Pacific Northwest SOTA Newsletter

January-February-March 2025

Photo by Bruce-VA7SGY on the way to The Flatiron-VE7/FV-414

Upcoming Event – the **ARRL January VHF Contest** is a chance to make contacts on 6m and up. Starting at 1900z on January 18th through the 19th. Two-meter FM can work of course and be prepared to give out contacts on 70cm FM as well (446.00). The exchange is grid square. If you have SSB on 6m and 2m and horizontal antennas from a summit, you may find yourself very popular: http://www.arrl.org/january-vhf.

Upcoming Event – Bonus Season has started for PNW Associations – look to the Association Reference Manuals to see where and when bonus points will apply – and then enjoy a snowy activation!

High Speed Straight Key – Amazing Wrist Workout!
https://www.facebook.com/reel/930531635137201

Repeaters as a SOTA Asset?
Contacts on terrestrial repeaters don't count towards your four QSOs for summit points, but repeaters can still be an asset for SOTA activations. Although not consistently monitored, calling on a local repeater and asking if folks could move with you to a simplex frequency could get you one or two more contacts. Besides "soliciting" for simplex contacts, repeaters could be a valuable safety resource. The time and trouble needed for programming local repeaters into your HT may be worth it.

How Long Will That Hike Take? Try Naismith's Rule for a Better Estimate...
https://www.youtube.com/watch?v=w5bEDHfUZIw

SOTA Badges by Greg-K7AGL

Are you Frood? A Low Rider? How about a Kiloeiffel? I am a Lazenby Activator, but a Moore Chaser. The conversation can get strange when SOTA ops talk about Badges! In 2023, the SOTA Database and user interface got a welcome makeover. One of the most important updates was a vastly improved ability to edit logs that had errors in them. Previously, you had to delete the entire log, then separately delete any of the S2S contacts, make the fix in your source file and then resubmit the whole thing. Having an elegant way to edit entries in the SOTAData UI and quickly update was a vast improvement. Another fun update to the user interface was the addition of "Badges." These are virtual awards that get credited to your SOTA Data account for various SOTA-chievements.

CW	Kilometer Up (1k)	FM
10 First Activations (10)	Seasonal Bonus	Two Kilometers Up (2k)
Three Kilometers Up (3k)	Activator 100 (100)	Kilopisa (1k)

The SOTA Management Team doesn't publish a definitive list of Badges. I am certainly not an authoritative source, but I have figured out quite a few of them and am looking forward to learning about/achieving more. I group them into three main categories: 1) special days you activate or chase 2) special things about the SOTA summit you activated or chased and 3) special milestones you achieve over time.

Achievements over time is probably the most familiar category. We are all aware of Mountain Goat (called "Activator 1000") and Shack Sloth ("Chaser 1000"), but there are also badges for the other various "honor roll" categories like S2S, Uniques, Mountain Hunter/Explorer, Tourist and some new categories like First Activations, as well as various height equivalents (like over time, your ascents adding up to the equivalent of 1000 Eiffel towers "Kiloeiffel" or Big Bens or other landmarks). There are also badges for chasing DX CC entities (first one at 10).

Badges introduced a way to celebrate various special things about summits. For example, "Four Kilometers Up" celebrates activating/chasing a summit between 4000 and 5000 meters. "Low Rider" celebrates a summit less than 200M in height. Badges that took me awhile to figure out where the "James Bond" badges for activating summits with references of 007. The first time you activate or chase one of these you'll see a little James Bond icon and "Lazenby" and on the second "Dalton" and then the third...Nothing! What's up with that? I think I have it figured out. The number of times you activate or chase a 007 summit is "measured" by the number of times the actor played Bond in a 007 movie. George Lazenby only made one movie so he's first up! And no actor made three movies, so nothing until your fourth 007 summit – which is Brosnan.

The other category that I group Badges into is what I call Special Days. There are a wide variety of these. The first time you activate or chase a continent, the first time you used a particular mode (VHF, UHF, HF, SSB, CW etc.), the first time you got a seasonal bonus. New ones pop up all the time, "Force Sensitive" (May 4), "American Pi" (3/14), "and Groundhog Day" to name a few. Badges have added a new layer of Fun to SOTA and I enjoy seeing a new badge pop up when I submit a log via the SOTAData interface. Hopefully if you aren't already, you will be Frood soon.

