



CHEESE BITS

W3CCX
CLUB MEMORIAL CALL

ARRL
Affiliated
Club



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December 2018

Number 12

PREZ
SEZ:

Well, Thanksgiving was busy at the KA3WXV house. Both kids and their families were able to make the trip to “Grandmom’s house”. Even the In Laws were able to make it. It reminded me how our XYLs are so important for many of us in building family traditions that help hold the family together in good times and bad. My wife Joanne is just one of many people / things I’m thankful for.

Now its time for the holiday shopping rush. But before you start wrapping gifts, visiting friends and relatives, come to the December General Meeting!

The December meeting is the Annual Packrat Holiday Social. Come and enjoy a relaxing evening of food and fellowship. We will start serving food from Giuseppe's at the Senior Center at 6:10. It's a good idea to be there at the usual 6 PM time, but we will have plenty of food throughout the evening. Don't forget to bring that Packrat friend you haven't seen at the meetings for some time. One other thing: If you have a dish of homemade cookies (are you reading this Joe, WA3SRU) you would like to bring too, feel free.

We will have a special Holiday Mario Table like last year. Now's the time to dig through items you bought at those Hamfests but never got used. Bring “the good stuff” to the meeting, put them on the Mario table.

The January contest is right around the corner: January 19th, and 20th 2019. The January General meeting is just two days before. Topics at the meeting will be on contest preparation lead by Mike, N2DEQ along with practical ideas from some of the high scoring Packrats from previous years. Also Ben, WA3RLT will have some comments on **how even the smaller stations can have a major effect on the overall Packrat score.**

I hope everyone has their antenna and tower work done by now. There's not much good weather between now and the contest. The nets on Monday and Tuesday evening have been doing well.

If you haven't been on the nets lately or have just repaired that LNA for the nth time, now is the time to test it out. Is it time to look at a new sequencer too!

Need to borrow some equipment for the January contest? Call Mike, N2DEQ now. There is Packrat equipment available for loan. Waiting till the January meeting would probably be too late.

The last General Meeting had to be cancelled due to the weather. We tried notifying members several ways. Email, phone calls, the Packrat forum, and the Main page of the Packrat web site. Hopefully everyone got the notice in time. This brings up an interesting topic – the Packrat web site. We posted the meeting cancellation on the site the same time we used the other methods of notification. We hope to make the

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PACKRAT 222 MHz REPEATER - W3CCX/R

222.98/224.58 MHz (PL 136.5) Hilltown, PA

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PACKRAT BEACONS - W3CCX/B

FM29jw Philadelphia, PA
50.080 144.300 222.062 432.290 903.072 1296.264 **2304.043**
3456.200 **5760.195** 10,368.034 MHz (as of 1/17, red = off the air)

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	50.145 MHz	N3RG FM29ki Ray
8:00 PM	144.150 MHz	K3GNC FN20ja Jerome
8:30 PM	222.125 MHz	KB1JEY FN20je Michael
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

website a central site for all the latest Packrat information. Check out the Main Page for the latest activity. Check out the Meetings tab for dates and times. Check out the special Tabs for members only information like minutes of BOD and General Meeting minutes.



Mike N2DEQ has posted much of the January contest information too! We expect to add even more links and tabs in the coming year. Soon there will be a new way to access the Packrat forum and its historical postings. Stay tuned for this and more.

Many of us spend considerable time on the internet looking for radio related technical information, construction projects and equipment. If you find something new and interesting, let your fellow Packrats know about it (and the Cheese Bits editor).. Consider doing a short presentation. Doc, our Vice President is always looking for interesting topics to add to our meeting schedule.

Bottom line, have some fun, learn more.

Build something

73, George KA3WXV

As George mentioned, the November meeting was snowed out. Not a blizzard but dangerous road conditions. Better safe than sorry. So no "November Meeting Pictures" in this month's Cheese Bits. Less work for K3JJZ !
-- Lenny W2BVH



It's Worth the Effort

After a successful second weekend on the ARRL EME contest using a single Yagi and 150W with JT65B on 432MHz, I contemplated what to do for the third weekend of the event. I brought enough gear to operate either 1296 or 144 and considered what would yield the most fun. As I pondered the setup of the portable mini-tower, the length of the 1296 loopers and the use of the preamps, relay switching, amplifier and sequencer, aside from the computer, AZ-EL rotor control and the Rigblaster, my thoughts turned to the KISS method of 144 operations.

