

SYNTOR X 9000

TRUNKED/CONVENTIONAL RADIO SYSTEM

OPERATOR'S MANUAL



CONTENTS

General Safety Information	1	Selecting Subfleets	14
FCC Requirements	3	Change System/Subfleet Using the Keypad	14
Service	3	Scan Option	16
Trunked Radio System Description	3	Status/Message Option	16
Subfleet/Fleetwide Call Capabilities	4	Horn and Lights Option	17
Modes of Operation	6	Public Address Option	18
Alert Tones	7	Siren Option	18
Introduction	8	<i>Private Conversation Feature</i>	19
Basic Control Unit	8	<i>Private Conversation Option</i>	20
Optional Features:		<i>Call Alert Feature</i>	22
Emergency, Horn Lights, Scan, Phone	10	<i>Call Alert Option</i>	22
Siren and Public Address	11	Emergency Call and Alarm Option	24
Status Message, <i>Call Alert</i> , <i>Private Conversation</i>	12	Dynamic Regrouping Option	26
General Operation Procedures	13	Automatic Multiple Switching (AMAX) Option	27
Selecting Trunked/Conventional Modes	14	Telephone Interconnect Option	28
Selecting Systems	14		

GENERAL SAFETY INFORMATION

The United States Department of Labor, through the provisions of the Occupational Safety and Health Act of 1970 (OSHA), has established an electromagnetic energy safety standard that applies to the use of this equipment. Proper use of this radio will result in exposure below the OSHA limit. The following precautions are recommended:

DO NOT Operate the transmitter of a mobile radio when someone outside the vehicle is within two feet (0.6 meter) of the antenna.

DO NOT operate the transmitter of a fixed radio (base station, microwave, and rural telephone RF equipment) or marine radio when someone is within two feet (0.6 meter) of the antenna.

DO NOT operate the transmitter of any radio unless all RF connectors are secure and any open connectors are properly terminated.

In addition,

DO NOT operate this equipment near electrical blasting caps or in an explosive atmosphere.

All equipment must be properly grounded according to Motorola installation instructions for safe operation.

All equipment should be serviced only by a qualified technician.

Refer to the appropriate section of the product service manual for additional pertinent safety information.

Installation Safety Warning

Consider the occupants' safety when you choose a location for the radio. Do not mount the radio overhead or on a sidewall unless you take special precautions.

If someone were to remove the radio and fail to replace it properly, road shock could bump the radio loose, and the falling radio could in some circumstances cause serious injury to the driver or a passenger. In a crash, the radio, even when properly installed, could break loose and become a dangerous missile. If you must mount the radio overhead or on a sidewall, give it the added protection of a retaining strap.

Warning

For vehicles equipped with electronic anti-skid braking systems, see "ANTI-SKID BRAKING PRECAUTIONS" Publication, Motorola Number 68P81109E34.

Warning

It is mandatory that radio installations in vehicles fueled by liquefied petroleum gas conform to the following standard.

National Fire Protection Association standard NFPA 58 applies to radio installations in vehicles fueled by liquefied petroleum (LP) gas with the LP-gas container in the trunk or other sealed-off space within the interior of the vehicles. This standard requires that:

1. Any space containing radio equipment shall be isolated by a seal from the space in which the LP-gas container and its fittings are located.
2. Remote (outside) filling connections shall be used.
3. The container space shall be vented to the outside.

2

FCC REQUIREMENTS

The FCC requires that you obtain a station license for your radio equipment before transmitting. No operating license or permit is required. The station licensee is responsible for ensuring that the transmitter power, frequency, and deviation are within the maximum limits allowed by the station license.

SERVICE

Should you wish to purchase a service contract for your Motorola equipment, contact your Motorola Service Representative, or write to:

National Service Manager
Motorola Communications Sector
1301 E. Algonquin Road
Schaumburg, IL 60196

TRUNKED RADIO SYSTEM DESCRIPTION

Communication "trunking" improves operating efficiencies by sharing system resources among the users. Trunking techniques

are well established in the communications industry and are used by telephone companies to support the millions of calls they service. Motorola has adapted similar trunking methods to the two-way radio industry.

A trunked radio system allows a large number of users to share a relatively few number of frequencies. When you want to establish communications with someone else in the system, a repeater, or communications path is assigned to your radio. Once your conversation has ended, the repeater is freed for other users. This sharing of frequencies is accomplished automatically in a Motorola Trunked Radio System through the use of multiple repeaters and a system central controller. Trunking allows all of the repeater air time to be simultaneously pooled, maximizing the amount of air time available to any one mobile unit and minimizing channel congestion.

Some of the key benefits of the Motorola Trunked Radio System are:

- No channel monitoring required prior to transmission.
- Fast system access.
- Automatic channel selection.
- Privacy among members of the same group.
- Uninterrupted conversations.

SUBFLEET/FLEETWIDE CALL CAPABILITIES

Within the trunked radio system, a mobile fleet can be segmented into different subfleets. Each subfleet is capable of operating independently of all other subfleets. Subfleet segmentation allows the fleet to be organized into predetermined groups according to function. Members of a specific subfleet hear only those messages intended for their subfleet.

A radio equipped with multiple subfleet operation can receive only one subfleet message at a time. Consequently, if the radio

is set to one subfleet, calls originating from another subfleet are not heard.

On radios equipped with Fleetwide Call, you can simultaneously initiate communications with all members of the fleet without regard to subfleet boundaries. This allows you to make announcements to the entire fleet. See Figure 1 for a typical subfleet configuration.

4

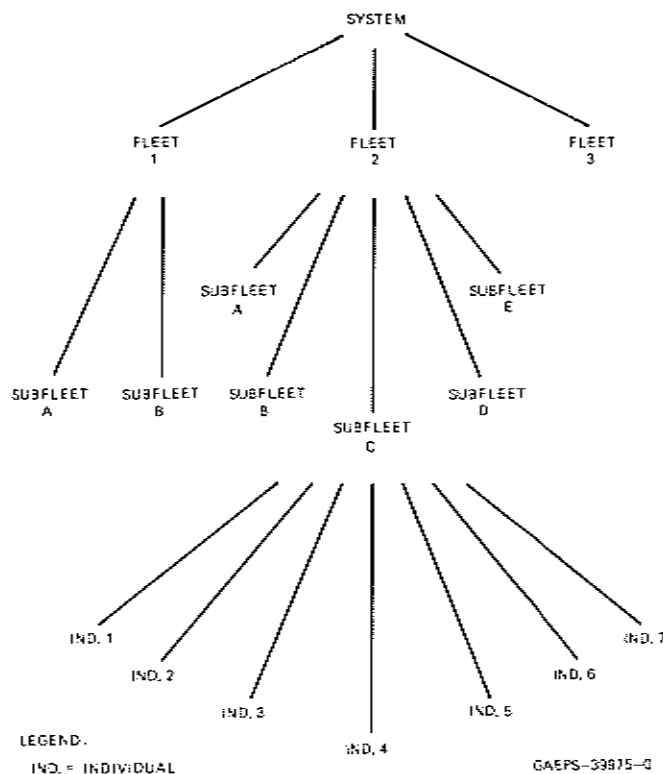


Figure 1. Typical Fleet/Subfleet Configuration

MODES OF OPERATION

If your radio includes more than one mode of operation, the additional calls which may be received in a particular mode are indicated in Table 1.

Table 1. Mode of Operation/Received Calls

Mode of Operation	Additional Calls Which Can Be Received (See Note)
Subfleet Mode	Private Conversation Calls Land to Mobile Phone Calls Individual Call Alert Calls Fleetwide Calls Systemwide Calls
Fleetwide Mode (Subfleet Selector set to Fleetwide Call position)	All Subfleet Calls Private Conversation Calls Land to Mobile Phone Calls Individual Call Alert Calls Systemwide Calls
Private Conversation Mode (Private Conversation button pressed)	Fleetwide Calls Systemwide Calls
Individual Call Alert Encode Mode (Individual button pressed)	Fleetwide Calls Systemwide Calls

Table 1. Mode of Operation/Received Calls (continued)

Mode of Operation	Additional Calls Which Can Be Received (See Note)
Telephone Interconnect Mode (Telephone Interconnect button pressed)	Systemwide Calls
Dynamic Reprogramming Mode	Private Conversation Calls Land to Mobile Phone Calls Individual Call Alert Calls Fleetwide Calls Systemwide Calls
Emergency Alarm Mode	Subfleet Calls Fleetwide Calls Systemwide Calls
Emergency Call Mode	Subfleet Calls Fleetwide Calls Systemwide Calls

Note

Fleetwide and Systemwide Calls do not interrupt voice traffic. However, when a voice channel is lost, a new voice channel is not reassigned until the Fleetwide or Systemwide Call is serviced.

