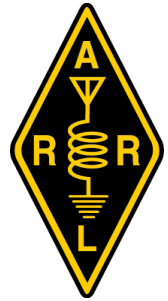




CHEESE BITS

W3CCX
CLUB MEMORIAL CALL

ARRL
Affiliated
Club



Volume LXVIII

November 2025

Number 11

PREZ

SEZ:

The Frost is on the Pumpkin!

That was the rally cry for many years alerting the Pack Rats that the January VHF Contest was not far off. Global warming has provided moderating temperatures over the last decade or two with daytime fall temperatures typically in the mid 60's and frost rarely seen till much later in the season. Still, shorter days and colder nights are clearly signaling that it is time to get ready for the big one!

The contest committee has started to gather and plan the club strategy for another run defending our string of Unlimited Club January VHF Contest wins. Let us know what help you need to add another band or improve your current station. There are a lot of knowledgeable people and resources within the club that are more than willing to assist fellow members. But it's up to you to ask for help. Send me a note and I will work to match you with the support you need.

The October meeting was another outstanding success. The noise figure testing team was busy throughout the evening making measurements from 2M thru 10 GHz. The full detail and results are included in the pages that follow. Thanks to Gary WA2OMY, Paul W2PED, and Ed WA3DRC who manned the three test benches and Steve N3FTI who recorded all of the results. Thanks also to Andrea K2EZ and Chris KE5NJ for photo documenting the entire evening.

On the other side of the meeting room, we enjoyed a thorough and well-done presentation by Dennis WA4LPR, Stan K4RCA, and Jason N4JHP from the Blue Ridge Microwave Society

(BRMS) on the topic of getting on the microwave bands and exploring all of the unique propagation modes that are possible on the higher frequencies. The presentation slides are now available on the Packratvhf.com website. We had a total of 39 member and visitor attendees between in-house and zoom. As always it was great to catch up with everyone. The photos show that everyone had a good time.

Check out the new updated 1296.300 MHz beacon located in FN20DH. Gary WA2OMY and Bruce WA3YUE have added Q65A15 to the mix of CW and tone messages broadcast over each one minute cycle. Q65 is more tolerant of frequency variations than FT8 so you should be able to decode the signal even if your xvtr is not GPS locked. My 40 year old crystal controlled homebrew 1296 xvtr decoded just fine.

Word has it that the Rochester VHF Group will be hosting the 2026 Microwave Update conference next fall. No details yet, but something to mark on your calendar. MUD conferences are a great experience and worth the trip.

The November club meeting will kick off our annual January contest preparation series. We have a wide range of member and guest presentations currently in the works that will be covered over the next couple of months. Don't miss out!

And for those looking further out on the calendar, Hamcation 2026 in Orlando, Florida is scheduled for February 13 -15. Go to www.hamcation.com for more information.

CU on the bands
Phil WA3NUF

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PACK RAT COMMITTEES

January Contest	N3RG, N2NC, W2SJ, AA2SD
June Contest	N3YMS, WA3YUE, W2SJ
Fall Sprints	WA3NUF, W9KXI, WA3EHD, WS3O
Pack Rat Awards	WA3EHD, W2SJ
Quartermaster	Vacant
Membership:	Ray N3RG, W2SJ, WA3GFZ

PACKRAT BEACONS - W3CCX/B

144.300 (FN21be), 222.060 (FN20tk), 432.300 (FN20tk), 903.300 (FN21be), 1296.300 (FN20dh), 2304.300 (FN20tk), 3400.300 (FN20dh), 5760.300 (FN21be), 10,368.300 (FN20tk) See <https://www.packratvhf.com/index.php/on-air> for details

MONDAY NIGHT NETS

VHF/UHF Monday:

<u>TIME</u>	<u>FREQUENCY</u>	<u>NET CONTROL</u>
6:45PM	224.580 MHz	KB3MTW Michelle
7:00 PM	Packrat Talk Group	KA3WXV George
		See Packratvhf.com ON AIR for details
7:30 PM	50.150 MHz	N3RG FM29ki Ray
8:00 PM	144.245 MHz	W2KV FN20ok Dave
8:30 PM	222.125 MHz	KC3BVL FM29jw Jim
9:00 PM	432.110 MHz	WB2RVX FM29mt Mike

Visit the Mt Airy VHF Radio Club at:

www.packratvhf.com or www.w3ccx.com

PACKRAT E-MAIL REFLECTORS

The Pack Rats have an E-Mail reflector that is open to Pack Rats and friends of the Pack Rats. The intent of this E-mail reflector is to have a convenient means of reaching list members on subjects of general interest to the VHF/UHF and Microwave community.

Packrats@mailman.qth.net

The Pack Rats also have a **Members Only** reflector. This list consists of, and is for the use of, **only Pack Rat club members**.

Packrats-members@mailman.qth.net

See the W3CCX Web page for specific information on joining.

