LBI-38979

ERICSSON

Mobile Communications

EDACS™ M-PA™ PORTABLE RADIOS

Operator's Manual

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INTRODUCTION

The EDACS™ M-PA™ Select, Scan and System model radios are high-quality microprocessor-controlled synthesized two-way FM portable radios. These full-featured radios are designed for operation in EDACS (Enhanced Digital Access Communications System) trunking systems and conventional radio systems. M-PA operation is highlighted by the radio's programming versatility. This permits custom operation of each radio to meet the needs of the radio system and the individual users.

This manual describes operating procedures for the three (3) different radio models.

The M-PA Select model radio is the basic version of the radio that can be programmed with up to sixteen (16) independent trunked groups and/or conventional radio channels. This unit features an eight-digit alphanumeric liquid crystal display (LCD) and a 16-position knob for group/channel selection. The display also has status flags that indicate various operating modes and it is backlit for nighttime and low-level ambient light operation.

Scan and System model radios have an LCD similar to the Select model radio. These radios have front panel keypads that provide additional operating features not available on the Select model radio. The Scan model radio has a 4-button keypad and the System model radio has a 16-button keypad. Additional features

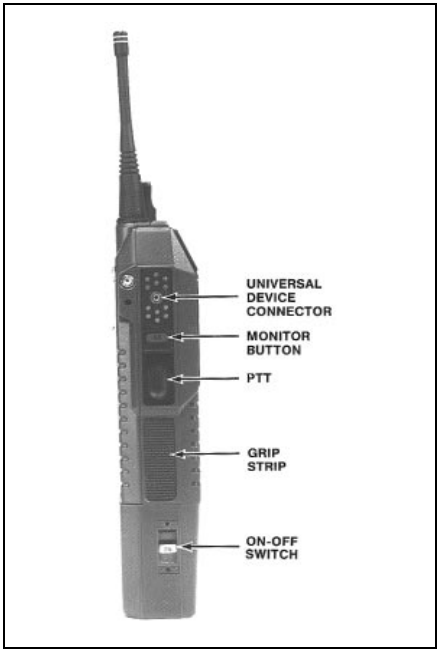


Figure 1 - Side View (All Models)

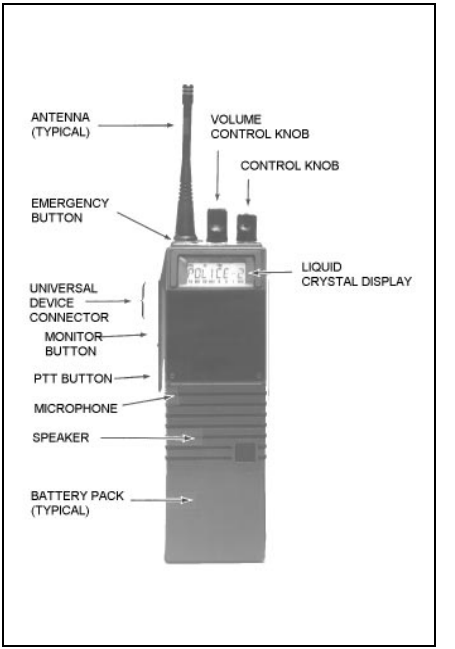


Figure 2 - Select Model

include expanded system and group/channel selection capability, trunked group and conventional channel scan capability, trunked mode individual call capability, and telephone interconnect call capability. The numeric keypad on the System model radio also allows storage of ten (10) operator-entered telephone numbers and ten (10) operator-entered radio ID numbers. These numbers can be recalled at will and initiated. Manually dialed telephone interconnect with overdial capability and conventional mode DTMF dialing is also provided by the System model's 16-button keypad.

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

The radio operates in trunked mode when a trunked system is selected and it operates in conventional mode when a conventional system is selected.

