

West Kootenay Amateur Radio Club

West Kootenay Amateur Radio New User Guide

WKARC new user Guide

**Document Identification Number
WK_NewUser_Guide_101**

2022-08-18

WEST KOOTENAY AMATEUR RADIO CLUB
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Revision History

Revision	Date	Author	Comments
0.24	2022-Aug-18	L. Wilson (VE7IHL)	Changed 146.640- repeater to use CTCSS tone of 88.5 Hz
0.23	2022-Jun-15	L. Wilson (VE7IHL)	Changed 147.060 repeater to a positive offset.
0.22	2021-Oct-13	L. Wilson (VE7IHL)	Updated repeater list for Golden, Invermere, and Fairmont Hot Springs. Added additional repeaters to the list.
0.21	2021-Oct-02	L. Wilson (VE7IHL)	Fix some typos and some grammar. Added some clarifications
0.20	2021-Oct-01	L. Wilson (VE7IHL)	Updated with more info and Lavina info.
0.14	2020-Jan-02	L. Wilson (VE7IHL)	Updated local coverage areas to include Salmo/Ymir
0.13	2019-Dec-31	L. Wilson (VE7IHL)	Added SCAIA VHF frequency 146.740-
0.12	2019-Nov-20	L. Wilson (VE7IHL)	Added section on APRS, Do's & Don'ts, and Recommend usage points.
0.11	2019-Nov-18	L. Wilson (VE7IHL)	Changes after initial review. Added section on digital modes.
0.10	2019-Nov-17	L. Wilson (VE7IHL)	First Draft

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1. INTRODUCTION

This document is intended to help a newly licensed amateur radio operator in the West Kootenay area (Nelson, Castlegar, Kaslo, Trail, etc.) get started. After passing your licensing exam, you may be wondering *What do I do next?* This document will tell you what repeaters to use and any local “protocol” necessary to operate them. It will also discuss when to use **Simplex** communications, and when to use the **Repeaters**.

1.1 What you **CAN** and **CANNOT** Do with Amateur radio

Amateur radio can be used for personal use, for experimentation, and for emergency use. You are **NOT** allowed to use the amateur radio bands for **any kind of Business use!**

Ensure that you always use the amateur radio frequencies in a professional manner. Never use profanity or attempt any kind of interference with another amateur operator. Always strive to be helpful in all cases.

1.2 Coverage Area

The coverage area that this document assumes that the user is intending to operate from the following areas:

- Kaslo
- Balfour / Proctor
- Salmo / Ymir
- Nelson
- Castlegar
- Trail
- New Denver / Slocan
- Riondel
- Most of Kootenay lake
- Duncan Lake
- Christina Lake

2. EQUIPMENT

What type of equipment should you be purchasing?

If you have an amateur radio operator certificate, your license will only allow you to operate in the designated amateur radio bands. This means you should be purchasing radios that are type accepted and meant to be used in the amateur bands only. These types of radios will (usually) also **receive** in other areas and bands too. Modifying amateur band radios to transmit outside of the amateur bands is not legal. (They are not type accepted for use outside of their designated ham bands).

For most of the newly licensed amateurs the main area of interest will be in the 2 meter (144 – 148 MHz) and possibly the 70 centimeter band (430 – 450 MHz). Equipment for operation in HF amateur bands is not covered in this document.

2.1 Where to buy Ham Radio Equipment

The Radio World store in Calgary, or Toronto is a good choice to use for your ham radio equipment purchases. The Calgary store would normally be your best choice, as shipping into BC would be less than shipping from Toronto. Their prices are reasonable, and their staff is knowledgeable. Online sales or phone purchases can be easily made. Use the links below for online purchases.

GPS Central – Calgary link: <https://www.gpscentral.ca/amateur-radio.html>

Radioworld – Toronto link: <https://www.radioworld.ca/amateur-radio/z-ar>

There are several USA Amateur radio stores but be aware of the exchange rate from US dollar to the Canadian dollar! You will also be required to pay the IMPORT/GST taxes on any online purchase from the USA.

