



CHEESE BITS

W3CCX
CLUB MEMORIAL CALL

ARRL
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Club



Volume LXV

November 2022

Number 11

PREZ

ARRL Handbook Now and Then

SEZ: I am a big fan of the ARRL Handbook. I obtained my first ARRL Handbook while a

teen, decades before I obtained my first ham license. I purchase the latest edition each year and recently switched to the six volume version. I usually give away older editions to deserving new hams but I have kept the 2003 edition. The cover of the 2003 edition features W8ZR's EZ-Tuner. W8ZR, Dr. James Garland, was President of Miami University in Oxford, Ohio after I graduated. His website, <http://www.w8zr.net> is worth visiting.

Working on this article reminded me of my visit to the QTH of Ed White WA3BZT in Delaware before he became a SK (silent key). Ed purchased (and kept) each edition of the handbook when published. His bookcase was quite a display. I wonder what became of those handbooks.

I purchased the 100th Anniversary Edition (2023) in the hardcover version because I am certain it will be a "keeper" for me. I also own a hardcover version of the 1978 edition. In the *Forward* to the 2023 edition, David Minister NA2AA and ARRL CEO observed that his first handbook was published in 1977.

The 2023 edition grants access both to the Windows and Mac/Linux version eBook downloads. My curiosity piqued, I determined

to compare my two hardcover editions. I was especially interested to be reminded how amateur radio has evolved over the decades.

Both versions begin with The Amateur's Code. The text in the 2023 edition is gender-neutral. I was surprised to find that the 1978 edition has extensive coverage of solid-state devices. Both versions have sections on transverters. The 1978 edition transverter section only covers operating frequencies up to 70 cm. As you might imagine, the 2023 edition offers extensive coverage of DSP (Digital Signal Processing), SDR (Software Defined Radio), and other features that digital computers have enabled since 1978. By contrast, the 1978 edition has Chapter 16 *Interference with other Services* while the 2023 edition appears to omit coverage of interference. I have been told by hams whose experience predates mine that 6 meter operation often interfered with the reception of pre-digital Channel 2 commercial television broadcasts. [Hams in the '60s referred to 6 Meter operation as a good way to meet all the neighbors –Ed.]

Comparing the VHF and UHF antenna sections, I saw a ground-plane design in the 2023 edition. I remember that a Packrat, Wayde Bartholomew K3MF had his design featured in earlier editions of the handbook.

As many Packrats know, I am a fan of test equipment. I noticed in the 1978 edition, frequencies were typically measured using crystal marker generators. I smiled because my

Pack Rats **CHEESE BITS** is a monthly publication of the
Mt. AIRY VHF RADIO CLUB, INC. –Abington, PA.

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MONDAY / TUESDAY NIGHT NETS

VHF/UHF Monday:

<u>TIME</u>	<u>FREQUENCY</u>	<u>NET CONTROL</u>
7:00 PM	224.58R MHz	WR3P FN20kb Ralph
7:30 PM	50.150 MHz	N3RG FM29ki Ray
8:00 PM	144.150 MHz	K3GNC FN20ja Jerome
8:30 PM	222.125 MHz	KC3BVL FM29jw Jim
9:00 PM	432.110 MHz	WB2RVX FM29mt Mike

Microwave Tuesday:

7:30 Coordinate QSO's on 144.260 for all Microwave bands you'd like to work. Also setup Q's at w4dex.com/uhfqso or **Packrat Chat Page**

W3SZ.COM

Visit the Mt Airy VHF Radio Club at: www.packratvhf.com or www.w3ccx.com

Heathkit HW-101 transceiver includes a 100 KHz marker generator. Not many years later, digital frequency counters became widely available. In the 1978 edition, there is a project to build a 50 MHz digital counter using TTL logic.



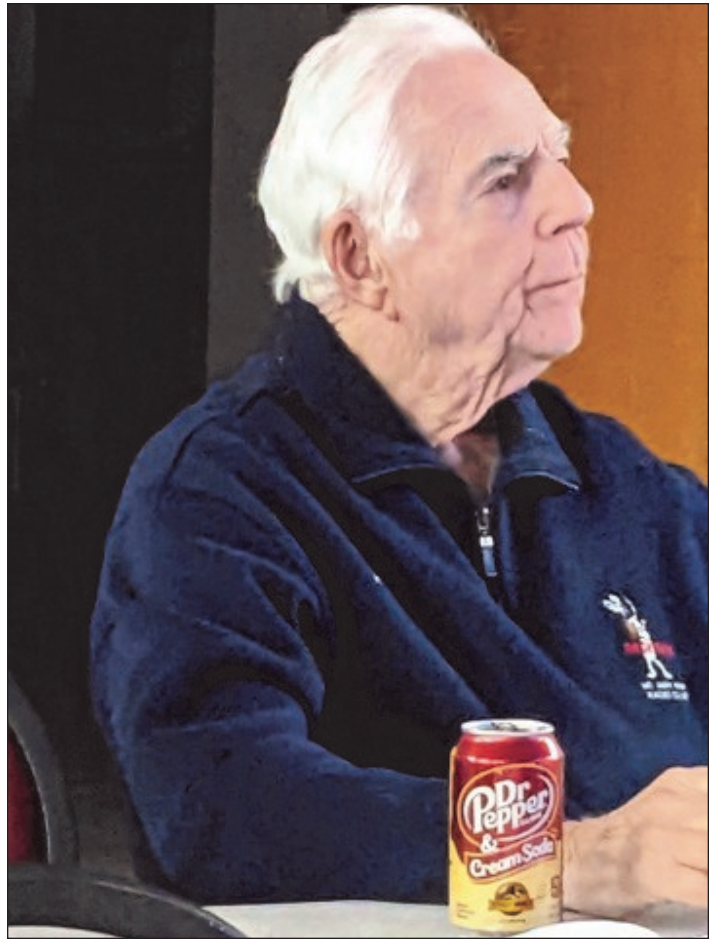
In the middle of Chapter 15 of the 2023 Edition, there is a color section showing the covers of 100 editions of the handbook, along with a summary by decade. There is a short interview with Jim “Skip” Youngberg K1NKR, a handbook collector. With the exception of vacuum tubes, there are many more types of electronic components covered in the 2023 edition. The 2023 Edition is a good one-place reference for the electronic components.

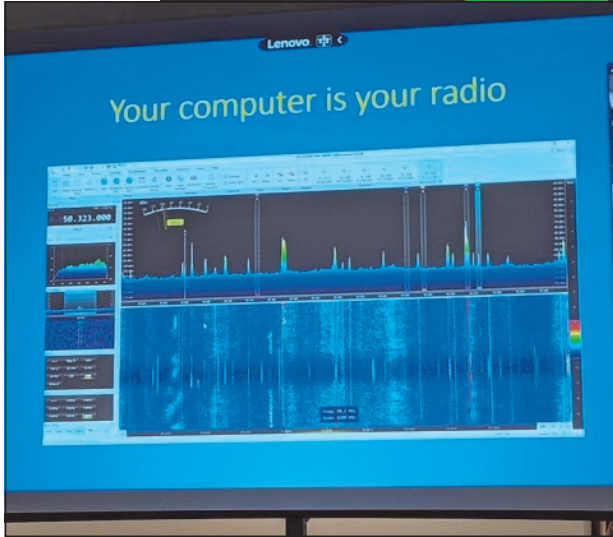
My advice: Buy the 2023 edition of the handbook. Then thumb through it to see sections to which you wish to return for a careful reading. The handbook's Lead Editor, Ward Silver NOAX, observes in the prefix that the intended audience includes hams “motivated to become better, more capable amateurs.” I hope that that this description includes me.