Groundhog Day	Summit To Summit	Hectoskytree (100)

Building a Sisterhood through SOTA – Amy-AG7GP and QST Mag
At the 2023 Oregon SOTA Campout, Amy-AG7GP, organized a YL-only activation. In a [January article in QST Magazine](#)
Amy shares what led to this activation, how it turned out, and what came of it.

**Pocket SOTA Radio Roundup: the (tr)uSDX and
QRP Labs QMX by Jeff-KX6I**
The intrepid SOTA activator can never truly have too many radios. Indeed, accumulating QRP transceivers can be almost as addicting as accumulating SOTA summits and learning the features and quirks of each radio is part of the adventure.

These are some of the members of the KX6I SOTA stable, tucked away in their individual sleeping quarters. →

Like most SOTA aficionados, if I had to choose only one radio it would without question be the Grand Poohbah, the vaunted Elecraft KX2. But here I discuss two options in the range of ~$100 that offer a lot of SOTA fun at a fraction of the cost of Elecraft hardware. Two features of importance to me for SOTA activations are small size/weight and multiple bands of operation (the more the better). Single frequency CW rigs are fun—but I would hate to lose out on making 4 QSO's because of abysmal propagation on a particular band. Radios that put out ~5 W are also in that sweet power spot for nabbing contacts and having access to WARC bands (12, 17, or 30m) to avoid contest-induced QRM.

← QRP transceiver shoot-out: (tr)uSDX vs QRP Labs QMX. 3 cell LiPo battery for scale.

(tr)uSDX – the details
The (tr)uSDX offers 5 bands, weighs a meager 70 g in its 3D printed case and easily stuffs into a jacket pocket. Everything you need to know about this radio, including how to buy it in kit or assembled form (from Amazon, eBay, or AliExpress), can be found at the website run by one of its creators https://dl2man.de/. The default when buying a kit or pre-built radio is the "Lo Bands" option for 80, 60, 40, 30, and 20 m. Plan on spending ~$85-95 for the kit or ~$140 for the assembled radio. The radio uses a clever dual board design—one main board and a separate filter board that allows configuring the radio for different band ranges. The filter board can be swapped for a "Hi Bands" option to yield 20, 17, 15, 12, and 10 m or the "Classic Bands" board that provides 80, 40, 20, 15, and 10 m. Those extra boards are only about $40 a pop—I run the "Hi" bander with a 49:1 EFHW cut for 20 m that has 3 links for 17, 15, and 12 m. The "Classic" pairs perfectly with a 49:1 EFHW cut for 40 m that uses a loading coil to bring the higher frequencies into resonance. It's very simple to take apart the case and swap boards—or swap band configurations in the field by 3D printing K6ARK's reimagined case design. The default OLED screen is tiny and rather dim—this makes it difficult to read the screen in bright sunlight. Fortunately, there is a dedicated truSDX online forum where users have posted hacks for brightening the display and installing a slightly larger OLED. I typically get 3-5 W of power output from a fully charged 11.1 V, 450 mAh LiPo battery. For an extra challenge, you can even run it at 0.5 W using a separate 5V USB input.

← Note that this (tr)uSDX has been modified with a larger OLED screen and tweaked for maximum brightness.

The (tr)uSDX supports CW and SSB (LSB/USB) and comes equipped with an onboard microphone and speaker. The speaker is essentially useless, so plan on bringing earbuds/headphones/powered external speaker if you actually want to

hear anything. Perhaps the best perk of this low-cost transceiver is the opportunity to yell into the tiny mic while holding the PTT button to make S2S contacts with SSB-only operators. It works in a pinch, but if you want to fight for more SSB contacts I'd suggest investing in one of [K6ARK's mini handheld microphones](#). I also like the fact that the PTT button can double as a straight key in CW mode in case disaster strikes and your external key fails.

← Here is a (tr)uSDX with original OLED in the K6ARK customized case that permits swapping RF boards. In sunny SoCal the display could be tough to see outdoors—not as much of a worry here in the PNW!