6

ALERT TONES

The following alert tones will aid you by indicating unique system conditions:

System Busy—If you hear this signal—similar to a telephone busy signal—when you press the microphone PTT (push-to-talk) button, you will not be able to transmit because all radio channels in the system are in use.

Automatic Call Back—When you try to transmit with all channels in use, the system goes into the automatic call back mode. When a channel is available, a series of four short beeps sound to let you know that you can now transmit.

Talk Prohibit—If you press the microphone PTT button and hear a continuous tone, you are either out of range of the trunked radio system or the system is out of service.

Failsoft—A beep that indicates failure of the system central controller. It sounds every 10 seconds when the unit is in an unmuted receive mode. The radio reverts from trunked operation to a system similar to conventional radio repeater operation.

Volume Set—This switch-enabled tone sounds to let you adjust the volume to the desired level before calls are actually received.

Talk Permit (optional)—This series of four short beeps sound when you press the microphone PTT button to verify that the system is accepting your transmission.

Time-Out Timer Alert (optional)—This continuous tone indicates that your present transmission will soon be disabled.

Phone Off-Hook (optional)—This low-pitch continuous tone indicates that your radio is in the Telephone Interconnect mode and cannot receive fleet or subfleet calls.

Invalid Key Chirp—This momentary, lower pitched tone indicates that you have selected an unprogrammed button position.

Valid Key Chirp—This momentary, lower pitched tone confirms that you have selected a valid, programmed button position.

Telephone Interconnect Busy (optional)—Four telephone-type busy tones indicate that the interconnect repeater is busy when you press the telephone button. If you let the unit in the telephone interconnect mode, the busy tones are followed by Call Back tones when the repeater becomes available.

Private Conversation Call—Two high-pitched tones indicate a private call has been received.

Individual Call Alert Paging—Four beeps sounding every 6 seconds indicate that the radio is being paged.

Central Acknowledge (optional)—One high-pitched tone indicates that an Individual Call Alert or Emergency Alarm has been received by the system central controller.

Mobile Unit Acknowledge (optional)—Four high-pitched tones indicate that the Individual Call Alert has been received by the intended unit, or the Emergency Alarm has been received by the intended dispatcher.

AMAX Rescan (optional)—A sequence of high-pitched tones indicates that the mobile unit is rescanning for a new site.

Dynamic Reprogramming (optional)—A unique chirp indicates when a dynamic ID has been received. If you have not selected the "reprogrammed" subfleet, this chirp sounds every time you press the microphone PTT button.

INTRODUCTION

System 9000 Control Unit

The SYNTOR X Systems 9000 Control Unit allows you to program your own names to represent talk groups. The names you assign are clearly shown in the eleven character alpha numeric display. At a glance, you can see all the key operating information including the talk group selected, the channel being scanned, and the on/off status of various options. The operating conditions are shown either by the display or by lighted indicators.

In addition to showing talk groups, the display will also show channel scan lists, private conversation lists, and frequently called telephone numbers. It also plays an integral role in encoding certain operating data through the control unit.

BASIC CONTROL UNIT

Before operating the trunked mobile radio, familiarize yourself with the various operating controls, indicators, and alert tones. Figure 2 shows the configuration of a basic trunking System 9000 control unit. The On/Off switch is located out of sight on the bottom right side of the unit.

The following paragraphs describe the use of Systems 9000 controls. A word shown in bold type, for example **[Mode]**, indicates a control on the front panel.

Use the **[Mode]** rocker switch to scroll forward or backward through the list of talk groups programmed in the system. Using a separate programming unit, you can enter up to 99 talk group names in the system.

Use the **[Volume]** rocker switch to control volume settings. After six seconds, the volume setting is retained if the unit is switched off and on.

Use the **[Menu]** button to gain access to options not controlled by other keys, and as an alternate method of selecting systems fleets and subfleets.

Use the **[Step]** button with other function keys to scroll through defined lists. (Used with **[Scan]**, Automatic Wide Area Switching, **[Phone]**, **[Pvt]**, **[Alt]**, **[Sts]**, **[H/L]**, and **[Menu]**)

Use the keypad to directly access (rather than scrolling) a specific talk group or mode name. Use it also to enter data for other options (for example, telephone numbers and *Private Conversation* identification numbers).

Use the **[DIM]** button to control the light intensity of the display and the back lighting of the buttons.

Use the **[S/S]** button to switch the display from the MODE name format to the SYSTEM/SUBFLEET format. For example, if the mode name "03 DISPATCH" is displayed, press the **[S/S]** button to display "SYS 01 SUB C." This informs you that mode name "03 DISPATCH" is a part of system "01" and subfleet "C."

Use the **[Sel]** button with **[Scan]** to select modes appearing on the display for adding to the scan list. Use it also to send status/message and call alert codes. For Dynamic Regrouping, use the **[Sel]** button to enter a request for reprogramming. If the radio is in the transmit/receive mode, the **[Sel]** button returns the radio to a predetermined home channel or subfleet. The home channel is programmed at the factory as System 1 Subfleet A, but may be changed with field programming.

Use the **[Del]** button with other options to delete items from Scan, *Private Conversation*, and *Call Alert* lists.

8

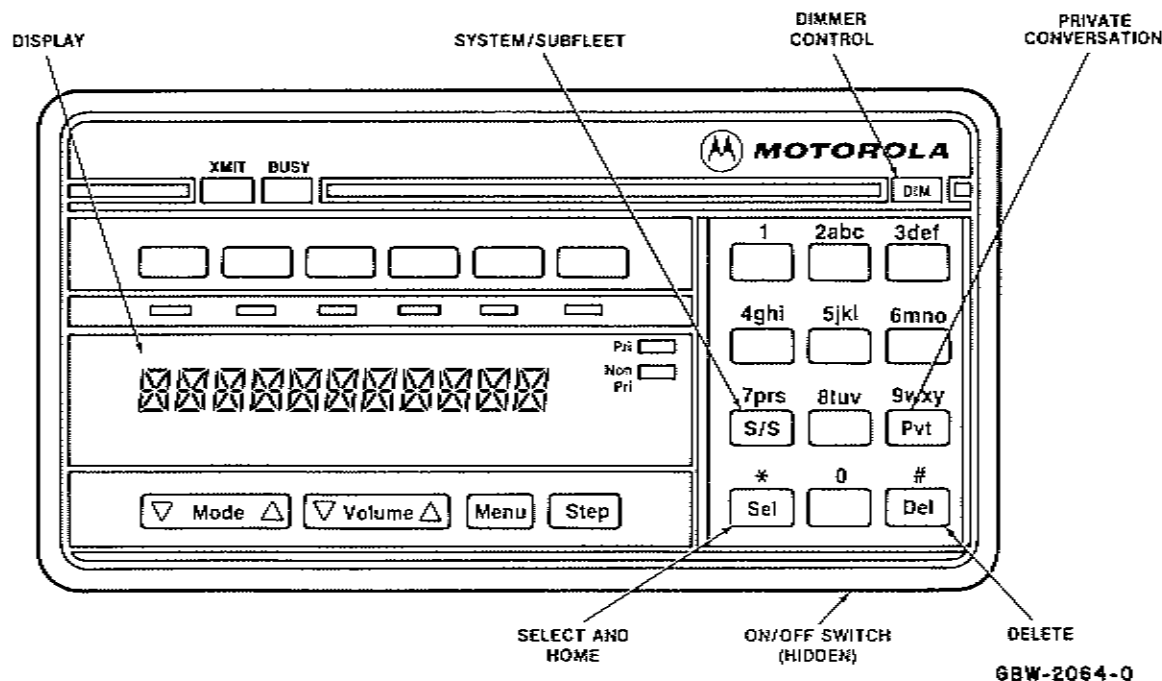


Figure 2. Basic Systems 9000 Control Unit

EMERGENCY, HORN/LIGHTS, SCAN, AND PHONE OPTIONS

The emergency [Emer] feature is standard on *Smartnet* versions but not available on *Privacy Plus* models. Press the [Emer] button to activate the specific emergency protocol stored in the radio. (See STIC 417 instructions.)

