Repeater Etiquette

On-Air Training
Idaho Falls Bishops' Storehouse
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Good evening to the Net. We live in a wonderful area surrounded by so many good people. We are fortunate to have been so richly blessed. I am grateful for the opportunities that permit me to rub shoulders and interact with each of you. You men and women listening to this transmission are the heart of the ERC program. Thank you for all that you do.

Situation Awareness

Winter weather is upon us. Roads are becoming more treacherous and weather- and power-related events are becoming more imminent. We encourage you to monitor local frequencies such as this repeater, your regional simplex frequency, and the national two meter calling frequency, 146.520 MHz, --to name just a few -- for emergency and priority traffic. If there is an event of any significance storehouse operators will be on this frequency handling traffic.

Part I

Repeater Etiquette

Tonight we're going to discuss Repeater Etiquette. I have a lot of information here and I anticipate some participation from you also. I'm going to break this up into two parts and we'll cover the rest of this next week.

In my research I found countless disclaimers like, "The following information is a simple guide to courteous operation on our repeaters and is not intended to be a 'rule book'." In fact, what I found is that there are about as many guidelines as there are repeaters.

Most of what we mention tonight will apply to any on-air experience, whether it be on a repeater or simplex, whether it be 2 meters or HF.

I will pause periodically to give you an opportunity to submit a comment on the topic at hand. If you would like to comment, give your call sign and then wait to be acknowledged before commenting.

What is a Repeater?

Let's start with some basics. What is a repeater? Repeaters usually enjoy the advantage of height and power to extend the range of your transmission. A repeater is a system that receives on one frequency and simultaneously retransmits that information on another frequency. The separation between these two frequencies is referred to as the offset.

In order to listen and transmit at the same time, repeaters use two different frequencies. On the 2-meter ham band these frequencies are 600 kilohertz apart. As a general rule, if the output frequency

(transmit) of the repeater is below 147 MHz then the input frequency (listening) is 600 kilohertz lower. This is referred to as a minus or negative (-) offset. If the output is above 147 MHz then the input is 600 kilohertz above. This is referred to as a positive or plus, (+) offset.

Virtually all radios sold today set the offset once you have chosen the plus or minus. In fact, some radios even set the plus and minus for you based on the band plan. As an example the Menan Butte repeater -- this repeater's output is 146.880 MHz. The input or the frequency it listens on is 146.280 MHz (600 Kilohertz below). If you have your radio tuned to 146.880 MHz and have entered the minus offset, when you push the push to talk (PTT) switch, it automatically transmits on 146.280 MHz. When you release the PTT to listen, the radio reverts back to 146.880 MHz to listen on the repeater's output frequency.

I think all of the repeaters in this area follow the standard offset. Keep in mind that there are exceptions to the rule so check local repeater listings when traveling.

Some of you might be thinking that this offset business is just a big hassle – plusses and minuses, inputs and outputs, 600 kHz separations – what's the point? Most repeater installations use the same antenna for transmit and receive. Without having an offset of 600 kHz the repeater would simply hear itself when it was transmitting on the same frequency it was listening on. Even with the offset, the two frequencies are close enough that some isolation is required. Isolation is achieved by placing a device referred to as a duplexer, cavities, or cans into the coax lines. This is designed to pass a very narrow range of frequencies and reject others. The input duplexers are adjusted to pass only the input frequency and reject or "notch" others out. The output duplexers are adjusted to pass only the output frequency.

While we're talking about all the technical stuff, and as if that weren't enough, let's mention tones. Most repeaters utilize a Continuous Tone Coded Squelch System (CTCCS). Motorola calls them Private Lines (PL). We commonly just refer to them as tones.

Tones prevent the repeater from being activated by extraneous signals and transmissions on nearby frequencies. When the repeater senses the proper sub-audible tone, it opens the squelch and retransmits the received signal. Tones are not automatically configured in your radio like offsets and offset directions. You have to program your radio to use the appropriate tone.

This is one of the most common issues we see with the use of the repeater—that operators, both new and seasoned, do not have the proper tone set in their radio. The easiest thing to do is to put your radio in VFO mode. Set the frequency and offset direction. Set the proper tone. Then save all these settings into a memory channel. Steve help us recently configure our radios so I won't go into more details now. If you need help programming your radio, contact your regional coordinator to get hooked up with a knowledgeable resource.