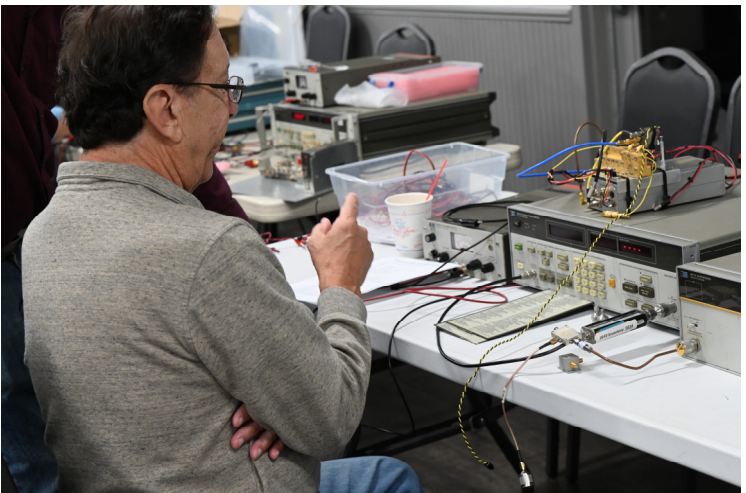
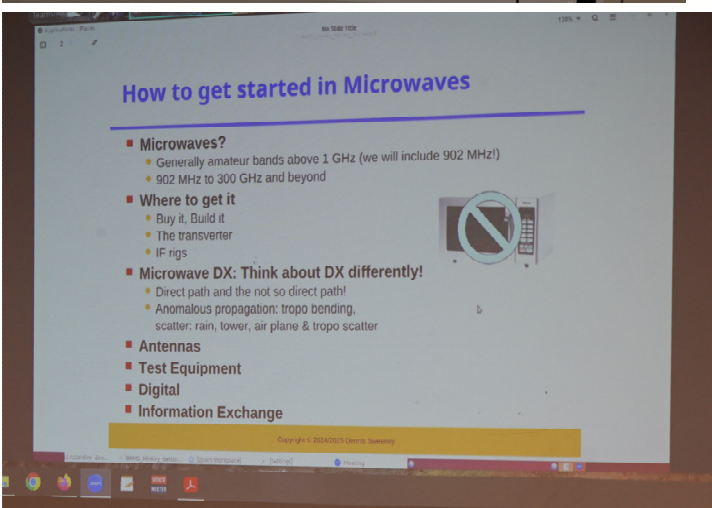
Packrats on Facebook

Use the browser link "www.facebook.com/PackRatVHF", or within Facebook search for the name "Mt Airy VHF Radio Club".

October Meeting

In Pictures

The October meeting featured the usual business meeting and two special events, the Noise Figure Measurement test bench and a presentation on How to Get Started in Microwaves.



October Meeting

In More Pictures



October Meeting

Noise Figure Test Bench

October Test Meeting a success!

Our 2nd annual October receiver and noise figure test meeting was well attended with enough items to test to fill more than 2 hours of time. We were able to finish all the items members brought in for testing about 9:30 and were able to clean up by 10:00 our planned departing time.

This was the 2nd October club meeting in which we offered receive noise figure testing on site. It was assumed we tested most everything club members had to test last year, but this was not the case. The more we talked about testing on the reflector, BOD meetings, and word of mouth, the more it became apparent there was a lot of demand. Early on it was apparent there was plenty of hardware to test on 10 GHz, since 10 GHz testing requires a mixer and LO, construction started for a separate setup for 10 GHz to avoid having to rearrange cables and test hardware.

Several club members volunteered to help and assist with testing and the meeting. Paul W2PED has a lot of experience with the HP 8970 noise figure meter and again this year made time out of his schedule to assist. Since we had three setups Ed, WA3DRC made the trip from MD to assist, Ed also owns and has experience with this equipment. We also want to thank Andrea, K2EZ, Chris, KE5NJ for volunteering to take pictures, and Steve N3FTI who kept track of test units and recorded results which are summarized below.

A word about noise figure testing. Making accurate and repeatable noise figure measurements is a challenge, even in a professional environment with recent and calibrated equipment. Couple this with equipment that is near or over 40 years old, it is amazing we can measure something and debate results within tenths of dB of expected. A real testament to the engineering and quality of the equipment designed and manufactured so long ago. The HP 346B noise source is the heart of the equipment required to do this. The noise meter measures the added noise of your LNA because the amount of noise applied from the source is known. The calibration of this source must be known and exactly right for expected results. There is good and bad news for this calibration to be correct. The bad news is the cost of sending your 20- or 30-year-old surplus noise source out to a cal lab for verification is way beyond a hobbyist budget. The good news is, the HP noise source is probably one of most stable and reliable pieces of test equipment ever made. So, if the noise source has not been damaged, chances are the numbers printed on the noise source are still usable. BTW, the same 346B noise source is still in the current catalog after 40 years, latest price is \$4356.00.

