MAY 2022 Volume 11 Issue 5

VE3ERC-LUB

President: Ted VE3TRQ
Vice-President: Frank VA3FJM
Secretary: Kirk VA3KXS
Treasurer: Paul VA3PDC
Trustee: Wes VE3ML
QSL Manager: Kirk VA3KXS
Repeater Trustee: Wes VE3ML
Website Admin: Ted VE3TRQ
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

In an emergency, tune Into our repeaters,
UHF 444.700 or
VHF 147.390 or
HF 3.755 LSB or
Simplex 147.510
For coordination and assignments.

The Oshawa repeater is down, antenna damaged during the heavy winds. The North Shore Amateur Radio Club had their antenna on this tower operated by Ruralwave/Rogers.

Thanks to Mike VE3MKX for the info.

THE PREZ SEZ!

This club is Radio-ACTIVE

President's Update for May 2022

Summer's almost here again, with Field Day in June, and Lighthouse Weekend in August. The prospect of actually getting together again is most welcome - it surely seems such a long time since we all got to see each other in person. Of course we will miss Al's gentle humor and tasty burger garnish, but hopefully we can all reminisce in person.

By the time you read this, the Elmira Radio Club AGM will be a memory, and we will probably have the same Executive as we did before it! I do hope the upcoming year in Amateur radio will be better, in that we will have their opportunity to do some new activities together - fox hunting, anyone? Or for that matter constructing a fox hunting receiver?

We also welcome back those Club members who went to Dayton for the first time in a few years - I hope they all renewed old acquaintances and met some Hams in person that were only callsigns and maybe voices before. And maybe a bit of "useful junk" also came back from that greatest of flea markets!

And I sure do hope to get back on the morning nets soon - this working for a living is wearing thin!

73 Ted VE3TRQ

An Exotic First Time POTA

By Rod Murray VA3MZD

I did my first POTA activation with Trevor VE7BM this afternoon in Port Coquitlam! Wonderful day in BC, meeting Trevor and doing lunch!

We managed to get 11 contacts in AK, ID, CA, AZ, BC, and SK.
We also did lunch and Trevor so very insisted on the meal being his treat.

Rod Murray
VA3MZD
Fergus, ON

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

(519-787-2279)

Thanks to Graham Bauman VE3BPY for sending this picture.

WEDNESDAY NITE NET CONTROLLERS

APRIL 13 - TONY VE3DWI

APRIL 20 - BRIAN VA3DXK

APRIL 27 - M E E T I N G

MAY 4 - BOB VE3IXX

MAY 11 - TED VE3TRQ

MAY 18 - BILL VA3QB

MAY 25 - M E E T I N G

JUNE 1 - KIRK VA3KXS

JUNE 8 - REG VE3RVH

JUNE 15 - FRANK VA3FJM

JUNE 22 - M E E T I N G

JUNE 29 - TOM VE3DXQ

JULY 6 - TONY VE3DWI

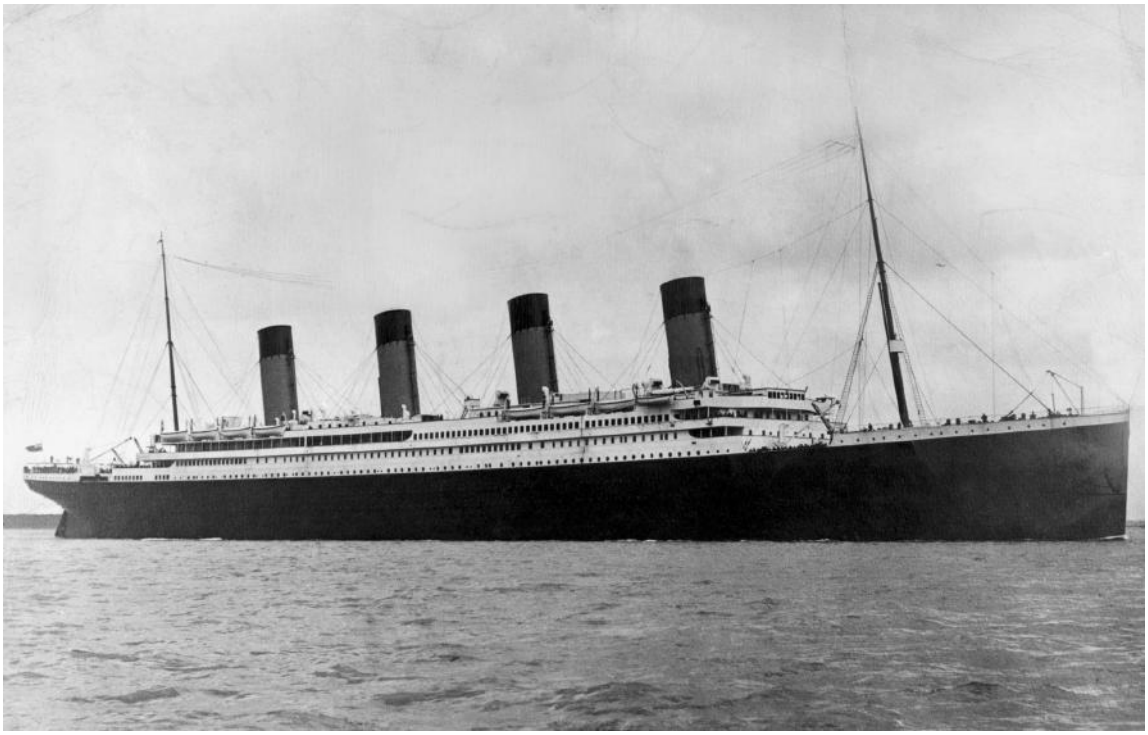
All Keyed Up by

Dan Romanchik, KB6NU

NIST and the Titanic: How the Sinking of the Ship Improved Wireless Communications for Navigating the Sea

April 16, 2022

This post is shamelessly ripped off from the National Institute of Standards and Technology (NIST) website. Before you jump all over me, anything published by the U.S. government is in the public domain.



