LBI-38846B

Operator's Manual

EDACS® MDX

MOBILE RADIO

ERICSSON

TABLE OF CONTENTS

NOTICE!

Repairs to this equipment should be made only by an authorized service technician or facility designated by the supplier. Any repairs, alterations or substitution of recommended parts made by the user to this equipment not approved by the manufacturer could void the user's authority to operate the equipment in addition to the manufacturer's warranty.

NOTICE!

This manual covers Ericsson and General Electric products manufactured and sold by Ericsson Inc.

TABLE OF CONTENTS (CON'T)

TABLE OF CONTENTS (CON'T)

SAFETY INFORMATION

The operator of any mobile radio should be aware of certain hazards common to the operation of vehicular radio transmissions.

A list of possible hazards are:

1. Explosive Atmospheres

   Just as it is dangerous to fuel a vehicle with the motor running, be sure to turn the radio off while fueling the vehicle. Do not carry containers of fuel in the trunk.

2. Interference to Vehicular Electronics Systems

   Electronic fuel injection systems, electronic anti skid braking systems, etc., are typical of the type of electronic devices that may malfunction due to the lack of protection from radio frequency energy present when transmitting. If the vehicle contains such equipment, consult the dealer for the make of the vehicle and enlist his aid in determining if such electronic circuits perform normally when the radio is transmitting.

3. Dynamite Blasting Caps

   Dynamite blasting caps may be caused to explode by operating a radio within 500 feet of the blasting caps. Always obey the **"Turn Off Two Way Radios"** signs posted where dynamite is being used. When transporting blasting caps in your vehicle:

   a. Carry the blasting caps in a closed metal box with a soft lining.

   b. Leave the radio **OFF** whenever the blasting caps are being put into or removed from the vehicle.

4. Radio Frequency Energy

   To prevent burns or related physical injury from radio frequency energy, do not operate the transmitter when anyone outside of the vehicle is within two feet of the antenna.

5. Liquefied (LP) Gas Powered Vehicles

   Mobile radio installations in vehicles powered by liquefied petroleum gas with the LP gas container in the trunk or other sealed-off space within the interior of the vehicle must conform to the **N**ational **F**ire **P**rotection **A**ssociation standard (**NEPA**) **58** which requires that:

   a. The space containing the radio equipment shall be isolated by a seal from the space containing the LP gas container and its fittings.

   b. Outside filling connections shall be used for the LP gas container.

   c. The LP gas container shall be vented to the outside of the vehicle.

SAFE DRIVING RECOMMENDATIONS FOR USERS OF MOBILE RADIOS*

Read the literature on the safe operation of the radio.

- Keep both hands on the steering wheel and the microphone in its cradle whenever the vehicle is in motion.

- Place calls only when vehicle is stopped. Use recall dialing to speed the time it takes to call.

- When talking from a moving vehicle is unavoidable, drive in the slower lane. Keep conversations brief.

- If conversation requires taking notes or complex thought, stop the vehicle in a safe place and continue the call.

Whenever using a mobile radio exercise caution.

*As recommended by the AAA

OPERATING PROCEDURES

Two-way **FM** radio systems must be operated in accordance with the rules and regulations of the Federal Communications Commission (FCC). Operators of two-way radio equipment must be thoroughly familiar with the rules that apply to the intended type of radio operation. Following these rules will help to eliminate confusion, assure the most efficient use of existing radio channels, and result in a smoothly functioning radio network. When using this two-way radio remember these rules:

1. It is a violation of FCC rules to interrupt any distress or emergency message. As the radio operates in much the same way as a telephone "party line", always listen to make sure that the line is clear - that no one else in on the air - before sending messages. If someone is sending an emergency message - such as reporting a fire, or asking for help in an accident - **KEEP OFF THE AIR**! Emergency calls have priority over all other messages.

2. Use of profane or obscene language is prohibited by Federal law.

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

4. The FCC requires that conversations be kept brief and confined to business. To save time, use coded messages whenever possible.

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

6. It is against Federal law to repeat or otherwise make known anything overheard on the radio. Conversations between others sharing a channel must be regarded as confidential.

7. The FCC requires the operator to identify himself at certain times by means of call letters. Refer to the rules that apply to the particular type of operation for the proper procedure.

NOTE

The GE-MARC and EDACS trunking environments have automatic identification features built in and do not require the user to identify by means of call letters.

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

INTRODUCTION

This manual describes how to use the EDACS MDX Mobile Radio. The MDX is a synthesized, microprocessor-based, high performance simplex mobile FM radio providing reliable two-way communications in both the GE-MARC and Enhanced Digital Access Communications System (EDACS) trunking environments. If your MDX is equipped with the Aegis™ Digital Voice or Encrypted Digital Voice option, the GE-MARC mode of operation is no longer available. The radio also operates with non-trunked or conventional communications systems. Direct mobile to mobile communication, when out of repeater range, is also provided.

In an **EDACS** trunked environment the user selects a communications system and group. In this mode, audio channel selection is transparent to the user and is controlled via digital communication with the system controller. This provides advanced programmable features and fast access to communication channels.

In a **GE-MARC** trunked environment the user selects a communications area and group. In this mode, audio channel selection is automatic and is controlled via tone signalling.

In the **Conventional** mode, the user selects a channel and directly communicates on that channel. In this mode, a system refers to a set of channels and a channel is a transmit/receive radio frequency pair.

In either the **EDACS** or **Conventional** modes of operation the user can program some or all of the talk groups or channels to transmit and receive Aegis Digital Voice or the highly secure Aegis VGE Encrypted Digital Voice. Aegis is a high quality voice coding algorithm allowing for easy voice recognition.

The exact operation of the radio will depend on the operating mode, the radio's programming, and the particular radio system. Most features described in this manual may be enabled or disabled through programming. Consult the system administrator for the particular features that are programmed into your MDX radio.

CONTROLS, INDICATORS, AND DISPLAYS

The MDX Scan radio contains ten buttons, an eight character DOT MATRIX display and seven indicators. The MDX System radio contains ten buttons, an eight character DOT MATRIX display and seven indicators along with a twelve button keypad. In addition, there are times when part of the eight character display is used to display the radio status. Backlighting on buttons illuminate Digital Legends.

CONTROLS

POWER — Momentary push-push switch. Press once to turn the radio ON. Press again to turn the radio OFF.

VOLUME — The momentary switches (auto ramping) VOLUME + and VOLUME -. Beeps each time the VOLUME button is pressed, except when a call is in process. Hold the button (up or down) to auto ramp the volume.

MENU — Momentary switch. The **MENU** button is used to access options on the MDX mobile. Menu operation is coupled with the **GROUP/SEL** buttons and the **CLR** button. To increment from one menu selection to the next, simply press and release the **MENU** button. Press the **CLR** button to return to normal operation. The menu choices are listed below with a description of how to change the choices (Note: You may have some or all of these menu choices programmed in your radio, and they may be programmed in a different order than presented here).

SPECIAL CALL: Press the **MENU** button until "SPC CALL" appears in the display. Pressing the PTT causes the last selected special call to be sent. To review or change the selection, use the **GROUP/SEL** keys to view/change the special call selection. Up to 25 phone numbers and individual decode numbers can be stored in the Special Call menu. While the desired number is displayed, press the PTT switch to initiate the call.

BACKLIGHT: Press the **MENU** button until "BRIGHT" appears in the display. To change the state of the backlight press the **GROUP/SEL** + or - button.

PUBLIC ADDRESS: Press the **MENU** button until "PUB ADDR" appears in the display. Press PTT to transmit in PA mode.

SCAN ADD/DELETE: Press the **MENU** button until "SCAN A/D" appears in the display. Use the **GROUP/SEL-** button to step through the group selections for the current system. Use the **GROUP/SEL +** button to change the scan state. An "S" is illuminated to the right of the display if the group/channel has SCAN enabled.

ALARM ON/OFF: Press the **MENU** button until "ALM ON" or "ALM OFF" appears in the display. Press the **GROUP/SEL +** or **-** buttons until the desired state is selected. (Note: This enables or disables the external alarm; e.g. horn or lights.)

STATUS: Press the **MNU** button until "STATUS" appears in the display. To review or change the selection,use the **GROUP/SEL** keys to view/change the selection of the status message. When the desired status is displayed, press the PTT switch to initiate the status transmission.

MESSAGE: Press the **MNU** button until "MESSAGE" appears in the display. To review or change the selection, use the **GROUP/SEL** keys to view/change the selection of the message. When the desired message is displayed, press the PTT switch to initiate the message transmission.