Controlling the radio is achieved via a variety of Menu entries that are easily navigated. Useful features include the ability to numerically display both power and SWR while transmitting and a good number of CW message memories that allow repeats of long messages (CQ CQ CQ SOTA DE <CALL> <CALL> <CALL> K). Also useful is the range of filter settings (Full, 3000, 2400, 1800, 500, 200, 100, 50 Hz). AGC is included as a Menu option, but I find the attack very slow and not particularly useful for my ears. It will do RIT but no XIT. It supposedly will run digital modes using only a USB cable to programs like WSJT-X, JS8CALL, or WinLink. VOX control can run FT8 in a pinch with appropriate audio cables should you be so inclined

As a budget SOTA rig, the (tr)uSDX performs adequately and I have used it for many successful activations. The receive qualities are often cited as its major weakness—it is not particularly pleasant for hours of listening and it can be tough to pull out weak signals with or without the AGC engaged. The coax connector is SMA, so be prepared to have an adaptor for your BNC-terminated antenna cables. Also note that the power jack requires a rather non-standard 1.4 mm DC plug, so another adaptor for your 2.1 mm power plugs will be necessary. Remember that built in SWR meter? You are going to want to pay close attention to that because there is no built-in SWR protection. I would suggest investing in a supply of extra final amplifier FETs for your RF board (3 BS170 FETs or single surface mount FDT86256 FET depending on the board) because keying up with a SWR >3:1 for any period of time will lead to a smoking mess. Firmware is constantly being tweaked by the creators. Be warned that loading firmware requires several hoops to jump through including keeping track of the unique serial number of your radio for downloading the firmware and running software to access the bootloader of the onboard ATMega328P chip. Best to not have to reload the firmware!

Pros: Excellent value, especially in kit form, for a 5-band radio that does both CW and SSB. Lightweight and fun to pull out of your pack or pocket on a summit. It is cheap enough to replace should you drop it over the side of the cliff or accidently step on it.
Cons: Easy to blow FA if not careful. Tinny sounding. Fussy to load firmware. Online operating manual is like an abstract art piece.

QRP Labs QMX – the details

The QRP Labs QMX is another 5-bander offered at an equally mouth-watering price. The radio is sold directly from the QRP Labs online store and priced at around $100 for the build-it-yourself kit. For another $50 you can opt to join a waiting list for a fully-assembled and tested radio. Plan on spending another $20 to order the sturdy black anodized aluminum enclosure. This yields a palm-sized radio weighing in at a svelte 100 g. The QMX is a CW rig that also covers the majority of digital modes and although it includes a small onboard microphone, it does not currently support SSB. While future firmware updates could potentially bring SSB, there is no guarantee this will truly happen. The radio is offered in three band ranges: 80/60/40/30/20 m, 60/40/30/20/17/15 m, and 20/17/15/12/10 m. I opted for the 20-10 m high band version to take advantage of propagation at the top of the solar cycle, but for the smart SOTA shopper looking for the single best radio the 60-15m version is hard to beat. If you are game to modify the high band kit, AI6XG describes how to configure the radio for 40-10 m.

The QMX is an amalgamation of two other popular QRP Labs projects: the QCX-mini single band CW radio and the QDX digital transceiver. The QMX packs a lot of components within its tiny form factor and kit builders should be aware that squeezing the finished boards into the aluminum enclosure can be a little nerve-wracking. In fact, things are so tight that I compulsively wrapped the boards with Kapton tape for fear of causing a short to the case. An interesting feature of the QMX is that it can be built to operate using either a 12 V or 9 V power supply via its 2.1 mm DC barrel jack. After fully optimizing the band filter toroid windings you can expect between 4-5 W output with either power supply configuration—so simply choose based on the batteries you plan on using in the field. The Menu settings include a number of onboard testing tools to ensure the radio is working to spec.


← The backlit LCD display is easy to read under any condition and the hefty aluminum enclosure could stop a bullet.