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 resume oper-

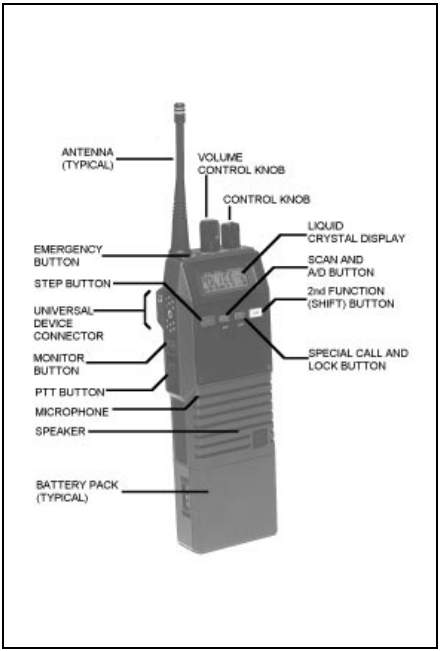


Figure 3 - Scan Model

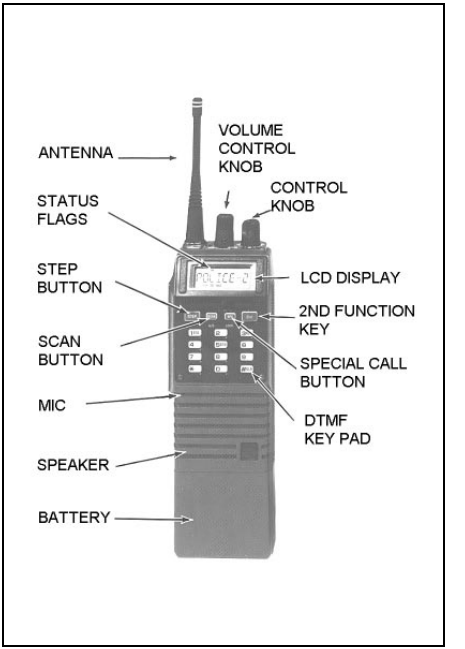


Figure 4 - System Model

ating on the previous group or channel. 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 volume level in the speaker. Rotating this knob in a clockwise direction will increase the volume and counter-clockwise rotation will decrease the volume. Minimum volume levels can be programmed into the radio to prevent missed calls when the knob is rotated fully counter-clockwise.

CONTROL KNOB

The rotatable 16-position CONTROL KNOB located on the top of the radio provides system, group or channel selection according to how the radio is programmed. 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.

On the Select model radio, the CONTROL KNOB selects any one of trunked systems and groups or conventional channels programmed into the radio.

On Scan and System model radios, the CONTROL KNOB is used in combination with the keypad to select

*a specific trunked system and group or a conventional channel. The selection method is determined by the radio's programming. See the section entitled "**SYSTEM/GROUP/CHANNEL SELECTION**" in the "**OPERATION**" section of this manual for details.*

PTT BUTTON

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

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

MONITOR BUTTON

Trunked Mode

When operating on a trunked system in special call mode, pressing the MONITOR BUTTON after an individual call has been received will return the radio to the group call mode. In this condition, the radio will not respond on an individual basis but it will then transmit group calls upon subsequent activations of the PTT BUTTON. The radio will also automatically return to the group call mode after the

programmed individual call-back time-out period expires.

This button is also used to toggle between group and regroup settings if the Dynamic Regrouping mode (with deselect capability) has been activated by the site controller.

On the System model radio, pressing the MONITOR BUTTON will clear all digits entered from the numeric keypad and return the radio to the selected group display.

Conventional Mode

When the radio is operating in conventional mode (on a conventional channel), the MONITOR BUTTON is used to temporarily unsquelch the receiver so channel traffic can be monitored. Momentarily pressing it will unsquelch the receiver.

If the selected channel has Channel Guard (CG) and/or Type 99 (T99) coded-squelch tone decode feature programmed for the selected channel, this button can also be used to enable and disable the programmed feature. Repeated activations will toggle CG and/or T99 between the enabled (on) and disabled (off) states. To toggle the programmed feature, press and hold the MONITOR BUTTON until the appropriate status flag toggles (at least two (2) seconds).

The MONITOR BUTTON is also used to reset the radio after a Type 99 (T99) selective call has been successfully received. If the radio is operating in a Type 99 mode, momentarily press the MONITOR

BUTTON to reset the radio after a T99 call is successfully received.

EMERGENCY BUTTON

When the radio is operating in trunked mode, pressing and holding the red EMERGENCY BUTTON on top of the radio for approximately one (1) second will initiate an emergency call on the programmed home group. If no home group is programmed into the radio the emergency call will be transmitted on the selected group.

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

STEP BUTTON
(Scan And System Models Only)

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

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

SCAN BUTTON
(Scan And System Models Only)

*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 turn on and all groups/channels on the scan list in the current system will be scanned.*

SPC BUTTON
(Scan And System Models Only)

Pressing SPC will switch operation from the group select mode to the special call mode. The last selected special call will be displayed.

While in special call mode, the next programmed special call can be

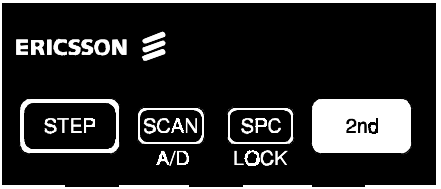


Figure 5 - Scan Model Keypad

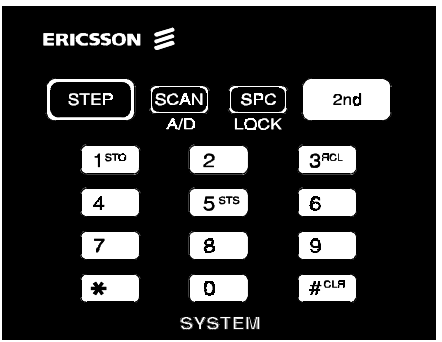


Figure 6 - System Model Keypad

*selected by pressing STEP. Pressing 2nd then STEP will select the previous programmed special call. The caller's ID of the last received individual call and the last received group call on the selected group are also selectable using this method. See "**Special Calls**" for details.*

2nd BUTTON (Scan And System Models Only)

On an M-PA Scan model radio the two (2) center buttons (SCAN and SPC) on the keypad are dual-function buttons. The second or shifted functions are accessed by first pressing the blue 2nd button. The SCAN button's second function is scan add/delete for scan list updating. The second function for the SPC button is the keypad lock feature.

