



Q5er – The Official Newsletter of the Skyview Radio Society

Swap & Shop Sunday, August 25, 2024



2024 SKYVIEW RADIO SOCIETY SWAP N SHOP!

SUNDAY AUGUST 25, 2024 8:00am until 1:00pm
LOCATED AT OUR CLUB GROUNDS NEAR NEW KENSINGTON PA
Aprox 13 miles northeast of Pittsburgh
2335 Turkey Ridge Road
New Kensington, PA 15068
Talk-in 146.640- 131.8pl
Admission \$5.00 – Table space is \$5.00 (Bring your own table)

Great prizes
Door prizes
Begali CW key raffle
Breakfast and lunch served
Get your Skyview Burger and your Skyview Dipole Hotdog!
Contact: John Italiano WA3KFS - 724-339-3821
K3mjw@arrl.net
<https://www.facebook.com/SkyviewRadioSociety>
Location is near the intersection of Rt. 366 and Rt. 380
GPS Coordinates : 40.51761, -70.67714

2024 is Skyview's 64th Anniversary !!

August 1, 2024

- ARPS Back in Business
- Goodbye Old Door
- Edward T Karsin
- Uniontown Gabfest
- Old Problems - New Fixes
- Hakko Hot Air System
- Skyview VE Sessions
- WA3PPD / K3MOB
- Another Collectable
-
- And More

Sunspot Numbers Peaking

Time to exercise
the 10-12-15-17-20
Meter bands While
They are Hot

Inside this issue:

FROM THE EDITOR	3
BUSINESS MEETING MINUTES	4
WAS IT WORTH IT?	6
THE DREADED REPLACEMENT	15
DEMYSTIFYING SWR	18
MAGNETIC LOOP ANTENNAS	30
BUILDING YOUR SHACK - PART 4	39
NEW MEMBERS	43
KUL-LINKS	44



The Skyview Radio Society Clubhouse is the “Every Tuesday Place” . . .

Something is going on at ‘the joint’ each and every Tuesday evening, from about 1900 hours to whenever.

See the general schedule of Tuesday events on the Skyview Web Page: <http://www.skyviewradio.net>

For the latest up-to-date plan, check the Groups.io Reflector at : <https://groups.io/g/K3MJW>

Directions are on: <http://www.skyviewradio.net>

Guests are always welcome !!

From the Editor

Nice variety of articles this month.

Thank You Authors. We would not have this newsletter without your articles.

Hope every reader finds something of interest in this issue.

Jody - K3JZD

Remember: The number of people older than you never increases, it only decreases

Ham Radio is a Contact Sport

From the Treasurer

Our Annual Swap & Shop is here.

It is our only fund raiser of the year.

Please buy the advance Entrance Tickets that John - WA3KFS distributes. Those are to protect us financially in case we have a bad weather / bad turnout day. Use them yourself for the door prizes or give them away.

While a lot of the jobs during the Swap & Shop are handled by the folks who have done them for years, let John - WA3KFS know if you would like to help out somewhere on the day of the event.

Of course there is always room for more help during setup on Saturday morning and clean up on Sunday afternoon.

And be sure to show up on Sunday and buy some Main Prize Raffle Tickets, some Begali Key Raffle Tickets, and some 50-50 Tickets. Oh yeah, there will be great Breakfast and Lunch food for you to buy while you are there.

Jody - K3JZD

ADVENTURE: The respectful pursuit of trouble

Skyview Radio Society is recognized by the Internal Revenue Service as a charitable non-profit organization under Section 501(c)(3) of the IRS Code. Donations to Skyview are tax deductible to the extent permitted by law.

Continue Use the Skyview Facilities At Your Own Risk - It is Not Really Totally History Yet.

Follow <https://groups.io/g/K3MJW> for COVID updates.

Growing old is mandatory; growing up is optional. – Chili Davis

June 2024 Business Meeting Minutes

de Don - WA3HGW

Skyview Radio Society

Monthly Business Meeting – June 4 ,2024

Call to Order: 7:30 PM by President Brian Manley, K3ES.

Attending – 31 Members: N3WMC, KC3CBQ, K3ES, KC3PXQ, K3JAS, KQ3S, NJ3R, AB3IK, K3JZD, K3STL, KC2EGC, K3WWP, W3IU, KC3VCX, WU3U, AG3U, AC3Q, KA3CBA, AG3I, K3FAZ, KB3DVD, KC3VNB, AB3GY, NM3A, AW3KFS, WA3HGW, W3UY, WC3O, AJ3O, WQ3Q and KC3DB.

Prior Meeting Minutes: The minutes of the May 7, 2024 meeting were distributed for member review. A motion to accept the minutes as presented was made by N3WMC and seconded by KC3PXQ. The motion passed without objection.

Treasurer's Report: Treasurer Jody, K3JZD, reviewed the Financial Report of 31 May, 2024. May fixed expenses were all the normally expected bills. The fixed expenses account is in good shape for the remaining months of the year. Additional expenses included Rest Room remodeling (drywall materials and installation, doors and trim). Income was from the May 50/50 drawing, VE exams, T-bill interest, plus a \$1000 donation from KC3FWD. A motion to accept the Treasurer's Report as presented was made by NM3A and seconded by KB3DVD. The motion passed without objection.

Membership Report: Tom, AB3GY, advised there is one new membership. AB3GY made a motion to open the membership rolls, which was seconded by WA3KFS. The new application is from Dan Barrett, KC3DB, an Amateur Extra class from Irwin, PA. AB3GY made a motion to accept which was seconded by KC2EGL. The motion passed without objection. AB3GY made a motion to close the membership rolls, which was seconded by NM3A. The motion passed without objection. Membership now stands at 153.

Radio Officer Report: Bob, WC3O, reported that everything is up and running well. All of the rotor control units were repaired, and a spare controller was sourced at the Dayton Hamvention. Additional tasks pending are replacement of the lift cable on the crank-up tower and refurbishment and installation of the ring rotor. We have the parts, just need time and manpower to get the work completed. Bob also discussed setting up for Field Day and also the upcoming Breezeshooters Hamfest this weekend. Breezeshooter help is needed for setup on Saturday and tear down on Sunday. All coming for setup on Saturday are invited to come for breakfast at the Country Kitchen on Route 8 at 8 AM.

Kitchen Report: Bob, WC3O, said there is about \$120 in the kitchen fund.

VE Report: There was one new Technician at the May VE test session. Presently there are four persons pending for the next VE session on June 15.

Newsletter: The June issue of the *Q5er* is out with 32 pages of great information. Thanks for all the members submitting articles. Jody is looking for even more submissions by July 15 for the August issue.

Facilities: No report. Dave, N3TIN, was not in attendance tonight

Building Committee: AG3I reports the doors, trim, grab bars in the restrooms and some of the lighting is installed. Door and trim painting is underway. Thanks to volunteers KC3CBQ and WA3HGW for the painting. Once painting is finished the next task is installing the flooring. Marty is looking for someone who can install the QVP flooring.

Operating Events Recap: No report this month

Q5er – The Official Newsletter of the Skyview Radio Society

Calendar of Events:

July 1 through 7 – 13 Colonies Special event. Operations from K3LR on July 6.

July 7 – Somerset K3SMT Hamfest.

July 16 – Ice cream social at the clubhouse.

August 3 & 4 – Pittsburgh Vintage Grand Prix, Schenley Park.

August 10 – W3PIE Uniontown ARC 73rd annual Gabfest.

August 17 & 18 – Westmoreland County Air Show at Arnold Palmer airport.

August 20 – Korn Roast at the clubhouse.

August 25 – Skyview Radio Society annual Swap & Shop. Set-up on Saturday August 24.

Old Business: Nothing at this time

New Business: Nothing at this time

Swap & Shop Report: John, WA3KFS, reports that pre-sale tickets will be sent to members in the next few weeks. If possible, pick up your tickets at meetings to save the club postage. The pre-sale of tickets to members will cover the basic expenses for the Swap & Shop should regular attendance be curtailed for any reason. It is suggested you give your additional tickets to non-hams or others who may be interested in electronics or ham radio in general.

Weather Night:

June 13 – Moved from Tuesday to Thursday evening. A tour of the NWS office in Moon Twp. at 6:30 PM sharp. Be at the office well before 6:30 to have time to sign in. There will be a weather balloon launch at 7 PM. Optional meet for dinner at the Eat & Park on University Blvd at 4:45 PM.

July and August – Special weather programs are under development. Stay tuned for exciting announcements!

Elmer Night: June 25. Field Day preparation. Radio and antenna setup and N1MM logging software review.

Net Report: Check-in numbers averaged 41.4 in May. Participation was down slightly due to so many members being at Hamvention one week.

50/50 Drawing: The 50/50 total collected was \$50. The winner of \$25 was Cousin Joe, PC3PXQ who donated his proceeds back to the club. Thanks Joe!

Meeting Adjourned: A motion to adjourn was made by WA3KFS and seconded by AJ3O. The motion passed without objection. The meeting was adjourned at 8:07 PM.

Respectfully Submitted,

Don Stewart – WA3HGW
Secretary; Skyview Radio Society, Inc.

(July 2024 Minutes Not Available)



Skyview APRS Fixed

de Cooky - WC3O

To tell you the truth I've never been into APRS, Automatic Packet Reporting System. For one thing that packet noise just bugs me, Yes, I know you can turn it off. It's just that I'm an HF kinda guy.

We've had an APRS station at the clubhouse for many years. It's located in the repeater shed. About all I do is see to it that the igate program is running on the computer. I do have peeps that do know all about APRS and I rely on them to keep things working in that department.

A long time ago Lenny, KB3LNC gave the club a box of old Motorola GM300 mobile radios. Lenny programmed all of the radios to the APRS frequency, 144.390. The GM300 radios are commercial grade and have a little 16 pin connector on the rear that has all of the goes-indas and goes-outas needed to allow easy connection to a TNC (Terminal Node Controller) and this makes them great radios for APRS duty.

The only problems with the connectors are that the terminal pins are tiny and hard to work with. The other problem is the connector locking tab is difficult to manipulate making it very difficult to remove the connector once it's inserted.

The radio to TNC cable that we had was a mish-mash of mickey moused wiring and was not robust and prone to breaking. We recently noted that our APRS station FM deviation was way below spec and making it difficult for other APRS stations to decode our signal.

While Bob, AG3U and Curt, WU3U were working on our other issues I decided it was high time to make a radio to TNC cable that would be rugged and dependable.

Enter EBAY!

I found someone selling the Motorola 16 pin connector with all 16 pins wired into a single cable. Simply pick out the wires that you need and snip the ones that you don't. This means I don't need to worry about proper crimping of those tiny little terminals. Perfect!

I needed to connect the other end of the cable to a male DB9 connector that will plug into the Kantronic KPC-3 TNC. While the DB9 connectors are not too hard to solder to, it is still challenging (Read a pain in the ass) to



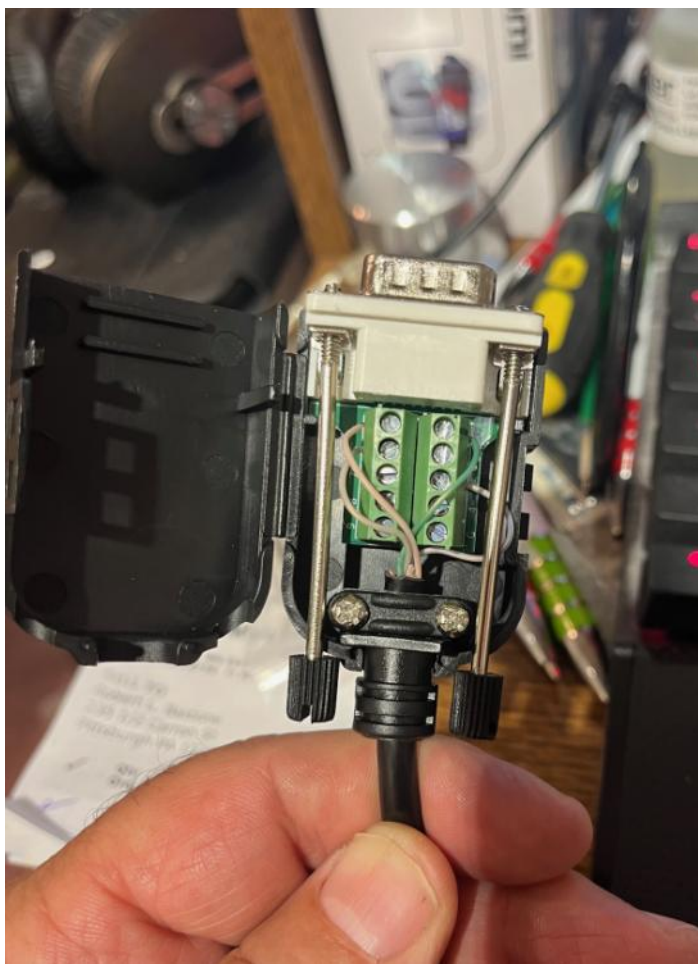
connect test equipment to for checking voltage levels and so forth.

Once again - Enter EBAY!

I found someone selling DB9 connectors that have a small screw terminal board and it all fits within the connector shell. It even has a great strain relief arrangement. Simply strip the wire, stick it in the correct numbered terminal cavity and tighten the screw. The screws also provide a great place to probe for signal levels. Perfect!

Assembling the cable was a breeze. Audio in, audio out and PTT. It is rugged and dependable.

There is even enough room under the hood of the DB9 to add a de-coupling capacitor to help isolate the APRS audio signal. Shweet!



The last issue is how hard it is to remove one of these Motorola 16 pin connectors once they have been inserted. To fix this issue I did the same thing that I do with those pesky 4 pin power connectors that are used on many modern HF radios. I either file down or cut off the retainer barb. SNIP! GOOD BYE retainer barb! With there being all 16 pins in this connector there is easily enough tension to keep the connector from accidentally being pulled out. No need for the barb.

Since then our low deviation issue has been resolved (TNX AG3U) and we are back in the APRS Business! Keep a look out for K3MJW-2! It's all the buzz.

Perfect!

de Cooky - WC3O
Skyview Radio Officer

Goodbye Old Door **de Cooky - WC3O**

When one door closes another door opens.

With the restroom remodeling came a new entrance door. The old door got moved to the pavilion where it awaited its disposition. With Field Day coming it was time to clean up the pavilion, and the old door.

The old door got dropped off down at Greco Scrap in Tarentum. I pulled the old door out of my truck and set it next to a dumpster. As I went to drive away I stopped, took a picture then thought about all the things that old door saw.