Historical photo shows RMS Titanic from the side, with four prominent funnels.

If you've seen the movie *Titanic* starring Kate Winslet and Leonardo DiCaprio, then you've watched the star-crossed lovers' untimely end and the tragic sinking of the Royal Mail Ship (RMS) Titanic. What the movie didn't show is that radio played a role in the ship's communication efforts — though it lacked standards that could have saved many more lives.

The tragedy of the Titanic raised awareness that improvements to wireless communication were needed and led to new regulations and legislation by Congress to improve wireless technology, radio equipment and standards for maritime navigation. Leading the charge to make this happen was the National Institute of Standards and Technology (NIST).

The Role of Wireless Technology in the Titanic Tragedy

The RMS Titanic was a luxury passenger liner making its first trans-Atlantic voyage from Southampton, England, to New York City. The ship was an impressive 269 meters long, just a little shorter than the 300-meter height of the Eiffel tower (minus the tip). In the late evening hours of April 14, 1912, the Titanic struck an iceberg about 640 kilometers (400 miles) off the coast of Newfoundland. By 2:20 a.m. on April 15, the ship had sunk, and only about 710 people survived. More than 1,500 people, including passengers and crew, were lost.

Reconstruction of a ship's radio room from around 1910, at the Science Museum in London.

At that time, the use of wireless systems, such as wireless telegraphs, on ships was relatively new. Passengers and crew could use these telegraphs to send messages back to land, and they played a role in ship operations like communicating between different areas of the ship. The technology relied on radio frequencies to transmit telegraph signals as coded messages without relying on telegraph lines.

The wireless telegraph on the Titanic was owned and operated by the Marconi Company and was considered one of the best systems in the world, with a range of up to 1,600 kilometers (1,000 miles). However, the system's electronics created so much "noise" that it disrupted the wireless systems of other ships in the area.

Throughout the day of April 14, four ships — all within 60 miles (96.6 kilometers) of the Titanic — had warned of icebergs in the area. The closest ship, the Californian, was 10 miles (16 kilometers) away when the Titanic's wireless telegraphers sent out the SOS signal for help. Unfortunately, the Californian's telegrapher had been rebuffed by the Titanic's telegrapher earlier in the day for interfering with the Titanic's private messages sent ashore and therefore had shut down for the night. The Carpathia, which was 58 miles away, responded to the signal for help but didn't arrive until an hour after the Titanic had sunk.

The sinking of the Titanic also highlighted the lack of trained telegraphers. Since the wireless technology was relatively new, many of the ships' wireless telegraphers were inexperienced. They had a hard time catching signals sent to them, had difficulty relaying messages and were frequently sending repeats of their messages so they made sense on shore.

This disaster would spur government officials, researchers and lawmakers to address the shortcomings in wireless technology.

International Radiotelegraph Conference and Radio Act of 1912

A few months after the Titanic sunk, the second International Radiotelegraph Conference was held in London to immediately address the technical aspects of radio. Two wavelengths were used at the time, and leaders of the conference agreed the 600-meter wavelength would be used solely for ships at sea. They also implemented rulings to reduce interference from spark transmitters, a popular type of radio transmitter on ships, which used electric sparks to generate brief pulses of radio waves.

Wireless telegraphers turned the transmitter on and off with each pulse to send messages in Morse code. The pulsed or damped radio waves diminish in strength as they travel, and the rate at which they decay is expressed in a quantity known as the decrement. The damped radio waves also have a wide bandwidth with continuous frequencies that diminish exponentially over time. When the measurement of decrement is high, the radio signal becomes broader, increasing the chance for interference from other signals with similar frequencies.

The new ruling set limits with a lower measurement of decrement from spark transmitters, allowing telegraphers to fine-tune or sharpen their receivers to catch the radio signal because it was on a narrower frequency band. The exception to the ruling was for SOS signals, so multiple parties could intercept them.

The rulings from the conference were implemented by Congress on July 23, 1912, through amendments to the 1910 Radio Ship Act. This resulted in the 1912 Radio Ship Act, which required an additional auxiliary power supply on ocean liners, and trained wireless telegraphers with at least two in charge of radio equipment.

Congress also passed the 1912 Radio Act, which required licensing of commercial and amateur radio stations, minimizing interference communication between stations, addressing types of wavelengths used and prohibiting interference in radio communication, to name a few. Congress delegated the task of investigating how to implement these measures to NIST, known at the time as the National Bureau of Standards.

Kolster and the Decremeter

At the aforementioned International Radiotelegraph Conference was the recently hired NIST research engineer Frederick A. Kolster. His first assignment was to attend the conference as an observer and technical adviser to a NIST official, Louis Winslow Austin, who was one of 12 U.S delegates. Austin directed the Naval Radio Telegraphic Laboratory, housed and operated at NIST in Washington, D.C., but owned by the U.S. Navy; it later became one of the founding units of the Naval Research Laboratory.

Kolster also assisted Professor Arthur Gordon Webster of Clark University, who had a paper published at the conference about regulations on using radio communications as a safety aid in navigation. Early drafts of the paper were reviewed by NIST for technical accuracy.
At NIST, Kolster was tasked with designing a device to help ensure radio communications would not suffer interference from other electrical devices on ships. His device, called a decremeter, measured the radio signal's rate of decay, and could be used by inspectors to determine that a ship was complying with the new regulation. The regulation led to the use of damped radio waves with a narrower frequency range that was less likely to cause interference with another ship's communications.

Kolster developed the original device between 1912 and 1914 and then designed a portable version that fit inside a suitcase-like structure, making it easier to move around. Once completed, the decremeter was accepted by the U.S Department of Defense and the Bureau of Navigation, whose functions would later be absorbed by the U.S Customs Service and the Coast Guard.