On an M-PA System model radio, six (6) of the buttons on the keypad are dual-function buttons. Press and release the blue 2nd function button to shift keypad selection to the scan add/delete (SCAN button), the keypad lock feature (SPC button), STO, RCL, CLR, or STS buttons.

ADD/DELETE BUTTON (Scan And System Models Only)

*When in trunked mode, pressing and releasing 2nd and then pressing A/D (shifted SCAN button) will toggle the selected group on and off the scan list. When the selected group is on the scan list, the **"S"** status flag will show in the display.*

In conventional mode, pressing and releasing 2nd and then pressing

*A/D (shifted SCAN button) will scroll the selected channel's scan priority between non-priority scan (**"S"** status flag), priority-two scan (**"2"** status flag), priority-one scan (**"1"** status flag) and no scan (no status flags).*

*Scan must be turned off (**"SCN"** status flag off) before groups or channels can be added to or deleted from the scan list.*

LOCK BUTTON (Scan And System Models Only)

*The radio's keypad can be locked to prevent accidental activations. To lock the keypad, simultaneously press the 2nd and LOCK (shifted SPC); **"LOCKED"** will be displayed when the keypad is locked. To unlock the keypad, press the 2nd and LOCK buttons again; **"UNLOCKED"** will be displayed momentarily.*

STO BUTTON (Shifted Digit 1 - System Model Only)

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

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

Store individual radio ID numbers by entering the ID number (1 - 16382)

followed by a pound sign (#). Next enter the storage location (1 - 10). Press and release 2nd and then press STO. ***"STORED"*** *will be displayed for two seconds.*

RCL BUTTON (Shifted Digit 3 - System Model Only)

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

CLR BUTTON (Shifted # Button - System Model Only)

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

STS BUTTON (Shifted Digit 5 - System Model Only)

The STS button will be used for future status operations.

INDICATORS

The radio's liquid crystal display (LCD) located on the front panel has eight (8) alphanumeric characters and various status flags located above and below the alphanumeric characters. This display provides indications of the current operating system, group or channel and it displays various other messages such as special call ID names or numbers, and telephone interconnect numbers. If programmed on, LCD backlighting will turn on for a short period anytime an active button is pressed or the CONTROL KNOB is rotated.

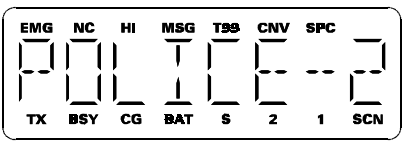


Figure 7 - Liquid Crystal Display

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

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

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

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

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

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

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

SPC *SPecial Call mode - On indicates the special call mode has been enabled. (Scan and System models only)*

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

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

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

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

S *Scan list - On indicates the selected group or channel is on the scan list. (Scan and System models only)*

1 *priority 1 - On indicates the selected conventional channel is designated as the priority-one scan channel. (Scan and System models only)*

2 *priority 2 - On indicates the selected conventional channel is designated as the priority-two scan channel. (Scan and System models only)*

SCN *SCaN mode - On indicates the radio is scanning. (Scan and System models only)*

UNIVERSAL DEVICE CONNECTOR

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

vehicular charger/repeater. The UDC is also used by the maintenance personnel when the radio is programmed.

ALERT TONES

The radio sounds three (3) basic alert tones or "beeps" to indicate various operating conditions. Alert tones may be programmed to remain off at all times.

500 Hz Tone - *trunked failure tone - sounds when a trunked failure has occurred (call denied, failed confirmation)*

1000 Hz Tone - *keypressed - sounds when a button is pressed and a status change occurs*

- *channel access tone - sounds when a trunked channel has been assigned and it is clear to talk*

- *low battery - sounds when the battery pack's charge is low*

2500 Hz Tone - *call queued tone - sounds when a trunked call is queued*

OPERATION

POWER-UP

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

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

SYSTEM/GROUP/CHANNEL SELECTION

The Select model radio can be programmed with up to sixteen (16) different system/group or channel combinations. To select a particular group or channel, rotate the CONTROL KNOB to the desired system/group or channel in accordance with the radio's programming.

The Scan and System model radios are programmed with <u>one</u> *of two different system/group/channel selection modes as follows:*

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

or

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

STEP Button Programmed For System Selection; CONTROL KNOB Programmed For Group And Channel Selection

System Selection

Press and release STEP to select the next trunked system programmed into the radio as indicated in the display. To select the previous system, press and release 2nd and then press STEP. Holding down STEP will cause the radio to automatically scroll through the system list. One or more of the systems may be programmed for conventional mode operation. Upon reaching an end of the system list, the radio may be programmed to stop selection or wrap around (go from one end to the other).