I got to thinking about all of the now silent keys that passed though that door. Bill Bell, W3RSR, Bob King, W3GH - Daniel Rabinovitz, K3ISO - Bob Siksa, K3OFX and many more. Plus all those that are still with us including Piero Begali, i2RTF - Tim Duffy, K3LR - Gerold Youndblood, K5SDR of Flex Radio when he visited Skyview along with Juan Manfredi, NA0B one day,

All the Field Days, contests and just everyday stuff up at the clubhouse. Walking into the warm clubhouse on FREEZING winter day to the sound of RTTY playing in the radio room. Even the police every time that alarm went off by accident!

So now there's a new door. I can only wonder who will pass through it next. Or maybe I'm thinking too much about this! hihi

So long old door. Thanks for the memories.

de Cooky - WC3O

Was It Worth It? Yes and No

de Charles - KC3TTK

Before I start, I just want to say that this article is for educational purposes only. I do not accept any responsibility for you breaking any of your toys. If you chose to try this, you accept all the risk.

Everyone knows about the Baofeng HT a \$25 HT that has helped many hams get onto the air for the first time. I know these radios are the bane of some operators' existence. I have said it before and I will say it again, the \$25 price point really does open the door for a lot of new operators to decide if the hobby is right for them. Well recently there is a new kid in town. Made by another Chinese company, presumably in the same factory as the Baofeng. It is the Quansheng UV-K5.

Two months ago, these babies were selling for under \$25 dollars. My first thought was it is just another cheap HT and I kept scrolling. Then I started seeing articles and videos about how "hackable" these radios are. I took the bait and clicked.

There are a few people turning these 25-dollar handheld UHF/VHF transceivers into HF receivers.

All it requires is a small, printed circuit board, which cost \$6 and some new firmware which costs zero.

After watching the videos about the modification, I wanted to document my experiences with this project. It seems like everything is on a video anymore and there are less and less write ups about these types of projects. This will be my attempt to document this project in writing.

Off to the dregs of the internet to order some Chinese Junk. Credit card in hand, browser set to stun: E-bay and Amazon here we come.

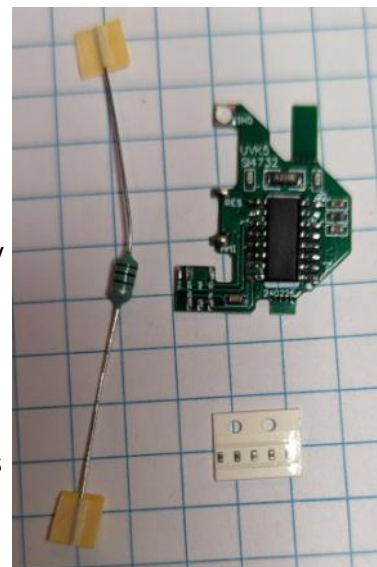
Here is a picture of the Quansheng UV-5K another low priced, entry level, unremarkable radio. It is weird how it has a very similar model number to the Baofeng (UV-5K vs UV-5R)



Here is the kit your purchase. The heart of this kit is a SI4732 integrated circuit. The datasheet for this particular circuit is impressive. It seems like an all-in-one AM/FM/SW/MW/SSB receiver.

I think it is the main component of a lot of the cheap SDR receivers that are on the market. In this kit you receive one printed circuit board, one inductor, and 5 capacitors. You get 5 but you only install one. They are rather small and are easily lost.

Now that we have all our parts its time to open our patient.



This radio comes apart remarkably easily. Remove the battery, volume knob and antenna, then pop the case apart with some sort of appropriate prying device (not a screwdriver).

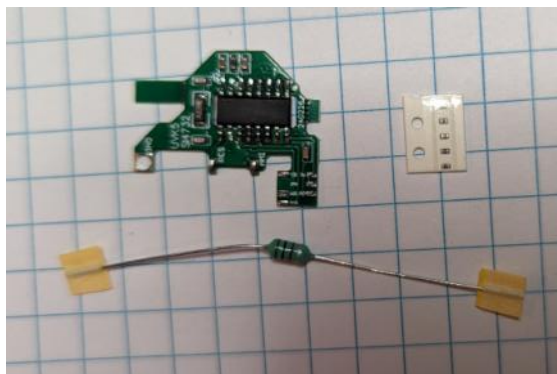


Q5er – The Official Newsletter of the Skyview Radio Society

Here are all the parts in a pile. There is the antenna, volume knob, battery, case, PCB assembly, a cover plate for the headphone jack and the keys. Upon initial inspection its plain to see how they can charge 25 dollars for a radio. There are very few parts, and the build quality is not great.



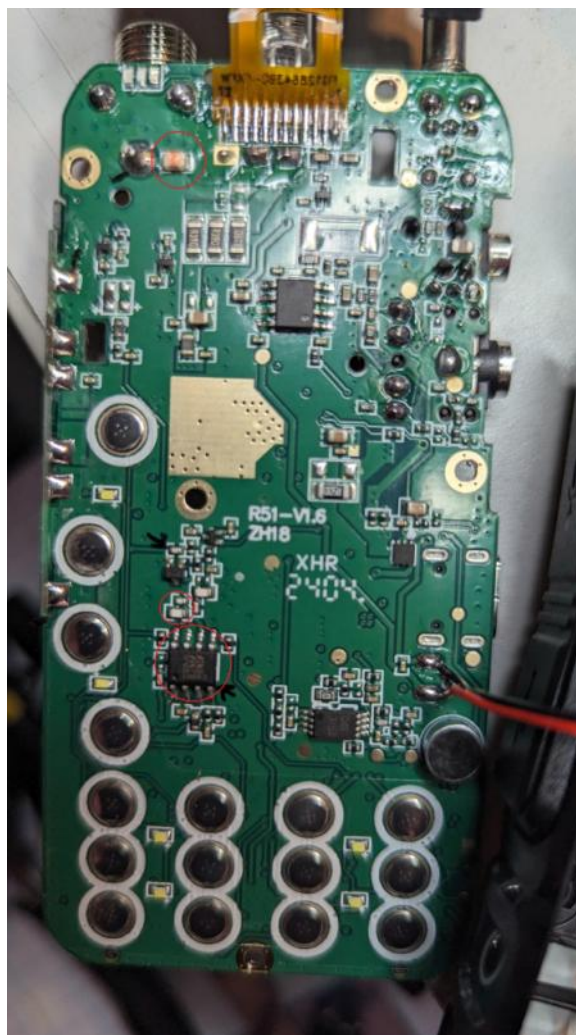
Now what? You have this radio torn apart on your bench. A tiny envelope showed up from overseas. It was the replacement parts.



There is a small PCB with a mess of components on it, an axial inductor and a five pack of what I think are 0402 capacitors. You only need one capacitor for the modification; the makers of the kit assume you will lose a few doing the modification. This was a good assumption because I lost two of them. One fell into my keyboard and the other, well it was on my bench and then It disappeared.

The next step in the process is the removal of some components.

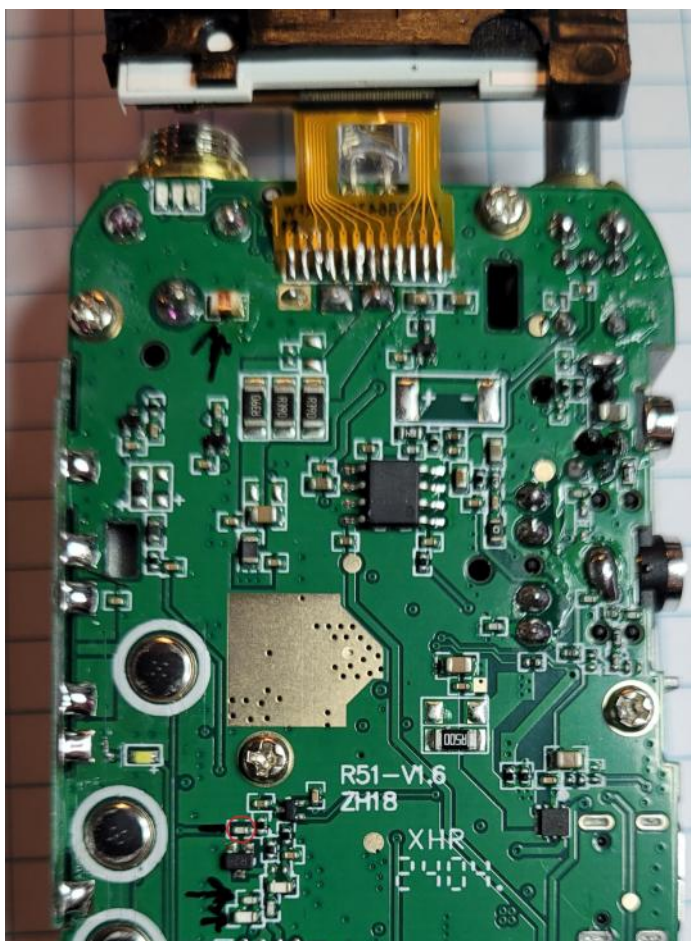
There is an inductor and two capacitors that need removed, along with an 8 pin IC. The pads on the tiny new PCB will be soldered onto the same place as the IC was removed from. The components are circled in red in the image below.



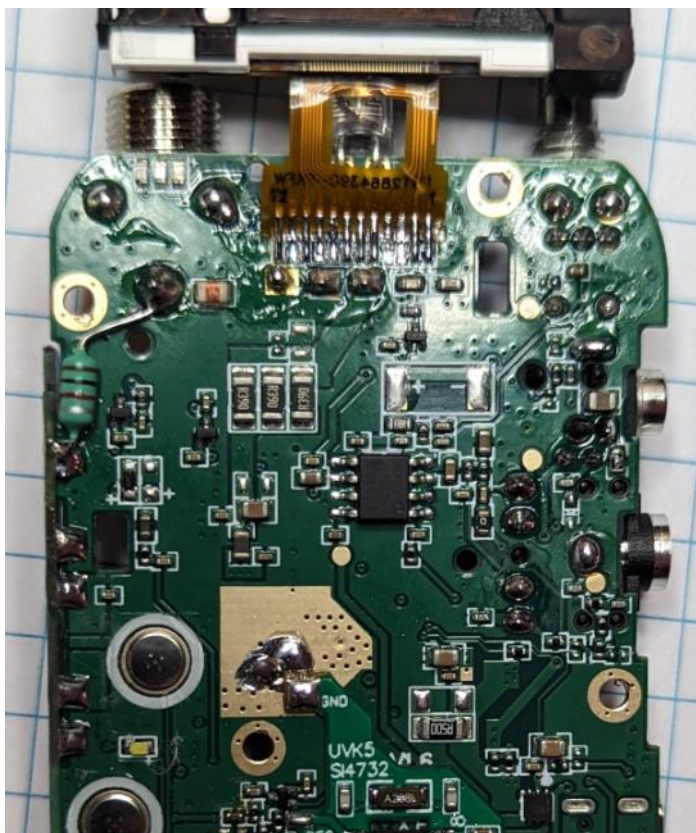
A word of caution here. Whatever method you chose to do the removal keep in mind that the board the radio is made with is very low cost. This means the traces are thin and are easily lifted from the board. The Inductor (near the top of the radio) was difficult to remove. I ended up accidentally just snapping it off. You will have to flip up the LCD to remove the inductor. The flat flex cable that attaches the LCD to the main board is extremely brittle.

Next there will be the capacitor you have to replace. This capacitor is the antenna port and the IC.

You will remove this capacitor and replace it with one of the supplied capacitors in the kit. The capacitor is circled in red in the image below.



Once that capacitor is replaced it is time to solder in the new inductor.



You can see in the image that there is a screw removed, and I did not mention that earlier. There is a reason for that I will elaborate on later. The keen observer will also notice that the inductor that is not removed. The reason I am documenting this is because I did some of these steps in the wrong order.

Here is a picture of all the components that were removed. The graph paper has 0.25 inch squares which gives an accurate scale for how tiny these components are



Now it is time for the next major step. Soldering on the new daughter board. There are a couple of tabs that need removed from the daughter board. They are easy to identify by the perforations on the board. The 8 pins that match up to the IC spot need to be soldered, along with the ground connection at the top.



There are two additional connections that need to be made between the daughter board and the radio. On the daughter board they are marked "ANT" and "RES" there needs to be a connection made with small gauge wire (I used 30 AWG) between these points and the points marked below.



When it is completed, it looks like this.



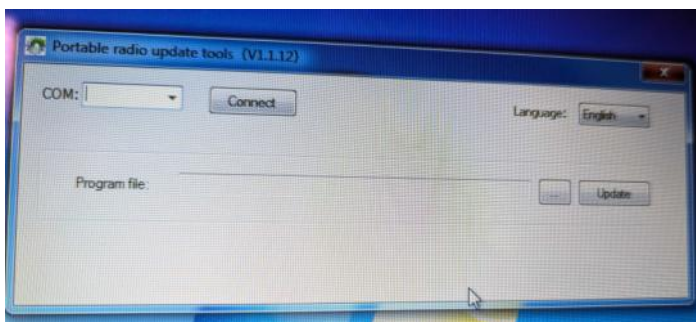
This should be the last step in the hardware modifications. Put your radio back together in the reverse order you took it apart. Don't forget the little bezel that goes over the audio jacks on the side. I forgot this about 10 times.

Now on to the firmware upgrade.

You need three things. The firmware upgrade tool, a programming cable, and the firmware

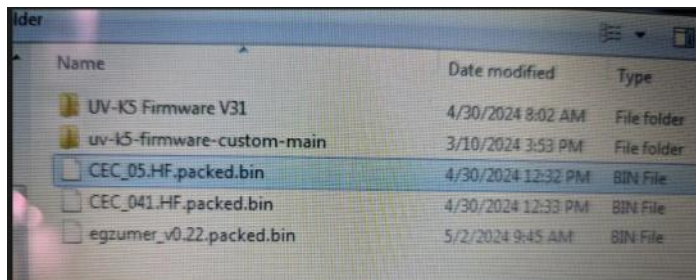
The firmware upgrade is tricky. Not from a technological standpoint but from a risk standpoint. If you are fortunate enough to have a 15-year-old windows computer laying around to put garbage software on, that is what I would use. Luckily, I have an old Dell for just such an occasion. If you find yourself interested in performing this modification and don't want to risk giving your computer an STI, I will be happy to let you use mine for the occasion.