Use the [H/L] button to activate relays that will flash the lights or sound the horn (or both) when a Selective Call, *Private Conversation*, *Call Alert*, or a telephone call is received. Select the specific alarm combination on the control unit with the [Step] key.

Use the [Scan] button to activate both conventional channel scan and trunking subfleet scan. The display shows the name of the mode being scanned.

Use the [Phone] button to convert the 3 x 4 keypad to a standard telephone encoder for making centralized telephone interconnect through the trunking system.

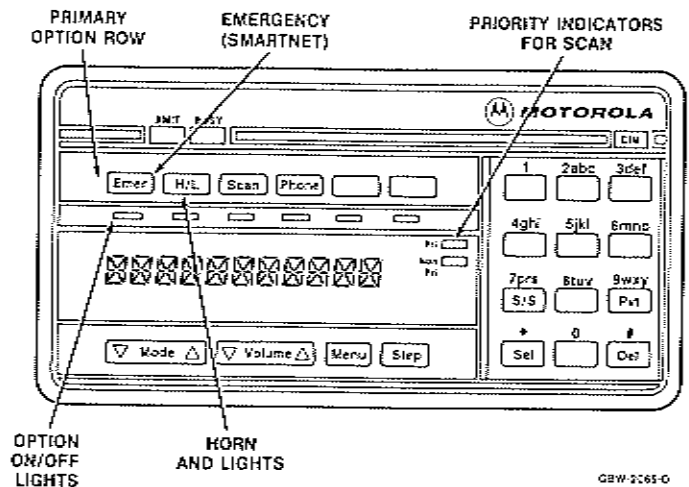


Figure 3. Emergency, Horn/Lights, Scan, and Phone Options.

10

SIREN AND PUBLIC ADDRESS OPTIONS

Use the [PA] button to set up an external speaker for public address. Adjust the Public Address volume with the [Volume] rocker switch. (The PA's volume level is affected by the radio's volume setting but not vice-versa.)

Use the [Siren] button with the [Wail], [Yelp], [HiLo], and [Man] keys for siren operation. The [ExRd] button routes the radio audio through the siren amplifier and speaker.

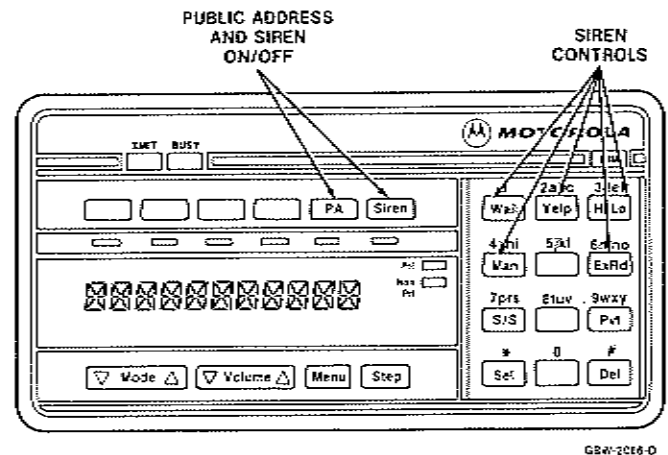


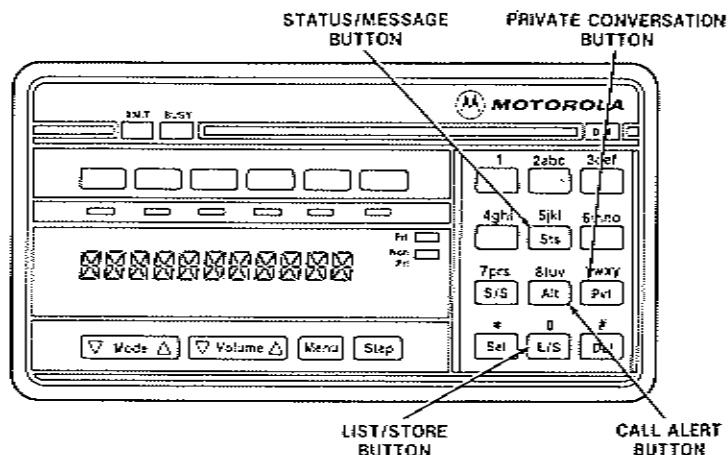
Figure 4. Siren and Public Address Options

STATUS/MESSAGE, CALL ALERT, AND PRIVATE CONVERSATION OPTIONS

Use the **[Sts]** button with other function keys to select and send eight status and eight message codes.

Use the **[Alt]** and **[Pvt]** buttons on units equipped with *Private Conversation/Call Alert* to select and enter the specific unit ID numbers of other radios.

Use the **[L/S]** button to list and store frequently called numbers and *Private Conversation/Call Alert* unit ID numbers.



GBW-1067-G

Figure 5. Status/Message, Call Alert, Private Conversation, List and Store Function Keys

12

GENERAL OPERATING PROCEDURE

To Turn On Radio

Turn power switch on. The graphics illuminate to indicate when radio is on.

Note

If "FAIL" appears in the display when the system is turned on, the system locks up until the condition is corrected. If "ERROR" appears, some non-critical data (e.g. mode names, phone names) has been changed. Report either condition to service personnel.

To Set Volume For Receiving Calls

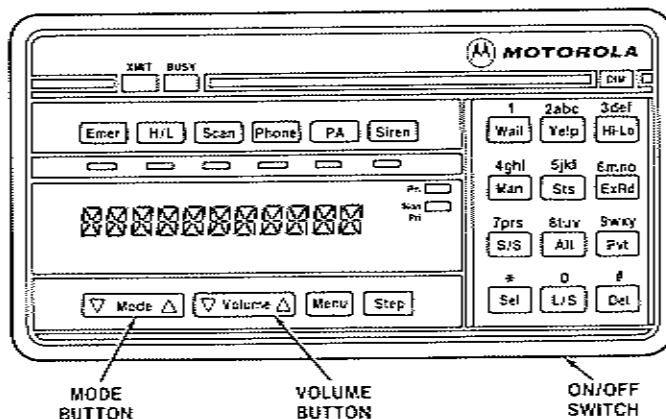
Press the **[Volume]** button and listen for the volume-set tone. Hold the button depressed for longer than 2 seconds; the sound level will increase or decrease and a volume indication (0 to 15) appears on the display. Adjust the volume for the desired listening level. The radio is ready to receive calls.

To Transmit

1. Select the desired talk group with the **[Mode]** button.
2. Lift microphone off hook. Press and hold the microphone PTT button.
3. When the red indicator lights, hold the microphone two inches from your lips and speak into the microphone in a normal voice. State your FCC call sign and proceed with your message. Release the microphone PTT button to receive.

4. If you hear a telephone-type busy signal when you press the PTT, all channels are in use. Release the microphone PTT and wait for the Call Back tone.

5. If you hear a continuous tone, you are out of range of the system. The red transmit light may flash several times as the radio tries to access the system. Release the microphone PTT button and try again when the vehicle is driven within range of the system.



GBW-1068-G

Figure 6. General Operating Procedures

SELECTING TRUNKED OR CONVENTIONAL MODES

There are 99 programmable modes available in the *Systems 9000* Control Unit. An overall system may consist of several fleets. Each fleet is divided into small groups called subfleets. In a trunked system, the mode name represents one of a system's subfleets. In a conventional system, the mode name represents a specific communications frequency.

Scroll the modes by pressing the **[Mode]** rocker switch to increment or decrement the modes. As each mode is displayed, either a valid or invalid chirp is sounded. When an invalid mode is found, scrolling automatically continues until a valid mode is found. When scrolling reaches the highest or lowest mode, it automatically rolls over to the opposite end of the list. For example, incremented scrolling follows this sequence—97, 98, 99, 1, 2, 3, etc.

By pressing the system/subfleet button **[S/S]** and then the **[Mode]** button, you can scroll through the system and subfleet assignments rather than the mode names. A typical display would be "SYS 12 SUB C."

SELECTING SYSTEMS

1. Press the **[Menu]** button until the prompt "SYS = _" flashes.
2. Go to a certain system in one of two ways: repeatedly press the **[Step]** button to display each system one at a time until you find the one you want, or use direct access detailed in "Change the System/Subfleet Using the Keypad."