73,
Michael **KB1JEY**

OCTOBER MEETING PICTURES







This month's meeting had more Zoom attendees than in-person attendees!



THAT'S A WRAP

By Pete **KOB**AK

A season filled with rover van progress is now done, with the van in my rental garage space till next spring. The garage I've been using for three years is overflowing with expensive performance and collectable cars—and a couple of oddball recreational vehicles—with the result that the garage owner is expanding his space. The good news for me is that I might have more room to work on the van this winter with my van in the temporary overflow garage. There's also a bonus advantage of there being less chance of dropping a wrench on a \$400k Lambo.

Subaru HF Station

October's portable ham fun was on HF. Working on the VHF rover over the last two years had prevented me from building a portable HF station in the used Subaru Forrester I bought last summer. Right after the September VHF contest I scrambled to build a medium-power (200-400w) vehicle-portable station for use in the PA and NY QSO parties as well as in POTA activations. (I had a good HF station in the TV van two years ago, but I no longer trust it enough for long roves for QSO parties and POTA.) The simplest HF antenna configuration was to use my large Model 200 Tarheel screwdriver antenna. I want to use a Hustler triband instead eventually so there's less prep time compared to the big screwdriver. A 12v 100Ah LiFePO4 battery, about the size of a car starter battery, is the power source.

I used a new Icom IC-705 in the PA QSO Party along with a 200w amplifier, where I came in no better than 2nd place (again). I bought the 705 because it's a small self-contained QRP HF-50-144-432 SDR that could also be a transverter driver someday after the rover van dies. It worked well in the PA contest in south central PA counties. While out doing a POTA activation between QSO Parties, a 2.5mm TRRS plug from a Heil-built adapter broke off inside the 705. I used the tiniest, pointiest tweezers I could find but could not retrieve the broken plug. I started disassembling the radio but with the tiny internal connectors used (think of the components in a cell phone if you've ever tried replacing an iPhone battery), I stopped before I broke something else, and will have to ship the 705 to Icom for an expensive fix.

Scrambling again to get a station to use the next weekend in the NY QSO Party, I barely got my old original IC-7100 radio and my original "500w" amplifier into the Suby. I was just able to successfully test it at a local park the night before the contest. In what is now an annual route, I activated the 5 counties of New York City and probably won my category (again)!

Van Inspection Fear

Finding repair garages able to take my heavy rover van is a challenge, especially with the antennas mounted on a mast that tops out at 12 feet above the ground. My original mechanic near where I used to work is honest and experienced with vehicles like mine having worked on a fleet of ambulances. However, his work organization is chaotic and takes too much time to complete work, as well as being a bit far from my home. When I had my rover van's air conditioning fixed this summer, I used a new mechanic willing to take the van after we tested the clearance of his garage. While the air conditioning work was done on time and at a reasonable price, when I discussed making him my go-to mechanic including an upcoming state inspection, he warned me that the undercarriage and manifold rust they saw would prevent the van from passing inspection. When I asked if they had a recommendation for someone who could work on those problems, he did not and added that he knows that in general truck body shops usually are not willing to do that kind of rust work.

"Oh no", I thought, the van might only have a few months of life left if the rust wasn't repairable, either because it would be difficult to find someone to do the work or if it would be uneconomic to keep the van

Wrap cont'd...

alive. I figured that since I know the last mechanic would definitely fail the van's inspection, I would take a chance to find yet another repair shop that might pass the van since it's a judgment call. There are two small repair shops on the same road a few minutes from my house, one of which had a tall bay opening that might be high enough. The chief mechanic (and probably owner) was willing to try, so I brought the van down for another height test. The van fit with just inches to spare, and I was grateful the mechanic was still willing to take the van as long as I removed the top 2m Yagi that he thought would prevent raising the van on his lift.

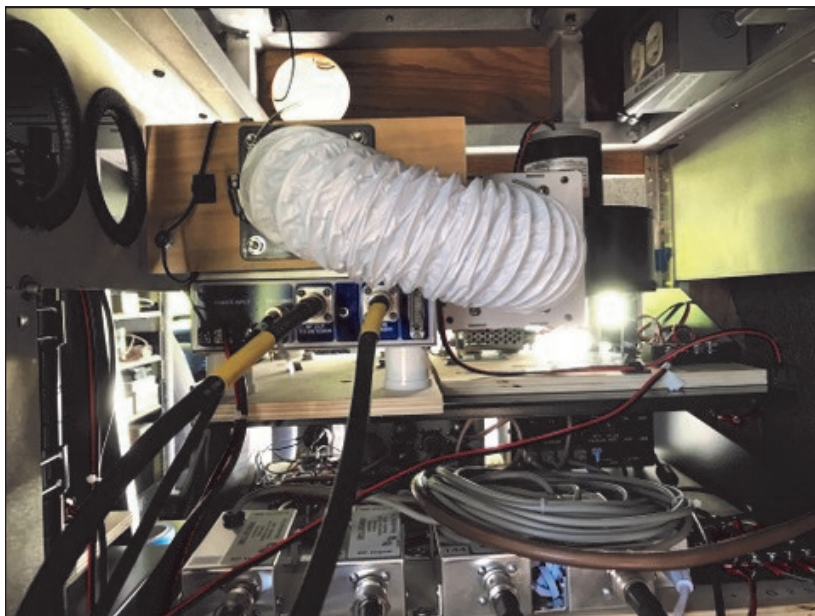
I scheduled the inspection for the day after the PA QSO Party. Being a natural pessimist, I had a happy surprise when I got the call that the van was ready for pickup and the price was a little over one hundred dollars including an oil change. "So ... so ... just to confirm it passed inspection?" I asked with a shaky voice. "Yes, no problems, you can pick up it whenever." Whew, van death was deferred, but I'm still thinking about what I'd have to do to have a modest VHF station in my Forrester when the inevitable happens.

Bungees Out, Bolts In

With my two biggest HF contests of the year done, I turned my attention back to the rover van where I wanted to replace the bungee cord install of the 6M amplifier and its large fan (as described in last month's Cheese Bits) with a more-secure, less-redneck arrangement. Trying several shelf configurations hoping to make use of the dead space above the top screw holes of the rack, I settled on the exact same rack shelf in the exact same spot on the rack. I could have saved quite a bit of time had I just done a simple replacement, but using the dead space was tempting in combination with the amp's and the fan's tops that didn't have to be visible.

