

2022-04-04 Hamlet Net - FM Simplex Operating

Announcements:

- This weekend, RMHAM is presenting their last RMHAM University class for 2023, the topic of which is troubleshooting.

Examples given are what if you can't communicate through a repeater? What if you cannot connect via Winlink? In addition to these specific cases, the presentation will cover systematic troubleshooting that can be used for many different situations.

More information about the presentation can be found on their web site at <https://www.rmham.org/> - Click on the "Past Course Syllabus" link under the "RMHAM University" menu item.

- LARCFest was last week. If you attended, Bob Smith is looking for your comments about the event - what went well, what could be improved, etc. Also, if you chose not to go to the event for some reason that we could possibly address, please let him know as well. His email is n0zfv@yahoo.com - or mention your comments on the net tonight, and we'll pass them on to him.
- Don Lee has put his presentation from LARCFest on "Getting Started with CW" on the LARC web site at w0eno.org, so if you're considering learning CW, check it out!!
- **April 22nd will be an antenna build and test session at the Clover Building for HF antennas that LARC will use for Field day. These will be wire antennas, so stop by to see how to make and test your own antennas, as well as to help out the club! 22nd is a VE Session - so still working on this.**
- Looking for volunteers in next few weeks for putting together FEMA forms for our events. Will be looking for people to help set that up.
- Chuck is also planning another antenna building activity - this time, you will be building your own 2 meter Yagi tape measure antennas. There will be a cost for this activity, but it's only \$10 - the club will provide all the materials, tools, and test equipment, and you will go home with a working and tuned antenna that you built yourself!

This antenna will come in handy for the next Fox Hunt that the club is putting on in May, as only DIY and homemade antennas will be allowed!

- Field Day is coming up in June, and the club is starting to work on planning for this event. The ARRL has released the 2023 Field Day logo and rules on their web site at arrl.org/field-day

- General meeting on 3rd Wednesday of the month - April 18th. We have Mark WC3W to talk about the CQDX Marathon program. Will be in person at the Clover Building and also via Zoom. The activity will open at 6:30 for socialization, with the meeting starting at 7pm.
- You can start earning your 2023 membership or future renewal by acting as NCS for at least 5 nets this year. You can run either this Tuesday night net or the Thursday night net (or both). We have scripts available for both, so all you need is a good connection into the repeater, and somewhere to keep track of names and call signs as people check in. If you're going to be on the net anyway, why not save some dough at the same time! There are four free memberships available for 2023, so don't wait to get started!
- Chuck has set a goal for the Club of running at least one activity a month. This can be a hands-on construction activity, an operating activity like Field Day, a fox hunt, or a special event station. The goal is to get people together to have fun with amateur radio! We have multiple locations at our disposal, as well as lots of Club equipment, so if you have an idea for something you think others hams would like to do, please let us know, and if you're willing to run it, even better!
- The Club is also looking for presentation topics for 2023. If you have any ideas, or better yet, would like to present, please let Chuck know and we'll get you on the schedule!
- All club activities are open to anyone - members and non-members. ~~If you have questions, ask them on a net or~~ send email to elmer@w0eno.org

Presenter: Bryan, AF0W

Topic: Simplex on FM

- Right now, we are communicating via a repeater in what is called duplex mode
 - This is because we are transmitting on one frequency and listening on another
 - The difference between the repeater's receive frequency and its transmit frequency is called the offset
- While probably the most often-used, it is not the only way to use your radio
- The other method is called simplex
 - This is where you transmit and receive on same the frequency, radio-to-radio
 - FRS radios work in this fashion
 - GMRS is also frequently simplex, but also support operating duplex through repeaters

- Simplex is also widely used on HF, but generally not with FM!
- Easier to program into your radio as there are no offsets, and typically no CTCSS or DCS tones
 - You can of course use tones, but if you do, you need to check the frequency before transmitting to make sure there is no one using it without tones
 - And remember, these tones do not impart any actual privacy onto your transmissions - anyone listening with no tone squelch enabled will hear your transmission
- When would you use this?
 - No repeaters in range
 - Don't know information on local repeaters (i.e. traveling)
 - Close enough to talk radio-to-radio
 - One reason for this that is frequently mentioned is to free up the repeater for users who are not in close proximity, but if you've listened to any amateur repeaters lately, you'll realize that this is not really a problem
 - In fact, conducting your conversation on a repeater allows other operators who are listening to join in or at least be informed about the topic you are discussing
- Follow national and local frequency use plans
 - Colorado's is put out by the CCARC (Colorado Council of Amateur Radio Clubs) - <https://www.ccarc.net/> -> Use Plans and Hotspots - Frequency Use Plans "FM Voice Simplex Frequencies"
 - There are 26 2 meter FM simplex frequencies , and 48 70 cm FM simplex frequencies you can choose from
 - Can also access existing repeater coordination information under Existing Coordinations -> Colorado Public Repeater Info

Calling Frequencies

- The simplex frequencies in the use plans include a calling frequency for each band
- Explain calling frequencies

