



JANUARY 2025

Volume 14 Issue 1

# VE3ERC-LUB

- President:** Frank VA3FJM
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- Secretary:** Rod VA3MZD
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- Lighthouse:**
- Maple Syrup Display:**
- Newsletter:** Bob VE3IXX
- ERC Website:** <https://ve3erc.ca>

## ERC REPEATERS

- UHF 444.700 + TONE: 131.8**
- UHF 444.700 + TONE: 123.0**
- VHF 147.390 + TONE: 123.0**
- VHF 147.255 + TONE: 131.8**
- EMERGENCY SIMPLEX: 146.550**
- UHF-IRLP node 2404,ECHOLINK VE3ERC-L**
- VHF- IRLP node 2403,ECHOLINK VE3ERC-R**



**Rod, VA3MZD showing off his  
End Fed Random Wire  
antenna for**

## Winter Field Day

**In an emergency, tune  
Into our repeaters,  
UHF 444.700 or  
VHF 147.390 or  
HF 3.755 LSB or  
Simplex 146.550  
For coordination and  
assignments.**



**Story on Page 16.**

# THE PREZ SEZ!

This club is Radio-ACTIVE  
This club is Radio-ACTIVE

## President's Update for January 2025

**O**n the Radio Amateurs of Canada website in the "Operating Guidelines" you can find the following wisdom which can give all amateurs a goal to strive for:

### Canadian Amateur Radio Hall of Fame

member (1997) **Bill Wilson, VE3NR (SK)** wrote the following Code of Ethics for Radio Amateurs which was featured in the December 1997 issue of *The Canadian Amateur* magazine:

## Code of Ethics by Bill Wilson, VE3NR:

The thoughtful Radio Amateur is:

**Responsible** – using courteous operating practice, complying with regulations and accepted technical standards;

**Progressive** – striving to develop and improve operating and technical skills;

**Helpful** – offering assistance, support and encouragement to other Amateurs, especially beginners; and

**Public Spirited** – offering use of station, knowledge and skills as a public service whenever possible.



**Radio Amateurs  
of  
du Canada**

### **NOTICE**

**Due to the Inclement weather  
The January Meeting  
Was Cancelled.  
See you in February (26th).**

**CONTRIBUTIONS TO VE3ERC-CLUB NEWSLETTER**

Do you have an article you'd like to submit? Or photos? Do you have any comments you'd like to make?

Perhaps you'd like to share a photo of your shack, a special project you are working on or a special interest!

**SEND THEM TO:**

**Bob [bobve3ixx@gmail.com](mailto:bobve3ixx@gmail.com)  
(519-787-2279)**

**NOISE-BLANKING, SIMPLIFIED:**



**WEDNESDAY NITE NET CONTROLLERS**

**DECEMBER 11 - TOM VE3DXQ**

**DECEMBER 25 - TED VE3TRQ**

**2025 JANUARY 1 - TONY VE3DWI**

**JANUARY 8 - BRIAN VA3DXX**

**JANUARY 15 - BOB VE3IXX**

**JANUARY 29 - HAGEN VE3QVY**

**FEBRUARY 5 - FRANK VA3FJM**

**FEBRUARY 12 - BOB VE3IXX**

**FEBRUARY 19 - TED VE3TRQ**

**FEBRUARY 26 - M E E T I N G**

**MARCH 5 - TONY VE3DWI**

**MARCH 12 - HAGEN VE3QVY**

**MARCH 19 - ROD VA3MZD**

# Test Equipment

## Part 4 - By Hagen Kaye VE3QVY

**I**n this part of the series I'll talk about my oscilloscope and why I chose it. Last year I had a mishap and accidentally fed my trusty oscilloscope of many years way too much RF power. The input circuitry didn't stand a chance and one of the inputs no longer had any resemblance of functioning. Turning misfortune into an opportunity, it was time to go shopping and find out what is new with oscilloscopes. My goal was to get the best bang for under \$1000.