14

SELECTING SUBFLEETS

1. Press the **[Menu]** button until the prompt "SUB = _" flashes.
2. Go to a particular subfleet in one of two ways: repeatedly press the **[Step]** button to display each subfleet one at a time until you get to the one you want, or use the direct access method detailed in "Change System/Subfleet Using the Keypad."

Note

Subfleets are lettered between A and P depending on how many and which subfleets were ordered on a particular trunked system. If an "R" appears in the display, see "Dynamic Regrouping Option."

3. If your radio has more than one trunked system, press **[Menu]** until the flashing SYS prompt reappears. Select a new system and use **[Menu]** to return to the SUB prompt. Use **[Step]** as before to select subfleets.

CHANGE SYSTEM/SUBFLEET USING THE KEYPAD

System

1. Press the **[Menu]** button to get the flashing SYS prompt.
2. Using the keypad, enter the number of the system you want to go to. When you enter the first digit, the previous system number is blanked out and the digit you entered flashes in the units position along with the SYS prompt. If you are inputting a

two-digit number, enter both digits in less than two seconds. If you wait *more* than two seconds between digits, the processor accepts the first digit as the input.

3. If the input number is valid, the processor goes to that system, issues a valid button chirp, and then returns the flashing SYS prompt.

4. If the input is invalid, the processor goes back to the previous system, issues an invalid button chirp, and then displays the flashing SYS prompt.

Subfleet

1. Press the **[Menu]** button to get the flashing SUB prompt.
2. On the keypad, press the button associated with the letter you want. For example, if you want subfleet "L," press **[JKL]**; a "J" is displayed. Press the same button and a "K" is displayed; press again and an "L" is displayed.
3. If the subfleet defined by the button is valid, the processor goes to that subfleet, issues a valid button chirp, and then returns the flashing SUB prompt.
4. If the subfleet defined by that key is invalid, the processor remains on the previous subfleet, issues an invalid button chirp and then displays the flashing SUB prompt.

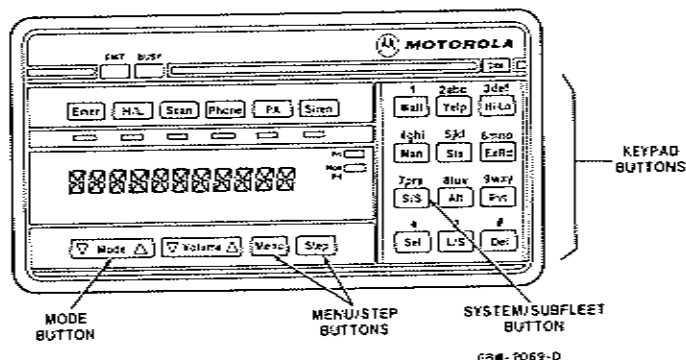


Figure 7. Selecting Systems and Subfleets

SCAN OPTION

Use this option to scan predetermined subfleets in trunked or 800 MHz conventional channels. To start scanning, press the **[Scan]** button.

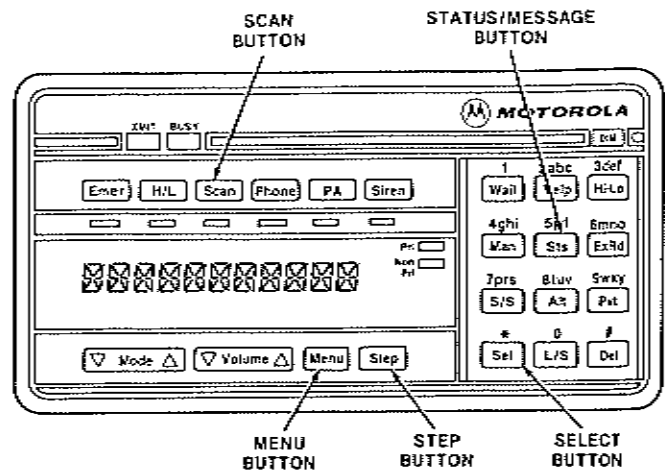
The scanner will scan all of the preprogrammed subfleets or 800 MHz conventional channels defined for that particular Trunked or Conventional position.

Release the scan feature by pressing the **[Scan]** button again.

STATUS/MESSAGE OPTION

Press the **[Sts]** button to display the current status. Press and hold the **[Sts]** button for two seconds to enter the configuration mode; a beep sounds and a cursor flashes in the display to indicate entry into the configuration mode. Use the **[Menu]** button to switch between "STATUS_" and "MESSAGE_."

To directly access a status or message, press a keypad number. To scroll through all available statuses or messages, press and hold the **[Step]** button. Press the microphone PTT or the **[Sel]** button to send your selection and exit the configuration mode. Select status "0" or press no keys for 15 seconds to exit the configuration mode without changing or sending a status or message.



GSW-2073-0

Figure 8. Scan and Status/Message Options

16

HORN AND LIGHTS OPTION

Use the horn and lights option when you must leave the vehicle but need to receive any incoming messages. Before leaving the vehicle, select the alarm you want as follows:

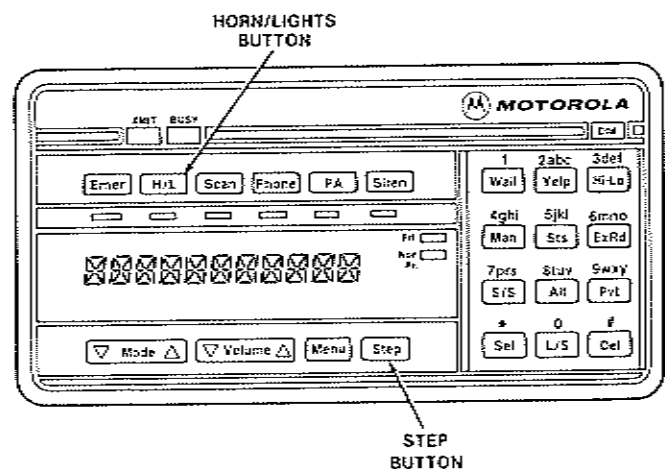
1. Press the **[H/L]** button; the status indicator will light and the display will indicate one of the following—HORN ON, LIGHTS ON, or H/L ON. The display will remain on for approximately two seconds. (If at this point, you press the **[H/L]** button again, the indicator light goes off.)
2. To change the alarm status, enter the configuration mode by holding down the **[H/L]** button until the indicator begins to flash and you hear a beep. Use the **[Step]** button to scroll the alarm list until the status you want is displayed. Release the **[Step]** button. Press the **[H/L]** button to exit the configuration mode. (If **[H/L]** was on when you entered the configuration mode, it will be on when you exit; if off when you entered, it will be off when you exit.)

When a page is received from *Call Alert*, *Private Conversation* Call, or *Telephone Call*, the vehicle's horn sounds and/or the car lights turn on for ten seconds. (The time may be reprogrammed with external programmer.)

1. If the page is a telephone call, telephone ringing is sounded.
2. If the page is a *Private Conversation* call, two beeps are sounded.
3. If the page is an Individual *Call Alert*, four beeps are repeated every 5 seconds.

Note

After returning to the vehicle, release the horn and lights feature by pressing the **[H/L]** button again.



GSW-2071-0

Figure 9. Horn and Lights Option

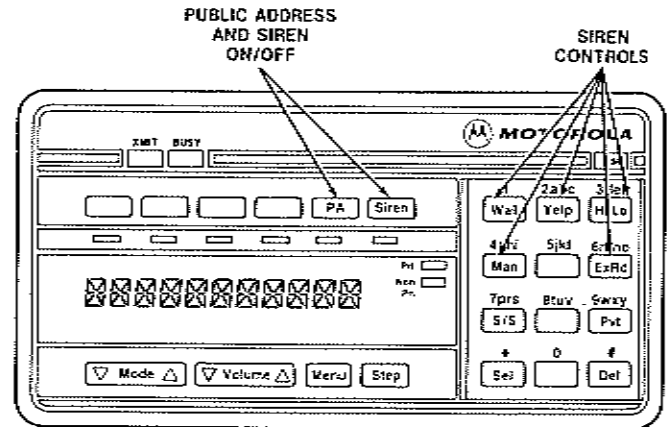
SIREN OPTION

Press the **[Siren]** button to activate the Siren option. The status indicator lights and the last selected Siren function, **[Wail]**, **[HiLo]**, **[Yelp]**, **[ExRd]**, or **[Man]**, is activated. You may preselect the functions by pressing the desired button when the Siren is off. The selected function will momentarily be displayed. You may also select a different function while the siren is on. While the siren is on, you can change functions with the "horn ring" as follows:

ACTIVE FUNCTION	CHANGE TO	HOW CHANGED
[Wail]	[Yelp]	Press and release horn ring; press again to return to [Wail] .
[Yelp]	"Airhorn" sound	Press and hold horn ring as long as you want to sound the "Airhorn."
[HiLo]	[Yelp]	Press and release horn ring; press again to return to [HiLo] .