The loose wiring I barely completed before the September VHF contest was replaced with better routing and tie-downs. Two blocks of wood would be bolt-mounted on the short 14"-deep rack shelf: One square for the fan assembly held the fan up about two inches for its air inlet (as described last month) as well as a short terminal strip and speed control. The other rectangular board used glued PVC end caps to hold the inch-long rubber feet of the amplifier, whose size and configuration was built to fit alongside the "500w" HF amplifier on a spanning rack shelf I used when the van had HF capability. **It is a bit of a miracle** that the two wood pieces, built with independent installations in mind, fit next to each other on a standard rack shelf with less than a quarter inch to spare.

The shelf location less than an inch above the front components of the shelf below made tightening the front two bolts of the fan's foot-square mounting board quite challenging. The rear bolts weren't easy either because of the awkward reach I had from the back while sitting on the generator box. The installation of the flexible plastic-and-wire 3" duct from fan to amplifier was made easier this time because I used larger hose clamps. I completed the installation just hours before my self-imposed deadline for bringing the van to its winter garage. I had hoped to get on the Packrats nets one last time the Monday before, but rain prevented a nice season-ending net session as well as delaying the van work two days.



A 50W GaN Solid State Power Amplifier for 10GHz

By Charlie Suckling G3WDG

[Sent to Cheese Bits by AI, K2UYH]

Introduction

SSPA's are becoming increasingly popular for high power applications, such as EME or advanced terrestrial modes, and are probably now becoming more commonly used than TWT amplifiers in amateur systems. Recent advances in GaN technology make it possible to construct SSPAs at the 50W power level using single devices. 10GHz amplifiers using GaAs devices usually require at least two devices combined to reach this level of RF power, with consequent added complexity and higher losses.

GaN devices offer many advantages over GaAs. In addition to the increased power levels per device, efficiency is usually considerably higher so that less heat is generated. Gain is also considerably higher. This results in physically smaller and lighter amplifiers requiring less operating current, making them altogether more suitable for mounting at the antenna feed point to keep system losses to a minimum. (ref 1)

Device selection

For amateur use, it is helpful if the manufacturer has taken care of all the RF matching internally in the package, whether in the form of a MMIC or a hybrid. Unmatched devices are very difficult to use at 10GHz and often have rather disappointing performance. Also, devices for amateur applications must be capable of supporting CW operation, so those that are designed for pulse-only are of little or no use to us. It also makes construction easier if the DC connections are separated from the RF connections, unlike IMFETs, where more complex bias circuits are needed. There is less stress on the soldered joints between the leads and the board, as only RF currents have to be conducted through the joints with a consequent potential improvement in long term reliability.

One very promising candidate which meets these criteria for the basis of a high power SSPA at 10GHz is the TGA2312-FL device from TriQuint Semiconductor (ref 2). This is advertised as a 60W device (under pulse conditions) covering 9-10GHz. Early experiments with this device at 10.4GHz in a 50 ohm system showed promise – a gain of over 9dB was measured at a CW output power of 34W with a drain efficiency of 34%. It should be noted that this device is available in many countries worldwide.

Evolution of the design

Experiments were performed to see if the device would respond to external tuning, since operation would be at one frequency and the wideband performance of the device was not needed. The usual method of moving tuning flakes around for best narrow-band performance was tried. After a little work, a CW output power of 45W was achieved with 9dB gain and 46% drain efficiency with silver foil tuning flakes. At this power level, it was found necessary to press down on the tuning flakes with a wooden stick, switch the RF on, take a quick measurement and switch RF off again, else **arcing** was sometimes observed around the tuning flake. The flakes were held carefully in position before being soldered down and a more detailed measurement taken.

A pcb was laid out to reproduce the geometry and position of the tuning flakes, and a second amplifier built. The printed stubs needed slight further adjustment and after a second iteration of this pcb, the same or better performance was achieved compared to the original tuned prototype, with no further

tuning needed.

Choice of pcb material

The first prototype of the amplifier was built using 0.635mm Rogers 3210 material and some tens of hours of trouble-free operation was achieved with this amplifier on-air mainly using digital modes (cycles of 1 minute continuous carrier, 1 minute off). However this amplifier eventually failed, as shown in Fig 1.

The temperature of the microstrip line was estimated as over 200 C using Rogers' Microwave Impedance Calculator 2010 (ref 3) and subsequent advice from Rogers was that this was far too high for reliable operation. A further design iteration was done to use lower loss and higher thermal conductivity pcb materials, which involved changing the matching circuits. The materials chosen were 0.5mm thick Rogers 4003 and 6035HTC. These run at about 80C and 45C respectively under operation, which is within the ratings of the board, provided it is soldered to the chassis. The revised matching circuits have identical dimensions for both materials. The TGA2312-FL device survived the board failure and has since been in regular use in an amplifier using a 4003 board, without problems!

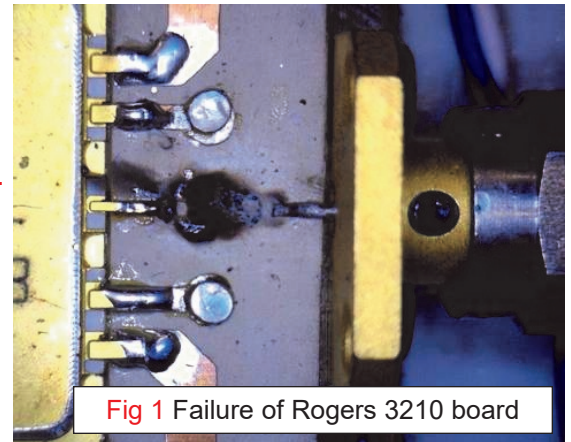


Fig 1 Failure of Rogers 3210 board

Amplifier performance

A number of amplifiers have been built to the final design. RF performance has been quite reproducible, indicating a high degree of control in the manufacturing of the device, and the amplifier construction method. Measured performance is shown below in Figs 2-4.

