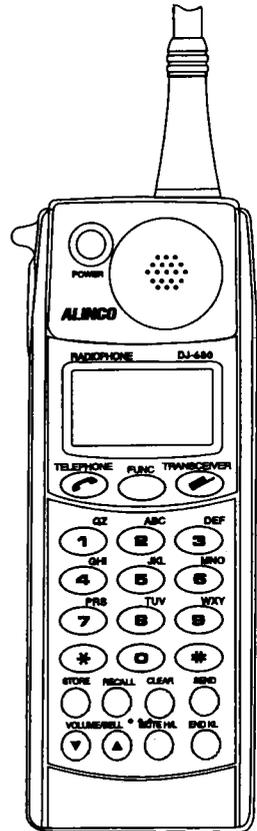


RADIOPHONE

DJ-680

Instruction Manual



Thank you for buying the ALINCO radiophone. The DJ-680 instruction manual contains important safety and operating instructions. Read this manual carefully before using the product.

Specifications and information found in this document are subject to change without notice.

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Names of products used in this manual are for identification purpose only and may be trademarks or registered trademarks of their respective company.

Introduction

Alinco's radiophone DJ-680 is a cellular-look radio supporting both full- and half-duplex communications. This is a transceiver, but it can be used to call a telephone as well as a transceiver when so programmed. If your party is using a telephone, you can talk and hear simultaneously as if you were also using a portable telephone.

With the Alinco EJ-27D logic board installed, the radio becomes capable of trunking. That is to say, it automatically selects an available communicating channel for you for a private selective call. Also, it has a capability to change the service area (called *site*) while you are in another city*.

In addition, this radio features:

- Redialing
- Output power change
- Automatic dialing with 100 memories*
- Battery power saving
- Semi-duplex communication for talking with another transceiver*
- Two-way radio mode for operation as a conventional transceiver*

This manual contains information you should know before using the DJ-680, and describes how to setup and maintain the radio. It also explains how to operate the radio when it is equipped with and without the logic board.

* : Note that your radio may not work exactly the same as described in this document, depending on how your dealer has customized it.

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Chapters in This Manual

This manual consists of the following chapters and appendices:

Chapter 1 Before Using

Contains general information you should know before using the DJ-680, such as the articles included in the package, precautions, and part names of the product. It also describes how to set up and maintain the radio.

Chapter 2 Basic Operation

Describes basic operations, including how to turn the power ON and OFF, adjust radio and ringing volume, lock keys, change output power level, and program auto-dial memory. These instructions are common to all users.

Chapter 3 Operation with the Logic Board

Describes how to receive calls and dial through the DJ-680 which is equipped with the EJ-27D logic board. Each section covers the operations dedicated to each operation mode: the radio-phone, semi-duplex trunking, or two-way radio mode.

Chapter 4 Operation without the Logic Board

Describes how to operate the radio when not equipped with the EJ-27D logic board. Procedures for dialing, receiving calls, and performing other functions are similar to those described in Chapter 3 "Operation with the Logic Board," but auto-line-hunting (trunking) is not featured.

Appendices

Includes helpful information, such as specifications, troubleshooting, optional accessories list and a flowchart on switching operation modes.

Conventions

The following typographical and graphical conventions are used throughout this manual.

Italic typeface refers to new terms or is used for emphasis.

Bold typeface refers to messages which appear on the display.

Normal typeface enclosed in double-quotation marks (" ") refers to the title of the chapter or section you should refer to.

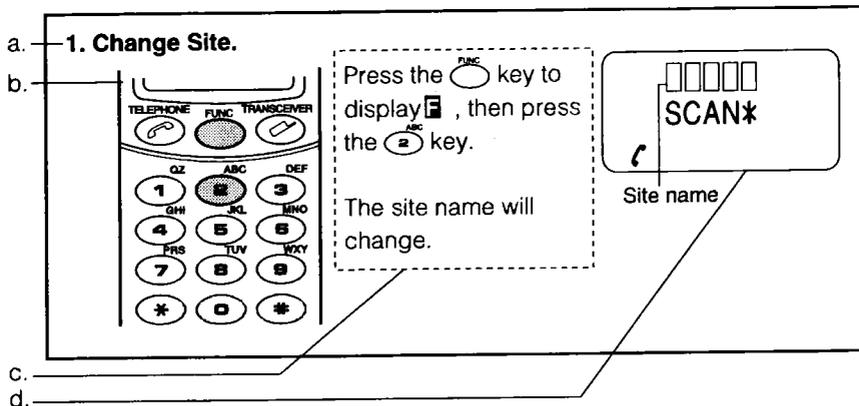


Caution: The caution icon indicates an important procedure which could result in damage to equipment if not followed correctly.



Note: The note icon indicates additional information which is helpful but is not necessarily known.

Procedures are described in the following format.



- The bold sentence is the instruction in this step. A sequential number appears at the beginning when the procedure contains two or more steps.
- The shaded parts indicate keys you should (or may) use in this step. Press the **FUNC** key, then the **2** key in this case.
- Describes detailed information, including keys you should press, notes, cautions, and alternative methods.
- A sample image of the display which will appear after you perform the instruction indicated. The boxes  should be replaced with the site name pre-programmed to your DJ-680 by your dealer.

Chapter 1

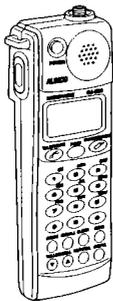
Before Using

This chapter contains general information you should know before using the DJ-680, such as the articles included in the package, precautions, and part names of the product. It also describes how to set up and maintain the radio.

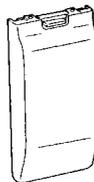
1.1 Unpacking the Radio

The DJ-680 package box should contain the following articles.

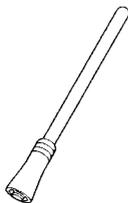
- DJ-680 (radio)



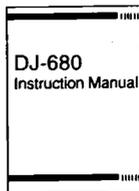
- Drycell case
(Depending on the version)



- Antenna



- DJ-680 Instruction Manual
(this manual)



1.2 Precautions

- Do not disassemble the radio.
- Install batteries with the correct polarity, if the drycell case is used.
- Ensure the antenna is securely attached to the radio.
- Use the radio in a clean environment between -20°C and +60°C (+4°F to +140°F).

1.3 Understanding the Terms Used in Radio Operations

This section describes the trunking, operation modes, and sites. You should be familiar with these terms when using the radio.

Trunking

The radio is capable of *trunking* if your dealer has installed the EJ-27D logic board in it.

Trunking eliminates the need for selecting the channel. The radio automatically skips busy channels and searches for an available channel while calling a party. On the other hand, a party can call you without having to know the channel to be used. Because your radio automatically provides an available channel.

A trunking network consists of trunked radios only. It performs selective and private communications, that is, your conversation cannot be heard or interrupted by other trunked radios.

Without trunking, you have to manually change the channel if it is busy. To receive a call from a telephone, you need to previously inform the party of the channel you are to use.

Operation Modes (When Equipped with the EJ-27D Logic Board)

The radio provides three different operation modes: *radio-phone*, *semi-duplex trunking*, and *two-way radio* (walkie-talkie) mode to serve various purposes of radio operation. Operation modes are briefly described on the next page. The diagram on that page illustrates the relationship between these modes.



Note: In this manual, the radio-phone and semi-duplex trunking modes are inclusively called trunking mode.

Your dealer may have disabled any of the operation modes. Ask the dealer about the modes and functions available on the radio.

Radio-phone Mode

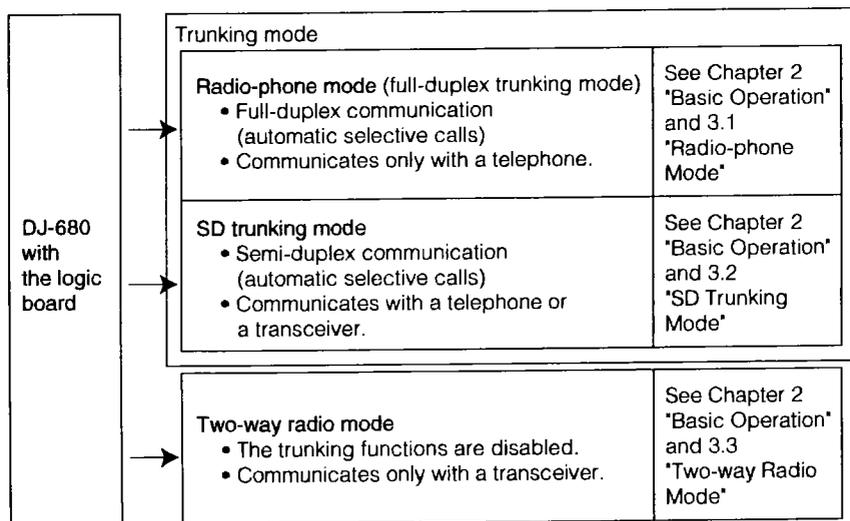
Normally, the radio will be in the radio-phone mode just after power-on, and you will work in this mode in most cases. The radio acts like a cellular phone. You may dial or receive a call from a party who is using a telephone (not a transceiver). You can then hear and talk simultaneously as if you were using a telephone (full-duplex communication). Trunking is activated, so you do not have to manually select the channel. The radio performs selective and private communications.

Semi-duplex Trunking Mode (SD Trunking Mode)

In the semi-duplex trunking (SD trunking) mode, you can communicate with a transceiver as well as a telephone. You cannot hear the party's voice while you are talking because the radio uses half-duplex communication. Trunking is activated, so you do not have to manually select the channel. The radio performs selective and private communications.

Two-way Radio Mode

If you wish to use the DJ-680 as a normal transceiver, select the two-way radio mode. This mode uses simplex or semi-duplex communication. You cannot speak while the other partner is talking. Trunking is completely disabled.





Operation Modes (Not Equipped with the EJ-27D Logic Board)

The radio provides three different operation modes: *duplex*, *semi-duplex*, and *two-way radio* (walkie-talkie) mode. Operation modes are briefly described below. The diagram illustrates the relationship between these modes.

Note that your dealer may have disabled any of the operation modes. Ask the dealer about the modes and functions available on the radio. The trunking function is not available when the logic board is not installed in the radio.

Duplex Mode

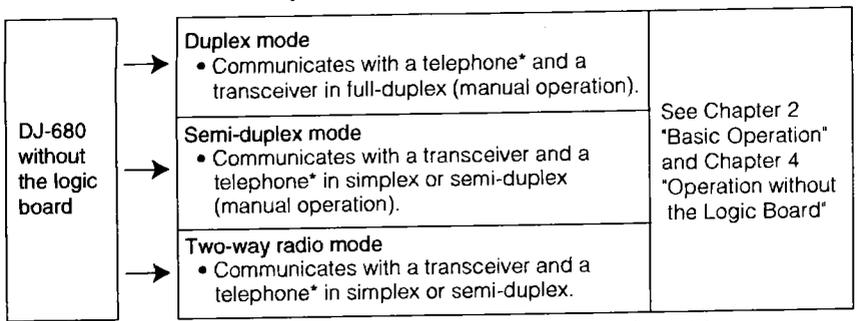
Normally, the radio will be in the duplex mode just after power-on. You may dial or receive a call from a party who is using a telephone* (or another full-duplex radio). You can then hear and talk simultaneously as if you were using a telephone.

