



Q5er – The Official Newsletter of the Skyview Radio Society

December 1, 2025

- RF is Hard To Block
- MilliHertz Repeater Checks
- The MAMONT WINDOM
- A What's This Question
- Mother Nature Issues
- An Unhappy Ending
- JCP-12 Antenna Review
- Antenna Switch Blues
- And More ...
-
-



tnx ChatGPT

**Sunspot Numbers
Are Still High**

**Time to exercise
the 10-12-15-17-20
Meter bands while
they are Still Hot**

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2025 is Skyview's 65th Anniversary !!



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

Lots of good educational articles again this month.

Quite a variety of subjects.

New authors are always welcomed.

Jody - K3JZD

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

From the Treasurer

Membership Renewal time.

In spite of some utility costs increasing, We are holding the line on the Annual Dues.

Looking forward to having you with us in 2026.

Jody - K3JZD

ADVENTURE: The respectful pursuit of trouble.

Ham Radio is a Contact Sport

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.

As much as I hate to point it out, COVID is not 100% gone. There are still daily hospitalization admissions for the more serious COVID cases. Sharing is not caring. If you are not feeling well, please stay home.

If you cannot do great things, do small things in a great way. - Napoleon Hill

Skyview Business Meeting Minutes

de Don - WA3HGW

Skyview Radio Society

Monthly Business Meeting – November 4, 2025

Call to Order: 7:26 PM by President Jerry LaSalle, W3UY.

Attending – 26 members: KB3OMB, AG3U, N3WMC, K3ES, K3STL, KE3IF, W3UY, K3FAZ, W3IU, WA3KFS, NJ3R, W1MP, WA3HGW, AB3GY, WC3O, KA3CBA, AG3I, KQ3S, KE3Z, KC3VNB, N3DRB, KC3PXQ, K3JZD, NM3A, AC3Q and KD3BYT.

Meeting Minutes: The minutes of the October 7, 2025 meeting, as amended, were distributed for review. A motion to accept the minutes as presented was made by N3WMC and seconded by KA3CBA. The motion passed without objection.

Treasurer's Report: Treasurer Jody, K3JZD, reviewed the 31 October 2025 Financial Report (attached). Jody noted we are in a good position for fixed expenses for the remainder of 2025. We will be needing propane shortly. No T-Bills were purchased and none have matured in the last month. Unallocated income was from Half & Half collection plus donation, VE testing and kitchen income. Expenses included replacement coax and rotor cable, a weather radio and the Geochron clock subscription. A motion to accept the Treasurer's Report was made by NM3A and seconded by KA3CBA. The motion passed without objection.

Membership Report: Tom, AB3GY, advised there are no new membership applications this month, but we do elect honorary members. AB3GY made a motion to accept the following honorary members for 2026: Pietro Begali-KD2JON, Bruna Begali-KI2RTF, Tim Duffy-K3LR and Dennis Woytek-KB3HPC. The motion was seconded by AC3I. The motion passed without objection. Membership renewal notices will be sent out in the next few weeks. 2026 membership will remain the same as 2025, e.g. \$50 for regular members. Membership still stands at 169.

Radio Officer Report: Bob, WC3O, reported that all radios were operating normally. In addition, the crank-

up tower work is now COMPLETELY FINISHED!!! This news was received with a hearty round of applause. The 10 meter vertical antenna as used for the Breeze Shooters net was repaired, the NVIS antenna was raised to a safer height to avoid contact with personnel, two sets of Heil headphones were returned for repair and the replacement antenna switch controller was defective as received and will be replaced by the manufacturer under warranty.

Kitchen Report: Bob, WC3O, reported that snacks were replenished. The current balance is \$108.

VE Report: There was one candidate in October. He failed the Technician test and will try again later. There are two candidates for the November VE session.

Newsletter: The October Q5er is now out with lots of articles by Cookie this issue. New material is requested by November 15 for the December issue.

Building Committee: Marty, AG3I, reported the project is still on track. We are waiting for the public meeting to be scheduled by the township. Updates next month.

Calendar of Events:

November 6 – ARRL Frequency Measuring Test.

November 15 to 17 – ARRL November Sweepstakes, Phone edition.

November 15 – Tour of the Iron City Brewery (\$15 admission).

November 29 & 30 – CQ WW CW contest.

December 6 – Skywarn Recognition Day.

December 6 & 7 – ARRL 160 meter CW contest.

December 13 & 14 – ARRL 10 meter contest, Phone & CW.

December 16 – Potluck dinner at the clubhouse.

January 3 & 4 – ARRL RTTY Roundup.

January 17 – Skyview banquet.

Old Business: None

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New Business: Election of 2026 club officers:
Vice President: Chris, AC3Q Elected, no opposition.
Director: Bill, N3WMC Elected by secret ballot.
Dan, NM3A Elected by secret ballot.
Congratulations to our new and returning officers.

Weather Night:

K3FAZ reviewed the weather forecast for the upcoming week. He reminded us of Skyward Recognition day and we will be operating from the clubhouse as WX3PIT. Weather Night on November 11 will be a presentation on winter weather, provided by K3FAZ due to NWS personnel being unavailable because of the government shutdown.

Elmer Night: Nothing scheduled at this time.

Smoke and Solder: Various projects underway. Project for building CW touch-sensitive keyer paddles is still progressing.

Net Report: 10/2 = 49, 10/9 = 43, 10/16 = 37, 10/23 = 41 and 10/30 = 43. Average is 43 check-ins for the month with W3UY getting the most check-ins on October 2 at 49.

50/50 Drawing: Total amount collected is \$50 with \$25 going to Hat Trick winner Jody, K3JZD. Thanks to Jody one more time for donating the proceeds to the club treasury.

Meeting Adjourned: A motion to adjourn was made by KC3PXQ and seconded by KA3CBA. The motion passed without objection. The meeting was adjourned at 7:59 PM.

Respectfully Submitted,

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



What's This ?

Dan—NM3A



It is an adapter to charge a USB device (phone, tablet, etc.) from a 9-20 V battery in the field, while still powering your radio.

Inside the Shrink Wrap is a buck converter which provides 5vdc to the USB connector.

I used this one :

https://www.amazon.com/gp/aw/d/B01D0WSBDC?psc=1&ref=ppx_pop_mob_b_asin_title

It's RF quiet from 100 kHz to 900 MHz (per my Nano VNA) while charging an iPhone, or under no load.

Dan — NM3A

RF is Hard to Block

Jody - K3JZD

On a very windy day in early November, I drove to Maryland to do a couple of SOTA Summits. When I got to the Summit that is at the top of the Wisp Ski Resort, it was extremely windy, with wind gusts that almost knocked me over.



I setup at a different location, in front of a huge boulder, which sheltered me from the wind. The picture is deceiving – my Magnetic Loop Antenna is centered on the boulder, not off to the far side of it.

Europe was a clear shot out in front of my location. But SW USA was behind the boulder. So, I did not figure the SOTA Chasers in the SW would hear my QRP signal very well. I was hoping for some European Chasers. To be able to call this an Activation.

But, on all of the higher bands that I used (10m-15m-20m), all of my SOTA Chasers were out to the West of me. My RF cut right through that huge boulder. I got expected signal reports from them. Really surprised me.

From now on I will not be so fussy about making sure that I have a clear line of sight in my preferred directions.

Jody – K3JZD

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

October 2025

— None —

November 2025

KC3VYK - Dave Fitzgibbons - Extra

de Bill - N3WMC

Not a Happily Ever After Story

Jody – K3JZD

Most stories here have Happily Ever After endings. This is not one of them. So, why is it here? I was just going to deep-six this story. But then I thought that perhaps something could be learned from it. So here it is.

Historically, I never thought much of End Fed Random Wire (EFRW) antennas, Vertical antennas, or Magnetic Loop antennas. It was always resonant Dipole antennas for me.

But then I started using various portable EFRW antennas for SOTA Activations. And found out that they can get the job done. I had to use a radio with a transmatch (aka tuner) with my EFRWs, which made them less than 100% efficient. But they were great for easy multiband operation.

Last year, I had experimented with a portable Magnetic Loop Antenna. I found out that it also worked better than expected. A Magnet Loop antenna gets tuned for each band, so no transmatch is needed. I found that in selected SOTA locations, I could deploy a Magnetic Loop antenna faster than an EFRW. I wrote about this antenna in previous Q5er articles.

I have always avoided Verticals because there was no way I was going to get away with planting one of them in the middle of my yard and running a whole slew of radials. But, I got to thinking that perhaps a portable Vertical antenna could be useful during some SOTA Activations where suitable trees are hard to find. So, I purchased a JCP-12 portable Vertical antenna. That disassembled antenna was compact and was fairly light.



I have deployed my JCP-12 Vertical in my back yard. I made several contacts from my back yard using QRP power. Three radials were just laid out on top of the grass. It covers 40-10 Meters. This antenna gets tuned for each band, so no transmatch is really needed to use it. There is a sliding tap on a center mounted loading coil and the collapsible whip length gets adjusted to make it resonant. That antenna tuning is best done using an antenna analyzer of some kind. One more thing that I would have to carry though to make that antenna perform well



After reading Dan – N3MA's article about the PERformer Vertical that he built (August 2025 Q5er), and after reading some other stuff about how Vertical antennas perform better elevated than whenever they are on the ground, I got the bright idea to raise my JCP-12 Vertical and radials to see if it would work better elevated.

I charged into it. I obtained a light weight collapsible 60" aluminum tripod and rounded up some guying materials. I modified the top of the tripod by cutting off the camera mount so that a piece of ½" PVC would slip over the top section to keep the base of the JCP-12 insulated from ground. I designed and 3D Printed a guying ring.

It turns out that Mr. Obvious was not involved in this scheme. Setting up a guyed light weight portable 60" tripod on an uneven surface turned out to be fun to watch, but not fun to do. Once I eventually had it up and securely guyed, I then found that setting the fully assembled JCP-12 Vertical antenna with a whip on top of it was 'interesting'.

I found that sections of my light weight portable 60" tripod wanted to slide down due to the weight of the antenna sitting on top of it. Then, as stood back and looked at it, I concluded that if it took a tumble, then the long collapsible whip at the top of the JCP-12 would most likely get kinked. A replacement for that collapsible whip may or may not exist.



But it was up. So, I gave it a try. I hit the 'Tune' button on my radio's auto-transmatch feature out of habit. But, after a whole lot of testing on 40m using 5 watts CW, I saw that I had only gotten one RBN spot. That was really poor. I had just gotten a whole lot of good RBN Spots while this antenna was still sitting on the ground.

Ready for this?? (I told you Mr. Obvious was not helping me here). Whenever I connected my antenna analyzer, the SWR that was 1.2:1 on the ground, was 3.8:1 with it elevated. Crap. Remember, having a radio 'tune' an antenna does not mean that the antenna will actually radiate. And there was not any possible way for me to reach the adjustable coil or the collapsible whip to re-tune it. Not unless I grew another 60".

As I stood there looking at this elevated Vertical that did not work, and could not be tuned, it hit me that this was not a Happily Ever After ending.

Jody - K3JZD

(See my JCP-12 Review article later on in this issue)



Load Testing

Is There a Place For Artificial Intelligence in Amateur Radio ? Charles - KC3TTK

A few Elmer nights ago we had a really nice presentation on “AI in Ham Radio” unfortunately I could not stay for the whole presentation. But what I saw was interesting and got me thinking.

Is there a place for this technology in Amateur radio? One of the reasons I wanted to get into ham radio is because I wanted a break from cellular phones and the internet. I wanted to learn the art of communication without wires. I know I probably sound like a Gen Z who “just discovered the joy of physical media (vinyl and compact discs)”. As someone who keeps paper logs and as a parent who started taking is teenage children to a music store because they wanted to show me what a “CD” was, I can appreciate this viewpoint.

I quickly learned that adding a computer opens the hobby in many ways. For a lot of these ways, the internet is still not required. There are plenty of “keyboard to keyboard” modes of communication. Look at everything FLDigi has to offer, there is JS8Call and even FT8 (ptooey). You still need a means to get these programs. But once you have them you don’t need that computer connected anymore.

But wait there is more. None of this is new to most anyone reading this. But you can look people up on QRZ, log QSOs in any number of databases and quickly search up troubleshooting tips for your rig.

When some of the Generative AI websites started becoming mainstream, I was hesitant to use them. I am not typically an early adopter of new technology. The few early interactions I had with the available AI were not favorable. Google AI summary usually contains obvious errors or false information. I assume this is because most of the internet is full of erroneous or false information. Garbage in Garbage Out. As some of the AI programs became more available, I tried them. Asking random questions and it seemed little more than a neat party trick. Cute but I was not really impressed.

Asking corporate America though, “AI IS THE FUTURE”. I assume that because AI does not need a paycheck or benefits, never calls in sick and just grimly does work, then sits motionless until its time to work again (bonus

points if you get that reference) that every CEO on earth is salivating at replacing its entire workforce with some sort of generative being. Whether the technology is ready or not, this will not stop executives from forcing AI onto the stage. This has been met with both disastrous and humorous results. Look up news stories of “AI hallucination”, “Lawyers using AI to file briefs without checking them” and “frustrating customer service interactions”

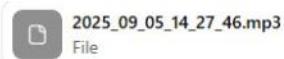
With all that being said “I for one support our new AI overlords.”

Besides the rantings of a man barely clinging to sanity, what does any of this have to do with ham radio? Well, a lot in fact. Earlier I mentioned some of the digital modes. There are many, they are confusing, and they are difficult to decipher without years of listening experience.

Recently I took a few quick recordings of different audio signals across some of the HF bands. Mostly between 6 and 8 MHz. I was curious if ChatGPT could tell me what these signals were. Using my phone as a recording device (I know the IC 7300 can record to an SD card) but this was a proof of concept.