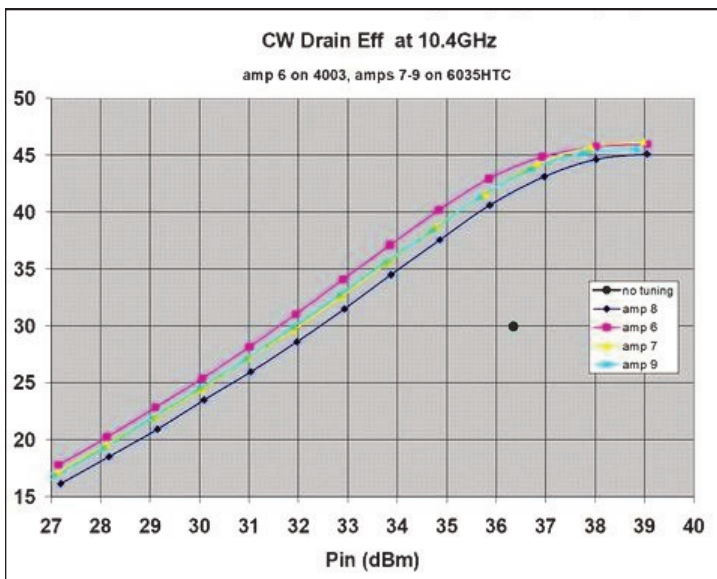


Fig 3 Drain Efficiency v input power at 10.4GHz for amplifiers

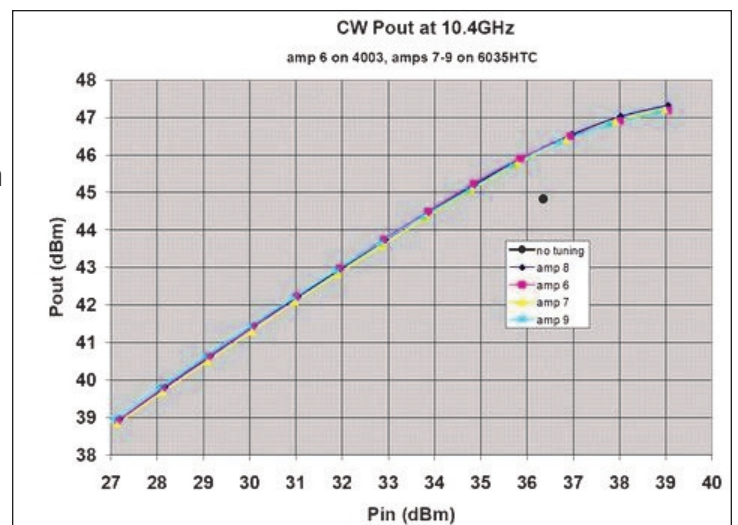
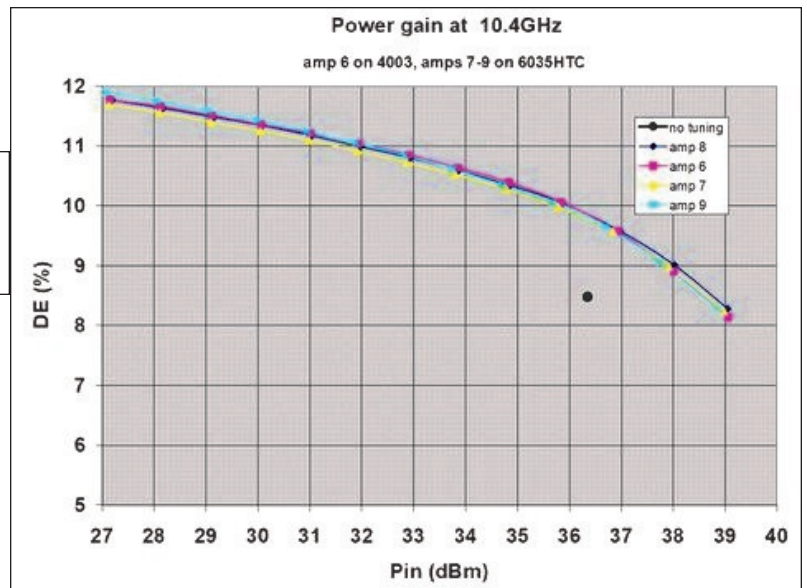


Fig 2 Output power v input power at 10.4GHz for 4 amplifiers

4

Amplifier performance (cont'd)

Fig 4 Power gain v input power at 10.4GHz for 4 amplifiers



Thermal analysis

To ensure that the amplifier would be reliable in the long term, a thermal analysis was performed. The factor that drives long term reliability is the device channel temperature (FET terminology for junction temperature). Channel temperature is calculated as package base temperature + (dissipated power * thermal resistance). The TGA2312-FL has an internal thermistor, the resistance of which gives good guidance of how hot the base of the device is under operating conditions. For this amplifier in an ambient temperature of 25C with either efficient forced air cooling or water cooling base temperature is in the region of 50C maximum.

The dissipation is calculated as the total DC input power + RF drive power – RF output power. Taking one of the prototype amplifiers as an example, the DC input power was 112W (24V * 4.67A), RF output 52W with 7.7W drive, giving a dissipated power of 112 + 7.7 – 52 = 67.7W.

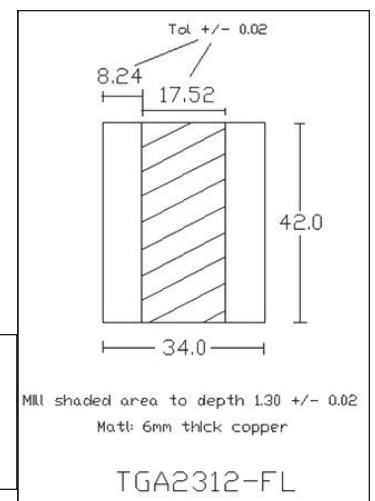
The datasheet quotes a thermal resistance of 0.85 C/W (for a specific case of pulse operation). Typically for GaN devices the thermal resistance for CW operation is considerably higher, because the thermal conductivity of the materials decreases at the higher internal operating temperatures associated with CW operation. In the case of the TGA2312-FL the CW thermal resistance is 1.68C/W. Thus the channel temperature is calculated as 50 + (67.7*1.68) = 165C. The data sheet for the TGA2312-FL has a graph that relates the lifetime of the device to the channel temperature, which for 165C channel temperature gives a predicted lifetime of over 100 million hours, so CW operation under these conditions should be perfectly safe.

Amplifier construction

Prototype amplifiers were built on both copper and nickel (Ni) plated aluminium chassis plates, machined according to Fig 5. Copper has a slight advantage with respect to thermal conductivity, but since there is plenty of margin, as shown above in the thermal calculations, this difference is not significant.

Copper proved much more difficult to machine, especially when tapping holes, and the writer's preference is now Ni plated aluminium.

Fig 5 Basic machining details for chassis plate



The use of Ni plated aluminium allows both the pcb and the device to be soldered to the chassis plate, for optimum heat transfer and minimum RF losses. Fig 6 shows the board layout and location of SMT parts.