The 2-line LCD display with switchable backlight is a pleasure to use—even in direct sunlight. Navigating the Menu through a combination of button presses and turns of the front knobs is intuitive. The radio provides multiple CW message slots, adjustable filter bandwidth, RIT, and after several firmware iterations, a functional AGC option. A standout feature is the built-in SWR bridge and customizable SWR protection setting. With SWR protection on (I keep my SWR limit at 3:1), the QMX prevents even rapid RF spikes from damaging the final amplifier. Like the (tr)uSDX, you can generate a readout of output power and SWR on the LCD during transmit, though this is accomplished by interpreting the numbers of bars displayed on a corner of the screen. One especially helpful feature in the "Hardware Tests" menu is a SWR measurement tool that transmits a reduced power signal to give a numerical report of SWR at the current wavelength. This means that the little rig also comes in handy when building resonant antennas! Firmware updates (downloadable from QRP Labs) are easily loaded onto the radio which appears as a USB Flash memory stick when plugged into the USB port of any Windows, Linux, or Mac PC. Unlike the (tr)uSDX, the online operating instructions for the QMX are very extensive and easy to navigate. There is also a very active QRP Labs user community that can be found on groups.io, so if you run into issues, it is very easy to seek help.

On SOTA summits, I find myself very impressed with the QMX. Like the (tr)uSDX, I have only used this radio with a resonant EFHW antenna with links. The receiver qualities are quite good and a previous problem where enabling the AGC caused a lot of "thumping" when listening to the CW sidetone have been resolved. If you have finicky ears, the CW filter settings (and many other radio settings) are more customizable compared to the (tr)uSDX. The QMX CW decoder seems to work a bit better than the (tr)uSDX but perhaps that reflects the better quality of the LCD display. Like all decoders, only the strongest and cleanest signals ever seem to be displayed. The audio gain can go quite high and I have

no trouble listening to signals on the windiest of summits. The QMX built for a 12 V power supply will easily get you 1-2 activations from a single charge of a 450mAh 3S 11.1V LiPo battery. The QMX has CAT control and a much more refined interface if one wishes to use digital modes like FT8 during an activation. In my opinion, for CW operators, the few extra dollars for the QMX provides a much nicer experience than the (tr)uSDX—provided you do not feel the need to use SSB during an activation.
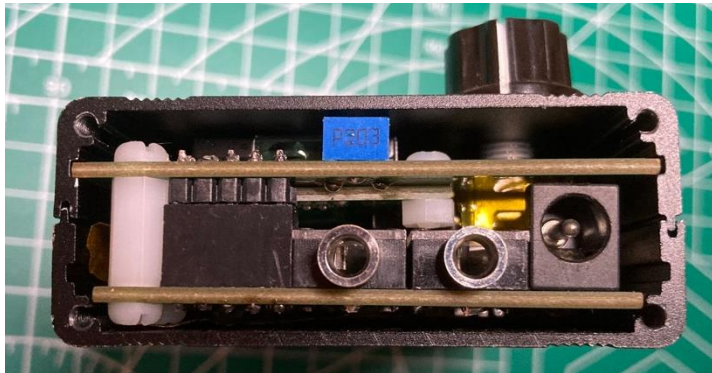
← Taking off one side of the enclosure reveals very little room left inside for modifications like a speaker or capacitive touch key circuit.

Pros: Low-cost, pocket friendly 5-band CW rig. Solid aluminum enclosure makes for a sturdy radio that should survive a drop on the rocks. Decent audio and easy-to-read display. Lots of menu options to tweak audio. Fantastic high SWR protection feature prevents mountaintop radio destruction. SWR test feature is a bonus when building resonant antennas.

Cons: No SSB (yet). Tight packing of components makes it hard to hack (i.e. adding internal speaker or capacitive touch keys). Take care during kit building to ensure there are no shorts to case.

SOTAmāt: Spotting on HF without cell, satellite, or APRS – by Will-KL0NP
Do you activate on HF but don't exclusively use Morse Code? Then you should try SOTAmāt! Brian Mathews, AB6D, created a system to reliably spot for SOTA or POTA, or to send one-way email or SMS messages. Using FT8 tones created by an app on your phone, all you need to do is key your radio microphone, hold your phone next to the microphone, and transmit the tones over USB. The magic behind the scenes is amazing, and is fully explained on the website, https://sotamat.com.
To get started you will need to create an account and select the frequencies and SOTA regions that you are likely to operate on in the field. And you can create

custom one-way email and SMS messages. Then you install the app on your mobile device and sync to the website. So far, my wife Franzi, WE7CAT, and I have had 100% success with spotting using the system when activating on HF SSB, even on days when propagation was very challenging. Twenty meters seems the most reliable for the FT8 spots. Once you go to www.sotamat.com, you will see other helpful tools that will help with SOTA activation. Have fun! Will, KL0NP