SCN

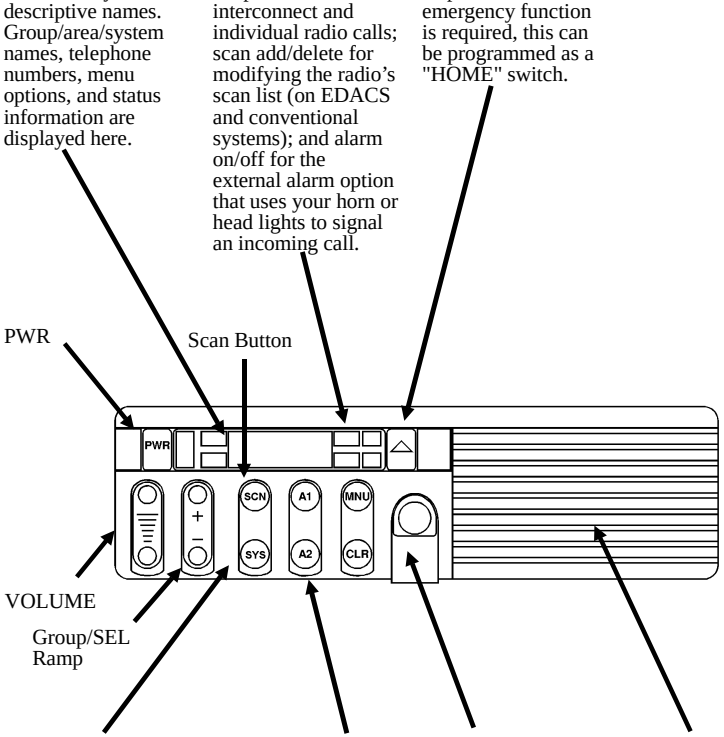
Momentary switch. Press the SCN button to enable or disable scan operation. The SCN indicator will light when scan is enabled. Pressing and holding the SCN button while on a conventional channel or an EDACS working channel will permit the user to adjust the squelch setting from the front panel by using the VOLUME ramp switch to open and close the squelch.

CONTROLS AND INDICATORS

8-Character Alphanumeric Dot Matrix LED allows you to identify group and system selections by descriptive names. Group/area/system names, telephone numbers, menu options, and status information are displayed here.

MENU button allows access to functions and options, including pre-programmed telephone interconnect and individual radio calls; scan add/delete for modifying the radio's scan list (on EDACS and conventional systems); and alarm on/off for the external alarm option that uses your horn or head lights to signal an incoming call.

Emergency ID/ Alarm (optional) sends an emergency alert and identifying code to the dispatcher. If no emergency function is required, this can be programmed as a "HOME" switch.



System Switch scrolls through the names of systems and/or channels programmed into the radio, displaying them on the Dot Matrix display.

Two Flex Keys give you one-touch access to the menu or optional features. Optional keycaps are available to identify the functions of pre-programmed buttons, including Special Call, Scan Add/ Delete, Public Address, Home System/Group, External Alarm, and display brightness.

Front-Mounted Microphone Connector provides easy access to the microphone and programming capabilities.

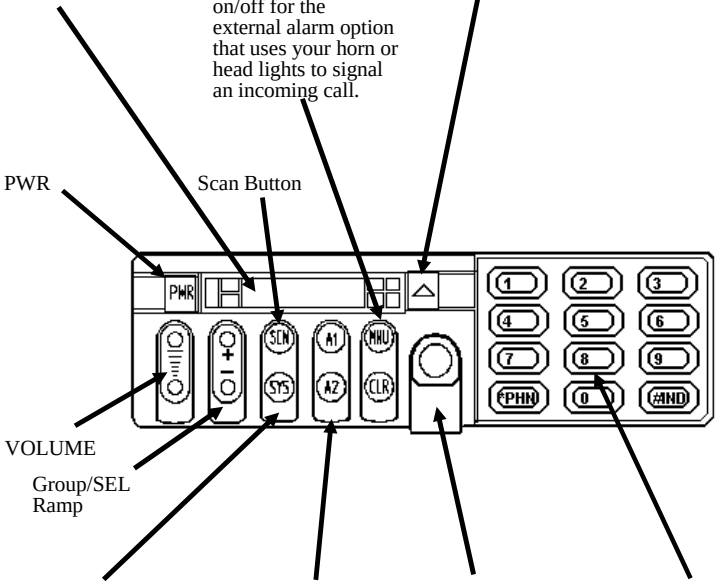
Front Mount Speaker with 4 watts of audio. An optional 10-watt external speaker is also available, for use in noisy environments.

Figure 1 - MDX Scan Radio

8-Character Alphanumeric Dot Matrix LED allows you to identify group and system selections by descriptive names. Group/area/system names, telephone numbers, menu options, and status information are displayed here.

MENU button allows access to functions and options, including pre-programmed telephone interconnect and individual radio calls; scan add/delete for modifying the radio's scan list (on EDACS and conventional systems); and alarm on/off for the external alarm option that uses your horn or head lights to signal an incoming call.

Emergency ID/ Alarm (optional) sends an emergency alert and identifying code to the dispatcher. If no emergency function is required, this can be programmed as a "HOME" switch.



System Switch scrolls through the names of systems and/or channels programmed into the radio, displaying them on the Dot Matrix display.

Two Flex Keys give you one-touch access to the menu or optional features. Optional keycaps are available to identify the functions of pre-programmed buttons, including Special Call, Scan Add/ Delete, Public Address, Home System/Group, External Alarm, and display brightness.

Front-Mounted Microphone Connector provides easy access to the microphone and programming capabilities.

System Keypad 10-watt external speaker must be used with the System model.

Figure 2 - MDX System Radio

CONTROLS (CONT'D)

SYS	Momentary switch. The **SYS** (SYSTEM) button is used to select system changes. System may be incremented by pressing and releasing the **SYS** button. Alternately, when the display shows the System name, the GROUP/SEL buttons may be used to increment or decrement the system selections. (NOTE: The radio may be programmed with wrap around on the system selection; this would allow the radio to switch from the highest to lowest system with one change instead of ramping all the way through the list.)
GROUP/SEL	Ramp Switch. The **GROUP/SEL** button is used to increment or decrement the current group/channel selection. It is also used as described above to increment/decrement the System. In conventional mode, these buttons change the channel selection.
CLR	Momentary switch. The **CLR** button is used to exit from the menu operation, monitor a conventional channel or end a special/individual call.
HOME/ EMERGENCY	Momentary switch. The **HOME** or **EMERGENCY** button is used to select a home system, group, or channel. The radio may be programmed to revert to a particular system and/or group/ channel within the selected or home system. It may also be programmed to send an emergency message when pressed and held for approximately one second (either on the selected system/group or on the Home system/group).
FLEX KEYS A1, A2	The aux buttons are used to access frequently used menu selections quickly. They can also be programmed as a HOME or Group/System, no Data Toggle button, External Alarm, Public Address, PriVaTe or Group ID entry.
NUMERIC KEYS 1-9, 0, *, #	On System radio, the twelve button keypad permits telephone interconnect and DTMF overdial as well as Group and Individual ID call entries.

DISPLAY INDICATORS

The radio's display is shown below. The character line is used to display system or area and group or channel names and also operational messages to the user. The line contains eight Dot Matrix LED characters. The 7 status indicators are used to show the various operating conditions of the radio.

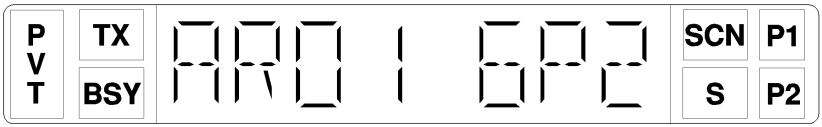


Figure 3 - Sample MDX Display

TX	On indicates the radio is transmitting.
BSY	Lights when a group is active (trunked system) or when a channel is busy (conventional system). Flashes when a call is queued on a trunked system.
SCN	ON indicates scan is enabled.
S	ON indicates group/channel in scan list.
P1	ON indicates selected channel is a priority channel (conventional only).
P2	ON indicates selected channel is a priority 2 channel (conventional only).
PVT	ON indicates selected channel has been pre-programmed for Aegis operation. Flashes indicates receiving an encrypted digital voice call.

NOTE

In EDACS operation the P1 & P2 indicators can be programmed to flash when the radio has received an individual call. Display shows "C* to show receipt of I-CALL.

DISPLAY ALPHA INDICATORS

The radio is capable of displaying status indicators in the alpha display. Some of these messages will use the entire display while others use only two or three characters. When the short message is displayed it may be on the right

or left of the display (PC programmable). It is separated from the normal information with an indicator such as an asterisk ("*").

Full Length Indicators

INDV	Displayed when your unit receives an individual call from another unit.
ID#####	If programmed, displayed when your unit receives an individual call where ##### is the unit ID of the calling radio. (Note: If the ID is in your Special Call list, you may choose to show an 8 character name instead of the number.)
PHN CALL	Displayed when your radio receives a telephone call from the trunked system.
DATACALL	Displayed when your radio is involved in a data call.
*NO DATA	Displayed when your radio is in the data disabled state.
* NC *	Displayed when no control channel is found on a trunked system.
ALL CALL	Displayed when receiving a system wide call.
AGENCY	Displayed when receiving an Agency Call.
FLEET	Displayed when receiving a Fleet Call.
EMERGNCY	Displayed steady when operator declares an emergency (optional), flashes when another user declares an emergency.
BOOT DSP	Displayed at power on in radios equipped for Aegis operation. Indicates initialization of Digital Voice Module.
LOAD KEY	Displayed when VGE encryption keys are being uploaded to the Digital Voice Module.

Abbreviated Indicators

F*	Displayed on radios defined in the PC programmer as supervisory when the trunked system is in failsoft mode. (Note: In failsoft mode, trunked dispatch operations is fully operational but interconnect may not be possible.)

C*	Displayed when an individual call has been received and not answered. By selecting Special Call in menu mode, the call can be recalled for return at a later time. (Note: The call is not saved through a power cycle.)
E*	Displayed when an active voice call on a trunked system is in an emergency state.