Other Inventions

During this time, Kolster also developed other instruments to aid in regulating maritime navigations and communications. The Bureau of Navigation needed a radio beacon system to help ships navigate in inclement weather, such as heavy fog or rainy conditions. Kolster designed an improved radio compass — the forerunner to modern aviation landing systems — that let a ship establish its current position by accurately figuring out the direction of signals coming from stations on land.

The technology was ready for deployment by 1915. However, the Bureau of Lighthouses, later absorbed into the U.S Coast Guard, was reluctant to install the beacons until ships were

equipped with the radio compasses. Most ship captains were hesitant to introduce more equipment out of fear that it would further clutter up their ships. It wasn't until around 1919 that an agreement was reached between the lighthouse managers and the ship captains, and the radio compass was officially approved by the U.S Department of Defense and implemented.

Kolster wasn't the only NIST researcher working on maritime navigation. NIST researchers C.W. Waidner and Hobart Cutler Dickinson boarded Navy patrol boats in the summer of 1912 to investigate possible methods of detecting how close or far away icebergs were. One possible method seemed to focus on analyzing temperature variations of the seawater, but their research proved inconclusive. Later in the 1930s, a team of NIST researchers (Frank Wenner, Edward H. Smith and Floyd M. Soule) developed a salinity meter for the International Ice Patrol to help it locate icebergs.

The sinking of the Titanic triggered immediate actions to prevent further tragedies at sea. Though it's not likely that a movie will be made about the safety regulations and laws that followed, NIST played a prominent role in developing the necessary standards and technology to support them.

About the Author

Alex Boss is a general assignment writer in the NIST Public Affairs Office and covers standard reference materials (SRM). She has a B.S. in biology from Rhodes College and an M.A. in health and medical journalism from the University of Georgia. Her favorite pastimes include playing in DC's recreational soccer leagues and drinking chai lattes.

Filed Under: History Tagged With: NIST, Titanic

From the PAST

Before about 1920, 'wireless' tended to mean telegraphy ('Morse'), mainly for shipping. Here is the radio cabin of 's.s. Burwah', fitted with an AWA 500-watt quenched spark transmitter and panel receiver.

Ship's radio room before 1920

Source: Museums Victoria

Public Domain (Licensed as Public Domain Mark)

Thanks to Tony VE3DWI for the following humourous article. Tony wrote:

I think we all know what an "Ugly Balun" is. Maybe a number of us built and used one in our dark past hi… hi. Here is an hilarious description of "how to build and the use of" the venerable U.B.

73, Tony VE3DWI

Ugly Balun

Let's talk about Ugly Baluns.

Some prefer to describe their Ugly Balun as, "I twisted some excess coax into a coil, and things seemed to work a little better."

My ham friend from near London said, "Forget all the dodgy codswallop about this Ugly Balun, mate, have you lost the plot? You're a right boffin, and you'd have to be a bleetin' gormless plonker to bugger one up. For a proper Ugly Balun, coil the ruddy extra coax up and Bob's your uncle." I think he was speaking in a foreign language or secret code.

If you are a true RF In The Shack aficionado, one who prefers to savor one's RF In The Shack but move it decadently to another band or many bands, you simply must experience the pure joy and tantalizing exhilaration of a correctly made Ugly Balun. One must carefully follow the accepted clear, precise, and concise definition of an Ugly Balun, as that is why they work so predictably: A correctly implemented Ugly Balun consists of exactly 7 turns of coax. Some prefer to riskily use three turns and then add three more turns plus a spare, but those on the Metric System will use 7000 milliturns. One must always use a length of coax that is exactly an odd multiple of 3/13 of a wavelength on all ham bands, but not 7/27 of a wavelength on any ham band, except during a new moon and during contests. Wrap your coax gently but firmly around a 4" PVC coupler, being careful not to bruise it. A length of 3" PVC works on Leap Years, and 6" iron well casing is preferred for the 2,200m and 630m bands. An empty gallon glass pickle jar works for acrid RF In The Shack on 40M, and emptying a gallon wine bottle or two can help prepare you for late-night 75M SSB.

Mentioning an Ugly Balun attracts those who brag that they once long-ago installed an Ugly Balun and the very next very day they simultaneously worked DX stations in East Overshoe, Clamponia, Dodecagon, Urgentina, Quinceaguay, Isle of Mah-Na-Mah-Na, and The Republic of Crayola with their radio completely unplugged; I suspect that these may be the same hams who used a gallon wine bottle.

Glad we got that all cleared up!

Mike VE3MKX sent the following:

Fun on 78 GHz

Here is a report from Mike N1JEZ on the trip to South Lancaster ON (FN25sd -- just east of Cornwall) by myself and Rene VE2UG to work him and others set up on Whiteface Mountain (FN34bi) in north-east NY state. We made contacts on both 47 GHz and 78 GHz over the path of 99 km. Note that Rene later travelled to FN35kc to give the guys another grid over a distance of 103 km.