More on SOTAmāt _and SOTAcat_ from Greg-K7AGL

We operators have a wonderful SOTA spotting service that utilizes the Reverse Beacon Network. I think of SOTAmāt along those same lines because it uses a large number of skimmers that are listening on FT8. I haven't learned CW yet (it's on my list!) so appreciate that as an HF SSB activator, I can use SOTAmāt to spot myself in really, really remote situations where there is no cell service and no APRS available either.
The typical way that you send a SOTAmāt Spot is by holding up your phone and keying your radio mic when it plays the FT8 tone. But I have a problem. Remey the SOTA dog. When I play the FT8 tones to spot, he starts howling! And that messes up the FT8 audio.

When I heard about SOTAcat, I not only liked the really cool features, but I thought it could solve my audio "problem." SOTAcat is a small hardware module (orange box in photo) that plugs into an Elecraft KX2 or KX3 radio's CAT port (Computer Aided Transceiver port, also known as a "serial port" or an "accessory port" or "ACC port") and provides WiFi control of the radio from your mobile device. Very cool!

SOTAcat forms a bidirectional connection with the SOTAmāt app on your phone allowing SOTAmāt to read what operating frequency and mode you have selected and automatically pick the closest setting from your SOTAmāt configuration. Making a change to SOTAmāt's frequency / band selector will, in turn, adjust the radio's operating frequency/band/mode. Once you enter your Summit Reference (or Park ID for POTA) SOTAmāt will use the SOTAmāt to send the proper FT8 message to spot yourself (you can also send a preconfigured SMS/email messages).

SOTAcat is a one-way device (it doesn't receive the FT8 audio from the radio) there's no acknowledgement that your spot was sent like there is with APRS. However, experienced users have found that nearly every message or spot sent with SOTAcat was picked up, usually by quite a few stations. One of the things a user needs to pay attention to is with the phone's time being off, which can be fixed with the "offset" button in SOTAmāt by clicking it when the FT8 chorus starts. This usually gets you well within the time window.

You can build the hardware for SOTAcat (details and GitHub links on the webpage), or it is available for purchase from K5EM. He is currently creating an online page to be able to purchase the hardware device. I reached out to him and purchased an early model. (see pic, the orange device plugged into ACC port on KX3, and note, Remey is dozing right next to it, no howls!)
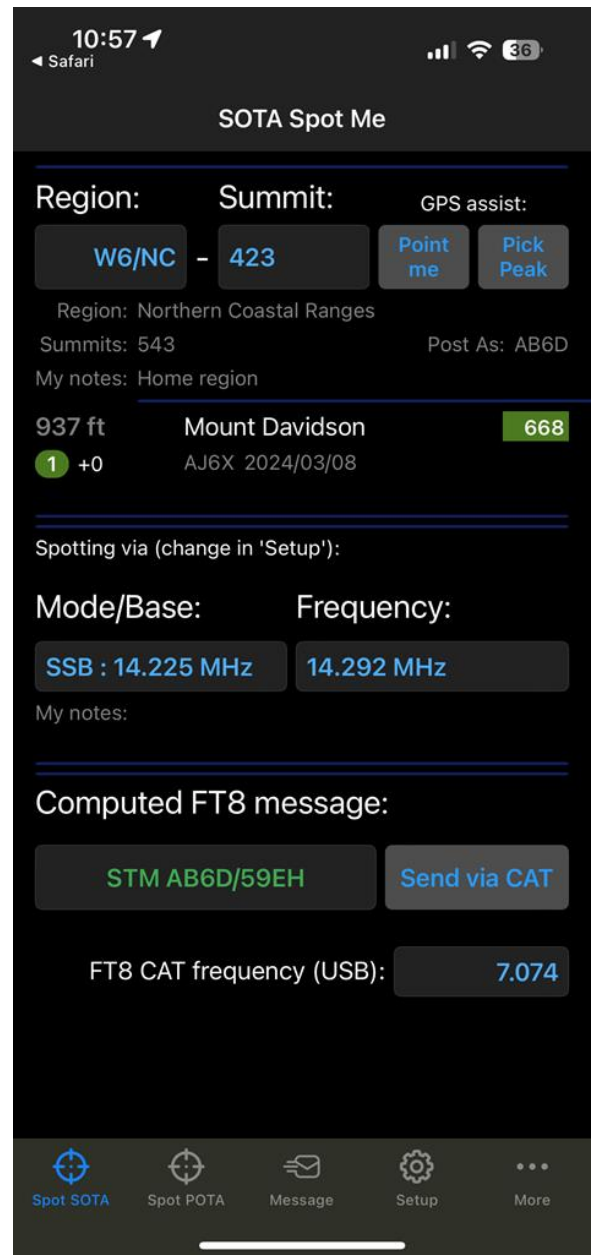
Channel spacing on 2m FM
There are established (albeit informal) standards in place for 2m FM channel spacing in every state.   In Washington and Oregon and the remainder of the PNW SOTA Associations, the standard is 20KHz (In CA it is 15KHz). SOTA Guru Bob-K0NR has an online article; https://www.amateurradio.com/simplex-channel-confusion-on-2-meters/.
Easy simplex frequences in the PNW would be 146.40, 146.42, 146.44, 146.46, 146.48, 146.50, 146.52, 146.54, 146.56 and 146.58MHz. However, the National Calling Frequency of 146.52 is best used for brief calling, and many use the informal "North American Adventure Frequency" of 146.58 for SOTA QSOs – monitoring .58 while hiking or hanging out on a summit may get you the occasional Summit-to-Summit.