On the System model radio, systems can also be selected by entering the system number from the numeric keypad and then pressing STEP. If a number out of the programmed range is entered, ***"RANGE"*** *will be displayed.*

Group/Channel Selection

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

CONTROL KNOB Programmed For System Selection; STEP Button Programmed For Group And Channel Selection

System Selection

Rotate the CONTROL KNOB to the desired trunked system as indicated in the display. One or more of the systems may be programmed for conventional mode operation. A stop-plate may be placed under the knob to limit the maximum positions to less than sixteen (16).

Group/Channel Selection

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

selection or wrap around (go from one end to the other).

On the System model radio, groups or channels can also be selected by entering the group/channel number from the numeric keypad and then pressing STEP. If a number out of the programmed range is entered, ***"RANGE"*** *will be displayed.*

TRUNKED MODE OPERATION

Digital trunking provides fast communication access. In this mode the operator selects a communication system and group and the communication channel is allocated through digital signalling with the site.

Receiving A Message

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

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

3. *Select the desired system and group. See the section entitled "****SYSTEM/GROUP/CHAN-***

***NEL SELECTION**" operating procedures for details. The display indicates the selected group.*

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

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

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

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

*The **"MSG"** status flag will remain flashing even after the individual call time-out period expires. On a Scan or System model radio, press the SPC button (SPecial*

Call) to call the originating unit back after the time-out period has expired. The originator's ID or name will be displayed. Follow the procedures for sending a special call.

Sending A Message

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

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

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

4. *When the channel has been acquired, the **"TX"** and **"BSY"** status flags are displayed and the channel access alert tone (one beep) sounds.*

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

6. *Release the PTT BUTTON when the transmission is complete. If the transmission exceeds the programmed Carrier Control Timer limit,*

the radio will unkey and an alert tone will sound.

7. *Listen for a reply.*

Emergency Operation (Trunked Mode)

Receiving An Emergency Call

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

Sending An Emergency Call

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

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

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

4. *When the radio receives a normal group channel assignment, it will return to the previously selected group.*

Clearing An Emergency

An emergency can be cleared from a System model radio if it is programmed with supervisory privileges. To clear an emergency from a supervisory System model radio, press 2nd, CLR, and then the EMERGENCY BUTTON all within one second. The ***"EMG"*** *status flag will turn off when the emergency state has been cleared by the trunked system.*

Dynamic Regrouping

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

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

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

Wide Area System Scanning

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

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

Scanning Trunked Groups (Scan And System Models Only)

Groups which have been previously added to the scan list on a per system basis can be scanned. Each system's scan list is retained in memory when the radio is turned off or when the battery pack is removed.

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

The following procedures outline scan operations for trunked groups.

See the conventional mode operating procedures for specific procedures on conventional channel scanning.

Adding Groups To And Deleting Groups From The Scan List

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

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

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

Using Scan

*Toggle scan operation on by pressing SCAN. The **"SCN"** status flag will turn on when the radio is scanning.*

When a group on the scan list receives a channel assignment, the radio unsquelches on the assigned

channel and the group name is displayed.

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

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

A "nuisance" group can be deleted from the scan list by pressing 2nd-A/D (shifted SCAN button) when the radio stops scanning on the "nuisance" call. The group will be deleted from the scan list. Add the group back to the scan list by turning the radio off and back on or by turning scan off, selecting the group, and pressing 2nd-A/D (shifted SCAN button).

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

Special Calls

Special calls include individual and telephone interconnect calls. Up to 99 different special calls can be programmed into a Scan or System model radio and selected for transmission. The Select model radio can receive special calls directed to it but it cannot initiate a special call transmission.

Receiving An Individual Call

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

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

On a Scan or System model radio, if the call is not responded to before the individual time-out period expires the ***"MSG"*** *status flag will continue to flash. Press SPC (SPecial Call) to call the originating unit back after the time-out period expires. The originator's ID number or name will be displayed.*

Sending A Special Call (Scan And System Models Only)

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

1. *Select the desired special call by following step a or b:*

a. Scan and System models - *Press SPC. The radio enters special call mode as indicated by the* ***"SPC"*** *status flag. The*

last selected special call will be displayed. Scroll through the special call table by pressing STEP or 2nd-STEP until the desired special call name appears in the display.

b. System models only - *Using the numeric keypad, enter the special call's table location number and then press SPC. The radio enters special call mode. Table location number 1 is the last received individual caller's ID number. Table location number 2 is the last received group caller's ID number on the selected group. Table locations 3 and higher allow access to the programmed special calls in the radio. If no individual calls or group calls have been received since the radio was turned on, the first two (2) locations will display* ***"ID"*** *and* ***"GR"*** *respectively (no number will follow). If a table location number larger than the special call table is entered,* ***"RANGE"*** *will be displayed when the SPC button is pressed and the radio will then return to the group display.*

2. *Press and hold the PTT BUTTON. The radio performs the necessary signalling required to obtain a communications channel. When the*

signalling is complete the ***"TX"*** *status flag turns on and the channel access tone sounds. Speak into the microphone in a normal voice.*

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

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

Individual Call From Keypad (System Model Only)

1. *Using the numeric keypad, enter the radio's individual identification number or recall a previously stored number using the RCL button. The LCD will display the number.*

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

3. *Hold the PTT BUTTON depressed and speak into the*

microphone in a normal voice.