PUBLIC ADDRESS OPTION

Press the **[PA]** button to activate the Public Address option. The status indicator lights and the display shows the current PA volume level. Adjust the Public Address volume with the **[Volume]** rocker switch. (The PA's volume level is affected by the radio's volume setting but not vice-versa.) If the **[Siren]** and External Radio **[ExRd]** and **[PA]** options are turned on simultaneously, the **[Volume]** controls both the External Radio and the Public Address volume levels. When **[PA]** is active, a microphone PTT overrides all Siren functions, but it will not key a radio transmission.



GBA-2056-0

Figure 10. Siren and Public Address Option

18

PRIVATE CONVERSATION FEATURE

This feature allows you to place and receive private calls to and from another person, typically a dispatcher or supervisor. The function button for this feature is labeled **[Pvt]**.

To Initiate a Private Conversation Call

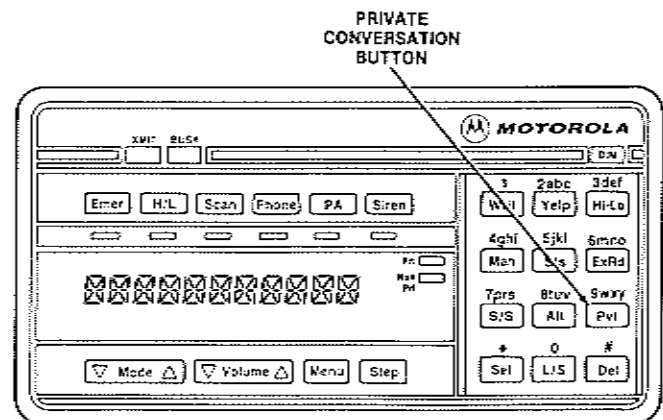
1. Press the **[Pvt]** button and then push and hold the microphone PTT button.
2. Pause for a second to allow the alert tone to be received by the other party.
3. Announce that the conversation will be private; then proceed with your conversation.
4. After completing a *Private Conversation* call, press the **[Pvt]** button again to release the feature.

To Receive a Private Conversation Call

1. When a *Private Conversation* call comes to you, two alert tones sound.
2. Press the **[Pvt]** button and push and hold the microphone PTT to talk.
3. After completing the *Private Conversation* call press the **[Pvt]** button again to release the feature.

Note

If the unit is equipped with the Horn and Lights Option, see that section for details about its operation.



GBA-2072-0

Figure 11. Private Conversation Feature

UNLIMITED *PRIVATE CONVERSATION* OPTION

To Initiate Unlimited *Private Conversation* Calls

1. With this option, you can make private calls to any radio in any fleet. Press **[Pvt]** to enter the Call Mode; the display shows the ID number of the unit you last talked privately with, regardless of who initiated that call. (The processor has ten memory locations. In location "0" it stores the last number you had a *Private Conversation* with, and in memory bank locations 1 through 9, it stores a list of units that you frequently and privately communicate with. The processor always "looks" at location "0" and calls whatever ID number is in that location.) At this point, you can call the last-called unit by pressing the microphone PTT button.

2. To call from the memory bank, press the **[L/S]** key; the display prompts you with "LIST ____". On the keypad, press a number from **[1]** to **[9]**. For two seconds the display shows the name, and then changes to the six-digit ID number of the unit selected by your keypad entry. When you press the microphone PTT, the new ID is loaded into location "0" and your *Private Conversation* transmission occurs.

Note

If you press the **[Menu]** button while "LIST ____" is displayed, the processor exits the Call Mode and goes back to the Mode Name function (or **[S/S]**, if previously selected).

3. To call units not in the memory bank, hold down the **[Pvt]** button for two seconds until you hear a beep and the display changes to "ID = ____". Enter the six-digit ID number of the unit with which you want to talk. Use the **[Del]** button or the **[Step]** button to erase errors. When the ID number is correct, press the microphone PTT to initiate the *Private Conversation*.

To Store ID Numbers in Memory

Note

The call list for *Private Call* and *Call Alert* are one and the same.

1. To enter the Storage Mode, press the **[L/S]** button with "LIST ____" displayed; the display changes to "STORE ____". Enter the location (1 through 9) where it is to be stored. For two seconds, the display shows the name and storage location, and then shows the six-digit ID number. Now enter the new six-digit ID number.

2. Use **[Step]** or **[Del]** buttons to erase errors and back up to the "STORE ____" or "LIST ____" prompts.

3. To store the new ID, press the **[Menu]** button. While the new ID is being stored, the processor exits the Call Mode and goes back to the Mode Name function (or **[S/S]**, if previously selected).

20

To Receive a *Private Conversation* Call

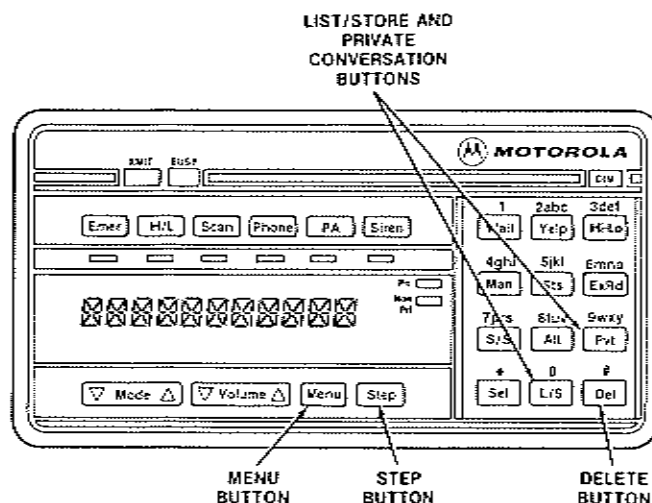
1. When a *Private Conversation* call comes to you, two alert tones sound.

2. Press the **[Pvt]** button and push and hold the microphone PTT to talk.

3. After completing the *Private Conversation* call press the **[Pvt]** button again to release the feature.

Note

If the unit is equipped with the Horn and Lights Option, see that section for details about its operation.



GEW-2573-D

Figure 12. *Private Conversation* Option

CALL ALERT FEATURE

To Acknowledge a Call Alert Page

A *Call Alert* page is four beeps with the display flashing "CALL ALERT." The display continues flashing and the beeps sound every six seconds until the alert is acknowledged by pressing the microphone PTT. After the PTT, the alert message disappears and the unit returns to the last used mode.

Note

If the unit is equipped with the Horn and Lights Option, see that section for details about its operation.

CALL ALERT OPTION

To Initiate a Call Alert Page

1. To initiate a *Call Alert* page, first press the [Alt] button to enter the Call Mode. The display will show the last ID called. (The processor has ten memory locations. In location "0" it stores the last number called. In memory bank locations 1 through 9, the processor stores a list of units. The processor always "looks"

at location "0" and calls the ID number in that location.) At this point, you can alert the last-called unit by pressing the microphone PTT button or the [Sel] button.

2. To call from the memory bank, press the [L/S] button; the display prompts you with "LIST ____." Press a keypad number from [1] to [9]. For two seconds, the display shows the name, and then changes to the six-digit ID number of the unit selected by your keypad entry. When you press the microphone PTT or the [Sel] button, the new ID is loaded into location "0" and your *Call Alert* transmission occurs.

Note

If you press the [Menu] button while "LIST ____" is displayed, the processor exits the Call Mode and goes back to the Mode Name function (or [S/S], if previously selected).

3. To alert units not in the memory bank, hold down the [Alt] button for two seconds until you hear a beep and the display changes to "ID = ____." Enter the six-digit ID number of the unit you want to alert. Use the [Del] button or the [Step] button to erase errors. When the ID number is correct, press the microphone PTT or the [Sel] button to initiate the *Call Alert*.