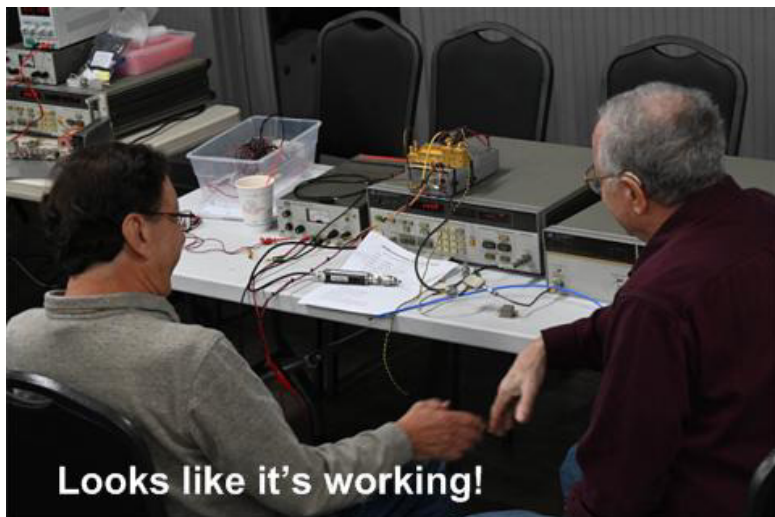
Contributing to the measurement challenge is adapters, cables and the accuracy of the noise figure meter. The RF connector on the noise source that appears to be common is a Male 3.5 MM. This connector has a thin and delicate center pin. To protect the center pin from damage we use an adapter that stays with the source. (I haven't been able to find noise sources with the optional N connector which would make it easier).

This adapter introduces measurement error. Not going to go into details here, there is an excellent article explaining amateur LNA noise figure and measured results written by DJ9BV, here: <http://f1chf.free.fr/hyper/article%20DJ9BV%20from%20F6DRO.pdf>

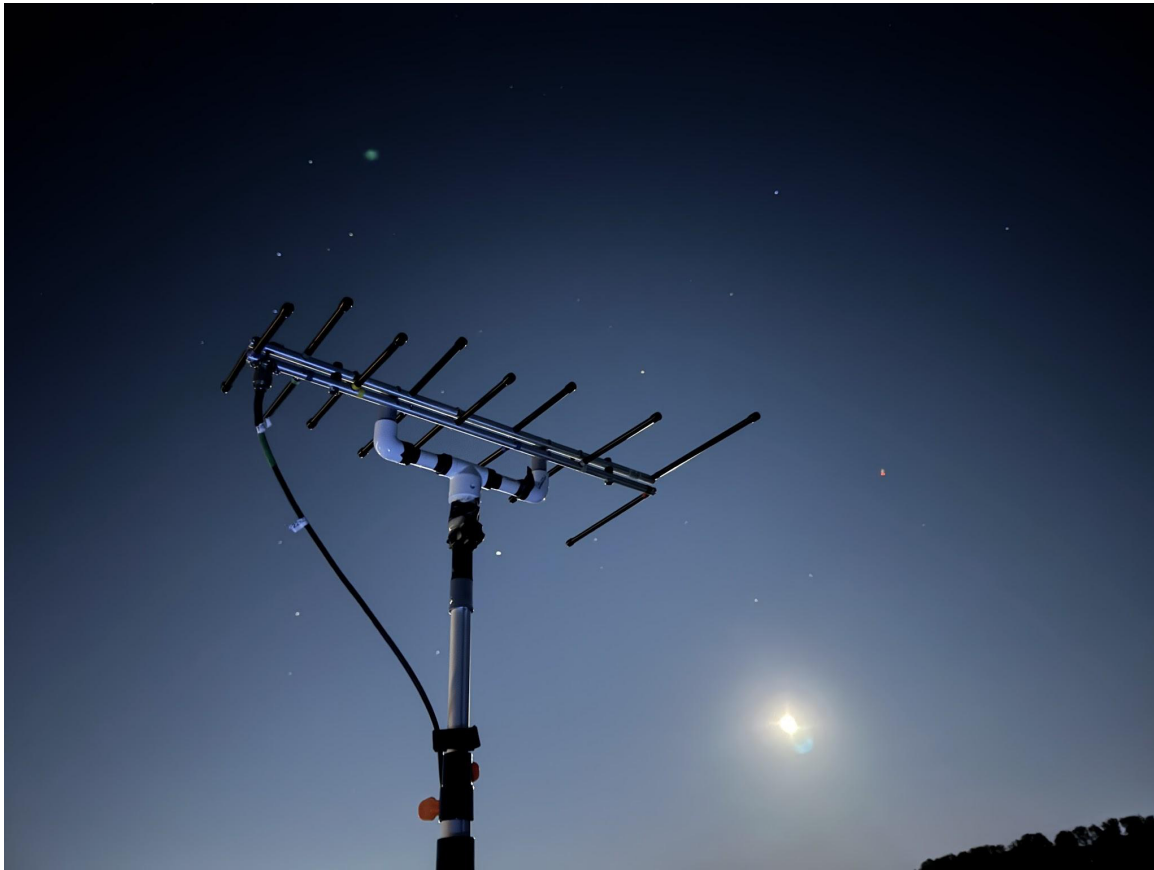
So, at times, two adapters are in use to connect the noise source. The Male N from 3.5 MM and back to SMA if required. Although the loss and mismatch is small using these adapters, remember a very slight change in your LNA tuning can make a significant change in noise figure.