A few good USA ham radio stores are:

HRO – Ham Radio Outlet <https://www.hamradio.com/>

Universal Radio Inc. <https://www.universal-radio.com/>

GigaParts <https://www.gigaparts.com/>

2.2 Handheld Transceiver

Most new amateurs will start out with a Handheld Transceiver (HT). This is the smallest and most portable amateur 2-way radio you can buy. It is a good starting point and will serve you well now and into the future. Be aware that this option will give you limited range, as compared to a mobile radio in your vehicle. Used with a repeater, your communication range will be increased substantially.

NOTE: For licensed amateurs who are also Fire Fighters, and/or Search and Rescue (SAR) members, you may be able to have some of the local 2m band (144-148 MHz) frequencies programmed into your radio. Check with your Fire Chief, or SAR Team lead to see if this is possible.

The limited range is due to the antenna that normally comes with an HT. You can get better HT antennas, but some of them may be larger than the stock antenna that comes with the HT. Recall that a $\frac{1}{4}$ wave antenna on the 2m band is about 19 inches. It is a trade-off between convenience and better range. Most HTs you can detach the antenna and attach a small length of coax cable going to *roll-up J-Pole* type of antenna to dramatically improve the HT's range.

2.2.1 Very Low Cost HTs

Generally, the low-cost import radios, (low cost being less than \$100 Canadian) are not recommended to purchase. The manufacturers of these radios have been able to reduce cost by removing the normal RF filtering circuitry on Receive and Transmit required for proper operation. Some of these radios are basically a software-defined-radio (SDR), meaning they have very little electronic circuitry, and rely on their internal software to do the job. The problem with this type of radio is that they can go *deaf* when another strong radio signal (that you are not intending to listen to) is being transmitted nearby. The low-cost radios are also not usually waterproof (or submersible). NOTE: It is possible to purchase higher priced amateur band HTs that ARE submersible.

2.2.2 Power Levels for HTs

The normal operating guideline (not a regulation) is to use the least amount of power to get the job done. Start with the low power setting, and if that is not working (or not working well) you can switch to the higher power setting. You may be surprised what 1 watt can do! NOTE: GMRS/FRS radios are usually limited to 1/2 watt! Using the lower power level will make your HT's battery last much longer.

2.3 Mobile Radios

Mobile radios are the best choice for operation in a vehicle. You can get single band, or dual band amateur radios. For the West Kootenay area, a single band radio will work fine for almost all cases and be a lower cost option.

Installation of this equipment in your vehicle can be time consuming and require specialized knowledge and tools in some cases. Choosing the mobile antenna and getting a suitable mounting bracket can be challenging.

For very temporary mobile operating, it is possible to run a low power (10 watts or less) mobile radio from the vehicles 12V accessory port and run RG58 coax cable out through a door's weather stripping to a magnetic mount antenna on the roof. Do not consider this as a permanent installation. Also be aware that some newer vehicles such as Ford F150/F250/F350 trucks are now using an aluminum body, which a magnetic mount antenna will not adhere to.

2.3.1 Power Levels for Mobiles

The normal guideline is to use the least amount of power to get the job done. Start with the low power setting usually 5 watts. If that is not working well, switch to the next higher power setting which is usually 10 watts. You may be surprised what 5 watts can do. Running the highest power setting on your mobile radio will not always get your communication range much farther.

2.4 Base Radios

For use in the 2m or 70cm bands, a mobile radio with a 12V DC power supply can also be used as a fixed base station radio.

You could use a handheld radio for base station use, but depending on the HT radio, it may get its receiver *front end* overloaded by local strong signals. Realize that a HT radio has been designed to work with a poor antenna, and as such will have a very sensitive receiver to compensate for this. Connecting this to a higher gain base station antenna may cause this problem.