I did this about a dozen times. However I only included two examples in here. If I detailed all of the times I tried this, the issue of the news letter would be about 70 pages. It would turn the news letter into a graphic novel.

The first try went as follows: I took a recording and gave ChatGPT a prompt.

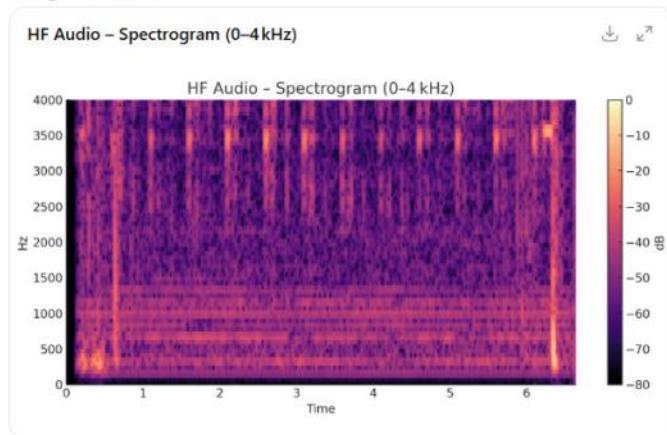


could you identify the communication mode of this audio signal on High Frequency. could you also print a spectrogram or some other visualization of the audio. Please and Thank you

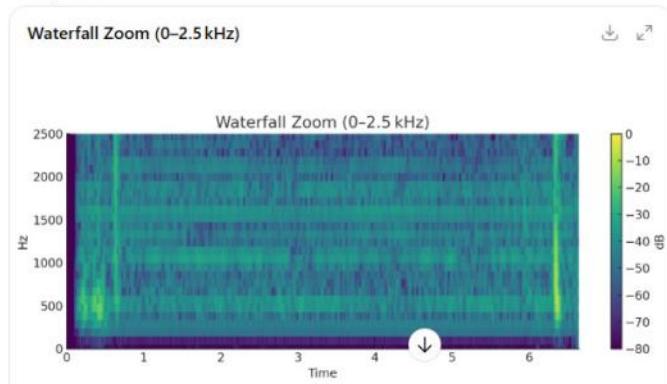
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This is what the GPT came up with:

Thought for 1m 17s



Thought for 36s



Likely mode: MIL-STD-188-110 Appendix B 39-tone OFDM

(sometimes called "STANAG 4539 / 188-110B" by hobby listeners)

Why this fits

Feature in your clip	Matches the 39-tone OFDM spec
Dozens of razor-thin carriers filling ≈ 2.4 kHz of audio bandwidth	The waveform uses 39 equally-spaced tones (plus a pilot) that fit inside a 3-kHz SSB channel
Spacing between the strongest carriers ≈ 44 Hz (some half- or quarter-spaced artefacts also show up)	39-tone OFDM tones are 44.44 Hz apart; the pilot sits ≈ 393 Hz below the lowest data carrier
Burst length $\approx 6\%$ s in your recording	A full "call" or link-setup burst for Appendix B often lasts ~ 6 s before switching to traffic
Murky, multi-tone "buzz" rather than clear single tones	OFDM transmits all carriers at once, unlike ALE or MFSK where one tone hops around

The standard is widely used on government / military HF circuits to pass low- to medium-rate data or digitally-encoded voice (ANDVT, MELPe, etc.). Hobby listeners often spot it on 3, 5, 8, 12 and 15 MHz bands.

Visualisation

Below are two waterfall-style spectrograms generated from your 6.6 s snippet:

1. Full 0–4 kHz view – shows the whole audio pass-band.
2. Zoomed 0–2.5 kHz view – easier to see the evenly spaced carriers.

(Scroll up a bit if you don't see the plots—they were rendered in-line.)

Things to look for in the zoomed view:

- Count the horizontal lines: you'll spot roughly 39 bright stripes.
- Measure the gap between two adjacent carriers (cursor read-out in most SDRs) – it hovers around 44 Hz.
- Notice the short vertical edges at the start/end of the burst: that's the modem's rapid ramp-up / ramp-down to fit inside a time slot.

How to decode (if you're curious)

Platform	Decoder
Windows	go2DECODE, DSDPlus, or SIGMIRA (select "110B 39-tone")
Linux / macOS	SigDigger for visual ID; whisper-ofdm, sds-modem or GNU Radio flowgraphs for full demod
Hardware	Most modern military HF sets (Harris, Rohde & Schwarz, Barrett) have a built-in "110B/39-tone" setting

Feed them ~ 2.8 kHz-wide USB audio centred on the signal and they'll lock within a second or two.

As you can see Chat GPT gave details about the mode, some visualization of the audio file, methods of decoding and some other advice and suggestions.

The second try I recorded something in the Amateur bands.



Thought for 1m 47s

The clip is the **MFSK-16 weak-signal keyboarding mode**—a 16-tone multiple-frequency-shift-keying signal that's been popular with radio amateurs since the early 2000s.

How we know it's MFSK-16

Feature seen in the audio	MFSK-16 spec
16 distinct audio carriers hopping around within the pass-band	MFSK-16 uses 16 orthogonal tones
Tone spacing ≈ 15.6 Hz (after correcting for the recorder's sample-rate offset)	Official spacing is 15.625 Hz
Occupied bandwidth ≈ 235 Hz	15 gaps \times 15.625 Hz ≈ 235 Hz
Symbol rate ≈ 15.6 baud	Each tone lasts 64 ms \rightarrow 15.625 baud

Because only one tone is keyed at a time, your waterfall shows a single razor-thin line that "walks" up and down between those 16 slots; when more than one station is present you'll see two (or more) such lines at once.

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Decoding (getting the actual text)

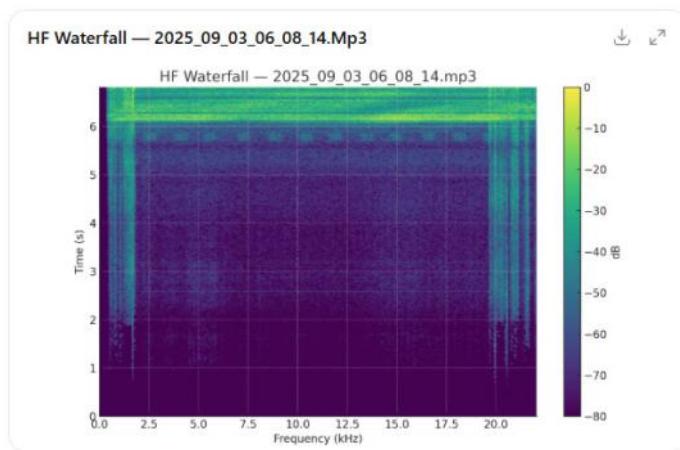
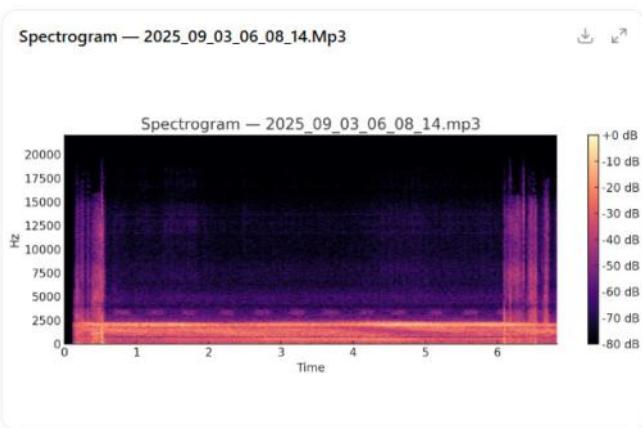
1. Software
 - Fldigi (Windows/macOS/Linux) – choose *MFSK-16* in the Op Mode → MFSK menu.
 - MultiPSK or dm780 are solid alternatives.
2. Radio settings
 - USB mode, center the signal so the lowest tone starts ≈ 1500 Hz audio (Fldigi shows a green “sweet-spot” bar).
 - IF bandwidth ≥ 500 Hz; AGC slow or off.
3. Let it copy
 - MFSK-16 has forward-error correction, so even marginal signals usually print 100 %.
 - If nothing appears after a few seconds, flip **RxDI** on—many stations send the RSID header that auto-selects the right mode.

Your 6.8-second snippet is too short to recover a full sentence (an average call-sign exchange takes ~15 s), but a real-time decoder will scroll the text as soon as it hears a few complete symbols.

Why hams still like MFSK-16

- Works down to -12 dB S/N
- Handles fading and polar flutter better than PSK-31
- Includes an image-transfer sub-mode for slow-scan pictures
- Easy to experiment—just a soundcard and free software

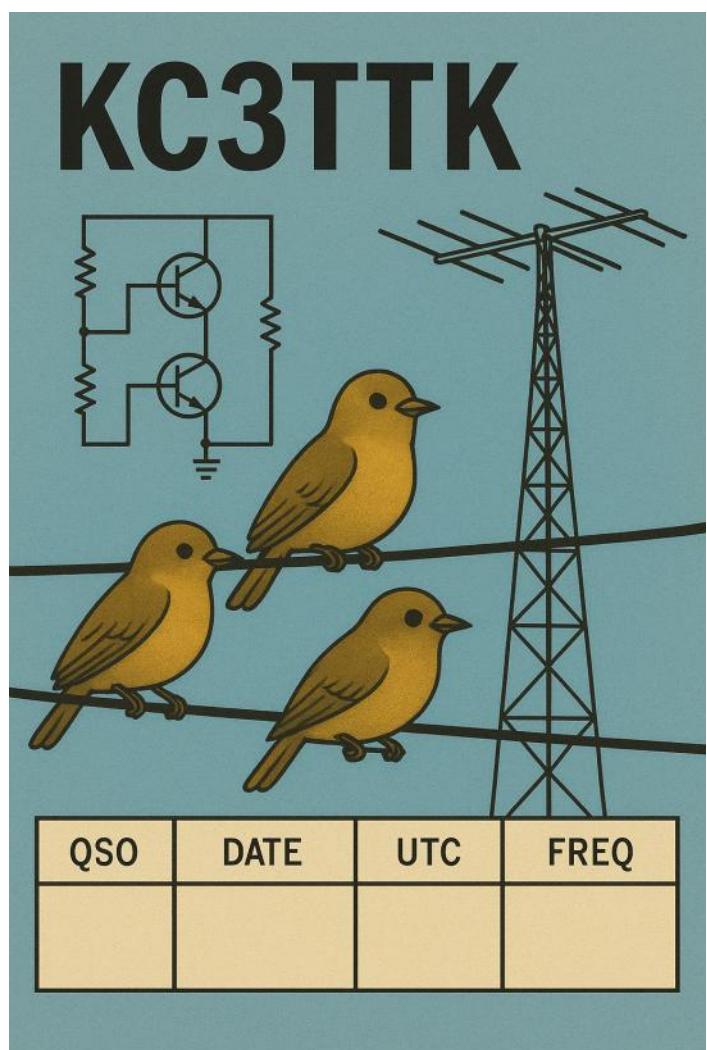
Give Fldigi a spin with the full recording and you'll see the decoded chat appear line-by-line. Have fun!

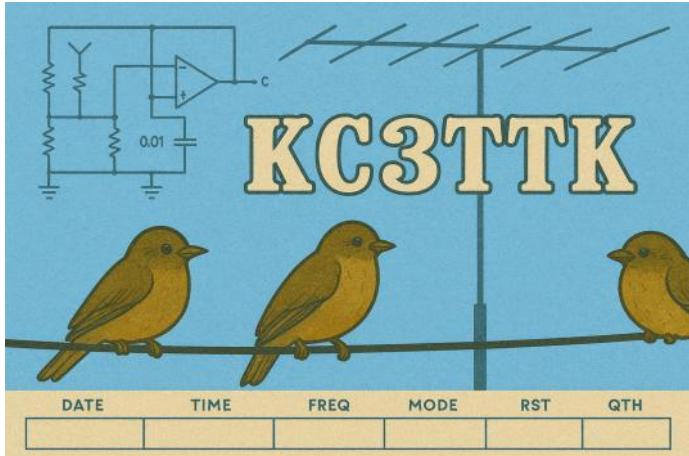


I thought this was really interesting and incredibly useful to a new ham. I know when I was starting out, I was incredibly overwhelmed by all the different noises I heard on the airwaves. Still I am not as familiar with all the sounds as I should be, but I think this will be a helpful tool.

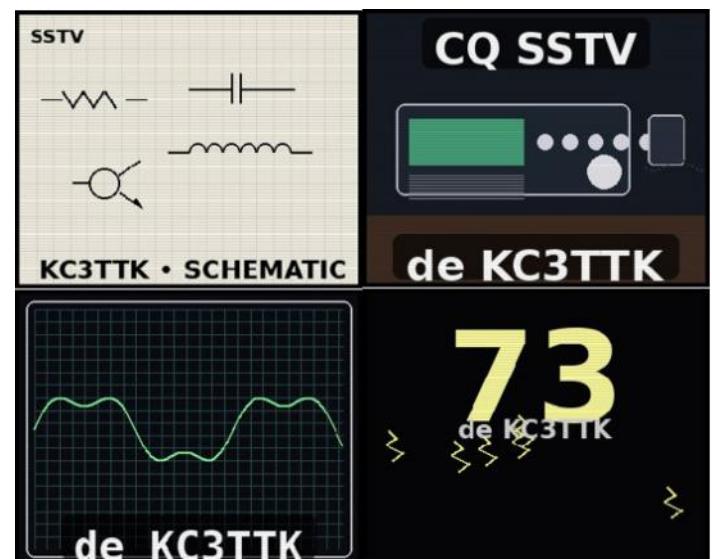
Something else I experimented with was creating QSL cards. I was to get QSL cards printed. I am not incredibly artistic, and I am not sure what I wanted to put on my cards. I wanted to do something more than a picture of my antenna or radio. I am also not well versed in photoshop or any of the other graphic design programs.