The test crew had fun measuring and talking about the results. If the gain and measured noise figure is close to expected results, your equipment is probably operating correctly. Start thinking about what you want to test for next year, even better, build a preamp and we can test it!

Gary
WA2OMY



Fall 432 Sprint AA2SD Rover 70CM Test ELK Antenna with a Push Up Pole



Quick Mount ELK 70CM antenna against brightly lit moon backdrop in FM29 During the Sprint

AA2SD/R Rover - October 8th 2025 FM29 Mullica Hill NJ- The Fall Sprints are the perfect opportunity to test equipment and set up time as a Rover. I tested a new 30 ft quick pole with a screw top mount painting pole that has been converted to hold a small Elk Beam. I tested the very small Elk Antennas 440L8 70 cm Band UHF Antenna. This antenna comes apart and folds into a very small and compact bag, all of the elements easily unscrew into a neat package.



ELK 70CM ready for storage and quick set up

This antenna provided good gain, and was easily topped on a 30 foot painters pole with no issues for a less than 15 min set up. Species for this antenna , eight color-coded elements for fast and easy assembly

24 inch long boom. 8.2 dBi gain. 1.3 lbs. weight. Full band coverage, 420 to 450 MHz. Great SWR, 1:1 to 1.4:1. 150 W Max Power.



Working with a headlamp flashlight during the Sprint, the ELK simply screw mounted to the pole top

I used LMR240 ultra flex for this set up to keep the weight off of the pole. <https://elkantennas.com/product/elk-antennas-44018-70-cm-band-uhf-antenn>

A very slow and brief mini Fall Sprint for me. I made (8) phone contacts during the first hour of the contest from a new location in Mullica Hill NJ. I was testing my FT991A with a new quick set up antenna pole and small 432 ELK antenna. Conditions were poor for contacts, but I use the Sprints to test equipment for my Roving. Thanks to all of the operators that worked me during this short sprint. No FT8 all phone contacts .

The antenna test was positive, and the quick setup worked very well, total 2 hours , 10 Minutes or less to set up with a removable Halo and push up pole. The push up pole will reach up to 30 ft, and can only be used with a wire antenna or a very lightweight antenna.

MM-DD	HH:MM	▲ Call
10-08	23:12	N2NT
10-08	23:12	N2DEQ
10-08	23:15	KC3FQF
10-08	23:16	KA3FQS
10-08	23:18	W2SJ
10-08	23:22	WA3DRC
10-08	23:23	K3GM
10-08	23:39	K1TEO

You check the antenna test at the YouTube Video Here

<https://www.youtube.com/shorts/pxkwrCWW7q0>

Listen for me during the next 902 and up contest at the end of the month and the Jan VHF Contest during 2026. Thank you to the Pack Rats for Sponsoring this Fall Contest