Are there any questions or comments about repeater architecture?

Listen

The first thing you all heard when you first took up amateur radio was "listen listen listen". The same holds true for repeater operation. Since there are so many different standards, it is important to get a

lay of the land before barging in blind, especially if you are new in an area. It may help to talk with a local ham to find out what some of the unwritten rules and practices are.

If and when you want to make your presence known to those monitoring this repeater, key your mic, state your call sign and say, “on the 88.” “N7TMS on the 88.” Many of us have radios set to scan multiple frequencies. If you only state your call sign, I’m not going to be able to determine what frequency you’re on. It isn’t necessary, but it is nice to know where you are. “On the 88” or “on the 88 machine” or “on the 88 repeater” or “on the Menan Butte repeater” or “N7TMS listening on the 88” or “N7TMS monitoring the 88” is sufficient to make your presence known, what frequency you’re on, and that you are available for a conversation.

Do not call CQ on a repeater. Simply stating your call sign is generally sufficient.

Courtesy is king

I don’t hear it happening much in this area, but monopolizing the repeater is frowned upon. If you find yourself in a long conversation with another ham, consider moving to a simplex frequency, if it’s practical to do so. Paul KG7DWT lives about five miles from me. If we find ourselves in a lengthy rag chew, it would be easy for us to change to a simplex frequency and carry on our conversation. However, from my home it would be next to impossible to make a simplex contact with Steve KC7IHV in Ammon. But, maybe that conversation could also be made over the telephone.

Try to avoid coughing, sneezing or clearing your throat while transmitting. Un-key your mic first.

Kerchunking

Many of us use the repeater to test our equipment. That is perfectly fine. In fact, it is even encouraged. There is very often a willing ham waiting to give you a signal report. However, I frequently hear operators keying and then unkeying their mic just to see if they can hit the repeater. This is called kerchunking. This is another practice that is highly frowned upon.

If you need to check your setup, key your mic and, at the very least, state your call sign or give your call sign followed by “testing”. Someone may or may not respond to you. If you would like someone to let you know how well you’re getting out, then ask by saying something like “This is N7TMS. Can someone give me a signal report?” or you could just say, “N7TMS, radio check.”

Similar to other conversations

In most other respects, talking on a repeater is similar to any other amateur radio conversation. You are still bound by identification rules, encouraged to pause between transmissions, and …….

Do not use phrases you’ve learned or heard on 11 meters such as "handle", "making the trip", "got a good copy on me?", "the personal here is...", "what's your 20?", and other strange phrases which should stay on CB. Speak plain English. We’ve all put a lot of effort in to earning an amateur radio call sign. Wear it with pride.

Identification

When using a repeater, hams are still required to identify themselves every 10 minutes and at the end of their conversation. Repeaters are also bound by that rule. This repeater, 146.88 on the Menan Butte has Keland Draney's call sign assigned to it. If you key the repeater after it has not been used for a period of time, it will identify itself with voice. "The time is 9:20, good evening. KM7G." While in use, it will identify itself every ten minutes with Morse code. These periodic repeater identifications are a great reminder to you to identify yourself also. Some operators might say at the beginning of a transmission, "This is N7TMS for ID" and then go on with the conversation. You could also just state your call sign prior to unkeying the mic. N7TMS.

Are there any comments or questions about identification?

That concludes tonight's training. Next week we will continue our discussion of repeater etiquette. We'll talk about pauses, breaking into existing conversations, signal reports and round tables. Until next week, 73.

This is N7TMS. Back to net control.

Part II

Signal Reports

Most of you are familiar with the RST standard of signal reports. Readability, Strength and Tone. Readability is on a scale of 1 to 5, 5 being the best. Strength and Tone are both on a 1 to 9 scale, 9 being the best. The tone is used for Morse code and digital work. In voice communications, we only use the Readability and strength, the R and S. A strong clear signal would get a report of 5-9. We always say the digits individual. So, 5-9, not fifty-nine.