Semi-duplex Mode

When you wish to communicate with a transceiver as well as a telephone*, switch the radio to the semi-duplex mode. Note that you cannot hear the party's voice while you are talking because the radio uses half-duplex communication.

Two-way Radio Mode

If you use the DJ-680 as a normal transceiver, select the two-way radio mode. You may communicate with a transceiver, as well as a telephone*. Because the two-way radio mode uses semi-duplex communication, you cannot speak while the other partner is talking.



* : Communication with a telephone is allowed when base stations are equipped with phone-patch.

Site Configuration

The term *site* in this manual has two different meanings depending on whether or not the trunking function works.

While trunking is activated (that is, in the radio-phone and SD trunking modes), a site means a service area on the trunking network where your radio can work. If you are in another area, you need to change to the site appropriate to that area.

While trunking is NOT activated (that is, in the duplex, semi-duplex, and two-way radio modes), a site refers to a group of channels.



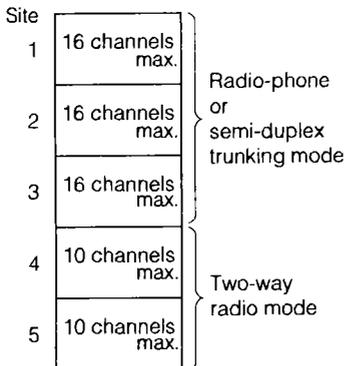
Note: A site is sometimes called a bank or a group of channels.

The radio supports five sites (sites 1 through 5). Your dealer may have configured up to 3 sites for the radio-phone and/or semi-duplex trunking modes (or duplex and/or semi-duplex modes). Sites 4 and 5, if enabled by the dealer, are dedicated for use in the two-way radio mode. This means, when you change the operation mode, the site is also changed.

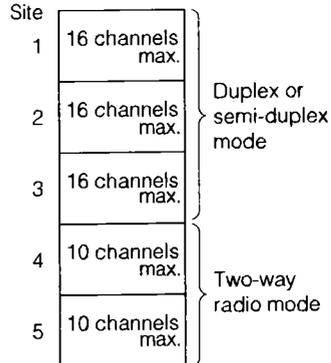
Sites 1 through 3 contain 20 channels per site, however, not more than 16 channels are networked at any one time (the number of actually usable channels is user transparent). Sites 4 and 5 each contain 10 channels maximum.

The dealer assigns a unique name to each site. You will see the site name, instead of the site number, on the display.

With the logic board



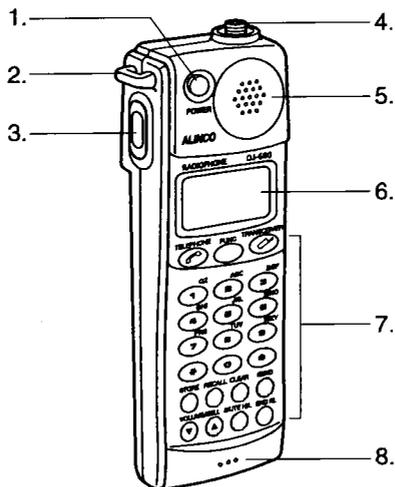
Without the logic board



1.4 Part Names and Functions

This section describes parts by name and function.

Top, Front, and Left Side Panels



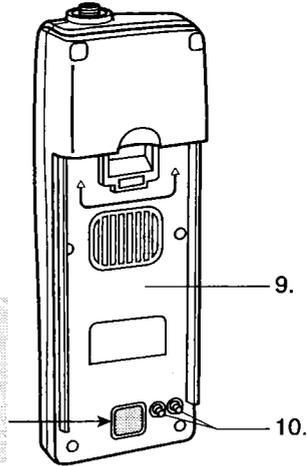
1. **POWER switch:** Press this switch to turn the power ON or OFF.
2. **Strap hanger:** Attach a hand strap here, if necessary.
3. **PTT key:** Push-To-Talk. In the radio-phone mode, press this key to transmit at high power. In other modes, press and hold this key while you are talking.
4. **Antenna connector:** Attach the supplied antenna here. See "Attaching the Antenna" in 1.5 "Setting Up the DJ-680."
5. **Speaker**
6. **Display:** Messages and icons appear in this area, indicating status of the radio. See "Display" later in this section.

7. Keys: These keys are used to operate the radio. See "Keys" later in this section.
8. Microphone: Speak into this microphone when talking with your party.

Rear and Right Side Panels

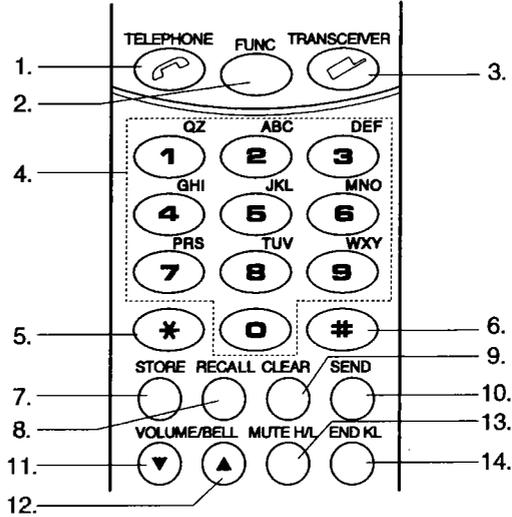


Caution:
DO NOT OPEN THIS CAP!
Touching the internal components or penetration of foreign matter inside may cause the radio to malfunction.



9. Battery pack mount: Mount the battery pack here.
10. Battery terminals: Power from batteries is supplied through these terminals to the radio.
(power-supply terminals)

Keys



1.  :

This key is used in combination with the  and/or  keys to switch the operation modes. See Appendix D "Switching the Operation Modes."

2.  :

Press this key first to activate the sub function of another key. When you press the  key, **F** will appear on the display.

3.  :

This key is used in combination with the  and  keys to switch the operation modes. See Appendix D "Switching the Operation Modes."

4.   :

The numeric keys are used to enter numbers and alphabetic characters.

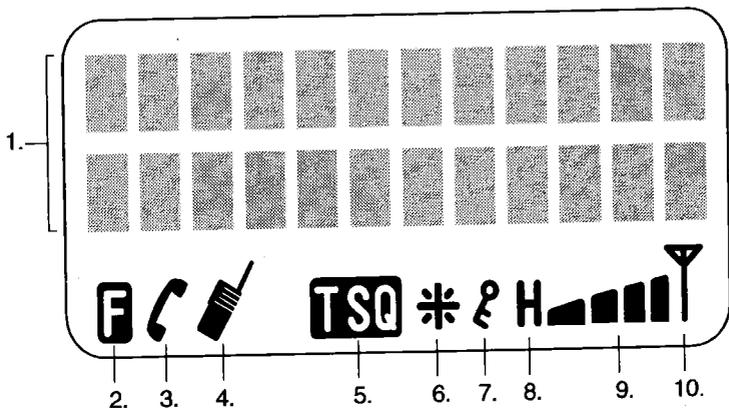
5.  :

Use this key to move the cursor () to the left while entering numbers or letters, or to call up lower channel numbers.



6.  : Use this key to move the cursor () to the right while entering numbers or letters, or to call up higher channel numbers.
7.  : Press this key to memorize telephone numbers for auto-dialing.
8.  : Press this key to choose an auto-dial number from memories.
9.  : Press this key to clear entries.
10.  : Press this key preceded by entering a phone number to initiate a call. To redial the last dialed number in the radio-phone mode, press this key alone. During conversation in the radio-phone mode, pressing this key enables the battery saving function.
11.  : Use this key to decrease the speaker volume. These keys are also available for ringing tone volume control while you are receiving a call.
12.  : Use this key to increase the speaker volume. This key is also available for ringing tone volume control while you are receiving a call.
13.  : Press the  key and press the  key to switch between the high and low output power levels (this function is disabled in the radio-phone mode). If your radio is not equipped with the logic board, you can press this key to monitor the incoming signals.
14.  : Press this key to terminate the conversation. Press the  key, then  key to disable the keys (other than the  key) to prevent from accidental key-operation.

Display



1. **Dot-matrix display:** There are two lines for displaying status messages, the current site name (or channel number), and calling phone number.
2.  : When you press the  key, the function icon appears, indicating that you can activate the sub functions of the keys.
3.  : The telephone icon appears when the radio is in the radio-phone mode or duplex mode.
4.  : The transceiver icon appears when the radio is in the semi-duplex-trunking, semi-duplex, or two-way radio mode. This icon is displayed along with the telephone icon when the radio is under the power saving mode while in the radio-phone mode.
5.  : The TSQ icon appears when TSQ (tone squelch) is enabled on the current channel (this function does not work in the radio-phone or SD trunking mode).

- 
6. ✳ : The scrambler icon appears when the scrambling function is enabled on the current channel (this function does not work in the radio-phone or SD trunking mode).
 7. 🔒 : The key-lock icon appears while the keys are locked.
 8. H : The high-power icon appears when the output power level is set to high. It disappears when output power is set to low.
 9.  : The S-meter indicates the strength of the received signal. The meter shows the output power level during transmission.
 10.  : The busy icon appears when the radio is receiving signals.

1.5 Setting Up the DJ-680

This section describes the dealer-configured parameters, and the instructions for installing batteries and attaching the antenna.

What You Need to Ask the Dealer

Your dealer will configure the radio before you take it home. To operate the radio successfully, ask the dealer about the items listed below before using it. The radio operates differently depending on the configuration.

- Whether or not the EJ-27D logic board is installed on the radio. If installed, the trunking functions (such as the radio-phone mode) are available.
- The operation mode set for each site (i.e. the radio-phone, SD trunking, and two-way radio modes)

For more information about operation modes and sites, see section 1.3 "Understanding the Terms Used in Radio Operations."

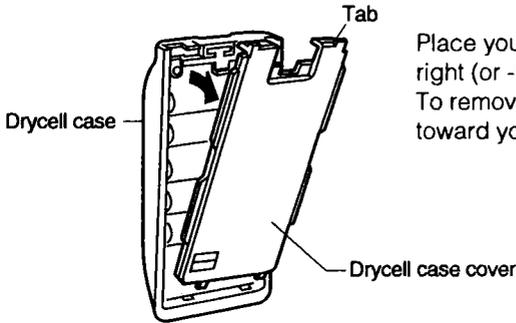
Installing Batteries

Either drycell case (five AA cells) or a Ni-Cd battery pack is available for power supply. This sub-section describes how to install the drycells using the drycell case.



- Note:
- For information about available Ni-Cd battery packs, see Appendix C "Optional Accessories List."
 - You can check the battery level by pressing the  and  keys in that order. See section 2.6 "Checking the Battery Level."
 - The radio has a battery saving feature which extends battery service life. See "Saving Battery Power" in 3.1 "Radio-phone Mode."

1. Open the drycell case.



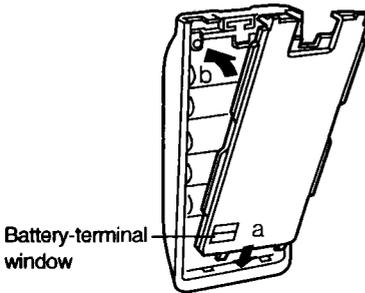
Place your finger on the tab at the upper-right (or -left) of the drycell case cover. To remove, carefully pull the cover toward you.

