Radio Programming

Newer radios may be programmed from a personal computer. A special cable for that radio is generally required. The lists of frequencies will be whatever has been used in the past, but the lists can be customized with a little more work. Most people have purchased Icom radios. This makes it easier to share experiences with others, but there are many other brands and models available. As long as you recognize the limitations of any radio, it will work fine

For those who need to program their radio manually, there are a lot of functions available on most radios that just confuse users. Think of the following steps, and then use those that you need.

- Receive frequency
    - You listen to the receive frequency
- Offset frequency
    - The difference between the receive and transmit frequencies
    - UHF= 5.000 MHz, VHF= 0.600 MHz
- Offset direction
    - Plus, minus, or none (for simplex)
    - Icom radios: the DUP function cycles between (blank, DUP, -DUP), or (blank, +, -)
    - UHF is typically minus
    - VHF varies by agency
- Tone frequency
    - Select the tone frequency required for that repeater or application.
    - There is a relatively short list of 32 tones, including 94.8, 107.2, 110.9, 162.2.
- Tone squelch
    - Encode, Decode with alarm, Decode, none
    - Icom radios: the TSQL function cycles between (blank, T, TSQL(*), TSQL)

Tone Squelch

All radios hear everything on the frequency to which you are listening. The normal squelch control allows the user to squelch all signals that are too weak, like background noise. This is called AUDIO SQUELCH. We are sharing our frequencies more and more, so other users may be heard on our frequencies.

The tone system (called *PL* by Motorola, *Channel Guard* by General Electric, and *Quiet Channel* by RCA) was developed to provide another method for controlling what signals are heard on your radio speaker. Almost all radios today can transmit a selected tone, and can pass to the speaker only signals that include the same tone. We call this TONE SQUELCH, since all signals without the correct tone are not heard on your speaker. The tone itself is simply a single note of a specific frequency (from a list of recognized tones), that is transmitted while the radio transmits. The volume of the tone is set very quiet, so that users should not be able to hear the tone, but the radios can. So it is also called a "sub- audible" tone.

While many radios will be set up to transmit a tone, it does not have to squelch signals without the correct tone. That is usually the users choice. On Icom radios, the T indicates that a tone will be included with all transmissions. The TSQL indicates that both the tone will be included, and that signals heard without the correct tone will NOT be heard on the speaker. The terms ENCODE and DECODE are the same as T and TSQL. HAM repeaters usually use the tone system to reduce the amount of radio noise that is passed by the repeater. Users are required to set their radios up to transmit the appropriate tone when accessing a repeater. Many radios have difficulty filtering out other strong off- frequency signals, and the tone squelch can reduce the bursts of noise. If you use a repeater output frequency for simplex contacts, you should also transmit the repeater tone even on simplex, so that those radios that are using tone squelch will be able to hear you.

Radio Use Guidelines

Repeaters: how to make a call and be answered

Many of us Search and Rescue people are used to calling another radio and expecting an answer. That's fine for Rescue radios, which are used mostly during missions and trainings. That also works for Amateur frequencies during SAR missions. Most people don't nurse a radio all the time. Even if they DO have the radio on, it may be sitting somewhere else, or the area may be noisy for whatever reason. You need to be heard thru the competition. Here's a few tips.

- **Listen.** If you are going to use the repeater, transmit briefly then listen. Is the repeater listening, or is it off for some reason? Can you even hear it? Is the signal strong where you are (many radios indicate the signal strength on the display)? Did you hear a burst of noise when you stopped transmitting, which can happen when the repeater cannot hear your signal very well.
- **Wait.** When the repeater has not been used for over ten minutes, the morse identifier will be transmitted (If used). All of this waiting lets listener realize that the radio is making noise. They can wander back to the radio, turn down competing sources of noise, turn up the volume, and so on. Some people scan several frequencies, so it can take several seconds to get the radio stopped on the right channel.
- **Be deliberate**. Transmit for a second or two before you make your call. Then, speak strongly and clearly.
- **Call twice.** The first call may get their attention, but the call is not understood because they aren't ready to listen. If I am working, the volume is low, area is noisy or just "zoned out". I don't know who called whom, unless they make a second call.

Many people make a quick call, and are expecting an answer even before the identifier is finished. It's no surprise when they don't get a response.

Repeater usage and Simplex alternatives

Repeaters are used to extend the range of our radios. If you are talking over a relatively short distance, you may not need the repeater, and it is more appropriate to use a simplex frequency (transmit and receive on the same frequency) of your choice. The Cal-Esar repeater operates on the output of our main simplex frequency so if simplex doesn't work you can extend the range by switching to the repeater.

SAR Radio Traffic:

There is a difference between the use of radios when a SAR mission is or is not in progress. Casual chatter is fine when nothing is going on, but it keeps the frequency busy. During a mission, especially at the start of the call, there is a lot of traffic on a number of radios. Many people have just one radio, and they don't hear any other traffic, so they may be more inclined to speak up about the status of the call or about other people responding. This is fine if all the other users are also people with only one radio. The people in the various "official" vehicles have many more radios, most of them require monitoring, several of them require talking, all while they are driving. This can include the Sheriff's radio, MEDS, Fire, Parks, the Rescue frequency, and cell phone!! Another way of looking at the problem is to consider what most people are listening for, which is the status of the mission or additional details about the mission. Other radio traffic is expected to be minimized. If you are talking, you can't hear what's going on, and nobody else can talk. This is especially important when using the one frequency that is heard by the largest number of responding SAR people. The only relevant traffic that most people will have is that they are enroute to the call (not heading for the mission after stopping at the gas station and the store and so on).