C1: 100pF
 C2: 0.47uF
 C3, 4: 1.0uF/50V
 G: ground
 T: internal thermistor
 Vg: gate bias
 Vd: drain bias (connected to both sides)

[**Note:** Charlie's very detailed 24 step construction / testing instructions with 12 construction photos is available via email from the Cheese Bits editor lennyw@comcast.net —W2BVH]

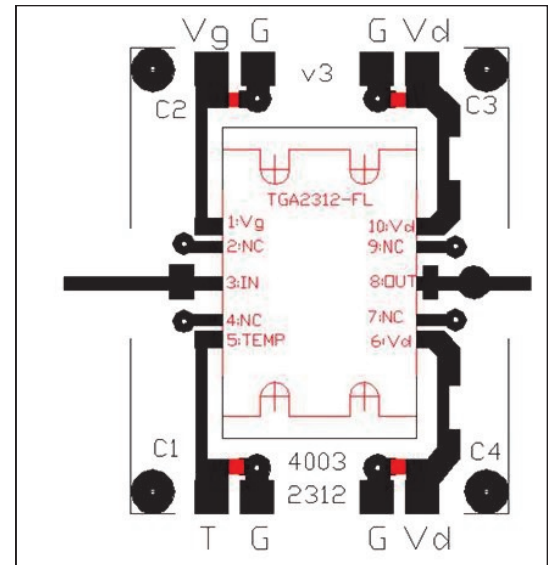


Fig 6 Layout of final version of TGA2312-FL amplifier for 10.4GHz

Integration of the amplifier

Fig 7 shows the author's complete 50W amplifier in a waterproof box. This amplifier uses a fairly large computer CPU style fan cooler as the heatsink. Gate bias is generated by a LT1054 voltage inverter to provide -5V which is then fed via a 47 ohm resistor to a 100 ohm multi-turn pot. The gate voltage also controls a MOS DC switch via level shifting transistors which in turn switches a relay in series with the drain bias. Thus the amplifier is protected against gross failure of the inverter supply. T/R switching is accomplished by external switching of the +24V drain supply, while the gate bias inverter runs continuously. Alternatively the relay that protects the device against failure of the gate supply could be fed from a switched T/R line.

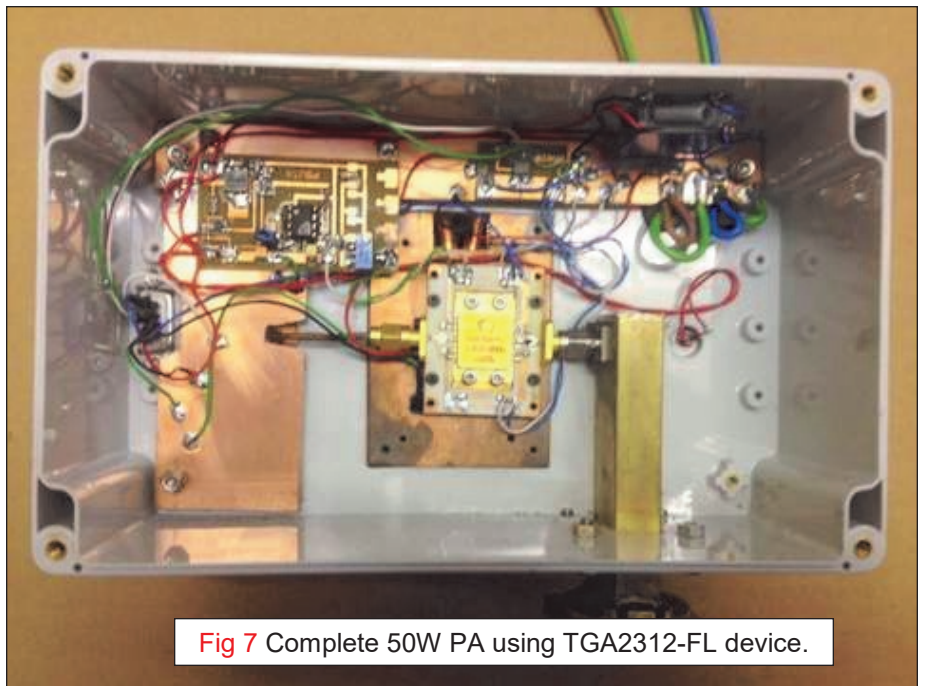


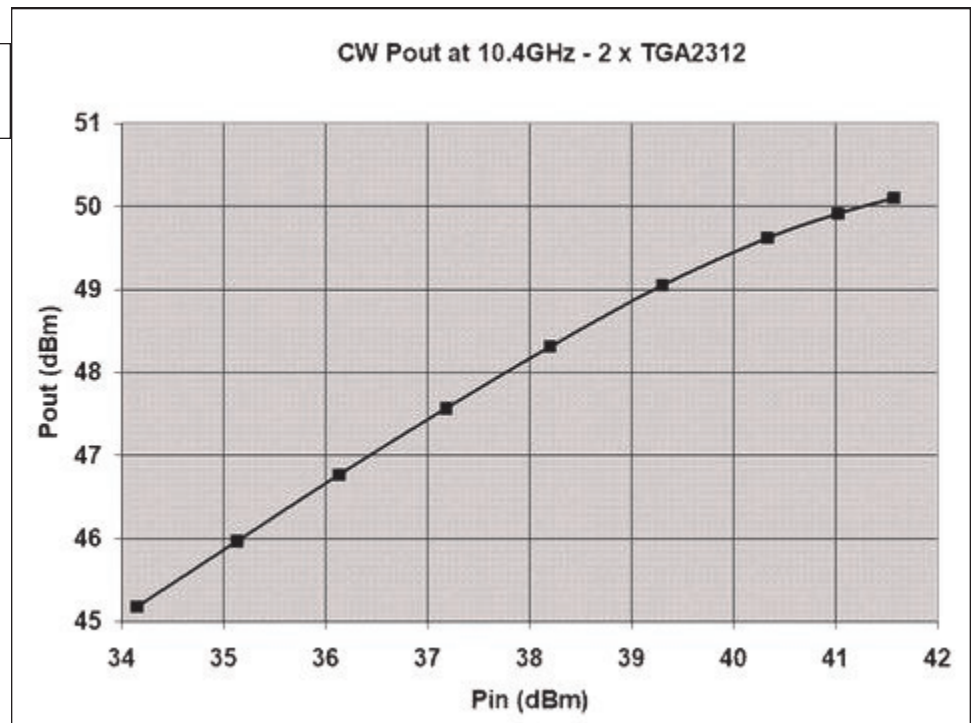
Fig 7 Complete 50W PA using TGA2312-FL device.

The PA also incorporates G4FRE/WW2R's remote monitoring system, so that the drain voltage and drain current can be monitored in the shack (ref 4).

Combining **two 50W** amplifiers to get 100W output power

Initial experiments with combining two amplifiers **using magic Tees** to obtain over 100W output have been very successful, as shown in Fig. 8. These results will be discussed in more detail in a later article.

Fig 8 Output power v input power of two TGA2312-FL devices combined



Acknowledgement

The author would like to thank [Rex Moncur VK7MO](#) for alerting me to this part, and TriQuint Semiconductor (now Qorvo) for the opportunity to evaluate the TGA2312-FL device.

References

1. [Charlie Suckling, G3WDG: GaN Pas for 3.4, 5.7 and 10GHz. DUBUS 2/1013, pp 84-93](#)
2. <http://www.triquint.com/products/p/TGA2312-FL>
3. <https://www.globalcommhost.com/rogers/acm-techsupportohub/calculatorMWI.php>
4. [Dave Robinson, G4FRE: Control and monitoring of EME solidstate amplifiers, Proceedings of EME2012 Conference](#)

Quick Note On Getting Started On EME

If you just cannot handle a dish, for whatever reason, and you have loop yagis, use them. Better some success than none. A hybrid coupler can look after polarization switching with a pair of linear & cross polarized feeds. You cannot use loopers on one boom but 2 booms slightly separated should be possible. In the early 1980s I heard my first 1296 EME CW SIGNAL with a single 45 EI looped and a 0.5 dB NF preamp. VERY WEAK but with today's preamps and some of the big guys, a contact would be possible. One of the French stations had 8 linear yagis on 1296 for a dxpedition and had an excellent signal. I am sure their receive performance was not great due to the noise contribution of the phasing harness..73 Barry VE4MA via K2UYH

I have found a very good real time winds/weather map of the world with many user-interactive setup options, including winds at specified altitudes, and times.