I prompted Chat GPT to create a QSL card. The prompt asked me some questions about what I would like on it and my call. I told it to draw some birds on an antenna. Here are a couple iterations of what it came up with.





I also am preparing an article about SSTV for an upcoming issue of the newsletter, so I also asked the GPT to some images to use with SSTV. These images have to be a specific size if you want to load them right into the SSTV software. I will delve into that more in my next article. But ChatGPT created a few images for me use with SSTV.



Some of these images are bizarre. I am impressed with some of the things these AI agents can do, I am also equally surprised at what they cannot do. It did a decent job with my QSL card, and the SSTV images some of them make sense but most of them are weird and I cannot tell what the GPT was trying to do. I continued a conversation with ChatGPT to try to make the images better, but they got worse and worse and I finally walked away from it.

Overall these generative AI programs are a tool (for now). They can be helpful and they can make mistakes. There are a lot of strong feeling about the future of AI in general, but the concept of AI is not new. The genie is out of the bottle so to say.

I think as far as amateur radio goes, there are some good uses for these tools. Especially for a new operator who is trying to figure out what everything is. If you have any good or new uses for any of these AI agents feel free to reach out to me. Thank you for reading

Charles - KC3TTK

Millihertz Repeater Checks: RTL-SDR + GPSDO + Spectrum Lab

Brian - KC3VNB

Ultimate Zero-Mod, Zero-Cost Method: Dangling Wire Injection

The Ultimate Hack: Just Dangle a Wire

Want ± 1 millihertz accuracy on repeater measurements — without a Tee, attenuator, or even an SMA cable? Simply dangle a short wire from your GPSDO (Global Positioning System Disciplined Oscillator) output and let it radiate a tiny local signal that mixes inside the RTL-SDR with the over-the-air repeater. No connectors. No mods. No cost. Just physics.

Why It Works (and Works Brilliantly)

- Your GPSDO outputs ~ 0 dBm (1 mW) — enough to radiate a few μ V from a 10 cm wire.
- The RTL-SDR's RF antenna input is perfectly suited to pick up local signals within 1–2 meters from such a weak source.
- The repeater signal (from a distant tower) arrives via that same antenna.
- Both signals mix in the dongle \rightarrow beat note in audio \rightarrow Spectrum Lab measures it to ± 0.001 Hz.

No Tee. No attenuator. No soldering. Just a wire.

Hardware: The Bare Minimum

Item	Detail
RTL-SDR	Any model
GPSDO	Leo Bodnar, BG7TBL, etc.
Wire	10–20 cm insulated wire attached to center pin of GPSDO
Antenna	Your favorite 2m antenna, although even the rabbit ears supplied with many RTL-SDR dongles works fine
Computer + Spectrum Lab	Available for free from: dl4yhf.de

Step 1: Set GPSDO to Precise Offset

Example: 460.400 MHz Repeater (a local public service frequency)

Setting	Value
Repeater Nominal	460.400000 MHz
GPSDO Frequency	460.399500 MHz → -500 Hz
Output Level	0 to +10 dBm (default) – adjust it up or down by placement of dangling wire – the idea is to get a signal comparable to the received repeater level

Step 2: Dangle the Wire

1. Strip 1 cm of insulation from one end of the wire.
2. Clip or tape it to the GPSDO SMA center pin, or use a breakout cable with alligator terminations.
3. Let the wire dangle freely — 10–20 cm long, pointed toward the RTL-SDR.
4. Position GPSDO within 1 meter of the dongle (closer = stronger signal).

[GPSDO]

|

[====] ← 15 cm wire dangling

|

[RTL-SDR] ← 50 cm away

↑

[Antenna] ← Repeater OTA

No connection to RTL-SDR input — just radiative coupling.

Step 3: Tune and Capture

Use your favorite SDR software, for example, SDRSharp. Tune it to the nominal repeater frequency, set modulation for AM, and set the bandwidth to a small number like 1.5 kHz. You

will likely need to adjust the receive frequency to the center peak of the repeater AND the GPSDO tone in the bandpass region, as in the third figure below. This can be just a bit tricky as the center carrier can be confused with a number of other peaks that are separated by the PL tone. Use the spectrum view in SDRSharp to assist with selecting the correct repeater peak in relation to the reference tone you are supplying. Also, be aware that the RTL-SDR dongle can create spurs that makes selecting the true carrier challenging (see second image below – the reference oscillator has multiple spurs.) It takes a little practice to get it all lined up.





Sample rate 48 kHz → full audio for Spectrum Lab

Step 4: Measure in Spectrum Lab (± 1 mHz)

Quick Config

1. Audio Input: Pipe from rtl_fm (or Windows: Virtual Audio Cable)
2. FFT Size: 131072 → 0.37 Hz/bin
3. Averaging: 5 or more periods
4. Frequency Analyzer → Peak Frequency → mHz display
5. For truly accurate results, sound card frequency must be calibrated in the audio setup screen of Spectrum Lab. This is done by feeding a reference tone to the sound card and entering the reference and observed values. Spectrum Lab then does a proper scaling to account for the sound card inaccuracy.

Step 5: Read the Beat (of course you'll need to do while the repeater is keyed up – during a net works well, or when the public bands are busy, as you'll have plenty of time to make measurements).

Example Beat Note True Carrier

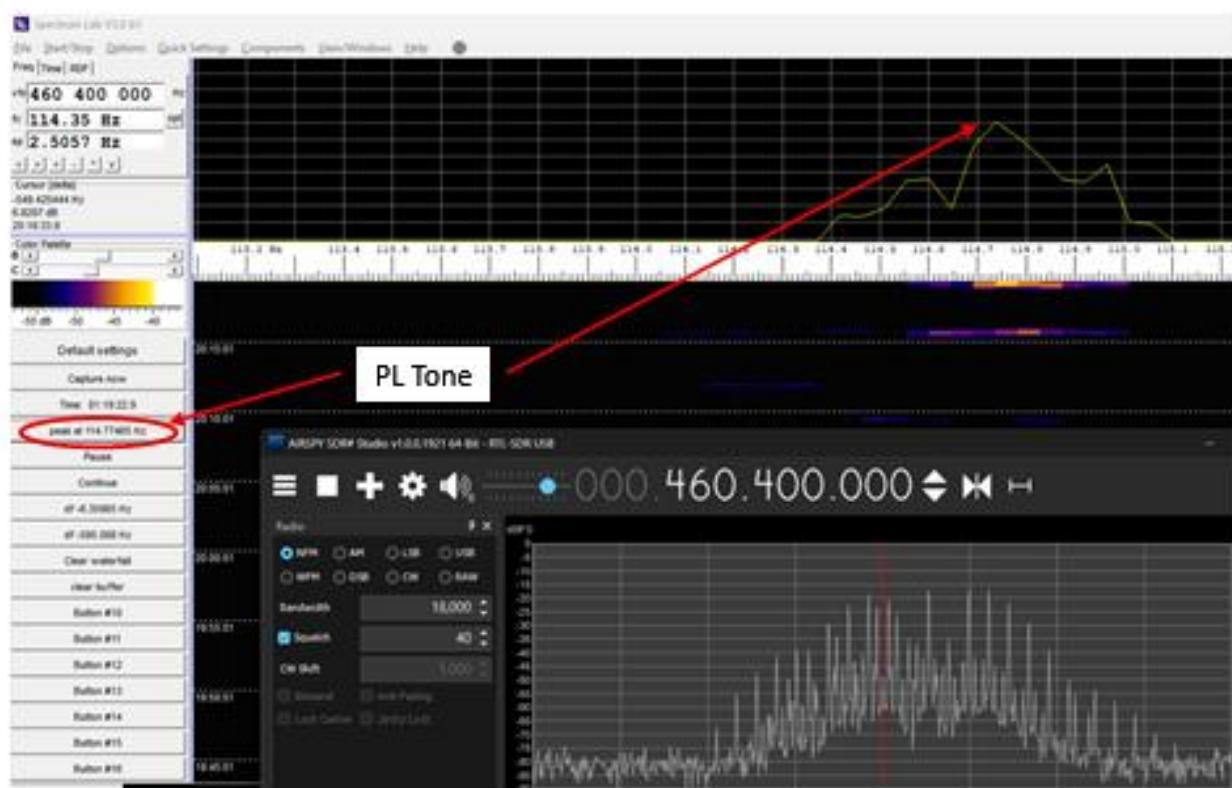
500.034 Hz	640.400034 MHz (+34 mHz)
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Formula:

True Freq = 640,400.000 + (Beat – 0.500) kHz

Step 6: PL Tone (Same Window!)

- In SDRSharp (or your preferred receiver s/w) change demodulation to Narrow FM (NFM), and a bandpass of 15 to 20 kHz. Turn off the reference oscillator – not needed for PL determination.
- Adjust center frequency of Spectrum Lab to expected PL frequency, with a span of a few Hertz.
- The peak reading gives the PL tone directly (e.g. a peak of 114.775 means the PL tone is 114.775 Hz, a mere 25 mHz from the standard value of 114.8. See figures below for SDRSharp and SpectrumLab.



Real-World Field Test: WQKC489 460.400 MHz

Condition Result

GPSDO Wire 12 cm, 40 cm from dongle

Beat Note 500.034 Hz

True Carrier 460.400034 MHz (+34 mHz)

PL Tone 114.775 Hz

Drift Subjectively observed less than 0.01 Hz drift from start to end of transmissions

Trustee: "That's good enough for government work!"

Pro Tips for Max Precision

Tip

Why

Use 15 cm wire

Optimal for 2 m radiation

Keep GPSDO 30–50 cm away Strong but clean signal

Shield dongle in foil Reduces stray pickup (optional)

Log to CSV Track drift vs. temperature

Use 500 Hz offset For ultra-clean beat (less audio distortion)

Cal Sound Card Use a reference tone and set in Spectrum Lab Audio tab

Why This Beats Everything

Method	Cost	Accuracy	Mods	Ease
Dangling Wire	\$0	$\pm 1 \text{ mHz}$	None	5 min
As compared to alternatives:				
Tee + Attenuator	\$15	$\pm 1 \text{ mHz}$	None	10 min
Clock Mod	\$5	$\pm 1 \text{ Hz}$	Soldering	30 min
RF Comms Analyzer	If you have to ask...	$\pm 1 \text{ Hz}$	None	5 min

Conclusion

With one dangling wire, a GPSDO, and Spectrum Lab, you now have a NIST-traceable, millihertz RF lab in your pocket:

- No connectors
- No mods
- No cost
- $\pm 0.001 \text{ Hz}$ on 2 m

Use it to:

- Certify repeater crystals

- Log micro-drift
- Win “most overkill measurement” at field day
- Teach RF physics with a \$0 demo

Bring a paperclip and your GPSDO to the next meeting — we'll measure the club repeater to the microhertz.

73 and stay within 0.001 Hz!

Brian - KC3VNB



It's Done !!

Cooky - WC3O

The re-cabling of the crank-up tower, that is. A project that I figured would take no more than two weeks and ended up taking over a year. In my 63 years, I have never had a project more irritating than this project. No kidding.

It's not that the cable replacement was that hard to do, although it wasn't too easy. The whole problem was dealing with Tashjian Towers in California.

I have never experienced customer service this bad, being completely and consistently ignored. I should have known that it was a sign of things to come when it all started off with finding a hornets nest in the top of the tower. It went downhill from there...

One of the main issues was that there were numerous design changes to the LM-470 tower from the time when it was manufactured by Tri-Ex Towers (What we have) through to the current version as the Tashjian LM-470.

All of the design changes were improvements, which is just great. The problem was that there was NO documentation to ANY of these changes!

Karl Tashjan and his shop Manager, Mike gave me important information in drips and drabs during the long process. And that was during the rare times that I had the opportunity to actually talk to them.

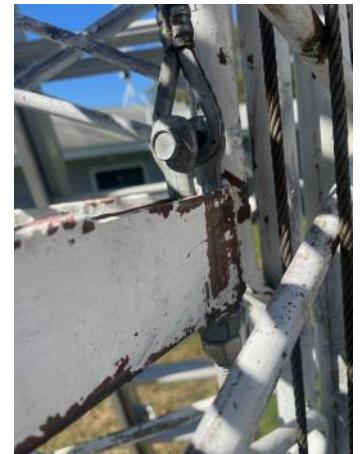
Most of the times my emails went unanswered, as were most of my voicemails. It got to the point that I had to MF the nice lady that answers the phone. She was the only one I could talk to! I didn't want to, but it was what I had to do to make her feel that I was about to go postal. It worked. To a degree... My apologies to the nice lady that answers the phone. She had nothing to do with this. It was all Karl and Mike.