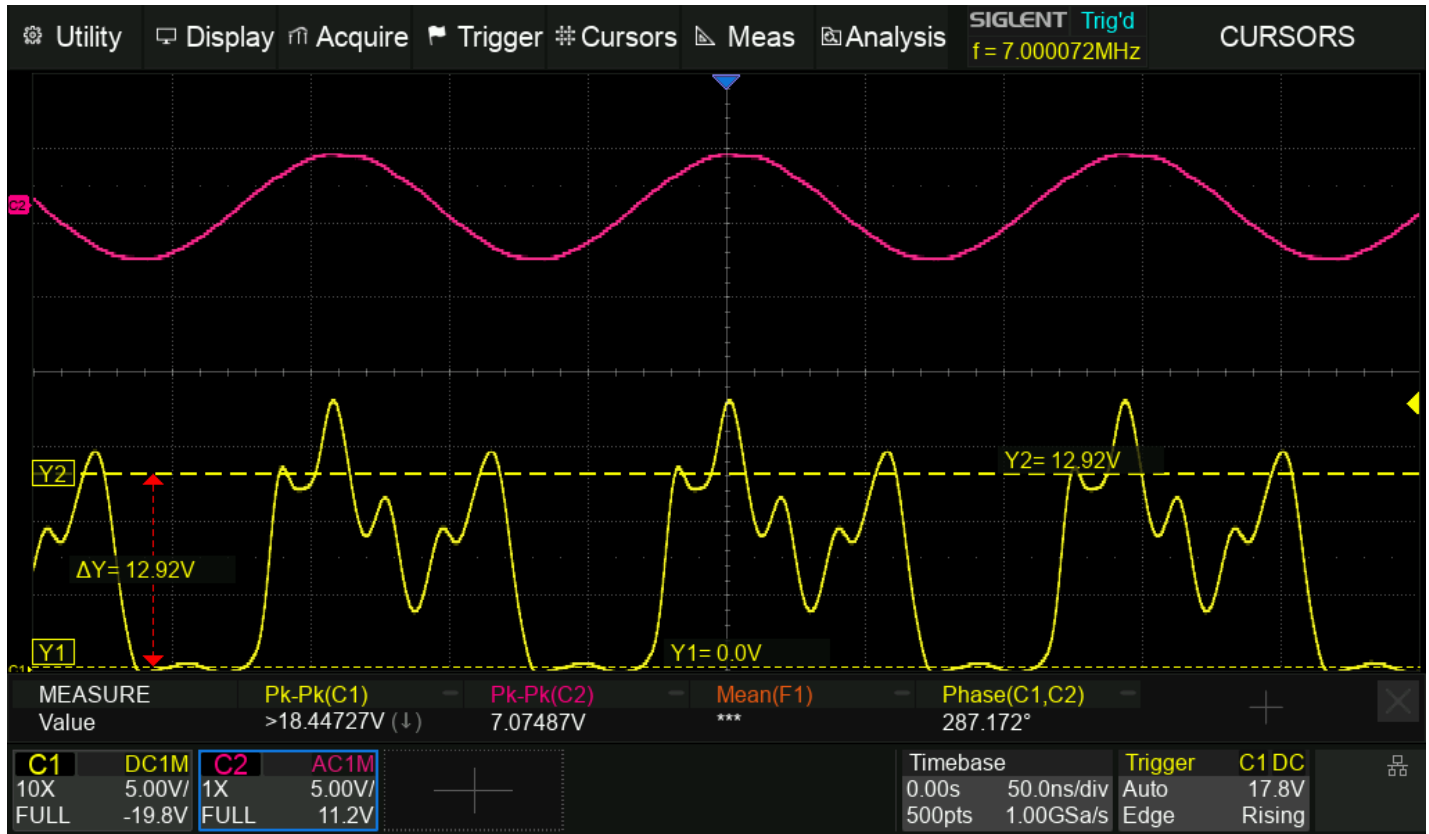
I really like the Siglent brand, so I spent a lot of time on their website. I also looked at Rigol and they make great equipment as well. Both make entry level oscilloscopes for under \$400 (even less if you find a sale) that would easily replace my existing scope. But I wanted to see what a few extra dollars gets and there are plenty of new exciting features with oscilloscopes priced from \$600 to \$1000 from both of these companies. And of course they both make real high end equipment ranging from over a \$1000 to the 'ask for a quote' price.

What caught my eye are the new HD or 12 bit resolution oscilloscopes. Most oscilloscopes are 8 bit resolution and can do some tricks to squeeze a little bit more detail. But having 12 bits of resolution lets you see the waveforms with very fine detail and this becomes even more pronounced when using a zoom feature - viewing the waveform at a slower time base and then zooming into the detail - handy when looking at modulation like AM or SSB. Interestingly enough these 12 bit HD scopes are derived from their more expensive models and have the same quality but lower bandwidth (max 200 - 250Mhz) and sampling rates and memory. Perfect for HF HAM radio work.

