

Los Altos Hills- Emergency Communications by Amateur Radio

Training Bulletin

REPEATERS

April 1, 2002

Typical HAM Emergency Frequencies

Command 1 146.760 – PL 151.4
Command 2 440.100 + PL 100.0
Command 1 ALT 145.450 – PL 100.0
Command 2 ALT 442.575 + PL 100.0
Milpitas test freq 144.135/S
Packet KE6AGJ-1 144.910 and 223.660

Repeater Operations – Program your radio

Hundred of repeaters surround the SF Bay area. For HAM operations, the most useful ones are on 144 (2meter) and 440MHz bands. Most require a control tone be programmed into your radio specific to the particular repeater. For a repeater to work, it must listen on one frequency and simultaneously transmit on a different one. The published frequency for the repeater is the one where you listen and it transmits. When you transmit, your output transmitter must be above or below – the so-called ‘offset’. For the SPECS repeater, this frequency is 600KHz below the 145.27MHz frequency, so you MUST set this offset into your radio. In most cases, you also must set the Private line tone (PL 100) into the radio to reach SPECS and cause it to transmit. This is called “programming your radio” and “opening the repeater.” When done correctly, the short phrase – “<your call> testing on SPECS” will result in a noisy burst of sound after you release the push-to-talk button – the “squelch tail” of the repeater. If you hear that, be assured that everyone in range of the repeater with their radio turned on will hear your call. SPECS is a ‘low level repeater,’ which means it is mounted on the flat land portion of the south Bay Area, on top of El Camino Hospital. It works even if all PG&E power is gone.

Repeaters repeat to each other, too!

A high level repeater, such as 442.575 on Black Mountain, overlooking the Town of Los Altos Hills, is even more impressive. This machine transmits on TWO output frequencies, one on 440 band and one on 220. You won’t hear the 220 as this is an inter-repeater link to 145.450 on Loma Prieta, the large mountain south of San Jose. What you say on the 440 repeater will be heard on 145.45 all over Northern California! Note that this 440 repeater has a positive + offset. Some people call repeaters – “the machine.” Offsets labeled – and + are standard offsets – your radio knows what these are. Some repeaters have non-standard offsets. On these, you need to dial in the specific frequency for the offset according to the repeater directory and your radio’s manual. The same thing is true for PL tones other than 100Hz. The repeater directory is a little book published by ARRL that you can obtain directly or at HRO. Repeaters are also listed on the Internet.

Access, ownership, and emergencies

Most repeaters are privately owned or owned by a club. If the repeaters are accessible to the ham community at large, the directory says this. However, if you are able to access a private repeater technically with your radio, then the magic word to use is EMERGENCY, if you have one. A simple phrase “Break for Emergency traffic” will usually get attention in a busy conversation.

Operating Niceties

If two remote radios try to access a repeater simultaneously, the result is random, but normally the radio with higher power is going to “win” and be more understandable at the repeater. Also, just clicking or “kerchunking” your push-to-talk button won’t test most repeaters. Most are programmed to ignore such brief radio bursts; this is true for SPECS. Be very careful not to start speaking before you have the push-to-talk button down. There is a slight delay through all the machinery and your first word may be missing at the other end. A fraction of a second is all that is required. In emergency and noisy situations, it is common practice to talk too fast, hold the mic against your lips, and shout. All of these are bad practices that result in over-modulated, non-readable transmissions. Be aware of this; avoid it.

Not-so-nice operations

If another radio in your room or vehicle is tuned to the repeater output and you use your radio to transmit to the repeater, the entire system is likely to go into a squealing audio feedback mode similar to an open mic in an auditorium pointed at a speaker. The only difference is that with a repeater, much more expensive equipment is being used and a huge geographic area is involved. Even audio at a very low level will feed back. The cure is to shut off all audio on the repeater from other radios nearby when you transmit. It is good practice to use a headphone set to cut out surrounding noise that distracts you, but this alone will not break the audio feedback path if another radio is nearby. You may hear metallic or ringing transmissions in less severe situations. Some operators are not aware they are creating this problem. Sometimes people can leave their radio in a “stuck mic” configuration. Most repeaters are set to drop such a connection within a few minutes. On SPECS, the setting is one minute and sometimes 30 seconds. This is not a place for long-winded transmissions! If you have a concern about this, write down what you are going to say, read it slowly to whoever is trying to copy it. Let off your mic frequently to listen for breaking traffic or to have your recipient – often net control – tell you OK, they got it.