I could simply use the TS2000x to drive my 350W TE amplifier, with its built-in preamp and a single 144 Yagi that I bought last year at Hamcation in Orlando. Not the ultimate, but functional. I had not previously tested this setup for EME, but if my calculations were right, I would enjoy some modest success. The tower and rotor were first to be setup on Friday morning. Unlike the northern weather, it was a high 80-degree day here in the sun and things were hot and sweaty. Lots of water to drink and frequent breaks. After assembling the tower, rotor and mast, I found that the length of the 2m Yagi would be hitting the ground by about 55 degrees of elevation. The solution was using the beam in horizontal position and moving the boom clamp further back toward the driven element.

Everything was hooked up and powered. I noted that the meter indicator on the rotor was showing zero degrees of azimuth while the digital readout was showing 180 degrees! Yikes, I have a reversed a wire in the control box. Easy enough to switch them, but not right before the moon rose. I'd simply subtract 180 degrees from the digital reading and use manual rather than automatic computer control of the rotor.

Moon rise here in Florida was at 6PM and the contest started at 7PM (00:00GMT) on Friday night. My JT65 screen was rather blank for several hours. I checked the beam position, power output, and scanned the band to at least find a birdie or two to confirm that things were operational. I watched the HB9Q logger and the N0UK logger for the QRO stations who would announce their CQ and calling frequency. At 01:38 I saw a trace on the screen and adjusted the program to decode—it read: WP4G VE6XH DO24. Things are working! Shortly after, I spotted another trace and decoded W5ZN (Joel, the past president of ARRL) calling CQ. I responded and he came back to me for my first digital 2m EME QSO. Although I decoded several other stations calling CQ, with my limited firepower and Faraday rotation, it wasn't until almost 3 hours later that I had my second and third QSOs with HB9Q and RX1AS. With those stations logged, I called it a night and hoped the Saturday evening moon pass would yield more contacts.



...EME cont'd

The conditions were favorable on Saturday and I was able to work OK1DIX, I2FAK, RK3FG and

UA3PTW. Many of them spotted me on the band as I called other stations and using the N0UK EME JT logger, they invited me to QSO with them. Everyone seemed to be working hard to get new initial contacts and also increase their contest scores. At a point in the evening both nights I saw a huge JT65 trace on my screen. I decoded it and found it was AJ4GC, another local in my grid, also using a single (but longer) Yagi and a bit more power to work several EME stations also.

Sunday morning came and it was time to disassemble everything and put it away as this is a CCR community. Fortunately, my neighbors are quite understanding and I only get questions like, "Who do you contact and what do you say?" I explain a bit of the activity and tell them that we mainly exchange technical info. The effort to assemble and disassemble the tower, antenna, and radios is time consuming for each event that I choose to operate. My EME contest score will not win any prizes, but I have the satisfaction of being one of the little guns who participated successfully. Thankfully, the preparation and planning paid off, and I can proudly stand among the ranks of the EME crowd, having operated both CW and WSJT modes on 4 bands over the last decade. **73, Rick K1DS**



I was just looking through my AM 6155 folder and ran across a couple of issues from 1983/84 of "The Southeastern VHF Society and East Coast 70 CM net " newsletter. What a great newsletter. Has this disappeared or is it still around? I did see a web listing for the Southeastern VHF Society but not sure if they are the same.

Hope to get the AM 6155 on 432 with a 4cx250 I have 3 dead 8930's and a number of good 4cx250's
Best Regards **Walt K3BPP**

Walt,

Five of the original newsletters are available at the top of this page:

http://www.w4dex.com/east_coast_70cm_net.htm

These were published by Charles WD4MBK, now K4CSO. **73, W4DEX**

[Note: If you look at the web page, you'll see that the 432 Wednesday night net is still active almost 40 years later -- W2BVH]

WSJT-X 2.0 IN THE JANUARY CONTEST

Joe Taylor, K1JT

ARRL members usually receive *QST* around the 15th of the preceding month. The January 2019 *QST*, due around December 15, will contain a tutorial on how to use the FT8 digital mode in the HF contest “RTTY Roundup”. Although it’s not covered in that article, Packrats and friends should know that *WSJT-X 2.0* is also eminently suitable for use in our big event — the January VHF Sweepstakes.