Among the differences in the new design included:

- Heavier cables

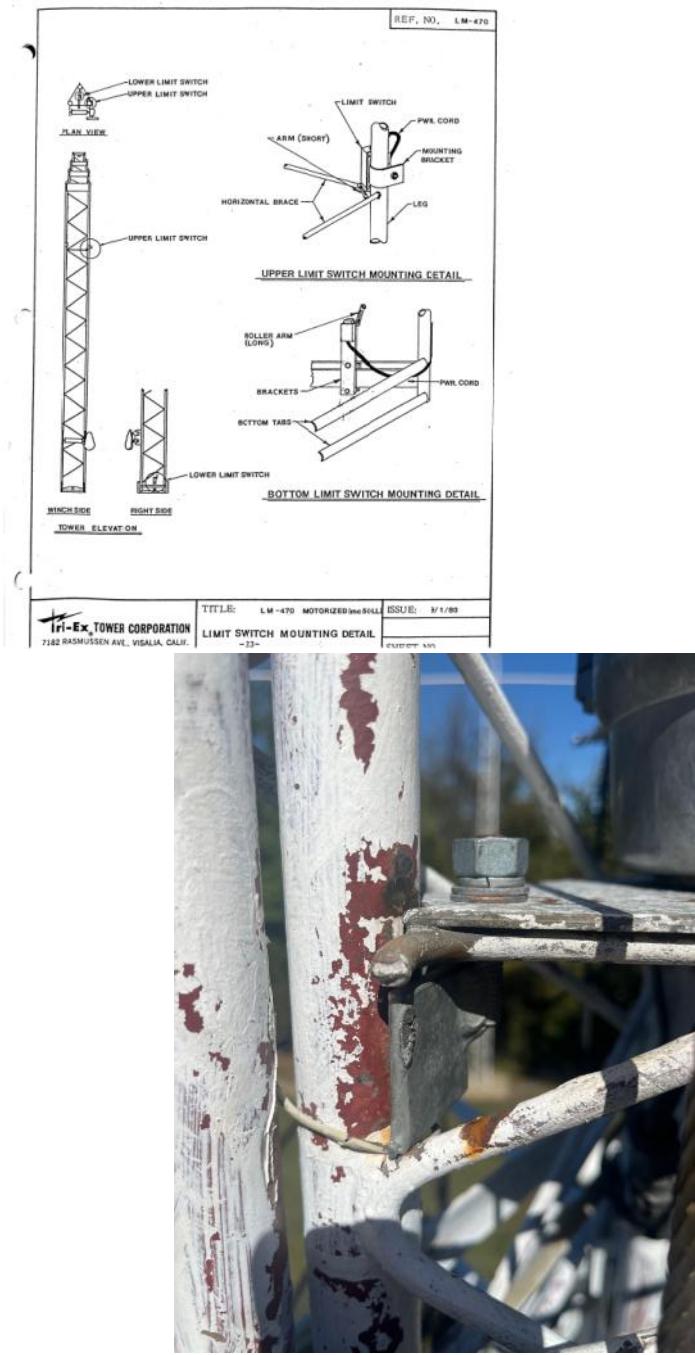


- Different cable lengths than the original cables
- Larger hardware
- Different size pulleys that also required larger hardware
- Cable tensioner brackets of a completely different design



- Changes in the pull-down cable tensioner spring (much larger)

- The tower with the revised parts installed now nests differently than it did with the old cables. The two top sections don't fully nest, giving access to the rotor when the tower is fully down. Actually, as it is now, only the bottom section is fully nested (Resting on a welded-on mechanical stop). The top two sections are still suspended on the cables. I'm sure the latest version of the tower has the stops installed lower, allowing the top two sections to be at rest.



I had information on NONE OF THIS! Did they ship me the wrong cables? Did they ship me the wrong hardware? What are these components for? There's nothing that looks like this currently on the tower? I had no idea, and information was not forthcoming from those that knew. Frustrating to say the least.

There was a lot of drilling (often on a ladder up 25 feet) to accommodate the larger hardware.



Even after most of the issues were worked out, I still had a problem of the two secondary cables on the two top sections being too long? That drove me crazy! What the hell am I doing wrong! Then, by accident, I figured out what happened. Those two cables wrap around 5 inch pulleys. Since I bought all of the replacement components directly from the manufacturer, I "assumed" that the pulleys were right. They were not! The original pulleys were 5 inches in diameter.

The new pulleys were actually 4.5 inches. THAT'S why the cables were too long! But the bearings were bad in our old 5 inch pulleys so I couldn't reuse them.

Thankfully I got to talk to Karl, who had me talk to Mike... They made up two 5 inch pulleys and all was right



with the world.

Another addition to the project was to install the proper spacers for the rotor mounting plate. (If you have a Tail Twister rotor installed the spacers keep the lobes on the rotor housing from hitting the cross braces on the tower)

Again, pain. They changed the bolt size and I had to drill out the holes in the rotor plate to accommodate the larger studs. They're in now...



The fun never ends

So there I am thinkin... It's done! It's DONE! I can't believe it! It's done. In my mind there's a band playing. Ticker Tape is falling from the sky. It's done!

Not so fast, Buster.

Since I was fiddling around with the rotor I figured, before I crank the tower up I should be sure the rotor is still working correctly. I went into the radio room and tried it. It works! I'm done!

Well, yes and no

I cranked the tower up to height. I go to the radio room. I go to turn the beam. THE FRIGGIN ROTOR DOESN'T WORK!!! Are you kidding me!

Short story long, some wires broke in the rotor control cable. Seriously.

Deep breath. Since I had to replace the rotor cable, I wasn't sure how old the coax was so I decided to replace both. I got the heavier duty rotor cable and some new DXE RG-213. I also added a lighting arrester for the rotor cable while I was there.



On the top side-arm, over the years, where the two cables turn and descend to the ground caused a sharp bend in the rotor cable and coax. I got some automotive heater hose, slit the side and ran the two cables through the hose to act as a cushion and a strain relief. I taped over the hose to keep the sun off of the rubber. It worked out pretty well.



Thanks to a guy on the TowerTalk Groups.io I have a PDF of the manual for the tower. (Tashjian wouldn't send it to me) I had it printed in a spiral bound book and made some notes as to the differences. It's in the cabinet in the radio room.

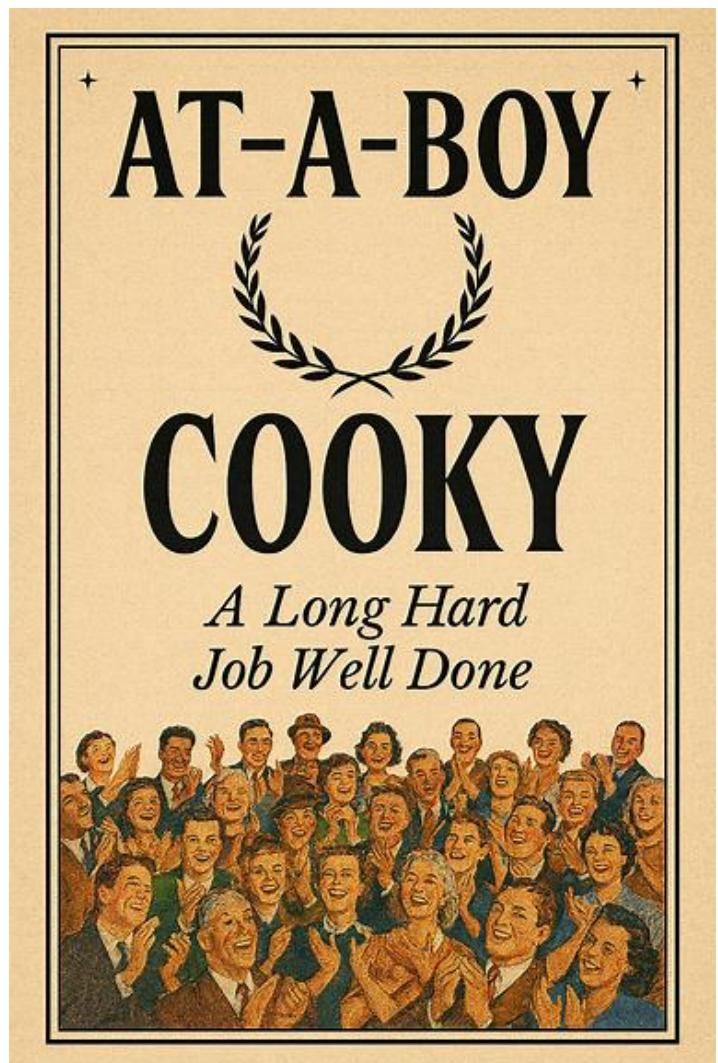
As my dad used to tell me "Now that wasn't hard was it?"

The story continues...

Since Tashjian did not charge us for the two 5 inch pulleys, I was a nice guy and sent the two 4.5 inch pulleys back. Due to the very convoluted path of this project, I have a bunch of spare parts, including two extra pulleys (They are @ \$100 each!), along with other hardware. Some of which I didn't even order... (Parts for the tilt-over fixture that we don't even have) I emailed Karl to see if we could return these items. That great Tashjian Tower customer service continues. I heard nothing.

It's done !!

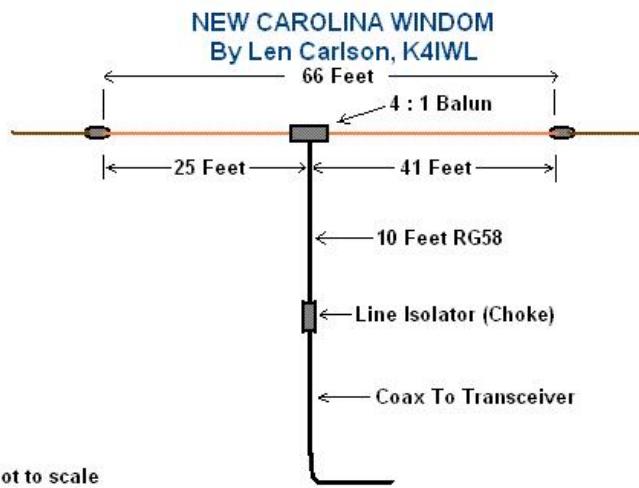
Cooky - WC3O
Skyview Radio Officer



The MAMONT WINDOM - A New Antenna Design

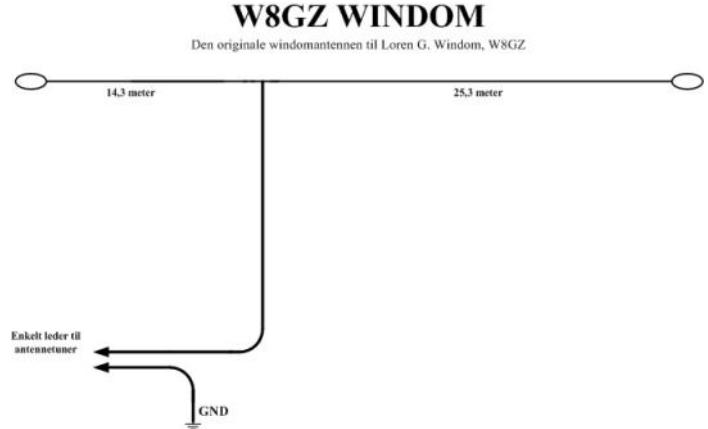
Dan - NM3A

I have been happily using a 160m Carolina Windom as my main antenna at home for 160, 80, and 60 meters for a long time. With a wide range tuner, it can load up on all bands from 160m through 6m. I also have an 80m-6m Carolina Windom that I have used as a portable Field Day antenna. Current iterations of Windom antennas are off-center fed dipoles with a 4:1 unun at the feed point and a 1:1 choke in the coax feed line. The Carolina Windom (no longer commercially produced, although it is easy to construct) adds a common mode vertical radiator in the form of a 10-22 foot length of coax, depending on the base band, between the 4:1 unun and the 1:1 choke in the feedline,



which takes advantage of Common Mode radiation from the outside of the vertical coax section. (This gives a claimed advantage on the higher bands, but the veracity of this claim is questionable.) They can handle up to 500 watts and work well. However, they are fairly heavy and need at least two tall supports, preferably three, to get it high and level for best efficiency. Because of this, the Carolina Windom is not an antenna that can be erected quickly and easily for portable operations and it is not easily carried to a remote location.

Aside: In 1929, Windom, W8GZ, described an antenna variant of the Hertz (center-fed dipole) antenna. It consisted of a random length single wire feed with an off-center placed top hat wire (as opposed to a centered top hat) which was fed against a ground system, preferably with lots of radials.



It is a single band antenna. While the aerial part of modern Windom variants physically look like the original, they are a somewhat different antenna electrically because of the coax feed line. They are an off-center coax-fed horizontal dipole, while the original Windom was more of a vertical with a large capacitive hat. The Carolina Windom attempts to recreate the original Windom's radiation pattern through the vertical coax section. (Although coaxial cable was developed around 1880, coax fed antennas did not become popular in amateur radio until after World War II, when surplus coaxial cable became available at a reasonable price.)

I have a number of very portable antennas that I use for POTA, SOTA, and other portable operations that work fairly well, but I am always looking for new and better mousetraps (antennas in this case.) I have built EFHWs, EFRWs, and end fed coax dipoles, (aka sleeve antennas) as well as vertical antennas. All of them work and each has its strengths and drawbacks.

Personally, my main criteria for Portable Antennas are:

- Ease of setup,**
- Light weight, and**
- Multi-band without making changes to the antenna.**

Other criteria are:

- Efficiency,**
- Gain,**
- Low take-off angle vs NVIS**
- Wide bandwidth,**
- Resonance (no need for tuner),**
- Small size, and Cost.**

Different amateurs and different situations will have a different mix of what is important. But the **MAMONT WINDOM** (an off-center fed sleeve vertical dipole described below) with a wide range tuner **meets my main criteria** and is also **Efficient**, has a **wide Bandwidth**, a **Low Take-off angle**, and is **low Cost**. It does need a wide range tuner for multi-band use. As a comparison, KJ6ER's currently popular POTA PERformer needs no tuner, is Efficient, Resonant, has a Low Take-off angle, a Wide Bandwidth, and some Gain but takes a moderate amount of Setup, is Bulky with a large space requirement, and needs physical re-Tuning for each band change.