2. Fill the drycells.



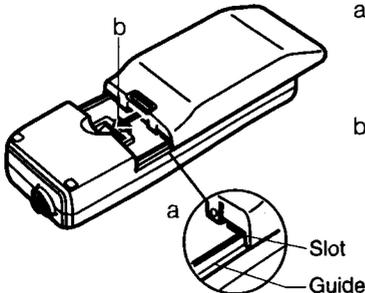
Caution: Place the batteries in the correct direction. The negative pole (-) must be connected to a metal prong inside the drycell case.

3. Refit the cover on the drycell case.



- a. Holding the cover with the battery-terminal window on the lower-left, align the lower edge of the cover with the lower edge of the drycell case.
- b. Press the cover until it snaps into place.

4. Mount the drycell case on the radio.

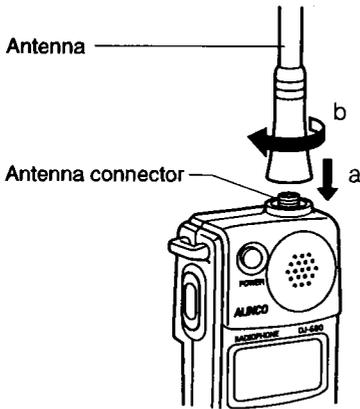


- a. Align the two slots on the rear of the drycell case with the guides on the batterypack mount.
- b. Slide the drycell case upward until the case snaps into place.

Attaching the Antenna

Be sure to use the antenna which came with your radio.

Attach the antenna to the radio.



Locate the antenna connector on the top panel of the radio.

- Holding the antenna by its base, align the male screw of the antenna with the female screw of the radio's antenna connector.
- Turn the antenna clockwise until it stops.

To remove the antenna from the radio, turn the antenna counterclockwise.

Depending on the version of the radio, you may have received a telescopic extendable antenna instead of a rubber antenna. When using the telescopic antenna, keep it retracted and extend fully only during a conversation.

1.6 Daily Maintenance

This section describes radio maintenance and how to remove the battery pack.

Cleaning



Caution: ■ Be sure to turn the power off before cleaning the radio.
■ Do not use ammonia-based cleaners.

When the radio becomes dirty, clean the outside with a slightly damp cloth (use water only).

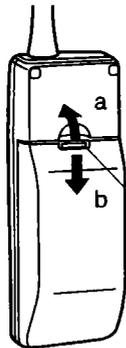
Removing the Batterypack

You will need to remove the batterypack from the radio to clean the unit or to replace (or recharge) the battery.



Caution: Turn the power off before removing the batterypack to avoid damage to the equipment.

Remove the batterypack



a) While pressing the batterypack latch slightly upward, b) slide the batterypack downward.

Chapter 2

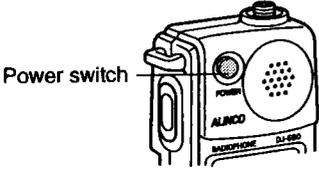
Basic Operation

This chapter describes basic operations, including how to turn the power ON and OFF, adjust radio and ringing volume, lock keys, change output power level, and program auto-dial memory. These instructions are common to all users.

2.1 Turning the Power ON/OFF

To turn the power ON or OFF, follow the instructions below.

Turn the radio ON.



Hold the POWER switch down until you hear a beep and a message appears on the display.

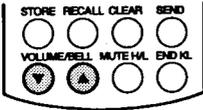
Turn the radio off.

Press and hold the POWER switch until the message disappears.

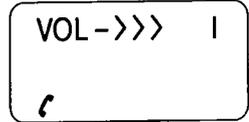
2.2 Adjusting Radio Volume

To control the speaker volume, follow the instructions below.

Adjust the volume.



Use the ∇ key to decrease the volume, and the \blacktriangle key to increase it.



The volume level is indicated by greater-than (>) signs.

Press the END/HL key to return to the normal mode.



Note:

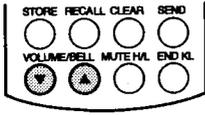
If no action is taken for about 5 seconds after pressing the ∇ or \blacktriangle key, the radio automatically returns to the normal mode.



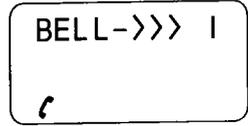
2.3 Adjusting the Ringing Tone Volume

When receiving a call, you can change the volume of the ringing tone.

Adjust the volume.



While receiving a ringing tone, use the key to decrease the volume, and the key to increase it.



The volume level is indicated by greater-than (>) signs.

Press the key to return to the normal mode.



Note: If no action is taken for about 5 seconds after pressing the or key, the radio automatically returns to the normal mode.

2.4 Locking the Keys

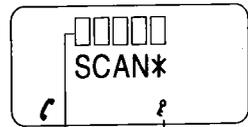
The *keylock* disables all the keys except the key. This prevents you from accidentally pressing keys you do not want or need to. In the trunking mode, the keylock is temporarily released when the radio receives a call, and reengaged when the conversation ends. Note that you cannot change the keylock setting during communication.

Lock the keys.



Press the key to display , then press the key.

The key symbol appears, indicating the keylock is ON.



Key-lock icon
The site name programmed by your dealer.

Release the keylock.

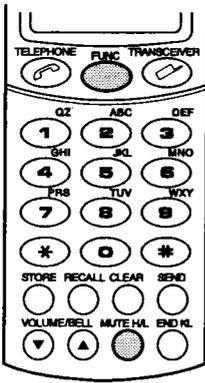
Press the key, then key. The keylock symbol disappears.



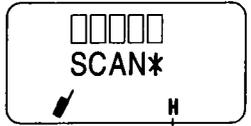
2.5 Changing Output Power Level

The radio starts at high output power. The high power mode is indicated in the display with the "H" icon (see picture below). If you are close to the base station and want to save battery consumption, you may like to switch the radio to the low power mode by following procedures. To secure good communications it is recommended that the radio be normally kept in the high power mode, and change to low power only when you are sure to reach the base station with low power.

Change the output power in other modes



Press the ^{FUNC} key to display **F** then press the ^{MUTE/HL} key.



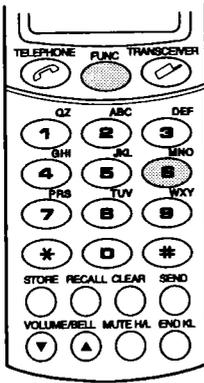
"H" disappears, indicating the transceiver has entered the low power mode.

To return to the high power mode, press the ^{FUNC} key, then the ^{MUTE/HL} key ("H" re-appears).

2.6 Checking Battery Level

It is recommended to check the battery level from time to time while operating the radio.

Check battery level.



Press the ^{FUNC} key to display **F**, then press the ^{MEMO} key.

BAT ->>>>

The current battery level will be indicated by greater-than (>) signs.

When you have just installed a fully-charged battery pack (or new drycells), five greater-than signs (>>>>>) will appear. The lower the battery level is, the fewer greater-than signs are displayed.

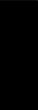
When only one greater-than sign appears, recharge the battery pack (or replace the drycells with new ones).

Press the ^{END KL} key to return to the normal mode.



Note:

If no action is taken for 5 seconds after pressing the ^{FUNC} and ^{MEMO} keys, the radio automatically exits the battery-check mode.



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Chapter 3

Operation with the Logic Board

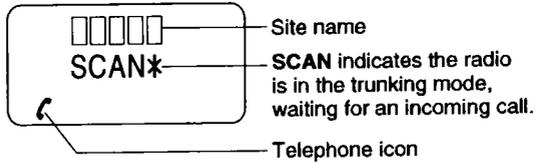
This chapter describes how to receive calls and dial through a radio which is equipped with the EJ-27D logic board. Each section covers the operations dedicated to each operation mode: the radio-phone, semi-duplex trunking, or two-way radio mode.

3.1 Radio-phone Mode

This section describes the operations in the radio-phone mode. Normally, the radio starts up in the radio-phone mode, and you will work in that mode in most cases.

You may dial a party who is using a telephone, not a transceiver, and also receive a call from him/her. Unlike traditional transceivers, you can hear and talk simultaneously as if you were using a telephone.

The radio displays the current site name and telephone icon like the following figure.



The radio-phone mode supports an *auto-line-hunting feature*. Upon initiating a call, if the base station is busy, the radio automatically skips that channel. If the radio cannot find an available base station (i.e. a channel), a busy-signal sounds and the radio aborts the call.



- Note:**
- The radio will be in a mode other than the radio-phone mode at power-on if the dealer did not configure for that mode.
 - In this manual, the radio-phone and semi-duplex trunking (SD trunking) modes are inclusively called trunking mode.



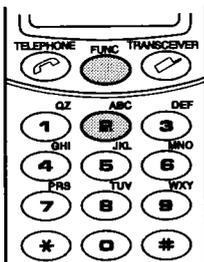
Changing Site (Roaming)

A *site* in the radio-phone mode means a service area of the trunking network where your radio can work. If you are in another area, you need to change to the site appropriate to that area. Ask your dealer which sites are available in the radio-phone mode. Note that the following procedure switches only to the sites configured for the current operation mode.



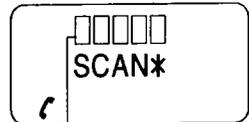
Note: The following procedure is not needed if auto-roaming is enabled on your radio by the dealer. The radio then automatically changes the site when initiating a call under another service area.

Change Site.



Press the ^{FUNC} key to display **F**, then press the ^{ABC} key.

The site name will change.

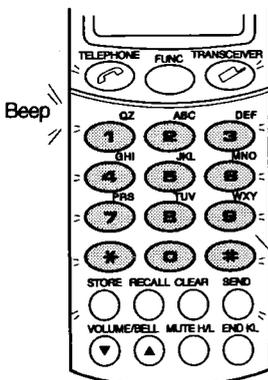


Site name

Receiving Calls

When the radio receives a call from a telephone, it beeps and the backlight of the keys blinks.

1. Answer the call.



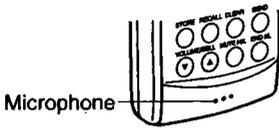
Press any of the numeric, (*), or (#) key to answer the call. Start conversation after a double-beep.

Backlight of the keys blinks.

(Continued to page 26)



2. Conversation



Speak into the microphone and talk as you would do on an ordinary telephone.

To transmit at high power, press and hold the **PTT** key (see "2.5 Changing Output Power Level").

To save battery power, press the **END** key during the conversation (see "Saving Battery Power" later in this chapter).

3. Hang up the phone.

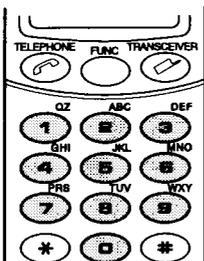


Press the **END** key to disconnect the connection.

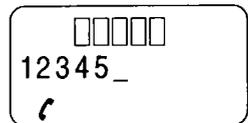
Manual Dialing

Normally, you will use the following procedures to make a call. You should quickly go through the procedures below because the radio will abort your entry if no action is taken for about 5 seconds.

1. Enter the telephone number.



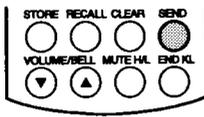
Use the numeric keys to enter the telephone number.



If you enter a wrong number, press the **CLEAR** key to clear your entry and enter the correct number.

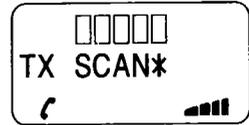
(Continued to page 27)

2. Start dialing.



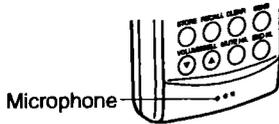
Press the  key.