22

To Store ID Numbers in Memory

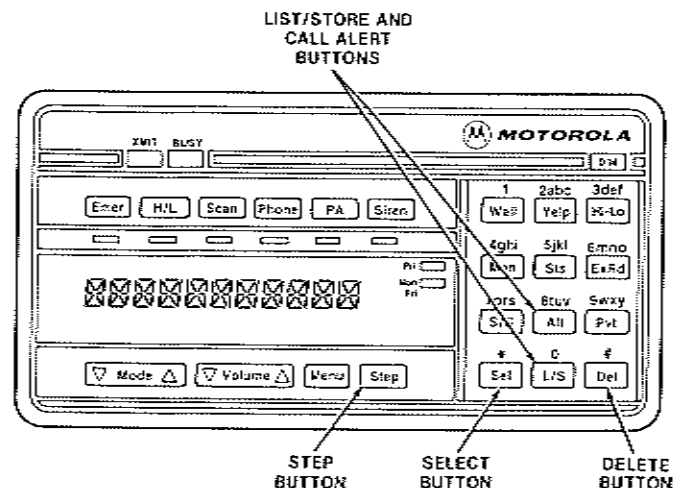
Note

The call list for *Private Call* and *Call Alert* are one and the same.

1. To enter the Storage Mode, press the [L/S] button with "LIST ____" displayed; the display changes to "STORE ____." Enter the location (1 through 9) where it is to be stored. For two seconds, the display shows the name and storage location, and then shows the six-digit ID number. Now enter the new six-digit ID number.

2. Use [Step] or [Del] buttons to erase errors and back up to the "STORE ____" or "LIST ____" prompts.

3. To store the new ID, press the [Menu] button. While the new ID is being stored, the processor exits the Call Mode and goes back to the Mode Name function (or [S/S], if previously selected).



GEW 2014-0

Figure 13. Call Alert Feature

EMERGENCY CALL AND ALARM OPTIONS

Emergency ALARM alerts the dispatcher that you have an emergency situation. Emergency CALL gives you priority channel assignments. Your unit may have either or both features. Emergency ALARM/CALL uses both features, with the system going from ALARM to CALL automatically after ALARM is acknowledged by the base station.

Note

On silent-emergency equipped mobiles, a hidden footswitch may be used to actuate the alarm. All audible noises and visual displays are inhibited. If an ALARM proceeds to CALL, no audible or visual indication will occur.

Note

If you are out of base station range, the radio will cause an out-of-range tone to sound when the [Emer] button is pressed. Left in the emergency mode, the radio "knows" to send the alarm message as soon as it re-enters base station range.

Alarm Only Option

1. Press the [Emer] button to go into the emergency mode.
2. On ALARM-only units, "EMERGENCY" will flash until the alarm message is sent and the base station acknowledges.

3. When acknowledgement is received, the unit sounds five quick beeps and the flashing message disappears. The ALARM operation is complete.

4. To exit the emergency mode, press and hold the [Emer] button for two seconds until a beep sounds.

Alarm/Call Option

1. Press the [Emer] button to go into the emergency mode.

2. When acknowledgement is received on ALARM/CALL units, "EMERGENCY" remains displayed. After three seconds, the mode name (or System/Subfleet) is displayed. The two displays alternate until you press the microphone PTT.

3. If acknowledgement has not been received, a PTT will force entry into emergency CALL and the "EMERGENCY" display alternates with the mode name (or System/Subfleet). The radio requests a priority channel assignment and prepares to transmit your voice message.

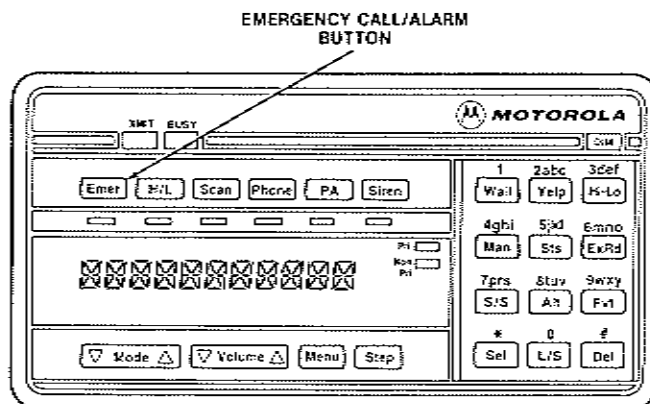
4. To exit the emergency mode, press and hold the [Emer] button for two seconds until a beep sounds.

Call Only Option

1. If your unit is equipped with emergency CALL only, press the [Emer] button; "EMERGENCY" and mode name (or System/Subfleet) alternately display.

2. Press the microphone PTT. The radio requests a priority channel assignment and prepares to transmit your voice message.

3. To exit the emergency mode, press and hold the [Emer] button for two seconds until a beep sounds.



GBW 2078-0

Figure 14. Emergency Call and Alarm Options

DYNAMIC REGROUPING OPTION

This feature is used by the dispatcher to establish special subfleets that are needed on a temporary basis and for a specific function or event. If you were not in your vehicle when the regrouping occurred, you will hear an alert tone when you try to transmit. If you are in your vehicle when it occurs, you will hear an alert tone and you will see one of the displays listed below.

DISPLAY	EXPLANATION
SYS# SUB X	Displays if you were operating in SYS/SUB mode.
"mode name"	Displays if you were operating in that mode.
UNLSTD ##-X	Displays if you were operating in "mode name" mode but no valid mode name was assigned to that system/subfleet.

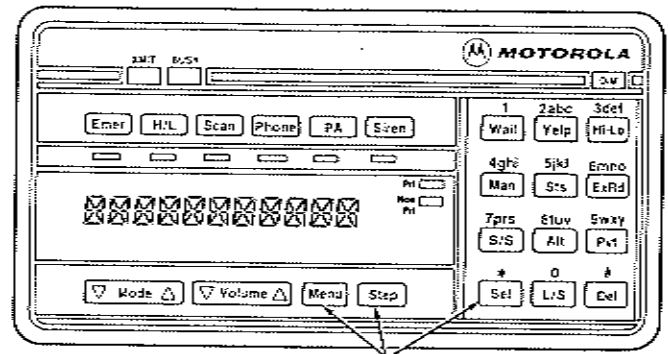
After regrouping, your unit operates in one of two modes—select-enabled or disabled. If it is select-enabled, you can leave the dynamic group and talk to other fleets, subfleets, or with conventional channels; if select-disabled, you can talk only with your dynamic group or with conventional channels, and you can use your *Call Alert* feature.

Reprogramming Request

1. To request reprogramming for a dynamic grouping assignment, press the **[Menu]** button until "RQST RPRGM" is displayed. (If in the SUBfleet mode, press the **[7]** button or **[Step]** to the "R" subfleet.)

2. Press the microphone PTT or the **[Sel]** button to send the request. When your request is heard by the dynamic regrouping console, you will hear one beep, and when the console acknowledges, you will hear four more beeps. Then the last valid mode name or system/subfleet returns on your display.

3. Once the mobile radio is in a dynamic group, only the dispatcher can reassign the radio back to the original subfleet.



MENU/STEP AND
SELECT BUTTONS

GBW-2075-0

Figure 15. Dynamic Regrouping Option

26

AUTOMATIC MULTIPLE SWITCHING (AMAX) OPTION

This option allows you to communicate over distances beyond the reach of a single site. When wide area coverage is required, multiple trunked sites are utilized, and AMAX automatically switches the radio to a different site when the signal of the current site becomes too weak. This occurs when the radio is driven out of range of one site and into the range of another.

Automatic AMAX Operation

A radio programmed for AMAX will automatically scan for a new control channel when the present channel's signal is too weak. To prohibit scanning (for example, during a momentary signal fadeout) and lock in a specific channel, follow these steps:

1. See "Manual AMAX Operation" and select the channel to be locked in.
2. Hold the **[Step]** button down for approximately two seconds.
3. The display changes to "LOCK," followed by the site number or field-programmed name of the AMAX channel being monitored.
4. Hold the **[Step]** button down for this extended time to toggle the lock on and off.
5. Exit this mode with the **[Menu]** button.

Manual AMAX Operation

1. Press the **[Menu]** button until "SITE" is displayed.

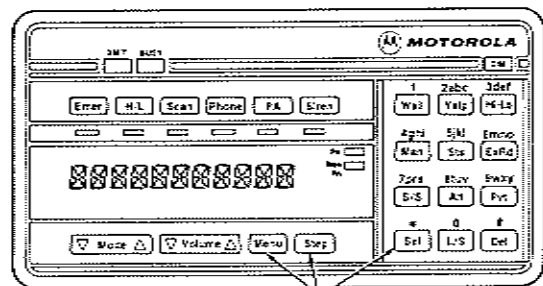
2. Momentarily press the **[Step]** button to initiate a scan. The display shows "SITE" followed by the site number or field-programmed name of the AMAX channel being monitored.