 SOTA VHF Equipment Evaluation by Jeff-WX7OR and Joe-WA7FWC
Successfully working weak signals on 2m FM from summits involves a little luck but can be made less enigmatic with some knowledge. One of the more challenging aspects is SOTA activators don't carry much test equipment to unravel what is happening. After activations with multiple radios and antennas combinations, I decided to conduct a more scientific study to make sense of my experiences. The goal is to both select more optimal equipment and quickly troubleshoot when things aren't going well.

Propagation Evaluation

The first test is evaluating received signal strength to evaluate how well I am getting out. Transmitting was done from Council Crest (1073 feet) on 146.48 MHz. The receiver was a Signal Hound SA-44 Spectrum Analyzer located ~3 miles away at an elevation of 300 feet.

Readings are in dBm and a little math is required for direct comparison since these radios had different output power. The IC-705 (10 watts) is +3 dB above VX-6R (5 watts) and +1.5 dB above the IC-V86 (7 watts). SWR was included to give some insight on how well the antennas were matched when connected to the IC-705.
 My favorite combo for SOTA is the IC-V86 with the AEA half- wave and the test results show this is one of the best combinations. The VX-6R always struggled even with aftermarket antennas and again the test results confirm this. In fact, most of the aftermarket antennas do not perform as well as expected. Clip-on radials would probably improve the performance of any antenna and might be a follow-up study.

The main take away from this test is not assume aftermarket antennas will give an improvement and it is worth the time to test your equipment. These tests can be as simple as signal reports or S-meter on an IC-705 from a chaser willing to spend a few minutes providing feedback.

Antenna Radio	Stock	RH-205	AEA 1/2 Wave	MFJ-1714	SRH320A	SRH77CA	Arrow 10BP Yagi - Vertical	Arrow 10BP Yagi- Horizontal
IC-V86	-108	-106	-98	-103	X	X	X	X
VX-6R	-107	X	X	X	-108	-108	X	X
IC-705	X	-107	-95	-94	-96	-96.5	-87.5	-85
IC-705 SWR	X	1.5	1.5	1.5	3	1.8	1	1

Radio Desense Evaluation

The previous test was about how well signals get out. This test is about how well a radio receives signals. Ability to receive signals is dependent on many aspects including antenna, intermod, multi-path, background desense, and transient desense. From my SOTA experience, my main issues have been the last two.
Background desense is from cumulative the noise level from man-made noise caused by the electronics all around and transmitters like FM stations. Background desense makes it difficult to receive weak stations. Transient desense is caused by a strong nearby transmitter resulting in the receiver to intermittently lose sensitivity. Many transmitters on remote peaks operate within the LMR band (Land Mobile Radio: 150-172 MHz), so this was the frequency range evaluated. These tests use a signal generator connected to the antenna coax with a splitter. Three separate tests were performed. The last test has not been completed on all radios yet.