You will hear successive tones while the radio is sending the number. Shortly, your radio calls the number.



If the call fails, you will hear a busy signal (three low beeps). If no one answers your call, you can abort it by pressing the  key.

3. Talk with the other party.

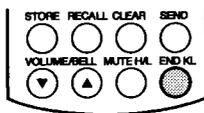


When the other party takes the call, speak into the microphone.

If the other party has difficulty in hearing your voice, hold the  key down to transmit at high power (see "2.5 Changing Output Power Level").

To save battery power, press the  key (see "Saving Battery Power" later in this chapter).

4. Hang up the phone.

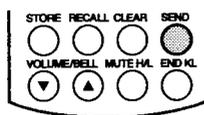


Press the  key to disconnect the connection.

Redialing

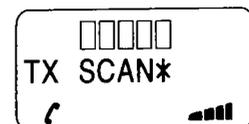
You can repeatedly call the most recently dialed number just by pressing a key. Redialing does not function if you have not dialed since power-on.

Call the most recently dialed number.



Press the  key.

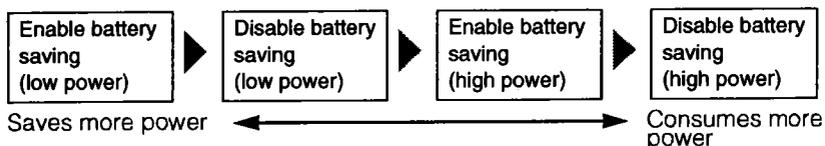
The radio will automatically call the number you last dialed.



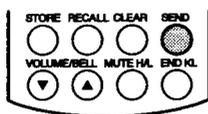
Saving Battery Power

The radio-phone mode has a power saving function which extends battery service life. When battery-saving is enabled, you have to press and hold the **(PTT)** key while you are talking. This is because the radio transmits your voice only when the **(PTT)** key is pressed.

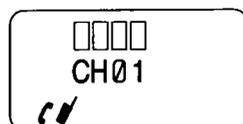
If you have difficulty in contacting a distant base station while the battery-saving function is on, you can switch to the high power mode.



Save battery power.



While communicating with a party, press the **(PTT)** key.



The transceiver icon () appears next to the telephone icon : now you are in the battery saving mode, and you must press and hold the **(PTT)** key while you are speaking.

To switch between high and low power:

Press the **(MUTE/HAL)** key to display **F**, and press the **(MUTE/HAL)** key. The high-power mode icon (H) will appear. Pressing these keys again returns you to the low power mode.

To disable battery-saving, press the **(PTT)** key again.



Programming the Auto-dial Memory

The radio can store 100 numbers for auto dialing. Once you load the memory, you can call the desired party just by specifying a two-digit number, or a few characters from the beginning of the title as memorized. You do not have to enter a long redundant telephone number.

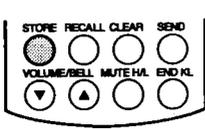
The memory numbers range from S00 to S99. A telephone number can contain up to 16 digits, while a memory title can contain up to 8 alphanumeric characters.

Note that the radio does not receive a call while you are programming or modifying the memory.

Programming Telephone Numbers and Titles

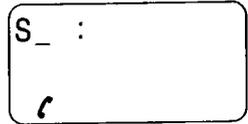
You should quickly go through the procedures below because the radio will abort your entries if no action is taken for about 10 seconds. You can exit the dial-programming mode anytime by pressing the  key.

1. Enter the auto-dial programming mode.



Press the  key.

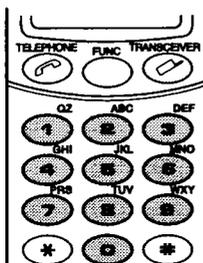
If this is the first time you enter the auto-dial programming mode, the initial memory number will not appear, and only the letter S will be displayed. Otherwise, the memory number last used and the corresponding data will appear.



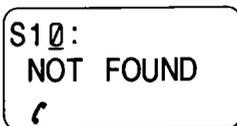
(Continued to page 30)



2. Select a memory number.



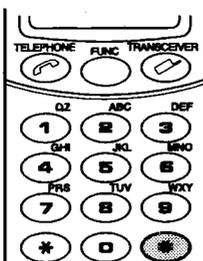
Use the numeric keys to enter a two-digit memory number. The range is from 00 to 99.



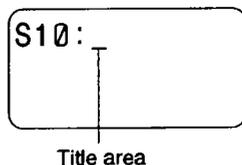
If you specify a memory number you have not programmed, **NOT FOUND** appears, indicating no data is stored in that memory.

To display one number smaller, press the key, then the key. To display one number larger, press the key, then the key.

3. Enter a memory title.



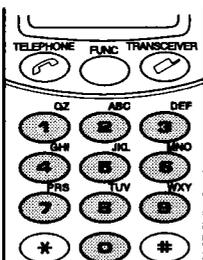
Use the key to move the cursor (|) to the beginning of the title area.



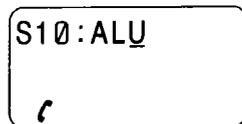
Title area

Then, enter a title (up to 8 characters), in the following manner.

To enter numbers (0 to 9), use the numeric keys.



To enter letters (A to Z), press the key to display , then press the key to



switch to the letter-entry mode. Enter the desired letter with the numeric key with the corresponding character marked at the upper-right. The letter to be entered depends on which key you press and how many times you press it (e.g. to enter "C," press the key three times).



Letters to be entered

(Continued to page 31)

To move the cursor to the right, press the ***** key, and to the left, press the **#** key.

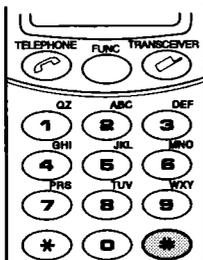
To delete a character, in the letter-entry mode, press the **⊖** key.

If you want to enter a numeric character after engaging the letter-entry mode, press the **FUNC** key to display **F**, then press the **1^{QZ}** key again. You will return to the number-entry mode.

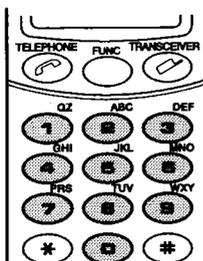
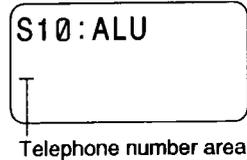
Example: To enter **ALU**:

- Press the **FUNC** key, then the **1^{QZ}** key to enter the character-entry mode.
- Press the **2^{ABC}** key once to enter **A**.
- Press the ***** key to move the cursor to the next column.
- Press the **5^{JKL}** key three times to enter **L**.
- Press the ***** key to move the cursor to the next column.
- Press the **8^{TUV}** key twice to enter **U**.

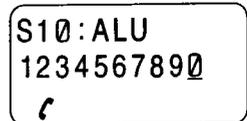
4. Enter the telephone number.



Press the ***** key until the cursor is at the beginning of the next line.



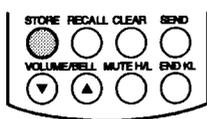
Use the numeric keys to enter the telephone number. You can enter up to 16 digits, but only 12 digits are visible at once. When you enter twelfth or later digits, the numbers you have entered will shift to the left.



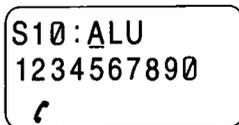
(Continued to page 32)



5. Store your changes.



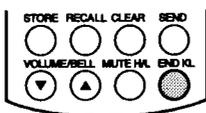
Press the ^{STORE} key. The cursor will move to the beginning of the title area.



If you want to abort your entry, press the ^{END KL} key before pressing the ^{STORE} key.

When you want to program another memory location, repeat steps 2 through 5.

6. Exit the auto-dial programming mode.



Press the ^{END KL} key.

Modifying or Clearing Telephone Numbers and Titles

You can change or clear the data in the memory you have programmed already.

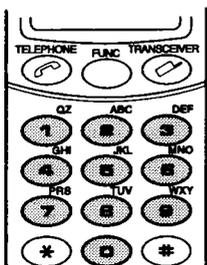
You should quickly go through the procedures below because the radio will abort your entries if no action is taken for about 5 seconds. You can exit the dial-programming mode anytime by pressing the ^{END KL} key.

1. Enter the auto-dial programming mode.

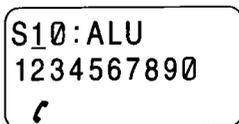


Press the ^{STORE} key. The memory number last used and the corresponding data will appear.

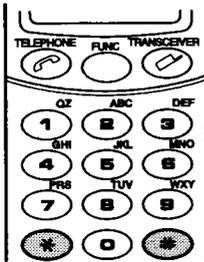
2. Specify the memory number.



Use the numeric keys to enter the number of the memory location which you want to modify or clear.

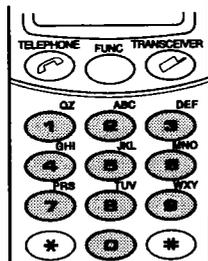


3. Modify or clear the data.



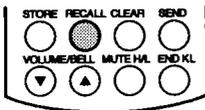
When you want to modify the data, use the \odot or \ast key to move the cursor to the position you want to change. You can type over the existing characters.

To enter numbers (0 to 9), use the numeric keys.

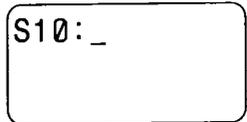


To enter letters (A to Z), press the \odot key to display **F** then press the \odot key to enter the letter-entry mode. Enter the desired letter with the numeric key with the corresponding character marked at the upper-right.

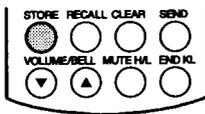
If you want to enter a numeric character after engaging the letter-entry mode, press the \odot key to display **F**, then press the \odot key again. You will return to the number-entry mode.



When you want to clear the entire data stored in this memory location, press the \odot key.



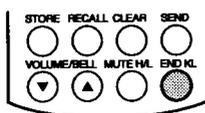
4. Store your changes.



Press the \odot key to store the new settings. You must also press the \odot key after you clear the data.

When you want to modify another memory location, repeat steps 2 through 4.

5. Exit the auto-dial programming mode.



Press the \odot key.

(Continued to page 34)

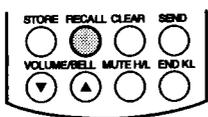


Auto-dialing by Specifying Memory Numbers

Auto-dialing allows you to make a call by entering a two-digit memory number instead of a long telephone number. To use this function, you must pre-program the memory (see "Programming the Auto-dial Memory").

You should quickly go through the procedures below because the radio will abort your entry if no action is taken for about 10 seconds.

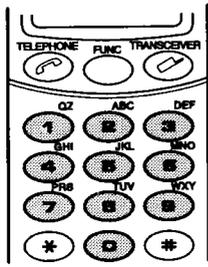
1. Enter the auto-dialing mode (for specifying a memory number).



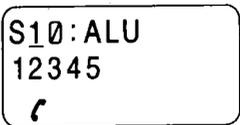
Press the ^{RECALL} key.

The memory number you last used will appear.

2. Specify a memory number.



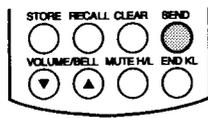
Use the numeric keys to enter a memory number (two digits).



To display one number smaller, press the ^{FUNC} key, then the ^{FUNC} key. To display one number larger, press the ^{FUNC} key, then the ^{FUNC} key.