The tool is called "AnonymPortableStationCPS" if you put that in your favorite search engine you will find it. Unzip and install at your own risk. The software is strange. There is nothing in the EULA, Nothing! Totally blank. Maybe the software is totally benign. Not sure if this is the right adjective but I will continue. Download and install the software from the Quansheng website or wherever you are most comfortable downloading software from. Once the software is installed open the program.



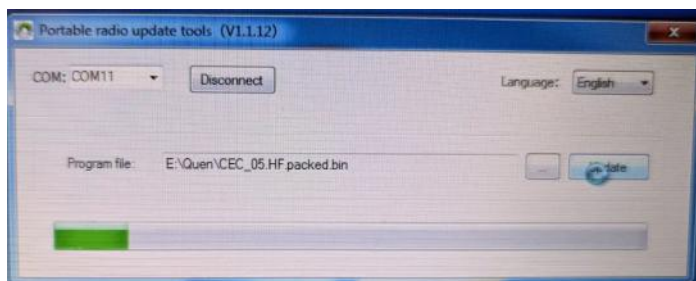
The actual firmware is called CEC_05.HF you will have to find this on Github. You want the "packed bin" file. This is what will be loaded onto the radio. There are several different firmware options for this radio. The CEC is the firmware that allows the HF receive option. There are other options that increase the UHF/VHF receive range, unlock 1.2 meters, have a waterfall option. It seems like

the combinations are endless for this radio. Maybe that is why it has the reputation for being one of the most hackable radios of all time.



If you have a Baofeng, you are in luck because the programming cable that comes with that is the same you need for this Quansheng. Plug the cable into the radio, hold down the PTT button and turn it on. You are now in programming mode.

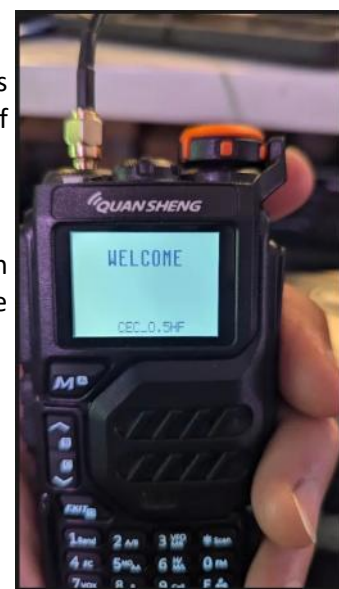
The software is open, the radio is in programming mode, and plugged into the USB port. Select your COM port in the software and select update.



The green bar will progress along the screen and the LED on the radio will look like it's having a rave.

Once the programming is finished, turn the radio off then back on.

You should see the version of the new software on the screen.



I turned my radio on tuned to the 20-meter FT8 frequency just to check if this worked and I got nothing! zip, zilch. I was ready to throw this away as a complete failure, but I opened it up and took another look inside. Remember back at the beginning when I mentioned the screw next to the new inductor. Well... Murphy got me. I thought I had bent the leads enough to fit inside the radio without removing that screw. Turns out that was not the case.



Now, the big question. “Does it work” well... yes and no. With the screw removed, the radio back together I tried again. I could hear noise now. I scrolled around the bands and heard a few voices.

There are a few downsides.

- First, the audio is low on SSB. This is sort of annoying. I think this is going to be fixed in a new revision of the daughter board.
- Second there is something off in the tuner. It seems like you need to be 1 kHz above the actual desired frequency. For instance, FT8 being on 14.075 MHz is clearer than being on 14.074 MHz.
- Third I have found no way to adjust the squelch, so there is always a ton of noise coming from the speaker. There may be a way, but the menus are unintuitive and clunky.

But, what else in the ham world can you get for \$30?

And it works. Kind-of.



Every time you change modes you have to hold down a button, for instance to get into HF you must hold down the Zero and it tells you to “wait”, going from AM to SSB it tells you to “wait”. I don’t have time to wait! I want it now!



I am not going to delve into navigating the menus. If you are interested in seeing the radio in person I will bring it to the club. There are plenty of YouTube videos that go through using this setup.

The pros: You can listen to some HF on a handheld. The radio still also works as an HT on 2 meters, 1.2 meters and 70 centimeters. You can also listen to broadcast FM and AM on this, and the air bands. Though I have not tried the air bands. Besides the Big 64 I have not tried any other repeaters with this either.

The cons: the sound quality and tuning abilities on HF are abysmal at best. The menus are clunky and unintuitive. This is a fun proof of concept to prove that you can listen to HF with a HT but not much more. I am sure there is more that can be done with this. But for now, that is all the more I am going to work on this.

Thank you for reading and happy hacking.

de Charles - KC3TTK

After going through all this you may be asking yourself what the point is. That I cannot answer. I wanted to see if the hype was real. I think, at least from what I have seen, the claims made by the folks online are slightly exaggerated.

Would I do this again? I would. I think I would try it again if there were some hardware and firmware improvements. It was a nice little project to practice soldering and programming with little risk of consequences. If you totally botch it you are out 30 dollars' worth of equipment. Every time I break something I learn something so the lessons learned can be worth more than 30 dollars.



The Dreaded Replacement of the Shack Computer

de Andrew - KC3SDJ

I figured that I would take a few minutes and reflect upon my recent shack computer upgrade.

I started into this great hobby by interfacing my IC-7300 with my old (very old) Dell Inspiron laptop with the Intel Core i5 (Sandy Bridge) processor. It originally had Windows 7 on it.

This was my college laptop, which was brand new in 2010. Well, it certainly isn't 2010 anymore, and after wondering how my laptop got so slow, I recalled that it is 14 years old! I can't believe that it was even still working at all!

I knew when I started into this hobby that all of the learning and sleepless nights of getting software to work would have to one day be redone. Well, it's that time.

The old Dell laptop became so slow that even FT8 decodes were difficult, Winlink Express was sluggish, and you can forget about N1MM and MMTTY for RTTY contests. Since RTTY has become my favorite mode, I had to do something, and do it before the NA QSO Party RTTY contest in July.

I asked a few friendly folks for recommendations, mainly Curt WU3U and Bob WC3O. Taking their recommendations into account, I searched for "mini-PCs" such as the Intel NUC. I found an Intel NUC online and brand new for just over \$200, and it features 16 GB RAM and a 512GB solid state hard drive.

It has the admittedly dated Celeron processor with 4 cores, but I figured that you really don't need a powerhouse to run ham radio software. I made the purchase and it arrived in a couple of days.

The next part of the process is the one most of us dread – taking everything that used to work on the old computer and making it work on the new one. I began by removing any factory-installed software that I was never going to use such as OneDrive, in order to make this thing as lean and mean as possible.

After that, I downloaded all of the software for radio activities that I could think of that I have used before, such as WSJT-X, N1MM, VSPE (a virtual COM port emulator – used for one-cable full FSK RTTY operations between N1MM and my 7300), Dimension 4 for timekeeping, Winlink Express, and a few others.

Now I had all of the software installed – I just had to make it all work again.

I did some Internet research and realized that the folks who wrote all of these programs had migration of this nature in mind, and I was advised to copy all of the configuration file directories from each of these programs on my old computer over to the same directory in the new computer.

I was delighted to realize that this did the trick for the most part, and all that was left to do was adjust audio settings. I was able to complete the migration in fairly short order thanks to a bit of Internet research, and all of these programs essentially picked up from where I left them on the old computer.

I must say that I highly recommend the NUC. I already had two external monitors, and a wireless keyboard/mouse combo. All that I really needed was the tiny box that has the memory and processor in it. Another bonus is that the internal fan of the NUC is essentially silent.

I now enjoy much faster FT8 decodes, and N1MM is faster than ever. I am looking forward to testing this thing out during upcoming RTTY season, starting with NAQP RTTY next month.

It's the little things that count. Now that I have a more capable PC, the hobby has become even more enjoyable.



Vy 73,

de Andrew, KC3SDJ

A Tribute to Edward T Karsin

Back when I was in high school I knew that I wanted to do something with electronics for a living. I never intended to end up working on cars. I attend Peabody High School in East Liberty, now the Obama School... Peabody didn't have an electronics course, but Allderdice in Squirrel Hill did. The course was actually 3 classes long. The deal was that I would go to Peabody for three regular classes and then to Allderdice for three classes worth of electronics. Sounded good to me!

When the time came I found my way for the electronics room at Allderdice. It was nicely equipped. Lots of Simpson 260s, a CRT rejuvenator (remember those!) and much more. I was happy. Then the teacher walked in. He slammed the door and proceeded to read us the riot act! What did I just get into! What just happened?

It was Ed Karsin. He (this is a true story) gave us a paper to take home for our parents to sign. It said that he could hit us if he felt it was needed. What the hell! I took it home. My parents signed it.

Well, as time went on I found that Edward T Karsin was one hell of a good teacher, and a good friend. I learned a great many things from Ed. After he laid the law down those first days he was a really great guy. Much to my relief I might add.

He allowed us to bring in TVs and radios to repair. He gave us great advice. There was one student, Kenny, that brought a TV in to repair. He fixed it! After Kenny repaired the problem he allowed the TV to run a while to be sure it was stable. Ed smoked cigarettes.

While Kenney was on the other side of the room Ed went over, lit a cigarette and blew a big puff of smoke into the TV. Then he yelled "Kenny! your TV is on fire!" Kenny comes running over, confused because the smoke pouring out of his TV smelled like cigarettes?

That was the kind of guy Ed really was. But, if you got too cocky or mouthed off Ed would switch back to crazy bastard mode in a split second. He knew how to keep his classroom in line.

Ed taught us how to build notch filters so that we could filter out the interference that COMCAST put in to block

de Cooky - WC3O

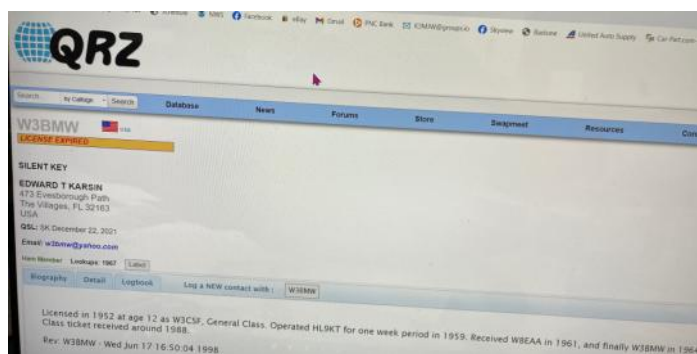
people from getting HBO without paying. We had FREE HBO! Such a deal. Ed was a ham! He was W3BMW. Go figure. Ed was also somewhat of an inventor. If you've ever seen one of those heavy duty mag-mounts that MFJ and others sold, the ones with 3 magnets on a T bracket? Ed designed and patented that! If you look in old ham magazines you will see it was called the W3BMW mag mount. No kidding!

We kept in touch a little over the years. He later moved down to God's waiting room, Florida. Actually, he moved down to The Villages. When my brother also moved down there I looked it up and Ed was right down the street!

Then COVID came to town. It landed up killing my brother. I never did get to go down there and visit. The other day I was at my work desk, hating cars, and I got to wondering... I looked up W3BMW on QRZ. It said Edward T Karson, Silent Key.

The moral of the story? DO NOT MOVE TO THE VILLAGES! THEY'LL KILL YOU!

So here's to you Edward T Karsin. One of the best teachers I ever had. Thank you.



de Cooky - WC3O

So after writing this tribute I had another realization! Two things, actually.

I always tell people that most of the little sayings that I have come from someone else. Here are two that I got from Ed Karsin:

- If you've ever been up the joint and I walk in the door you may have heard me say - "What the HELL! is going on here?" We would be in class and Mr Karsin would walk into the room and say this. It was just to get our attention. It worked.

- The other saying that I've adopted: It would be the beginning of the class and Mr Karsin was trying to get our attention to start the class. We would keep talking. Then, he would simply say "SEX". The room would IMMEDIATELY drop to silence! Then he would proceed with the class.

Try it sometime.

de Cooky - WC3O

Anyone Coming Through Squirrel Hill while on the Way to Skyview ??

I no longer have a car. I would enjoy going to the Skyview Meetings and would become a member if some kind soul were to offer me a ride to and from.

Ted Pinsker - WA3BOJ

412-983-7256

wa3boj@arrl.net

Another Collectable

Like many, I have been collecting wall warts. We all know that they are worth saving because we will surely need them some day. The old heavy linear ones are the best. Much better than the newfangled light weight switching ones.

Well, I have just realized that I have another collectable - landline phone cords, I have a good variety of coiled and non coiled handset cords. Long ones and short ones. And also quite a variety of different lengths of wall to landline phone cables. I even have some of the hard to come by one onto two splitters for connecting answering machines in parallel with the phones. These wireless landline phones are just a passing fad. We will be needing these landline phone wires again.

de Jody - K3JZD

Uniontown Gabfest

The Uniontown Amateur Radio Club will be holding its Annual Gabfest on **Saturday August 10th, 2024**. It will start around 8AM and continue until around 1PM.

The Gabfest will be held on the Uniontown ARC grounds. The grounds are near the intersection of Route 119 and Route 51. Very easy to get to. (GPS Coordinates are : **39.9330, -79.7422**). Talk-in will be on the **147.045 W3PIE Repeater**.

This is a small, but pleasant and well attended ham-fest. They have decent prizes and great food. In spite of the wind storms and tornados that we have been having, there are still lots of shade trees on the Uniontown ARC property. New Membership Applications will be available on-site.

The Uniontown ARC maintains an on-site Ham Radio Equipment Museum. There are brands of ham radios displayed there that many of you have never heard of. Old timers will enjoy reminiscing. Everything displayed there has been restored and is in working condition. You have to see this museum to appreciate it. Free admission (and it is air conditioned).

The Gabfest has Free Entry, Free Parking, and Free Vendor Spots again this year. However, this may be the last year that it will all be free. Costs of holding this annual event have risen.

Be sure to purchase plenty of the Main Prize Raffle Tickets while you are there. Uniontown has a great Main Prize Raffle Ticket Management System—you do not have to fill out the stubs on all of your raffle tickets – it is painless -- so you can buy more tickets without worrying about getting writer's cramp. I wish they were all done that way!!

Support your Local Ham Radio Clubs.

Demystifying SWR Measurement

Voltage Standing Wave Ratio (VSWR or more commonly, just SWR) is simply the ratio of the maximum and minimum voltage amplitudes measured along a transmission line (*i.e.* coax, ladder line, etc.) The reason that the amplitude varies along a line is due to reflections at any impedance mismatches along the line. The reflected wave combines with the original signal (called the forward wave) to create a standing wave along the line. Figure 1 illustrates this phenomenon. To see the animated version, please visit [Standing Wave Animation](#).

