

21-1902

RadioShack Copyright

22 Ch GMRS/FRS Two-way Radio

Your RadioShack 22 Channel FRS/GMRS Two-way Radio provides short-range voice radio communication that lets families and groups keep in touch with each other on specific reserved channels.

Your RadioShack 22 Channel FRS/GMRS Two-Way Radio is a lightweight, palm-sized radio you can use to talk with another person who has a FRS/GMRS radio set to the same frequency as your radio.

Your radio has 22 channels and 38 different quiet codes, which you can use to talk with another person who has a GMRS or FRS radio set to the same frequency as your radio. Your radio also has auto-squelch, so you will not hear anything on a channel unless someone is transmitting nearby on the same channel.

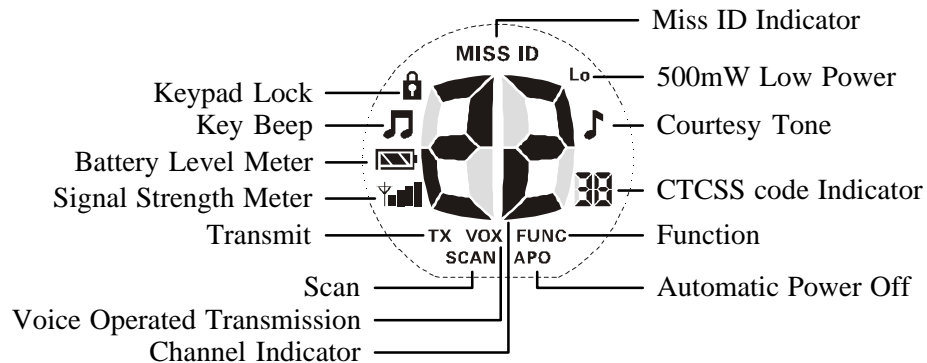
You can connect an optional speaker/microphone and earphone to the radio (neither supplied, available at your local RadioShack store).

Your radio's display has a backlight that turns on for about 5 seconds when you press any key except PTT.

Your radio's other features include:

- **22 Channels** – provide clear communications for up to two miles in FRS channel and up to three miles in GMRS channel.
- **Channel Scan** – use to find other FRS users.
- **38 Quiet Code** – eliminates interference from other radios that are not tuned to the same channel and quiet code as your radio.
- **Key Beep** – short beep generation for key pressed acknowledgement except PTT or Function key.
- **Voice Operated Transmission (VOX)** – enables standalone usage and works with handsfree accessory.
- **Automatic Power Off** – the radio auto power off when the radio is idle for 30, 60 or 90 minutes.
- **Hi/Lo power selection** – select the transmit power 0.5W or 1.0W in GMRS channel.
- **Courtesy Tone** – at the end of transmission, it generates for end of message acknowledgement.
- **Caller ID** – In transmitter, user can select the receiver radio to receive the Call. In receiver, the radio will receive the Call that is address to this radio and display the transmitter ID number on LCD.
- **PLL (Phase –Lock Loop) Controlled Circuitry** – provides accurate and stable channel selection.

Description of 21-1902 LCD diagram




INSTALLING BATTERIES

Your radio requires four AAA alkaline batteries (not supplied) or rechargeable nickel-cadmium (Ni-Cd) / nickel-metal hydride (Ni-MH) batteries (supplied) for power. For the best performance and longest life, we recommend RadioShack batteries.

Cautions:

- Use only fresh batteries of the required size and recommended type.
- Do not mix old and new batteries, different types of batteries (alkaline or rechargeable), or rechargeable batteries of different capacities.

1. Rotate **VOL/OFF** counterclockwise until it clicks to turn off the radio.
- 2.
3. Pull down the latch on the battery compartment cover, then remove the cover.
- 4.
5. Slide **CHARGE ON/OFF** inside the battery compartment to **OFF** (for alkaline batteries) or **ON** (for Ni-Cd or Ni-MH rechargeable batteries) when charging the battery through the 6V DC jack on the button of the radio.
Warning: Never install non-rechargeable batteries when CHARGE ON/OFF is set to ON. Non-rechargeable batteries can get hot or explode if you try to recharge them.
6. Install four AAA batteries according to the polarity symbols (+ and -) marked inside.
5. Replace the cover and push the latch up until it clicks, then rotate **VOL/OFF** clockwise until it clicks to turn on the radio.