> Background Desense:
> - Sensitivity w/o filter – This is a measurement of the sensitivity of the receiver in a real-world high-RF environment that indicates how well a receiver deals with background desense.
> - Minimum Received Signal Strength – This is the minimum signal strength that the receiver can hear reported as S-meter + dB. These values give a relative idea of how well the radios receive weak signals in the presence of background noise.
> - Sensitivity w/ filter – Sensitivity w/ filter – The test used an OCI 2m bandpass filter but would be similar to the SOTA Beam bandpass filter. This value is also useful to indicate how well a radio receives in the absence of out-of-band signals.
>
> Transient Desense:
> - Transient Desense - The radio is challenged with an LMR band signal (152 MHz signal). The value in the table is the signal strength in uV required for the receiver to lose the ability to receive a ~S1 signal on 146.48 MHz.

- Transient Desense Minimum Distance – This is minimum separation from an LMR transmitter to be able to receive ~S5 signal based on a free-space RF path loss.

This section has more data and more things to think about. Radio receiving in challenging environments tends to favor more advanced radios with more filtering (IC-705) or simpler radios without wide band receivers (FT-60R or IC-V86). Test results are for omni-directional antennas. Half-wave antennas are good from transmitting, but will increase desense issues. Yagis can help reduce desense and pull-out weak signals.

Radio	Sensitivity w/o filter (uV)	Minimal Received Signal	Sensitivty w/ Filter (uV)	Transient Desense (uV)	Minimum Distance (meters) S5
Yaesu FT-818	0.84	3.8	0.94		
ICOM IC-705	0.94	4.2	0.94	8404	24
Kenwood TH-D72	0.67	3.2	0.67	2982	67
Wouxun KG-UV7(6/2)	0.75	3.5	0.67	66755	3
Yaesu FT-60	1.68	5.8	0.59	298	673
ICOM IC-V86	2.98	7.5	0.47	1187	169
KG-Q10 KG-Q10	1.68	5.8	0.84	298	673
Kenwood TH-D74	3.75	8.2	0.94		
Anytone AT-878UV	2.66	7.2	0.94	1677	120
ICOM ID-52A	5.95	9+1.5dB	0.42		
Yaesu FT-70	8.40	9+4.5dB	0.38	840	239
Kenwood TH-D75	8.40	9+4.5dB	0.75	211	950
Yaesu FT-5R	14.94	9+9.5dB	0.75	298	950
ICOM IC-T10	16.77	9+10.5dB	0.38		
ICOM ID-51A	21.11	9+12.5dB	1.06		
Baofeng UV5R	42.12	9+18.5dB	0.75	421	950
Baofeng UV17R	84.04	9+24.5dB	0.59		
Yaesu VX-6	149.45	9+29.5dB	0.67	2111	95
Yaesu VX-3	334.57	9+36.5dB	0.94	5303	38

Conclusions
Both the antenna and radio evaluations align with my experiences on summits. The VX-6R is a great waterproof radio for our kayaking adventures away from civilization, but struggles in challenging RF environments or weak signal reception. The IC-705 with a Yagi is great for both transmit and receive, but is more weight and set-up and not so great in the rain. My goldilocks set-up is the IC-V86 with a ½ wave antenna, but it will struggle on summits near transmitters. Some strategies to help minimize desense are to move as far away as possible in the AZ, stand between the LMR transmitter and the radio, or use cross-polarization (transmit vertical and listen horizontal).

Wintertime Snowshoe Activations
In the previous Newsletter issue, there was an update on snowshoe activations for each of the PNW SOTA Associations. When planning a winter activation, consider that you might only achieve about half the speed as on a dry trail – something to put into your Naismith's Calculator. It's important to have a clear idea what path to take as there may be few or no landmarks buried under the snow. A map and compass would be a critical back up navigation tool – using tracking and having extra batteries for your GPS unit is the way most navigate to a summit.