ALERT TONES

The EDACS MDX radio generates a set of unique alert tones to indicate operating status. The following section identifies and describes the alert tones used in the MDX radio for Conventional, GE-MARC, and EDACS applications.

ALL APPLICATIONS

SELF CHECK TEST ALERT	One beep is sounded after the radio is turned on to indicate that the radio has passed the self diagnostic test. Optional in PC programmer.

EDACS APPLICATIONS

CALL ORIGINATE ALERT	If programmed, a short tone is sounded whenever the Push-To-Talk (PTT) button is keyed and the radio has acquired a channel. This tone indicates the user may begin communications.
AUTOKEY	When the PTT is keyed to place a call on the system, but the PTT is released before getting to the channel (e.g. a queued call), the radio automatically keys on the channel when it gets the assignment. The radio generates a long beep and holds the transmitter keyed for two seconds. Pressing the PTT button keeps the channel and sends the message before this two second time-out has expired.
OUT OF RANGE/ SYSTEM INOPERATIVE	A single low pitched tone will sound immediately after the PTT switch is keyed indicating the radio is out of range of the repeater. The radio tries to place the call for a short period (3 seconds) after the initial attempt. The radio generates a second low pitched tone when it gives up trying to place the call. The system is off the air or the radio needs servicing when the radio is within calling range, and these tones are heard.

CALL RECEIVED	If programmed, a single alert tone sounds when a group call is received and a two tone alert (one high followed by one low tone) is sounded for an individual call.
CALL DISABLED ALERT	You will hear a continuous low pitched tone when your radio is set to an Rx (decode) only group/channel and you press PTT on the microphone. This tone indicates that you are not allowed to place a call on this setting.
CARRIER CONTROL TIMER	The Carrier Control Timer alert is a low pitched tone you will hear whenever you have kept the PTT button continuously pressed for a pre-programmed length of time. Four warning beeps preceed the tone and transmitter shutdown. The transmitter shuts down when the steady low pitched tone starts, interrupting communications. To maintain communications, release and re-key the microphone. This resets the timer and turns the transmitter back on. The CCT is a built in precaution against extended use of the system.

EDACS ALERT TONE SETS

There are two EDACS alert tone sets: single and continuous. The EDACS MDX radio can be programmed to use either set.

Single Alert Tones

CALL QUEUED	If one short, high pitched tone sounds after the transmitter is keyed, it indicates the system has placed the request in a queue. This tone sounds at both the transmitting and receiving end that a call is forthcoming. If the PTT is unkeyed while in the queue, the radio will automatically key push-to-talk when a channel becomes available (see AUTOKEY).
SYSTEM BUSY	If you key the PTT bar and hear three short, medium pitched tones, it indicates that the receiving party is already on the system or the system is busy and its queue is full. You must re-key later to access the system.
CALL DENIED	A single low pitch beep will sound when the PTT switch is keyed and the request is denied by the

system. This happens if the unit is an invalid user or if the unit is requesting an unavailable service.

Continuous Alert Tones

CALL QUEUED	If you hear two short, high pitched beeps after you key the microphone, the system has placed your request in a queue. The tones sound at both your transmitting unit and the receiving unit(s). This indicates to the receiving unit(s) that they will receive a call shortly. These tones will repeat every half second at the caller's radio until Push-To-Talk is released. If you unkey the microphone wile in queue, your radio will autokey when a channel becomes available [Automatically key (push-to-talk), see AUTOKEY].
SYSTEM BUSY	If you key the microphone and hear four short, low pitched beeps, the receiving party is already on the system or the system is busy and its queue is full. The busy tone sequence is repeated as long as you continue to press the PTT switch. You must release and re-key the PTT switch to access the system.
CALL DENIED	If you hear five long low pitched tones when you key the microphone, your request has been denied by the system. this happens if you are an invalid user or if you are requesting an unavailable service.
END OF "CALLBACK"	After receiving a Multi-Group Decode, Scan or Individual Call, you will have a pre-programmed period to respond back to the caller. At the end of this period, the radio will sound two short tones to indicate a return to normal operation, and the received call can no longer be answered directly.

GE-MARC APPLICATIONS

CALL RECEIVED ALERT	If programmed, a single alert tone sounds when a group call is received and a two tone alert (one high followed by one low tone) will sound for an individual call.
CALL ORIGINATE ALERT	**WAIT** will momentarily be displayed when a call is placed; then a three-tone alert is sounded to indicate the call origination is complete. This indi-

	cates a channel was acquired and is ready for normal conversation.
INVALID CALL ORIGINATE ALERT	A low frequency tone is sounded for one second immediately after pressing PTT and the display does not show **WAIT**. This indicates a call was attempted within a group that is not enabled for call originate or an invalid dispatch overdial call was attempted.
SYSTEM TONES	A low frequency tone is sounded for one second after attempting to place a trunked call and **BUSY** will be displayed. This indicates the GE-MARC system is busy. If the "Call Retry" option has been enabled through programming, the radio will retry at 5 second intervals, up to 15 times unless **END** is pressed, a channel is acquired, or an out-of-range condition occurs.
OUT OF RANGE ALERT	If **NO SVC** is displayed and five beeps are sounded after attempting to place a trunked call, then the radio is out of range of the GE-MARC system. If the beeps sound when the radio is within known range of the system, the radio may need servicing. If the "Call Retry" is active, the radio will try the channel at twenty second intervals for five minutes.
CARRIER CONTROL TIMER	(GE-MARC and Conventional) A pulsed tone signal is sounded after PTT is pressed continuously for a pre-programmed time. After nine seconds of pulsing the alert tone, the radio unkeys the transmitter and communications are interrupted. While the tone is pulsing, the user can release and press PTT again to reset the timer and resume the conversation. In the conventional mode, the radio unkeys and beeps until PTT is released.
SYSTEM TONES	The GE- MARC radio may generate other system tones to alert the user of custom programmed events. Contact your GE-MARC system operator for details about these alert tones.

OPERATING NOMENCLATURE

TRUNKED OPERATION (EDACS OR GE-MARC)

Trunked operation refers to the use of a set of radio frequency channels by multiple user groups. Users may place and receive calls to single or multiple users without being monitored by other users (or group) on the system.

CONVENTIONAL OPERATION

All radios on a conventional system operate in one of two modes: repeated or talk-around. Talk-around (also referred to as "direct mode") provides a direct radio-to-radio short-range communications link. It is intended to maintain communications outside of the main system coverage area. Trunked features (such as call queueing and system scan) are not available in conventional mode.

DEFINITION OF TERMS

System — The term system refers to the particular group of station repeaters and set of group/special calls providing service to the radio. Radios can be preprogrammed to work in different systems by changing the systems selection or through wide area roaming.

Group Or Subfleet — A group of users share the same preprogram-med group identification number in their radios. All radios in the same group receive dispatch calls placed by any one radio in the group.

Fleet — A fleet of users consists of multiple groups (subfleets). Radios can be preprogrammed to make fleet calls to simultaneously access multiple user groups.

Agency — An agency is composed of multiple fleets. Radios can be pre-programmed to initiate agency calls to access multiple fleets.

Individual Call — Every radio in the system has been assigned a preprogrammed, unique individual identification code. A radio can be programmed to individually call another particular radio from the Special Call Menu.

Wide Area System Operation (Optional)

This function applies when your systems are networked together in a multi-site configuration. In this mode, your calls are automatically routed to the proper system. You may notice a delay when you press the PTT button while the system is connecting the correct sites. The BSY indicator will be on, indicating you are on the voice channel. In this mode, you can release and press PTT again to override the delay. This gets you onto the system, but does not guarantee that everyone will hear the message.

When in the multi-site mode, your radio may be programmed to look for alternate systems when you go out of range of the currently selected system. If an alternate system is found, the radio locks onto the system and automatically selects the correct information for this new system. Alternately, the radio may be programmed to revert to a conventional channel when out of range of the trunked system.

Each trunked system may also have a priority trunked system associated with it when set to a system with a priority system programmed, the radio periodically checks for the priority system. If found, it automatically switches to that system. The timer is reset every time the PTT button is pressed to avoid interrupting a conversation.

ProSound™

The radio may be programmed for ProSound system scan operation for multi-site applications. ProSound scanning is an enhanced replacement for wide area system scanning. This algorithm insures that the radio continually receives high quality audio. When the selected system degrades to a pre-programmed level, the radio begins searching for the best adjacent system on a part time basis. Once a better system is found, the radio changes to the new system and sounds a tone. Should the control channel be lost completely, the radio will scan the adjacent systems until a suitable one is found.

Telephone Interconnect

This feature allows you to initiate preprogrammed Special Calls or receive telephone calls through your radio if the system is configured for this operation.

BASE/UNIT OPERATION

This pre-programmed option is used in some fleets so units can only hear and talk to a base dispatch unit, not to other radios in the group. In this mode of operation, when a radio in a particular group is talking to the base dispatch

unit, all other radios in that group will receive a "System Busy" tone if they try to access the system.

OPERATING THE RADIO

TURNING THE RADIO ON

1. Push the POWER switch. The display shows the group alpha name once power up is complete. When powering up, the last selected Group or Channel should be displayed unless the radio is programmed for a pre-programmed power up System/ Group. The radio optionally generates a beep once the power up sequence is complete. On radios with Multi-site features enabled, the radio automatically logs onto the system once power up is complete.