These models for under \$1000 come in either 2 channel or 4 channel, with the later being slightly more expensive. As well both companies offer models with smaller and larger screens with the same features, with of course the larger screens being more expensive. And strangely enough both companies offer models in white or black. The black ones are the newer versions and are significantly cheaper with slightly better specs. I guess black is the new white.

With plenty of options to choose from with varying specs I spent several days looking at comparison charts, occasionally clicking on those fancy \$5000 scopes just to see what a lot of money gets for your dollar. I ended up getting the Siglent SDS822X HD oscilloscope. I went with 2 channels and the smaller screen to save some dollars, but went with the maximum bandwidth, sampling rate and memory. The oscilloscope came in at \$800 which was right under my budget.

This oscilloscope has not disappointed me at all. The clarity of the captured waveforms is incredible over my last scope (which was about 10 years old). The following is a screen capture of a 7 Mhz signal going through a RF MOSFET power amplifier. One waveform is the clean filtered output and the other is connected at the drain of the MOSFET showing the crazy waveforms created when the harmonics are filtered out.

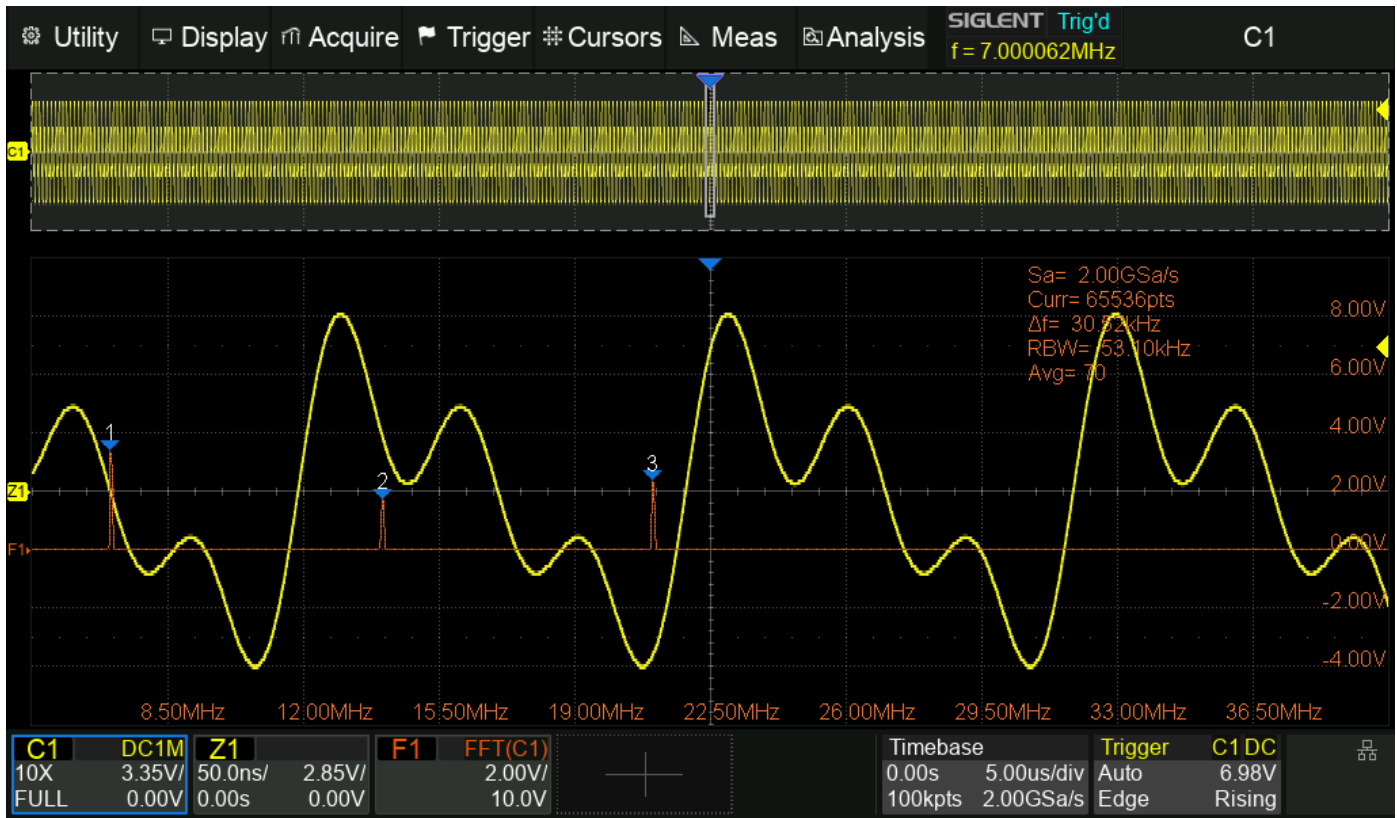


Besides the basic functionality of displaying waveforms and making detailed measurements these newer oscilloscopes have faster computers and more memory to analyse the data, and they all come with an Ethernet port so grabbing screenshots like above is a breeze. You can control the oscilloscope with your computer, but I still prefer to turn knobs and dials. And the oscilloscope can control other equipment over the network, such as a signal generator which I mentioned in last month's article - the oscilloscope controlling a signal generator to make Bode plots.

Another handy feature is to automatically make measurements and display them on the screen. Shown above are the common measurements I make - the peak-to-peak voltage of channel 1 and channel 2 as well as the phase difference between the two inputs. Just about every measurement that can be made can be selected so you can design your own panel of the measurements you would like to make. For manual measurements the scope has cursors (horizontal and vertical) so you measure or make voltages (vertical) or time based values such as delay, phase, frequency.

Among the long list of mathematical functions the scope can do, it can do Fast Fourier Transforms and quickly. This allows you to do a spectrum analysis on a signal to see all the harmonics. Although my spectrum analyser can do this, it can only do it on 50 ohm impedance signals. With an oscilloscope the spectrum analysis can be done on the voltage measured with the high impedance probes. This is a handy tool as an alternative to using the spectrum analyser.