Warm (and dry) clothes to change into at the summit, plus some snacks can be more important than getting QRV. A shelter like a Bothy Bag can make a windy peak more than tolerable. And as always, having company along should be considered one of the "Eleven Essentials," as is an extra helping of common sense. Enjoy!

SOTA ARTS PAGE

Waves of Wonder by Piju-9M2PJU

Through static and silence, a voice breaks through,
A call sign echoes, both familiar and new.
Fingers dance on keys, with practiced grace,
As signals traverse time and space.

Antennas reach high, kissing the sky,
Capturing whispers as they fly by.
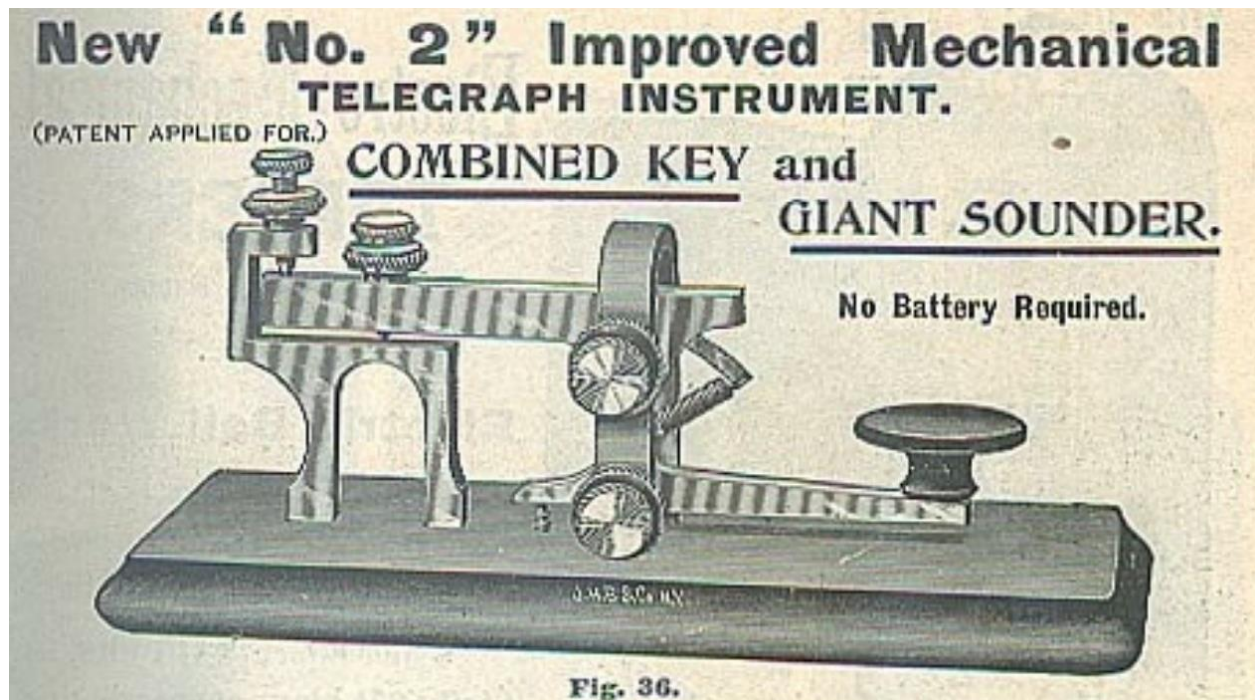From shack to shack, across land and sea,
Hams unite in radio harmony.

In times of peace, they chat and share,
When disaster strikes, they're always there.
Emergency comms, when all else fails,
Amateur radio never derails.

DX hunters chase that elusive call,
While QRP ops make do with small.
CW devotees tap out their song,
Digital modes push technology along.

From satellites orbiting up above,
To local nets filled with ham radio love,
This hobby spans the world so wide,
With friendship and knowledge on every side.

So here's to the hams, both old and new,
Exploring the spectrum, ever true.
In this world of bits and endless chatter,
Amateur radio will always matter.

73s to all, near and far,
May your signals be strong, wherever you are.

New "No. 2" Improved Mechanical TELEGRAPH INSTRUMENT.
(PATENT APPLIED FOR.) COMBINED KEY and GIANT SOUNDER.
No Battery Required.
Fig. 36.

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