See: <https://www.windytv.com/?mbeurope,51.041,-7.251,6>

Best, 73, Pat Barthelow AA6EG [Note: and the maps are gorgeous! Take a look. —W2BVH]

New Book Available

Dear Friends, and Fans of Project Diana - I am excited to let you know that my new book, *To the Moon and Back: Essays on the Life and Times of Project Diana*, is now available on Amazon in 3 versions ([black & white paperback](#), [full-color paperback](#), and [kindle](#)). It can also be purchased from the [InfoAge Science and History Museums Store](#). Nearly half the book is devoted to the history of radar at Camp Evans, starting with its fumbling beginnings at Pearl Harbor and culminating in the stunning success of Project Diana. The remaining two sections are devoted to my father and his family background, and to my Jersey Shore childhood in postwar America. For further information about the book, please visit my author website (<https://www.cindypomerleau.com/>).

Thanks so much,
Cindy Stodola Pomerleau
W2AXO

A Very Low Noise (pre)-Amplifier for the UHF 70cm to 9cm bands

PDF of a great construction article by Sam Jewell, G4DDK . A long URL, but it works fine: https://linkprotect.cudasvc.com/url?a=http%3a%2f%2fwww.g4ddk.com%2fVLNASept13.pdf&c=E,1,2usTqXEBxYysAL1XsKRBnunocvCpc0Ki-kWsm6P3U7z-p4wf_8-zW1C1nXpy18b7MUbdYtmAH2MTvU1JeAVWASJZiKu4s-ko4-EkJvDBN2z75qDAefl,&typo=1

Sent to Cheese Bits by **K2UYH**, thanks!

Even after the catastrophic destruction of the Arecibo Radio Telescope / Radar Antenna, its data are still being mined and are very useful. Using data collected by Arecibo between December 2017 and December 2019, scientists have released the largest radar-based report on near-Earth asteroids ever published. See <https://www.msn.com/en-us/news/technology/collapsed-arecibo-telescope-offers-near-earth-asteroid-warning-from-beyond-the-grave/ar-AA13xsm> for a very interesting article on the subject.

—W2BVH

Apparently commercial interests are gunning for the 10 GHz ham band

K3ZJ at the league **would like to hear from amateurs** about our use of the 10 GHz band. I believe that short comments (no emotional reactions please) would be helpful. At some point the FCC will probably release a proposal for public comment. Hopefully, the league will have info from us and others to formulate a strong response, and of course individuals can also respond directly to the FCC when there is an invitation for public input.

Tom WA1MBA

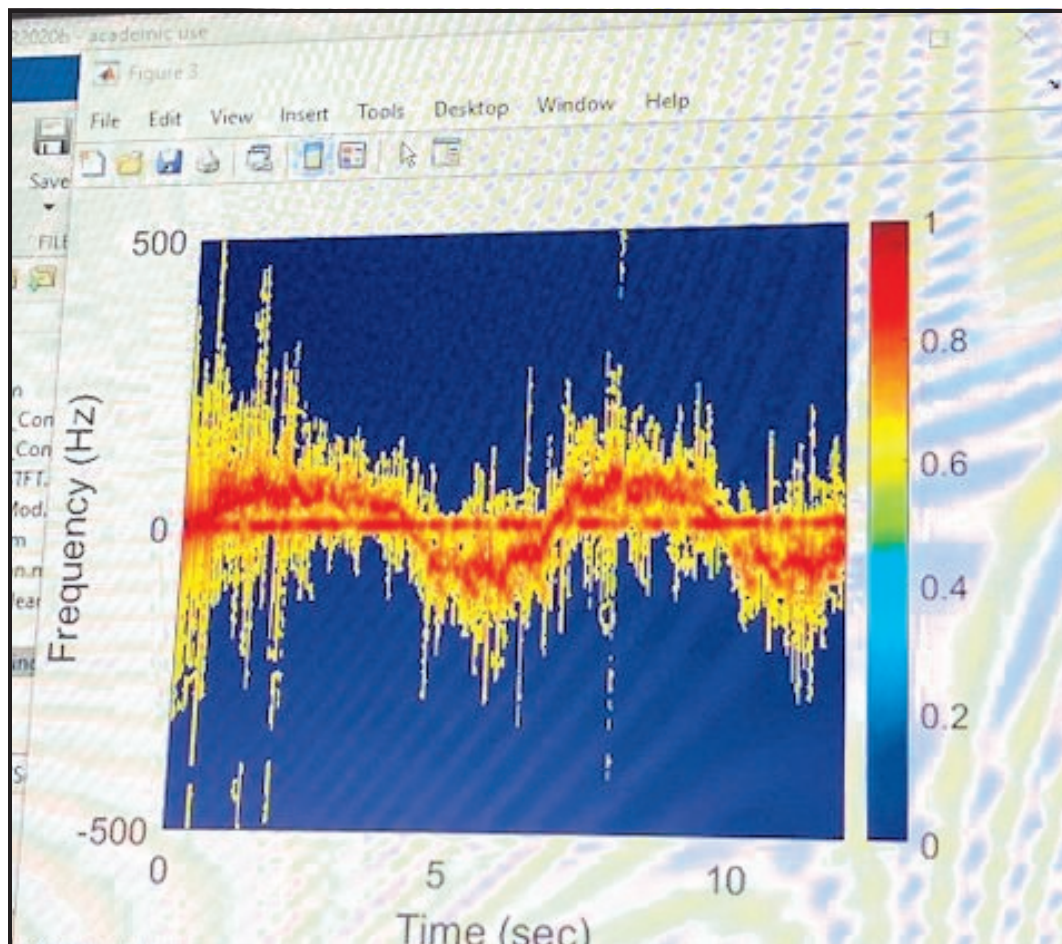
The actual filing is at <https://www.fcc.gov/ecfs/search/search-filings/filing/1004923311843>

My son John is starting a senior project at Widener (BSEE) using 77GHz radar to recognize human movement in a healthcare setting. He would be interested in hearing from Packrats (or others) who might have done similar work.