Shown below is an example of some of the analysis that is possible. I've fed the oscilloscope with my signal generator set to 7 Mhz with both 2nd and 3rd harmonics. In yellow on the top is the waveform captured to generate the spectrum analysis in orange. In yellow on the bottom is the same waveform zoomed in to show the actual waveform.



There's plenty more features and a thick manual that I'm still going through, discovering different types of analysis that can be done on the signals that are captured. As well, there are optional accessories (for extra money as well) that can analyse switching power supplies and a digital probe that can capture up to 16 digital I/O signals and the analog signals at the same time.

I'm really happy with my decision to spend a few more dollars and impressed with the latest offers and the speed and power of modern digital oscilloscopes. Perhaps in 10 - 15 years I'll take a look to see what's new and exciting, of course, white will be the new black in the future.

**73, VE3QVY.**





# From the PAST

Pilot Officer Harry Keast, 22, is missing following air operations



**Harry Keast**

over enemy territory. his wife, who is with the editorial department of The Star, has been notified. She was formerly Kathleen Grimshaw, Hamilton and Guelph. Wireless-air gunner on a Lancaster, Pilot Officer Keast joined the R.C.A.F. in September, 1942, went overseas the following July, and has been on six bombing missions over Berlin. Born in Detroit, he moved to Hamilton from Sarnia four years ago with his parents. Mr. and Mrs. Arnold Keast, Jackson St. W., Hamilton. Before enlisting his hobby was model aircraft. His father is a veteran of the last war.

Thanks to Tom VE3DXQ for sending the following:

My Brother found this article about my uncle Harry Keast. He was married to my mother's sister. Just wondering what was meant by Wireless-air gunner.

I suspect all on board had to have radio training just in case a distress call had to be made.

Unfortunately, he died in the last bombing raid over Germany. He is buried in Germany.

## A CLEFHW Antenna?

By John VA3KOT (Ham Radio Outside the Box)

I have been on a quest recently. My objective: to explore strange new antennas and boldly go where no ham has been before. It is not that I particularly seek out the weird and wonderful; instead I try to adapt existing antenna designs using lateral thinking ("ham radio outside the box") to create variations that make backpack outdoor operating sweet and simple.



### The long and the short of it

You may recall an antenna idea I posted some time ago called "Long Tall Sally". The theory behind that idea was that a vertical antenna does not have to be a quarter wavelength long. By stretching the vertical radiating element, the radials can be made shorter, thereby reducing the antenna's footprint. I built a 25 feet tall radiating wire with two raised radials about 5 feet long. Long Tall Sally was resonant on the 20m band.