On the HF bands, you'll typically hear something like this: "Your signal report is five nine in south Florida." If the other station can copy you really well, you will usually get a "Five" for Readability. The Signal Strength usually reflects what the operator is seeing on the S-Meter of his receiver. Of course, with both CW and SSB, the S-Meter will be bouncing around a bit, so some interpretation is required. More importantly, there is considerable variation in S-Meter calibration, so signal reports can vary from radio to radio. A 55 or 57 report indicates that the signal is very readable but the signal strength is not as strong as a 59 signal.

Most S Meters show an extended scale above S9 that is listed in terms of decibels. The scale may be marked with +10 dB, +20 dB, etc. indicating that the signal strength is that much stronger than S9. You'll hear radio amateurs say something like "you are 5 9 plus 20 dB." Or they may just say "you are 20 dB over."

You will also hear the classic Five Nine signal report on FM, which is basically saying "excellent signal." While S Meters are often inconsistent on CW/SSB transceivers, they are almost universally poor on FM rigs like 2-meter mobiles and handhelds. Most FM radios just give you an unlabeled bar graph that is only a relative indicator of signal strength. Usually, these are not labeled in terms of S units, so don't try to interpret them as such. If all of the bars are lit up on your meter, then you might give a report of "your signal is full scale."

On VHF FM, signal reports are often given in terms of FM quieting. A strong FM signal is said to "quiet the receiver" since there is virtually no noise present in the received audio. As the signal strength is decreased, noise starts to appear on the received signal. At some signal level, the noise increases dramatically and the signal becomes unreadable. This dramatic increase is called the threshold effect, meaning that FM signals do not gradually fade out, they suddenly crash into the noise. The key idea here is that you want your signal to be strong enough to be above this noise threshold. In terms of a signal report, a strong signal may result in a "full quieting" report. If the signal is less than full quieting, you may hear a report like "90 percent quieting" or "you have about 10% noise", which both describe the amount of noise present in the signal. If the signal is really noisy, the report might be "50% quieting."

For FM repeater operation, keep in mind that the signal you are receiving is coming from the repeater and not from the other station. So if the other radio ham is fiddling around with his antenna and asking for signal reports, the repeater signal strength is going to remain the same. You may notice that the other station's signal into the repeater gets more or less noisy, so giving a report on how well he is

hitting the repeater is helpful. “Joe, you are full quieting into the repeater.” This is another reason why FM signal reports tend to be in terms of receiver quieting.[1]

Are there any questions or comments about repeater signal reports?

Pauses

Pause between transmissions to allow other operators to break in. In our training a few weeks ago, we talked about these pauses. Leaving some space between transmissions is probably most important on a repeater. More people are monitoring here and it is more likely that someone would need to break into an ongoing conversation. After the other operator stops transmitting, take a breath or two, and then key up and say what you need to say.

While we’re talking about pauses, let me say a word about linked repeater systems. There are repeaters in this area that are part of the Intermountain Intertie—a series of repeaters that are linked together. When you transmit into one of them, an automatic link is established from repeater to repeater and your signal is transmitted on the output frequency of each repeater. The Intermountain Intertie consists of about 18 repeaters covering much of southern Idaho and south roughly following the I-15 corridor. For example, when you transmit on the Jumpoff Peak repeater near Howe, you are talking to 1000’s of Hams between here and Las Vegas.

So a couple of words to the wise when using the Intertie:
First of all, be extra mindful of what you say. More people are listening than just your neighbors.
Secondly, be extra mindful of carrying on long conversations. You’re not just tying up one repeater…you’re tying up ALL of them.
And lastly, in addition to the pause before you transmit, it is also extremely helpful to pause AFTER you key the mic, but BEFORE you begin speaking. I was listening to a net a few months ago. An operator was attempting to check in. I don’t recall his call sign, but he would key the mic and the only thing we were hearing was the suffix of his call sign. It literally takes 1 to 2 seconds for the link to be established between the repeaters from one end to the other. So, when using the Intertie, or any other linked system for that matter, remember to pause…key the mic….pause…and then begin speaking.

Are there any questions or comments about pausing?

Use of the term “Break”

Let’s talk about a couple of ways you can participate in an ongoing conversation.

Here’s the scenario: Jared KG7ORN and Steve KB7ITU are in the middle of a conversation on the 146.94 repeater, talking about installing a radio in a fellow ham’s pickup. You want to talk to Steve.

