

Essential Info About Repeaters From The ARRL Repeater Directory 2013 & 2014

For those of you who haven't yet won your ARRL Repeater Directory at a PPRAA meeting, I thought I'd extract a few of the most essential nuggets of information here. Even if you have your directory, I hope you find this useful as a convenient reminder.

By the way, PPRAA meetings are great places to win a wide range of nifty, err, cool prizes, from components and tools to reference material. They meet 6 – 7 pm on the second Wednesday of each month at the IHOP at 5749 Setson Hill Blvd. Check them out at PPRAA.org.

Here are three key points from Chapter One, General Information, about repeater operations:

- To initiate a contact, simply indicate that you are on frequency. “This is KDØSMP monitoring” will suffice. Please don't “ker-chunk” (key up without identifying yourself) the repeater “just to see if it's working.” That's neither nifty nor cool.
- Repeaters are intended primarily to facilitate mobile operation. If you just want to rag chew, that's **not** what repeaters are for. You might make your contact on a repeater, that's fine, but then move to a simplex sub-band for your rag chew.
- Autopatch facilities should never be used to avoid a toll call or where regular telephone service is available.

Re repeater-to-repeater interference: In an effort to resolve repeater-to-repeater interference complaints, the FCC is emphasizing repeaters be coordinated. The station engaged in non-coordinated operation has primary responsibility to resolve the interference.

Where can you find the band plans that form the basis of this frequency coordination? Good question! You'll find them at [Colorado Council of Amateur Radio Clubs](#) (CCARC). It is definitely worth a look, especially how they have channelized the repeater sub-bands and where they have put simplex and data ops. Refer to their [Frequency Use Plans](#) so you don't try to operate on top of anyone else, and to keep from being so stomped on. Expect to spend a little time with these plans, enough to allow your eyes to uncross and adapt, it will definitely be worth your effort.

What, you say! You thought FCC rules set aside portions of bands for specific modes and that's that? Well, as the ARRL Repeater Directory puts it, there is still a need to further organize our space among user groups by 'gentlemen's agreements.' These agreements in Colorado **are** those band plans maintained by CCARC and they emerge by consensus of the band occupants. Band occupants, that's you if you operate in the VHF-UHF bands.

You might be surprised to learn that States use differing channel spacing on the 2 meter 146-148 MHz VHF band. Colorado is on the western edge of the half of the U.S. that, with few exceptions, spaces channels 15 KHz apart. Montana, Idaho, Utah, Arizona, New Mexico, Texas and states west space channels 20 KHz apart. That is why repeater spacings west of here might seem a bit strange to you.

It is perhaps instructive to review the information ARRL lists for repeaters in its Directory. Let's look at two **GGARC**-sponsored **open** (anyone can use it) repeaters in Colorado Springs (**control**) operated by KØIRP at transmitter **output** frequencies of 146.9100 MHz and 447.35 MHz. These receivers are tuned

to the standard **offsets** (0.600 MHz = 600 KHz for VHF and 5 MHz for UHF) **down** from their corresponding transmitters. They have emergency power backup, which is good to know in, well, an emergency. Here are these listings formatted as in the ARRL Directory (my comments last row, *italicized*):

Location	Output	Input	Notes	Call	Sponsor
Colorado Springs	146.9100	-	o 151.4/ 151.4e	KØIRP	GGARC
Colorado Springs	447.3500	-	o 151.4/ 151.4e	KØIRP	GGARC
	<i>repeater's transmitter output</i>	<i>negative offset</i>	<i>open repeater repeater's receiver looks for 151.4 Hz / repeater transmits 151.4 Hz e for has emergency power</i>		

Critical for using these repeaters, though, is to know they use a CTCSS (PL)TM code squelch control tone of 151.4 Hz to block interference. CTCSS is particularly effective against interference from adjacent channels, which motivates its use in urban environments (cities). In order for the **receivers** to pass your transmissions on to their transmitters, you need to configure your radio to **transmit** the 151.4 Hz **CTCSS** tone, which in the vernacular is to **tx 151.4 Hz pl**.

Tone standardization isn't perfect. While the Electronic Industries Association (EIA) lists 39 tones, Motorola equipment augments these with three others. Also, newer amateur transceivers support eight tones additional to the basic EIA set of 39. Check equipment specs to be sure your radio supports the CTCSS tones used by the repeaters you want to access.

Note that the **Notes** column lists that CTCSS tone twice. That's not a typo. It means these repeaters also **tx 151.4 Hz pl**. Dave KØIRP configures his repeaters to both rx and tx pl so that commercial transceivers can rx pl for squelch control.

Dave does not recommend amateur radio gear rx pl, simply because the CTCSS circuitry in most mobile amateur radios is not quite fast enough to avoid clipping the beginning of received signals. It's your option, though. Play safe by setting no CTCSS tone for your receiver, i.e., **rx carrier** if you like. Or be adventurous by setting a CTCSS tone of 151.4 Hz for your receiver and see how fast your radio's squelch circuits fly ... or not so much.

Interesting factoid: these two repeaters were the first in Colorado Springs to both rx and tx pl at all times.

Well, that's two pages, about enough for one installment. Set your squelch for another installment soon.

By Dan Martin KDØSMP

With thanks to Dave Givan KØIRP for consultations. However, I lay claim to all mistakes and misunderstandings.