A quarter wavelength vertical antenna has a feedpoint impedance that is a close match to 50 ohms, but as its length increases so does its feedpoint impedance. Long Tall Sally's feedpoint impedance is around 200 ohms and requires a 4:1 transformer to bring it down to 50 ohms.

### That's a good question officer, I can explain

Then I did another experiment. One of my favorite antennas is the Rybakov. A Rybakov is a 25-29 feet long vertical radiating element (length not critical) fed against a ground plane. It too uses a 4:1 transformer and is tunable on all the bands from 40m on up. It is usually supported on a telescoping fiberglass pole. In the winter, my fiberglass pole has a habit of getting stuck in the extended position so I sought an alternative that would eliminate the pole. I didn't want to have to explain to a police officer why I had a flapping 30ft pole draped over the roof of my truck.

I came up with the idea of using a telescoping stainless steel whip which does not get stuck in the cold. I have a whip that extends to 18.5 feet. The theory is that by using a small inductance at the base of the whip, the electrical length could be extended to match the Rybakov's physical length. A coil with an inductance of 5 microhenries gets the job done. The whole antenna directly attaches to the external frame of my backpack and can be set up in just a few seconds. The idea worked but still has one drawback – it requires a ground plane. I used 4x13ft ground radials. The radials are easy to deploy in warm weather, but not so easy in winter when the snow is deep and crisp and even.

While sitting in my soft, warm and comfy recliner chair sketching ideas on the back of my eyelids, another idea began to materialize. How about stretching the vertical radiating element all the way to a half wavelength long? The essence of this idea is a well-established antenna called a vertical End-Fed Half-Wave. For the 20m band this is about 33 feet tall. Ugh! That means using a telescoping fiberglass pole again so scratch that idea. But wait. Suppose I apply the inductive base loading idea that I used for my winter Rybakov?

### Crazy huh?

Well let me introduce the Coil Loaded End-Fed Half-Wave (CLEFHW) antenna. It comprises the same 18.5 feet long whip, base loaded with a coil with an inductance of 6.6 microhenries. How

did I arrive at that inductance? I used the online calculator at [66pacific.com](http://66pacific.com). However, that online calculator, while useful, is intended for quarter wavelength verticals. I wanted to calculate the value of a base loading coil for a half wavelength antenna. I couldn't find an online calculator for base loading half wavelength verticals but for every problem there is a solution.

### The bands are in harmony

Some of our ham radio bands are harmonically related. The relationship is not exact but in some cases is close enough for our purposes. When I am doing a POTA activation on 20m I usually hang out in the QRP section of the band around 14060 KHz. On the 40m band the QRP watering hole is around 7030 KHz. That is a very fortuitous coincidence. A half wavelength on 20m is a quarter wavelength on 40m. So I surreptitiously plugged the 40m frequency into the online calculator and got the answer I needed.

### But will it work?

The weather hasn't been kind to southern Ontario for the last couple of weeks. As I write this post we are experiencing a blizzard – high winds and quickly accumulating snowfall. The snow is the kind of very fine crystals that get caught in the wind and swirl around making outdoor operating a less than optimum experience. A couple of days ago we did get a break in the weather so I set up an ugly prototype of a CLEFHW on my deck in the outback (out in the backyard) just to see if I could make it work.

### Its ugly, but it seems to be doable

I didn't have a 6.6 microhenry coil handy so I grabbed my homebrew variable inductor. In the shack I set it to the required inductance using my Almost All Digital Electronics L/C Meter IIB. Then off out into the frozen, barren tundra on my deck to try it out. The ugly prototype was certainly not an elegant setup but my RigExpert antenna analyzer showed the idea was sound in theory. I had an SWR of 1.49:1 on 20m.

### 49:1 outside the box

Of course, a 49:1 transformer was required. I have made several of these and, perhaps unsurprisingly, I use an "outside the box" design. The secondary is 14 turns of 20awg insulated solid copper wire on a FT-140-43 toroid. The primary is a separate winding comprising 2 turns of the same wire wound on top of the center of the secondary winding. I do not use a capacitor across the primary since, in my experience, it doesn't make any significant difference on the higher bands.

### Short Tall Sally?

The end result is an End-Fed Half-Wave antenna for the 20m band that is only 18.5ft tall and can be mounted on my backpack frame and erected in seconds. For QRP operation no counterpoise at all is needed. A short piece of coax will be sufficient to dissipate the very small common mode current along the outer surface of the coax shield.