The battery icon's segments  display to show how much power remains. When the Battery bracket flashes, replace alkaline batteries or recharge Ni-Cd or Ni-MH batteries.

Warning:

- **Dispose of old batteries promptly and properly. Do not burn or bury them.**

Caution:

- **If you do not plan to use the radio for a month or longer, remove the batteries. Batteries can leak chemicals that can destroy electronic parts.**

Recharging Ni-Cd or Ni-MH Batteries through 6V DC jack

Warning:

- **Do not attempt to charge alkaline batteries. Non-rechargeable batteries can get hot or explode if you try to recharge them.**

The radio's DC 6V jack is for charging Ni-Cd or Ni-MH batteries and powering the radio.

You can recharge Ni-Cd or Ni-MH batteries inside the radio at home or vehicle, using a 6V, 600mA AC or DC adapter and a size F Adaptaplug™ connector.

Cautions:

- **You must use a Class 2 power source that supplies regulated 6V DC (Not more than 6V) and delivers at least 600mA. Its center tip must be set to positive and its plug must fit the radio's DC 6V jack. Using an adapter that does not meet these specifications could damage the radio or the adapter.**
- **Always connect the adapter to the radio before you connect it to an external power source (such as an AC outlet or a vehicle cigarette-lighter socket). When you finish, disconnect the adapter from the power source before you disconnect it from the radio.**

1. Rotate **VOL/OFF** fully counterclockwise to turn off the radio.
2. Pull down the latch on the battery compartment cover and remove the cover.
3. Set **CHARGE ON/OFF** to **ON**.
4. Place four Ni-Cd or Ni-MH batteries in the compartment according to the polarity symbols (+ and -) marked inside. Then replace the cover and push the latch up until it clicks.
5. Attach the Adaptaplug to the adapter so TIP reads positive (+).
6. Connect the Adaptaplug's other end to the radio's DC 6V jack and plug the adapter into a standard AC outlet or vehicle's power source.

Note:

- **Complete charging takes about 10 hours. When charging is complete, unplug the AC or DC adapter from the power source, then disconnect it from the radio's DC 6V jack.**
- **Ni-MH batteries take longer to charge than Ni-Cd batteries.**

Recharging Ni-CD or Ni-MH batteries through slow-charger

1. Power up the slow-charger.
2. Place four Ni-CD or Ni-MH batteries in the compartment according to the polarity symbols (+ and -) marked inside, then replace the cover and push the latch up until it clicks.
3. Place the radio into the slow-charger.

Note:

- **Complete charging takes about 10 hours. When charging is complete, remove the radio from the slow-charger.**

Important: The EPA certified RBRC® Battery Recycling Seal on the nickel-cadmium (Ni-Cd) battery indicates RadioShack is voluntarily participating in an industry program to collect and recycle these batteries at the end of their useful life, when taken out of service in the United States or Canada. The RBRC program provides a convenient alternative to placing used Ni-Cd batteries into the trash or the municipal waste stream, which may be illegal in your area. Please

call 1-800-THE-SHACK (1-800-843-7422) for information on Ni-Cd battery recycling and disposal bans/restrictions in your area. RadioShack's involvement in this program is part of the company's commitment to preserving our environment and conserving our natural resources.

OPERATION

Power On/Off

Rotate **VOLUME/ OFF** to turn the radio on or off and adjust the volume.

Transmit

Hold down **PTT** to send a page to other FRS radios set to the same channel (and the same quiet code, if you selected one). TX appears. Release **PTT** to stop transmission.

Note:

- If you hold down **PTT** for about 2 minutes, the radio automatically stops transmission to save power.

Selecting Channel

Press **UP** or **DOWN** key manually to select the desired channel. The selected channel number appears.