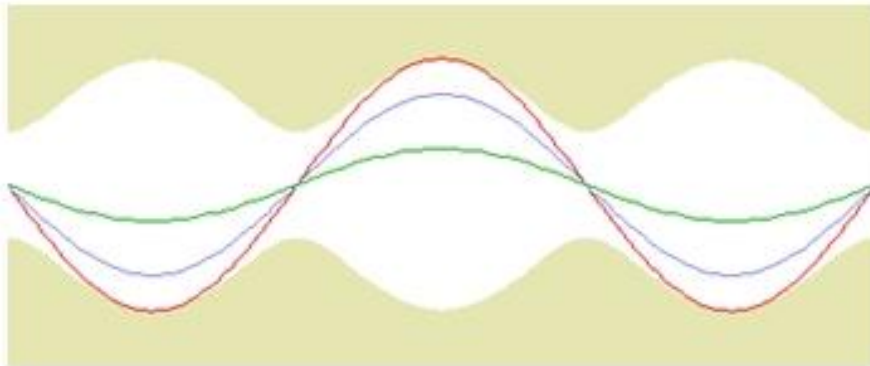


Figure 1. Illustration of Standing Waves along a Transmission Line

The blue wave is the forward wave (*e.g.* the signal generated by a rig), the green wave is the reflected wave, and the red wave is sum of those; what you would actually measure as you physically move along the length of the line. The SWR is the ratio of the maximum and minimum red wave amplitudes.

If the transmission line and load impedances are known, SWR can be readily calculated. To see how it can be calculated, and why it is important, please refer to the SWR article in the February 2024 Q5 newsletter. Even though the transmission line impedance is almost always known, the load impedance rarely is, and for anything other than a pure resistive load, it will vary with frequency. Thus, for real loads like antennas, it is difficult to calculate and so we need a convenient way to measure SWR. You could attempt to do it directly by measuring the voltage along the line (be it V_{PP} or V_{RMS} , as long as you are consistent) and find the minimums and maximums. This is usually not possible for a number of reasons; sampling the voltage along the center conductor of coax is extremely difficult, and the line needs to be at least $\frac{1}{2}$ wavelength long. If you are working with UHF/EHF, it is possible to insert a probe in a slotted waveguide to do the measurement, but that is not a typical scenario for Hams. If you are using a sufficiently long piece of ladder line, it may however be possible to do so.

So, if a direct measurement of SWR is not possible, what can we do? Well, with a little ingenuity, there are some indirect methods that use far simpler measurements, and employ just a little bit of math to get what we're after. Let's start by defining a few things on our sample transmission line (Figure 2.)

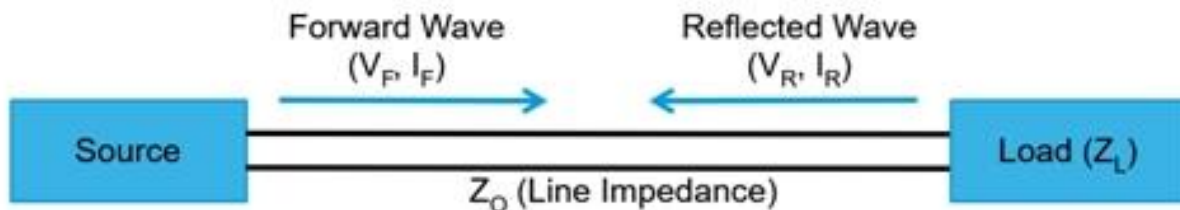


Figure 2 Basic Configuration where SWR Measurement is Useful

The Source is a radio or an amplifier, which generates the Forward Wave. That wave travels along a line with impedance Z_0 , until it encounters the Load with impedance Z_L . At that termination point, a reflected wave is sent back to the source. Each of the waves is characterized by their voltage amplitudes, V_F for the forward wave, and V_R for the reflected wave. Each wave will have a current, I_F and I_R respectively, and is given simply by Ohm's law:

$$I_F = V_F/Z_0 \quad I_R = V_R/Z_0 \quad \text{Eqs 1 and 2}$$

If we pick a single point along the transmission line and measure the voltage and current (which we will call V_M and I_M), we will get the result of the combined waves. In particular, the voltages of the forward and reflected wave will add, while the current measured will be the difference between the forward and reflected currents. This can be understood by remembering that current has direction – in our case we'll define a current flowing to the right as positive, and to the left as negative. The measured quantities are therefore:

$$V_M = V_F + V_R \quad I_M = I_F - I_R \quad \text{Eqs 3 and 4}$$

Ok, that's good and all, but how do we get the individual forward and reflected components when all we can measure is a sum and difference? At first blush, this might seem impossible, like figuring out how much water we had separately in two buckets when we can only measure combined volume after they've been poured into one bucket. It turns out, we actually do have enough information – but before delving into the math – let's consider it subjectively for a bit, to help gain some better intuition on how this works.

In the simplest case, when the load impedance matches the line impedance, there is no reflected wave, and the measured voltage and current would just be that for the forward (source) wave.

$$V_M = V_F \text{ and } I_M = I_F$$

And since $I_F = V_F/Z_0$ this means $I_M = V_M/Z_0$. So, in our simplest case, if we were to measure the voltage and current, we would find that they follow Ohm's law perfectly. For example, if our transmission line has a 50Ω impedance, and we measure 50 Volts and 1 Amp, we know that we must have a perfect match, since $50V / 1A = 50\Omega$.

Now consider a short circuit termination. That situation gives rise to a reflection coefficient of -1. That means that the reflected wave voltage and current will be -1 times the forward wave voltage and current respectively. In our example forward wave case of 50V and 1A, the reflected wave will be -50V and -1A. Using our combined voltage and current equations from before, that would mean we would measure $50V + (-50V) = 0V$ and $1A - (-1A) = 2A$. This makes sense since with a short, we expect the voltage to be zero, and certainly expect the current to be larger than the perfectly terminated case.

How about an open termination? In that case, the reflection coefficient is +1. Our reflected wave is therefore 50V and 1A. Combining as before, this means we would measure $50V + 50V = 100V$ and $1A - 1A = 0A$. Again, this should be fairly obvious – an open would mean we don't have any net current flow on the line, and we would expect the voltage to be higher since there is no load at all. As an aside, you can see why having a short or no load at your radio's antenna terminal could be a bad thing – in one case the voltage is doubled, and in the other, the current is doubled. Some output stages might not like that.

Ok, so we have those two extremes – what about all the possible terminations in between those cases? Subjectively speaking, if your load impedance is greater than the line impedance, you can expect the measured voltage to be greater than the matched case, and the measured current to be less. Vice versa, if your load impedance is less than the line impedance, the measured voltage will be lower than the matched case, and the measured current will be higher. Remember that in the matched case, the measured voltage and current will match our expectations from Ohm's law. In all other cases, the measured voltage and current will not match Ohm's law – in fact, the degree of mismatch (be it high or low) compared to what we would expect from Ohm's law corresponds to the degree of mismatch from a perfect termination. For example, if you measured the voltage on the line to be 60V and 0.8A, you'd know that the line is not matched since $60V / 0.8A$ is not equal to 50Ω . Not terribly far off, so thus the mismatch is not that bad. Another way to think about it is from a power perspective. In our matched case, we know that the load was getting 50W (that is, 50V times 1A). If we just measured 60V and 0.8A and our radio is still set to 50W output, we know our load is only getting 48W (60V times 0.8A). That difference of 2W is the power reflected back due to the mismatch. Not terrible by any means.

Now that we have a feel for how a deviation from the expected relationship of voltage and current on the line gives an indication of the forward vs reflected waves, let's get down to a quantitative analysis. We'll start with rearranging Eqs 1 and 2 by multiplying both sides of each by Z_0 :

$$Z_0 * I_F = V_F \qquad Z_0 * I_R = V_R \qquad \text{Eqs 5 and 6}$$

Now, multiply Eq 4 by Z_0 and distribute the multiplication:

$$Z_0 * I_M = Z_0 * (I_F - I_R) = (Z_0 * I_F) - (Z_0 * I_R) \qquad \text{Eq 7}$$

Notice that the two terms on the right are really just V_F and V_R given by Eqs 5 and 6:

$$Z_0 * I_M = V_F - V_R \qquad \text{Eq 8}$$

We now have an expression where we have the difference of the Forward and Reflected voltages. Let's add both sides of Eq 8 to both sides of Eq 3 to make a really interesting observation:

$$\begin{aligned} V_M &= V_F + V_R && \text{Eq 3} \\ + \quad Z_0 * I_M &= V_F - V_R && \text{Eq 8} \\ \Rightarrow V_M + (Z_0 * I_M) &= V_F + V_R + (V_F - V_R) = 2 * V_F && \text{Eq 9} \end{aligned}$$

Voila! We know or can measure all of the three variables on the left side. Thus, by adding the measured voltage to the measured current (multiplied by the already known line impedance), we get a value of two times the forward wave voltage. Metaphorically speaking we're half way to figuring out how much was water was originally in each bucket...

Let's do the same thing, except subtract Eq 8 from Eq 3:

$$\begin{aligned} V_M &= V_F + V_R && \text{Eq 3} \\ - \quad Z_0 * I_M &= V_F - V_R && \text{Eq 8} \\ \Rightarrow V_M - (Z_0 * I_M) &= V_F + V_R - (V_F - V_R) = 2 * V_R && \text{Eq 10} \end{aligned}$$

Eq 10 says that if we subtract the measured current (multiplied by the line impedance) from the measured voltage, we'll get two times the reflected wave voltage. Obviously, we can just take half of each of those results to get the actual forward and reflected wave voltages. Now let's take a look at some examples to help better understand what's going on.

The following figures illustrate the theory just discussed. They are views of the voltage and current at a single point on the transmission line, like you would see on an oscilloscope – if it could show the separate forward and reflected waves. Figure 3 shows the case for a matched termination. Notice that if you applied Ohm's law to the measured V and I, you would get 50Ω . As you can see from the graph on the right, there is no reflected wave, and the forward wave voltage is exactly equal to the measured voltage, $2 V_{PP}$.

Figure 4 shows what happens when the load impedance is very large – in this case, 950Ω . The measured voltage is almost double that of the forward wave voltage, and there is very little current measured. The reflected wave voltage is almost equal the forward wave voltage. As a test of our approach, we are still able to get the correct forward wave voltage of $2 V_{PP}$.

The case of shorted termination is shown in Figure 5. As expected, the measured voltage is zero, and the measured current is twice that compared to the matched case measured current. We still get the same result for the forward voltage, however in this case, the reflected voltage waveform is inverted compared to the forward voltage. Finally, in Figure 6, we have a load with resistance and reactance. Even though the measured voltage and current are phase shifted, the resulting forward wave is still identical to the prior cases. Also notice that the reflected wave is phase shifted compared to the forward wave.