73

Scott

AA2SD

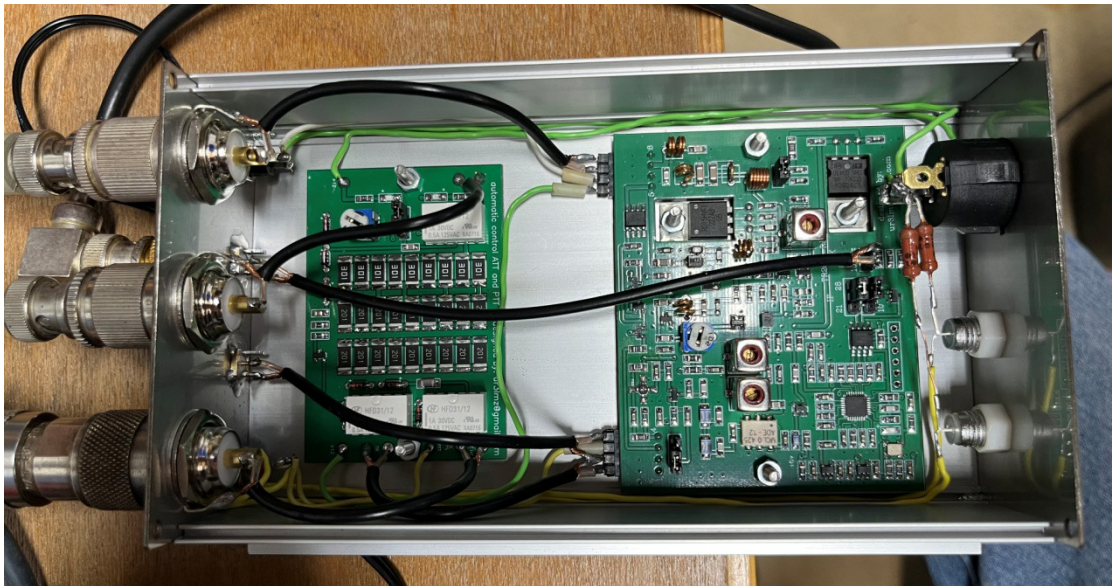


222 MHz on the Cheap

The 222 MHz band has been a favorite of mine for years. It was the first transverter kit I built from Down East Microwave many years ago. That same transverter with the addition of a Q5 Signal digiLO and a few other minor modifications still forms the heart of my 222 MHz station.

Recently there has been an uptick in interest in the 222 band due in no small part to the efforts of K1WHS and the Tuesday night 222 activity session. This has caused the source of 222 transverters on the secondhand market to dry up and for there to be a search for 222 antennas. New transverters are commonly available from Q5 Signal, Down East Microwave, and the Ukrainian source doing business under the name XADO on the web. New antennas for this band can be found from Directive Systems and Engineering, M2 Antenna Systems and others. There are used antennas floating around from these and other manufactures and there is also the possibility of home brewing your own antenna. One unusual source is a high band VHF TV antenna by a company called Stellar Labs. Using this antenna on the 222 band was introduced to me by an article in the March N.E.W.S Group news letter which was reprinted in Cheese Bits in the April 2025 edition.

In an effort to see how inexpensively someone could get on the 222 band from scratch I purchased a "Ukrainian" transverter through eBay and a Stellar Labs 30-2476 VHF TV Yagi from Newark Electronics. The transverter arrived first so I took it down to the shack and began testing it. Like any good Ham I removed the cover.



There are two boards the "automatic control ATT and PTT" board shown on the left and the actual transverter board shown on the right.

The "ATT/PTT" etc. board has a pot to adjust the drive to the transverter board and a jumper to select between RF sensed keying or hard keying. The main function of this board is to reduce the power from the IF rig to the mW level required by the transverter board using a fixed 30 dB attenuator followed by an adjustable attenuator (pot). There is also a relay to route the IF rig antenna signal to an HF output connector when the transverter is turned off and the IF radio is used for HF.

It appears that the "Ukrainian" transverter board is a work in progress. The unit I received did not match the supplied schematic. The unit I received had tunable coils where the schematic showed fixed coils it also had a bias adjustment pot for the final amplifier which was not shown on the schematic. I sent

emails to the two addresses listed on the instruction sheet and to my surprise I received answers from both people within two hours of sending my email. This is great customer service. They explained that the transverter is undergoing constant improvements.

The IF radio I used for initial testing was my ANAN-10 out of the antenna port rather than the transverter ports as the Ukrainian transverter is set up to be driven that way. I was concerned about the frequency accuracy and drift having heard some presumably older versions of this transverter on the air that were off frequency and drifted, so after a brief warm-up I measured the transmit frequency and found it to be 260 Hz low. After a one minute of CW key down the frequency moved up 10 Hz to 250 Hz low so there is some drift but it doesn't look too bad. Both the IF radio and the frequency counter use the GPS disciplined 10 MHz reference in the shack. I then switched the transverter to use an external 10 MHz reference. This requires removing the top cover and moving a frequency reference jumper from the 40 position (this is the frequency of the internal crystal) to the 10 position. There is an SMA connector on the rear panel for the 10 MHz reference input. After doing this the frequency had no measurable error. In the unit I received, and presumably all current units, there is also a jumper to select between a 28 MHz IF and a 21 MHz IF. I did not experiment with this jumper.

All of these measurements were made with the transverter adjusted to produce about 5 W output. I chose this power rather than the rated 6 to 8 W or the commonly claimed output of 10 W based on a paper written by W7QQ and KK6MC¹ that showed that measured transmit IM performance degraded significantly above 5 W output.

There is plenty of receive gain. The transverter increased the noise floor of the ANAN-10 by about 17 dB². There is no way to adjust the receive gain in the transverter so perhaps an attenuator between the IF radio and the transverter could be used to tame the gain. This attenuator can be placed right in the common IF line with no switching because its loss in transmit mode can be compensated for by adjusting the Output power level ADJ pot on the "automatic control ATT and PTT" board.