FRS Frequencies Table

Channel	Frequency (MHz)	Description
1	462.5625	FRS 1/GMRS Interstitial 1
2	462.5875	FRS 2/GMRS Interstitial 2
3	462.6125	FRS 3/GMRS Interstitial 3
4	462.6375	FRS 4/GMRS Interstitial 4
5	462.6625	FRS 5/GMRS Interstitial 5
6	462.6875	FRS 6/GMRS Interstitial 6
7	462.7125	FRS 7/GMRS Interstitial 7
8	467.5625	FRS 8
9	467.5875	FRS 9
10	467.6125	FRS 10
11	467.6375	FRS 11
12	467.6625	FRS 12
13	467.6875	FRS 13
14	467.7125	FRS 14
15	462.5500	GMRS Primary 1
16	462.5750	GMRS Primary 2
17	462.6000	GMRS Primary 3
18	462.6250	GMRS Primary 4
19	462.6500	GMRS Primary 5
20	462.6750	GMRS Primary 6
21	462.7000	GMRS Primary 7
22	462.7250	GMRS Primary 8

Selecting Quiet Codes

Quiet Codes lets you talk and listen to other radios set to the same channel and quiet code. This is like having a sub-channel within a channel, giving you greater communication flexibility. When you set a quiet code (there are 38 codes to choose from) and turn on this feature, you can communicate with anyone who has a radio set to the same channel and quiet code.

To select the desire quiet code, hold down **FUNC** key, **FUNC** appears on the display, and repeatedly press or hold **UP** or **DOWN** key until you see the code number you want to use. (See the “Quiet Code Chart” for complete list of quiet codes).

To turn off the quiet code feature, hold down **FUNC** key and repeatedly press or hold **UP** or **DOWN** key at the same time until the quiet code number disappears.

Quiet Code Chart

CTCSS No.	Frequency (Hz)	CTCSS No.	Frequency (Hz)
1	67.0	20	131.8
2	71.9	21	136.5
3	74.4	22	141.3
4	77.0	23	146.2
5	79.7	24	151.4
6	82.5	25	156.7
7	85.4	26	162.2
8	88.5	27	167.9
9	91.5	28	173.8
10	94.8	29	179.9
11	97.4	30	186.2
12	100.0	31	192.8
13	103.5	32	203.5
14	107.2	33	210.7
15	110.9	34	218.1
16	114.8	35	225.7
17	118.8	36	233.6
18	123.0	37	241.8
19	127.3	38	250.3


Using Scan

Press and hold **Up** or **Down** key to scan up/down Channel and Quiet code. The radio automatically scans through the channels and pauses on each active channel. While scanning, press **UP** or **DOWN** key to change the scanning direction. Press **PTT** key to stop scanning.


Note:

- The radio automatically scans through quiet codes while scanning through the channels. The quiet code feature automatically turns on when signal is detected on a channel and quiet code, and turns off after the signal disappears.
- During scan, the radio will not receive Caller ID data.

Using Key Lock

To lock or unlock keypad, hold down **FUNC** key and press **PTT** key to lock or unlock the keys.  appears when the keys are locked. When keypad is locked, user can still transmit (press **PTT**), send Call (press **CALL**) or temporarily enable/disable Vox function (short press **PTT** key when Vox level is 1-4).

Using Key Tone

You can set the radio so it sounds a tone when you press any key except **PTT** or **FUNC** key. To turn on the key tone feature, press **MENU** key to activate the Menu function  icon appears and **ON/OFF** flashes. **On** appears when the keytone is ON and **OFF** appears when it is OFF. Press **PTT** key to store the setting. When no keypress found in Menu mode, the radio will exit without save after 20 seconds.

Using VOX

Vox operation allows you to transmit voice message without pressing any key. To activate VOX, continually press **MENU** key until **vox** appears. Press **UP** or **DOWN** key to select the desired level (There are four levels of sensibility 1 ~ 4, i.e. Lo ~ Hi), select **OFF** to turn off this function. Press **PTT** key to store the setting. When no keypress found in Menu mode, the radio will exit without save after 20 seconds.

Note:

- You still can send a page to the other FRS radio in VOX mode when the keys are locked.