### Is a CLEFHW efficient?

Heck no, I don't expect it to be terribly efficient. Those of us who like to trek into the woods carrying a complete station on our backs don't worry too much about antenna physics. We know we are using "compromised" antennas but as long as the contacts roll in we are happy backpackers. The loading coil and the transformer may introduce some loss but there is no fundamental reason why the CLEFHW should not be a perfectly viable antenna for field operations.

### Could it work on 40m?

Could a 20m EFHW work on 40m? Sounds like a naive question but the answer (if like me you think outside the box) is a qualified "yes". Remember we used the online calculator to find the value of inductance required to base load our whip for operation on 40m? So, if we take out the 49:1 transformer and throw out some radials we have an instant quarter wavelength vertical antenna for the 40m band. With a tuner we should be able to squeeze 15m out of it too.

### Field Trials

Up here in the Great White North we don't even button up our Mackinaws until it gets down to a hundred below. I have other tales of winter bravado to tell in exchange for a beer or two. I read some multi-decadal oscillation of ocean currents somewhere in the world will combine with the expected El Nina to produce an exceptionally cold and snowy winter this year. So far it ain't lookin' good. If my aging snowblower keeps chugging along I may be able to break out of the shack before winter's end to see if I can make some contacts on my new CLEFHW. Meanwhile I'll work on tidying up the design to make it more suitable for the rigors of the Big Blue Sky Shack. I'll keep you posted.



Here is an article in The Observer in Elmira that was passed on to me. It was dated from last November 7. Articles like this are always good publicity.

Ed.

# Tech Tips

## Tech Tips



Are You worried about keeping your equipment safe when you do frequent portable operation in possible harsher environments?

K7SW, in his YouTube video shows how he uses a good quality painter's tape (which does not leave a sticky residue) to wrap up his radio. He of course cut out the speaker area as well as any breathing holes so as not to interfere with normal operation. This provides a great protection from getting scratches on the radio. Also, because his Yaesu ft-857 doesn't have the output ports labeled, he added labels on top of the painter's tape to avoid any possible confusion out in the field.

In addition, he used a soft eye glass pouch to transport his microphone. You can view his video at:

<https://www.youtube.com/watch?v=gFSwKI8jkoo>

<https://www.youtube.com/watch?v=gFSwKI8jkoo>



# Cheap HF Quarter-Wave Stubs

**By: Al Duncan VE3RRD**



ome may ask “why would I need a quarter-wave stub”? When our club is activating a lighthouse, beach or park, we are often setting up two or even three stations with antennas in fairly close proximity to each other. Although some stations may be QRP, many times we are also including a 100W transceiver for SSB.

This can cause major interference between stations, even when everyone is on a different band. For example, a transmitter on 40m (7 MHz) can overload a receiver on the 20m (14 MHz) band, making it almost impossible for the 20m station to copy CW or even voice.

A “shorted” quarter-wavelength (for a particular frequency) piece of coax, will appear as an open at the other end of this shorted stub. For example, if we make a shorted stub for 20m and connect it to the transceiver, it will not affect the SWR on 20m but will appear as a partial short to signals on the 40m band. This is because the 20m quarter-wave stub will appear as an eighth-wavelength shorted stub on 7 MHz and will greatly attenuate these signals. Likewise,

also placing a 40m stub on the 7 MHz station can greatly reduce any harmonic RF it is producing on the 14 MHz band.

You can use a regular T-connector (either BNC or UHF as required) attached directly to the transceiver, with the antenna coax connected to one side and the quarter-wavelength shorted stub (for the band you will be operating on) connected to the other side of the T.