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

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

Telephone Interconnect Calls - Automatically Dialed (Scan and System Models Only)

Telephone calls programmed into a Scan or System model radio can be placed using the special call feature as follows:

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

2. *Select the desired telephone interconnect call by pressing STEP or 2nd-STEP until the desired special call name appears in the display.*

3. *Press and release the PTT BUTTON. The radio will per-*

form the necessary signalling required to obtain a communication channel. When the channel is obtained, the ***"TX"*** *and* ***"BSY"*** *status flags will turn on and the DTMF tones will be heard in the speaker. The radio then enters receive mode.*

4. *When the called party answers, press the PTT BUTTON and speak into the microphone. Unlike a regular telephone, it is not possible to talk (transmit) and listen (receive) at the same time.*

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

Telephone Interconnect Calls - Manually Dialed (System Model Only)

1. *Using the numeric keypad, enter the telephone number. Up to a maximum of 31 digits can be entered, with the last eight (8) being displayed.*

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

3. *Press and release the PTT BUTTON to initiate the call. The radio will perform the necessary signalling required to obtain a communication channel. When the channel is obtained, the* ***"TX"*** *and* ***"BSY"*** *status flags will*

turn on and the DTMF tones will be heard in the speaker. The radio then enters receive mode. If telephone interconnect signaling is not successful, the radio will return to the idle mode with the telephone number displayed until the time-out period expires or another group or system is selected.

4. *When the called party answers, press the PTT BUTTON and speak into the microphone. Release the PTT BUTTON to listen. Unlike a regular telephone, it is not possible to talk (transmit) and listen (receive) at the same time.*

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

DTMF Overdialing (System Model Only)

After the radio has established a connection to the telephone system, it may be necessary to "over-dial" digits using DTMF (Dual-Tone Multi-Frequency) tones. This process allows access to systems such as banking services and control of equipment such as answering machines. The overdial procedure is as follows:

1. *Using the special call mode, establish telephone connection to the desired system.*

2. *Enter the digit or digits (33 maximum) that need to be transmitted.*

3. *Press the PTT BUTTON to transmit the digit(s).*

4. *Repeat steps 2 and 3 as needed.*

CONVENTIONAL MODE OPERATION

The procedures that follow describe conventional mode operation. Follow these procedures if operating in a conventional system. Each conventional channel can have one or more features, such as Channel Guard, programmed when the channel is selected.

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 the desired conventional channel. See the section entitled "**SYSTEM/ GROUP/CHANNEL SELECTION**" for details. The display will indicate the selected channel's name.*

3. *Momentarily press the MONITOR BUTTON to disable squelch and adjust the*

volume for the approximate desired speaker audio level.

If a coded-squelch tone decode feature such as Channel Guard (CG) or Type 99 (T99) is programmed for the selected channel, this feature will be enabled when the channel is selected. The appropriate display status flag will turn on to indicate the programmed feature. The feature can be disabled by depressing the MONITOR BUTTON for approximately two (2) seconds. The appropriate status flag will toggle off when the feature is disabled. Toggle the feature back on by again depressing the MONITOR BUTTON for approximately two (2) seconds.

4. *When a message is received the receiver will unsquelch and the message will be heard in the speaker. The* ***BSY*** *status flag will turn on. If programmed and enabled, the correct Channel Guard or Type 99 must be received before the receiver will unsquelch.*

5. *Adjust the volume as necessary.*

Sending A Message

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

2. *Verify the channel is not busy by temporarily depressing the MONITOR BUTTON to disable squelch or by 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 turn on.*

4. *Hold the radio approximately three (3) inches from the mouth and speak into the microphone in a normal voice. If the transmission exceeds the programmed Carrier Control Timer limit, the radio will unkey and an alert tone will sound. If this occurs during a transmission, simply release the PTT BUTTON and then press it again to re-key the radio.*

5. *Release the PTT BUTTON when the transmission is complete.*

6. *Listen for a reply and retransmit as necessary.*

Emergency Operation (Conventional Mode)

To enable an emergency transmission, press the red EMERGENCY BUTTON on the top of the radio for approximately one (1) second. If an

emergency channel is programmed, the radio will switch to the emergency channel, turn on the ***"EMG"*** *status flag and transmit GE-STAR emergency signalling. If no emergency channel is programmed, the radio will transmit GE-STAR emergency signalling on the selected channel.*

Scanning Conventional Channels (Scan And System Models Only)

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

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

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

Adding Channels To And Deleting Channels From The Scan List

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

2. *Select the desired channel to be added to or deleted from the scan list. If the selected channel is currently on the list, the **"S"** status flag will be on.*

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

Using Scan

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

If programmed for dual-priority scan operation, the priority-one, priority-two and then the remaining channels on the scan list 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 (Scan And System Models Only)

*The radio can be programmed for telephone interconnect operation while it is operating in conventional mode. The current operating conventional channel must be equipped with telephone interconnect capability before a telephone interconnect call can be placed. Conventional mode telephone interconnect calls are handled using the radio's special call mode. See the sections entitled "**Telephone Interconnect Calls - Automatically Dialed"**, "**Telephone Interconnect Calls - Manually Dialed**" and "**DTMF Overdialing**" for specific operating examples.*

OPERATING TIPS

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

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

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

OPERATING RULES AND REGULATIONS

Two-way FM radio systems must be operated in accordance with the rules and regulations of your local communication authority. 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.