The center-fed sleeve dipole has worked well for me, but it is not really multi-band. If that works well, why not an off-center-fed sleeve dipole antenna? Like the modern Windom, this should be multi-banded with a wide range tuner, such as most external auto tuners and many manual tuners. John, VA3KOT, reported this on his '*Ham Radio Outside the Box*' and his initial testing showed me it is possible. I built one for 40-10m, which are the most popular bands for portable operations. Built to John's dimensions, it is 66 feet long with 22 feet of RG174 coax and then 44 feet of insulated #22 wire connected to the far end of the coax center conductor. The proximal end of the coax is terminated in a coax connector and connected to a 1:1 choke balun



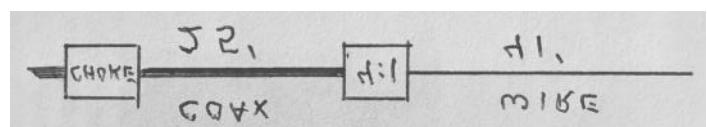
to electrically define the shorter, lower end of the antenna. A variable length of coax connects it to the antenna tuner.

On testing this, a wide range tuner could match 40m, 20m, 15m, and 10m but not other bands reliably. As the feed impedance should be around 200 ohms, I placed a 4:1 balun between the choke and the coax to the tuner. This made some bands better and some much worse, probably because the 22 foot feedline to the electrical feed point transformed the impedance at the 4:1 unun in different ways for different bands.

I realized that the 4:1 balun should go right at the antenna feed point. A 4:1 voltage unun was built and soldered at the electrical feed point, which markedly improved the antenna matching. With the antenna erected as a sloped vertical with the top at about 45 feet and the physical feed end at 5 feet, SWR was about 5:1 or less on all bands from 60m through 10m except 30m, which was about 7:1. 40m, 20m, and 10m were all below 3:1 SWR. On these three bands the antenna can be used without a tuner on some radios. A wide range tuner will make this useable on all bands from 60m through 6m.

If the antenna is completely vertical, it will have a low angle of radiation for most of these bands. As a sloper it will have a bit of directional gain at the expense of low radiation angle. As an inverted V it should have an omnidirectional pattern with NVIS emphasis.

I later built one with slightly different dimensions - 25 foot RG-316 coax - 4:1 unun - 41 foot wire.



This matches the dimensions of the 40 meter Carolina Windom flat top part. This matches a bit easier and has a slightly lower SWR on all bands. In fact, on 40m, 20m, and 10m, the SWR is below 2:1.



On these bands most radios can use this antenna without any tuner. Surprisingly, my Elecraft T1 also tuned the antenna on 80m despite over 10:1 SWR. I am sure efficiency suffers there, but it does allow getting on 80m.

The 4:1 unun was wound on an FT50-43 toroid (0.50" outside diameter) using 22 gauge magnet wire. To keep the windings parallel and tight together, I doubled the wire,

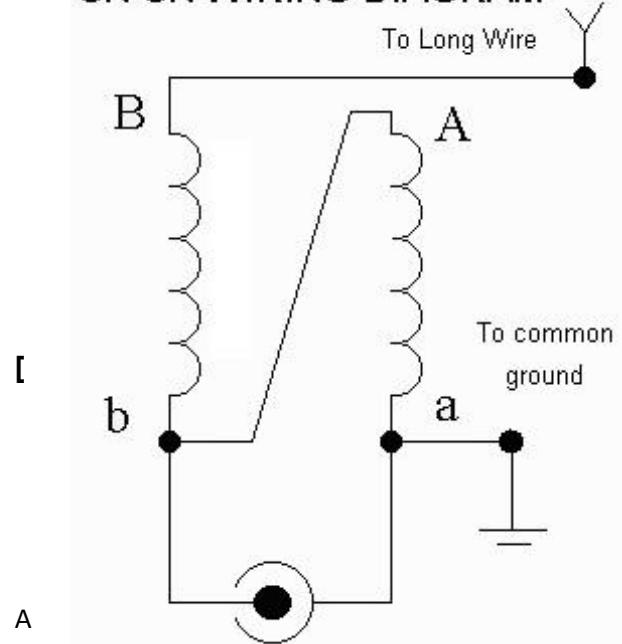


then suspended it taut. I used clear fingernail polish to glue the two wires together. After drying, it was easy to make a nice tight winding on the toroid. The toroid was mounted on a small home made PCB with a plastic spacer. The coax and wire were soldered directly to the PCB.



This could then be covered with shrink wrap and potted with hot glue or epoxy to weather proof the unun. With larger toroids, speaker or power zip-cords can be used to keep windings parallel on the toroid. The FT50-43 can easily handle QRP power. For 20 W, an FT50-43 can be nested inside an FT82-43, or double up on the FT50-43, or use an FT106-43. For 100 W, an FT140-43 or FT240-43 can be used. Heavier gauge wire should be used with higher power (>20W) ununs and chokes. Losses in the unun were measured at 0.2 (FT140-43) to 0.3 (FT50-43) dB at 30 MHz. This 4:1 is a simple voltage unun (auto-transformer).

UN-UN WIRING DIAGRAM



Guanella (current) balun has no advantage with the sleeve concept antenna as the inside and outside of the coax sleeve are physically not able to be separated, nullifying the balance of the balun and the advantage of the second toroid. In addition, a current 4:1 balun requires two toroids and two windings, making it twice as heavy and bulky.

Real world testing with a NanoVNA or with a radio and tuner shows SWR is below 7:1 on all amateur frequencies above the lowest band and much lower on most amateur bands. Modeling radiation with EZNEC shows an omnidirectional pattern and relatively low take off angles of the main lobe on 80m through 17m bands with the exception of 20m, where it is about 30 degrees. A 20m version (33 foot) would have much lower take off angle on the fundamental frequency. Radiation patterns are not be significantly different with differing feedlines.



After confirming function at home with a NanoVNA, I took the antenna to several POTA activations with excellent results using an Elecraft T1 to match the antenna to the radio. My throwing skills are not quite up to 66 foot vertical throws, but 30-40 foot throws are well within my capabilities. Fortunately, the antenna functions well as a sloper, inverted V, or as an inverted L as well as a true vertical and can be setup with a pushup pole as well. Although it could be deployed horizontally, this would defeat many of the advantages of this antenna.

A 20 meter version (12.5 feet coax and 20.5 feet wire) allows for 20 through 6 meter operation with a much smaller height requirement to put a completely vertical antenna on the air in the field. This is far smaller and should be an efficient radiator for working DX for portable operations, especially on 20m, 17m, and 15m where take-off angles are about 15 degrees. Twelve and ten meters have higher takeoff angles. Throwing a line up in a tree or erecting it with a pushup fiberglass pole is simple and quick. A wide range tuner will also allow operation on 30 and 40m, but efficiency suffers here.

This antenna can be scaled up or down in frequency and can be beefed up with much larger baluns and coax. With 18 gauge or larger wire, RG-8X or larger size coax, a larger unun and choke, this antenna can handle much higher power levels. As such, it could make a very good home antenna with a remote antenna tuner at the base of the antenna. Using insulated wire and an antenna launcher, it can be erected as a 40m full vertical or an inverted L in a tall tree in your back yard. Shorter versions covering 20-6 meters can easily be set up as a vertical on any reasonable height tree. As a sloper, a metal tower could also support this antenna. Installation of these antennas only requires a single high vertical support.

A 40m version deployed as an inverted V or sloper should give good NVIS and short skip performance, while still giving okay performance on higher bands. As a pure vertical or inverted L, it should have excellent low angle radiation on 40m, 30m, and 17m. However, 20m, 15m and higher frequencies will have fairly high radiation angles. It is resonant on 40m, 20m, and 10m. Other bands require a wide range tuner.

The sweet spot for portable use is the 20m version. (Coming to a Smoke and Solder night near you soon!) Deployment as a pure vertical is easy to do in the field with either a tree branch or a pushup fiberglass pole. It has low takeoff angles for 30m through 15m and 6m. However, 12m and 10m angles are rather high. It can be used without a tuner on 20m and 10m; other bands require a wide range tuner. Daytime portable use should be excellent on 20m, 17, and 15m and still quite good on 30m.

Advantages of the **MAMONT WINDOM** antenna are:

- Multi-band
- Light weight
- Easy to deploy portable
- Feed line is part of antenna
- Single vertical support necessary
- Low take off angle on most bands
- Wide bandwidth
- Easy to build
- Measurements not critical
- Can be shortened for easier deployment
- Can be lengthened to include longer wavelength bands
- Can use heavier coax, baluns, & wire for higher power

Disadvantages:

- Wide range Tuner needed on many bands
- Shorter lengths lose ability for lower bands.
- Longer lengths need tall supports & antenna launcher
(This may be an advantage for permanent home use.)

Selected References:

Yerger, K2ATY, 'A Coaxial Cable Vertical Dipole Antenna', *HF Dipoles for Amateur Radio*, (2019), pp 79-81, ARRL publications

Richter, WB0USA, 'Off-Center-Fed Dipole Antennas: Theory and Practice', *HF Dipoles for Amateur Radio*, (2019), pp 105-123, ARRL publications

Corby, VA3KOT, 'An Off-Center Fed Sleeve Dipole', *Ham Radio Outside the Box.ca*, January 2025

Windom, W8GZ, 'Notes on Ethereal Adornments - Practical Design Arrangements for the Single-Wire-Fed Hertz Antenna'. *QST*, p 19, September 1929

Dan - NM3A



INTRODUCTION TO ANTENNA MODELING



Heil Sound: A Beginners Guide

Chris - AC3Q

Introduction

If you've ever operated up at K3MJW during a ham radio event, chances are you've probably had the opportunity to experience one of the Heil brand headphones we have available for use in the radio room. And, if you're like me, you've may have wondered how they work and even thought about purchasing one for your own rig.

Well, today's your lucky day because I just recently purchased a set and figured it would be prudent to share some of the information I collected while researching the most current offerings from Heil Sound. So, grab a cup of coffee and sit back while I endeavor to organize my thoughts and convey what I've learned.

A Brief History

Heil Sound began back in 1966 when Illinois theater organist and electrical engineer Rober Heil decided to combine his passions for music and electronics to help support himself and launch his future in audio innovation.

His big break came in 1970, when he was asked to fill in one evening as the audio engineer of the Grateful Dead. The system setup he used was so advanced and clear that it caught the attention of not only the band, but others in the music industry.

Following that success, Bob officially launched Heil Sound as a company focused on professional audio equipment. He became a pioneer in live sound reinforcement, working with artists like The Who, Joe Walsh, and Peter Frampton. Heil Sound also became famous for the *Heil Talk Box*, a guitar effect used by Frampton on "Do You Feel Like We Do" and by Joe Walsh on "Rocky Mountain Way."

In later years, Heil Sound expanded into high-quality microphones for amateur radio and broadcasting, becoming a favorite among radio hosts and podcasters.

Available Models

Heil Sound offers a variety of different headphones and microphone combinations, but for the sake of brevity we will only be focusing on the Pro Set 6, Pro Set 6 Elite, and PRO7. All three are available online except for the Pro Set 6 which has just recently been discontinued. If you are interested in purchasing a version of this model, I would advise doing so sooner rather than later before existing supplies are exhausted. Also, the other aspect to remember about these models is that they are available with either a dynamic or electret condenser microphone. More on this in the sections ahead.



Figure 1: Pro Set 6, Pro Set 6 Elite, PRO7

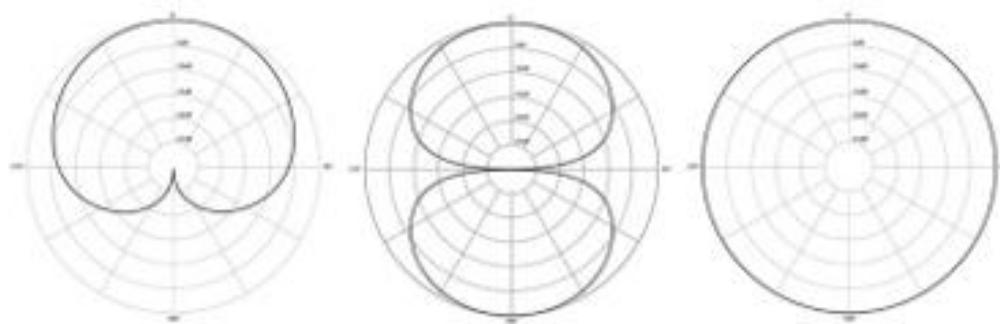
Specifications

Pro Set 6 MSRP: (\$169)	Pro Set 6 Elite MSRP: (\$229)	PRO7 MSRP: (\$349)
Element: PS 6 PS iC	Element: PSE 6 PSE iC	Element: Dynamic iC iC Electret
Frequency Response: 100 Hz – 12.5 kHz 35 Hz – 12 kHz	Frequency Response: 100 Hz – 12.5 kHz 35 Hz – 12 kHz	Frequency Response: 100 Hz – 12 kHz 35 Hz – 12 kHz
Polar Pattern: Cardioid Cardioid	Polar Pattern: Cardioid Cardioid	Polar Pattern: Cardioid Cardioid
Impedance: 600 Ohms 1.5 k ohms	Impedance: 600 Ohms 1.5 k ohms	Impedance: 600 Ohms 1.5 k ohms
Output Level: -57 dB at 1 kHz -48dB at 1 kHz	Output Level: -57 dB at 1 kHz -48dB at 1 kHz	Output Level: -57 dB at 1 kHz -48dB at 1 kHz
Weight: 10.6 oz 10.6 oz	Weight: 13.8 oz 13.8 oz	Weight: 17 oz 17 oz
Pros: lightweight, price, phase reversal switch, fully adjustable microphone	Pros: higher quality ear pads, metal headband, phase reversal switch, durable	Pros: noise isolation, phase reversal switch, fully adjustable microphone, interchangeable element, monitor jack
Cons: less durable	Cons: fixed microphone	Cons: price, weight

Types of Microphone Elements

Ok, this is why we're here. What's the skinny on the microphone elements? Well, starting off, dynamic microphones are passive and do not require power. Most modern amateur radio transceivers use this style of microphone. They have a cardioid polar pattern which is perfect for minimizing background noise, and they pull in vocal frequencies positioned directly in front of the mic exceptionally well. If you've ever used a Shure SM58, then you already know generally what to expect regarding performance.