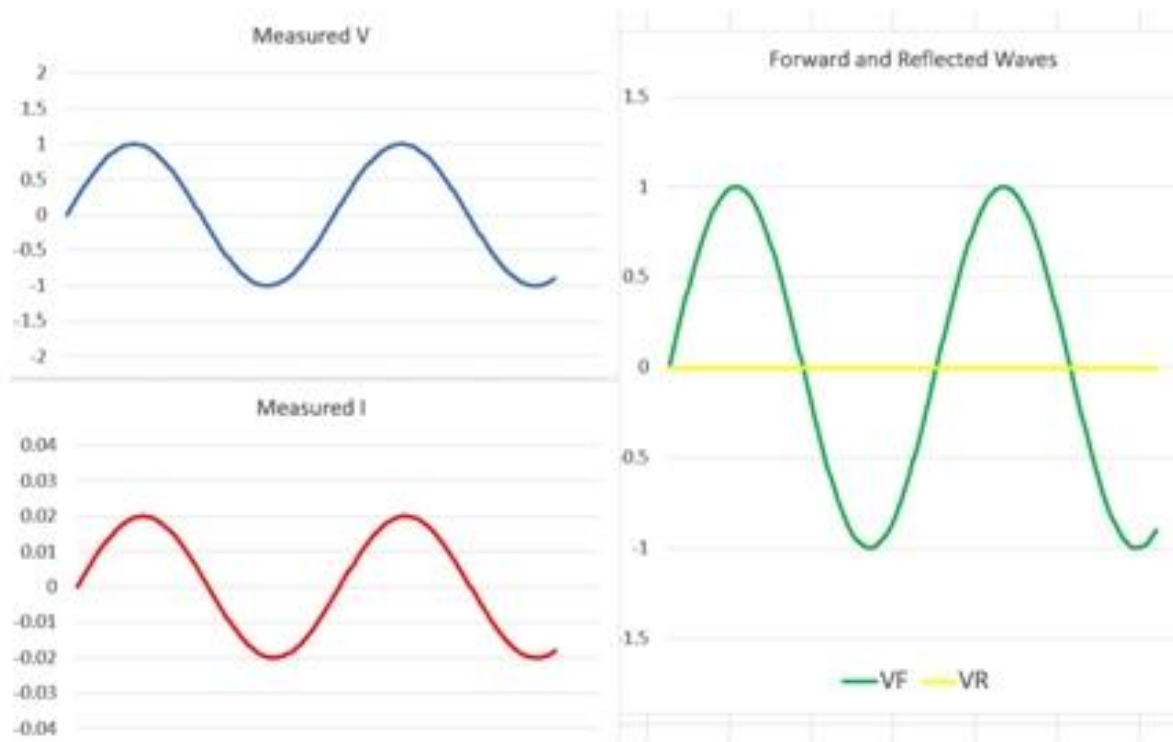


Figure 3 Matched Termination

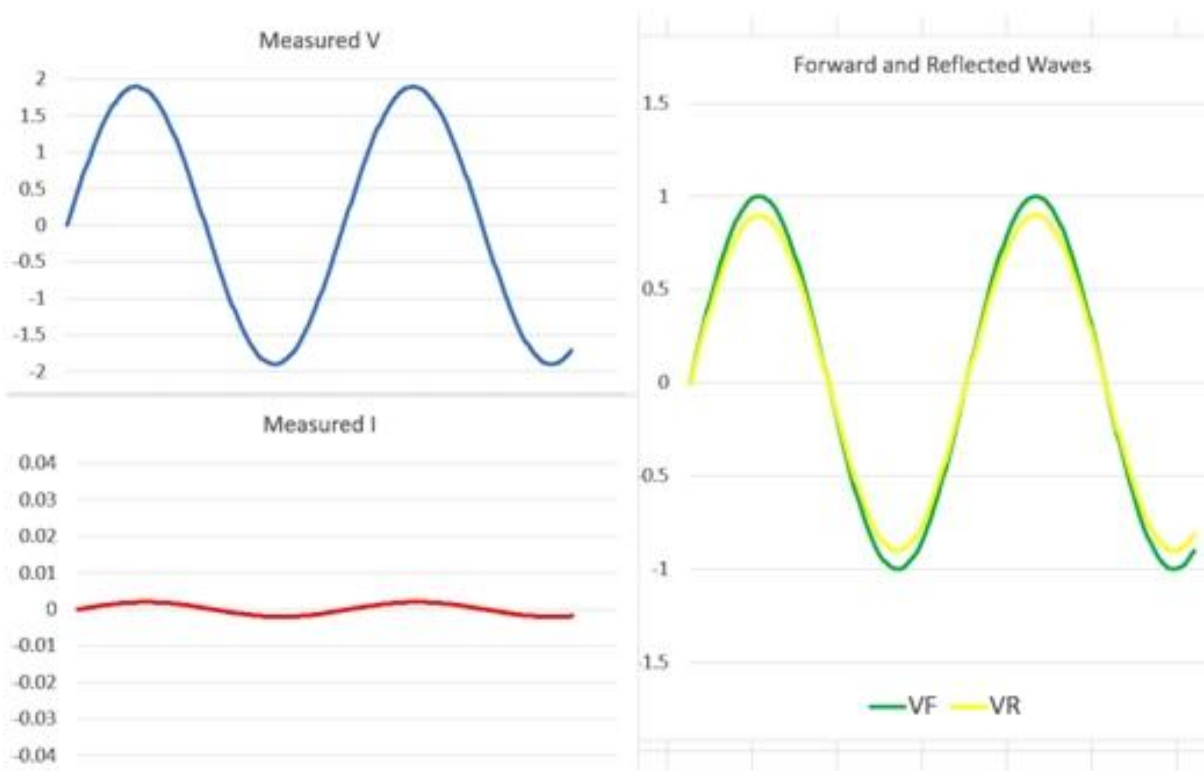


Figure 4 950Ω Termination

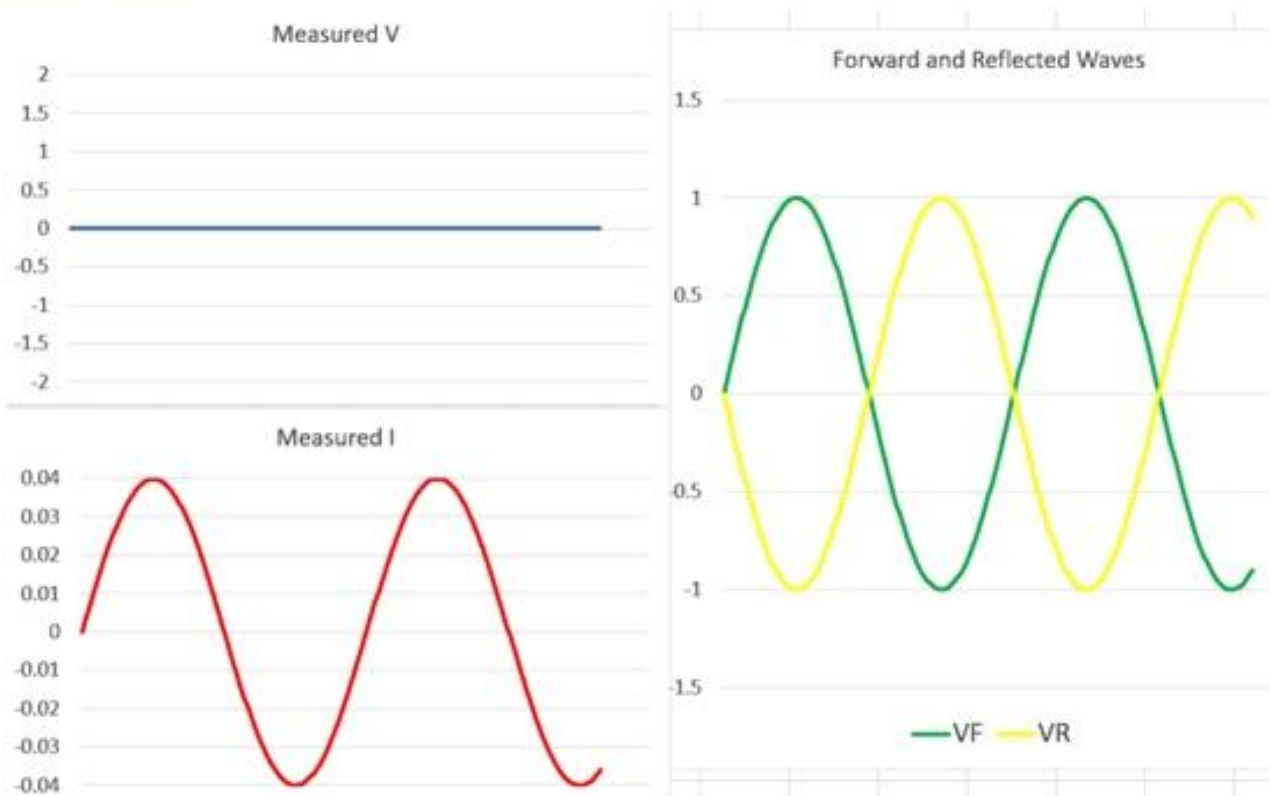


Figure 5 Shorted Termination

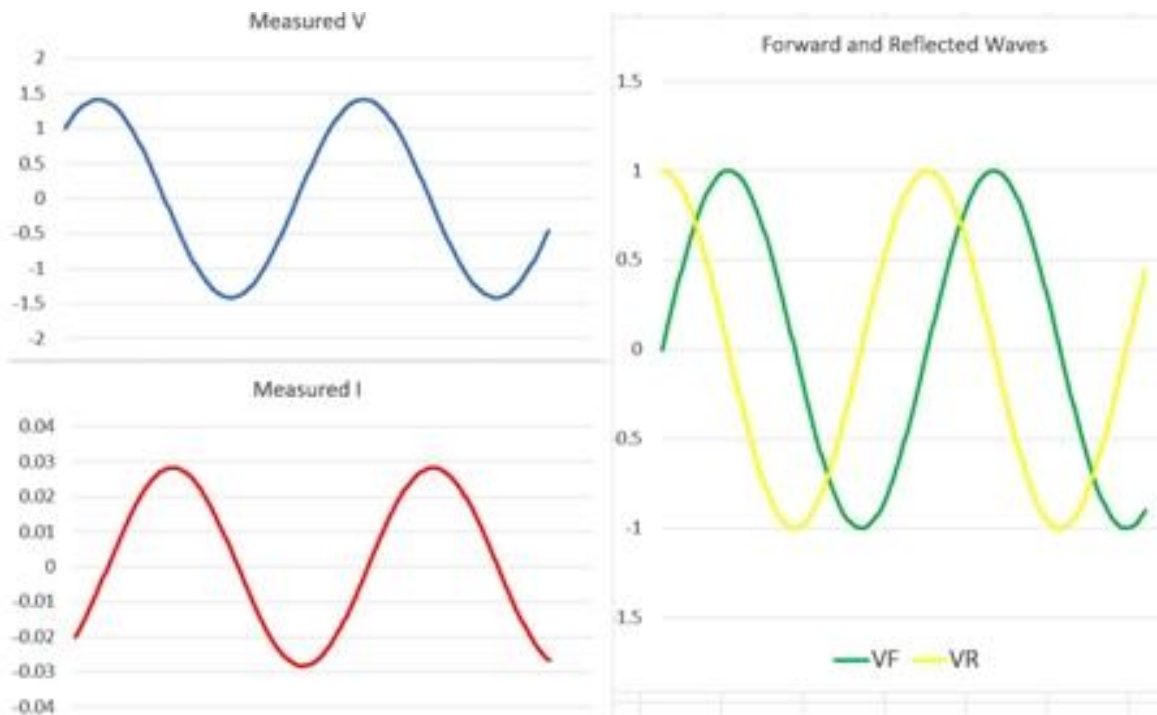


Figure 6 Resistive and Reactive Load

The important takeaway at this point is that we can determine the forward and reflected waves just by measuring the voltage and current at single point on the line, as long as we know the line impedance. As for the actual SWR value, I'll leave the proof to the reader, but getting the SWR from those two voltages is given by:

SWR = (1 + |V_F / V_R|) / (1 - |V_F / V_R|) where || is used to take the magnitude of the argument.

Now that we know how to use our measurements of voltage and current at a point on the line and turn that info into V_F, V_R and the SWR, how do we actually perform those measurements? Fortunately, for us, there are a couple of ways that are easy to implement, and don't disturb the signal too much. After all, what good is knowing the SWR if we severely affect the signal we are trying to measure?

The techniques about to be shown here are generally referred to as directional couplers. The name may make you think that it is somehow mysteriously measuring the forward and reflected waves directly – but there is no such way to do so (at least not in the realm of cables and frequencies that Hams operate in). That's why the title of this article starts with "demystifying" – here we dispel the notion that there is some dark magic that directly measures which way the waves are moving.

The first circuit we'll consider is shown in Figure 7. The TX node is connected to our radio's center conductor output, and of course the ANT node connects to our antenna. You will likely notice that circuit is symmetrical – the lower half where we can sense the forward wave is just a

flipped image of the upper half for the reflected wave (in the figure, REV for reverse, is used instead of reflected.) Let's break it down and see what is happening in each half.

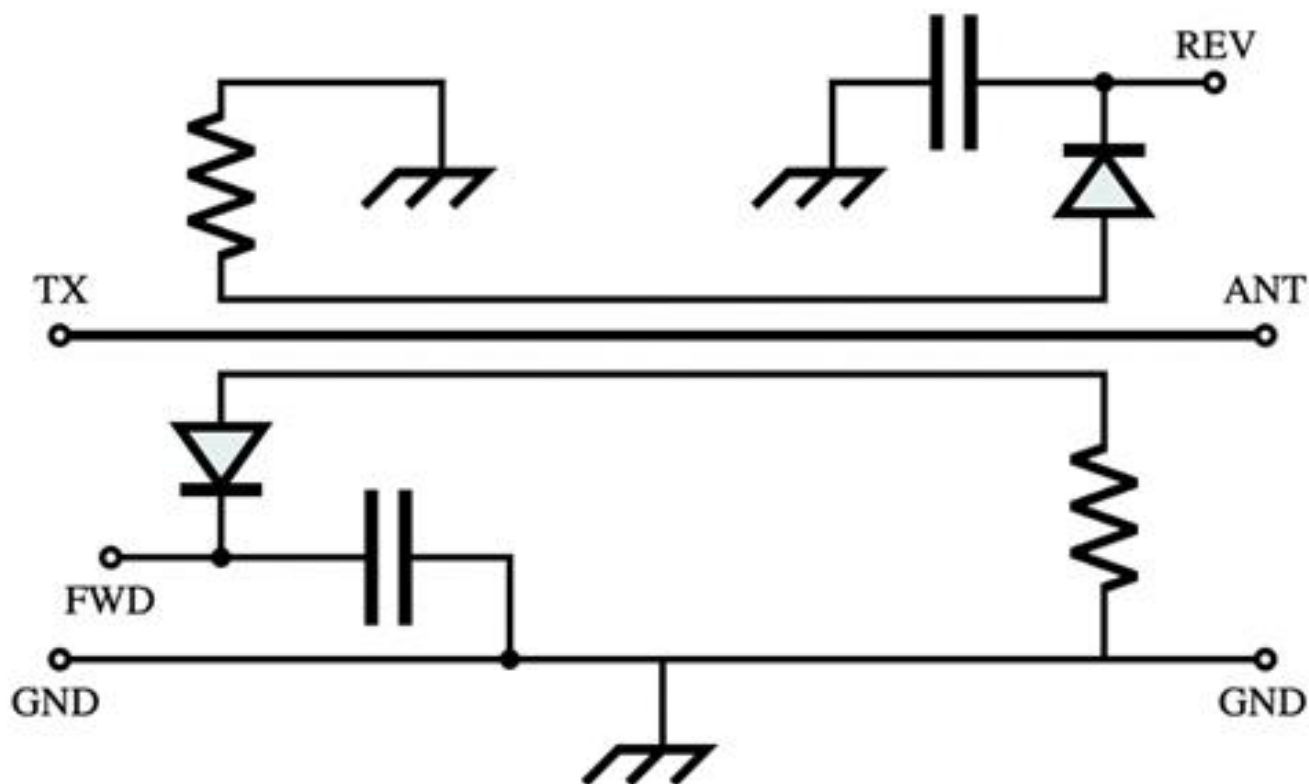


Figure 7 Directional Coupler

Figure 8 shows just the portion needed for sensing the forward wave. The physical circuit resembles the schematic in that there really are two parallel conductors in close proximity, so that they can couple both capacitively and inductively. Think of it as a one-turn to one-turn transformer that has significant capacitive coupling between the windings. As shown in the figure, there will be a coupled voltage (opposite in sign to the voltage on the signal line) and a coupled current that flows opposite to the direction of the net current flowing toward the antenna. The bottom line is that this will sum up the coupled voltage (proportional to $V_F + V_R$) with the voltage developed by the coupled current (proportional to $I_F - I_R$) across the resistor. By picking R appropriately, this will act just like Z_0 did in scaling the current so that we can cancel out the contribution from the reflected wave. That "summing" does just what we did in Eq 9. The diode and capacitor are there to act as a peak detector, so that we can read out the magnitude of the forward wave. For small signals, it is important to use a device with a small voltage drop, such as a germanium or Schottky diode.