HANDLING OF BATTERY AND ACCESSORIES

REPLACING THE BATTERY PACK

Remove The Battery Pack From The Radio

Turn off the radio. Hold the radio in your left hand with the backside facing you. Press the release latch with your right thumb and slide the battery pack out in the direction of the release latch.

Reconnect The Battery Pack To The Radio

*Ensure that the **ON/OFF** switch is in **OFF** position. Align the battery pack with the slide grooves and insert into grooves until the release latch clicks into place.*

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

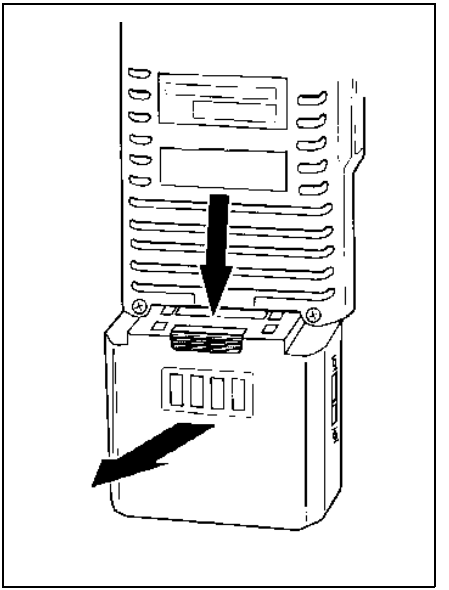


Figure 7 - Removing The Battery Pack

*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 or 6) position, standard and rapid charge units. In addition, the vehicular chargers/repeaters simultaneously charge the battery packs while the radio is operating. For specific instructions refer to the applicable charger Operating Manual.

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

RECHARGEABLE BATTERY PACK DISPOSAL

The product that you have purchased contains a rechargeable battery. The battery is recyclable. At the end of its useful life, under various state and local laws, it may be illegal to dispose of this battery into the municpal waste stream. Check with your local solid waste of-

ficials for details in your area for recycling options or proper disposal.

Recharging The Battery Pack Using Rapid Charger Or Multi Rapid Charger

Make sure that the charger is connected to a 220 VAC power supply.

Switch off the radio. Put the radio into the charger. The front of the radio must be facing the front of the charger.

*The **CHARGE** indicator gives a constant red light if the charging works properly.*

*The battery is ready for use when the **READY** indicator gives a constant green light.*

*The **READY** indicator shows that the charger has switched to trickle charging.*

Recharging The Battery Pack Using Vehicular Charger

Make sure that the charger is connected to a 12 Vdc power supply.

Switch off the radio. Put the radio into the charger. The front of the radio must be facing the front of the charger.

*The red **CHARGE** indicator gives a constant red light if the charging works properly. The battery is ready for use when the green **READY** indicator lights. The **READY** indicator shows that the charger has switched to trickle charging.*

USING VEHICULAR CHARGER IN MOBILE CONFIGURATION

Make sure that the charger is connected to a 12 Vdc power supply and that the external loudspeaker, microphone and antenna are connected to the charger.

*The power switch on the radio may be in either the **ON** or **OFF** position. Put the radio into the charger. The front of the radio must be facing the front of the charger.*

*Slide the radio engaged latch towards the radio. The red **RADIO ENGAGED** indicator lights when the radio is properly connected to the charger.*

*Turn the **VOLUME** switch on the charger to the **ON** position and adjust*

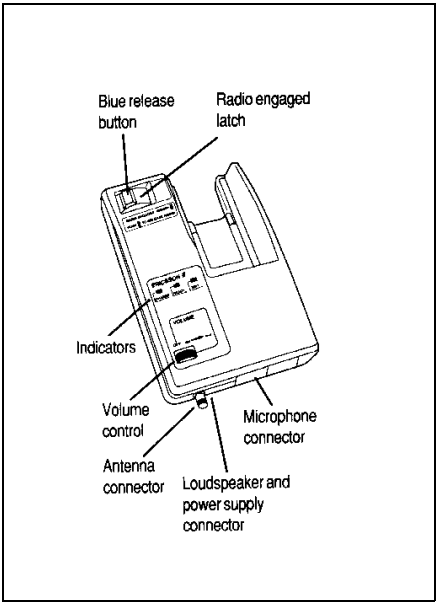


Figure 8 - Using The Vehicular Charger In Mobile Configuration

the volume level. External loudspeaker and microphone are used for communication.

