of channels) in the radio is programmed for either Aegis or Voice Guard communications. Modes programmed for Aegis operation have three (3) different voice modes that are programmable on a per-channel basis: clear, digital and private. Modes programmed for Voice Guard operation have two (2) voice modes that are programmable on a per-channel basis: clear and private. The 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. Channels programmed for clear operation cannot transmit or receive Aegis digital or private messages.

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. Aegis digital signals are not encrypted. Channels programmed for Aegis digital operation transmit only digital signals and they can receive clear and digital signals. In other words, with a certain 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,

TRANSMIT/RECEIVE MODE COMPATIBILITY FOR AEGIS OPERATIONS

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*

TRANSMIT/RECEIVE MODE COMPATIBILITY FOR VOICE GUARD OPERATIONS

CHANNEL PROGRAMMING (TRANSMIT)	RECEIVE CAPABILITY	
	CLEAR	PRIVATE
CLEAR	Yes	No
PRIVATE	Yes	Yes *

** assumes the proper cryptographic key is loaded*

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 when the selected channel is programmed for Voice Guard operation. Accordingly, a Voice Guard transmission cannot be received when the selected channel is programmed for Aegis operation.

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-channel basis according to the radio's programming. Channels within Aegis modes can be programmed for keys 1 - 6. Channels within Voice Guard modes 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 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. In Aegis Scan and System models, the mode may be toggled between private and clear using the PVT button If the selected channel is programmed for switched capability. Radios programmed for forced private operation do not allow a change of the transmit mode; the PVT button does not function.

NOTE

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

Transferring Keys Into The Radio

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 channel as indicated in the display.*

Key Zero (Select Models)

The cryptographic keys stored in DES version radios can be zeroed or "dumped" by removing the battery pack for several minutes (typically three) or disassembling the radio. Either action will clear all of the keys stored in a DES radio.

The cryptographic keys stored in VGE version radios cannot be zeroed once they are transferred into the unit. A different key must be loaded into the same location(s) to prevent unauthorized communications.

Key Zero (Scan and System Models)

All cryptographic keys stored in the radio can be zeroed or "dumped" when the radio is on by simultaneously pressing the MENU and SCAN 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 cryptographic key(s) are zeroed, one or more keys must be transferred into the radio from the Keyloader before private communications may continue.

The cryptographic keys stored in DES version radios can also be zeroed using two (2) additional methods. Removing the battery pack for several minutes (typically three), or disassembling the radio will zero all of the cryptographic keys stored in a DES version radio.

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. *Select model - Select the desired channel. Scan and System models - Select the desired operating mode, channel, and/or Channel Guard. See the* ***MODE/CHANNEL/CG SELECTION*** *for details.*

3. *Press the MONITOR BUTTON briefly to disable squelch and adjust the VOLUME CONTROL for the approximate desired speaker audio level. Pressing the MONITOR BUTTON may affect Channel Guard and/or Type 99 tone operation if programmed for the selected channel.*

4. *If the selected channel is programmed for private operation, the radio will automatically switch between clear or private receive operation.*

   When an encrypted transmission is received, the "PVT" status flag will flash, the receiver will unsquelch, and the message will be heard in the speaker. The selected channel must be programmed for private operation and the correct cryptographic key must be loaded into the radio for this to occur.

   If a clear mode (non-encrypted) transmission is received, the receiver will unsquelch and it will be heard in the speaker. However, if the selected channel is programmed for Channel Guard or Type 99 tone operation, the receiver will not unsquelch unless the correct CG or T99 tone is received.

5. *Adjust the volume as necessary.*

TRANSMITTING A MESSAGE

1. *Select models - Select desired channel. Scan and System models - Select the desired mode, channel, and/or Channel Guard.*

If the channel has been programmed for digital operation, the radio will transmit Aegis digital signals and it will receive clear and Aegis digital signals.

Encrypt/decrypt optionally equipped radios: 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 Scan and System models .

When private mode is enabled, the "PVT" status flag in the display will turn on. Toggle transmit operation to private or clear, as desired, by pressing the PVT button (when the menu mode is not enabled).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.