For amateur HF band use (only permissible to use if you passed your basic exam with a mark of 80% or better) there are base only type HF radios available. These will typically cost more than a mobile radio and will require much larger antennas to be erected.

2.5 Digital Modes for FM Radios (VHF/UHF)

Over the last few years many amateur radio manufactures have produced FM radios capable of operating digital modes. When you hear the term *Analog*, this means Non-Digital FM operation. Analog operation has been around for a very long time and is the default mode for FM radios. Most of the radios capable of Digital operation will also do Analog operation. The radios that do digital modulation, still do this using a base FM modulation method.

2.5.1 Common Digital Modes

The most common digital modes that you will find in amateur radios are as follows:

Mode	Description	Ease of Use / Programming
DMR	Digital Mobile Radio Digital standard that was defined in Europe for commercial usage	Moderately Difficult
D-STAR	Digital Smart Technologies for Amateur radio Designed in Japan by the Japan Amateur Radio League.	Some concepts need to be learned first
C4FM	C4FM is Yaesu' s System Fusion digital mode for amateur radio. Yaesu is a Japan manufacturer of amateur radios.	Easiest to use

Note that DMR digital mode is used in commercial type radios (originally Motorola) and requires setup/programming using a computer before the radio can be used. For a commercial radio, they are (usually) not programmable from the front panel/keyboard. Amateur radios ARE front panel programmable, so you can use them right out of the box with PC programming.

2.5.2 What can you do with Digital Modes?

Using Digital Radio Modes, the amateur with a digital handheld radio (using DMR or DSTAR or Fusion (C4FM) is offered a whole new world of communication via WIFI Hotspots and the Internet. There are worldwide Talk groups and many amateurs have taken up this mode of distance communication during times of poor HF propagation.

The digital *Hot Spots* are typically quite small and use your home's WIFI internet connection to connect to other amateur radio operators operating in the same fashion. This allows you to make world-wide contact without any external antenna, and just using an HT! Note that because this type of operation requires use of the Internet; It is not considered 100% reliable for emergency communications.

2.5.3 APRS (Packet Radio)

APRS (Amateur Radio Position Reporting System) digital mode that uses Packet Radio protocol, has been around for many years (invented in the 1980's). It uses an (old) 1200 baud telephone type modem modulation method over FM. There are some amateur radios equipped to use APRS directly with internal packet modems that give integral APRS capability. Some of these types will also have a built-in GPS. The GPS is normally used with APRS to report your (moving) position of your vehicle.

The Yaesu FTM-400XDR, FTM-100DR, and the FT1(X)DR are a few examples of amateur radios that have Packet/APRS support built in, including a GPS receiver. Be aware that using APRS/GPS on a HT will consume additional battery power.

Packet Radio itself is not as popular as it once was, but the APRS usage of packet radio has survived. Do a Google search for more information on APRS and packet radio.

3. RECOMMENDED USAGE PROTOCOL

When attempting to use a frequency in the amateur band, you would normally be calling another amateur station. Keep the communication short and to the point. The following recommended Etiquette points were taken from an Internet posting and contains some good points.

3.1 HAM RADIO ETIQUETTE

Congratulations on your new ham license. We understand that getting on the air can be a bit intimidating. Don't worry; we all were new hams once.