For those not already in the know, here are a few hints on how to use it to your best advantage:

First and foremost: Most Packrats already know that digi-modes should be only one of many arrows in your quiver. As implemented in *WSJT-X*, digital QSOs involve the exchange of terse, carefully optimized, highly structured messages. Most transmissions contain callsigns, grid locators, maybe a signal report, rogers, or 73s, and that’s pretty much it. Yes, you can send free text messages with up to 13 characters. But in general it’s not easy or convenient to convey meanings like “Do you have any other bands?” or “Let’s QSY to 222.130”. In return for these restrictions and limitations, the digi-modes let you make QSOs with signals 10 to 20 dB weaker than required for SSB or CW, and with meteor-induced signal enhancements that last less than a tenth of a second. For most ‘Rats in the January contest, your best bet is to use digi-modes to make QSOs that you can’t make with SSB or CW — especially to gain new multipliers. If you have the station capabilities, always remember that those making the best scores in the January VHF SS use lots of bands and make many of those “money QSOs” at 902 MHz and higher.

Second: *WSJT-X 2.0* is scheduled for public release on December 10, 2018. If you plan to use *WSJT-X*, be sure to get this one. Installation is simple; there’s no need to uninstall any previous version(s) on your computer. The program has a wide range of features and options. Be sure to read the Quick-Start Guide to *WSJT-X 2.0*, available from the [Help menu](#). If you are not already a frequent user, you will surely benefit from practice well in advance of the contest. Do *not* install the program the week before the contest and expect to use it effectively!

MSK144, **FT8**, and **JT65** are the digital modes most useful in a VHF contest. The first two of these use timed 15-second Tx/Rx sequences, while JT65 uses one-minute sequences. You need a reliable means of keeping your computer’s clock synchronized with UTC within a second or so. Follow instructions for your operating system found in the *WSJT-X User Guide*. Computer aided transceiver (CAT) control of your radio is also highly recommended, and fully supported by *WSJT-X*.

MSK144 is designed for meteor scatter. It’s highly effective on both 50 and 144 MHz. On either band [you can work stations out to 1200 miles](#) or so, any morning. Best times are 3 AM to 9 AM, local time. With a single Yagi and 100 Watts you can usually work a similarly equipped station in no more than 15 minutes (6 meters) or 30 minutes (2 meters). With a kilowatt these times are more like 5 and 10 minutes. Make skeds if you wish, either online or in advance of the contest, to increase your multiplier totals on these bands.

FT8 is highly effective for weak sporadic E on 6 meters — conditions in which it seems “the band is almost open, but not quite”. You can easily work signals you can’t even hear. The mode is also very good for tropospheric scatter, from 50 MHz up to at least 432 MHz. On any of these bands a single

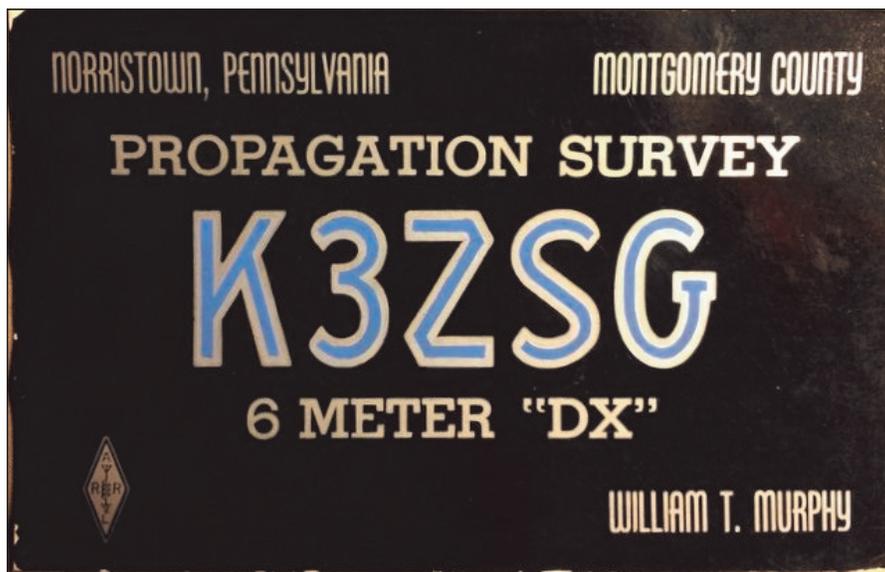
Yagi and 100 Watts can **work similar stations out to 300 or 400 miles**, pretty much any time. With a bit of effort, it's not that hard to accumulate 30 multipliers (grids) on 6 and 2 meters.

