

Los Angeles Fire Department  
ACS - Auxiliary Communications Service

FRS Radios - Family Radio Service  
GMRS Radios- General Mobile Radio Service

A Brief Lesson – Version dated 08/05/07  
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### **Introduction**

FRS/GMRS radios are low power, inexpensive handheld ‘walkie talkies’ or ‘handie-talkies (HTs) which can be used for short distance radio communications. There is no FCC license required for use of the FRS frequency spectrum, but GMRS radios require an FCC License. Neither FRS nor GMRS radios require you to take or pass any tests. Many of these types of radios also include frequencies in both the GMRS and FRS ranges. You are required to obtain an FCC license if you wish to use the GMRS frequencies.

### **Power**

Typically, radios on the FRS frequencies will transmit at .5 (one-half) watt while the GMRS frequencies will transmit at up to 2 watts or more, depending on the power setting. As you can see, GMRS radios are substantially more powerful and will enable longer range communications. But GMRS radio batteries don’t usually last as long because they’re putting out more power.

### **Frequencies**

FRS radios have FRS frequencies only. GMRS radios often have FRS frequencies as well, but when transmitting on the FRS frequencies, the GMRS radios are designed to transmit on the lower FRS power only. The radio manufacturers commonly identify their frequencies by Channel numbers and there are suggested assignments, but no official standardization. As a result, some manufacturers assign the same frequencies to different channel numbers.

On some radios, like many Motorolas:

Frequencies 1 - 14 are FRS  
Frequencies 15 – 22 are GMRS

Other radio manufacturers may place the frequencies on different channel numbers.

It’s important that you know which frequencies are assigned to which channel on your radio. Much of the difficulty people experience when trying to contact FRS/GMRS radios made by a different manufacturer is some radios may have the frequency you want to use assigned to a different channel. This problem can be solved if you know what your channel frequencies are (keep a list with the radio...) and test your radio with the radio you wish to contact before you need to communicate with them.

### **Range**

When you purchase a radio, the manufacturer will rate them as having a range in miles. Usually, the longer the range, the higher the price will be. Remember that these ratings are for areas that

have little or no interference so they are not reliable for use in a city setting. They will work closer to rated range from hilltop to hilltop, or anywhere with an unobstructed view between the radios. The range is shorter when there is uneven terrain. Things such as building, hills, trees, etc. will severely limit your range. Using the radio inside of a car will be a problem due to the metal all around you. Generally, the actual range of FRS and GMRS radios will be significantly less than advertised.

### **Selecting Frequencies for your group**

You should select two frequencies that you will use. Try so select channel numbers that are easy to remember like 2 and 4 or 7 and 11. Remember to compensate for different channel numbers between different manufacturers if necessary. Denote one frequency as the primary and the other as the secondary frequency (or channel A and channel B). If there is a lot of traffic from other groups on your primary frequency, you can tell everyone to switch to your secondary frequency. In an actual emergency, listen for quiet frequencies and then assign them as your primary and secondary frequencies.

If there is extensive traffic on the base frequencies, consider using one of the Interference Eliminator Codes. See below for setting these and potential problems.

### **Setting Up the Radio**

This example is for the typical Motorola TalkAbout line of radios.

Turn on the radio by rotating the large knob on top.

The display will show:

- The amount of power left in the batteries
- The current frequency setting (the large sized number)
- The interference eliminator code (also called the quiet or privacy code (the small sized number)

You can move through all of the possible menu settings by pressing the menu button. The number will blink to indicate which setting you are on.

### **Setting Frequencies**

Setting 1 – Frequency - Press the Menu button and note that the frequency will blink. Press the + or – buttons to move to a higher or lower frequency. If finished with your settings, just wait and the blinking will stop and the frequency will be set in memory. If not finished, continue to setting 2.

Setting 2 – Interference Eliminator Codes - The small number to the side of the frequency will blink. There may be up to 38 or more Interference Eliminator Codes available. Press the + or – buttons to move to a higher or lower code. If finished with your settings, just wait and the blinking will stop and the frequency will be set in memory. If not finished, continue to setting 3.

For emergency communications, it's often best not to use any codes at all in order to hear all transmission on each channel.

### **Other Settings**

Setting 3 – Call Tones – See your radios instruction manual for this option.

Setting 4 – Hands Free Voice Activated Settings (Requires a compatible headset) See your radios instruction manual for this option.

### **Transmitting and Receiving**

On the left side of the radio (looking at the front) is the PTT – Push to Talk button.

Grasp the radio from the back so that you can easily press the PTT button.

Locate a small hole on the front of the radio. This is the microphone hole. The other group of holes is the speaker.

Think about what you are going to say before you transmit. Try to make your transmission as brief as possible.

To transmit, press and hold the PTT button. Wait one second for the radio to transmit the call tone, and then speak to the front of the radio, near the microphone hole. Speak in a normal voice as if you were speaking on the phone. Speaking too loudly will transmit an unintelligible signal.

Release the PTT button when finished speaking so that you can hear the reply. The speaker on your radio will be muted when you are transmitting.

### **Communication Protocols**

#### **Transmitting**

When transmitting, start by pressing your Push To Talk (PTT) button for at least one half second, or more, to allow your radio to start up and for your signal to reach the other radios. You must be sure to get the attention of the person to whom you wish to speak. All others on the channel can then ignore the transmission as it is not addressed to them.

So first say the designation of whom you are calling. This may be a name, a station id like fire patrol, medical, base, IC (incident command), etc. Then identify your self. Again, this may be your name, a station id like fire patrol, medical, base, IC (incident command), etc. For example, if you are “Search One” and you need to contact your IC, the correct sequence is:

“IC, IC, this is Search One.