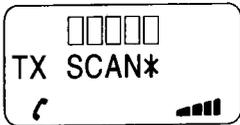
If you specify a number not in the memory, NOT FOUND will appear. Enter a correct number.

3. Start dialing.



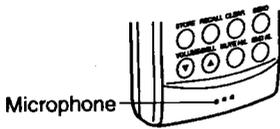
Press the ^{SEND} key.

You will hear successive tones while the radio is sending the number stored in the memory. Shortly, the radio calls the number.



If the call fails, you will hear a busy-signal (three low tones). If you get the ringing-tone but no one takes your call, you can abort it by pressing the ^{END KL} key. (Continued to page 35)

4. Talk with the other party.

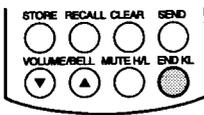


When the other party takes the call, speak into the microphone.

If the other party has difficulty in hearing your voice, hold the **(PTT)** key down to transmit at high power (see "2.5 Changing Output Power Level").

To save battery power, press the **END** key (see "Saving Battery Power" earlier in this chapter).

5. Hang up the phone.



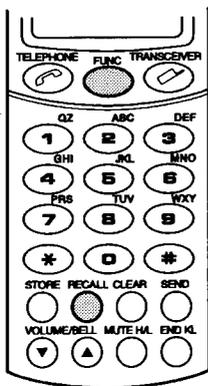
Press the **END/HL** key to disconnect the connection.

Auto-dialing by Specifying Memory Titles

Auto-dialing allows you to make a call by entering a few characters from the beginning of the memory title, instead of a telephone number. To use this function, you must previously program the memory (see "Programming the Auto-dial Memory" earlier in this chapter). You should quickly go through the procedures below because the radio will abort your entry if no action is taken for about 10 seconds.

(Continued to page 36)

1. Enter the auto-dialing mode (for specifying a memory title).

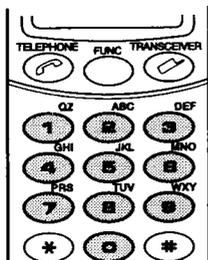


Press the ^{FUNC} key to display **F**, then press the ^{RECALL} key.

S00:ZZ
999999
c

The memory number you last used will appear.

2. Specify a memory title.



Enter the entire or a part of the memory title.

You only have to enter one or more characters from the beginning of the title, and keep in mind that the character at the cursor (c) and before are used to search for the title. For example, when you have two titles **BASE** and **BANK** and want to find **BASE**, enter **BAS** and place the cursor at the S.

As an alternative, you can display previous titles alphabetically by pressing the ^{FUNC} key, then the ^{FUNC} key, and subsequent titles by pressing the ^{FUNC} key, then the ^{FUNC} key.

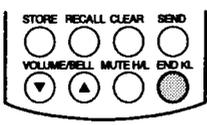
To enter numbers (0 to 9), use the numeric keys.

To enter letters (A to Z), press the ^{FUNC} key to display **F**, then press the ^{QZ} key to switch to the letter-entry mode. Use the numeric keys to enter the desired letter.

To delete a character, press the ^{QZ} key in the letter-entry mode.

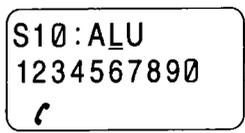


3. Search for the specified title.

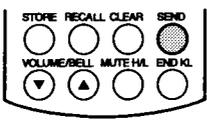


Press the ^{END KL} key.

The specified title will appear if it is found. If not found, the closest title will appear.

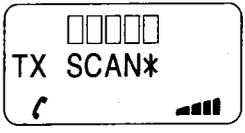


4. Start dialing.



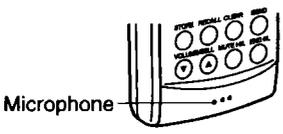
Press the ^{SEND} key.

You will hear successive tones while the radio is sending the dial number corresponding to the specified memory title. Shortly, the radio calls the number.



If the call fails, you will hear a busy-signal (three low tones). If you get the ringing-tone but no one takes your call, you can abort it by pressing the ^{END KL} key.

5. Talk with the other party.

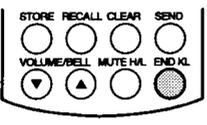


When the other party takes the call, speak into the microphone.

If the other party has difficulty in hearing your voice, hold the (PTT) key down to transmit at high power (see "2.5 Changing Output Power Level").

To save battery power, press the ^{SEND} key (see "Saving Battery Power" earlier in this chapter).

6. Hang up the phone.

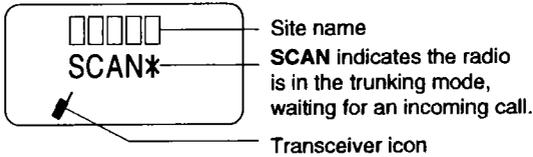


Press the ^{END KL} key to disconnect the connection.

3.2 SD Trunking Mode

This section describes operations in the SD trunking (semi-duplex trunking) mode. This mode allows communications with a transceiver as well as a telephone. Note that you cannot hear the party's voice while you are talking.

In the semi-duplex trunking mode, the radio displays the current site name and transceiver icon like the following figure.



The SD trunking mode supports the auto-line-hunting feature. Upon initiating a call, if the base station is busy, the radio automatically skips that channel. If the radio cannot find an available base station (i.e. a channel), a busy-signal sounds and the radio aborts the call.



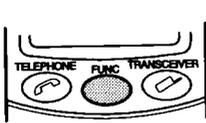
Note: In this manual, the radio-phone and semi-duplex trunking modes are inclusively called trunking mode.

Entering the SD Trunking Mode

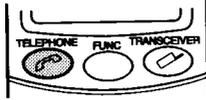
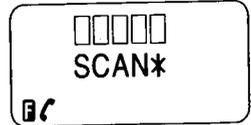
The radio will be in the radio-phone mode at power-on. If necessary, switch it to the SD trunking mode. If no site is configured by the dealer for the SD trunking mode, the radio does not switch to that mode.

A quick reference for changing modes is given in Appendix D "Switching Operation Modes."

Switch from the radio-phone mode to the SD trunking mode.

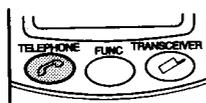
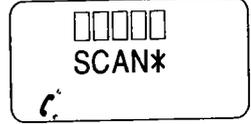


Press the  key.



Press the  key.

The telephone icon () blinks.



Press the  key again.

The transceiver icon will () appear and blink for about 30 seconds before lighting solidly.



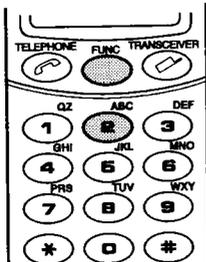
If you press the  key one more time while the transceiver icon () is blinking, you can return to the radio-phone mode.

Changing Site (Roaming)

In the SD trunking mode, a *site* means a service area of the trunking network where your radio can work. If you are in another area, you need to change to the site appropriate to that area. Ask your dealer which sites are available in the SD trunking mode. Note that the following procedure switches only to the sites configured for the current operation mode.

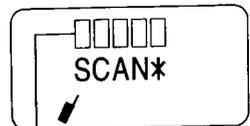
 *Note: The following procedure is not needed if auto-roaming is enabled on your radio by the dealer. The radio then automatically changes the site when initiating a call under another service area.*

Change Site.



Press the  key to display , then press the  key.

The site name will change.



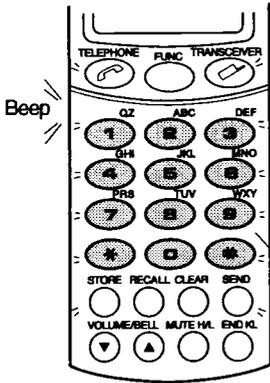
Site name



Receiving Calls

When the radio receives a call from a telephone, it beeps and the backlight of the keys blinks.

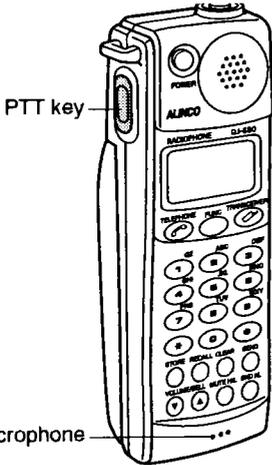
1. Answer the call.



Press any of the numeric, (*), or (#) key to respond the call. Start conversation after a double-beep.

Backlight of the keys blinks.

2. Talk with the caller.



Hold the (PTT) key down as you speak, and release it while listening to the party talking.

To transmit at the high power, press the (PWR) key, then the (MUTE HL) key (see "2.5 Changing Output Power Level").

3. Hang up the phone.



Release the (PTT) key, and press the (END KL) key to disconnect the connection.

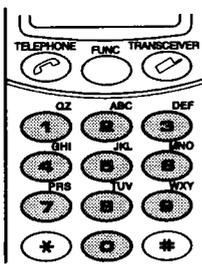
Dialing

The procedures for dialing a telephone or a transceiver are the same, except that they use the different transmission commands. To call a telephone, use the command 1* , or 2* (you must ask your dealer which command you should use). To call a transceiver, use 3* . There are two methods for manual dialing, and you can use whichever is convenient to you.

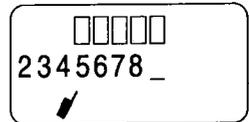
You should quickly go through the procedures below because the radio will abort your entry if no action is taken for about 5 seconds.

Method 1

1. Specify the telephone number or called radio's subscriber number of the other party.

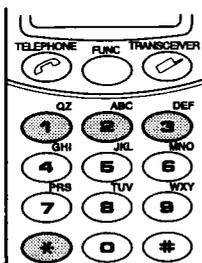


Use the numeric keys to enter the desired number.

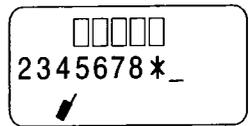


If you enter a wrong number, stop entering numbers and wait until **SCAN *** appears again. This clears your entry, allowing you to re-enter numbers. Pressing the **FUNC** key does not erase your entry though the radio returns to the **SCAN *** display.

2. Enter the transmission command.

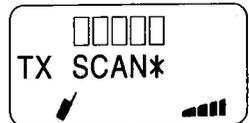


To call a telephone, press the **1** key (or **2** key), then the ***** key.



e.g.) When dialing 234-5678, your entry must be 23456781* or 23456782*.

To call a transceiver, press the **3** key, then the ***** key.

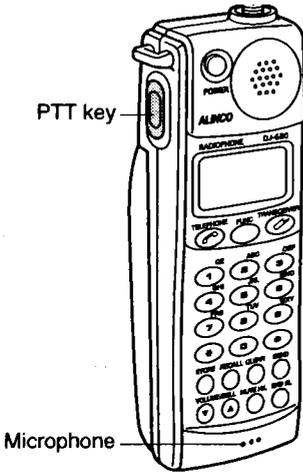


e.g.) When calling a transceiver No.1005, your entry must be 10053*.

If the call fails or if no one takes your call, you will hear a busy-signal (three low tones).



3. Talk with the other party.



The radio dials the number immediately and you can hear the ringing tone. When the other party answers the call, you will hear a double-beep.

Hold the (PTT) key down while you speak, and release it while listening to the other party talking.

To transmit at high power, press the ^{FUNC} key, then the ^{MUTE/HL} key (see "2.5 Changing Output Power Level").

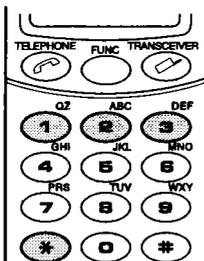
4. Hang up the phone.