- Take the time to listen to the repeaters.
- Speak like you were talking to someone face to face. Key the mike, AND THEN start to talk. Don't start speaking as you key the mike. Repeaters have a short delay before transmitting. If you start speaking too soon, your first few words may not be heard. Make sure you have finished talking before you un-key the mike. Give your call sign clearly, and slowly.
- Use plain English and avoid jargon as much as possible. Q-codes are really a Morse code shorthand. They have their place when voice communications are marginal. Say, "My wife" rather than the "xyl".
- Avoid falling into the habit of using cute isms: "Roger Roger", "QSL on that"...
- Avoid phonetics unless you are asked to do so. When using phonetics, use the standard phonetics. "Alpha, Bravo, Charlie"... etc.
- If you are listening and would like to have a conversation, just give your call sign. You can add "monitoring", or "listening". Using the term "CQ" on a repeater is generally discouraged.
- When you wish to communicate on a frequency, listen for a while before talking, there may be a conversation in progress.
- If you want to join into a conversation, just give your call between transmissions rather than using the term "Break Break". You will be acknowledged and allowed into the conversation.
- If you want to talk to a certain person, call them using their call sign once or twice, then your call sign.
- In an emergency, give your call and say "Emergency" rather than using "Break Break". Saying "Emergency" will make it clear why you are interrupting, and it will also get more attention from those just listening.
- Make sure you ID (state your call sign) according to the rules but avoid over ID'ing. If you are using a repeater system, the repeater has a timer so that it may ID every 10 minutes. Whenever you hear the repeater ID that is a good time to send yours. There is no need to send your call sign, then say "For ID". Your call sign IS your ID.
- It is generally frowned upon to "Ker-chunk" a repeater. That means keying up your radio for just a moment so that the repeater transmits, usually you hear the "courtesy beep" afterwards. This is also annoying to the repeater owners and control operators. If you want to make sure you are transmitting okay, make sure you give your call sign.

Have fun. These are just a few pointers to help you sound like an old pro. You will make friends. Do not be afraid to ask questions. We were all beginners at one time.

The above was copied and modified from the November 2003 Grounded Grid newsletter, Wichita, Ks Written by Bob McHugh, N4BM. Further modified by VE7IHL.

4. SIMPLEX OR REPEATER?

4.1 Simplex

If you are to be communicating locally with another ham in the same general area and are basically line of sight, a good choice can be to use the simplex mode. Simplex means that you are using your radios with a direct RF path, no repeater is being used. This will limit you to maximum of several kms, (depending upon your location and power level), but is a good choice for nearby local communications.

4.1.1 2m Simplex frequencies

The 2m frequencies listed below should not interfere with repeaters:

146.500	
146.520	National simplex calling frequency, a good one to monitor
146.540	
146.560	
146.580	

4.1.2 70cm Simplex Frequencies

These 70cm frequencies should not interfere with repeaters:

446.000	National simplex FM calling frequency
446.000 - 446.175 446.025, 446.050, 446.075, etc.	Allocated 70cm FM simplex frequencies, pick from this area on 25 KHz spacing

5. WEST KOOTENAY AREA LOCAL REPEATERS

The following list of local amateur FM repeaters are available for use in the West Kootenay area. Most, but not all of them will require a sub audible tone (CTCSS tone) to activate the repeater. Repeaters will give a much larger communication range.

In the following repeater area listings below, there will be some overlap in coverage areas. This is intentional.

5.1 Nelson, Castlegar, Slocan Valley Areas

In these areas there are two 2m repeaters available for use located on Slocan Ridge.

5.1.1 146.640- (VE7RCT)

FM analog only, 88.5 Hz CTCSS tone

This is the preferred repeater to use for normal FM repeater use. The negative sign means you must setup your radio to use a negative -600 KHz transmit offset. This means that when you transmit, you will be transmitting your signal on 146.040; and when you receive your radio will be listening on 146.640 Mhz.

5.1.2 145.130- (VE7RRW)

FM & C4FM digital, 100 Hz CTCSS tone

This repeater supports Yaesu C4FM digital mode and analog. It can be used for normal FM analog repeater use but has a lower power output than the 146.640- repeater. The negative sign means you must setup your radio to use a negative -600 KHz transmit offset. This means that when you transmit, you will be transmitting your signal on 144.530; and when you receive your radio will be listening on 145.130 Mhz.

5.1.3 147.040+ (VE7BDY)

FM & C4FM digital, 100 Hz CTCSS tone

The location of this repeater is in the Taghum area and is not a mountain top repeater. It will not have a wide area coverage compared to the 146.640- repeater. It has been tested successfully from Balfour, Nelson, and Castlegar, but your access to this repeater may vary depending upon your current location.