Electret condenser microphones with [iCom](#) radios on the other hand are active, requiring an additional 48 volts of phantom power to work. This extra power helps drive the element and improves sensitivity thus producing higher quality audio. The only drawback is that they sometimes pick up unwanted background noise, so a quiet studio environment is preferred for optimal sound quality. Dynamic mics fare better in noisy multi-op scenarios.



CARDIOID

FIGURE-OF-EIGHT

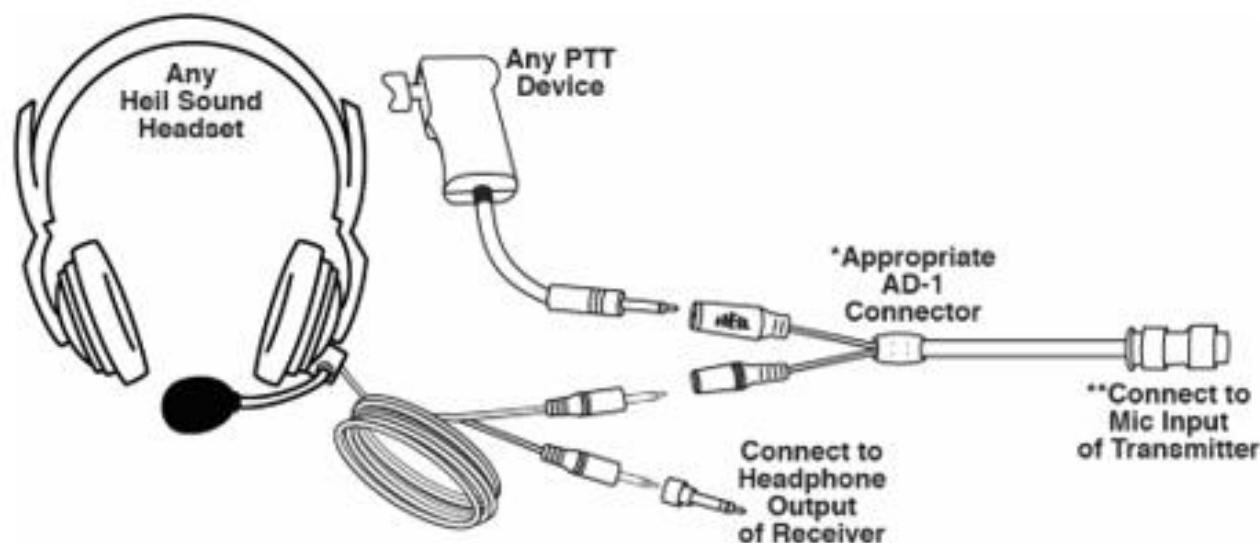
OMNI

Now, you're probably wondering if you can use a dynamic microphone on an [iCom](#) brand radio or an electret condenser microphone on a [Yaesu](#) or Kenwood brand radio. Well, to quote Cooky, "Yes and no." The problem with hooking up an electret condenser mic to a non-phantom powered radio is the obvious lack of power. This leaves you with the option of purchasing an external phantom power supply exclusively for the microphone or simply using a passive dynamic microphone instead. The choice is yours, but it will add additional expenses and cables to your setup.

The alternative scenario of hooking up a dynamic microphone to an [iCom](#) brand radio is a little easier to solve. Since dynamic microphones don't need the phantom power supplied by the radio, we simply need to purchase the correct adaptor cable to block the phantom power from reaching the microphone. Heil achieves this by adding a blocking capacitor to their AD-1 cable which is required for each of these headphones.

Types of Adapters

An adaptor cable? You didn't say anything about an adaptor cable! Yeah, yeah, relax. This makes sense if you think about it. With this setup you want to accomplish two things: 1) be able to hear through the headphone speakers, and 2) have a PTT device trigger the boom microphone so you can communicate. The important things to remember are that you want the correct adapter connection for your brand of radio, and you want the correct type of cable for your style of microphone (dynamic or electret condenser). Remember, you can use a dynamic microphone on an **iCom** radio with phantom power, you just need the adapter cable with the blocking capacitor to block the 48v of power. Conversely, if you want to use an electret condenser microphone on an **iCom** radio, you will need to purchase the adapter without the blocking capacitor. Makes sense?



*See the Adaptor Selector on the Heil Sound website for compatibility information.

**Input jacks vary based on AD-1 connector type.

Illustration not to scale.

Radio	Microphone	Equipment
iCom	Electret Condenser	AD-1 w/o Capacitor for iCom Radios
iCom	Dynamic	AD-1 w/ Capacitor for iCom Radios
Yaesu, Kenwood, etc.	Electret Condenser	AD-1 w/o Capacitor + External Phantom Power
Yaesu, Kenwood, etc.	Dynamic	AD-1 w/o Capacitor for Your Brand of Radio

Conclusion

Well, I hope you found this article informative and helpful. I encourage you to experiment with which microphone sound you prefer. There are several videos available on YouTube which demonstrate the differences between dynamic and electret condenser microphones. They are worth a watch, if you have the time.

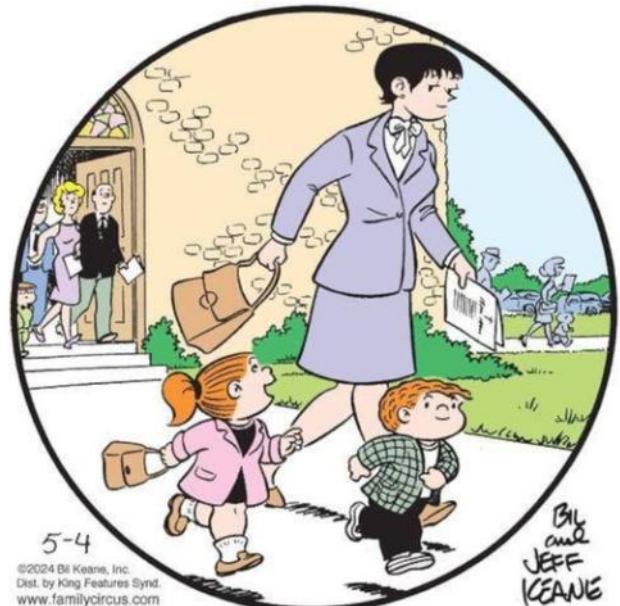
Remember, most amateur radio stations use a dynamic microphone and it's a standard for a reason. So, if you're not sure which to get, I recommend going with a dynamic microphone as it has the most utility. They perform well in noisy environments and don't require phantom power which makes them cross-compatible with multiple brands. Just pay attention to which adaptor cable you are using, and you should be good to go.

One last thing, make sure you remember to adjust the gain on your radio accordingly. Electret condenser microphones use 48v, so they don't need that extra gain. You can probably get away with 20% on your mic gain, where one would typically use 50% with a dynamic microphone. Don't say I didn't warn you! Until next time ...

Best Regards,

Christopher J Vanek de **AC3Q**

"Always Carry 3 Quarters"



They sang so bad that it sounded like FT8!

A Decent Portable Antenna

Jody - K3JZD

If you do any portable operating, your portable antenna is a major consideration. You need two main things: it must be relatively easy to setup and take down; and it must radiate RF. If you do any operating where you have to walk any distance, such as SOTA Summits, then size and weight also become factors.

I do mostly SOTA operations. I will occasionally do a POTA activation. I will occasionally operate in some local park for some specific QRP event. I have tried many different types of antennas over the years. Some of the ones that I discounted early on have become the ones that I have tried recently. I wrote previously about my surprising success with a portable Magnetic Loop Antenna (MLA).

Portable vertical antennas fell into the category of 'second class antennas' in my mind. So I have always avoided them. However, I have just tried using a JCP-12 Portable Vertical antenna. The JCP-12 is a little pricier than my homebrewed EFRW antennas that I frequently use. But some good reviews led me to go ahead and order one to try out.



<https://www.amazon.com/GOOZEEZOO-Shortwave-Regulator-7MHz-50MHz-Multi-Band/dp/B0BVB73JJD?th=1>

The quality of the parts is much better than I expected. It is light. The black sections are aluminum. The rest is bright steel. The extendable whip is solid. And a nice travel bag. The center loading coil has markings for 20m and 40m. And they are accurate. No marking for 30m, and you remove the loading coil for all bands above 20 meters. Above 20m the length of the extendable whip must be adjusted for lowest SWR, using either an antenna analyzer or your rig's SWR readout.

It is self-supporting as long as the pointed ground spike is securely pushed into the ground. If you are somewhere with rock hard earth, you are going to have hunt around for a soft spot to be able to push it in far enough to hold up the antenna.



How does it work? I used it at a SOTA Summit near Mercer PA a few weeks ago. That "Summit" is just a little bump-up hill – not really a 'Summit'. There I used it with my KH1, which only produces about 3 watts when using its internal battery. It was late in the day for Europe, but I worked F4WBN, who never seems to let any activation go by. Of course he does all of the heavy lifting. I worked KX0R who was on a SOTA Summit in CO. I

worked WW7D who was at home in WA state. I worked AK5SD who was at home in TX. So, I was happy. Of course I had the SOTA Spotting Network helping me out.

I also used this JCP-12 with my KX3 at the Bushy Run Battlefield during the Adventure Radio Society Fall QRP Flight of the Bumblebees. I was not on real high ground there. But it did well.

This Reverse Beacon Network (RBN) map speaks for how well my 5 watts of RF got out from the Battlefield while using this antenna on 40m, 20m, 15m and 10m.



Summary

While not cheap, the JCP-12 Portable Vertical is effective. It is a keeper. There are still some drive-up SOTA Summits where nothing will be faster to deploy than my Magnetic Loop Antenna. But there will be many others where I can foresee this Portable Vertical being a fast setup and take down. But, in either instance I will still carry my proven 53' EFRW antenna as a backup.

Jody - K3JZD

This is why women live longer...



The Five Principles Of **MY SHACK**

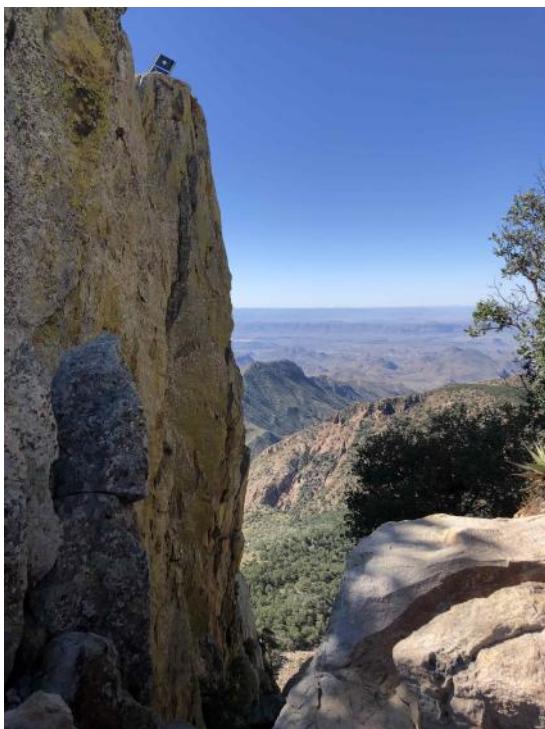
- 1 NEVER THROW ANYTHING OUT.**
You never know when you might need it.
- 2 I KNOW WHERE EVERYTHING IS.**
I know by instinct – it only appears to be a mess.
- 3 YES I NEED SEVEN OF THOSE.**
You can never have too many tools.
- 4 LEAVE THAT ALONE.**
Can't you see that's work in progress.
- 5 IT WORKS BETTER THAT WAY.**
Stop asking stupid questions.

Compact Portable Field Kit: Part I

Dan - NM3A

Effective Field Go Kits vary from the “everything in the back of my truck” monstrosity to an ultra small Pixie transceiver and wire of less than 2 ounces. I have a wide range of Go Kits, although nothing at those extremes.

On a cross country camping trip in 2021, Janice and I hiked to the Chisos Range’s 7832 foot Emory Peak in Big Bend National Park.



It was a ten mile hike out and back from the visitor’s center with about a 2500 foot rise. Here’s visual proof that we made it!



Although it was late October, it was still quite warm at 80+ F. Because of the hours long hike, temperature, and need to carry lots of water and food, I opted to not take my then current Go Kit as it weighed about 6 or 8 pounds and I had to minimize the weight. I still regret needing to make that decision and missing a unique SOTA for me.

Since then I have been thinking about a lightweight option for portable operations after a long hike. I have contributed a few kits to QRPer.com’s Field Kit Gallery and reviewed the others. Adam, K6ARK, lists a complete SOTA kit using an MTR-2B transceiver (40 & 20m) that weighs 6.6 ounces including the carry pouch! A 10 foot extendable mast can be added, which gives an ultra compact and lightweight kit for less than one pound. Perfect for long hikes or for an Every Day Carry kit.