Release the (PTT) key, and press the ^{END KL} key to disconnect the connection.

Method 2

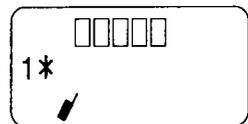
1. Enter the transmission command.



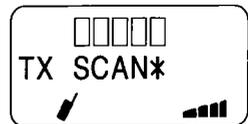
To call a telephone, press the ^{QZ} (1) key (or ^{ABC} (2) key), then the (*) key.

To call another trunked radio, press the ^{DEF} (3) key, then the (*) key.

You will hear two beeps when the radio successfully establishes the connection with the base station.

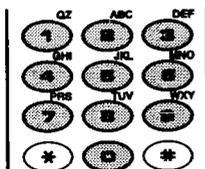


When entering 1* .



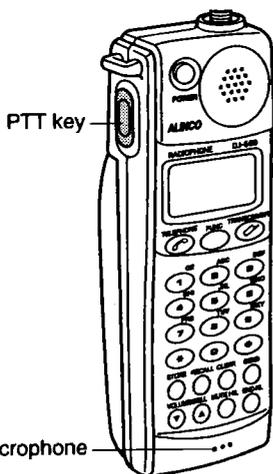
While dialing

2. Specify the telephone number or called radio's subscriber number of your party.



Holding the (PTT) key down this time, enter the number with the numeric keys. As you press each key, the radio dials the number in real-time.

3. Talk with the other party.

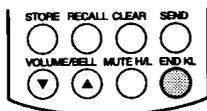


You will hear a ringing tone, and a double-beep will follow when the other party answers the call.

Hold the (PTT) key down while you speak, and release it while listening to the other party talking.

To transmit at high power, press the ^{HI} key, then the ^{MUTE/CL} key (see "2.5 Changing Output Power Level").

4. Hang up the phone.

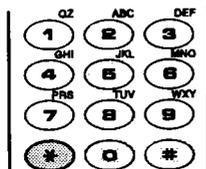


Release the (PTT) key, and press the ^{END/CL} key to disconnect the connection.

Redialing

You can redial the most recently dialed number just by pressing a key. Redialing does not function if you have not dialed since power-up.

Call the most recently telephone number.



Press the (*) key twice.

The radio will automatically call the number you last used.

Clear Channel Alerting

If a call is attempted and no trunking channels are available, the user will get a busy signal. The user can try to redial over and over until the call is processed, but this is very frustrating. Clear channel alerting mode eliminates this problem.

If clear channel alerting is enabled and all channels are busy when a call is attempted, a busy signal will be generated by the radio. After the busy signal, the radio will continue to scan all trunking channels, looking for a free channel. The radio will chirp every 10 seconds while in this mode. When a channel is freed, the radio will generate a double beep. You can then attempt the call again. The radio will not automatically redial. If other subscribers are using the clear channel alerting mode at the same time, the first user to attempt a call will capture the channel.

To exit the clear channel alerting mode and return to the SD trunking mode, press any numeric key on the radio's key pad.

Calling Other Transceivers in Your Group (Group Call)

If you belong to a group of transceivers defined by your dealer, you can call all the members of that group simultaneously. The procedures are the same as when you call a telephone or a transceiver, except for entering the transmission command 4 * instead of 1 *, 2 *, or 3 * after the number dialed.

While calling the group, a short ringing tone is heard and the called transceivers respond automatically because your radio is connected to multiple parties. You can confirm the connection is established by hearing a double-beep.

Calling the System Operator

You can call the system operator by using the following procedure.

Press the  key, then the  key.



Note: This service may not be available in your network. Ask your dealer about this service.

Emergency Calls

In case of an emergency, you can call the telephone number of the liaison office previously specified in the system. To do so:

Press the  key, then the  key.

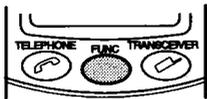
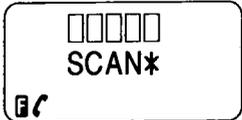
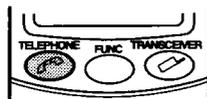
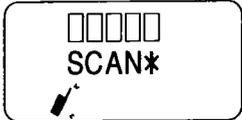
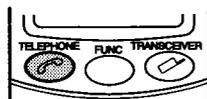


Note: This service may not be available in your network. Ask your dealer about this service.

Returning to the Radio-phone Mode

To switch from the SD trunking mode to the radio-phone mode, follow the instructions below. A quick reference for changing modes is given in Appendix D "Switching Operation Modes."

Switch to the radio-phone mode.

	Press the  key.	
	Press the  key. The transceiver icon () blinks.	
	Press the  key again.	

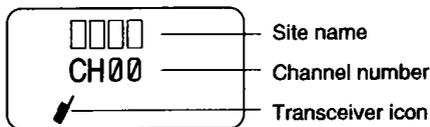
The telephone icon will appear and blink for about 30 seconds before lighting solidly.

If you press the  key one more time while the telephone icon is blinking, you can return to the SD trunking mode.

3.3 Two-way Radio Mode

This section describes the operations in the two-way radio mode. If you wish to use your radio as a traditional transceiver, switch the radio to the two-way radio mode. The two-way radio mode uses simplex or half-duplex communication, so you cannot speak while listening. The trunking function (i.e. auto-line hunting) is completely disabled.

In the two-way radio mode, the radio displays the current site name, channel number and transceiver icon like the following figure.



Note: The two-way radio mode is available only if your dealer has enabled the sites dedicated for that mode.

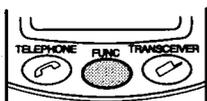
Entering the Two-way Radio Mode

The radio will be in the radio-phone mode at power-on. To enter two-way radio mode, you can use the same procedure whether you are in the radio-phone or SD trunking mode now, although the pictures below are for switching from the radio-phone mode. A quick reference for changing modes is given in Appendix D "Switching Operation Modes."

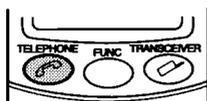
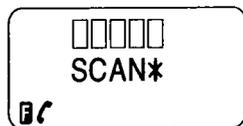


Note: As an alternative, you can press the  key, then the  key to switch from the semi-duplex trunking mode to the two-way radio mode.

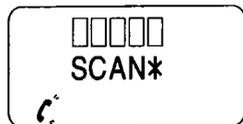
Switch from the radio-phone mode to the two-way radio mode.



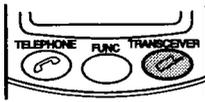
Press the  key.



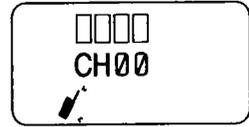
Press the  key.



(Continued to page 47)



Press the  key again.

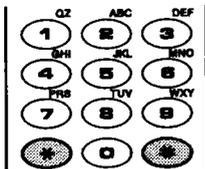


You will hear three beeps. The transceiver icon will blink for about 30 seconds before lighting solidly.

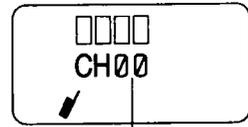
If you press the  key while the transceiver icon is blinking, you will return to the radio-phone mode.

Selecting a Channel

Change the channel.



Press the  key to display one channel number larger, and the  key to display one number smaller. The radio automatically skips the channels which have been excluded by the dealer.

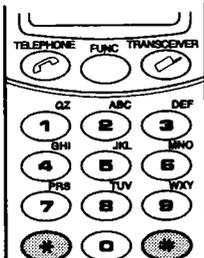


Channel number

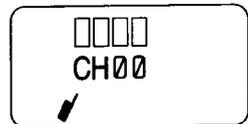
Scanning Channels

The radio can scan the channels to search for one which is receiving a signal. The radio automatically skips the channels which have been excluded by the dealer. The scanning is performed only within the current site (i.e. current group of channels).

1. Start scanning.



To scan the channels in ascending order, press and hold the  key for more than two seconds.



To scan the channels in descending order, press and hold the  key for more than two seconds.

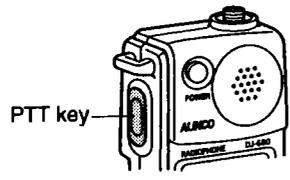
(Continued to page 48)



The channel number changes rapidly while scanning. Scanning stops when the radio receives a signal, and restarts when no signal is picked up for a period of two seconds.

You can change the scanning direction by pressing the or key, whichever opposite to the current direction.

2. Quit scanning.

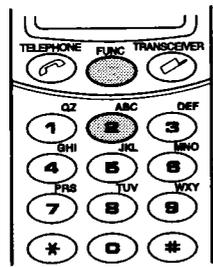


Press the key.

Changing Site

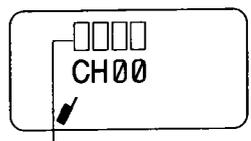
In the two-way radio mode, a *site* means a group of channels. While the radio is in the waiting state, you can manually switch to another site, provided that your dealer programmed the radio for it. Note that the following procedure switches only to the sites configured for the two-way radio mode.

Change Site.



Press the key to display **F**, then press the key.

The site name will change.



Site name

Dealer-configured Parameters

This section describes the function parameters which are configured by the dealer. Your radio operates differently depending on the configuration the dealer has set up.

Selective Calling

Selective calling is to call a specific party by specifying an ID code. This function is set up for each site by the dealer. In selective call communications, each transceiver has been programmed with a code (a three-digit DTMF code), and will unmute when receiving it. Without the correct code, the radio remains muted even if there is a signal present on your channel.

Note that the BCLO may prohibit transmission on a channel where a different muting system is enabled. For information about BCLO, see "Busy Channel Lock Out (BCLO)" later in this section.

With both TSQ and selective calling enabled, voices can be heard only when the radio has established a connection through selective calling *and* has received the correct tone. For more information about TSQ, see "TSQ (Tone Squelch) (CTCSS)" later in this section.

Calling the other party

To call a specific party:

1. Enter the called radio's code (a three-digit DTMF code), and press the  key.
2. Press the  and  keys.
3. Press the  key.

The radio will automatically start the call, and establish a connection with the other party's transceiver. If you do not transmit or receive a signal for 10 seconds, the connection will be automatically terminated, and you will need to go through the above procedure again to re-start the connection.



- Note:**
- You can also communicate with the other party by pressing and holding the  key, and entering the other party's three-digit code, instead of performing the above procedure. In this case, the other party is not informed of who is calling him/her.
 - The radio's code (a three-digit DTMF code) is not the same as the subscriber number used when calling a radio in the SD trunking mode.

Receiving calls

When your radio receives its own code, it establishes a connection with the caller and blinks the key backlight to inform you of the call. Hold the **(PTT)** key down and speak into the microphone while the backlight is blinking.



Note: You should start speaking while the backlight is still blinking (for 10 seconds). If the backlight goes out, the radio may terminate the connection.

The number which will appear on the display is the code of the caller. **ERR** may appear if the radio fails to receive the caller's code, however the connection is established. If the radio does not transmit or receive a signal for 10 seconds, it will automatically terminate the connection.

TSQ (Tone Squelch) (CTCSS)

TSQ (tone squelch) allows you to communicate only with a specific group who has the same tone as your radio. The tones used in TSQ are almost *inaudible* and may be set up for each channel by the dealer. If TSQ has been set, the TSQ icon **TSQ** appears on the display.

When the radio receives the correct tone, the squelch is unmuted allowing you to communicate with the caller. If the radio receives a signal without any tone or receives an incorrect tone, you cannot hear the voice of the other party.