2. Set the volume using the VOLUME RAMP button. A short beep sounds each time the VOLUME button is pressed. The beeps will not sound if a call is being received.

SELECTING SYSTEM/GROUP/CHANNEL

Use the **GROUP/SEL** and **SYS**tem controls to select a different Group, System, or Channel.

Group Selection

1. If the unit is in Menu Mode, press and release the **CLR** button to return the radio to normal operation.

2. Press the **GROUP/SEL** + or - ramp button until the desired Group name appears in the alphanumeric display. A tone sounds each time the Group name changes (unless a call is being received).

System Selection

1. If the unit is in Menu Mode, press and release the **CLR** button to return the radio to normal operation.

2. Press and release the **SYS** button to bring up the currently selected system. Press and release the **SYS** button again to increment the System selection.

3. If you want to ramp the system choices up or down, press the **GROUP/SEL** + or - ramp button while the system name is displayed.

A tone sounds each time a System name changes. On units with Automatic Log in for Multi-site Operation, the radio transmits briefly after a system change.

Channel Selection (Conventional System)

To select a different channel when you have selected a conventional system:

1. Press the **GROUP/SEL** + or - ramp button until the desired channel name appears in the alphanumeric display. A tone sounds each time the channel name changes unless the **BSY** indicator is on.

FRONT PANEL SQUELCH ADJUSTMENT

The squelch setting of the radio can be adjusted by the user through the front panel controls. There are a total of 256 steps used internally to the radio for squelch level adjustment.

With the radio on a conventional channel or an EDACS working channel, press and hold the SCN button. Then use the VOLUME ramp button to open and close the squelch. After setting the squelch to the desired setting, release the SCN button to return the radio to normal operation.

INTERNAL/EXTERNAL SPEAKER

When the Internal/External Speaker Option PMSU5A has been installed along with an external speaker, the operator can select either speaker one of two ways.

1. Set the ON/OFF switch on the option box to the ON position to select the external speaker and disable the internal speaker. Place in OFF position to select the internal speaker only.

OR

1. Press the **A1** or **A2** button (pre-programmed) to select the external speaker and disable the internal speaker. Press the **A1** or **A2** button again to select the internal speaker only.

MICROPHONE PUBLIC ADDRESS OPERATION

When the Public Address Option PMSU5A has been installed along with an external speaker, the operator can use the microphone as a public address system.

1. Make sure the radio is turned ON.

2. Press the **MNU** button until **PUB ADDR** appears in the display. Press the PTT switch to transmit the microphone audio to the external speaker.

3. When the PA operation is completed, press the **CLR** button to return to normal operation.

OR

1. Make sure the radio is turned ON.

2. Press the **A1** or **A2** button (pre-programmed). When **PUB ADDR** appears in the display press the PTT switch to transmit the microphone audio to the external speaker.

3. After the PA operation is completed, press the **A1** or **A2** button to return to normal operation.

EDACS TRUNKED OPERATION

PLACING A TRUNKED DISPATCH CALL

To send a message on a trunked system, proceed as follows:

1. Select the System and Group you wish to transmit on.

NOTE

If the group you wish to transmit on is not in the list, a properly programmed System Model MDX has the capability of operating on a user selected group ID.

2. Press and hold down the PTT button.

3. You will hear a short beep (unless the radio is programmed to mute the beeps) indicating that you have access to the system. When you hear the beep, you may begin your message. (Note: If you hear two or more tones or a continuous tone, the system may be busy, your request has been placed in queue, or your call request has been denied for some reason. Refer to ALERT TONES for more details.)

4. After you have finished your call, releasing the PTT button ends the call automatically.

NOTE

In rare instances, several low pitched, fast "chirps" will be heard before the Call Originate tone sounds. This is caused by your radio automatically re-trying to gain access to the system after the first attempt failed (Auto-Retry). This normally occurs in fringe areas and in heavily used systems. The Auto-Retry is one of the features utilized by the radio system to provide reliable communications under adverse conditions.

MANUALLY ENTERING A GROUP ID (System Model Only)

1. Press the **A2** button and observe "GID ENTR" in the display

2. Enter the group ID number using the numeric keypad. (Valid range 1-2047).

3. Press the **A2** button again and observe "GID nnnn" (where nnnn is the entered number) in the display. This new group will replace the first group in the list.

NOTE

It is recommended that a null group be programmed into the first location initially. This will avoid overwriting a desired group from the list unintentionally.

RECEIVING AN EMERGENCY MESSAGE

From The Selected Group

When an emergency is received from a member of your selected group, "EMERGNCY" flashes on your display.

If an emergency call is made, "E*xxxxxx" (where xxxxxx is the balance of the group display) will flash in the display until the call is complete.

When an emergency transmission is received from a member of your selected Group or System; the "E*" portion of the display will flash, the BSY indicator will come on, and a tone sounds. When this occurs, follow your standard emergency procedures. The emergency display remains on until the emergency is cleared.

From A Scanned Group

When you receive an emergency call from a scanned Group (scan operating), the display shows the scanned Group's name with the first two characters replaced by the emergency indicator (typically "E*"). The **BSY** indicator comes on, and you hear the Emergency tone. The display will flash until the **BSY** indicator goes out and the radio returns to normal operation.

SENDING AN EMERGENCY MESSAGE

To send an Emergency call to the selected (or Home) System/ Group, proceed as follows:

1. Press and release the **HOME/EMERGENCY** button (holding it pressed for approximately one second). The radio continuously displays "**EMERGNCY**" (unless programmed off). A message with your ID is also sent to the dispatcher declaring an emergency. You will be given highest priority for voice communication**.**

2. Press the PTT button and wait for the channel-available tone. Speak into the microphone in a normal voice. All audio and displays are restored to normal.

3. Release the PTT button when the transmission is complete, and listen for any reply. The **TX** indicator will go out when you release the PTT button.

CLEARING AN EMERGENCY

If your radio has been programmed as a supervisory unit, you may clear emergency calls. When the emergency is no longer in effect, the emergency call may be cleared as follows:

1. Press and hold the **CLR** button.

2. Press and release the Home/Emergency button. The **EMERGNCY** display goes off.

3. Release the **CLR** button.

SPECIAL CALLS

The Special Call feature within the Menu operation allows you to make calls to individual radios, telephone interconnect Calls and/or System All Calls.

Placing A Telephone Interconnect Call (On Systems Equipped With Interconnect Hardware)

1. Make sure the radio is turned ON, and the proper System has been selected. Press the **MENU** button until the name **SPC CALL** appears in the display. Press the **GROUP/SEL** + or - buttons until the desired name appears in the display. The number may be entered manually on the 12 button keypad of the System Model radio.

2. Press the PTT button momentarily and release for a pre-programmed number. Press the "*" key for a manually entered number on the System Model radio.

3. The radio automatically transmits the pre-programmed number stored in the radio's memory. The system dials the number and the ringing tone is heard on the radio. When the landline party answers, you may speak to them by pressing the PTT button and talk.

NOTE

Your MDX radio is capable of simplex (one way) conversation only. The person you are talking to can hear you ONLY when you have the PTT button pressed. You can hear the person on the telephone ONLY when the PTT button is released.

If you leave the PTT button released for too long, the system will send three beeps. When you hear these beeps, you have five seconds to press the PTT button before the call is automatically terminated.

4. To terminate the call, momentarily press the **CLR** button or hang up the microphone.

Answering A Telephone Interconnect Call

1. Receiving a telephone interconnect call is much like receiving an individual call (refer to RECEIVING AN INDIVIDUAL CALL). When the telephone call is received, the radio displays **PHN CALL**.

2. To terminate the call, momentarily press the **CLR** button or hang up the microphone.

3. If you were out of the vehicle when the call came in, the display will show "**C***" or "***C**" or **P1** & **P2** indicators will flash to indicate that a call was received. If you select SPC CALL from the menu, the "**C***" or **P1**, **P2** indicator, will go away if the call was a phone call. See RECEIVING AN INDIVIDUAL CALL for more detail.

Placing A Special Call To Another Radio

1. Make sure the radio is turned ON, and the proper System has been selected. Press the **MENU** button until the name **SPC CALL** appears in the display. Press the **GROUP/SEL** + or - buttons until the desired name appears in the display. The radio ID may be entered manually if using the MDX System Model radio.

2. Press the PTT button and wait for the channel available tone before talking.

3. When completed, release the PTT button and listen for any reply.

4. When your call is finished, press the **CLR** button or return the microphone to the hookswitch. The previously selected Group name appears on the display.

Receiving An Individual Call

When you receive an Individual Call (call directed only to your radio), the display changes to one of the following displays:

1. "*INDV*"

2. "IDxxxxx", where XXXXX is the numeric ID of the calling radio

3. "ALPHA", where ALPHA is the alpha name of the calling radio

Receiving an Individual Call will also cause the **BSY** indicator to turn on. After the transmission, the **BSY** indicator will go out. The display will continue to show the above until the pre-defined time-out for calling back expires. During this callback period, press the PTT button to return the call. If the call is not returned before the time has expired, the display will return to the Group display with a "**C***" at the left side or a "***C**" at the right side of the display or **P1**, **P2** indicators flashing. This indicates a call has been received. Pressing **CLR** will cause this indicator to go out. The radio will retain the ID in the Special Call list until the radio is powered off or another call is received.