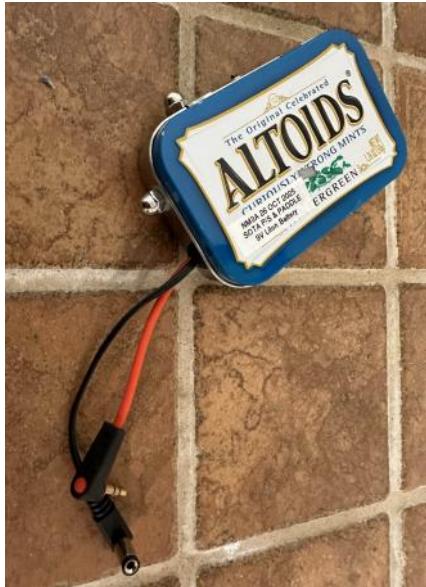


Q5er – The Official Newsletter of the Skyview Radio Society

That post inspired this lightweight SOTA kit.



It consists of my favorite QMX (or QCX) transceiver with an attachable Altoids tin that contains a power supply and a capacitive touch paddle. A tuned 40m EFHW attaches directly to the rig with a 49:1 unun and no tuner. A rock or other locally acquired weight can be used with the included throw line to erect the antenna or it can just be supported on any shrubs or rocks available. This gives a total of 17 ounces. Not the lowest, but it's very light weight by my standards.



Inside the tin is a 1.3 Ahr rechargeable Li Ion 9 volt battery and USB-C charge cable.



A slide switch mounted on the side has the lever shortened so it cannot be accidentally powered ON when stowed. A fingernail or pencil can easily operate it. This provides power to the rig via a short 5.5/2.1 mm coaxial plug cable and to the K6ARK capacitive touch paddle interface.



The 1.3 Ahr battery will provide at least 3 hours of operation at the most common duty cycle for CW or SSB. (Digital use would drop that to maybe 2 hours.) Using 9 volts for my 12 volt transceivers lowers the power output to about 2.5 to 3 watts and also raises the threshold for damage to the finals from poor SWR. A plastic divider provides separate battery, charge cord, and interface/switch compartments.

The inputs to the touch paddle interface are two #6 SS acorn nuts mounted on the corner of the tin. Nylon shoulder washers and larger nylon ordinary washers isolate the nuts from the body of the tin. In straight key mode, these become a cootie (side swiper) paddle.



The power cord and the paddle cable are routed to the radio through a small grommet on the left side of the tin. The tin itself has hook type Velcro on the box to hold it to the rig's or to the tilt stand/cover's underside. The tilt stand/cover is an F4EGX design from Thingiverse. This gives a very compact handheld rig. Logging can be via a phone app or on a paper log.



The antenna is an EFHW for 40 meters using a 10 watt 49:1 unun and 28 gauge silicone wire. This is stored on a wood/insulation sandwich winder weighing only 0.3 ounce. In optimal (vertical or sloper) deployment, SWR is less than 1.5:1 for 40, 20, 15, and 10 meters in the CW/digital portion of the bands. All 4 bands SWR are well below 2:1 in most antenna configurations. Running at low (9V) voltage and power help protect the rig finals from SWR aberrations, so no tuner is needed.

Basic Go Kit Contents:

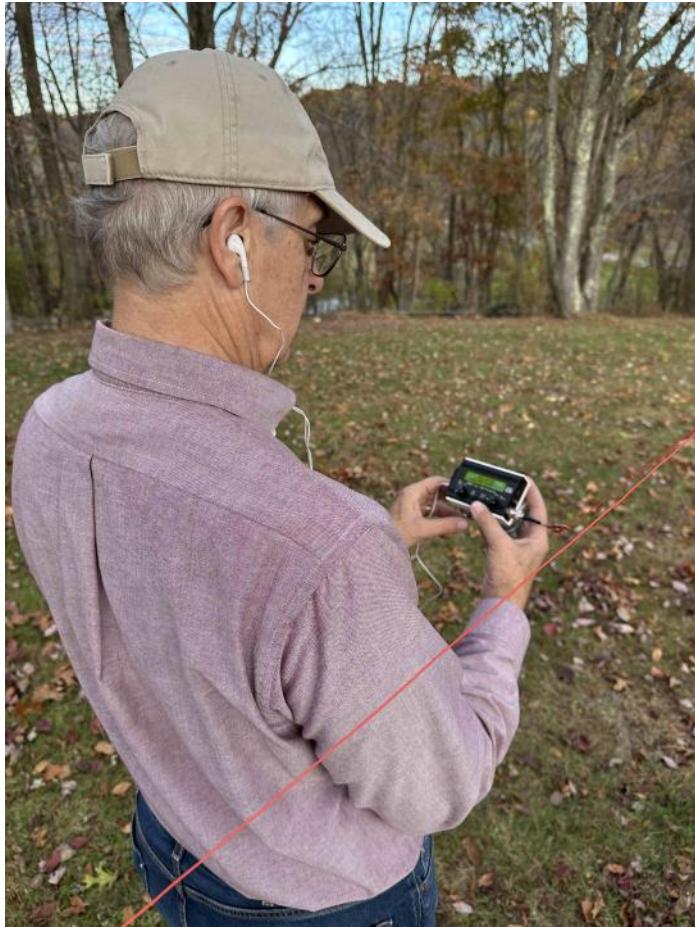
- Soft bag - no padding needed
- QMX (or QCX)
- BNC protector (3D print)
- Cover/tilt stand for QMX (F4EGX 3D print design)
- Altoids tin with 9V battery, capacitive touch paddle/K6ARK interface
- USB-C battery charging cable
- EFHW for 40 meters with integral 49:1 unun, and BNC
- Throw line
- Ear pods, corded
- Log book & golf pencil
- Velcro wrap

Options:

- Light weight carabiner
- Spare battery
- Microphone/PTT & cable
- Light weight telescoping pole ~8 oz

All of this in the small cloth bag that fits in any small space in a backpack or even in a waist pack. Logging can be on small log book & pencil, or a phone app. Notice that there are no spares of any kind in the basic kit. This is to keep the weight and volume down. A spare battery could be added if multiple activations were planned.

Now I have no reason to leave a rig behind on long hikes!



Well, maybe I do...

On testing in the real world, the capacitive touch paddle keys the radio erratically or autonomously, and frequently adds an element to any character. This did not do this in practice mode or with a dummy load attached, so obviously RF is getting into the key circuit.

So, it's perfect and it's a great idea! ...Or so I thought, as long as I don't actually radiate any RF. In the words of Skyview's prophet, "Nothin's easy!"

Back to the drawing board. To be continued....

Dan - NM3A



A New Kid on the Block

Cooky - WC3O

As many know - At Skyview, we do RTTY contesting. It was many years ago when we first started RTTY contesting. RTTY was once a popular digital mode and you could often hear RTTY QSOs and conversations on the bands. Nowadays? Not so much. About the only time you hear RTTY today is mostly during contests. Occasionally you will hear a DX station using RTTY. Much more FT8 and other digital modes these days.

RTTY is a great contest mode. However, transmitting RTTY is kind of like transmitting a full power carrier for long periods of time. It is hard on the equipment. At the club we actually participate in the high-power category, up to 1500 watts. We typically run around 1200 watts. That is hard on amplifiers, and everything downstream of the amplifier. Things including filters, antenna switches, coax/connections and antennas.

When we first started doing this RTTY thing, our equipment was not nearly as good for contesting as it is today. We had two Ameritron AL-572 amplifiers that were used. These are nice amplifiers that use four 572 tubes. They were touted as "Near legal limit", putting out @ 1300 watts PEP. It was NEVER meant for the brutal life of RTTY contesting. These two amps were put through hell. We would run them in RTTY mode at @ 500 watts. Even then, it was way more than these amps were ever meant to do.

Over the years, we have accumulated much better amps for what we are doing. The center station, however, was still one of the old AL-572s. It has war stories. It still works but it is definitely out of whack. It needs some TLC and likely a fresh set of tubes. I have been looking for an amp to replace it with an amp that can do what we need it to do.

Well, one day I get an email from Marty, AG3I about an amp for sale in PA that belongs to a well known ham that is a member of FRC (Frankford Radio Club, a HUGE contesting club). The amp was an Alpha 91b and the price was reasonable. Usually, I like to get amplifiers from old guys that likely didn't use them much and by the time we land up with them, it's practically a new/old amplifier that has had an easy life.



With this one, I don't know what it has been through but the owner is a very active ham and contesteer. But I figured that if he was trying to sell it to his FRC buddies, it's likely in good shape. Add to that, he is a long-time friend of our own Don, WA3HGW. I figured it was likely safe to make the purchase.

When I talked to Don about the amp he offered to drive out to eastern PA and pick it up, doubling as a chance to visit his sister. I talked to Jody about it and we were off to the races!

The Alpha 91b

Alpha has a long, proud history of making some of the finest tube-type linear amplifiers that could be had. Their old advertisements boasted that you could put a brick on a CW key with an alpha amplifier at full power (Constant 1500 watt carrier output) for DAYS and come back to a perfectly happy amplifier. Do you know what? It's true.

Alpha amplifiers were always made in Colorado (They are now made in Dayton Ohio, sort of... But that's another story) This is a 91b. The b stands for Bulgaria. The 91b was actually manufactured by ACOM. Alpha subcontracted with ACOM to build these amps as a cheaper alternative to its sister USA built amplifier, the Alpha 99. While the 91b was less money, they performed equally as well as the 99 did.

These Alpha amps have pretty good fault protection. If any parameter is too far out of whack that it could damage the amp or tubes, it trips offline. In a club situation, that is very important. The only thing I don't like is that the amp recovers automatically after it has been unkeyed for 5 seconds. It automatically comes back online.

That's just fine assuming that the operator is paying attention to what is going on. I've seen a number of times people at the club talking with the amp out of its comfort zone. They key up, the amp trips offline and the operator is completely unaware. They unkey the radio to receive, the amp recovers, they key up to talk and the amp trips.

One important thing with running an amplifier (Tube or solid state) on HF - **You REALLY NEED TO PAY ATTENTION** to what is going on. Green lights are good. Yellow lights, not so good. Red lights are bad. Keep that in mind.

One of our other amps also trips offline to save itself, but you need to cycle the Operate switch to put the amp back online. I like that better. You need to pay attention.

As I've said before, linear amplifiers are three things: Expensive to buy. Expensive to run. Expensive to repair. Play nice with them and play conservatively and they will last a very long time.

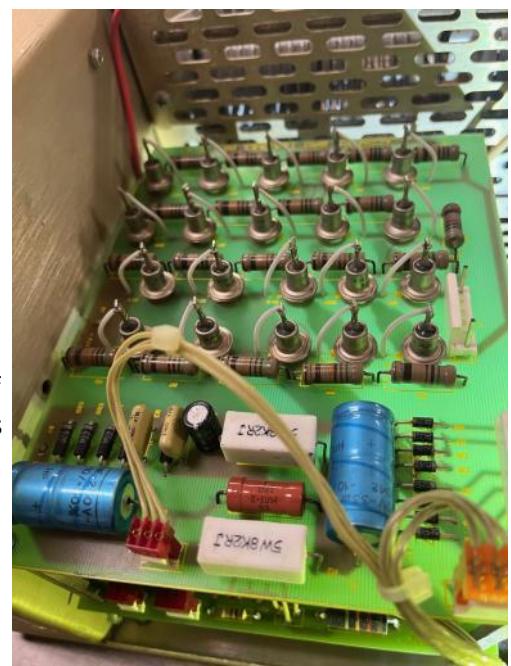
Meanwhile:

A short time later Don returns with the amplifier. She looks pretty good. Not like new, but pretty good.

I need to do a couple of things before we slide her into place. First is that I want to take the cover off to look for any war wounds. Things that look like that were broken and repaired. Any burn/arc spots on the variable capacitors or the band switch.



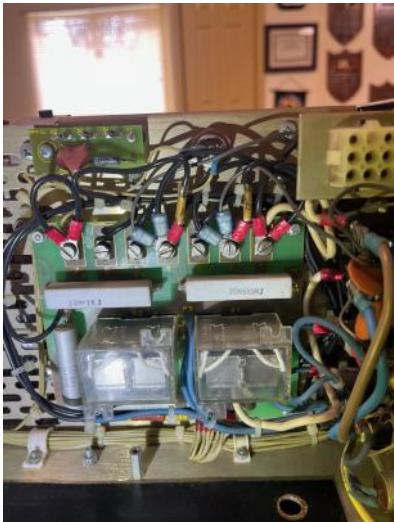
I got the compressor out and blew the dust out of the blower and fan. Also I removed the plate on the bottom of the amp to blow any dust out of the cooling fins on the tubes. I ran a rag around inside to pick up additional dust.



Not knowing when this amp was last used, a week ago? A month ago? 10 years ago? Tubes can accumulate gas (air) inside when not used for extended periods of time. This can lead to high voltage arcing within the tube and cause damage. Usually the tube is ok, but it can damage components in the amplifier. There's a little guy inside the tube/s called a getter.

The purpose of the getter is to absorb gases that may have found their way into the tube. The getter works when it gets hot, like when the heater elements in the tube are powered up. I powered up the amp and just let it sit for hours,

letting the getters do its thing.



At 120 volts the amp pulls TWICE as much current as it does at 240 volts. The outlets and wiring were not designed to pull that many amps. That's why I put a sticker on the front of the amp that says **800 watts MAX**. She'll make more, but we don't have the ability to pull that kind of amperage on that circuit.



A situation in our radio room is that we have a shortage of 240 volt circuits. There's plans to fix that situation, but for now we lack enough 240 volt outlets. The other two amps are running on 240 volt which means that this amp needs to be set to run on 120 volts. That requires changing taps on the transformer.

These amps are MUCH happier on 240 volts. Like I said, plans are in motion to rectify that situation.