Using the transverter on the air for one of the Bottom Four Friday nets resulted in good signal reports and had no problems hearing the stations that checked in.

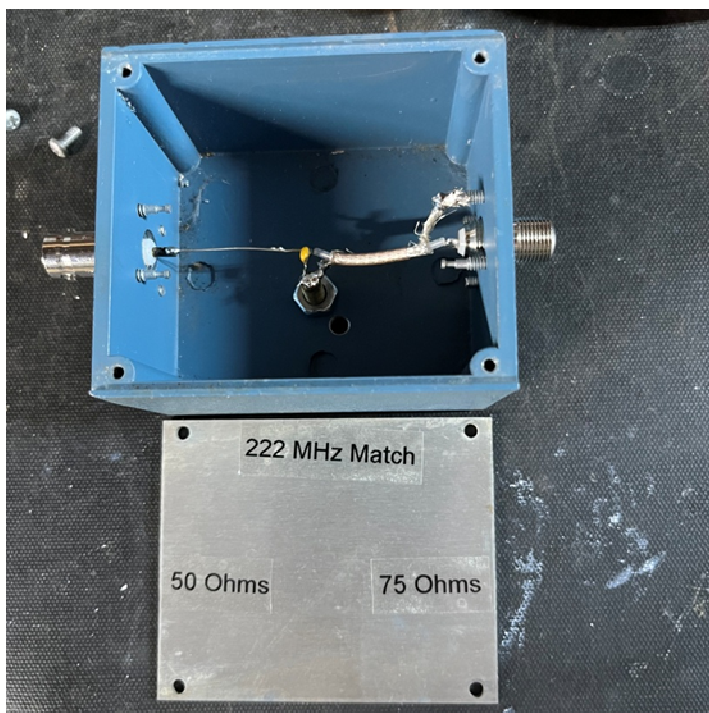


The VHF High Band TV Yagi is too large to fit into my shack/workshop so it was assembled and tested in the back yard. The idea to use this antenna came from Chris Fagas WB2VVV and was originally published in the N.E.W.S. LETTER March edition <https://www.newsvhf.com/newsletter/2025.pdf>. Chris used the Stellar Labs VHF Hi Band TV Antenna model 30-2475 available from Newark. This antenna has 5 elements counting the 3 element reflector as a single element and is 60.5" long with an advertised gain of 12 dB. I opted for the model 30-2476 "Deep Fringe" version which has 8 elements counting the 4 element reflector as a single element and is 82.7" long with an advertised gain of 14 dB. The deep fringe model is currently listed at \$23.09 while the shorter model is listed at \$19.37. These are nice quality antennas. The elements are held onto the boom with machine screws and wing nuts so they can be disassembled and reassembled easily for rover or portable use. The deep fringe model separates into three parts, two for the boom and one for the reflector.

These antennas are matched to 75 Ohms and have an inte-

gral female F connector on them. WB2VVV took apart the matching network and found it to be an etched pcb hairpin. He estimates that it should handle powers less than 100 W. Neither he nor I tested the power handling capability but it will certainly handle the output of the Ukrainian transverter.

A 75 Ohm resistive load should produce a 1.5:1 VSWR when driven by a 50 Ohm source. I measured exactly 1.5:1 VSWR on a MFJ antenna analyzer through about 25' of RG-6 cable.



I built a little L section matching network to improve the match. This resulted in a VSWR of a little under 1.2:1 measured with a nanoVNA. The straight wire on the left forms a 25 nH inductor working with a small leaded 6.8 pF NPO capacitor in the center. This construction does not lend itself to fine tuning but the first try was pretty close and judged to be good enough. The box also takes care of converting the type F connector to a 50 Ohm BNC.

For the final stand alone setup a Yaesu FT-857D with a 10 dB attenuator was used as the IF radio. A home-made band decoder was used to get the PTT signal for the transverter. The feedline was 50' of quad shielded RG-6 coax.³

This is a QRP station for sure but Dave W2KV has worked Dave K1WHS in Southern Maine with one of these transverters all be it using a better antenna but a lot of stations can be worked with this simple setup.

Not counting the IF radio which most people have, the homemade matching network which really isn't necessary, the total cost for getting on 222 is about \$200 not including tax or shipping. It should be noted that if you are handy assembling things and have an IF radio that has a mW level transverter interface, the assembled transverter board without enclosure and attenuator board is presently available for \$95 taking the price down lower.

Hope to work you on this band.

Tom KA3FQS

¹ Transmit Performance of the Transverters Store (Ukrainian) 222MHz Transverter
W7QQ Bill Schwantes, KK6MC James Duffey <kk6mc@amsat.org>
New Mexico VHF Society <nmvhf.org> February 2017

² -114 dBm xverter off, -97 dBm xverter on using the internal crystal oscillator, the external reference did not change this.

³ Note 50' run of RG 6 has 1.3 dB of loss at 222.1 MHz.