GROUP SCAN OPERATION

You may program your radio to scan a number of Groups for activity.

Adding/Deleting To/From Scan

To add a Group to Scan,

1. Press the **MENU** button until **SCAN A/D** is displayed for menu operation.

2. Press the **GROUP/SEL** (-) button until the **GROUP** name is displayed.

3. Press the **GROUP/SEL** (+) button until the desired level is displayed (**NONE** or **S**).

4. Press the **CLR** button when complete to return to normal operation or menu operation.

If your radio has one of the auxiliary keys pre-programmed to edit the SCAN list, the list may be changed by using the GROUP/SEL buttons to display the GROUP name, and then pressing the auxiliary key until the desired level is displayed.

Starting Or Stopping Scan

1. Press the **SCAN** button until either the "SCN" indicator goes off or on.

NOTE

1. The radio will remember the scan state through a power cycle unless programmed with a predefined power up state.

2. The radio may be programmed to stop scanning when the microphone is removed from teh hookswitch.

3. When the radio is programmed, a FIXED SCAN list can be specified. If this is done, the SCAN list cannot be changed.

RECEIVING A CALL

When a call is received by the radio, the call is decoded. A single alert tone will sound indicating a group call has been received or a two tone alert will sound if an individual call has been received. The display will show the system or area and group when receiving a group call and the system or area and

individual decode when an individual call is received. If the calling party's name is not found, their five digit ID will be displayed instead**.**

If a dispatch call is desired, simply pick up the microphone and press the PTT to transmit to the caller.

ENDING A CALL

The call can be terminated in one of three ways:

METHOD 1: Press **CLR**.

METHOD 2: A system disconnect or time out occurs. During a dispatch call the time out occurs after 6 seconds of channel silence. During an interconnect call the time out occurs after 30 seconds of channel silence.

METHOD 3: Returning the Microphone to the hang-up bracket (enabled through programming).

NOTE

If a channel disconnect occurs before the conversation ended, the call must be initiated again. To avoid confusion it is recommended that a procedure be set up so that the originator of the call is the one designated to re-establish communications. Two or more operators originating a call simultaneously may acquire two different channels making communication impossible.

CONVENTIONAL FAILSOFT OPERATION

In the unlikely event of a failure of the EDACS System, communications may take place in conventional failsoft mode. Your radio will be automatically directed to a communications channel set up for this purpose. During this mode of operation, your control unit displays "CONV FS" in the alphanumeric display. You will also notice increased activity on your channel during conventional failsoft operation, so be careful not to transmit until the channel is clear.

Operation during conventional failsoft will be the same as operation on a conventional system, except you cannot select a communications channel, or use Emergency or Special Call. When trunking is restored, the radio automatically returns to normal operation.

NOTE

Emergency and Special Call are not operational during conventional failsoft. Also, the GROUP control will not operate.

MOBILE DATA TERMINAL INTERFACE (OPTIONAL)

Your MDX radio is capable of interfacing with a Mobile Data Terminal/Computer Host (EDACS ONLY). When placing or receiving data calls, the MDX displays "DATACALL". When "DATACALL" is present, voice calls are disabled. You will miss all voice calls made to the radio when data is being exchanged.

NOTE

Optional interface cables are required when operating with the Mobile Data Terminal/Computer Host.

You can stop transmission and reception of data using any of the following methods:

1. Remove the microphone from the hookswitch.

2. Hold the **CLR** button and press PTT. A high pitched beep will be heard. Release the **CLR** button.

3. Declaring an Emergency (not to be used unless an actual emergency condition exists).

4. A group or system change.

When in the no-data mode, the radio displays "*NO DATA". This will remain displayed until the no-data mode is cleared by one of the following (depending on how it was activated):

1. Replace the microphone into the hookswitch.

2. Repeat the CLR-PTT sequence.

3. Use the CLR-PTT sequence during the emergency to enable data.

SCAN LOCKOUT MODE

Following the transmission or reception of a data call, if scan is enabled, scanning will stop temporarily (duration pre-programmed). During this time

the scan LED will flash to indicate that scan is enabled but temporarily suspended. This mode is normally exited when the pre-programmed time expires; however, the following actions will terminate the scan lockout mode before the timeout is completed.

- The CLR button is pressed.
- PTT is pressed.
- A group or system change.
- Entering phone call mode.
- A new emergency assignment has been received.
- PTT pressed in Public Address Mode.
- An emergency declared or cleared.
- Microphone removed from hookswitch (off-hook).
- Receiving an individual or phone call.
- Receiving Agency, Fleet or System All Call.
- Pressing the SCN button to turn scan on or off.

DATA LOCKOUT MODE

The data lock mode is a pre-programmed mode when the radio will not respond to any data channel assignments and prevents receive data calls from interrupting voice calls. Transmit data calls will still be initiated when needed by the operator. After a pre-programmed time, the radio will respond to receive data calls; however, the following conditions will clear the data lockout mode:

- The CLR button is pressed.
- Transmitting a data call.
- Changing a system.
- An emergency.
- Pressing PTT while in Public Address mode.
- Turning scan on with the SCN button.

STATUS OPERATION

Status operation permits the transmission of pre-programmed status conditions to the EDACS site. The status can be sent in two ways.

1. Press the **MNU** button until "STATUS" appears in the display. Use the **GROUP/SEL** buttons to step through the selections.

2. When the desired status is displayed, press the PTT switch to send the status to the site or stored in the radio memory where it can be polled by the site at a future time. If the site does not receive the status properly, the radio will sound a low pitched tone.

3. Press the **CLR** button to return the radio to normal operation.

OR

1. Press the **A1** or **A2** button (pre-programmed). "STATUS" appears in the display. Use the **GROUP/SEL** button to view/select the status to be sent.

2. Press the PTT switch to send the status to the site or to be stored in the radio memory where it can be polled by the site at a future time.

3. Press the **A1** or **A2** button to return to normal operation.

MESSAGE OPERATION

Message operation permits the transmission of pre-programmed message(s) to the EDACS site. The message can be sent in two ways.

1. Press the **MNU** button until "MESSAGE" appears in the display. Use the **GROUP/SEL** buttons to step through the selections.

2. When the desired message is displayed, press the PTT switch to send the message to the site. If the site does not receive the message properly, the radio will sound a low pitched tone.

3. Press the **CLR** button to return the radio to normal operation.

OR

1. Press the **A1** or **A2** button (pre-programmed). "MESSAGE" appears in the display. Use the **GROUP/SEL** button to view/select the message to be sent.

2. Press the PTT switch to send the message to the site. If the site does not receive the status properly, the radio will sound a low pitched tone.

3. Press the **A1** or **A2** button to return to normal operation.

DYNAMIC REGROUP OPERATION

Dynamic regroup operation permits multiple talk groups (up to eight) to be added to a radio via the system manager. The radio must be pre-programmed to respond to regrouping. Dynamic regrouping will not be activated in a radio until an activation message is sent by the system manager. Each radio that receives and acknowledges the regrouping instructions is successfully regrouped.

Emergency Operation

If the pre-programmed groupset on the currently selected system contains an EMERGENCY/HOME group and the radio is in dynamic regroup, the radio will exit dynamic regroup and declare the emergency on the HOME group. If no EMERGENCY/HOME group is present, the radio will declare the emergency on the currently selected dynamic regroup group.

AEGIS OPERATION

NOTE

Each channel or talk group (EDACS) can be programmed for ANALOG Voice, Aegis Digital Voice, or Aegis VGE Encrypted Digital Voice mode of operation by programming the "KEY" variable

When programmed "DIS", a channel or talk group will only operate in the ANALOG mode. ANALOG voice calls can be easily monitored by unauthorized persons.

When programmed "DIG", a channel or talk group will only transmit Aegis Digital Voice. Aegis Digital Voice and ANALOG Voice calls can be received.

When programmed "1-6", a channel or talk group will transmit Aegis VGE Encrypted Digital Voice. Valid cryptographic keys must be loaded into the MDX using the Universal Key Loader. The "PVT" icon (indicating encrypted mode is on) can be turned on and off using one of the AUX keys or by chosing "FORCED" as the mode of operation in the programmer.

VOICE MODES

Each system (trunked or conventional) in the radio can be programmed for Aegis communications. Aegis programmed systems have two (2) different voice modes: clear (analog) and digital. 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 mode.

TRANSMIT/RECEIVE MODE COMPATIBILITY FOR AEGIS OPERATION

GROUP/CHANNEL PROGRAMMING (TRANSMIT)	CLEAR RECEIVE	DIGITAL RECEIVE
CLEAR	Yes	No
DIGITAL	Yes	Yes

NOTE

Conventional Aegis requires Channel Guard on the channel to operate correctly.

CLEAR MODES

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

AEGIS DIGITAL MODE

Aegis digital mode allows the radio to transmit and received 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.

Message trunked group calls and individual calls will be answered back in the mode in which they were received, assuming the call or hang time is still active. Individual, phone, all and emergency calls will be transmitted clear if digital mode is disabled or inoperative.

1. If receiving an analog message trunked call, the radio will respond in analog mode during the hang time on the working channel.