Note that the BCLO may prohibit the transmission on a channel where TSQ is enabled. For information about BCLO, see "Busy Channel Lock Out (BCLO)" later in this section.

If both TSQ and selective calling are functioning, voices can be heard only when the radio has established a connection through selective calling and has received the correct tone.

Scrambler

Scrambling signals prevents other persons from monitoring your conversation. This function is set up for each channel by the dealer.

When your radio transmits scrambled signals, the receiver will receive and convert them into standard signals to reproduce your voice.

The receiver must be set by the dealer so that it can accept the scrambled signal. When TSQ is enabled, the radio converts scrambled signals only when receiving the correct tone.

Busy Channel Lock Out (BCLO)

BCLO prevents transmission on a channel which is receiving signal with a tone other than the one for your group. This function is contingent on activation of TSQ or selective calling, and is dealer programmable. BCLO permits or prohibits transmission according to the TSQ and selective call settings as described below.

When only TSQ is enabled

BCLO prohibits transmission when the radio receives a signal without any tone or receives a tone different from yours.

Transmission is allowed when the radio is not receiving any signal, or receiving signals with the matching tone.

When selective calling is enabled

You can transmit when the radio is not receiving any signal, or when it receives a signal along with the correct code. Once the transmission is performed successfully, the radio establishes a connection with the other party. BCLO will then be cancelled temporarily, allowing you to perform transmission anytime, as you want.

If the radio does not transmit or receive a signal for 10 seconds, it automatically breaks the connection and activates BCLO again.

When both the TSQ and selective calling are enabled

You can transmit when the radio is not receiving any signal. Once the transmission starts, the radio establishes the connection and keeps it.

When you are called through selective calling, the radio must receive the correct tone before it can establish the connection with the caller. You will hear ringing tones when the connection is successfully made.

Once the connection is established, you can transmit anytime except when the radio is receiving a signal without any tone or with an incorrect tone.

Time Out Timer (TOT)

The *TOT* expires and shuts down the transmission if you continuously transmit for more than the time specified by the dealer. To restart the transmission, release the (PTT) key and press it again.

ANI (Automatic Number Identification)

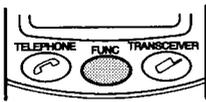
When the ANI function is enabled by the dealer, the radio automatically sends the pre-programmed ID code at the beginning and/or end of transmission. The base station will identify your radio by the received code.

Returning to the Trunking Mode

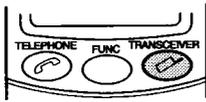
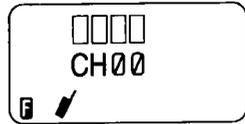
To return to the trunking mode (the radio-phone or SD trunking mode), follow the instructions below. Normally, the radio will return to the radio-phone mode. However, if no site is configured for the radio-phone mode, the radio will enter the SD trunking mode.

A quick reference for changing modes is given in Appendix D "Switching Operation Modes."

Switch from the two-way radio mode to the trunking mode.

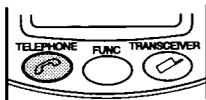
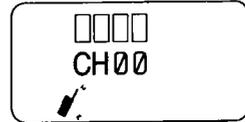


Press the  key.

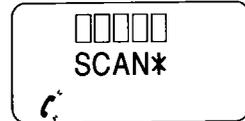


Press the  key.

The transceiver icon () blinks.



Press the  key.



You will hear three beeps. The telephone icon () will blink for about 30 seconds, indicating the radio is in the radio-phone mode.

If you press the  key while the telephone () icon is blinking, you can return to the two-way radio mode.

Chapter 4

Operation without the Logic Board

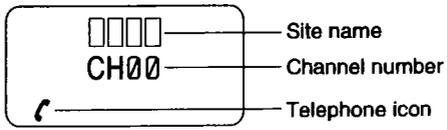
This chapter describes how to operate the radio when not equipped with the EJ-27D logic board. Procedures for dialing, receiving calls, and performing other functions are similar to those described in Chapter 3 "Operation with the Logic Board," but auto-line-hunting (trunking) is not featured.



4.1 Changing Operation Modes

There are three operation modes: duplex, semi-duplex, and two-way radio. The radio will be in the duplex mode when the power is turned on, and you can change to another mode by referring to the appropriate part in this section. Settings of these modes are done by the dealer and not all the modes may have been enabled on your radio. Ask your dealer about the available operation modes.

In the *duplex mode*, the radio displays the current site name, channel number, and telephone icon like the following figure.

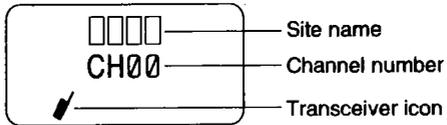


For more information about the operation modes, see "Operation Modes (Not Equipped with the Logic Board)" in section 1.3 "Understanding the Terms Used in Radio Operations."

A quick reference for changing modes is given in Appendix D "Switching Operation Modes."

Entering the Semi-duplex Mode

When the radio is in the semi-duplex mode, it displays the current site name, channel number, and transceiver icon.



To change from the duplex mode to the semi-duplex mode, follow the instructions below. Note that, if no site is configured by the dealer for the semi-duplex mode, the radio does not switch to that mode.

1. Press the  key to display **F**.
2. Press the  key to blink the telephone icon.
3. Press the  key again to switch from telephone icon to the transceiver icon.

The transceiver icon will blink for about 30 seconds before lighting solidly.

If you press the  key one more time while the transceiver icon is blinking, you can return to the duplex mode.

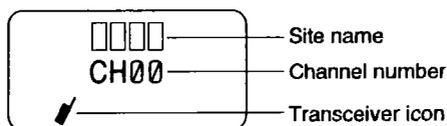
To return to the duplex mode, repeat the above key operation.



Note: Without the EJ-27D logic board, the available functions are almost the same both in the semi-duplex and two-way radio modes. Consequently, in the semi-duplex mode, a channel may have been configured for simplex communication.

Entering the Two-way Radio Mode

When the radio is in the two-way radio mode, it displays a transceiver icon and a channel number.



To switch from the duplex mode to the two-way radio mode, follow the instructions below. Note that you cannot enter the two-way radio mode if your dealer has disabled it, or has not configured any sites for that mode.

1. Press the  key to display **F**.
2. Press the  key to blink the telephone icon.
3. Press the  key again to switch from the telephone icon to the transceiver icon.

The transceiver icon will blink for about 30 seconds before lighting solidly.

If you press the  key while the transceiver icon is blinking, you will return to the duplex mode.

To return to the duplex mode, press the , , and  keys in that order.

4.2 Transmitting

To transmit:

Press the  key and speak into the microphone.

In the duplex mode, the radio can transmit and receive signals simultaneously. But, you must also press the  key to speak through the radio.

To change output power level, press the  key, then the  key.

To control the speaker volume, use the  and  keys.



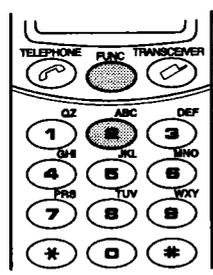
Note: If the BCLO function is enabled, it may prohibit transmission when the radio is receiving a signal. For information about BCLO, see "Busy Channel Lock Out (BCLO)" later in this section.



4.3 Changing Site

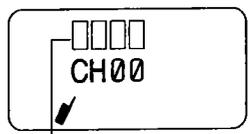
In any mode, when the radio is not equipped with EJ-27D logic board, a *site* means a group of channels. While the radio is in the waiting state, you can manually switch to another site. Note that the following procedure switches only to the sites configured for the current operation mode.

Change site.



Press the ^{FUNC} key to display **F**, then press the ^{AHC} key.

The site name will change.

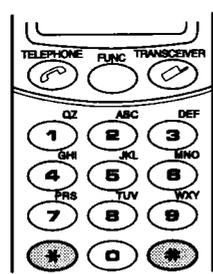


Site name

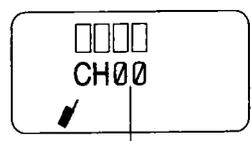
4.4 Selecting a Channel

To change the channel, use the below procedure (this is common to all operation modes). You can select only a channel within the current site.

Change the channel.



Press the * key to display one channel number larger, and the * key to display one number smaller. The radio automatically skips the channels which are not programmed by the dealer.



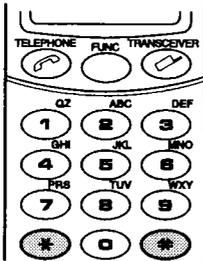
Channel number



4.5 Scanning Channels

The radio scans the channels to search for one which is receiving a signal. The radio automatically skips the channels which are not programmed by the dealer. The scanning is performed only within the current site.

1. Start scanning.



To scan the channels in ascending order, press and hold the **(*)** key for more than two seconds.

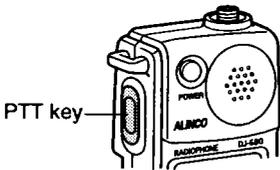


To scan the channels in descending order, press and hold the **(*)** key for more than two seconds.

The channel number scrolls rapidly while scanning. Scanning stops when the radio receives a signal, and restarts when no signal is picked up for a period of two seconds.

You can change the scanning direction by pressing the **(*)** or **(*)** key, whichever opposite to the current direction.

2. Quit scanning.



Press the **(PTT)** key.

Scanning also halts when you press the **(FUNC)** and **(ABC)** keys to change the site.



4.6 Monitoring

Even if the radio is not receiving any signal on the current channel, you can temporarily unmute that channel. To do so;

Hold down the  key.

The monitoring operation is cancelled when you release the  key.

4.7 Turning ON/OFF the Beep

The radio generates a beep (or beeps) every time you press a key. If this is inconvenient to you, you can turn it OFF. To do so;

Press the  key to display **F**, then press the  key.

To turn the beep ON, press the  key, then the  key again.

4.8 Dealer-configured Parameters

This section describes the function parameters which are configured by the dealer. Your radio operates differently depending on the configuration the dealer has set up.

Selective Calling

Selective calling is to call a specific party by specifying an ID code. This function is set up for each site by the dealer. In selective call communications, each transceiver has been programmed with a code (a three-digit DTMF code), and will unmute when receiving it. Without the correct code, the radio remains muted even if there is a signal present on your channel.

Note that the BCLO may prohibit transmission on a channel where a different muting system is enabled. For information about BCLO, see "Busy Channel Lock Out (BCLO)" later in this section.

With both TSQ and selective calling enabled, voices can be heard only when the radio has established a connection through selective calling and has received the correct tone. For more information about TSQ, see "TSQ (Tone Squelch) (CTCSS)" later in this section.

Calling the other party

To call a specific party:

1. Enter the called radio's code (a three-digit DTMF code), and press the ***** key.
2. Press the ***** and **1** keys.
3. Press the ***** key.

The radio will automatically start the call, and establish a connection with the other party's transceiver. If you do not transmit or receive a signal for 10 seconds, the connection will be automatically terminated, and you will need to go through the above procedure again to re-start the connection.



- Note:*
- You can also communicate with the other party by pressing and holding the **(PTT)** key, and entering the other party's three-digit code, instead of performing the above procedure. In this case, the other party is not informed of who is calling him/her.
 - The radio's code (a three-digit DTMF code) is not the same as the subscriber number used when calling a radio in the SD trunking mode.

Receiving calls

When your radio receives its own code, it establishes a connection with the caller and blinks the key backlight to inform you of the call. Hold the **(PTT)** key down and speak into the microphone while the backlight is blinking.