73
Ray VE3FN

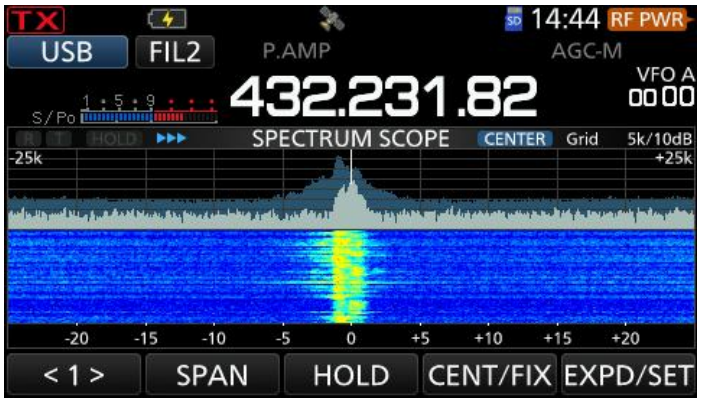
Subject: [10GHz-Up] Fun on 78 GHz

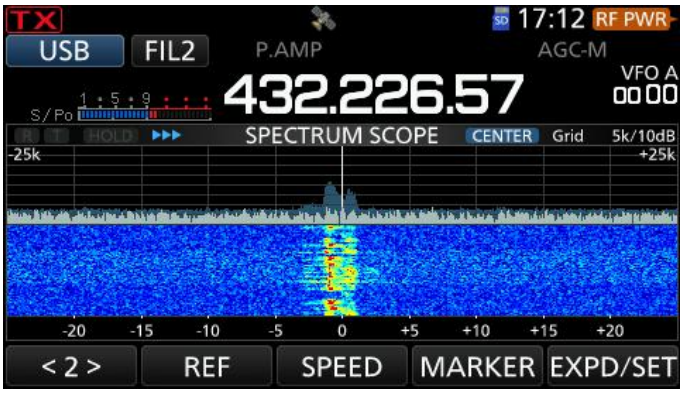
A group of us in Northern New England decided to take advantage of some good conditions to work 78 GHz from WhiteFace Mountain in Northern NY FN34bi to point across the border on Monday 5/23/2022.

The crew consisted of Henry, KT1J Paul, W1GHZ and Mike, N1JEZ on Whiteface and Rene, VE2UG and Ray, VE3FN in FN25SD Lancaster. This path is 96km and LOS.

We had a dewpoint at the Whiteface end in the low 30's. Signals on 78 GHz were very strong. Here's a clip of Rene working me on SSB.

https://drive.google.com/file/d/10pjPgNm_vyPzVsd6NgWhrqK5TJ_bS5dp/view?usp=sharing





Screen shot of Rene's signal on my IC-705 in the morning and afternoon.

https://drive.google.com/file/d/1bgqW9sGmvj2vj0qzVj0Hp-EaoJ7MNmde/view?usp=sharing

I was thrilled to work Ray, VE3FN on CW. Ray has about 10 uW with a mixer only.

Rene was able to work Henry, KT1J who was also running just a mixer. Audio here.

https://drive.google.com/file/d/10TkkHXGXwqRYiwBU_JXu41DZPncgEoFZ/view?usp=sharing

After completing in FN25SD, Rene traveled to FN35KC 103 km. Signals were still very strong. We worked in SSB again. Screen shot shown above right.

https://drive.google.com/file/d/1p-vJCFkI-OrEAj1tjGLfW3NWRyw_KRUY/view?usp=sharing

This is my best distance for W/VE and maybe a new record?

Rene forgot his CW key for 78 GHz, but good old ham ingenuity saved the day. Rene sending dashes :-}

https://drive.google.com/file/d/1bzFDStJCk1sAE3mdpgfLTNkQc97ALhFR/view?usp=sharing

I don't have any pictures. Paul and Rene did take some and might share.

My rig, DL2AM mixer to WA1MBA Amp/LNA Procom 10" dish.
Rene described his rig in the first audio clip above.
Ray, VE3FN runs a mixer to a 1' dish?
And Henry, KT1J has a DL2AM mixer to a 10" Procom dish.

Rene and I have a lot of margin left with our rigs. Our next outing is WhiteFace to Mt Equinox FN33kd at 148 km within the next few weeks.

Paul had a new 47 GHz rig he was testing which worked very well. Maybe he'll share some details. All the 47 GHz contact were very strong as well.

73, Mike, N1JEZ
"A closed mouth gathers no feet"

ERC Elmira Radio Club Inc. – Annual General Meeting Minutes

May 25, 2022

Attendance - Members	**Attendance - Officers**
Bill Reid VA3QB	Ted Rypma VE3TRQ – President
Bob Koechl VE3IXX	Paul Curtin VA3PDC – Treasurer
Bruce McLellan VE3QB	Kirk Sinclair VA3KXS – Secretary
Colin Jones VA3BLW	
Doug Kuhn VE3CXU	**Guests**:
Gary Kornstein VE3JGK	None
James Clayton VA3JIC	
John Linnerth VE3OVO	
Judd Hodge N4WXU/VE3WXU	
Ken Buehler VE3KCY	
Linda Willis VE3CZ	
Marianne Lelieveld VE3MXT	
Mike Willis VE3FE	
Rich Clausi VE3DCC	
Rick Brown VE3IMG/VA3YV	
Rod Murray VA3MZD	
Roger Sanderson VE3RKS	
Teresa Clayton VA3LTH	
Thomas Daniel VA3VRA	
Tom Mahony VE3DXQ	

Meeting Location: Zoom

Meeting Minutes

1. **Call to Order:**
    a. Meeting was called to order by President, Ted Rypma VE3TRQ at 7:30 pm and he welcomed everyone present.
2. **Roll Call:**
    a. Roll call established all who were present and it was noted quorum had been attained.
3. **Approval of Agenda:**

a. Ted noted that the agenda had been circulated prior to the meeting.

b. MOTION to approve the agenda as circulated.

Motion By: Bruce VE3QB

Carried

4. **Presentation**
   a. None.
5. **Secretary Report:** Presented by Kirk Sinclair VA3KXS.
   a. Correspondence Received:
      i. None.
   b. Minutes of the April 27, 2022 meeting were emailed to members on the same day.
      i. No corrections were noted.
   c. MOTION to approve the minutes of the April 27, 2022 meeting.

   Motion By: Kirk VA3KXS

   Carried
6. **Treasurers Report:** Presented by Paul Curtin VA3PDC
   a. Details of transactions for the month of April were displayed on screen.
   b. MOTION to approve the financial statements for April 2022.