*The red **CHARGE** indicator gives a constant red light if the charging works properly. The battery is ready for use when the green **READY** indicator lights. The **READY** indicator shows that the charger has switched to trickle charging.*

*The red **XMIT** indicator will light each time the transmission button on the microphone is pressed.*

*Press the blue release button and slide the latch away from the radio to release the radio from the vehicular charger. The red **RADIO ENGAGED** indicator will turn off when the radio is released.*

INDICATORS

LED	MODE	CONDITIONS
RED	CONTINUOUS BLINKING	REGULAR CHARGE REDUCED CHARGE
GREEN	CONTINUOUS FAST BLINKING SLOW BLINKING	CHARGE READY CHARGE FAULT CHARGE PROHIBITED

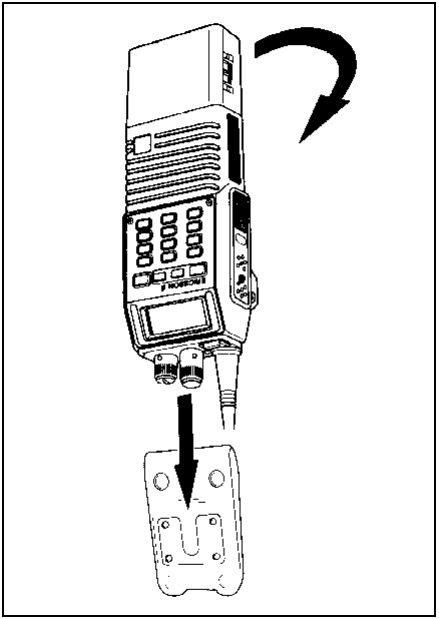


Figure 9 - Inserting And Removing The Radio From The Belt Clip

CARRYING THE RADIO IN BELT LOOP OR BELT CLIP

Put The Radio In Belt Loop Or Belt Clip

Hold the radio upside down. Put the swivel mount on the radio into the slot on the belt loop or the belt clip. Turn the radio 180 degrees and make sure that the radio is locked in the carrying accessory.

Remove The Radio From The Belt Loop Or Belt Clip

Turn the radio upside down (180 degrees). Lift the radio upwards from the slot at the carrying accessory.

CARRYING THE RADIO IN LEATHER CASE OR PLASTIC HOLDER

Put The Radio In Leather Case Or Plastic Holster

Put the radio into the leather case or plastic holster with the battery downwards and the keypad facing away from the case. To lock the radio in the case make sure the swivel mount is placed into the slot at the backside of the case.

Remove The Radio From Leather Case Or Plastic Holster

Fold the radio out from the case so the swivel mount is clear from the slot in the backside of the case. Lift the radio upwards from the case.

REMOVING AND REPLACING THE SWIVEL MOUNT

Remove The Swivel Mount

Slide a flat-blade screwdriver under the spring retainer and twist. While twisting, slide the swivel mount out from under the holder.

Replace The Swivel Mount

Place the end of the swivel in the grooves and slide the mount until it snaps into place.

CONNECTING AUDIO ACCESSORIES

The audio accessory connector must be placed so that the guide pin is inserted into the control hole of the accessory connector at the radio. Tighten the screw with a coin or a screwdriver.

CHARGERS

<u>UNIVERSAL STD CHARGER</u>

Battery is charged in 14 hours (can be used as a trickle charger).
Power supply 120/230 Vac.