Using APO

You can set the radio to automatically power off when the radio is idle (no any key pressed or Tx or Rx) for 30, 60 or 90 minutes. To turn this feature ON/OFF, continually press **MENU** key until **APO** and **30, 60, 90** or **OFF** appears, press **UP** or **DOWN** key to select the desired one, if you select **OFF**, the radio will not automatically power off. Before the radio shuts off, the radio will alert beep sounds. After auto power off, the radio can be wake up by any key press when rotary switch in ON state.


Using Hi/Lo transmitter power

You can set the radio transmit power is 0.5W or 1.0W. The transmit power of channel 8-14 is fixed at 0.5W only (FRS channel). To select 1.0W transmit power, make sure that the channel isn't 8-14 and then press **MENU** key until **Lo** icon appears, if you select **OFF**, the radio transmit power is 1.0W, select **ON** to set the transmit power is 0.5W. When no keypress found in Menu mode, the radio will exit without save after 20 seconds.

Note:

- No Hi/Lo transmit power selection when Channel number is 8-14 (FRS Channel).

Using Courtesy Tone

You can set your radio so the person you are communicating will hear a tone when you finish transmitting. To turn on the radio courtesy tone, press **MENU** key repeatedly  appears and **ON/OFF** flashes on the display. **ON** appears when the courtesy tone is on and **OFF** appears when the courtesy tone is off. Press **UP** or **DOWN** key to turn the courtesy tone on or off. Press **PTT** key to store the setting.

Using Headset

You can make or answer calls with handsfree convenience using an optional headset with a 3/32-inch plug (not supplied, available at your local RadioShack store) To connect a headset, insert the headset's plug into the MIC/SPK jack on the right side of the radio.

Note: Do not change your headset's mode (VOX or PTT) while the radio is in use and be sure to switch your radio off to reset it before switching between VOX and PTT.

Caller ID Operation

The Caller ID data includes the Transmitter ID and Receiver ID information. The Transmitter can select the Receiver radio ID number who wants to call, and the Receiver radio will only receive the Caller ID data who is addressed. The Caller ID data communication is based on the same Channel and CTCSS code setting. The communication can not establish if the Channel and CTCSS code are not the same.

Caller ID data is sent when user presses **CALL** key. The radio will transmit Caller ID data to the desired radio. At the same time, other radio will check the receiving Caller ID data at the same Channel and CTCSS code. If the Call ID number matches with its Home ID number (Receiver ID number) or equal to Group Call, then it represents the call is addressed to this radio. As a result, the receiver will display the Sender ID number on the LCD and generate Call melody. There are five different Call melody to let user distinctive who transmit a Call (Please refer to the Call melody note later).

After Caller ID transmission is completed, both radios (Transmitter and Receiver) will change its CTCSS code setting to Private code for 15 seconds. It is used to avoid interruption from original Channel and CTCSS code. In the 15-second period, both radios can only transmit and receive voice message at the original Channel with Private Code. Besides the **ID** icon on both units will be flashed on LCD to indicate this 15-second period. When conversation is made within this period, the 15-second timeout will be extended for another 15 seconds. To exit the 15-second period, press **CALL** key or waiting the 15 seconds timeout.

After 15-second timeout, both radios will restore to their original settings and LCD display will revert back to the display without Caller ID function. On the other hand, if the receiver hasn't press any key after a Caller ID is received, its LCD display will keep on showing the received ID number and **MISS ID** icon flashed until any key is pressed (except **FUNC** key). Also, reminder beep will be generated to remind user that there is an incoming call and it will be beep once every 10 minutes for a period 30 minutes. It will be removed when the user pressed any key except **FUNC** key.

Setting Home ID

Home ID data allows you to enter the ID number that will appear on receiver radio as you communicate with them. User can select Home ID number 1-16.

1. Set the Transmitter and Receiver in the same channel (and same quiet code, if you select one)
2. Hold down the Receiver's **FUNC** key and press **CALL** key to enter Setting Home ID mode. Release all key and then press **UP** or **DOWN** key to select your desired Home ID number.
3. Press **PTT** key to stored the setting.