   Motion By: Paul VA3PDC

   Carried
7. **Presidents Report:**
   a. Very little to report - too much time spent working, not enough time spent on Radio!
8. **Committee Reports:**
   a. Summer Field Day Committee - Bill Reid VA3QB
      i. Bill plans to meet with Wally again around June 6 to finalize details of using the air field.
      ii. Some funds will be required to rent a porta-potty, buy a lock for the gate, etc.
      iii. MOTION to approve a budget of up to $500 for field day expenses.
      Motion By: Bill VA3QB
      Carried
9. **Unfinished Business**
   a. Repeater Technical Committee - Bill Reid VA3QB / Tony Lelieveld VE3DWI
      i. Ted VE3TRQ has some new coax from Tony VE3DWI and plans to use it to connect a new antenna for the link radios.
      ii. No update from Tony this month.
      iii. Bill VA3QB & Ken VE3KCY have been discussing extending the repeater tower at Ken's location by two sections and adding some concrete to the base.

10. New Business

a. Officer Elections - Ted VE3TRQ

i. Per the bylaws, voting shall be done during the AGM and in the case of an unopposed slate, in which a nominee is the single candidate nominated for a particular office, the nominee is elected by 'acclamation'. This is the case for all executive offices this year.

ii. Elmira Radio Club members nominated for executive positions, all unopposed:

1. Ted Rypma VE3TRQ – President
2. Frank Monteith VA3FJM - Vice President
3. Kirk Sinclair VA3KXS – Secretary
4. Paul Curtin VA3PDC – Treasurer
5. Wes Snarr VE3ML – Trustee

iii. *MOTION to accept the slate of candidates as presented.*
Motion By: Jim VA3JIC
Carried

b. Club Sanctioned Events - Ted VE3TRQ

i. *MOTION to declare that all club-organized activities for the upcoming year are officially sanctioned events.*
Motion By: Kirk VA3KXS
Carried

c. Year-end Treasurers Report – Paul VA3PDC

i. Paul presented the details of the 2021 year-end Treasurers Report and answered questions from the membership.

ii. *MOTION to approve the 2021 year-end Treasurers Report as presented.*
Motion By: Paul VA3PDC
Carried

11. Announcements

a. The next meeting will be held Wednesday, June 22, 2022 via Zoom.

12. Adjournment

a. *MOTION to adjourn at 8:01 pm*

Motion By: Ted VE3TRQ

Carried

Open sleeve 3 band antenna with telescoping elements and one cable connection

By Daniel Romila VE7LCG

Many radio amateurs live in apartment buildings or condos where big antennas are not possible. Even hitting local repeaters to participate in nets can be difficult. Using a handheld with its own rubber duck antenna is a desperate solution. Stepping outside the building is not always possible depending on the weather.

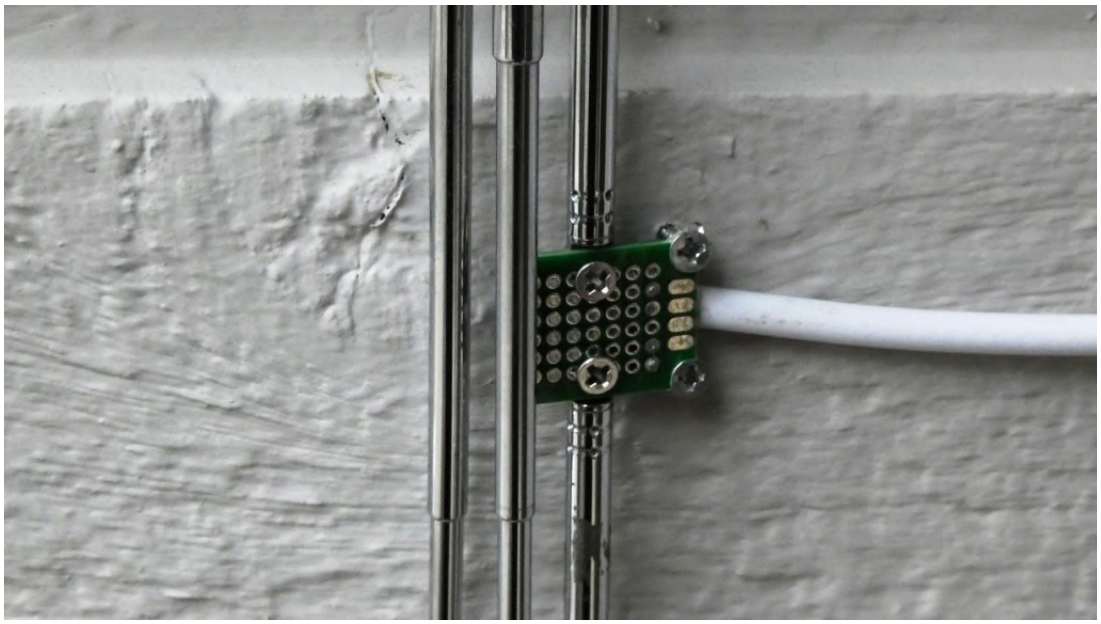
So while something like a Baofeng UV-5R walkie-talkie (3-bands in its last versions) would do, the antenna would not do for maintaining a “social” radio amateur life.

In order to keep things peaceful and respect the building rules, the antenna cannot be seen from outside. To make use of a tri-bander one coax cable is easy to install, three of them would be a difficult task. Using a triplexer would be expensive and again complex.

I decided to do a single dipole antenna, connected with a single coax cable, and use the Open Sleeve concept. In very close proximity, I put two half-wave elements tuned to the two bands but not electrically connected. The final construction was made from telescopic antennas, and looks like the picture on the left.

The main dipole is connected to the coax cable. I had 10 meters of RG58 cable, terminated with SMA connectors, as I need for my Chinese triple-band handheld. Verify what kind of connector do you need for your specific model of transceiver you have.

The whole construction starts with finding a sweet spot on the balcony. You can use an inside wall but I decided to put the antenna outside. My dipole was built from two telescopic antennas screwed on a test dual sided perforated PCB. I found it strong enough for this project and didn’t have to bother to unsolder any of the components on the board.



I want to insist here that finding a sweet spot for the antenna to hit the wanted repeaters is the most important thing, more important than the SWR values

I placed the original one band dipole on a side wall of the balcony. I made the main dipole from telescopic antennas, long enough for the lowest frequency band I intended to use, in my case 144 MHz. So the main dipole is the longest dipole of the three. One can stop at just two bands, or use the same concept for four bands.