2. If receiving an analog I-Call, the radio will respond in analog mode during the call back time.

3. When using the "call back" feature to respond to an I-Call the call will be transmitted in the mode in which it was received.

Scanned Group Calls

Receiving a scanned group call is the same as receiving a selected group call. During the scan hang time, if the radio was programmed for autoselect, it will transmit back in the same mode in which the call was received. For example, if a clear group is entered in the scan list, it will only receive clear calls. If the same group was available in digital and entered in the scan list, it can receive clear and digital calls, provided autoselect was programmed in the radio. The user can select transmitting on the scanned or selected group. If a

group is entered in the scan list more than once and in different modes (clear or digital), only the first occurrence of the group will be used.

CONVENTIONAL OPERATION

Outside Address

The same outside address (works similar to Channel Guard operation) must be programmed in the transmitting and receiving radios when Aegis digital operation is enabled. If address is not correct, the radios will not communicate.

Channel Guard

Channel Guard encode is transmitted on analog, clear channels only. Channel Guard decode will operate on either a clear or digital channel. The exception is when GE•STAR signaling is used (see GE•STAR paragraph).

GE•STAR

When GE•STAR is programmed on a private channel, the radio will transmit GE•STAR in clear mode and then switch to private for the voice portion of the call. If GE•STAR is sent with Channel Guard, then both are sent in clear mode and then radio switches to private mode. Emergency GE•STAR data burst is transmitted in clear mode.

GE-MARC OPERATION

PLACING A DISPATCH CALL

1. Select the desired system or area and group.

2. Press PTT.

3. The display changes from the selected system or area and group display to **WAIT** while the radio is acquiring a repeater.

4. The radio sounds a three-tone alert signal when the communications channel is acquired.

5. If the radio is out of range of the selected system, 4 short and 1 long beep will be heard and **NO SVC** will be displayed for approximately 20 seconds. While **NO SVC** is displayed, no attempts can be made to place a call. If a new area is selected **NO SVC** turns off and the

call can now be attempted in the new service area. If all available repeaters are busy when the call is attempted, 1 long beep is heard and **BUSY** is displayed. If the call retry option has been enabled through programming, **RETRYING** displays instead of the BUSY message.

6. The Selected area and group is displayed again once the call is completed.

RECEIVING A TRUNKED DISPATCH CALL

1. You will hear a beep each time you have an incoming call (unless the radio is programmed to mute the beep). A single beep indicates you are receiving a group call. Two beeps (high-low) indicate you are receiving an individual call. You will then hear the voice message. You can answer the call by pressing the PTT button.

NOTE

In some modes of operation such as an agency call, fleet call, or individual call, you must answer the caller within several seconds. If not, two short beeps will sound, the call will be terminated, and normal system operations will resume.

2. When you hear a high pitched beep, someone in your system has tried to call you, but the call was queued because the system is busy. These beeps let you know you will receive a call shortly.

SPECIAL CALLS

The Special Call feature within the menu operation allows you to make calls to individual radios, Telephone Interconnect Calls and/or System All Calls.

Placing A Telephone Interconnect Call (On Systems Equipped With Interconnect Hardware)

1. Make sure the radio is turned ON, and the proper System has been selected. Press the **MENU** button until the name **SPC CALL** appears in the display. Press the **GROUP/SEL** + or - buttons until the desired name appears in the display. The number may be entered manually on the twelve button keypad of the System Model radio.

2. Press the PTT button momentarily and release for a pre-programmed number. Press the "*" key for a manually entered number on the System Model radio.

3. The radio automatically transmits the pre-programmed number stored in the radio's memory. The system dials the number and the ringing tone is heard on the radio. When the landline party answers, you may speak to them by pressing the PTT button and talking.

NOTE

Your MDX radio is capable of simplex (one way) conversation only. The person you are talking to can hear you **ONLY** when you have the PTT button pressed. You can hear the person on the telephone **ONLY** when the PTT button is released.

If you leave the PTT button released for too long, the system will send three beeps. When you hear these beeps, you have five seconds to press the PTT button before the call is automatically terminated.

4. To terminate the call, momentarily press the **CLR** button or hang up the microphone.

Answering A Telephone Interconnect Call

1. Receiving a telephone interconnect call is identical to receiving an individual trunked dispatch call (refer to RECEIVING AN INDIVIDUAL CALL). When the telephone call is received, the radio displays **PHN CALL**.

2. To terminate the call, momentarily press the **CLR** button or hang up the microphone.

3. If you were out of the vehicle when the call came in, the display will show "**C***" or "***C**" or **P1** & **P2** indicators will flash to indicate that a call was received. If you select SPC CALL from the menu, the "**C***" or **P1**, **P2** indicator, will go away if the call was a phone call. See RECEIVING AN INDIVIDUAL CALL for more detail.

Placing A Special Call To Another Radio

1. Make sure the radio is turned ON, and the proper System has been selected. Press the **MENU** button until the name **SPC CALL** appears in the display. Press the **GROUP/SEL** + or - buttons until the desired name appears in the display. The radio ID may be entered manually if using the MDX System Model Radio.

2. Press the PTT button and wait for the channel available tone before talking.

3. When completed, release the PTT button and listen for any reply.

4. When your call is finished, press the **CLR** button or return the microphone to the hookswitch. The previously selected Group name appears on the display.

Receiving An Individual Call

When you receive an Individual Call (call directed only to your radio), the display changes to one of the following displays:

1. "*INDV*"

2. "IDxxxxx", where XXXXX is the numeric ID of the calling radio

3. "ALPHA", where ALPHA is the alpha name of the calling radio

Receiving an Individual Call will also cause the **BSY** indicator to turn on. After the transmission, the **BSY** indicator will go out. The display will continue to show the above until the predefined time-out for calling back expires. During this callback period, press the PTT button to return the call. If the call is not returned before the time has expired, the display will return to the Group display with a "**C***" at the left side or a "***C**" at the right side of the display or **P1**, **P2** indicators flashing. This indicates a call has been received. Pressing **CLR** will cause this indicator to go out. The radio will retain the ID in the Special Call list until the radio is powered off or another call is received.

DIRECT MODE OPERATION

The direct mode provides short range, line of sight communications. In the direct (or talk-around) mode, the direct mode is not functional in a trunked system.

1. Select the direct mode system or area using +/- ramp button on the front of the radio.

2. Determine if the channel is in use before making the call. To monitor the channel press **CLR** which momentarily disables the squelch. Also, removing the MIC from the holder allows monitoring of the channel without disabling the squelch (Channel Guard and Busy Tone are disabled). If the channel is in use the **BSY** indicator will be turned on.

3. Press PTT and send the message. **TX** displays when the radio is transmitting.

CONVENTIONAL MODE OPERATION

1. Select the conventional mode system using +/- ramp button.

2. Determine if the channel is in use before making the call by pressing **CLR** to momentarily disable the squelch and monitor the channel for activity. Also, removing the microphone from the holder disables Channel Guard which allows monitoring of the channel without disabling the squelch.

3. Press PTT to send the message.

RECEIVING A CALL

1. Make sure that the radio is turned ON, and the proper channel is selected using the **GROUP/SEL** + or - ramp button and the **SYS** button.

2. Press the **CLR** button to monitor the channel. Noise will be heard if there is no activity on the channel. This function is also useful for setting the desired volume level.

3. You will hear the voice message automatically if a valid message is received by your radio.

SENDING A MESSAGE

1. Make sure the radio is turned ON, and the proper Channel and System have been selected.

2. Press the **CLR** button to determine if the channel is in use. Never transmit a message with your radio while the channel is being used by someone else. Also observe the BSY indicator (lighted when channel in use).

3. Press the PTT button and speak into the microphone. The TX indicator will light each time the PTT button is pressed.

4. Release the PTT switch and wait for an answer to your call. Then complete your message.

5. When the PTT switch is pressed continuously for a pre-programmed time (default of 30 seconds), the carrier control timer (if enabled) will sound a pulsed alert tone and unkey the transmitter. Release and press the PTT switch again to reset the timer and resume conversation.

NOTE

Always speak in a normal tone of voice. Hold the microphone cupped in your hand and touching your cheek lightly. Speak across the face of your microphone, not directly into it. Shouting will degrade your transmission, so do not speak any louder than normal.

SCAN OPERATION

SCAN SETUP

You may program your radio to scan a number of Channels for activity on the selected system.

Starting Or Stopping SCAN

Press the SCAN button to alternate between Scan on (SCN indicator illuminated) and Scan off (indicator dark).

Adding/Deleting To/From SCAN

SCAN should be off before changing the SCAN list.

1. Press the menu button until SCAN A/D is displayed.

2. Press the GROUP/SEL (-) button until the CHANNEL name is displayed.

3. Press the GROUP/SEL (+) button until the desired priority level is displayed by the scan priority indicators on the right side of the display; the choices are S, P2; P1 or all off (all off removes the channel from the SCAN list).

4. Press the CLR button when completed to return to normal operation.

If your radio has one of the auxiliary keys pre-programmed to edit the SCAN list, the list may be changed by using the GROUP/SEL buttons to display the CHANNEL name, and then pressing the auxiliary key until the desired level is displayed.