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. The "TX" and "BSY" status flags are displayed. NOTE: In Scan and System modes, if the selected channel is programmed for private operation and clear transmit 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 radio is not in private mode.*

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.*

EMERGENCY OPERATION

The radio may be programmed to transmit GE-STAR emergency signalling when the EMERGENCY BUTTON is pressed or from a UDC connected lanyard. If the EMERGENCY BUTTON is programmed for GE-STAR emergency activation, press it for approximately one (1) second to activate the transmission. If the lanyard is programmed for activation, follow the instructions provided with it. GE-STAR is programmed to transmit in one of the following methods:

- *GE-STAR is transmitted on a predetermined mode and channel regardless of the selected channel. In this case the selected channel is available for voice and the radio will periodically "jump" to the predetermined channel and send the emergency message and then "jump back" to the selected channel for voice operation.*

- *GE-STAR is transmitted on the selected channel. If the channel is changed the emergency bursts will follow the newly selected channel.*

- *The radio switches to and stays on a predetermined mode and channel and GE-STAR is transmitted on that channel. Rotating the CONTROL KNOB will not change channels. Turning the radio off and back on will reset this condition.*

- *GE-STAR is sent on the selected channel and the radio locks onto that channel. Rotating the CONTROL KNOB will not change channels. Turning the radio off and then back on will reset this condition.*

SCANNING CHANNELS (Scan and System Models)

The Aegis M-PA may be programmed for non-priority scan, dual-priority scan, or scan operation may be disabled. Scan programming options include a 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.

The radio may be programmed to scan only the channels in the current mode or it may be programmed to scan across modes.

The radio will receive clear, digital or private messages on each scanned channel depending on how each channel is programmed.

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

If the "SCAN A/D" menu is programmed, channels may be added to and deleted from the scan list of each mode as follows:

1. *Select the desired mode and channel. If the selected channel is currently on the list, the "S" status flag will be on.*

2. *Press the MENU button until "SCAN A/D" is displayed.*

3. *Press the SEL button 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 priority 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 can not 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 through 4.*

5. *Press the EXIT button to return to normal operation.*

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. Sampling 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. Sampling 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.

TELEPHONE INTERCONNECT CALLS

The keypad on the radio's front panel allows the operator to make telephone interconnect calls on radio systems equipped with this capability. Telephone numbers may be manually dialed using the DTMF numeric keypad, or one (1) of the ten (10) programmed or stored numbers can be selected and automatically dialed. In System models, each channel may be programmed for telephone interconnect by enabling it for DTMF dial operation. Voice transmissions may be encrypted if the channel is programmed for private operation and the operator selects private mode after the dial sequence is completed.

*System models only - Most systems require an "*****" to be sent at the beginning of a transmission to get a dial tone. Others require "#". After the dial tone is received, the number is sent. At the completion of*

the call most systems require a "#" to be sent to disconnect the user from the telephone system. Others require "".*

Communication takes place in a simplex mode. In other words, the PTT BUTTON must be pressed each time you wish to transmit and it must be released to receive.

Placing A Manually Dialed Call (System Models only)

1. *If the "SCN" status flag is on, press SCAN to turn scan off.*
2. *Select a channel in your radio system that has telephone interconnect capability. The radio should be programmed for DTMF operation on this channel.*
3. *If private mode is enabled ("PVT" status flag on), press the PVT button to disable private mode.*
4. *Press and hold the PTT BUTTON to key the transmitter.*
5. *While holding the PTT BUTTON, press either the "*" button or the "#" button as required by the radio system to obtain a telephone line. The radio will transmit the selected tone.*
6. *Release the PTT BUTTON and listen for a dial tone.*
7. *When the dial tone is received, press and hold the PTT BUTTON and dial the desired telephone number. As you dial each number, the DTMF sidetone will be heard in the speaker as the radio transmits the DTMF tone.*
8. *Release the PTT BUTTON when the dial sequence is complete.*
9. *When the called party answers, press the PTT BUTTON each time you wish to talk (transmit) and release it when you wish to listen (receive). If desired, enable private mode by pressing the PVT button.*
10. *At the completion of the call, press and hold the PTT BUTTON and then press the "#" or "*" button as the telephone interconnect system requires. Release the PTT BUTTON.*

Placing An Automatically Dialed Call

Ten (10) telephone numbers can be programmed or stored in the radio for automatic dial operation. Typically, telephone numbers that are programmed into the radio by the maintenance personnel each have a specific name (8 characters maximum) assigned. For example: "OFFICE" or "HOME".

In System models, telephone numbers that are stored in the radio using the numberic keypad are named "PHONE x" (where "x" is the storage location 1 - 10) when they are stored. When stored numbers are later recalled using the "PHONE" menu, the last eight (8) entered digits of the number will be the name that appears in the display.