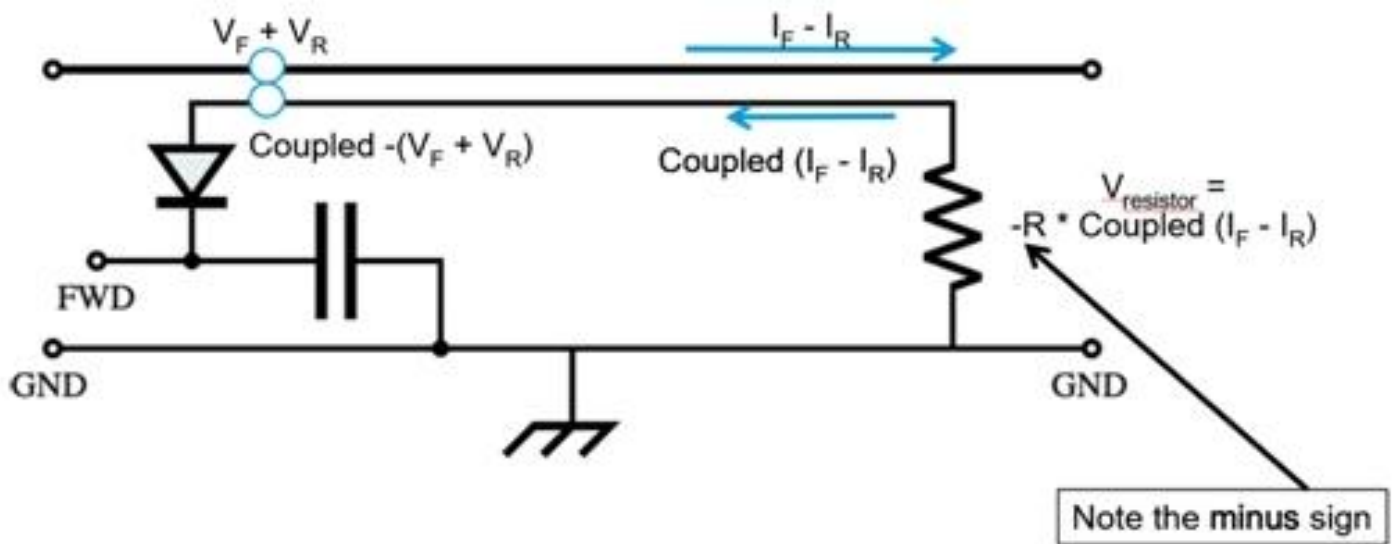


Figure 8 Forward Half of Directional Coupler

Now that you've seen the trick for getting the forward wave's voltage, the reflected wave's circuit is easy to figure out. In Figure 9, note that the resistor is now on the other side, so when we do our voltage loop addition, it will have the opposite contribution to what it had in the forward coupler circuit. That is, it will effectively subtract the voltage resulting from the "scaled" coupled current. It then corresponds directly to what we did in Eq 10, yielding the reflected wave only.

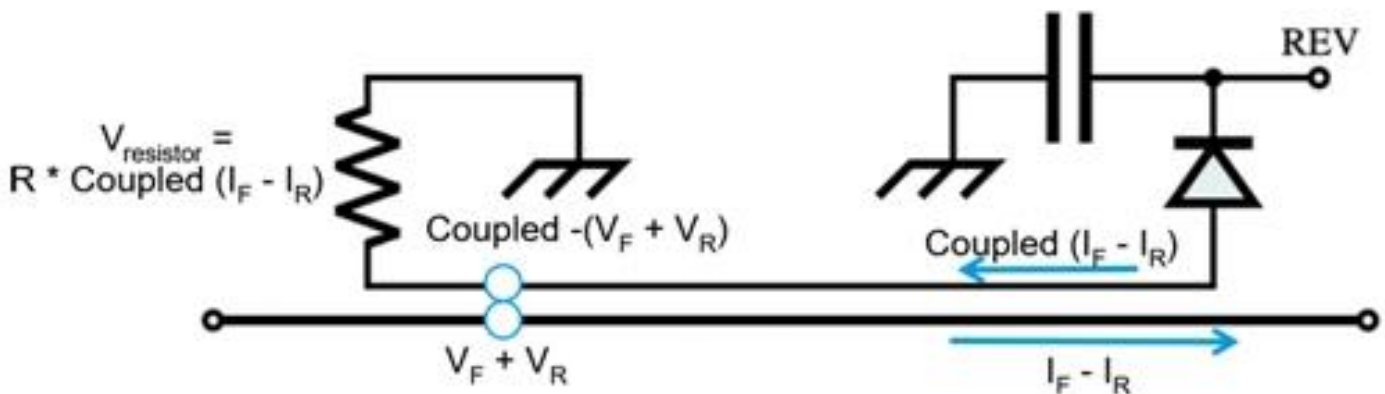


Figure 9 Reflected Half of Directional Coupler

Another directional coupler type is built using toroidal type transformers. The theory of operation is exactly the same – the voltage and scaled current are sampled from the transmission, and either added or subtracted to yield the forward and reflected wave voltages respectively. Figure 10 shows a coupler of this type. If you want to see its details explained, I encourage you to see the excellent video, put together by W2AEW at this [link](#).

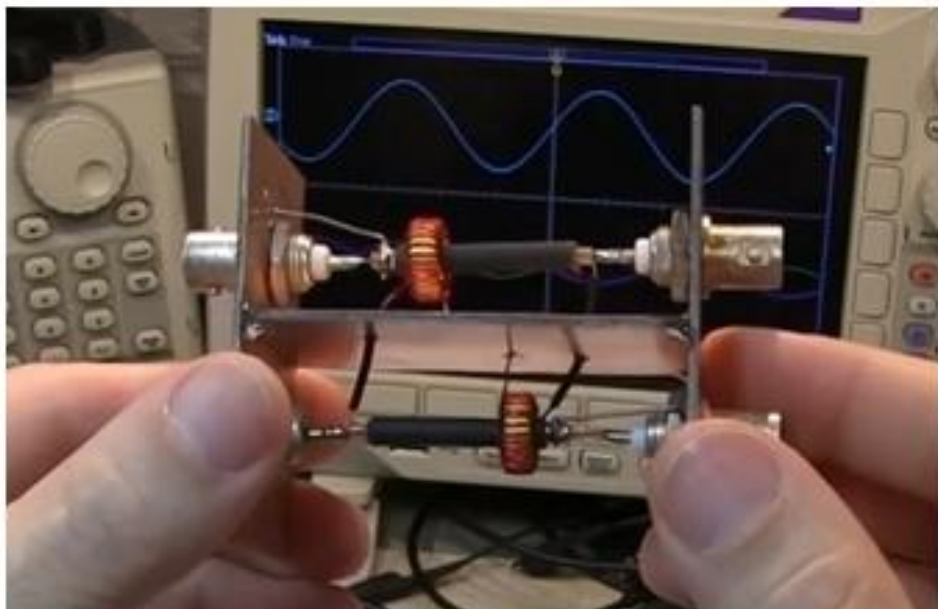


Figure 10 Transformer Based Directional Coupler

You have my thanks and admiration for making it this far – hopefully this article has given both better insight into what's happening on your cable, as well as a little understanding of the theory into how directional couplers work. What may have seemed like a magic device for separating waves turns out to be rather simple, once its inner workings are explained. Please do not hesitate to send along any questions or comments to kc3vnb@gmail.com.

de Brian - KC3VN



de Cooky - WC3O

New Fixes For Old Problems

de Cooky - WC3O

Sometimes we let problems go, sometimes for years! Here are two cases that recently got resolved.

1: The boom microphones at the club are held in place by brackets that clamp on to the rear edge of the upper shelf. The brackets are made from pot metal (Whatever that is) and have long threaded bolts with a crank on one end and a flat on the other end that meets and clamps from the bottom of the shelf.

In theory this is great. However, the pot metal bracket bends on an angle and meets the shelf at a bad angle. The bottom line is that they keep loosening



up. The threads in the bracket get damaged and the bolt doesn't want to turn. I have no idea how many times I've removed the bracket and cleaned/lubricated the treads. Before long, it's loose again...

Well I finally did it. I removed the bracket and drilled a hole down through the top. I again cleaned/lubricated the threads and re-installed the bracket. This time I ran a screw down through the top. MOVE NOW SUCKA!

FINALLY the brackets are tight, and hopefully stay that way. It didn't take long to do. Why didn't I do this years ago!



2: While we now have newer/better bandpass filters in the radio room, we still have our old ICE 419 bandpass filters that we used for many years. We still use them for Field Day, POTA and other events. Over the years some of the filters developed issues on certain bands.

Rich, K3RWN took it upon himself to see what was wrong with each filter and go about repairing them. Rich soon learned what I learned and found that filter design involves black magic! They are just coils and capacitors. How hard can they be? Well, pretty damn hard!

Rich took the filters to local talent, a proficient in the black arts, Jim - WA3TFS. Check out his QRZ page. Jim had the filters back in working order quickly. Between Rich and Jim, the 500 volt capacitors were replaced with 1000 volt components. While these filters are not of very high quality, they do perform quite well, albeit they are very lossy. However, they perform better than their numbers would imply.

The next issue is where I swung into action, sort of. The



power connection on the back of the filters is a barrel connector. There is a very common barrel connector that is often used for supplying 12 DC power. This, is not one of them...

We had located some of the correct connectors, but they were not proper and prone to shorting or not working. Rich found the spec on the CORRECT connector. Since these are odd-ball connectors we wanted to be sure that the cables for the filters stayed with the filters.

I bought right-angle molded connectors from ebay with cables attached. There isn't much on the back of the filters to attach the cables to. Rich gave me the idea of using a ring terminal and keeping it attached to the grounding stud on the back of the filters.

The terminals I came up with were the open barrel type. To be sure the crimp on the terminal did not cut through the wiring I added a piece of heat-shrink to further insulate the cable. It worked great! Just add the PowerPole connectors and they are done!

Now the cables are attached to the filters and won't wander off. The filters are tuned and all is right with the world.

If you run into Rich or Jim please thank them.

Two problems solved.



de Cooky
Skyview Radio Officer

Hakko Hot Air Soldering de Cooky - WC30

A while ago we received a donation of a Hakko hot air soldering iron. Over the years I've done my share of soldering with an iron. But I've never used a hot air iron.



The only problem with the iron is that it arrived with no tips.



At Dayton I happened across a soldering iron dealer and he sold a kit with various size tips. I installed one tip and it fits well.

There's one other problem with the iron. I really don't know how to use it! Looking for an experienced person to show us how she works!

de Cooky
Skyview Radio Officer

Magnetic Loop Antennas

de Jody - K3JZD

Ed: This is long. But I wanted to keep it all together in the same issue.

We all know that if you want to catch RF and squirt RF out into the world, longer, bigger, and higher antennas work best. So, I never gave any real thought to small loop antennas. How can a little ring that sits near the ground be effective?

A while back I was telling Dale - N3HXZ, a fellow SOTA Activator, where I setup off to the side of a back road to do a SOTA Summit near Connellsville. Quite a few of the SOTA Summits in WPA are on plateaus, which provide large Activation Zones. This peak of this particular Summit is on private property, right in someone's back yard. So, rather than seek out the owner and get permission to operate there, I chose to use a location within the Activation Zone that is on pullout on a public road.

I was telling Dale that this location has a couple of adjacent trees suitable for hanging a wire antenna from, and that there is also room there to setup a guyed pole if he does it that way. Dale said that he uses a portable loop antenna whenever he does a roadside activation like this. He went on to say that he will often work into Europe and South America, as well as out to the West coast while running 5 watts with his portable loop antenna.

That conversation got me interested in small portable loop antennas. I found that what makes them 'portable' is that they come apart easily and, the components will all fit into a large laptop case. Dale said that it takes him about 5 minutes to unpack and assemble his MLA and about the same 5 minutes to disassemble and repack it.

A portable loop antenna would weigh more and would be bulkier than my simple 53' EFRW wire, 9:1 UnUn, and slingshot. But I would not be carrying it very far whenever I'm doing a roadside activation.

I have been seeing the full page PreciseRF ads in CQ Magazine [RIP] for quite some time. They have a pretty compelling story on their web page. And there were a lot of reviews which suggested that they were well made

and worked well. PreciseRF offers three portable models at three price points. All three are basically the same design.

<https://preciserf.com/product-category/antenna/>

Their "SOTA-1 PreciseLoop Light Weight Magnetic Loop Antenna" seemed to be all that I needed. But when comparing this model to the more expensive "Deluxe HG-1 Precise Loop MLA", I found that this SOTA model had four things that I felt were detrimental: it used smaller lighter coax for the loop, the tuning capacitor did not have vernier tuning, the tuning capacitor case was not marked to show where to start the tuning for each band, and I thought the capacitor tuning indicator being on the front would make it hard for me to see any band marking that I might add myself whenever the loop was sitting on low tripod.

So I rationalized my way up to the "Deluxe HG-1 PreciseLoop MLA". While more expensive than the "Express PreciseLoop Light Weight Magnetic Loop Antenna", it was a complete ready to go package. So if I had any issues with it, I would only have one vendor to deal with. The larger coax added a little weight, but the argument that was made for the larger coax providing more radiating surface seemed to be compelling. I figured every little bit would help. When packed, the weight of this one is 4-5 pounds. Not a problem for a roadside activation.



A definition that I found says: “A loop antenna is actually sensitive to the magnetic field and not the electric field (it is also called a magnetic loop). It outputs a voltage proportional to that field. A particularity of this type of antenna is to provide a voltage proportional to the frequency of the signal.”

OK. I found that definition on-line, and it was supposed to take the mystery out of loop antennas. But that definition did not make the light bulb in my head burn brightly. Rather than try to fully understand that, I figured I would just try one.

So, I gritted my teeth and clicked on the [Purchase] button for a “Deluxe HG-1 PreciseLoop MLA”.

<https://preciserf.com/shop/hg-1-preciseloop-magnetic-loop-antenna/>

Rather than rushing right out to some SOTA Summit and learning how to use it there, I set it up inside of my house. Some folks who live in HOA’s or multi-story apartment building will routinely use these loops inside, so why not give that a try. My ranch house is brick on one side and plastic siding on the other three sides. That is better than having aluminum siding I guess.

So, a couple of things about a MLA. It should be located away from surrounding objects. It is very directional. The capacitor must be ‘tuned’ to the frequency that you are using. It has a pretty narrow bandwidth - you can move your frequency a little, but move too much and you have to retune the capacitor.

Indoor Testing

Tuning a MLA is a two step process: After setting your rig to the desired frequency, you adjust the tuning capacitor until you hear the maximum noise on your receiver. Then you provide a 2-3 watt carrier and fine tune it by adjusting the tuning capacitor to obtain the lowest reverse SWR.

For the first step, you have to be able to hear your receiver. Since I was indoors that was not hard for me to do. I initially had my KX3 transceiver sitting right beside my MLA, so fine tuning to obtain the lowest [reverse] SWR reading on my KX3 display was not hard to do.



I figured it was time to test this MLA on the air. Over the next couple of days I worked 11 POTA Activators and 1 SOTA Activator with my MLA using 5 watts CW on 20 and 10m. They were located all over, from ME to FL, and down into AL and MS, then out to CO. I was pretty impressed with that

Then I added some coax and moved my KX3 out to my kitchen table where I could sit more comfortably. I tuned the loop capacitor for maximum noise on my chosen 20m frequency. Then I Oops, how do I tune for lowest SWR now?