Note:

- If no key pressed within 20 seconds in Setting Home ID mode, the radio will automatically exit without saving.
- If Home ID is changed, the radio will automatically reset the Caller ID number to Group Call.

Setting Caller ID

Caller ID data allows you to enter the receiver's radio ID number that you want to call. Receiver's radio only receive the Call when the Caller ID data is matched with its Home ID. User can select Caller ID number 1-16 or Group Call.

1. Hold down Transmitter's **CALL** key until the Call ID number flashes on the display, press **UP** or **DOWN** key to select the receiver's home ID number or GROUP option. (If you select receiver's home ID number 1 ~ 16, you can only send a page to one user or several users setting with the same ID home number, if you select GROUP option, you can send a page to all users.).
2. Press **PTT** key to stored the setting.

Note:

- If user presses **UP** or **DOWN** key to change Caller ID number and the number is equal to the Home ID. Then the LCD will display the next Caller ID number in order to prevent any match of Home ID and Caller ID.

Call Melody

In Transmitter's radio, the call melody will generate after the Call ID data is sent. The Call melody is depends on the Call ID number. The Call tone melody map is state as following Table.

Call Melody No.	1	2	3	4	5
ID	Call ID = Group Call	Call ID = 1~4	Call ID = 5~8	Call ID = 9~12	Call ID = 13~16

In Receiver's radio, the call melody will generate after the Call ID data is received. The Call melody is depends on the Sender ID number. The Call tone melody map is state as following Table.

Call Melody No.	1	2	3	4	5
ID	Group Call	Sender ID = 1~4	Sender ID = 5~8	Sender ID = 9~12	Sender ID = 13~16

For example,
John want to Call Mary

John's radio setting

Channel	22
CTCSS	38
Home ID	3
Call ID	5



Peter's radio setting

Channel	22
CTCSS	38
Home ID	4
Call ID	12



- If John want to Call Mary. He need to change Caller ID number to Mary's Radio ID number 7.
- To change Call ID number. Press & hold Call key for 2 seconds or until Call ID number flash on the LCD display.
- Press Up or Down key to change the Call ID number to 7 (Mary's radio number).
- Press PTT to confirm the Call ID setting.



- Peter can't receive Caller ID.
- The CTCSS setting remain unchanged.

John's radio setting

Channel	22
CTCSS	38
Home ID	3
Call ID	7

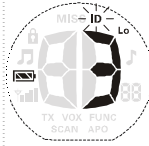


Mary's radio setting

Channel	22
CTCSS	38
Home ID	7
Call ID	1



- Press Call key to transmit Call to other radio.
- After the Call transmission, the radio CTCSS setting is changed to Private Tone.



- Mary receive the ID data which is address to her.
- The radio displays the transmitter ID number on LCD.
- The radio CTCSS setting is changed to Private Tone.

John's radio setting after Call

Channel	22
CTCSS	Pr
Home ID	3
Call ID	7



John want to Call all radio in the same Channel and CTCSS code

John's radio setting

Channel	22
CTCSS	38
Home ID	3
Call ID	5



- If John want to sent a group call. He need to change Caller ID number to Group ID.
- To change Call ID number. Press & hold Call key for 2 seconds or until Call ID number flash on the LCD display.
- Press Up or down key to change the Call ID number to "9P" (Group Call).
- Press PTT to confirm the Call ID setting.



John's radio setting

Channel	22
CTCSS	38
Home ID	3
Call ID	gP



- Press Call key to transmit the Call to other radio.

- After the Call transmission, the radio CTCSS setting is changed to Private Tone.

John's radio setting after Call

Channel	22
CTCSS	Pr
Home ID	3
Call ID	gP

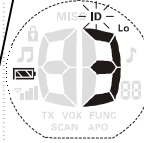


Peter's radio setting

Channel	22
CTCSS	38
Home ID	4
Call ID	12



- Peter receive the ID data which is address to all radio in this Channel and CTCSS code.
- The radio displays the transmitter ID number on LCD.
- The radio CTCSS setting is changed to Private Tone.