Wait for a reply before transmitting your information or request. If you do not receive a reply, repeat the call every few minutes or so until you do get a reply. The person you’re calling may be extremely busy and can’t respond to you right away. Don’t call continuously. If the person you’re calling is too busy to answer, continuous calling will just encourage them to lower the volume on their radios. Wait a minute or so between calls unless your call is an actual emergency call. If it IS an emergency call, say so. “This is an emergency”, or “I have emergency traffic” and say so right away.

You should also let the other party know what type of message you are sending after you identify yourself. If an emergency exists, say ‘I have emergency traffic’. If you need to ask a question, say ‘with a question’. If you are relaying simple information, say ‘information only’.

If you don't receive an answer after four or five attempts, perhaps your radio is not reaching the person you are calling. Try moving to a new position, higher if possible, and move away from metal and concrete and other material that can block or scatter your signal.

After you receive a reply, transmit your information or request.

Keep your transmissions as short as possible. Think about what you need to say before you start your transmission. Decide on the shortest, clearest way to say what needs to be said. Once you've transmitted what you need to say, stop transmitting and wait for your party to reply. They may need to think about what you said, and it may take a moment for them to reply. If the person you're calling is using good radio protocol, they will respond as soon as you've reached them and let you know that your message was received.

If the other party asks a question and you need a moment to think about the reply, or you need to gather the requested information, ask them to wait by saying their designation followed by 'standby' or 'please standby'.

These radios usually send a tone to indicate that you have released the PTT button and have ended that portion of your transmission. If not, say the word 'over' at the end of each portion of your transmission.

When completing a transmission, say your designation followed by the word 'out' or 'clear'.

### **Receiving a Transmission**

When you hear your designation being called, push the PTT button and respond by saying the designation of the calling station followed by the word 'go' or 'go ahead'. Release the PTT button. This lets the calling party know that they have gotten your attention and you are ready to listen to their information or request.

If you have received the information or request clearly and wish to respond with a positive response, you can say, 'understood', 'affirmative' or the old radio terms 'roger' or 'copy'. A positive response may be 'negative'. If you did not clearly understand the message, ask for the message to be repeated or say 'negative copy'.

### **Rule for GMRS Transmissions**

When you receive your GMRS license, it will include your FCC Call Sign. When transmitting on any of the GMRS frequencies, you are required to say your call sign at the beginning of a conversation, every 10 minutes on a long conversation, and at the end of a conversation.

GMRS licenses are inexpensive and give you additional special privileges, so you might want to consider purchasing one for your family.

### **Other rules to observe**

Remember that the frequencies on these radios are shared by the general public and anyone on the same frequency as you can hear everything that you say. Even if you use the Interference Eliminator Codes (or privacy codes) you do not have a private conversation.

You must never use any profanity on the air as that not polite and is illegal.

You must terminate the use of a frequency if anyone on the frequency states that they are transmitting an emergency message. Listen to the message and respond if you can be of assistance.

In any emergency situation, never say the full name of a victim or disclose any private information about them. For example, if your CERT partner Jane Doe is injured in a search operation, your proper transmission back to the IC could be: “IC, IC, this is Search One – I have emergency traffic.” Once the IC responds, you could say “IC, this is Search One. We are at the corner of First and Main and I have an injured CERT member. She is a 27 year old female injured in a fall, she is conscious, but having difficulty breathing” or whatever your message needs to be. You do not and should not give out her name, or any more information about her than is absolutely necessary for the IC to respond appropriately.

Respect the privacy of all people that you come in contact with.

Try not to transmit land line or cell phone numbers over the air. Exchange these numbers with members of your group in advance.

Anything you transmit by FRS and GMRS radios can and will be heard by other people – sometimes lots of other people. Nothing you transmit is private, nor is it intended to be. Think about what you’re going to say before you say it, and remember, you’re talking to a crowd.

### **Use of GMRS Frequencies by Unlicensed Users in an Emergency**

It is never legal for an unlicensed individual to transmit using Amateur or GMRS radio frequencies. In an actual emergency, when there has been or there is the likelihood of harm to persons or property, you may use the GMRS frequencies even if you are not licensed for these frequencies, but you may be sanctioned and/or fined by the FCC for doing so. Make sure it is an immediate life or property threatening emergency before you grab any radio and start transmitting. You might be interrupting other important emergency communications.

It is never legal to use an unlicensed Amateur or GMRS station without a licensed control operator. If you purchase a GMRS radio and plan to use it ‘only in an emergency’, your transmissions, even in an emergency, will be violating Part 97 of the FCC Rules and Regulations. GMRS licenses are easy to get and you are strongly encourage you to do so.

From: [http://www.arrl.org/news/files/ARRL\\_AppropriateUseGuidelines.pdf](http://www.arrl.org/news/files/ARRL_AppropriateUseGuidelines.pdf)

“Perhaps, if an unlicensed person operates an Amateur station without a licensed control operator present during an actual emergency, he or she may not be sanctioned by the FCC after the emergency ends. However, whether or not the sanction is applied, unlicensed operation with no licensed control operator is never permitted by anyone at any time.”

From: [http://wireless.fcc.gov/services/index.htm?job=service\\_home&id=general\\_mobile](http://wireless.fcc.gov/services/index.htm?job=service_home&id=general_mobile)

“If you operate a radio under the rules that apply to GMRS, you must have a GMRS license.”