JT65 has a 6 dB advantage over FT8, owing to its longer transmissions. In practice, these days, it is mainly being used for EME. If your station is moonbounce-capable using JT65 on 2 meters, by all means make some EME QSOs. Nearly every one of them will be a new multiplier! In the January 2013 contest I operated on 2 meters only, making 268 QSOs in 96 grids. Of these, 73 QSOs and 67 grids were via EME. No skeds — I just called CQ, and answered CQs, off the moon. There's plenty of activity on 2m EME, especially in Europe, and with JT65 you can make as many as 10 QSOs per hour. In this year's contest **moonrise is around 3:40 pm on Saturday, moonset 6:30 am Sunday**. About an hour later the next day. EME conditions will be excellent in both moon passes. It's always nice to see a few Europeans, VKs or JAs in a VHF contest log!

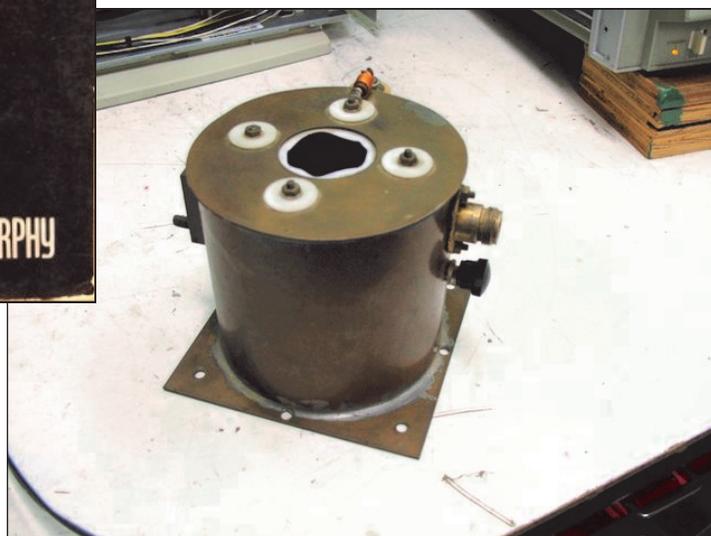
Default operating frequencies, 6 and 2 meters

Mode	Typical propagation	Default frequencies
MSK144	Meteor scatter	50.260, 144.150
FT8	Weak Es, troposcatter	50.313, 144.174
JT65	EME	50.190, 144.100 – 144.160

"From a teenage ham's "Eyeball" QSO with **an illustrious** long time Packrat, almost 50 years ago." I think that Bill will get a charge out of it. I remember Bill showing us a unit he built: maybe an Amp for 432, with a component that looked like half of a copper tin can inside and that, I think, somehow resonated at that UHF Band. We onlookers, suitably impressed and a little bewildered, We were aware that Bill was affiliated with a group of mysterious VHF/ UHF Wizards known as the Packrats. Bill was also the organizer and main resource for my first June VHF Contest circa 1969-70 at a microwave tower site near Red Hill in Montgomery County. 73. Griff NE3I



Copper can. Not exactly like this (more open on top) but similar. (Pic from W2BVH)



Adventures of the Last Cranky Ham - Part 1

By Michael Davis KB1JEY

For background on the KB1JEY 54 foot Hy-Gain tower, you might want to visit the newsletter section of the Packrat website and look up the articles that I wrote about acquiring and erecting the tower in a three-part series published in Cheese Bits in December 2010, January 2011, and April 2011.