I verified the antenna for the whole band of 2 meters, and it worked. I fine tuned the elements, by shortening or lengthening the telescopic antennas. The dipoles have a total length of 950 mm for 144 MHz, 595 mm for 220 MHz and 298 mm for 432 MHz. I will confirm the final lengths tuned for 2 meters, 1.25 meters and 70 centimeters bands at the end of the article. To my surprise the optimum lengths for one band does not influence much the optimum lengths of the other dipoles.

Once the main dipole worked, and was solid on the wall with the coax in its final position, I started to add the open sleeve elements. This time I made each dipole from one single telescopic antenna, since it was not necessary to be broken in two for electrical connections. I installed them on the wall as you can see in the picture. You might find better suited solutions for your particular case.

The three dipoles have to be isolated. Keep in mind the open sleeve antennas have some loss of power. It did not make any

difference for me – I hit the same repeaters with a tuned dipole, electrically connected, as with an open sleeve element, connected just electromagnetically, in the close proximity of a main dipole tuned for another band.

I fine tuned the three-band antenna with a NanoVNA SAA2, version 2.2. I used a computer screen to get a bigger image and in order to be able to take screenshots for this article. I connected the NanoVNA SAA2 with a USB cable to the computer and I used the program called NanoVNA Server. Since I have Windows 11 I can no longer use NanoVNA QT program.

If a computer program is used for NanoVNA the calibration has to be done with the NanoVNA connected to the program, on the computer and stored on the computer. The calibration made on NanoVNA, when used independently has no value for the program and cannot be used.