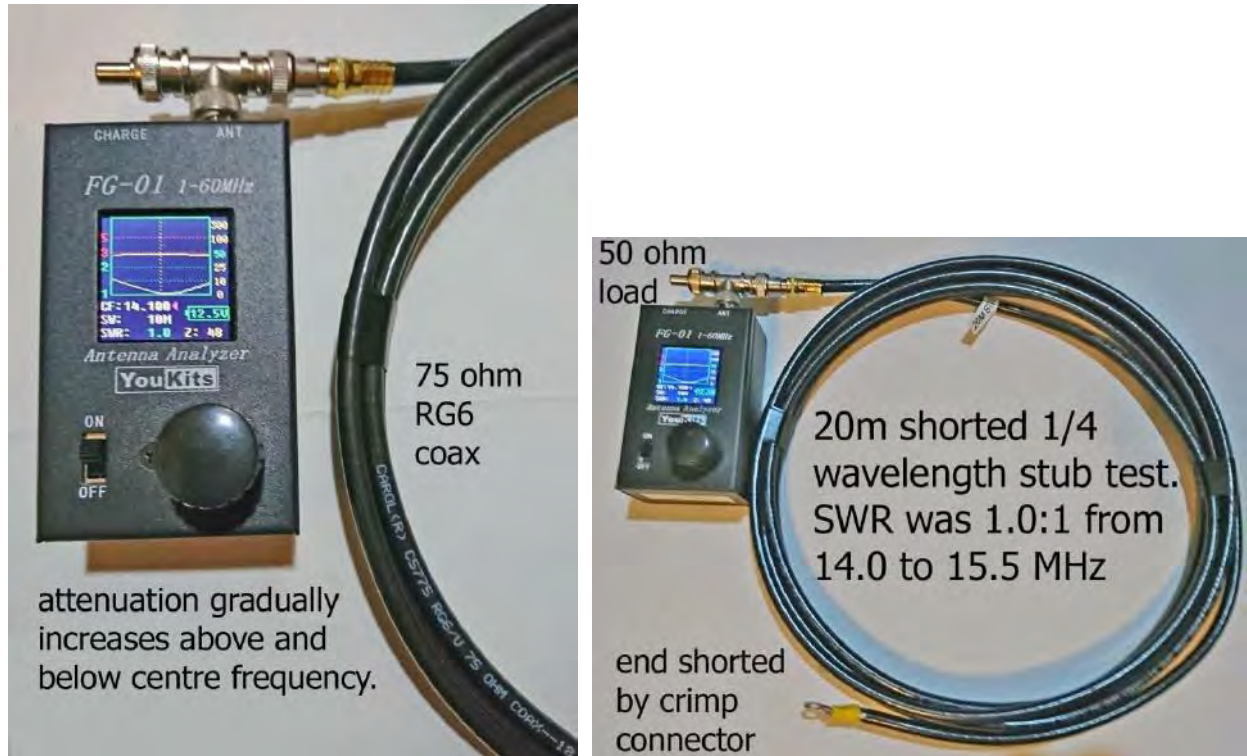
After searching the internet and reading several articles on the difficulty of making precision quarter-wave stubs out of expensive 50 ohm coax, and placing them in precise locations on the station feed line; I almost gave up on the idea of trying to make my own.

The fact is that a multiband antenna is not always 50 ohms on every band, and a transceiver’s internal tuner can compensate for mismatches that may be introduced by the antenna or by attaching a quarter-wave stub. Since I didn’t plan on using a KW, any small coax should work for QRP levels. And why should it have to be 50 ohm coax, I had lots of quality 75 ohm RG6 satellite TV coax laying around. I put an F-connector on the RG6 and then used an F to BNC adapter.

I cut the RG6 for each band, using the formula  $(468 / \text{MHz}) / 2$  to find the length in feet. I didn’t know the velocity factor for my RG6 so I multiplied the result by 0.9 which made it a bit long.

My little YouKits FG-01 antenna analyzer made it very easy to trim the coax to the proper frequency. It can visually display the center frequency for an open quarter-wave stub in real-time also, so I just kept cutting off an inch or so at a time until it looked good while attached to

the T-connector along with a 50 ohm load. Then I shorted the center conductor to the shield braid at the end and used a crimp-on lug, its tab can be cut off and heat shrink used to insulate the end of the stub if desired. After shorting the stub, the exact 1:1 SWR bandwidth can be measured, with a 50 ohm load where the antenna will connect.



Everyone in our group has made a stub for each of the various HF bands they plan on using when we are operating together. I have found that these stubs even work well on the club TS-480SAT at 100W, and have also used them on my KXPA-100 PA when operating my KX3 at 100W. I used a UHF type T-connector on the transceiver/PA output and then used a UHF to BNC adaptor to mate to the stubs.

When everyone is on a different band and all are using their quarter-wave shorted stubs, interference between stations has been greatly reduced (and in many cases, completely eliminated). Also the stub tends to attenuate out-of-band signals from other (non-amateur radio) sources.

Maybe my version isn't as effective as the "real thing"; but it's cheap, easy to make and works well for us. This project proved to me that it's better to try it and see if it works, rather than just accept that the "experts" say it probably won't. Total cost was very low - half a dozen type F crimp-on connectors, one or two F to BNC adaptors, a BNC or UHF "T", and a UHF to BNC adaptor if needed; the RG6 coax was free.