Mary's radio setting

Channel	22
CTCSS	38
Home ID	7
Call ID	1



- Mary receive the ID data which is address to all radio in this Channel and CTCSS code.
- The radio displays the transmitter ID number on LCD.
- The radio CTCSS setting is changed to Private Tone.



Using the Swivel Belt Clip

To attach the belt clip, insert the clip into the socket at the back of the radio until it clicks. To remove the belt clip, press the button at the tip of the clip and pull out the clip.

Using an Optional Wrist Strap

You can attach an optional wrist strap (not supplied) to the radio. Slide the wrist strap's small loop under the bar on the tip of the radio. You might need to use a small screwdriver or straightened paper clip to do this. Then pull the strap's large loop through the small loop.

CARE

Keep the radio dry; if it gets wet, wipe it dry immediately. Use and store the radio only in normal temperature environments. Handle the radio carefully; do not drop it. Keep the radio away from dust and dirt, and wipe it with a damp cloth occasionally to keep it looking new.

Modifying or tampering with the radio's internal components can cause a malfunction and might invalidate its warranty and void your FCC authorization to operate it. If your radio is not performing as it should, take it to your local RadioShack store for assistance.

FCC Information

Important: Do not open your radio to make any internal adjustments. Your radio is set up to transmit a regulated signal on one of 22 assigned frequencies. It is illegal to alter or adjust the settings inside the radio to exceed those limitations. Any adjustments to your radio must be made by a qualified technician using the proper test equipment. To be safe:

Never open your radio's case.

Never change or replace anything in your radio except the batteries.

Your radio might cause TV or radio interference even when it is operating properly. To determine whether your radio is causing the interference, turn it off. If the interference goes away, your radio is causing it. Try to eliminate the interference by:

Moving your radio away from the receiver.

Calling your local Radioshack store for help.

If you cannot eliminate the interference, the FCC requires that you stop using the radio.

This device complies with Part15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Licensing Information

Your radio operates on General Mobile Radio Service (GMRS) frequencies and is subject to the Rules and Regulations of the Federal Communications Commission (FCC). The FCC requires that all operators using General Mobile Radio Service (GMRS) frequencies obtain a radio license before operating their equipment. To obtain the FCC form please request Form **605** which includes all forms and instructions. If you wish to have the document faxed, mailed or have questions, please use the following contact information.

Faxed	Mailed	Questions
Contact the Fax-On-Demand system at:	Call the FCC orms Hotline at:	Regarding FCC license Contact the FCC at:
1-202-418-177	1-800-418-FORM 1-800-418-3676	1-888-CALL-FCC 1-888-225-5322
		Or: http://www.fcc.gov

Changes or modifications not expressly approved by RadioShack may void the user's authority granted by the FCC to operate this radio and should not be made. To comply with FCC requirements, transmitter adjustments should be made only by or under the supervision of a person certified as technically qualified to perform transmitter maintenance and repairs in the private land mobile and fixed services as certified by an organization representative of the user of those services.

Replacement of any transmitter component (crystal, semiconductor, etc.) not authorized by the FCC equipment authorization for this radio could violate FCC rules.

Note:

Use of this radio outside the country where it was intended to be distributed is subject to government regulations and may be prohibited.

Safety Information

Your wireless handheld portable transceiver contains a low power transmitter. When the Push-To-Talk (PTT) button is pressed, it sends out radio frequency signals. The device is authorized to operate at a duty factor not to exceed fifty percent. In August 1996, the Federal Communications Commission adopted RF exposure guidelines with safety levels for handheld wireless devices.

Cautions:

To maintain compliance with the FCC's RF exposure guidelines, hold the transmitter and antenna at least 2 inches from your face and speak in a normal voice, with the antenna pointed up and away from your face. If you wear the handset on your body while using the headset accessory, use only the supplied belt clip for this product and when transmitting, take it out of the belt to ensure the antenna is at least 1 inch (2.5cm) from your body.

Use only the supplied antenna. Unauthorized antennas, modifications, or attachments could damage the transmitter and may violate FCC regulations.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

SPECIFICATIONS