NOTE

1. The radio will remember the scan state through a power cycle unless programmed with a predefined power up state.

2. The radio may be programmed to stop scanning when the microphone is removed from the hookswitch.

3. When the radio is programmed, a FIXED SCAN list can be specified. If this is done, the SCAN list cannot be changed.

4. A previous channel with priority will become a non-priority scan channel when a new priority channel is programmed.

The SCAN function allows monitoring of up to 1 6 receive channels on the selected system. The scanned channels may be any frequency within the frequency band limits of the radio and may be Channel Guard protected. All scan functions are retained in memory, even if the 12 Volt vehicle battery is disconnected.

Any channel may be scanned with or without a priority level. One channel may be programmed for Priority 1 (P1) and another for Priority 2 (P2) with any or all remaining channels programmed as non-priorities.

RECEIVER SCAN RATE

The scan rate for the radio will vary depending upon the number of channels programmed into the scan list and whether or not Channel Guard is programmed. The scan rate will be faster when fewer channels are programmed into scan memory.

Scan operation will be determined by the following conditions:

- PRIORITY 1, PRIORITY 2 and NON-PRIORITY PROGRAMMED
  The Priority 1, Priority 2 and up to 14 remaining channels will be scanned. Once a carrier is detected (and if programmed, the correct Channel Guard is decoded), the display will indicate that channel. Sampling of the Priority 1 and Priority 2 channels continues while receiving a message. Should a Priority 1 or 2 channel carrier (and correct Channel Guard) be detected while a non-priority channel is being received, the applicable indicator, P1 or P2 lights, and the channel is switched to the Priority 1 or 2 channel regardless of what is being received on the non-priority channel.

- NON-PRIORITY PROGRAMMED
  Up to 16 non-priority channels may be scanned. Once a carrier is detected (or correct Channel Guard is decoded) the digital display will indicate that channel. Scanning will stop and remain on the channel until the carrier disappears; after a few seconds scanning resumes. The channels are scanned in descending order.

USING THE RADIO WITH SCAN

The Selected Channel

The SELECTED channel is the channel in the display when scan is turned on by pushing the SCAN switch. When a signal is not being received, the radio reverts to this channel for transmitting. When a signal is being received, the radio can be PC programmed to either revert to the SELECTED channel or remain on the received channel for transmission.

The SELECTED channel does not necessarily have to be a channel in the scan list. The SELECTED channel will be temporarily entered into the scan list and scanned until the SELECTED channel is changed.

When scan is turned off by pushing the SCAN switch, the radio will return to the SELECTED channel.

Display

Channel indicator

While no signal is being received, the channel indicator will always show the SELECTED channel. When an active channel is received, the channel indicator will show the received channel.

SCN indicator

When the SCAN button is pushed, the radio will light the SCN indicator and begin scanning. The SCN indicator will flash when the microphone is placed off-hook to show the radio is no longer scanning (only if the radio is PC programmed not to scan off-hook).

Transmitting While In Scan:

Transmitter operation in scan is determined by the PC programming of the radio's personality. A flow chart is provided in this section to summarize the scan operation described below.

- Off-hook scan not enabled (default):

  With off-hook scan not enabled (normal default condition), all scanning will stop when the microphone is placed off-hook. The SCN indicator will flash to show all scanning has stopped. If a signal is not being received when the microphone is placed off-hook, the radio will transmit on the SELECTED channel. If a signal is being received when the microphone is placed off-hook, the radio can be PC programmed (using the "scan transmit option") to either stay on the receive channel or revert to the SELECTED channel. When the microphone is placed back on-hook, the radio will immediately start scanning, even if the received channel was still active.

- Off-hook scan enabled:

  With off-hook scan enabled, moving the microphone off-hook will not affect scan operation. The radio will continue scanning. If a signal is not being received, the radio will transmit on the SELECTED channel. If a signal is being received, the radio can be PC programmed (using the "scan transmit channel" option) to either stay on the receive channel or revert to the SELECTED channel when the mic PTT is keyed.

- On-hook

  When the microphone is on-hook (in the microphone hanger) and the radio is not receiving a channel, the radio always transmits on the SELECTED channel.

  When the radio is receiving a channel the radio's personality can be programmed to transmit either on the received channel or the SELECTED channel. If the radio was programmed for the SELECTED channel, the display changes to the SELECTED channel when the transmitter is keyed.

Monitor (CLR) Switch Operation In Scan

The CLR switch does not operate while scanning inactive channels. When a channel becomes active, the CLR switch operates only during the scan hang time after the channel activity disappears.

Channel Changes In Scan

Pushing the channel switches (UP or DOWN) while scan is turned on will change the SELECTED channel assignment. If a signal is being received and

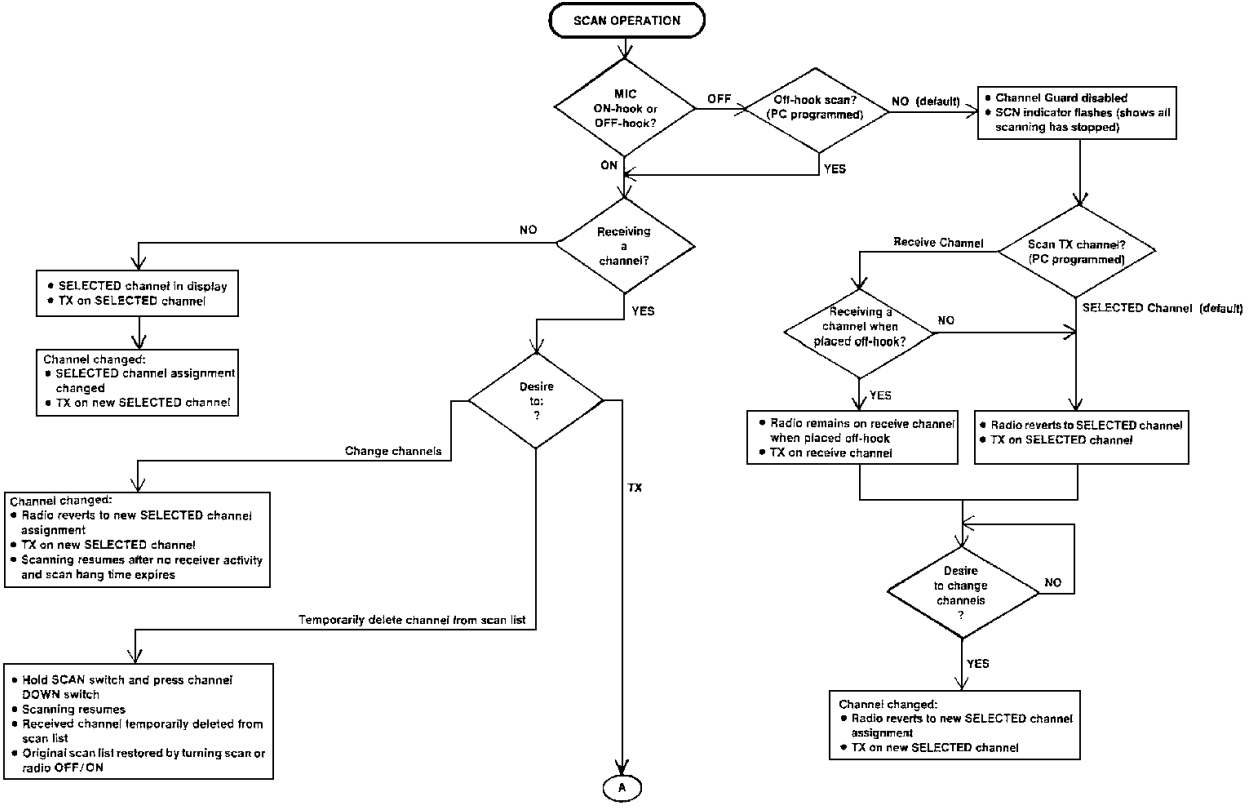
the channel switches are pushed, the radio will revert to the new SELECTED channel assignment. After 2 seconds, if no activity appears on the new SELECTED channel, scanning will resume. If the SELECTED channel is changed to a channel not in the scan list, the new channel will be temporarily added to the scan list until the SELECTED channel is changed again.