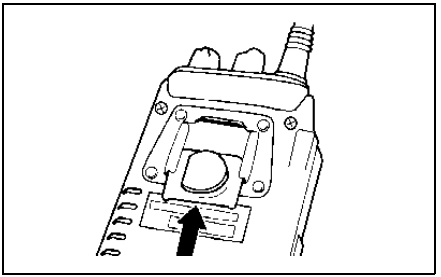


Figure 10 - Removing And Replacing The Swivel Mount

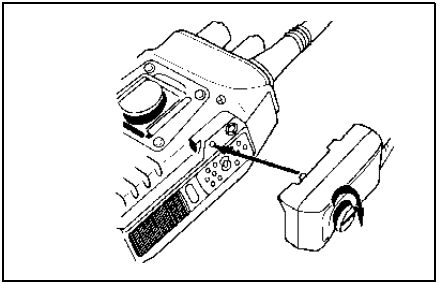


Figure 11 - Connecting Audio Accessories

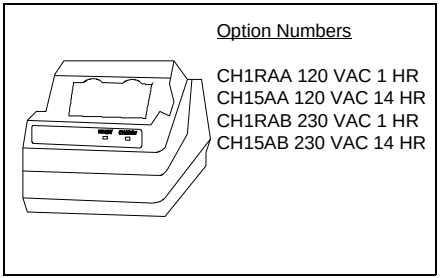


Figure 12 - Universal Desk Charger

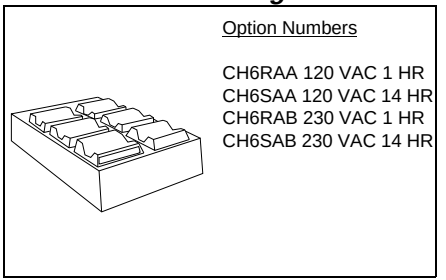


Figure 13 - Universal Multi-Charger

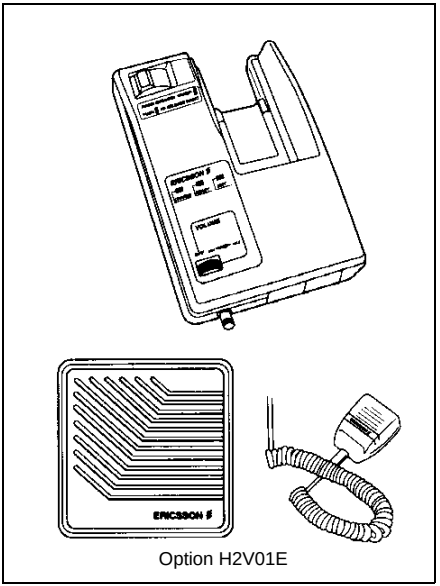
Universal Rapid Charger

Power supply 120/230 VAC 50-60 Hz.
Battery charged to 80% after 1 hour.
Battery charged to 100% after 3 hours.
After 3 hours only trickle charge.

Universal Multi Charger

Charges up to 6 batteries at a time.
Power supply 120/230 VAC 50-60 Hz.
Rapid Battery charged to 80% after 1 hour.
Battery Charged to 100% after 3 hours.
After 3 hours only trickle charge.

Standard - Battery charged in 14 hours (can be used as a trickle charger).



Option H2V01E

Figure 14 - Vehicular Charger, External Microphone and Loudspeaker

Vehicular Charger

The vehicular cassette is delivered with external microphone and external loudspeaker. The microphone is equipped with a transmission button.

Power supply 12 Vdc, negative ground.
Battery charged to 80% after 1 hour.
Battery charged to 100% after 3 hours.
After 3 hours only trickle charge.

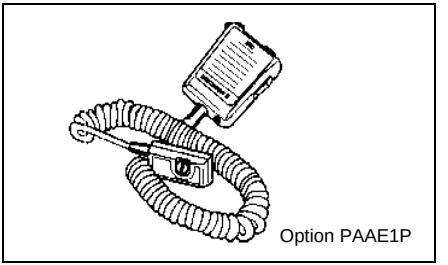


Figure 15 - Speaker/Microphone

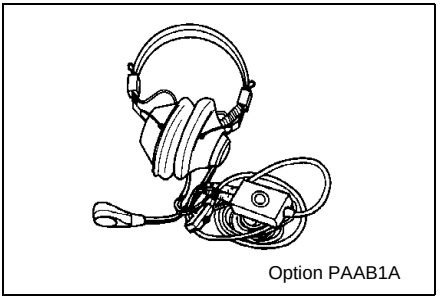


Figure 16 - Headset

AUDIO ACCESSORIES

Speaker/Microphone

The speaker/microphone is equipped with a transmission button, a volume switch with two volume levels (high/low) and a connector for ear-piece kit.

Headset

The headset is equipped with head-phones, microphone, and a cable with a transmission button.

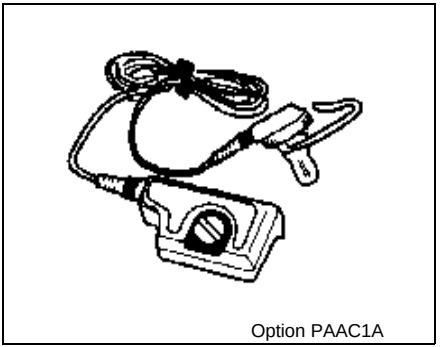


Figure 17 - Audio Accessories Earpiece Kit

Earpiece Kit

The earpiece kit replaces the loudspeaker. It is possible to use the earpiece inside a helmet.

BATTERIES

Battery approx. 1200 mA, standard
Battery approx. 1700 mA, option

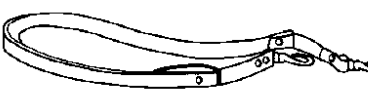
CARRYING ACCESSORIES

Swivel mount for carrying the radio in a belt loop or belt clip.

Belt loop
Belt clip

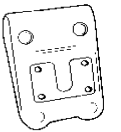
Plastic holster
Leather case
Shoulder strap for leather case

Shoulder strap



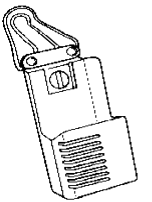
Option PAHC1K

Belt loop
Belt clip



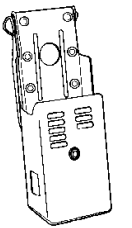
Option PAHC1C

Plastic holster



Option PAHC5R

Leather case



Options
PAHC5N Short Battery
PAHC5P Tall Battery
PAHC3V Short Battery
w/ Swivel Mount
PAHC5P Tall Battery
w/Swivel Mount

Printed in U.S.A.