Before interrupting, ask yourself, “Does what I have to say have ANY thing to do with the on-going conversation?” Or ask, “Is my traffic a higher priority than the existing traffic?” If so, then your interruption is welcome. If, however, your purpose for interrupting is to have a separate conversation with one of the operators you hear (Steve, in this example) or someone else entirely, then you should wait until their conversation has ended. Then call that Steve directly.

[1] http://www.hamradioschool.com/practical-signal-reports/

Of course there are exceptions to every guideline, right? Maybe you do need to talk with some other operator. If it is urgent, you may break in and ask if it would be okay to make a quick contact with another operator. Most hams will oblige. Keep your contact short, maybe evening changing frequency once the contact is established so that you can return the repeater back to the original operators.

When you break into an ongoing conversation, wait for the pause. Repeaters will generally send a courtesy tone when operators un-key. Most repeaters in this area send a single tone. Others send a series of tones or even the letter K in Morse code. In the CW world, a K (dah-di-dah) is a signal to the other operator in the conversation that it is his or her turn to transmit.

Wait for the courtesy tone, and then key your mic and say “break” followed by your call sign. For example, “Break, N7TMS”. You may also just give your call sign, “N7TMS”. In some areas, the word “Break” is reserved for emergency traffic. In this area, we do not strictly adhere to that guideline, so it is acceptable for normal use. When in doubt, just give your call sign.

If you do have emergency traffic, then you should key your mic at the pause and say “Break. N7TMS with emergency traffic” or at the very least give your call sign followed by the word emergency, like “N7TMS, emergency” [Pause for a couple seconds.] This is an exercise.

Are there any questions or comments about the use of the term Break?

Acknowledge breaks

If someone breaks, especially if they break with the word “emergency”, acknowledge them immediately. Like we discussed a few weeks ago, Whether or not it is an emergency, they have a purpose for interrupting. Perhaps there is they have some relevant information to contribute to the conversation or maybe they have some traffic to pass to another operator.

The breaking station should have given their call sign, as we just described. If so, you can acknowledge them by saying, “Go ahead N7TMS”. If they did not give their call sign, just say something like, “Go ahead Break”.

Round tables

When there are only two operators in an on-air conversation, it’s easy to keep track of who’s turn it is to speak. When you hear the repeater’s courtesy tone at the end of a transmission, it’s your turn.

But now you have three people in the conversation. When someone un-keys, whose turn is it? In situations like this things can get a little confusing, out of hand, and even chaotic unless there is some order to the madness. When Terry N7HBA ends his transmission, who speaks next? Maybe two or three people key up at the same time and double. Or maybe everyone expects someone else to talk and no one ends up talking leaving a large dead space.

Round tables are similar to ad hoc, informal nets. An example is the two meter side-band nets that are running a couple nights a week and the discussion that follows the ARES/RACES net on Thursdays. Sometimes, an operator will step up and help give everyone a turn to transmit. I have found that it is helpful to jot down on paper a list of operators that are participating. That way, at the end of my transmission, I can pass the ball intelligently to another operator. For example, “blah blah blah. K7DSM, it’s your turn. This is N7TMS” is a clear signal to all involved, especially Dave K7DSM, that it’s his turn to

transmit next. This eliminates any confusion and minimizes the doubles. If Dave doesn't have anything to contribute then he can use a similar method to just pass it on to another operator at the round table.

If Dave doesn't respond, then N7TMS can come back on and pass it to another operator.

Are there any questions or comments about round tables?

Are there any questions or comments about repeater etiquette in general?

That concludes tonight's training. Thank you for your comments. I look forward to hearing all of you courteous voices on the air. This is N7TMS, back to net control.

Appendix: Additional Information

Standard Repeater Input/Output Offsets

Band	Offset
6 meters	1 MHz
2 meters	600 kHz
1.25 meters	1.6 MHz
70 cm	5 MHz
33 cm	12 MHz
23 cm	20 MHz

(Note that input/output offsets are voluntary among local and regional "Frequency Coordination Groups". They are not fixed in stone by the FCC! They are "recommended" offsets for a particular area. Your area may be different. Check with your local repeater operators.