The image is their first test of the lab setup (started last year by another group). It's recording his movement walking toward and away from the sensor. Below is an abstract of their project submitted to a conference. I'd like to find anyone with experience who would be interested in contacting him to share professional insights into this type of radar application. -- Pete KOBAC

Title: Continuous Human Activity Recognition using a MIMO Radar for Transitional Motion Analysis

Abstract : Continuous Human Activity Recognition (CHAR) is an important aspect for detection and rapid response to critical health events, such as monitoring fall risk assessment. Radio frequency (RF) sensors provide desirable sensing modality for this application due to their non-intrusive sensing, privacy preservation, and accurate classification within all lighting conditions. In this paper, we consider a multi-antenna radar system capable of processing streaming radar data returns due to the activity of more than one subject in the field of view. To concurrently enable CHAR for multiple subjects requires to incorporate joint spatio-temporal preprocessing of radar returns using micro-Doppler (MD) analysis and high-resolution receive beamforming. Subsequently, MD image segmentation is performed at different look directions using a recurrent neural network (RNN). MD signatures captured at different look directions are passed through a 3D convolution neural network (CNN), to perform multi-task learning. The focus group comprises of individuals performing daily human activities, and real time measurements at 77 GHz frequency are performed using Texas Instruments (TI) cascade radar. We compare the performance of the proposed multi antenna radar with the state-of-the-art algorithms implementing streaming RF sensor data for human activity recognition.



US Opts to Not Rebuild Renowned Puerto Rico Telescope

Looks like this is the final nail for the Arecibo Telescope. It will be used as an educational site in the future. An article on the subject is at <https://news.yahoo.com/us-opts-not-rebuild-renowned-155437220.html>

—W2BVH

Recent Crystal Radio DX Group Listening Event

The Facebook Crystal Radio DX Group's fall listening event was held two weekends ago over a two-night listening period. Unlike last year's event, this was not a contest but rather a leisurely opportunity for members to take some time to see what they could hear with their setups. Also unlike last year, this one introduced and encouraged members to see what they might hear on **shortwave!**

Complete report at: <https://www.amateurradio.com/recent-crystal-radio-dx-group-listening-event/>

If you're careful in your design you can squeeze some impressive sensitivity (and DX) out of a crystal set.

—W2BVH

Carrington Event Article

Here's a nice article about the 1859 "Carrington Event". It describes the largest solar flare ever recorded. So powerful that the sun was giving shocks to telegraph operators when they touched their keys.

<https://www.worldatlas.com/space/the-largest-solar-flare-ever-recorded.html>

Call For Papers

Microwave Update 2023 (postponed from 2020, 2021, and 2022) plus Northeast VHF/UHF Conference

April 14 & 15, 2023
Hilton Garden Inn @ Bradley Airport, Windsor, CT

Details for registration and hotel coming very soon at microwaveupdate.org

CALL FOR PAPERS

Presentations and papers for PROCEEDINGS needed (you've had three years, so there must be some good stuff out there).

More info, email me: w1ghz@arrl.org

Danish Scientists Achieve 1.84 Petabit per second Data Transfer Over Single Fiber Optics Cable

The entire Internet's bandwidth almost twice over was squeezed through a single fiber optics cable with the aid of a revolutionary photonic chip that splits a laser beam into different colors.

The headline promises a bit (pun intended) more than it delivers since the cable has 37 separate fiber optic strands in it, but even so it's still impressive.

See the article at:

<https://www.notebookcheck.net/Danish-scientists-achieve-1-84-Petabit-per-second-data-transfer-over-single-fiber-optics-cable.663375.0.html>

—W2BVH

K3WHC 10 GHz Contest Results

10G:	98 Q's	781.00 DX Pts	778.86 Best DX
24G	3 Q's	87.00 DX Pts	85.98 Best DX
47G	2 Q's	9.00 DX Pts	8.37 Best DX
LIGHT	2Q's	9.00 DX Ptd	8.37 Best DX
Total	105	33744 Pts	

Barry Hansen, K7BWH, notes on the Pacific Northwest VHF Society email list, that Scott Farrell, KE4WMF, has put together an "excellent" video entitled, "[VHF Contest Rover - A Beginner's Journey](https://www.youtube.com/watch?v=RCOV1WfJwwQ)," — <https://www.youtube.com/watch?v=RCOV1WfJwwQ> — showing his VHF contest rover setup in his Volkswagen GTi. He's indexed the over 27-minute video, which makes it easy to get to the part you're interested in.

The Wayback Machine In CHEESE BITS, 50 Years Ago

Nibbles from November 1972. Vol. XV Nr 11
de K3IUUV Bert
(author's comments in italics)

“Our Prez Sez”. Prez Walt, **K3BPP** reported that the first Hamarama, held on October 1st was a huge success. *(It was the forerunner of many more held by the club until recent years.)* He reminded us that only three months remain to complete your homebrew project. He also noted that Chuck **WA3LNH** is the leader of a moonbounce project, and is looking for other interested members to join him. *(The beginning of the Packrats keen interest in moonbounce activities.)*

Calendar. October 25, the January contest coordinators will hold their meeting at the QTH of Doc, **K3GAS**. November 15, Club meeting, with a talk by Dick Knadle, **K2RIW** on receiving direct Apollo broadcasts from the moon. *(Dick successfully set up a receiving station to capture the Apollo astronaut traffic with Houston, surprising NASA!)* And December 20, the closed club meeting at which contest strategy will be discussed. January 6-7, the big CONTEST. *(Scheduled at that time on the first weekend in January, it has since migrated to the third weekend.)*

New Products of Interest to Hams.

W3NSI, Lyn's always interesting article offered up the following new items: 1) A junction field-effect device called a Fetron has been developed as a plug-in replacement for a vacuum tube, without any circuit mods. Current packaging provides replacements for a **6AK5** or a

12AT7 tube. First use of these devices is in telephone equipment, with many already installed by Pacific Telephone Co. in the San Francisco area. *(I think this was a short-lived fad, with complete replacement of hardware displacing the idea. But a search on Google turned up some interesting articles, including pictures. You might want to read some.)* 2) Gelyte batteries, by Gould. Three sizes of rechargeable, sealed lead-lead dioxide batteries are now offered by Gould. They are 6-volt output, and range from 2.6 to 9 AH. Price \$9.60 to \$12.

VHF Report. Joe, **W2EIF** notes that an opening on September 28th “was north of a line drawn from Long Island west.” Above the line, stations from Chicago, Michigan and Wisconsin were working New England stations on bands through 432. On October 11, Joe worked **W4VHH** in South Carolina on 432. He reports that “The big news is that Oscar 6 is now in orbit and functioning well.” Joe has heard signals from all US districts using the satellite. Input is on 2-meters, with output on 10-meters. A simple ground plane antenna suffices to work through the satellite.

Membership Report. Applied for membership was Pete Shavney, **WA3OVH**, located in Glenside. Visitors at the last meeting included future member **W3FSC**, Oscar (Ozzie) Jacoby.

Construction Article. Jo, **WA2EIF** provided dimensions and construction details for a 10-meter crossed-dipole antenna useful for receiving the Oscar-6 satellite downlink signal. An RG59/U balun is used for the connections and feed matching.

Tidbits. Packrat Lewis Clement, **K3AA**

was the guest of honor at the 1972 Historical Radio Conference. He was interviewed at the Smithsonian Institution by Wayne, **W4AA**. A full list of K3AA's accomplishments was included. He first became a radio amateur in 1905(!). Using a carbon needle type detector, he heard Lee de Forest's signals from the Atlantic Fleet when they visited San Francisco in 1908. He was licensed as 6X8 in 1912. A report on the Gaithersburg hamfest held on October 22 indicated over 5,000 people registered!