This repeater is experimental and mainly used for testing of different digital modes. Yaesu C4FM digital mode is one of the digital modes supported. At times it may also support other digital modes such as DMR, and D-STAR. It can also be used for normal FM analog repeater use.

The positive sign means you must setup your radio to use a positive +600 KHz transmit offset. This means that when you transmit, you will be transmitting your signal on 147.640; and when you receive your radio will be listening on 147.040 Mhz.

5.2 Crawford Bay, Kaslo, Kootenay and Duncan Lake Area

In this area, there are two FM analog repeaters providing coverage.

5.2.1 147.060+ (VE7BTU)

FM analog only, 100 Hz CTCSS tone

This repeater will cover most of Kootenay Lake, and down to the Nelson North Shore area.

The positive sign means you must setup your radio to use a positive +600 KHz transmit offset. This means that when you transmit, you will be transmitting your signal on 147.660; and when you receive your radio will be listening on 147.060 Mhz.

NOTE: The repeater offset has changed in June-2022 to use the positive offset. (147.060+)

5.2.2 145.170- (VE7WKM)

FM analog only, 100 Hz CTCSS tone

This repeater will cover the top (North) part of Kootenay Lake and Duncan Lake area. It can be heard as far south as the Kokanee Creek campground.

The negative sign means you must setup your radio to use a negative -600 KHz transmit offset. This means that when you transmit, you will be transmitting your signal on 144.570 and when you receive your radio will be listening on 145.170 Mhz.

When using this repeater, you will only hear a very short repeater transmit “Tail”. There are no courtesy tones.

5.3 Trail Area

In the Trail area, there is a single repeater for that area.

5.3.1 146.840- (VE7CAQ)

FM analog only, no tone required

The negative sign means you must setup your radio to use a negative -600 KHz transmit offset. This means that when you transmit, you will be transmitting your signal on 146.240; and when you receive your radio will be listening on 146.840 Mhz.

5.4 Other Repeaters

Other repeaters that you may find useful in your travels are:

Creston	146.800-	88.5 Hz	VE7RCA	Mount Thompson
Cranbrook	146.940-	88.5 Hz	VE7CAP	Baker Mtn
Invermere/Fairmont	146.850-	110.9 Hz	VE7RIN	Lyttle Mtn
Golden, Radium	147.000+		VA7OGO	Whitetooth Mtn. (Kicking Horse Resort)
Grand Forks	146.940-	100.0 Hz	VE7OGF	Observation Mtn
Grand Forks	147.280+	100.0 Hz	VE7RGF	Bald Knob (Phoenix)
Oliver	147.160+		VE7RBD	Mount Baldy
Kelowna	146.860-	88.5 Hz	VE7RBG	Big White
Kelowna	147.000+	88.5 Hz	VE7ROW	Okanagan Mtn
Penticton	146.920-		VE7OKN	Apex Mountain
Nakusp	146.940-	100.0 Hz	VE7RDM	Nakusp
Edgewood, Hwy#6, Nakusp, SCAIA Mtn.	146.740-		VE7SMT	SCAIA Mtn
Colville (USA)	146.620-	100.0 Hz	K7JAR/R	Monumental Mtn WA
Spokane (USA)	147.360+		K1RR/R	Stensgar (Stranger) Mtn WA

Some repeaters will require a sub-audible tone added to your transmit frequency.

6. ECHOLINK AND IRLP ACCESS

Echolink and IRLP are methods that are used to connect users/repeaters over the internet. More information can be found at their web pages listed below:

IRLP <http://status.irlp.net/index.php>
Echolink <http://echolink.org/>

Salmo and Genelle have IRLP and Echolink nodes that are open for anyone to use.

Salmo 147.55Mhz simplex 100hz tone
Genelle 147.44Mhz simplex No tone

7. PHONE APPS FOR REPEATER LOCATIONS

A good iOS/Android app for your cell phone or iPad is **RepeaterBook** (powered by RepeaterBook.com).