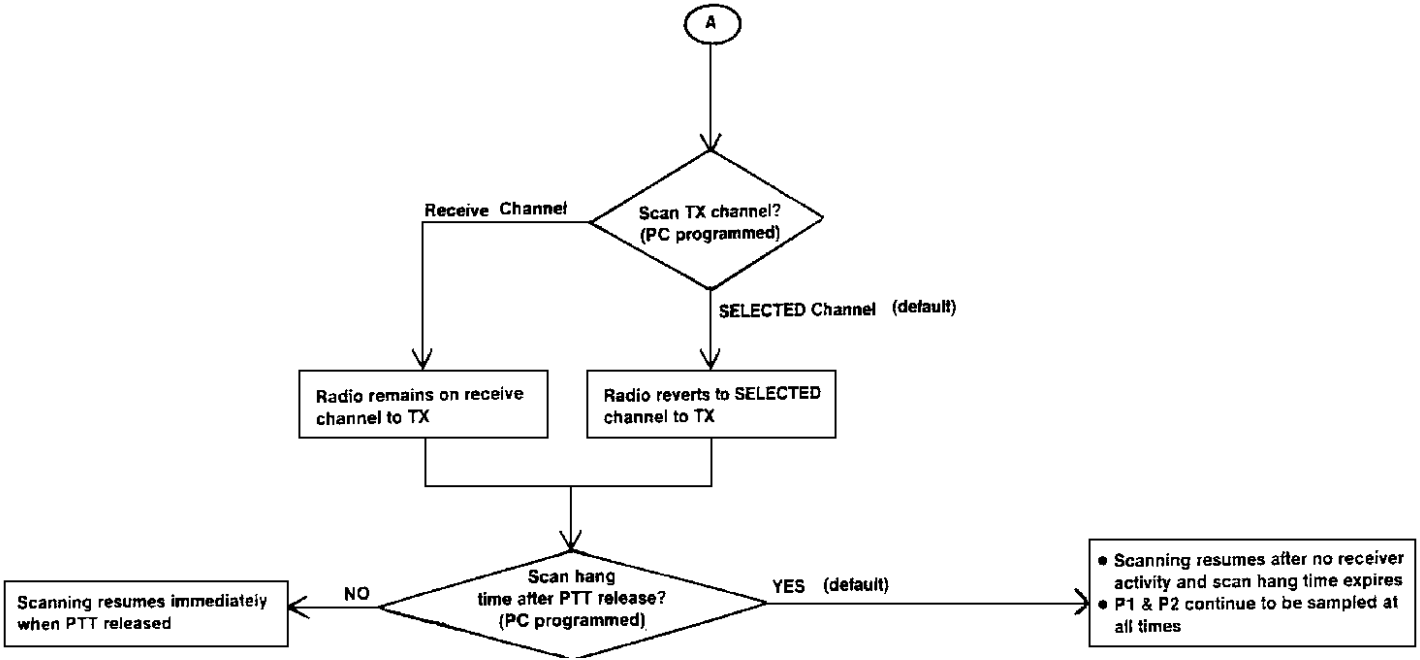
- Temporary channel deletions

  The SCAN function must be turned off to make any permanent changes (additions, deletions, re-priorizations) to the scan list. While in scan, temporary channel deletions may be made to the scan list. The original scan list will be back in effect by either turning scan off (by pushing the SCAN switch) or by turning the radio power off and back on.

  When the radio stops scanning on an active channel, the channel may be temporarily deleted by pressing the applicable A1 or A2 key (pre-programmed for SCAN ADD/DELETE) or by going into Menu mode SCAN A/D and pressing the GROUP/SEL (+) button. The radio will immediately resume scanning while skipping over the temporarily deleted channel.

  Temporary deletions cannot be made until the radio stops on an active channel. P1 and P2 channels cannot be temporarily deleted.


SCAN OPERATION
MIC ON-hook or OFF-hook?
OFF
Off-hook scan? (PC programmed)
NO (default)
• Channel Guard disabled
• SCN indicator flashes (shows all scanning has stopped)
YES
ON
Receiving a channel?
NO
• SELECTED channel in display
• TX on SELECTED channel
Channel changed:
• SELECTED channel assignment changed
• TX on new SELECTED channel
YES
Desire to:
?
Change channels
Channel changed:
• Radio reverts to new SELECTED channel assignment
• TX on new SELECTED channel
• Scanning resumes after no receiver activity and scan hang time expires
Temporarily delete channel from scan list
• Hold SCAN switch and press channel DOWN switch
• Scanning resumes
• Received channel temporarily deleted from scan list
• Original scan list restored by turning scan or radio OFF/ON
TX
A
Receive Channel
Scan TX channel? (PC programmed)
SELECTED Channel (default)
Receiving a channel when placed off-hook?
NO
YES
• Radio remains on receive channel when placed off-hook
• TX on receive channel
• Radio reverts to SELECTED channel
• TX on SELECTED channel
Desire to change channels ?
NO
YES
Channel changed:
• Radio reverts to new SELECTED channel assignment
• TX on new SELECTED channel


A
Scan TX channel?
(PC programmed)
Receive Channel
SELECTED Channel (default)
Radio remains on receive channel to TX
Radio reverts to SELECTED channel to TX
Scan hang time after PTT release?
(PC programmed)
NO
Scanning resumes immediately when PTT released
YES (default)
• Scanning resumes after no receiver activity and scan hang time expires
• P1 & P2 continue to be sampled at all times

TYPE 99 OPTION

If the Type 99 Option is present, individual selective calling is possible. Press the programmed Flex key or use the menu and GROUP/SEL keys to enable the decoder option (Scan must be off). The LED display will show the option status: "T99 ON" or "T99 OFF". Press the button a second time to toggle the option status. The display will revert to normal channel display after 5 seconds. When a call is received, an alert tone will be heard and the display will flash, alternately "T99" and the channel selected. After receiving the call, press the CLR button to reset the decoder for the next call. The display will stop flashing.

If a call was received and the display is flashing, the CLR button must first be pushed before the T99 option may be disabled.

If the Horn Alert option is present with the Type 99 option, the radio can beep the vehicle horn when a Type 99 call is received. This option permits alerting persons out of the vehicle when a call is received. The Horn ON/OFF switch which is mounted on or near the radio is used to turn off the horn beep relay.

ADDITIONAL ACCESSORIES (OPTIONS)

The following equipment options are available for the MDX radio. Refer to your local radio supplier for ordering information.

MDX Optional Accessories

Option	Description	Part Number
PMAN1L	800 MHz roof mount antenna with TNC connector	19B209568P5
PMAN1M	900 MHz roof mount antenna with TNC connector	19B801182P3
PMAN1N	900 MHz glass mount antenna with TNC connector	19B801182P5
PMAN1P	900 MHz mag mount antenna with TNC connector	19B801182P4
PMAN1R	VHF/UHF roof mount antenna with TNC connector	19B209568P6

Option	Description	Part Number
PMCC9M	External Speaker cable, 18 inches	19A149590P8
PMCD1W	External speaker cable, 16 feet, requires option PMZM1K	19A149590P10
PMCD7W	Power cable, 9 feet	19B801358P18
PMCD7Z	External option cable, 2 feet	19C851585P14
PMCD9A	Power Cable, 18 feet	19B801358P17
PMCE7G	RDI interface cable. Used with data application.	19A705884P4
PMEN1D	Aegis modification kit	
PMLS1F	Speaker, MIL-STD-810 C & D, 5" x 5", GE logo, requires options PMCD7Z & PMCC9M	19A149590P1
PMLS1H	Speaker, MIL-STD-810 C & D, 5" x 5" Ericsson Logo, requires options PMCD7Z & PMCC9M	19A149590P11
PMMA1L	Desk mounting wedge for staion use	19C851685G2
PMMA1M	Mounting bracket	19C138051G11
PMMC3X	Desk microphone for station use, GE logo	19C851086P14
PMMC5A	Desk microphone for station use, Ericsson logo	19C851086P15
PMMC5K	DTMF microphone, GE logo	
PMMC5L	Noise cancelling microphone, Ericsson logo	
PMMC5N	DTMF microphone, Ericsson logo	
PMMC5W	Noise cancelling microphone, GE logo	
PMMK3D	Keycap kit w/removal tool	344A4254G2

Option	Description	Part Number
PMPD1A	Noise suppression kit	19A148539G1
PMPL1X	Wide Area Scan (ProSound)	
PMPL1Y	Priority System Scan	
PMPL1Z	Emergency	
PMPL3A	Dynamic Regrouping	
PMPS1C	Power supply, 120 VAC, 50/60 Hz, 13A. For station use.	19A704647P12
PMPS1D	Power supply, 240 VAC, 50/60 Hz, 13A. Unterminated. For station use.	
PMSU1C	Alarm (horn) relay kit, requires option PMCD7Z	19A705499P1
PMZM1K	External speaker kit, GE logo, requires option PMCD7Z, includes options PMLS1F and PMCC9M	
PMZM5R	Mil-Spec Microphone and Hanger, GE logo	
	PROGRAMMING OPTIONS	
TQ3370	Programming Interface Module Kit	
TQ3372	Programming Cable	
TQ3346	GE-MARC/Conventional Programming	
TQ3364	EDACS Programming (Also includes GE-MARC and Conventional)	

NOTES

NOTES

NOTES

FREQUENTLY CALLED NUMBERS

MEMORY LOCATION	NAME	TELEPHONE NUMBER
01		
02		
03		
04		
05		
06		
07		
08		
09		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		

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 change only for the Equipment covered under Paragraph B.3, and only during the first three (3) months following the date of sale to the Buyer. Thereafter, labor will be charged at prevailing rates. To be eligible for no-charge labor, service must be performed by an Authorized Service Center or other Servicer approved for these purposes either at its place of business during normal business hours, for mobile or personal equipment, or at the Buyer's location, for fixed location equipment. Service on fixed location equipment more than thirty (30) miles from the Service Center or other approved Servicer's place of business will include a charge for transportation. Equipment located off-shore is not eligible for no-charge labor.

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

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

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

EMERGENCY NUMBERS

Police
State Police
Fire
Poison Control
Ambulance **Life Saving and Rescue Squad**

OPERATING TIPS

The following conditions tend to reduce the effective range of two-way radios and should be avoided whenever possible.

Operating the radio in low areas of terrain or while under power lines or bridges.

Obstructions such as mountains or buildings between the vehicle sending and the system/person receiving the message.

In areas where transmission or reception is poor, some improvements may be obtained by insuring that the antenna is vertical (particularly if a glass mount antenna is used). Moving a few yards in another direction or moving to a higher elevation may also improve communications.

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.