- The idea is that you establish contact on a calling frequency and then move to another frequency for the actual conversation, thus freeing up the calling channel
- Original purpose was for when radios had a limited number of fixed crystal-controlled frequencies
 - Would establish contact on calling channel, then figure out another frequency that you both had in common and move to it
- Frequently used by traveling hams to try to make contacts as they go through an area
 - I've seen a few cars with white round oval stickers with 146.52 in them - presumably indicating that the driver is monitoring that frequency
- While they are likely the most-often monitored simplex frequencies for each band, this does not mean that there is anyone listening at any particular time
- If you have your radio scanning through repeaters, you may find it beneficial to include them in your scanning list
- Typically don't call CQ, but is good to include your frequency as others will likely be scanning many frequencies - something like "This is AF0W - alpha-foxtrot-zero-whiskey looking for a contact on 52" - if you just gave a quick "af0w", it's likely you would not be heard
- **Does anyone know what the 2 meter and 70 cm calling frequencies are?** (146.520 and 446.000)
- To see if you are within simplex range when communicating via a repeater, you can each individually enable "reverse mode" on your radio while the other user is transmitting
 - This swaps your receive and transmit frequencies so that you are listening to the other operator directly (by listening to the repeater input frequency), and transmitting on the repeater's output frequency
 - If you can hear them, and they can hear you, then you are within simplex communication range
 - Be sure to switch your radio back out of reverse mode when done testing!
 - If you don't you'll get really frustrated when you can only hear some people on the repeater (those who are within your simplex range)!

- To toggle reverse mode on Baofeng radios, press the *SCAN key quickly - an "R" will appear at the top of the display - press it again to switch back to normal operation (the "R" will go away)
- On a Yaesu FT-60R, press the HM/RV key - you will see a flashing dash on the display to indicate the radio is in reverse mode. Press it again to return to normal mode.
- Note that if you have your radio set for low power mode to use a repeater, you may have to switch to a higher power mode to work a station via simplex
- Another time you use simplex on FM is when using digital protocols
 - Examples include Winlink, packet radio, APRS, SSTV
 - You also use it if you have a simplex hotspot that you are using with a digital voice protocol such as D-STAR and DMR
 - Operating a hotspot simplex does have one big issue - since only a single transmission can occur at a time on the hotspot frequency, if you are connected to a busy Brandmeister group, the transmissions from the hotspot may not stop long enough for you to get in and control your hotspot
 - This is where a duplex hotspot comes in handy - you can transmit to your hotspot at the same time it is transmitting to you, which would be able to to change to a different talkgroup, for example
 - If you are setting up a hotspot, note that the CCARC web site also includes guidelines for selecting an appropriate frequency to use
- There is also such a thing as a simplex repeater
 - While a normal repeater simultaneously retransmits received signals, a simplex repeater first records incoming transmissions, and then when the incoming signal drops, replays the recording on the same frequency
 - Using a simplex repeater also means that the frequency is actually occupied for twice the duration of any transmission
 - It can also be annoying to other operators who can hear the transmitting station directly, as they will hear them make the initial transmission as well as the repeater replaying

- One thing to note is that this mode of operation does only require a single radio (as opposed to duplex repeaters which have both a receiving and a transmitting radio)

Appalachian Trail Golden Packet

- One interesting application of simplex FM is the annual Appalachian Trail Golden Packet event on the third Saturday of July
- Created by Bob Bruninga, inventor of APRS in 2009
- During this operating event, participants attempt to pass a APRS message packet via multiple stations spread out on 15 mountaintops along the Appalachian trail - a distance of over 2200 miles without the use of any infrastructure
- The first successful transmission through all stations occurred in 2014, and was repeated in 2016 at 9600 baud
- Phase 1 of the event uses Kenwood packet-capable radios (such as the TM-D710G in the LARC GoBox) configured as digipeaters (or digital repeaters) - even though the name implies duplex operation as with a voice repeater, digipeaters actually operate in a store-and-forward simplex mode
- Phase 2 allows owners of non-Kenwood radios to participate using a purpose-built setup based on the Direwolf software running on a Raspberry Pi Zero W with a specific audio interface.
 - The group found that the Direwolf stations actually performed better than the Kenwoods!
 - I've read on the internet that people have had better luck with Direwolf than dedicated hardware TNCs

Summary

- As you can see, there is much more that you can do on your dual-band radio other than just talking on repeaters
- In the past, LARC ran an exercise where each participant individually transmitted on FM simplex and other stations kept track of whether or not they could hear the transmitter.
- This information could be useful if there is an event that takes out repeaters in the area
- If you are bored with the repeater action in this area, you might want to give simplex FM operating a try!

Questions:

- **The question for the week is:** Have you ever operated simplex (i.e. not through a repeater) on 2 meters or 70 centimeters with your radio?
- **In my case,** I've used APRS for sending position reports and messages, made Winlink connections using 2 meters, and also tried making a Winlink digital contact point-to-point with Chuck in Firestone, but we were unsuccessful. I've also participated in a foxhunt which was conducted on a simplex frequency

More Info:

- CCARC Frequency Use Plans; <https://www.ccarc.net/wordpress/frequency-use-plans/>
- Calling Frequencies: <https://www.qsl.net/n7fan/comm/amateur/calling.htm>

Notes:

- If you have ideas for net topics or general meeting topics / presenters, please let us know! Tell us on a net, or send email to k0itp@w0eno.org

Email to elmer@w0eno.org

1. K0ITP - Chuck - Firestone
2. KC0CT - Joe - Broomfield
3. KN6CFI - John - Longmont
4. KV0N - Raman - Lafayette
5. W0PPC - Steve - Lyons
6. AE0DO - John - North of Longmont
7. K0JWD - Jim - Mobile S of Longmont
8. AF0W - Bryan - El Paso via Echolink

Simplex - POTA/SOTA and contests