I had learned that tuning for maximum noise got it really close, but not perfect. Giving the capacitor tuning knob a nudge and going back to the radio to see what that did to the SWR was not very effective.

So I ended up using one of my Wyze WiFi security cameras to watch my KX3 SWR indicator so I could watch the SWR reading on my cell phone while I was adjusting the capacitor on the Loop.



That worked, but there was some latency because the video from the Wyze camera goes out on the Internet to the Wyze servers and then comes back to my cell phone.

Something better will be needed. But for now, it would have to do. Over the next two days I worked 13 SC stations during the SC State QSO Party and 27 NC stations during the NC State QSO Party, with my indoor MLA using 5 watts CW on 20 and 40m.

When chasing after POTA and SOTA Activators, it was not that hard to get them. They are good at listening for QRP signals - I just have to wait until the high powered chasers let up a little.

But when going after these NC and SC QSO Party QSOs, it was tougher for me to get them because (1) they were not listening for QRP signals, and (2) many of them were running with machine generated 40 WPM CW, making it hard for me to get their attention with my 20 WPM straight key. I had to give up on a few of them that were seemingly deaf.

I could hear the European stations that were chasing the NC & SC QSO Party operators who were running a frequency - on both 20m and 40m. Bottom line: I was quite surprised at how well it did during these events. It shouldn't do that well. There is a whole lot of house between where my MLA is sitting in my living room and the NC-SC-FL stations that are to the South of me. HF RF is everywhere !!!

I finally came to the conclusion that when 'tuning a loop', you are adjusting the loop to your transmitter frequency. You do that while running 2-3 watts output. If done right, then you will have zero SWR back at your transmitter and you can run without using your radio's tuner turned on as long as you stay close to the same frequency. So, back to coming up with something better than my Wyze WiFi security camera to do the loop tuning.

Some Things That Were Tried

I started out with what looked like an ideal 'out of the box' solution - a Sound Indicator intended to be used to tune a MLA.

<https://www.alphaantenna.com/product/swr-sounder/>

It was supposed to sit right at base of the loop. It was a big disappointment. It was (1) a little pricey, and (2) ineffective. If I sat it on the table below the loop, that was too far away for it to do anything - it did not make any noise at all when it was there. If I hold it in my hand, real close to the base of the loop, it makes noise and seems to work. But then whenever I move it away, the loop is de-tuned.

The device and my hand came into play while tuning. So if it is close enough it affects the tuning, and if it is not close enough it does nothing. I opened it up and found four capacitors, four diodes, and a buzzer. About \$5.00 worth of parts. Not enough there to be any great invention.



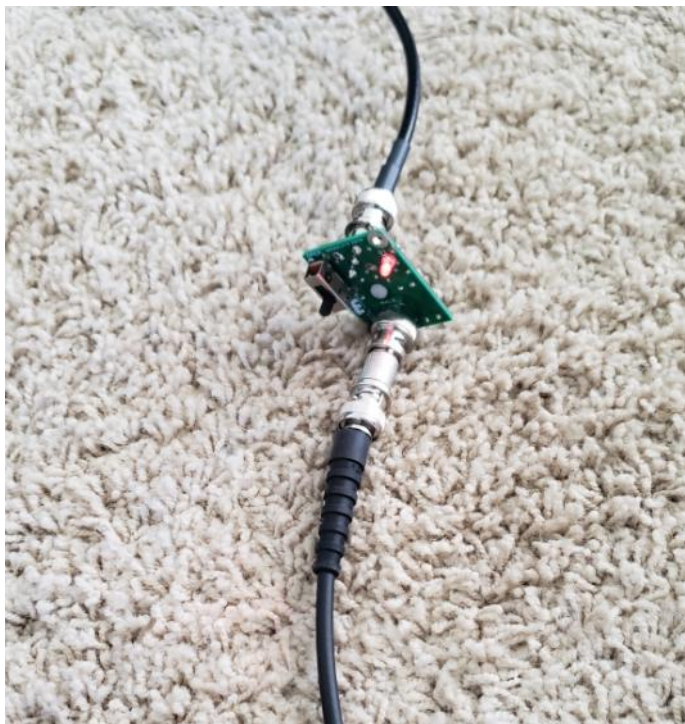
Next I tried a QRPGuys LED Tuning Indicator.

<https://qrpguys.com/tuning-indicator>

I was hoping it could be put right where the coax connects to the loop. But when I connected it there, it was saturated with RF and ineffective. The LED was always at full brightness.



So I connected a 10' length of coax to the loop, put the QRPGuys device at the end of that 10' length, and then ran my 50' length of coax back to my radio. With that device sitting on the floor, I could still see the LED while I was tuning. It worked, however it is a bit sensitive.

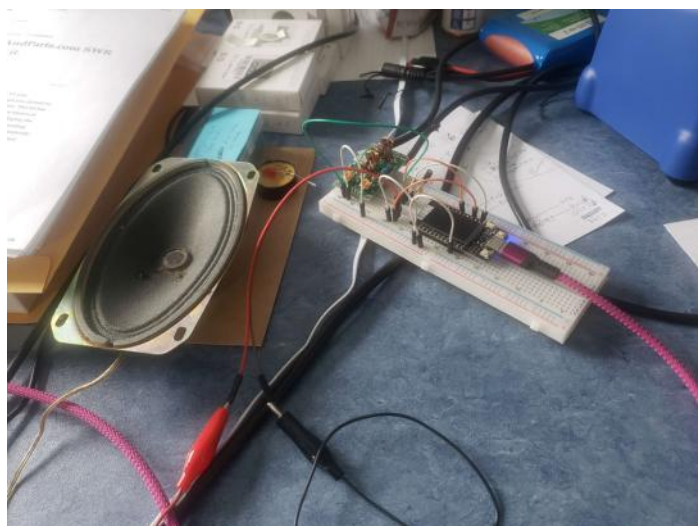


It is rated at 10 watts. That is not a problem whenever I'm doing my tuning at 2-3 watts. I can leave it in the line, just putting it into "Operate" (Bypass), and then run 5-10 watts through it OK. But I figure that I can safely run 25 watts CW with this loop.

So I tried running 25 watts with this QRPGuys device in "Operate" (Bypass) mode. It worked - no smoke. But I may be pushing it whenever I'm putting 25 watts through the small Tune-Operate slide switch that it uses.

And if I forget and leave it in "Tune" mode, and then key down at 25 watts, that may smoke something in it. But, even though it is a bit sensitive, it is quite usable for up to 10 watts CW. (But if I forget and leave it in "Tune" mode, it eats 75% of my power).

Next I tried a custom high tech solution. I built a Kits and Parts SWR Bridge <https://kitsandparts.com/bridge.php> (I actually got a Chinese knock off on eBay because the new guy who took over the Kits and Parts products line did not come up in my Google search back then). I connected the REVERSE SWR output to an analog input of an ESP32 microcontroller. I programmed that ESP32 microcontroller to trigger and play a tune on a connected speaker whenever it saw any REVERSE SWR coming in. That system requires 5vdc power, so I put that system right at my radio out in the kitchen.



That turned out to be more challenging than I thought it would be because the output from the Kits and Parts SWR Bridge is jittery - the simple diode rectifier that it uses does not produce a steady DC voltage, and it is not filtered very well. It works fine on a regular analog Volt Meter because the analog Volt Meter smoothes out the ripple. But the ESP32 microcontroller analog input samples so fast that it sees every little jitter in the incoming voltage.

In the end, I did filter it enough to get it to work. I can go into my living room and manually tune the loop to where I did not hear any tone coming from this system located in my kitchen. The Kits and Parts SWR Bridge is supposedly only rated for 10 watts. I put 25 watts through it while working a POTA activator, and I had no problem with it being in the line at 25 watts. Others have said that it will handle 100 watts CW. Looking at the circuit, I agree with that.

But, after doing my tuning at 2-3 watts, I found that I have to disconnect the speaker whenever I'm running 25 watts because I have a little more REVERSE SWR voltage then, and that triggers the tone. I had to do a lot of fine tuning of values in my program to get the trigger set right - odds are that it would need to be tweaked all over again if I used a different Kits and Parts SWR Bridge - so I can't make a 'product' out of it. But it will work for me.

If I packaged this system, and carried a 5vdc Cell Phone Power Pack to run it, I could take this system in the field to use for SOTA and POTA QRP activations. However it seems more suitable for in-home usage. The speaker is not amplified, so it might be hard to hear outdoors.

Remote Tuning From The Radio?

Another popular approach is connecting a reversible motor to the Loop Capacitor, with a means of remotely controlling the motor. With a system like that that, I would be able to remain at the radio and just tune the loop for lowest SWR indicated by the radio .

Rather than invent something that already existed, I purchased stepper motor control hardware and software from N6JJ. Then I purchased a stepper motor and some couplings from eBay.

The N6JJ stepper motor controller hardware used all standard components, but he had created a nice circuit board to connect everything together. Plus he included the full version of his latest remote control software when purchasing his control board.

<https://www.youtube.com/watch?v=9yk-2Kybxgk>

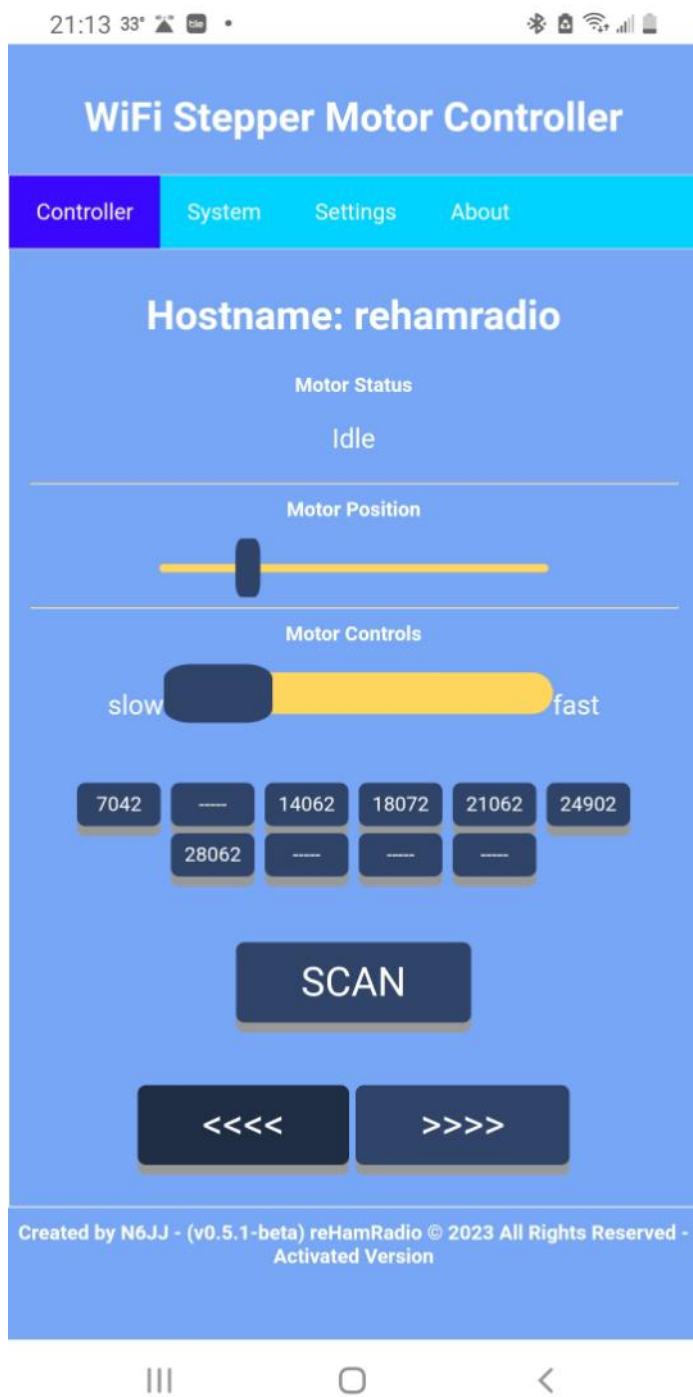
It was up to me to figure out how to physically mount the stepper motor. I did what could have been done with plywood by designing a 3D printed bracket. The N6JJ controller board requires a 12vdc source. I had a small 12vdc supply that I used. A dedicated 12vdc battery would also do the job since the stepper motor does not draw a lot of current.



The N6JJ software runs in a browser window. It will run in a cell phone, PC, or Mac browser window. However, you have to use the cell phone, PC or Mac as a 'Hotspot'.

I used it with my cell phone. The N6JJ software does everything that is needed, including providing memory settings which will position the loop tuning capacitor close to where it needs to be for each user defined frequency. You still have to manually do the final tweaking

to get the loop tuned to the lowest possible SWR. It generally provides an affordable remote loop tuning solution.



However, I found a few downsides to the software. Whenever my cell phone is running the 'Hotspot' software, that seems to be a battery eater. And I found out

that whenever I was doing the final manual adjustments to find the lowest possible SWR, it was very easy to overshoot and go too far because there is a little latency.

Whenever that happens, you have to reverse the direction. Some times that took a lot of back and forth commands from the cell phone to hit the lowest SWR.

I also found that just giving it just a tap in a direction results in an inconsistent amount of rotation of the stepper motor, which makes it even easier to overshoot. And I found that if you are too fast at providing the reversing commands, it is possible for the software to hiccup and run the stepper motor to the very end of the travel, putting you far from where you want to be for the band that you are on.

I had some discussion with N6JJ. He said that he was working on adding 'Single Step' buttons which will restrict the stepper motor rotation to only 1/32 of a turn each time those new 'Single Step' buttons are pressed. That may prevent the overshoot that I was seeing when zeroing in on the lowest SWR.

He said that he could not duplicate the situation where I found that it would run to the end of travel. He wanted to blame that on my cell phone being old. I told him to be more aggressive in providing opposing direction commands during his testing - that seemed to be what caused what I could make happen repeatedly. That was several weeks ago - I have checked a few times to see if there is any updated software is available. I have not found any update yet.

The bottom line on this approach is that if N6JJ adds the 'Single Step' buttons, it has the potential to work. It should be quite suitable for home use, where you can use a small 120vac powered 12vdc supply.

Since the N6JJ control talks to the cell phone's 'Hotspot' no Internet connection is required. So if you wanted to take it out to the field, you could take along another 12vdc battery and the controller. However, I will just use this at home, and I will manually tune my loop whenever I'm out in the field.