144-148.cal

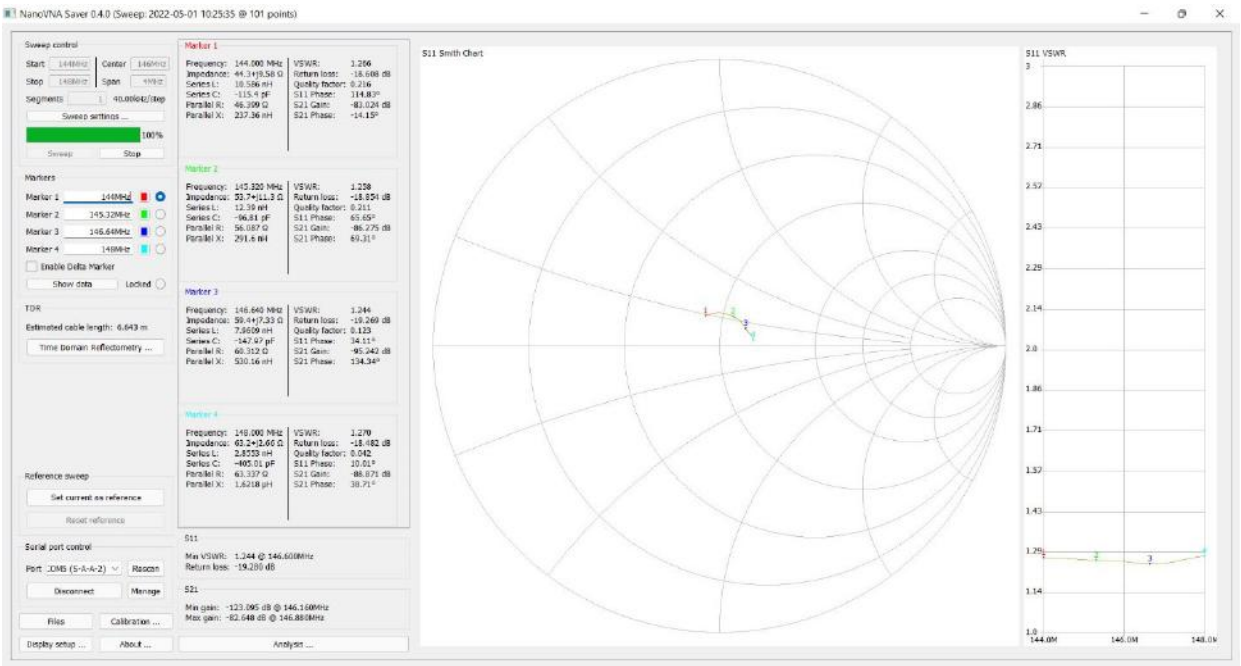
222-225.cal

430-450.cal

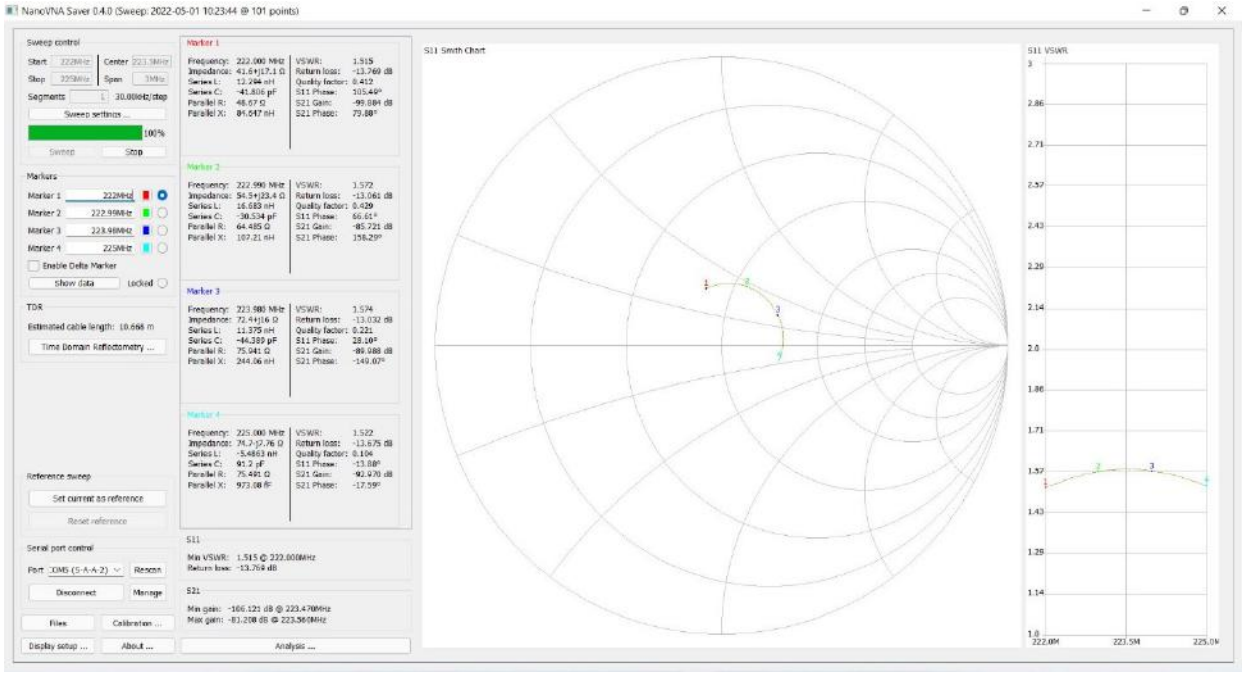
I used the calibration procedure from the NanoVNA Server program and stored the calibration data on the computer. It is better at first to decide the sweeping range as needed, for example 144 MHz to 148 Mhz for the two meter band, and execute the calibration after the stimulus start and stop has been imposed. Please see how to use the NanoVNA Server program, or the program of your choice, or simply the NanoVNA independently if you have it but do not want to use a computer.

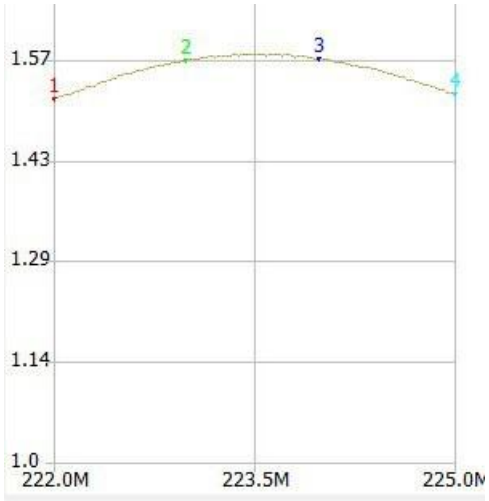
The purpose of this article is the antenna description, not NanoVNA software. I just want to mention here that I limited the measurements to the ham radio bands because the measurements points are spread from the stimulus start to the stimulus stop frequencies. I want to have as many as possible measurement points inside my useful interval, not outside.

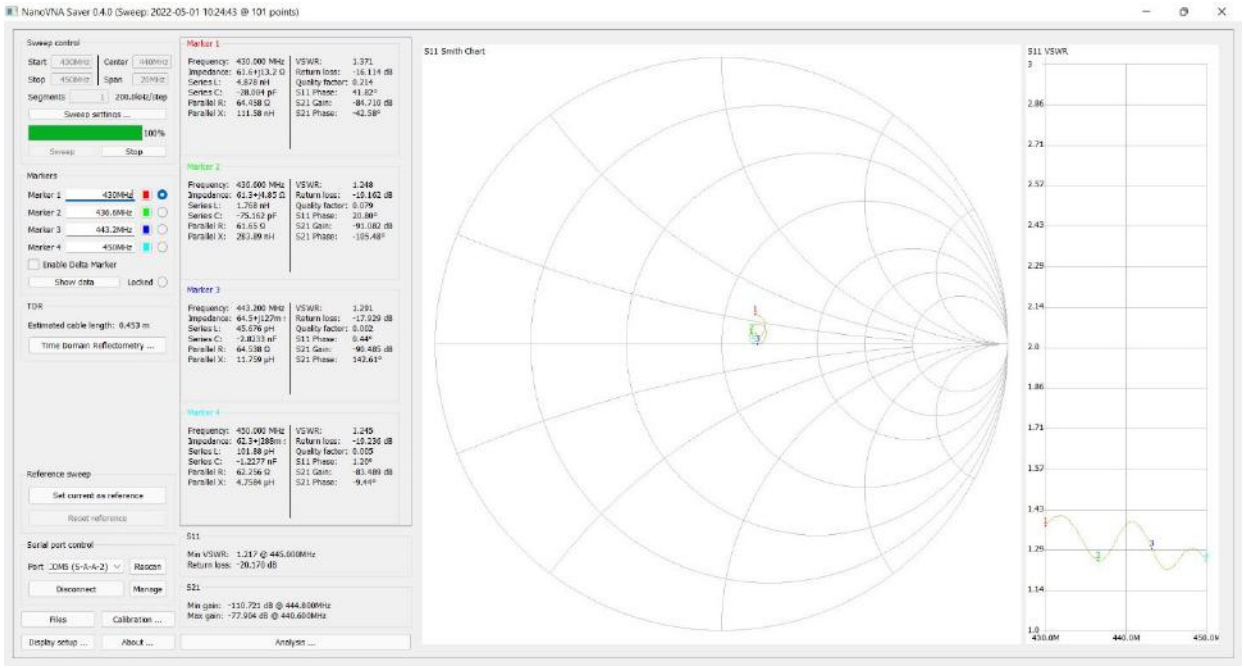
Here are the results:

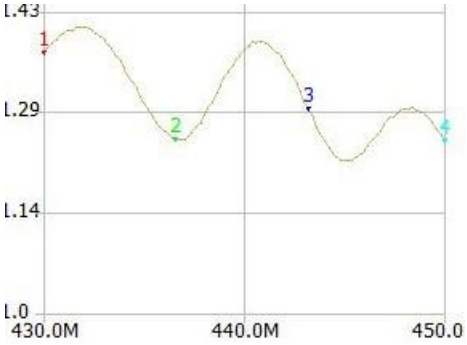



1.29
1.14
1.0
144.0M
146.0M
148.0M


NanoVNA Saver 0.4.0 (Sweep: 2022-05-01 10:23:44 @ 101 points)
Sweep control
Markers
TDR
Reference sweep
Serial port control
S11 Smith Chart
S11 VSWR


1.57
1.43
1.29
1.14
1.0
222.0M
223.5M
225.0M





SWR was under 1.26 for the 2 meter band, under 1.59 for the 1.25 meter band and under 1.40 in the 70 centimeters band. The last open sleeve element, the 70 centimeters tuned one can be omitted, but in this case the SWR would have bigger variations inside the band. The same about the seen impedance. You see in the last graphic my placement of the 70 centimeters dipole was not exactly symmetrical, due to the wall constraints.

The open sleeve element method can be an easy way to add the 220 MHz band to an existing 144 MHz dipole. Telescopic antennas permit easy adjusting for best SWR if you have an antenna tunning instrument, like NanoVNA.

I also tried 3 electrically connected dipoles, each one made from 2 telescopic antennas. The SWR and loss values are better for 3 electrically shortcut dipole antennas than for the open sleeve method. For small powers (less than 50 Watts) using a triplexer is not justified and damages the losses. But this is not the subject of this article.

Just as a note, the computer programs allow the display of nice SWR values, with several decimals. Do not believe anything after the first two decimals. If you obtained something too close to one, like 1.009, that means the computer program is way above what the NanoVNA tool, whatever version you would use, especially the first version of NanoVNA, can know to measure. Look in the tool specifications. Remember that the measurements are not done continuously in the ham radio band, but only in a limited number of frequencies. The same happens with the calibration, so you have an idea about reading the SWR values with 3 or more decimals. It is important to establish the stimulus range first and perform the calibration after, but that only partially compensates the limitation of

NanoVNA, with limited number of points of measurement, only 101 if the NanoVNA is used independently. This is totally insufficient for adjusting a repeater, because the limited dynamic range and because of the probability of getting the best tuning of filters exactly between two adjacent NanoVNA measurement points, so never to be able to see and never be able to get to the optimum for that filter/repeater.

As promised, here are the optimum lengths I found for the three dipoles, in order for readers to quickly find them when building this antenna. The dipoles have a total length of 950 mm for 144 MHz, 595 mm for 220 MHz and 298 mm for 432 MHz.

Thanks to Rick VE3BK and Mike VE3MKX for the following:

PLASTIC ANTENNAS DO NOT WORK

As a joke, someone posted the following to a Facebook ham radio group.

73 Mike VE3MKX

"I spent all morning trying to get my mfj automatic antenna tuner to tune my rain gutter and couldn't get it to work. Could it be the type of coax or is maybe the wrong type of plastic gutter?"

Some of the responses this received are collected below. I'm including the funny ones. I skipped the people who didn't get the joke or just responded with "are you serious?".

Ivan Ferrol

"Are the down spouts touching the ground. That's probably it"

Richard Lomax:

"Use a flux capacitor to adapt to the non metric radio waves."

Kenny Martin:

"wait till it rains and recheck the swr."

Dave Moes"

"Everyone knows that plastic gutters require plastic coax, not that silly stuff with copper in the middle."

Leon Noel:

"You forgot to get last years Christmas lights plugged back in. Gotta have those lights working. Another thing that helps, is to scrape all the paint off your house especially if you have one that has paint containing lead. All that lead in the paint will short out your gutters. You need to have that guttering as far away from any other metal as possible. And if your house has a metal roof, then your gonna need to take that off as well."

John Scotter"

"Plastic is always resin  "

Jason Straatmann

"Haven't you heard? Propagation is in the gutter.

"The problem is the glaxitor coefficient. You will need to use a scliomite connector with a non neodymium flux-aton to gain a matching flop bucket. It will

tune right up."

(The secret sauce: Add more plastic radials.)"

Tim G Arnold Sr.:

"I would add 20ft of hose pipe as a ground plane !"

Jim Roe:

"Will work if you add a 1 KW amp"

Will Kleyboecker"

"Plastic that's good for FT8 isn't it? LOL"

Eric Johnson"

"Ladder line may be a better bet for plastic gutters"

Andrew Barnard"

Rick Danby VE3BK also sent the following information:

Innovation, Science and Economic Development Canada has approved the use of special call signs from **May 15 to July 14**. These dates correspond to the early summer busy operating season and will be available to all Canadian Amateurs who wish to use the special call signs on all occasions in including Field Day, the June VHF Contest, the RAC Canada Day Contest and the IARU World Championship.
To use the special call sign, substitute the prefix normally assigned to your province or territory by the special prefix shown in the following table. For example, VE3 becomes VX3, VA7 becomes VG7, and YV2 becomes XK2, and so on.

For more information on the Platinum Jubilee visit:
https://www.canada.ca/en/canadian-heritage/campaigns/platinum-jubilee.html

Province and Territory Prefixes	Special Event Prefixes	Province and Territory Prefixes	Special Event Prefixes
VE1 (NS)	VX1	VE7 (BC)	VX7
VA1 (NS)	VG1	VA7 (BC)	VG7
VE2 (QC)	VX2	VE8 (NT)	VX8
VA2 (QC)	VG2	VE9 (NB)	VX9
VE3 (ON)	VX3	VO1 (NF)	XJ1
VA3 (ON)	VG3	VO2 (LAB)	XJ2
VE4 (MB)	VX4	VY0 (NU)	XK0
VA4 (MB)	VG4	VY1 (YT)	XK1
VE5 (SK)	VX5	VY2 (PEI)	XK2
VA5 (SK)	VG5	CY0 Sable Is	N/A
VE6 (AB)	VX6	CY9 St-Paul Is	N/A
VA6 (AB)	VG6		