- Note:* You should start speaking while the backlight is still blinking (for 10 seconds). If the backlight goes out, the radio may terminate the connection.

The number which will appear on the display is the code of the caller. **ERR** may appear if the radio fails to receive the caller's code, however the connection is established. If the radio does not transmit or receive a signal for 10 seconds, it will automatically terminate the connection.

TSQ (Tone Squelch) (CTCSS)

TSQ (tone squelch) allows you to communicate only with a specific group who has the same tone as your radio. The tones used in TSQ are almost *inaudible* and may be set up for each channel by the dealer. If TSQ has been set, the TSQ icon **TSQ** appears on the display.



When the radio receives the correct tone, the squelch is unmuted allowing you to communicate with the caller. If the radio receives a signal without any tone or receives an incorrect tone, you cannot hear the voice of the other party.

Note that the BCLO may prohibit the transmission on a channel where TSQ is enabled. For information about BCLO, see "Busy Channel Lock Out (BCLO)" later in this section.

If both TSQ and selective calling are functioning, voices can be heard only when the radio has established a connection through selective calling and has received the correct tone.

Scrambler

Scrambling signals prevents other persons from monitoring your conversation. This function is set up for each channel by the dealer.

When your radio transmits scrambled signals, the receiver will receive and convert them into standard signals to reproduce your voice.

The receiver must be set by the dealer so that it can accept the scrambled signal. When TSQ is enabled, the radio converts scrambled signals only when receiving the correct tone.

Busy Channel Lock Out (BCLO)

BCLO prevents transmission on a channel which is receiving signal with a tone other than the one for your group. This function is contingent on activation of TSQ or selective calling, and is dealer programmable. BCLO permits or prohibits transmission according to the TSQ and selective call settings as described below.

When only TSQ is enabled

BCLO prohibits transmission when the radio receives a signal without any tone or receives a tone different from yours.

Transmission is allowed when the radio is not receiving any signal, or receiving signals with the matching tone.

When selective calling is enabled

You can transmit when the radio is not receiving any signal, or when it receives a signal along with the correct code. Once the transmission is performed successfully, the radio establishes a connection with the other party. BCLO will then be cancelled temporarily, allowing you to perform transmission anytime, as you want.

If the radio does not transmit or receive a signal for 10 seconds, it automatically breaks the connection and activates BCLO again.

When both the TSQ and selective calling are enabled

You can transmit when the radio is not receiving any signal. Once the transmission starts, the radio establishes the connection and keeps it.

When you are called through selective calling, the radio must receive the correct tone before it can establish the connection with the caller. You will hear ringing tones when the connection is successfully made.

Once the connection is established, you can transmit anytime except when the radio is receiving a signal without any tone or with an incorrect tone.

Time Out Timer (TOT)

The *TOT* expires and shuts down the transmission if you continuously transmit for more than the time specified by the dealer. To restart the transmission, release the **(PTT)** key and press it again.

ANI (Automatic Number Identification)

When the *ANI* function is enabled by the dealer, the radio automatically sends the pre-programmed ID code at the beginning and/or end of transmission. The base station will identify your radio by the received code.

Appendices

The appendices include helpful information, such as specifications, troubleshooting, optional accessories list and a flowchart on switching operation mode.



A Specifications

General Specifications

Frequency range	V version(original)	Full-duplex	RX 450 - 470MHz/ TX 155 - 174MHz
		Simplex	RX/TX 155 - 174MHz
	V21 Version	Full-duplex	RX 400 - 420MHz/ TX 155 - 174MHz
		Simplex	RX/TX 155 - 174MHz
	U11 version	Full-duplex	RX 136 - 155MHz/ TX 400 - 420MHz
		Simplex	RX/TX 400 - 420MHz
U12 version	Full-duplex	RX 155 - 174MHz/ TX 400 - 420MHz	
	Simplex	RX/TX 400 - 420MHz	
Number of channels	Trunking mode	20 ch × 3 sites	
	Two-way radio mode	10 ch × 2 sites	
Antenna	TNC type		
Antenna impedance	50Ω		
Supply voltage	Ni-Cd: 6 V, Drycell: 7.5 V		
Standard drycell case	AA type × 5		
Frequency stability	±3 ppm		
Current drain	Transmission	High 1000 mA/Low 650 mA	
	Reception	Squelched 100 mA	
Battery life time (TYP.)	Continuous reception	11 hours by 1100 mAh Ni-Cd	
	Continuous transmission	2 hours by 1100 mAh Ni-Cd	
Operating temperature	-20°C to +60°C (+4°F to +140°F)		



Transmitter Specifications

Output power	High	2 W (Dealer adjustable)
	Low	0.5-2 W (Dealer adjustable)
Modulation system	Variable reactance frequency modulation	
Maximum frequency deviation	±5 kHz	
Spurious suppression	-60 dB	
Harmonic suppression	-60 dB	
Residual noise	-40 dB	
Mod. distortion	Less than 5 %	

Receiver Specifications

Receiving system	Double-conversion superheterodyne	
Sensitivity	0.5 μ V at 12 dB SINAD	
Selectivity	6 dB at 10 kHz or more	
	-70 dB at 25 kHz or less	
Adjacent channel selectivity	65 dB at 25 kHz	
Inter modulation response	70 dB	
Image response	70 dB	
Spurious emission	2 nW	
Audio output (8 Ω load)	More than 50 mW	

*: Specifications are subject to change without notice or obligation.

B Troubleshooting

This appendix contains information about radio problems, possible causes, and actions you should take in the event of trouble. If the problem still exists after taking the specified remedial action, contact an authorized dealer.

Problem: The radio does not turn ON.

- Cause:**
1. The battery may be dead.
 2. The drycells are loaded backwards.

- Action:**
1. When using drycells, replace them with new ones. When using a battery pack, recharge it.
 2. Load the drycells in the correct direction. The negative pole (-) must contact the metal prong inside the drycell case.

Problem: The radio cannot establish a connection in the radio-phone or semi-duplex trunking mode.

- Causes:**
1. The antenna is not be attached to the radio.
 2. The signals from the base station is weak because you are in a shadow area of the base station coverage.
 3. You selected a site out of the service area.
 4. The radio's EJ-27D logic board is incorrectly configured.

- Actions:**
1. Attach the antenna which came with your radio, and make sure it is securely fixed to the radio.
 2. Change to a location in a line-of-sight (perspective place) to the base station.
 3. Access a base station and change to an appropriate site. Or, operate the radio within the service area.
 4. Contact the dealer to configure the radio correctly.

Problem: You have trouble hearing the other party's voice.

- Causes:**
1. The speaker volume level is too low.
 2. The signals from the base station is weak because you are in a shadow area of the base station coverage.

- Actions:**
1. Press the  key to increase the volume. It is recommended that you set volume to the medium level (VOL->>>) in normal operation.
 2. Change to a location in a line-of-sight (perspective place) to the base station.

Problem: You cannot call a telephone through auto-dialing in the SD trunking mode.

Causes: You did not enter the correct transmission command (1 * or 2 *).

Actions: Before dialing, ask the dealer which transmission command you should use, 1 * or 2 * . In auto-dialing, enter the correct command after pressing the  key.

For more information about how to use auto-dialing, see "Auto-dialing by Specifying Memory Numbers" or "Auto-dialing by Specifying Memory Titles" in section 3.2 "Semi-duplex Trunking Mode (SD Trunking Mode)."



C Optional Accessories List

Names of products used in this manual are for identification purpose only and may be trademarks or registered trademarks of their respective company.

Optional Products

- EJ-27D Trunking logic board*
- EBP-40N Ni-Cd battery pack 1100 mAH
- EBP-41N Ni-Cd battery pack 600 mAH
- EDC-70 Rapid charger (220 VAC input)
- ESC-32Z Soft case with belt clip

*: This may come standard depending on the version of the radio.

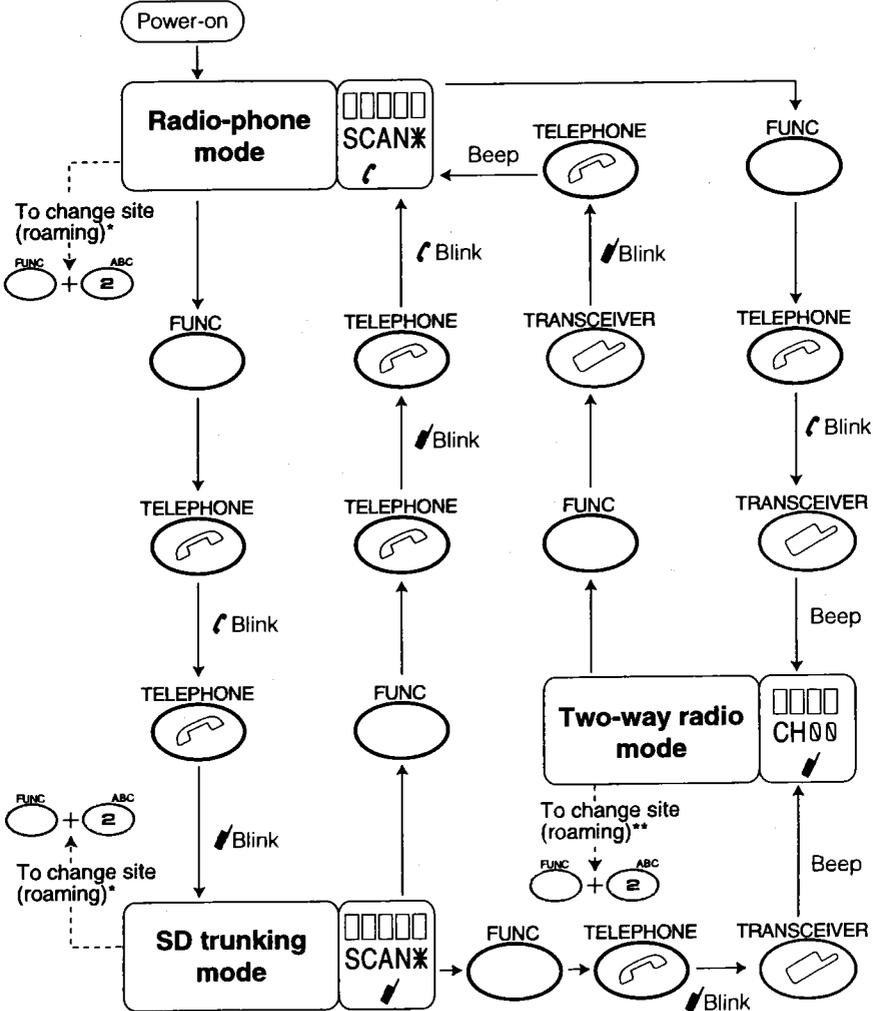
Related Products

- DR-605 Full-duplex VHF/UHF mobile transceiver with a socket for a logic board
- DR-610 Full-duplex VHF/UHF mobile transceiver with separatable front control
- EJ-21X Logic board for DR-605 and DR-610
- ST-869-07 Radio/Telephone Interface Module (for data communications through trunking) for DR-605/610.

D Switching Operation Modes

Use this chart as a quick reference for changing operation mode.

When the logic board is installed in the radio



* : This operation switches only to the sites configured for the current operation mode, and is not needed if auto-roaming is enabled on your radio by the dealer.

** : This operation switches only to the sites configured for the two-way radio mode.

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