My son was chewing on electric cords, so I had to ground him. It's OK, though. He's doing better and conducting himself properly.



Set of 5 quarter-wave stubs for 10, 15, 17, 20 and 40m bands. I plan on also making one for the 80m band. These are compact and light-weight, and all fit into a small bag (wind some in diameters that can nest inside others). Don't forget to label each stub with the band it is for, as you make them. We will definitely be trying them out during the next Field Day with two 100W club stations; usually one is on SSB and the other on CW or a digital mode.

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## When Life Throws You a Curve Ball

Electrical instruments are not the only means by which the Morse alphabet may be transmitted, for in some instances instruments would be in the way, while in others the wires might be down and communication cut off.

This is interestingly illustrated by an event in Thomas A. Edison's life. When he was a boy and an apprentice telegraph operator on the Grand Trunk Line, an ice-jam had broken the cable between Port Huron, in Michigan, and Sarnia, in Canada, so that communication by electricity was cut off. The river at that point is a mile and a half wide, the ice made the passage impossible, and there was no way of repairing the cable. Edison impulsively jumped on a locomotive standing near the river-bank and seized the whistle-cord.

He had an idea that blasts of the whistle might be broken into long and short sounds corresponding to the dots and dashes of the Morse code. In a moment the whistle sounded over the river: "Toot, toot, toot, toot,—toot, toooooot,—toooooot—toooooot—toot, toot—toot, toot." "Halloo, Sarnia! Do you get me? Do you hear what I say?"

No answer.

"Do you hear what I say, Sarnia?"

A third, fourth, and fifth time the message went across, to receive no response. Then suddenly the operator at Sarnia heard familiar sounds, and, opening the station door, he clearly caught the toot, toot of the far-away whistle. He found a locomotive, and, mounting to the cab, responded to Edison, and soon messages were tooted back and forth as freely as though the parted cable were again in operation.

**From Harper's Electricity Book for boys by Joseph H Adams**

# CORRESPONDANCE

## Thanks to Rod VA3MZD who wrote about CW Practice websites.

. I'm sure I shared this website before but I stumbled on this video today which explains it much better. Vband is a virtual CW practice space which allows you to use your PC, keyboard, tablet or phone to practice your CW and also practice with other hams. There's a Bot which will allow you to practice with a computer using standard CW exchange messages. Using a little fob between your computer and actual key you can practice the real thing with your straight, cootie or iambic keys.

check it out! <https://hamradio.solutions/vband/>

<https://youtu.be/4ciJR-hEyA8?si=cIcWDP1zP6fRUmJs>

I bought a knock off fob which connects the key to the pc or iPad and is much cheaper than the VBand version.

[https://www.ebay.ca/itm/185910278762?mkcid=16&mkevt=1&mkrid=711-127632-2357-0&ssspo=TBu7WZSJRX6&sssrc=4429486&ssuid=EagRS4HZR32&var=&widget\\_ver=artemis&media=COPY](https://www.ebay.ca/itm/185910278762?mkcid=16&mkevt=1&mkrid=711-127632-2357-0&ssspo=TBu7WZSJRX6&sssrc=4429486&ssuid=EagRS4HZR32&var=&widget_ver=artemis&media=COPY)

**Rod Murray**  
**VA3MZD**

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## Mike VE3MKX sent the following:

Want to see how well your antenna is or isn't doing ??  
See the possible challenges that you face to make that contact !!  
check this website out for line of sight and the terrain that you have to deal with !!  
drag and drop or enter specific locations...  
Thanks David for the link !

<https://www.scadacore.com/tools/rf-path/rf-line-of-sight/>

**73 Mike VE3MKX**

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## And more about CW from Mike as well:

Hi , some good **CW info** for your newsletter ! ( **good filler at bottom of his QRZ page** )

<https://www.qrz.com/db/AD0WE>

**73 Mike VE3MKX**



WFD from POTA park CA-5319 Belwood Lake. I operated 1 Oscar ONS from inside my ice fishing hut in the park. Made 25 contacts in 3 hours of operation. The @tuftelndotnet EFRW performed well with the new Xiegu G90 radio at 10watts SSB. It was a chilly, breezy -8C outside the hut so the Little Buddy propane heater came in handy. Had a few visitors including a friend Bryan who was official photographer!