November Pack Rat Calendar

2025

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT/SUN
Leonids Meteor Shower Nov 6 – 30 Peak Nov 17 - 18					1/2
3 Pack Rat Nets	4 222 Activity Night	5 KC3BVL 1296 Net	6	7 KC3BVL Lower Four Nets	DST Ends 8/9 ARRL EME Contest 50 to 1296 MHz
10 Pack Rat Nets	11 222 Activity Night	12 KC3BVL 1296 Net	13 BOD Meeting	14 KC3BVL Lower Four Nets	15/16
17 Pack Rat Nets	18 222 Activity Night	19 KC3BVL 1296 Net	20 Pack Rats General Club Meeting	21 KC3BVL Lower Four Nets	22/23
24 Pack Rat Nets	25 222 Activity Night	26 KC3BVL 1296 Net	27 Thanksgiving	28 KC3BVL Lower Four Nets	29/30
12/1 Pack Rat Nets	12/2 222 Activity Night	12/3 KC3BVL 1296 Net	12/4	12/5 KC3BVL Lower Four Nets	12/6 – 12/7

Antenna Legislation

Don't delay and write your Congressman and your Senator! See below makes it quick and easy.

H.R. 1094 House Bill and S. 459 Senate Bill are in Congress to protect the rights of 3/4 million hams to put-up their antennas! (See ARRL email below.)

H.R. 1094 House Bill

<https://na01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.congress.gov%2Fbill%2F119th-congress%2Fhouse-bill%2F1094%2Ftext&data=05%7C02%7C%7Cbabaa618caca44b7b69508ddf6cbae8d%7C84df9e7fe9f640afb435aaaaaaaaaaaa%7C1%7C0%7C638938076846246596%7CUnknown%7CTWFpbGZsb3d8eyJFbXB0eU1hcGkiOnRydWUsIlYiOiIlwLjAuMDAwMCIsI-IAiOiJXaW4zMilslkFOljoitWFpbCIsIldUljoyfQ%3D%3D%7C0%7C%7C%7C&sdata=rtp19fz%2Bu%2BWEgeicVnxa1Xp%2FI8d%2BhhGwimRNdfwHP0%3D&reserved=0>

S. 459 Senate Bill

<https://na01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.congress.gov%2Fbill%2F119th-congress%2Fsenate-bill%2F459%2Ftext&data=05%7C02%7C%7Cbabaa618caca44b7b69508ddf6cbae8d%7C84df9e7fe9f640afb435aaaaaaaaaaaa%7C1%7C0%7C638938076846259581%7CUnknown%7CTWFpbGZsb3d8eyJFbXB0eU1hcGkiOnRydWUsIlYiOiIlwLjAuMDAwMCIsI-IAiOiJXaW4zMilslkFOljoitWFpbCIsIldUljoyfQ%3D%3D%7C0%7C%7C%7C&sdata=knrDZdYZbymnKbnlJfr2EVnrRo7LrLzOpn%2FofDe%2BAVE%3D&reserved=0>

So don't delay and write your Congressman and your Senator!

All you need to do is sign-up at:

ARRL - Help Pass The HOA Legislation

<https://na01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fsend-a-letter.org%2Fhoa%2F&data=05%7C02%7C%7Cbabaa618caca44b7b69508ddf6cbae8d%7C84df9e7fe9f640afb435aaaaaaaaaaaa%7C1%7C0%7C638938076846272515%7CUnknown%7CTWFpbGZsb3d8eyJFbXB0eU1hcGkiOnRydWUsIlYiOiIlwLjAuMDAwMCIsI-IAiOiJXaW4zMilslkFOljoitWFpbCIsIldUljoyfQ%3D%3D%7C0%7C%7C%7C&sdata=0MrDrn64FB9g78KIKjf1D0%2FMq11gHPLnCbYkyYacBbQ%3D&reserved=0>

Your letter will be HAND DELIVERED to both your Congressman AND your Senator! 73, Rick K1DS

The NEW 1296 mixed mode beacon is on the air from Pottstown (FN20dh)

The 1296.300 beacon has been re-installed at our Pottstown site, FN20dh

It is now mixed mode, details on keying sequence are listed below.

Reports welcome, respond to the reflector if you want. We need feedback on the performance of both CW and digital, we can use this information to decide if we want to change other beacons to use this modulation format. Remember it may be possible you would not be able to hear CW, but able to decode the beacon digital mode.

Details

Running Q65 Mode A 15 seconds (for the first 15 seconds of the minute, synced to GPS timing.)

CW—W3CCX for 20 seconds (15 to 35 seconds of the minute.

Keydown for the remainder of the minute.

Carrier is at 1296.300, Q65 (bottom) starts 200 Hz above this, 1296.300200.