Hamarama, 1972. A nice report by chairman Dave, **W3ZD**, on the results of the first Hamarama, held on October 1 at the Warwick Fire Hall. It was a huge success. 350 people registered for the event, and 64 sellers were present. The whole affair was capped off by a spirited auction conducted by chief auctioneer El, **K3JJZ**. The Ladies Auxiliary supplied hotdogs and hamburgers. Plans are already underway for next year, so hold the first Sunday in October.

Swap Shoppe. By W3ZRR. (*Always nostalgia. Now we use the club reflector.*) For sale by Jack, **W2AXU**, a Collins 62S-1 VHF converter (6 and 2 meters), Very good condition, \$450. From **K3RFL**, a model T-2000 Panadaptor with 30 MHz IF, extra tube and manual. \$30. And from Don DeRosa, a Hallicrafters S-85 receiver with a Heath "Q-Multiplier" for \$60, a 6-meter single ring halo for \$6, and Nixie 8421 tubes for \$7 each.

Ads. *The October 72 issue included the half page back cover ad from club member Ham Buerger (CDR HAM-M for \$109.95, HAM-M Jr (TR-44) for \$69.95, and a model a model PP Phone Patch for*

*\$14.95!) 27 business card ads were included in this issue. I note the current Cheese Bits ad complement includes only 4 small ads, a ¼ page from Beko and a ½ page from Down East. If you'd like to join them, contact the ad chairman, Bob, **W2SJ**.*

Miscellany. *Postage for this issue was a single 8-cent "Flag" stamp. (6 double sided, 8-½ x 11" sheets). (Don't forget, current postage is going to 63-cents on January 1, and a penny postcard will cost 60-cents!) As usual, many "folksy" comments about members, their families, and activities were included in this edition of Cheese Bits. If interested, or for more detail on any of the above items, visit our website (www.W3CCX.COM) and read the full issue scanned by **K3IUV** (me), and posted on the website by **WS3O**, our webmaster. I have also posted the club Officers history, club Membership history, and Packrat Inventory (updated frequently) on the **W3CCX** website. These files are password protected, and only accessible to registered members. Are you registered? I hope you enjoyed reading these bits of nostalgia as much as I did in writing the article. If yes, you might let me know. Thanks to those that did.*



thirty, de K3IUV (comments or corrections to: K3IUV@ARRL.net)

Events

For inclusion, please direct event notices to the editor.

EME - 50—1296 MHz – Wknd 3 - Contest - November 12-13, 2022. See <http://www.arrl.org/eme-contest> for details

Winterfest - Hamfest - January 14, 2023. Sponsored by HRAC. Harrisburg PA. Details at: <http://www.w3uu.org/winterfest/>

Firecracker - Hamfest - July 1, 2023. Sponsored by HRAC. Harrisburg PA. Details at: <http://www.w3uu.org/firecracker/>

[**Reminder:** Look for the North American Meteor Scatter Sprint contest in August 2023. Details will be found at <https://kv5w.com/2022/07/24/na-meteor-scatter-sprint-digital-rules/>]

Sustainable Contesting

Becoming a better operator usually refers to becoming more skilled at the techniques of contesting. The human operator is part of the signal chain -- becoming and maintaining a healthier human is something that can translate into better contest scores. There's no quick pill for this one, and some of the most important skills are boring, like getting more and better sleep, eating appropriately, and exercising regularly.

Sitting for 12, 24, or 48 hours during a contest has a negative impact, but you can take advantage of the time between contests to counteract those effects. Maintaining the human can lead to a longer life, and therefore more contests. Isn't that what it's all about?

73, Brian, N9ADG

[From a recent ARRL Contest Update, sent to Cheese Bits by W3GAD]

Open Position - Packrat Contest Chairman.

Qualifications: A club member with a strong desire to continue the PR tradition of putting out the best effort every contest.

To make communications a much easier effort. The past Chairman will provide template emails and presentations.

Contact Michael KB1JEY if you are interested in helping out the club in this important position.

KC3BVL Friday Net

Lately Packrat Jim KC3BVL has been conducting a Friday night net with schedule as follows:

7:30 pm	144.160
8 pm	50.160
8:30 pm	222.150
8:45 pm	1296.160
9 pm	432.160
9:15 pm	2304.100

Reminder: there are 3 FT8 VHF / UHF Activity Contests each month. For info see: <http://www.ft8activity.eu/index.php/en/>

For those interested in an online "Contest Only" event calendar for VHF+, see <https://www.qsl.net/n2sln/contestcalendar.html>

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 W2BVH

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. W2BVH

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PLEASE SEND IN 2022 DUES

Club dues are due as of Jan 1st, 2022. Go to
https://www.qsl.net/w3km/MtAiryRC_Dues.htm and
use the "check here" link to see if you already paid.
If not, enter your callsign and click on "PayPal"

AS OF 10/5/22 13 DUES REMAIN UNPAID

Dave **W3KM**

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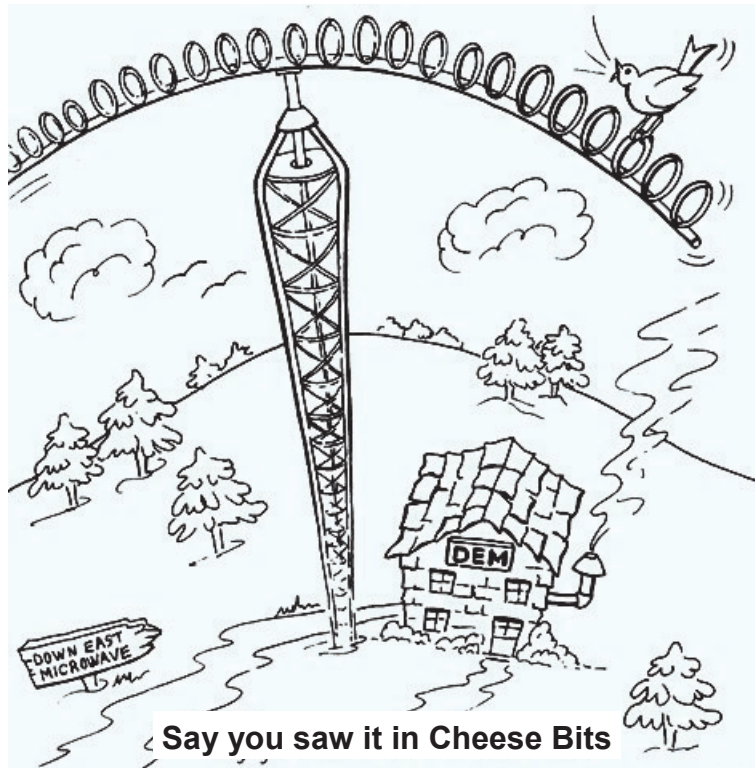
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