3. Press **[Step]** again to scan for a new channel. When a new channel is located, the cursor stops flashing and the new site number or name is displayed. If it cannot find a new channel, the cursor stops flashing and the previous site name or number is displayed.

4. Exit this mode with the **[Menu]** button.

Note

Automatic Multiple Switching (AMAX) is not accessible while in the conventional mode.



MENU/STEP AND
SELECT BUTTONS

GBW-2075-0

Figure 16. Automatic Multiple Switching Option

TELEPHONE INTERCONNECT OPTION

With this option you can place calls to and receive calls from persons on land lines on your mobile radio. All calls between yourself and the land line user are private regardless of who initiates the call.

The unit stores **nine** phone numbers and the last-called number. Although the display shows only eleven digits at a time, phone numbers up to 16-digits long can be stored.

To Manually Initiate a Telephone Call

1. Press the **[Phone]** button to enter the phone call mode.
2. The indicator light comes on and the last-dialed number is displayed.
3. Listen for a dial tone and then enter the first digit. The "idle" display goes away, the entered digit is displayed, dialed, and stored in "scratchpad" memory. A valid key chirp confirms each dialed digit.
4. There is no limit on the number of digits you can manually dial, but the scratchpad memory holds only 16 digits. If 17 are entered, the memory loses the first 16 digits and considers the 17th digit the first.

Note

If the **[Step]** button is pressed at any time during dialing, the system leaves the manual mode and goes to autodial mode. If you hang up (press the **[Phone]** button) at any time during dialing, the system stores, in location "0," all the digits dialed up to that point and then leaves the phone mode.

5. After the call has been placed, the display shows the dialed number. (If the number is more than 11 digits long, the display alternately shows the first part of the number and then the last part.)

6. To end a call, press the **[Phone]** button.

To Autodial a Telephone Call

1. Press the **[Phone]** button to enter the phone call mode.
2. The indicator light comes on and the "idle" display shows the last number dialed. (**[Step]** and **[0]** redials the last-called number.)
3. Press **[Step]** to activate the autodialer; the display shows "RECALL ____"

Note

If the **[Step]** button is pressed when "RECALL ____" is displayed, the system leaves the autodial mode and goes to manual mode.

4. When you enter a number from **[1]** to **[9]** the system dials the phone number in that memory location. Press button **[0]** to redial the last number dialed. If dashes appear, that location has no stored number.

Note

If you hang up (press the **[Phone]** button) during autodialing, the system goes out of the phone mode. Only the digits dialed up to that point are stored in location 0. The following buttons are ignored during autodial: **[Step]**, **[*]**, **[#]**, and **[0]** through **[9]**.

5. The phone number digits are dialed as each is displayed, and a valid key chirp sounds simultaneously.
6. After the call has been placed, the display shows the dialed number. (If more than 11 digits, the displays alternates between the first part of the number and the last part.)
7. To end a call, press the **[Phone]** button.

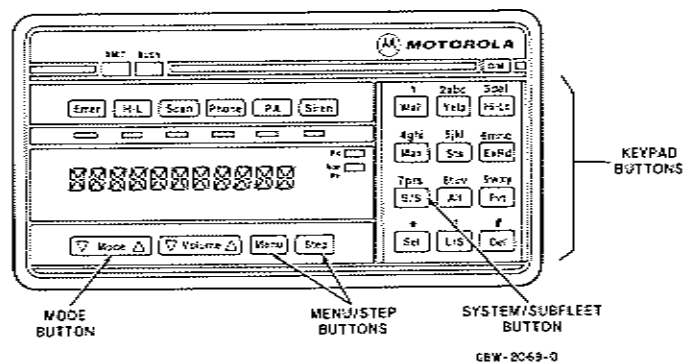


Figure 17. Telephone Interconnect Option

To Use the "Scratchpad" Memory

1. During a phone conversation, use the display as a scratchpad to "write down" a phone number for later use. Press [Step] to display "RECALL ____," then press the [*] button. The display shows all dashes.
2. Digits entered on the keypad scroll across the display as if being dialed but no tones are sounded. (Do not enter more than 16 digits; if you enter a 17th digit, the first 16 digits are lost.)
3. Press the [Phone] button to hang up and store the number in Location 0.
4. Press [Phone], [Step], and [0] to call the number.

Note

This feature is especially useful when calling information. Call your saved number or make a note of it before you call yet another number. Any call made erases the scratchpad number and enters the last-dialed number.

To List and Dial Phone Numbers

1. With the [Phone] button off, press the [L/S] button; "LIST ____" is displayed.

30

Note

The [L/S] button is also used for *Private Conversation* and *Call Alert*. Be sure these features (if used) are not active when listing or storing telephone numbers.

2. When you enter a number from [1] to [9], the display shows the name and the phone number stored in that memory location. If dashes appear on the display, that location has not been programmed.

Note

If a phone number is longer than 11 digits, the first part of the phone number is shown for one second and then the last part is displayed for two seconds. The two parts are alternately and repeatedly displayed.

3. To look at other locations, press the [Step] button to go back to the "LIST ____" display; then enter another number.

4. To call from a listed number, press the [Phone] button. This activates the phone mode and moves the listed number to the idle display. If you press the [Phone] button when dashes are displayed, the last-called number moves to the idle display. Call the number in the idle display by pressing the [Step] button.

To Store Phone Numbers

1. With the [Phone] button off, press the [L/S] button; "LIST ____" is displayed.

Note

If you press the [Menu] button while "LIST ____" or "STORE ____" is displayed, the processor exits the phone mode and goes back to the Mode Name function (or [S/S], if previously selected).

2. Press [L/S] again to go to the "STORE ____" display. Select a memory location by entering a number from [1] to [9]—a [0] recalls either the last-called number or the scratchpad number.
3. The display shows the name and the phone number of the party stored in that location. The number is then displayed in the "idle" format. If dashes appear on the display, that location has not been programmed.

Note

Press the [Step] button to go back to the "STORE ____" display. The number just displayed is not affected. Select other locations as before.

4. With a location selected and its phone number displayed, you may enter new numbers. The first digit entered erases the screen and displays the new digit. If you enter a wrong number, press the [Step] button to delete the last character in the display. When you delete the last of your new number, the display shows the original number stored at that location.

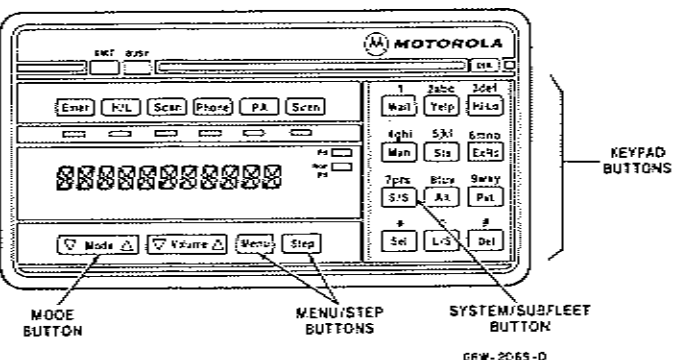
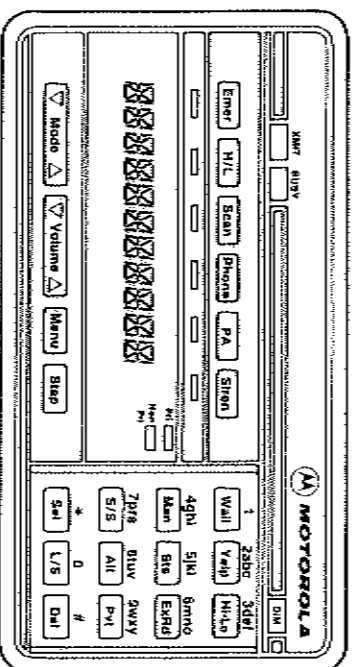


Figure 18. Telephone Interconnect Option

COMPUTER SOFTWARE COPYRIGHTS

The Motorola products described in this instruction manual may include copyrighted Motorola computer programs stored in semiconductor memories or other mediums. Laws in the United States and other countries preserve for Motorola certain exclusive rights for copyrighted computer programs, including the exclusive right to copy or reproduce in any form the copyrighted computer program. Accordingly, any copyrighted Motorola computer programs contained in the Motorola products described in this instruction manual may not be copied or reproduced in any manner without the express written permission of Motorola. Furthermore, the purchase of Motorola products shall not be deemed to grant either directly or by implication, estoppel, or otherwise, any license under the copyrights, patents, or patent applications of Motorola, except for the normal non-exclusive, royalty free license to use that arises by operation of law in the sale of a product.