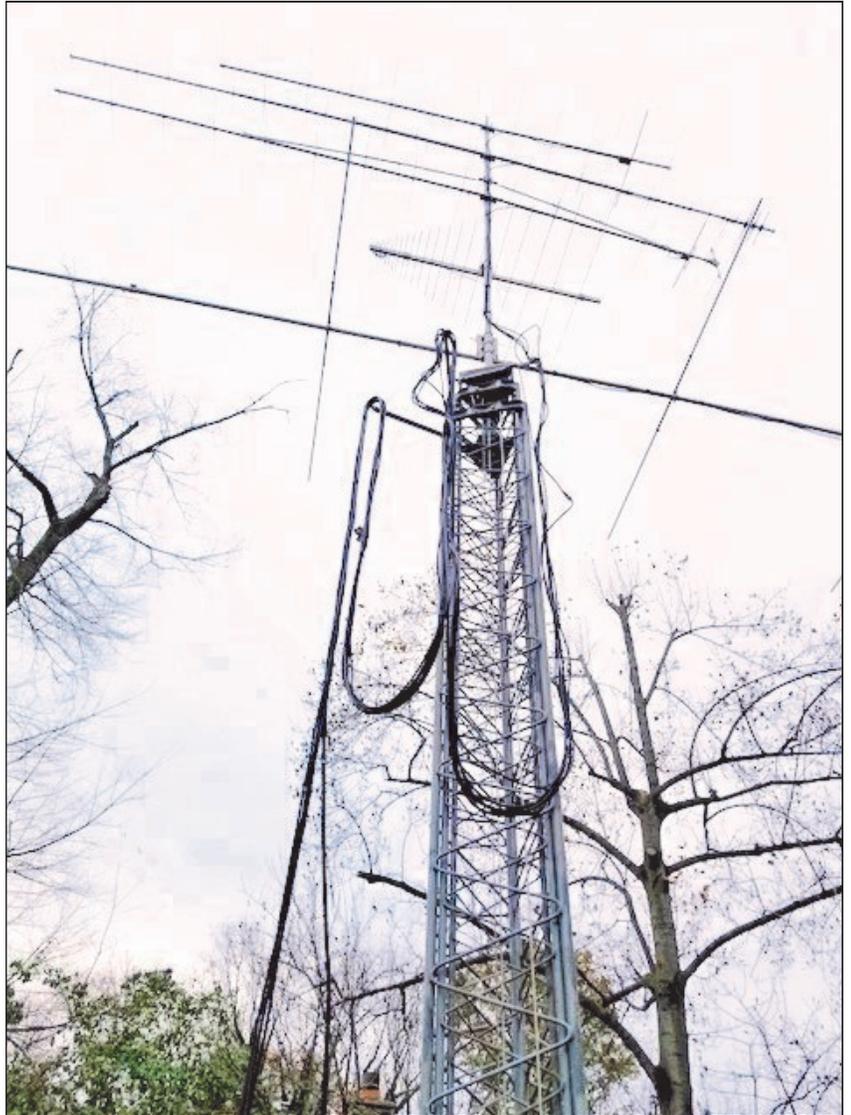
The tower has been up for over eight years now. I call myself the "last cranky ham". Why? you might ask given that most of my friends consider me one of the happiest people they know. When most Packrats erect a crank-up tower, the next effort that they mount is to put an electric winch on the tower. As an example, Joe Seibel WA3SRU put a motorized winch on his Hy-Gain tower shortly after erecting it. Mike Gullo WB2RVX put a motorized winch on his tower to save his back. So it appears that I may remain the last Packrat who cranks up his or her tower by hand.

So why have I hesitated to motorize my tower winch? First, an electric winch requires a source of 12 VDC or 120 VAC to drive the winch motor. Second, one needs to come up with an arrangement to stop the winch motor at the end of its travel. It seemed to me to be a lot of trouble for the convenience. However,

George Altemus KA3WXV has cautioned me that I might not be physically able to crank my tower up and down in the future so I should think about motorizing my tower winch as well.