The KISS Approach

At the end of this quest, I eventually found that the simplest, and easiest thing to use for tuning my loop is my classic low tech analog SWR Bridge that I found on eBay.

I adjust the sensitivity pot to wide open to get the maximum REVERSE SWR meter movement. I set it right near my loop. Then I key my transmitter at 2-3 watts, and manually adjust my loop capacitor for the minimum REVERSE SWR on this meter.

I can leave this in the line all of the time. It is a passive device – no power is required. I leave it set to REVERSE all of the time. There is no Tune-Operate switch to remember to throw. It is as KISS as it gets.



(In the upper right is the compass that I used whenever I was rotating my loop indoors)

Outdoor Testing

I tried using my MLA during a roadside SOTA Activation (W3/PT-008, near Connellsville). By this time, I had obtained another newer and smaller version of a classic SWR Bridge. I had tie-wrapped it to the stand for my loop. That is all that I took to assist with the my tuning as my testing at home showed that to be simpler to use and more reliable.



The MLA did OK during this SOTA Activation. I made 38 QSOs. Four were Summit to Summits. Four were DX QSOs into Europe. Lots of Midwest and West Coast stations. I even worked some of the folks who were at the Skyview clubhouse doing K2M. That was surprising because I had my loop aimed NE-SW. Skyview was NW of me - MLAs are pretty directional.

I ran 10 watts instead of my usual 5 watts. I was only doing one site today, so I could go for broke with my battery. Hard to say it that made a difference or not - but I figured it was a compromise antenna so I tried to make it easier on the guys at the other end.

Did I do better or worse than I would have with my sloped 53' EFRW that I normally use? Hard to say. Is propagation the same on any two days? Are the number of SOTA Chasers who happen to be there whenever I am there the same any two days? Too many variables to make a judgment. I'll stick with "It worked better than I thought it would".

I saved about 10 minutes of setup time and 10 minutes of teardown time by using my assembled loop (it fits in my Honda CR-V) instead of using my EFRW. The time savings would have less if I had my MLA disassembled and in its travel bag. I was always running a frequency, but using the MLA still required jumping up to re-tune the loop for every time that I changed bands. With the EFRW, I would just press [Tune] on my KX3 each time I changed bands. And my loop will not tune 30 meters. But my EFRW will not tune 12 meters, so I guess it is a tie there.



Next time out with my MLA, I will just run my normal 5 watts. That will probably be whenever I do a multi-day trip that has six or so roadside SOTA summits up near Clearfield PA. Doing more summits over a couple of days will be a better field test of my MLA.

Summary

MLAs have a narrow bandwidth. The loop should be re-tuned after making any frequency change. This makes loops more useful whenever you are running a frequency than whenever you want to move all around chasing various stations. I found and tried several different methods that I could use to assist me in doing my loop tuning. All but the Alpha Antenna 'SWR Sounder' worked. Some methods were suitable for field use as well as in-home use. Some are probably more suitable for just in-home use.

My success at using my loop indoors was somewhat surprising. Especially whenever there was a whole lot of house in the way with the direction that it was pointed. However, QRP CW with an indoor MLA does not provide a commanding signal. So, most of the QRP CW contacts that I made were made by me chasing other stations during some event, not from running a frequency.

Using my MLA indoors with 20-25 watts CW provided slightly improved results. I only tried it with CW - I did not try it with any digital modes or SSB. Indoors, it is a compromise antenna. However there are situations where outdoor antennas are not possible.

My success at using my loop outdoors was better than expected. Going out to do my SOTA Activations, I had hopes getting the four QSOs needed to call it an Activation. I got many more RBN Spots and QSOs than I had expected, And I worked into France, Spain, Germany and Switzerland.

The signal reports that I got were nothing to brag about, but I made the QSOs. The time saved by using my MLA rather than my EFRW was minimal. However I might appreciate the ease of using the MLA more whenever I'm doing three or four activations in a day.

While a small portable MLA is compromise antenna, for me it is a keeper.

For someone who is in an apartment or an HOA, it may be an answer (although not everyone will be able leave it set up in their living room).



de Jody — K3JZD

Andy Pato
WA3PBD / K3MOB
SK - 17JUL24

Probably everybody in the Western PA amateur radio community knew Andy.

Andy owned and operated the 146.73 Two Meter Repeater since the early 1970s. He was always on the repeater. He was approachable, and willing to chat with or assist anyone.

Andy was a seller at just about every local hamfest, including our Swap & Shop.

Prior to retiring, Andy had worked as an electronic technician. Over the years he repaired many radios for fellow hams.

Andy knew GE repeaters inside and out, and was a go-to resource for many surrounding repeater owners who used GE equipment.

Andy succumbed to liver cancer. Only four months after being diagnosed. He was too far along whenever he was diagnosed.

Andy's passing came a shock to me, and I'm sure to many others who did not know that he was fighting that disease.

Pittsburgh has lost a staple in the Western PA ham radio community.

RIP Andy

Skyview VE Sessions

Skyview provides VE Testing at the Skyview Clubhouse each month (Details provided later, near the end of this newsletter)

Here are some of the recent success stories

June 2024

James Walker KB3DLS passed the Extra exam

Charles Ashby WB3LCE passed the Extra exam

Nelson Griesheimer KC3ZIM passed the Technician exam

Ted Self KC3ZHR passed the Technician exam

July 2024

Robert Brooks KB3ENT passed the General exam

de Bill - N3WMC

BUILDING YOUR SHACK - Part 4
(OR HOW NOT TO BE RELEGATED TO THE BASEMENT)

de Bill - NY9H

With time come changes in the radio equipment..

In this picture appearing for the first time is the TenTec Hercules II 500 watt solid state amp and the TT 253 1.5KW Autotuner. The TenTec Omni sold to Joe Walsh (Eagles) and a ICOM 756 is on the main space.



This is before the 7800 & K3 arrived.... a boom microphone on a DIY Target gooseneck lamp, AKG element, far bottom right the antenna / rig switching. ICOM 756 & Elecraft K2 with a ACOM 2000A replacing the TenTec Titan power amp.(sold to friend Jim K9YC)



Q5er – The Official Newsletter of the Skyview Radio Society

Directly below my station cabinet, in the basement, are several support items. On the hanging shelf Networking routers, RAID drive, switches, IP and analog telephone start from the left, then The ACOM 2000A amplifier chassis. An on-line IIT 800VA UPS (not SBS) has metering both on in & outputs.

Two PVC pipes carry cabling up to the station and out to the tower. Other goodies include SP-600.



Q5er – The Official Newsletter of the Skyview Radio Society

Along came two more computer monitors, accommodating the extensive log program capabilities ie: maps. Dx SPOTS. The ICOM 756 became a 7800, the ICOM flagship, and the LP-100 watt/SWR system.



That's it for this issue.

I think that if you have followed along during this series of articles, you are beginning to understand that a ham shack is never finished !!

Bill – NY9H



Uniontown Amateur Radio Club

74th Annual Gabfest



Saturday, August 10, 2024



The Uniontown Amateur Radio Club – W3PIE will conduct our
74th Annual GABFEST
Saturday, August 10th, 2024!

The gates open around 8:00 AM with vendors welcome at any time prior to 8:00 AM! Please check our web site www.w3pie.org for updates.

The GABFEST will be held at the Radio Club Grounds located on Old Pittsburgh Road just off Northgate Highway/RT 43 Mon Fayette Expressway--- near RT 51 and US RT 119 in Uniontown, PA

Talk in will be provided on 147.045 + (Full Time PL 131.8) Just call for W3PIE Gabfest Talk-In. This talk-in is provided for directions and Gabfest information. No check in is needed if you know how to get here!

As always, free parking is available! Refreshments available! Free Swap-N-Shop Set-up with registration! Check our web site prior to the event for Updates.

Same Location, Same Free Parking, Same Great Food, New Presentations, More Fun – and always a good time and conversation with area hams

Hamfest Prizes for our event
1 st Prize- Westinghouse 4500W Inverter Generator
2 nd Prize- Xiegu G90 HF Radio
3 rd Prize- Yaesu FT70DR Handheld
4 th Prize- Yaesu FT70DR Handheld

Address of UARC-W3PIE is 433 Old Pittsburgh Rd, Uniontown, PA

Contact Tony Alviar 724-430-1277 (M-F 8-4) or George Syner 724-439-1554 (leave message if no answer) if more information is needed. Also, Information is available anytime on 147.045 + (Full Time PL 131.8). Additionally- email officers@w3pie.org for information



Look forward to seeing everyone this year!

Welcome New Members !!

Welcome the following Skyview Radio Society Members who have joined us since publishing the **June 2024** newsletter:

N5DB - Dan Barrett - Irwin

W1MP - Linda Robinson - Shadyside

KC3ZIM - Nelson Griesheimer - Murrysville

WB5LLI - Mike Saladino - Pittsburgh 15239

Remember that something is going on up at 'the joint' every Tuesday. Sign up for the K3MJW Groups.io Reflector to get the latest news and event announcements by email.

If you are a reader who is interested in becoming a Skyview member, then go to:
<http://www.skyviewradio.net/> for information.

If you are a reader who is not yet a ham, and you are interested in becoming a ham, , then go to:
<http://www.skyviewradio.net/> for information.



Skyview Radio Society Roster as of **31 JUL 24**

NM3A	K3HSE	KC3OCC	KB3UIO
N3AFS	AG3I	N3OEX	N3UIW
KB3APD	AC3IE	K3OGN	KC3UNP
NA0B	KE3IF	N3OIF	W3UY
N3BAH	KC3IIO	KB3OMB	KX3V
W3BUW	AB3IK	K4PDF	KC3VCX
KF3C	WB3IMB	KC3PIM	KC3VNB
KA3CBA	W3IU	K2PMD	K3VRU
KC3CBQ	K3JAS	KE3PO	KC3VYK
W3CDW	N3JLR	W3PRL	W3VYK
K2CI	KA3JOU	KC3PSQ	N3WAV
K3CLT	ND9JR	KC3PXQ	KC3WCJ
K3CWE	K3JZD	AC3Q	K3WM
N5DB	WA3KFS	NU3Q	N3WMC
K3DCG	AC3KI	WQ3Q	KA3WVU
N3DRB	AC0KK	KC3QAA	K3WWP
KB3DVD	K3KR	NJ3R	N3XF
KC2EGL	KC3KXZ	K3RMB	N3YJN
KC3EJC	WE3L	W3RRK	W3YNI
AB3ER	WA3LCY	I2RTF	KB3YRU
WA3ERT	AC3LD	KI2RTF	W3YS
N3ERW	KC3LHW	K3RWN	KB3YYC
K3ES	WB5LLI	KQ3S	KE3Z
KG3F	K3LR	K3SBE	K3ZAU
WB3FAE	KC3LRT	WA3SCM	KC3ZIM
K3FAZ	AB3LS	KC3SDJ	W3ZVX
KC3FEI	N2MA	KC3SNZ	
K3FH	KC3MBM	KB3SOU	
K3FKI	N3MHZ	K3STL	
KC3FWD	KC3MIQ	KC3STV	
AC3GB	K3MJ	KB3SVJ	
N2GBR	W1MP	KC3TEX	
AC3GE	K3MRN	WV8TG	
K3GIR	N3MRU	N3TIN	
KC3GPM	KS3N	N3TIR	
K3GT	G4NFS	W3TLN	
AB3GY	KB3NSH	KK3TM	
KC3GZW	AJ3O	N3TTE	
NY9H	WC3O	KC3TTK	
WB3HFP	WO3O	AG3U	
WA3HGW	KC3OCA	NS3U	
KB3HPC	KC3OCB	WU3U	

Notes: Only Call Signs are being published. Refer to QRZ.COM for more information. (Unable to publish those without Call Signs.)

Kul - Links

Jody - K3JZD

There is lots of stuff out on the Internet... Some of it can brighten your day. Some of it can educate you.

I can't really copy and past it all in here. But, I can point you at some of it

Here you go—the way to eat that stuff that is good for you but tastes like crap—this will make it taste good?

[!https://tinyurl.com/yck87c64](https://tinyurl.com/yck87c64)

I started fooling with computers back in 1977. I was able to understand the workings of the 6502 CPU and was programming it in hexadecimal machine code. However, when I read something like this I realize that life is no longer quite as simple as it was in 1977.

<https://tinyurl.com/yx2cc7v2>

I'll consider any Kul - Links that you find.

Email then to me at: K3JZD AT ARRL DOT NET

They might just end up in the next issue

Previous Issues

Previous Issues of the Q5er are available at

<http://www.nelis.net>

Next Newsletter will be **October 1, 2024**
Closing Date For Submissions : **Sep 15, 2024**

K3JZD AT ARRL DOT NET

Become Well Known Publish in the Q5er

The Q5er goes to other clubs and is available to all on our web site.

Submissions to : **K3JZD AT ARRL DOT NET**

>>>>> **WARNING** <<<<<<

An Alarm System has been installed up at the joint. Do Not go in there on your own until you learn how to disarm and rearm it.

**** Skyview VE Testing ****

For Testing Dates, See :

<http://www.arrl.org/find-an-amateur-radio-license-exam-session>

Time: Usually 8:15 AM

Location: Skyview Clubhouse Meeting Room
2335 Turkey Ridge Rd
New Kensington PA 15068-1936

Contact: Bill Dillen
(724) 882-9612

Email: bdillen@comcast.net

<http://www.skyviewradio.net/ve-tests/>

Please E-Mail or call to register!!!

While walk-ins are accepted, the exam session may be cancelled if no candidates are scheduled.



Q5er Editor & Publisher: Jody Nelis - K3JZD

This newsletter may be freely forwarded.

Permission is granted to other Amateur Radio publications to reprint articles from this issue, provided the original author and "*The Skyview Q5er*" are credited.

email your comments and article submissions to: [K3JZD AT ARRL DOT NET](mailto:K3JZD@ARRL.NET)



I just got my ham radio license, now what do I do?

That's Easy

Come up to the Skyview Clubhouse on any Tuesday and ask !!!

And See : <https://tinyurl.com/y79tqsr8>

All General Information about the Skyview Radio Society is at <http://www.skyviewradio.net>

Subscribe to K3MJW [groups.io](https://groups.io/g/K3MJW) reflector for All Current News & Activities : <https://groups.io/g/K3MJW>
If you want to keep up with what is going on NOW, that is the place - have it forward msgs to your email



Is this how your dining room looks ??

Send in pictures of your Ham Shack