Operating Instructions for the Motorola SYNTOR X 9000™ Control Unit



Fully Optional Control Head

Site

Status/Message Option. If you have this option, you can send up to eight status and eight message codes.

Press [Sta] to display the current status. Press and hold [Sta] for two seconds to enter the configuration mode; a beep sounds and "STATUS_" appears on the display to indicate entry into the configuration mode. Use [Menu] to switch between "STATUS_" and "MESSAGE_". To directly access a status or message, press a keypad number. To scroll through all available statuses or messages, press and hold the [Step] button. Press the microphone PTT or [Sel] to send your selection and exit the configuration mode. Select status "0" or press no keys for 30 seconds to exit the configuration mode without changing or sending a status or message.

To Receive

Push the [Volume] rocker switch and listen for the adjust tone. Hold the button down; the volume increases or decreases. Adjust for the desired volume level. The display indicates volume levels from 0 to 15. Release the [Volume] rocker switch. The radio is ready to receive calls.

To Transmit

Press [Mode] to select a talk group or conventional channel. Press and hold the microphone PTT; when the transmit light comes on, speak into the microphone in a normal voice. State your FCC call sign at the beginning of each transmission. If you hear a tone when you press the PTT, the system is alerting you that certain conditions exist. The table on the reverse side lists the tones and their meanings.

Note

If "FAIL" appears in the display when the system is turned on, the system locks up until the condition is corrected. If "ERROR" appears, some non-critical data (e.g. mode names) has been changed. Report either condition to service personnel.

Table of Tone Signals

TYPE OF TONE	CAUSE	WHAT TO DO
TALK PROHIBIT CONSTANT TONE (Transmit light may also flash when you press the microphone PTT or the Phone button.)	You are out of coverage range of the system, or The system is temporarily out of service.	Try again when you are in a better location—for example, when on a hill or simply closer to the system. Wait until the system is back in operation. Occasionally, try again.
BUSY TONE (telephone-type busy signal)	No channel is available.	Release the PTT button. You will hear call back tones when it's your turn for a channel.
TALK PERMIT or CALL BACK TONE (one short beep and one long beep)	You now have access to a channel.	The radio holds the channel open for about three seconds. Press the PTT and begin your transmission.
BEEP EVERY TEN SECONDS	System is in FAIL SOFT.	A system failure has occurred. You can still transmit and receive, but you must share a channel with other groups until the system is repaired.
CONSTANT TONE DURING YOUR TRANSMISSION	Time-out timer warning.	Finish your transmission quickly before your transmitter is disabled.

H/L

Horn/Lights Option. If you have this option, you can select an external alert to signal you when you are away from your vehicle.

Before leaving your vehicle, press [H/L]; the indicator lights and, for two seconds, the display shows HORN ON, LIGHTS ON, or H/L ON. That preset alarm will alert you when a page is received from Call Alert™, Private Conversation™ Call, or Telephone Call. From the different sounds, determine the type of call:

Telephone ringing—telephone call.

Two beeps—Private Conversation call.

Four beeps, repeated every five seconds—Individual Call Alert.

To change the alarm status, press and hold [H/L] until the indicator flashes and a beep sounds. Press [Step] to scroll; when the status you want is displayed, release [Step]. Press [H/L] to exit the change mode. (If [H/L] was on when you entered the change mode, it will be on when you exit; if off when you entered, it will be off when you exit.)

After returning to the vehicle, press [H/L] to release the feature.

Alt *Call Alert.* This feature allows you to page, and receive pages from, other units. With the Horn/Lights option, the vehicle's horn sounds and/or the headlights flash when a page is received.

To send a Call Alert page

Press [Alt] to activate Call Alert. Select the unit to be paged (see the List/Store Feature). Press and release [Sel] or the microphone PTT to send the page. A tone sounds when the page is sent.

To receive a Call Alert page

When you receive a Call Alert page, the display flashes "CALL ALERT" and four high-pitched beeps sound. (If your unit has the Horn/Lights button engaged, the horn sounds or the headlights flash.) The display flashes and the beeps sound every 5 seconds until you press and release the microphone PTT button or you turn the radio off.

Pvt *Private Conversation.* With the basic unit, you can converse privately with one other unit. If you have the Unlimited Private Conversation option, you can speak privately with any unit in any fleet.

To start a Private Conversation

For Basic Private Conversation, press [Pvt]. Press the microphone PTT and announce the private call. Proceed with the conversation. When the call is complete, press [Pvt] to release the feature. For Unlimited Private Conversation, select the unit to be called with the List/Store Feature.

To receive a Private Conversation call

When a Private Conversation call comes in, two alert tones sound. Press [Pvt] and push and hold the microphone PTT to talk. After completing the call, press [Pvt] again to release the feature.

L/S *List/Store Feature.* With Unlimited Private Conversation or Call Alert, you may select the unit you want to call by entering either a memory location number or an ID number.

Memory Location—press [Pvt] or [Alt], then press [L/S]. "LIST_" is displayed. Press a memory location button from [1] to [9]. The unit's ID is displayed. To store new ID numbers, [Step] to the "LIST_" display (if necessary) and press [L/S] to display "STORE_". Enter a number from [1] to [9]; a name is displayed and then a number. Enter a six-digit ID and use [Step] to correct wrong entries. Press [Menu] to store the new number.

Direct Input—press and hold [Pvt] or [Alt] until you hear a beep; the display shows "PC_". (If you pressed [Pvt]) or "CA_". (If you pressed [Alt]). Enter a six-digit unit ID number. Use [Step] or [Del] to correct wrong entries.

Phone

Telephone Interconnect Option. If it has a [Phone] button, your radio is equipped for telephone interconnect.

If you hear a busy signal when you press [Phone], leave it on. When a channel is available, a dial tone sounds. Then place the call. If you hear an out-of-range tone when you press [Phone], you are out of the system's coverage range. During a call, only one person may talk at a time. Each time you release the PTT button, a beep signals the other party to speak. An alert tone sounds 15 seconds before the call times out. Press [Phone] to end a call and continue normal radio operation.

To receive a call

When a phone call is received, a ringing tone sounds from the speaker. Press [Phone] and converse as described above.

To manually place a telephone call

Press [Phone] and wait for a dial tone. As you key in the digits, the number is displayed and a valid-key "chirp" confirms each dialed digit. Dial as many digits as you like, but only the last sixteen are stored in the scratchpad memory. After the call is placed, the dialed number is displayed.

To autocall a telephone number

Press [Phone] and then [Step]. "RECALL_" is displayed. Press a number from [1] to [9] to dial the number stored in that memory location. Press [] to recall the last-dialed number. As each digit is dialed and displayed, a valid-key chirp sounds. The displayed number is stored in Location "0."

To list and dial a telephone number

Use "LIST" to view names and numbers before you place a call. With the [Phone] off, press [LS]: "LIST_" is displayed. Enter a number from [1] to [9]; a name is displayed and then a number. To view more, press [Step] ("LIST_" is displayed) and then enter another number. Press [Menu] to exit or press [Phone] when the number you want is displayed; press [Step] and [0] to call the number.


To use the "Scratchpad" memory

During a call, press [Step] to display "RECALL_"; then press []. The display shows dashes. Use the keypad to "write down" up to 16 digits. Press [Phone] to store the number; press [Phone], [Step], and [0] to call the number.

To store a telephone number

With the [Phone] off, press [LS]: "LIST_" is displayed. Press [LS] again; "STORE_" is displayed. Enter a number from [1] to [9]; a name is displayed and then a number. Enter a new number. Use [Step] to correct a wrong entry. Press [Menu] to store the new number.

Motorola is an Equal Employment Opportunity,
Affirmative Action Employer.

Motorola, , SYNTOR X 9000, *Private Conversation*,
Smartnet and *Call Alert* are registered trademarks
of Motorola, Inc.

68P80100W90-O