In the end the new guy on the block looks pretty good. Time will tell. Many thanks to all involved.

Always remember: **PAY ATTENTION when running linear amplifiers.** If you need help please let me know.

Cooky - WC3O
Skyview Radio Officer

HamPlus Antenna Switch System

This, along with most of my stories recently, is under the notion that nothin's easy. I have no idea what I did or to whom, but I must have did somebody wrong.

We have really enjoyed the HamPlus antenna switching system that has been in use up at the club for many years now. It has been very dependable and a great asset to the club. We did need to replace the actual switch under the desk once, but I think it was damaged by lightning. One way or another, the magic smoke came out. It was replaced and has been working great since.

(For the purpose of this article we will refer to the pushbutton controller units as "The switch". All of the system "smarts" is built into the pushbutton units. The actual switch under the bench simply has a large gaggle of relays inside to do the actual antenna switching. There is no RF that goes through the pushbutton units)



The switch controller on the Yellow station ran into an issue. It was not noting the radio changing bands, and was not switching the antenna automatically as it should. Thus, it was also not automatically switching the bandpass filter to the current band on the radio.

The switch knows what the radio is doing because it gets constant data from the radio via a "CI-V" cable between the radio and the switch. The switch has a CI-V pass-through to allow sharing of the radio data. I have the CI-V data pass through the switch, on to the computer so that the logging software knows what the radio is doing.

I did a lot of troubleshooting by changing out the switch with another switch from one of the other radio positions. It worked fine. I reinstalled the unit that was on the yellow station, and it didn't work. OK so we have a bad switch.

Cooky - WC3O

I ordered another one from DX Engineering with the hope of sending the bad switch back in for repair. This way we would have a spare in case we lose another switch.

The new switch arrived quickly. Like everything else in modern living, they made some changes to the switch. Most notably they changed the radio connector from a DB25 to a DB9. This meant I needed to make up a revised cable for the new switch. Not too big of a deal. I cut an old serial cable with a DB9 male connector and soldered on a 7-pin DIN connector that connects to the ICOM radios.

The only things that go on in this cable are power (13.8 volts), ground and a PTT signal. The switch has a lockout so that you can't "hot switch" antennas while you are transmitting, so it needs a PTT input. I made up the cable and buzzed it out with an ohmmeter to make sure I got it right. It was right.

Like I said, when I powered up the new switch it worked great! Well, yes and no... Whenever I keyed the radio to transmit, the switch would change antennas for no reason! WHY! Can't anything go normal? No, no it can't.

I got in contact with Rod at DX Engineering and Celso from HamPlus in Brazil. We went over what it was doing and I re-performed all of the diagnostics. I could find nothing that I was doing wrong or any issues with the configuration. Ron gave me ideas. Celso gave me ideas. We went over everything and still, the switch kept changing antennas when I transmitted for no reason.

Rod recommended that I send the switch back and they sent me another new switch.

Great! I hooked it up. IT'S DOING THE SAME THING! (sort of). This one, when I went to transmit it would simply drop the antenna, leaving no antenna connected. WHAT THE HELL!

I found the problem. Guess what it was.

The cable that I made up was half of an old serial cable, with factory molded DB9 connectors. I re-checked the connections and they were all good.

However... I found that when I hit PTT, not one but TWO pins were being energized. What?

I cut the DIN connector off and the two pins were still shorted together. What?

As it turns out, there are two pins inside this factory molded DB9 connector that are shorted together. I cut another serial cable and soldered on the DIN connector. Guess what. The switch works just fine...

So what was that shorted pin doing to the switch?

Good question. While we use ICOM radios with CI-V data, other manufacturers transmit band data using what's called "BCD". (Binary-Coded Decimal - BCD)

Yaesu, Elecraft and others use BCD and the switch is designed to be compatible with those radios. That pin that was accidentally being energized was telling the switch that I had switched bands even though I did not.

That's what was going on.

Insult to injury

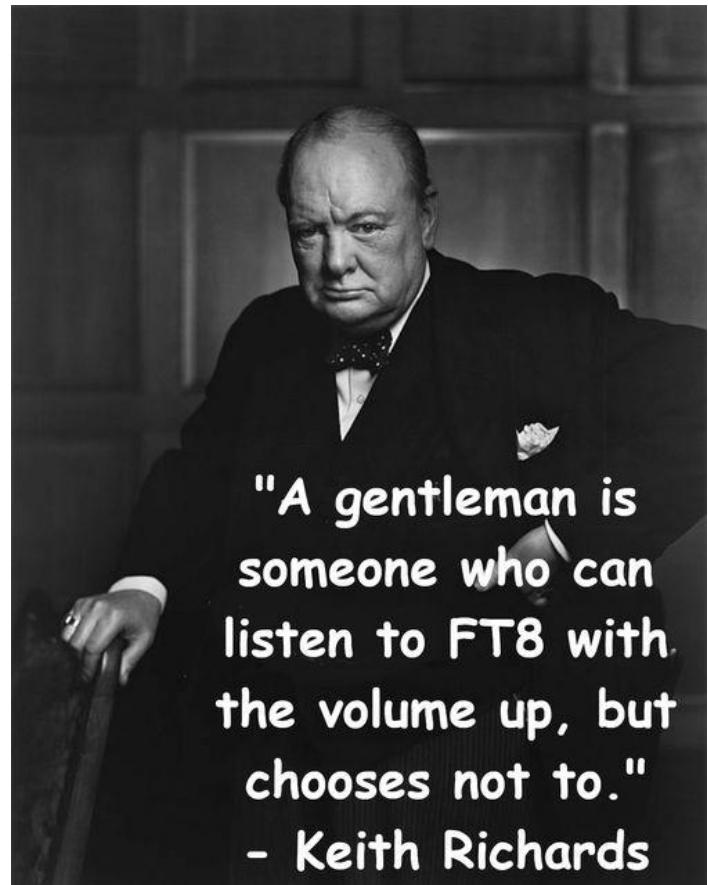
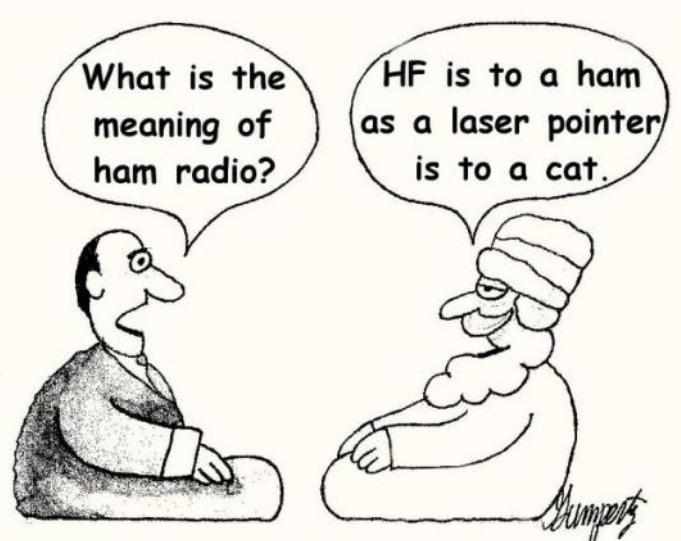
While all of this stuff was going on, we needed to have a switch to allow use of the Yellow station. I put the old controller back in place AND NOW IT'S WORKING!!!

The Allman Brothers were right. I must have did somebody wrong

Very special thanks to Celso at HamPlus, Rod at DX Engineering and DX Engineering in general. Great service all.

Nothin's easy

**Cooky - WC3O
Skyview Radio Officer**



Welcome New Members !!

Welcome the following Skyview Radio Society Members who have joined us since publishing the **October2025** newsletter:

KD3AMZ - Matthew Nolen - Pgh 15211

NG3G - Bob Matcuk - Murrysville

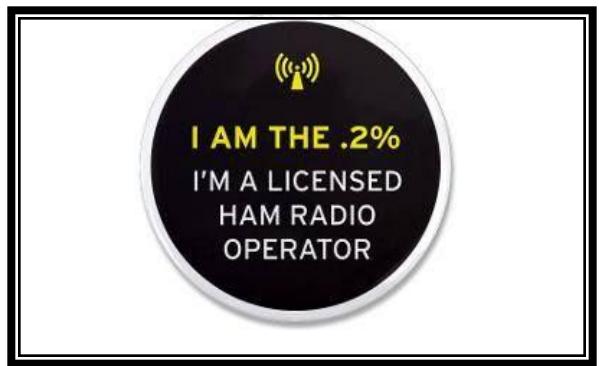
Remember that something is going on up at 'the joint' every Tuesday. Sign up for the K3MJW Groups.io Reflector to get the latest news and event announcements by email.

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 **30 NOV 25**

K3AEB	K3 GT	KS3 N	N3 TTE
KD3AET	AB3 GY	AC3 NA	KC3 TTK
N3AFS	KC3 GZW	G4 NFS	AA3 TZ
KD3AMZ	NY9 H	KB3 NSH	AG3 U
KD3ANT	WB3 HFP	AJ3 O	NS3 U
KB3APD	WA3 HGW	WC3 O	WU3 U
KD3AQP	KB3 HPC	WO3 O	KB3 UIO
NA0B	K3 HSE	KC3 OCA	N3 UIW
N3BAH	AK4 HZ	KC3 OCB	KC3 UNP
W3BRL	AG3 I	KC3 OCC	W3 UY
KD3BUF	AC3 IE	K3 OGN	KX3 V
W3BUW	KE3 IF	N3 OIF	KC3 VCX
KD3BYT	KC3 IIO	KB3 OMB	KC3 VNB
KF3C	AB3 IK	K4 PDF	K3 VRU
KA3CBA	WB3 INB	KC3 PIM	KC3 VYK
KC3CBQ	W3 IU	K2 PMD	W3 VYK
W3CDW	KU3 J	KE3 PO	N3 WAV
K2CI	K3 JAS	W3 PRL	W3 WC
K3CLT	WB3 JHC	KC3 PSQ	KC3 WCJ
WB6CQA	N3 JLR	KC3 PXQ	K3 WM
K3CWE	KA3 JOU	AC3 Q	N3 WMC
N5DB	ND9 JR	NU3 Q	N3 WMI
K3DCG	K3 JZD	KC3 QAA	KA3 WVU
N3DL	WA3 KFS	N3 QZU	K3 WWP
N3DRB	AC3 KI	NJ3 R	N3 XF
KB3DVD	AC0 KK	K3 RAW	W3 XOX
KC2EGL	K3 KR	K3 RMB	KC3 YEZ
KC3EJC	KC3 KXZ	W3 RRK	N3 YJN
KA3EKO	WE3 L	I2 RTF	KC3 YMC
AB3ER	WA3 LCY	KI2 RTF	W3 YNI
WA3ERT	AC3 LD	K3 RWN	KB3 YRU
N3ERW	KC3 LHW	KQ3 S	W3 YS
K3ES	WB3 LJQ	K3 SBE	KB3 YT
KG3F	WB5 LLI	WA3 SCM	KB3 YYC
WB3FAE	K3 LR	KC3 SDJ	KE3 Z
K3FAZ	KC3 LRT	KC3 SNZ	K3 ZAU
KC3FEI	AB3 LS	KB3 SOU	KB3 ZFC
K3FH	KC2 LVG	K3 STL	KC3 ZIM
K3FKI	KB3 LYA	KC3 STV	KC3 ZOH
KC3FWD	N2 MA	KB3 SVJ	W3 ZVX
NG3G	KC3 MBM	W3 SW	
AC3GB	N3 MHZ	KC3 TEX	
N2GBR	KC3 MIQ	WV8 TG	
AC3GE	K3 MJ	N3 TIN	
K3GIR	W1 MP	N3 TIR	

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.....

Can you say that's a lot of computers ??

<https://tinyurl.com/preview/24a4suoj>

Tnx Chuck - K3CLT

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 **February 1, 2026**
Closing Date For Submissions : **Jan 15, 2026**

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 - N3WMC
(724) 882-9612

Email: bdillen@comcast.net
<http://www.skyviewradio.net/ve-tests/>

Please E-Mail or call to register!!!

— NO WALK INS—MUST REGISTER —

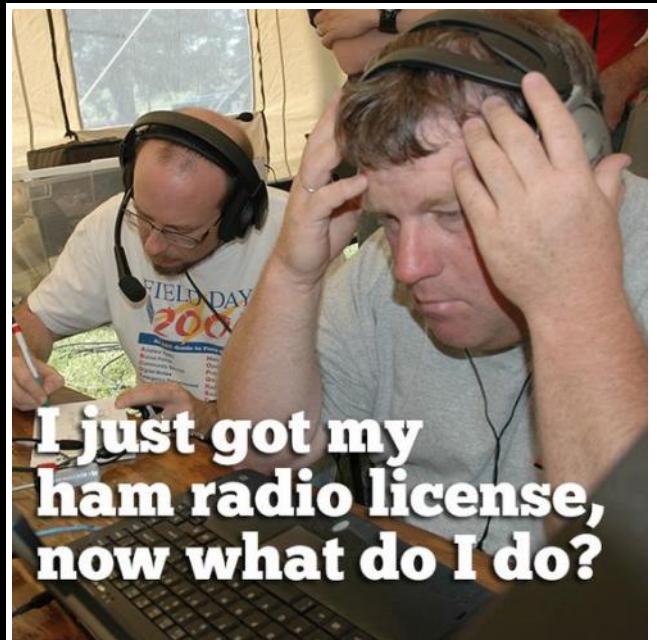


Q5er Editor & Publisher: Jody Nelis - K3JZD

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email your comments and article submissions to: **K3JZD AT ARRL DOT NET**



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** 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