To recall a programmed or stored number and complete a call, proceed as follows:

1. *If the "SCN" status flag is on, press SCAN to turn scan off.*

2. *Select a channel in your radio system that has telephone interconnect capability. The radio should be programmed for DTMF operation on this channel.*

3. *If private mode is enabled ("PVT" status flag on), press the PVT button to disable private mode.*

4. *Press the MENU button until "PHONE" appears in the display.*

5. *Press the SEL button to scroll through the phone list until the programmed or stored name for the desired telephone number appears in the display.*

6. *Press and release the PTT BUTTON to automatically dial the selected number.*

7. *When the called party answers, press the PTT BUTTON to transmit and release it to receive. Repeat as needed. If desired, enable private mode by pressing the PVT button.*

8. *At the completion of the call, press the EXIT button. The radio will then transmit the disconnect digit to hang-up.*

Editing The Programmed Telephone Numbers Or Storing A New Telephone Number

Any of the programmed or stored telephone numbers may be edited using the "PHN EDIT" menu. This menu also allows new phone numbers to be stored (added) to the list. Up to a maximum to ten (10) different numbers can be programmed and/or stored in the radio.

1. *Press the MENU button until "PHN EDIT" appears in the display.*
2. *Press the SEL button until the name for the desired telephone number appears in the display.*
3. *Enter the new number using the numberic keypad. If a mistake is made, press the MONITOR BUTTON to abort and then enter the correct number.*
4. *After the correct number has been entered, press EXIT to enter the new number and return to normal operation.*

"KEY LOCK" MENU (Scan And System Models)

The "KEY LOCK" menu allows the keypad (SCAN button and the twelve (12) numeric buttons) to be locked or disabled to prevent accidental activation. If this menu is programmed into the radio, lock and unlock the keypad as follows:

Lock The Keypad

1. *If the "SCN" status flag is on, press SCAN to turn scan off.*
2. *Press the MENU button until "KEY LOCK" appears in the display.*
3. *Press the SEL button until "LOCKED" is displayed.*
4. *To lock the keypad press the EXIT button.*

Unlock The Keypad

1. *Press the MENU button until "KEY LOCK" appears in the display.*
2. *Press the SEL button until "UNLOCKED" is displayed.*
3. *To unlock the keypad press the EXIT button.*

"ALERT" MENU

The "ALERT" menu allows the alert tones to be disabled or enabled. If this menu is programmed into the radio, disable and enable the alert tones as follows:

Disable The Alert Tones

1. *If the "SCN" status flag is on, press SCAN to turn scan off.*
2. *Press the MENU button until "ALERT" appears in the display.*
3. *Press the SEL button until "DISABLED" is displayed.*
4. *To disable the tones press the EXIT button.*

Enable The Alert Tones

1. *Press the MENU button until "ALERT" appears in the display.*
2. *Press the SEL button until "ENABLED" is displayed.*
3. *To enable the tones press the EXIT button.*

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 improved by using an externally mounted antenna.

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

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 7.*

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 8.*

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

Figure 7 - Installing the Battery Pack

Figure 8 - Removing the Battery Pack

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 9 - 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, III, 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 defined in 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.

PAPA1G	*Battery, High Capacity, Short Case.*
PAPA1F	*Battery, Extra High Capacity, Tall 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*
PAAE3E	*Speaker/Microphone*
PAAE1B	*Speaker/Microphone with GE-STAR Lanyard*
PAAE3G	*Speaker/Microphone/Antenna*
PANC1B	*Antenna, 136- 151 MHz, Helical*
PANC1C	*Antenna, 146- 162 MHz, Helical*
PANC1D	*Antenna, 157- 174 MHz, Helical*
PANC1F	*Antenna, 440-470MHz, Helical*
PANC1G	*Antenna, 470- 494 MHz, Helical*
PANC1L	*Antenna,378-440MHz, Whip*
PANC1N	*Antenna,440-512MHz, Whip*
PANC1H	*Antenna, 806 - 870 MHz, Elevated Feed*
PANC1K	*Antenna, 806-870MHz, Flex*
PANC1V	*Antenna, 492- 512 MHz, Helical*
PANC1Z	*Antenna, 896- 941 MHz, Helical*
PAHC1C	*Belt Clip*
PAHC1D	*Swivel Mount with Belt Loop*
PAHC5N	*Case, Leather, with Belt Loop (Short Case)*
PAHC1F	*Case, Leather, with Belt Loop (Tall Case)*
PAHC1K	*Shoulder Strap, Leather, with Mounting Plate*
PAHC5R	*Holster, Plastic.*

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.

GLOSSARY

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

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 Ericsson'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)*

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

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

*RADIO TYPE*_____

*FREQUENCY BAND*_____

*OPERATOR'S NAME*_____

MODE NUMBER	*MODE NAME*	*CHANNEL NUMBER*	*CHANNEL NAME*	*VOICE MODE**	*CG/ T99*	*USE*

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

MODE NUMBER	*MODE NAME*	*CHANNEL NUMBER*	*CHANNEL NAME*	*VOICE MODE**	*CG/ T99*	*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)

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)

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