Gary WA2OMY, Bruce WA3YUE

Other Beacon News

If Q65 is successful on 1296, the 2 meter beacon will be the next beacon considered for modification.

The 3400 beacon was verified to be working.

It has been reported that the 222 beacon has dropped in power by about 2 dB. We will be looking for or building a reliable 10 W amplifier for this beacon.

Regularly Scheduled On The Air Events

VHF/UHF Monday - Every Monday except holidays and contest nights the following nets are held, 224.58 MHz FM Repeater at 6:45, Packrat Talk Group DMR net at 7:00 PM, 50.150 MHz USB NCS N3RG FM29ki at 7:30 PM, 144.245 MHz USB NCS W2KV FN20os at 8:00 PM, 222.125 MHz USB NCS KC3BVL FM29jw at 8:30 PM, 432.110 USB NCS WB2RVX FM29mt at 9:00 PM.

1296 MHz Activity Night—There's an informal 1296 activity night in the NY/NJ/PA/CT region (and beyond) every Monday night starting around 9:30 pm (or so) on 1296.110. No coordination, just jump in and say hello .

222 MHz Activity Night—There's been an informal 222 activity night in the Northeast (and beyond) every Tuesday night starting around 7 pm (or so) Eastern Time. ON4KST is being used by some to coordinate Q's when direct CQ's are weak.

KC3BVL UHF+ Wednesday Net—Packrat, Jim KC3BVL conducts a Wednesday night net with schedule as follows: 7:30PM—903.100, 8:00PM—1296.100, 8:30PM—2304.100.

KC3BVL VHF Friday Net—Packrat, Jim KC3BVL conducts a Friday night net with schedule as follows: 7:30PM-144.160, 8:00PM-50.160, 8:30PM-222.150, 9:00PM-432.160

SWAP SHOP

We would like to gauge the effectiveness of the Swap Shop page. Can you respond to cheese-bits@packratvhf.com with a brief note on the number of replies you received as a result of your ad? (Even if zero, the information will help guide improvements needed)

The RLC 6 position coax switches have been sold.

For Sale Wiltron 87478-20, 10 MHz to 20 GHz synthesized sweep generator. No manuals or accessories. Local pickup only. Make an offer.
Tom ka3fqs@gmail.com

For Sale Stellar Labs VHF Hi Band TV Antenna model 30-2476. This antenna works fine on 222 MHz using low power ,<100 W and is specified to provide 14 dB of forward gain. This is a 75 Ohm antenna but can be used in 50 Ohm systems. \$10 or best offer. Local pickup.
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Editor's Notes

Thank all of those who contributed to this edition of Cheese Bits. There were a few good articles and plenty of good photographs. Thank those of you who covered the October meeting for me, my wife and I were on vacation so I could not attend. Thanks also to Jim and George who took the W1GHZ 10 GHz preamp kit I assembled to the meeting for testing. To my surprise it works!

As always thanks to my wife Melanie who took time out from nursing her sick horse to proofread and correct this edition.

Tom KA3FQS

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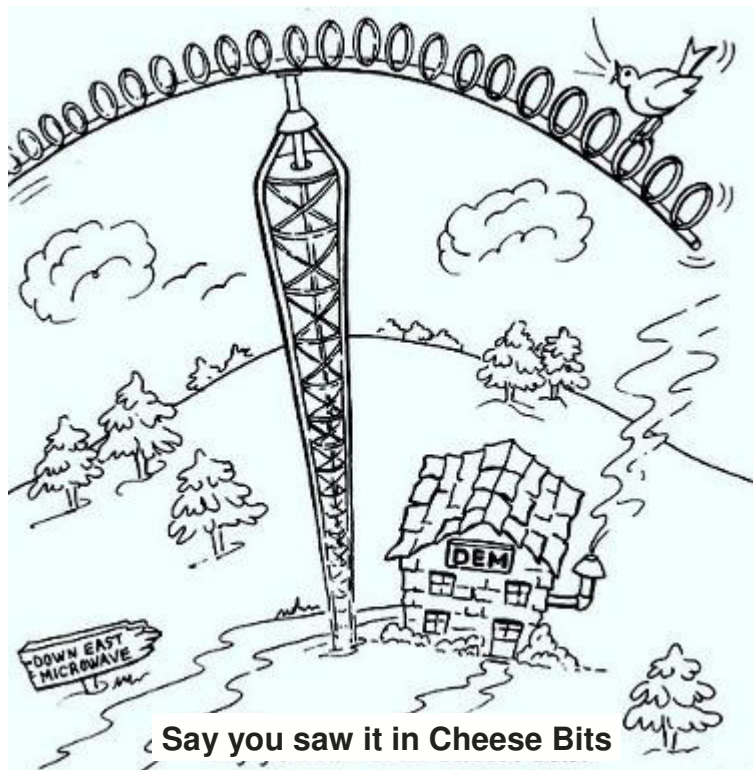
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