At the beginning of November, I saw an email from CPO Outlets, advertising a "factory reconditioned" Milwaukee Hole Hawg right-angle drive electric drill. I remember that during a visit to Packrat Ed White WA3BZT's QTH shortly before he became a silent key, that Ed and I talked about winches. Ed suggested that a Hole Hawg would be a good way to crank my tower up and down. He owned one and offered to let me try it. The Hole Hawg offered by CPO Outlets was powered by an 18 V lithium battery, eliminating the need to run an extension cord. With a Hole Hawg, I could wind the winch up to the last turn or two and complete winding it by the hand crank, avoiding the need to install a stop mechanism.

I ordered the Hole Hawg. When it arrived, I realized that that I would need to acquire a 7/16 inch hex to 1/2 inch square adapter to secure a 3/4 inch impact socket to the Hole Hawg's QUIK LOK chuck. I visited my local hardware store which typically stocks all varieties of drill and socket wrench adapters. They never heard of such an adapter. I then went to my local electrical supply house that displays all sorts of Milwaukee tools and accessories on the pegboard. They did not even know what to order. A visit to



...Cranky cont'd

Google on my smartphone yielded the Milwaukee part number. They ordered the adapter, apparently available only from Milwaukee for about \$40 and it arrived a week later.

I invited George KA3WXV and Tom KA3FQS to **witness the retirement of the "last cranky ham"**. I plugged the adapter, a 5 inch extension, and a 3/4 inch socket into the QUIK LOK chuck. I put the socket on the winch hub nut and squeezed the trigger. All that happened was the clicking of the Hole Hawg's slipping clutch. Strange, the Hole Hawg is a pretty beefy power tool. It ought to have requisite torque. At least I had a good visit with George and Tom.



Monday morning, I called Milwaukee and asked what the specification was for the maximum torque that a Hole Hawg would deliver before the clutch kicked in. I was told that it was 18.5 ft/lbs. Next, I taped a straightened pink paper clip to the indicator beam of my deflecting torque wrench. The indicator tip on the indicator beam had broken a while back and the paper clip made it easier to read the amount of deflection. Cranking my tower winch with the wrench, I measured about 10 ft/lbs of torque as I cranked the tower up.

The phone representative at CPO Outlets offered to send me a return label. Instead, I decide to drive to the Milwaukee factory service center in Havertown. The counterman informed me that it was their policy not to accept reconditioned tools for warranty repairs. Odd, I thought. Which factory reconditioned my Hole Hawg? After another quick call to CPO Outlets while in the service center, plus a behind the scenes conversation between the counterman and the service center manager, the counterman changed his tune. They would send it off to the repair depot in South Carolina.

Stay tuned for Part 2 of the Adventures of the Last Cranky Ham.

[Evidently Michael did this article with a bit of assistance from his friend Cliff Hanger (callsign unavailable) --W2BVH]

K0BAK Rover DC Distribution Update

Last month, I described progress on power distribution in the TV van I'm building into a VHF & HF rover. The two major sub-projects completed last month were the switching and monitoring of two 200Ah lead-acid batteries, and 120v AC distribution from and to a combination inverter / charger / switcher. In progress last month was the third and **most complex** sub-project, the main station DC distribution and vehicle battery connection. I'm happy to report that I was able to complete that last major distribution project, and the van is ready to supply high current (80A) regulated 14v DC from either or both large station batteries, high and low current unregulated (nominally 12v) DC, as well as two-way connections to the vehicle batteries for charging in either direction.

Station Battery Charging

Until October, I was hoping to use the charger function of the 3kW inverter to charge the large station batteries from AC, from shore power when parked and from the Auragen generator between rover operation stops. The Auragen is a ~4kW 120vac generator system which is powered from the van motor via a specialized 400vdc alternator and inverter. It is ridiculously RF noisy in operation, but since I don't operate in motion it would have been acceptable to use between operation stops. It seemed logical to me that I could use the Auragen in motion. Unfortunately, when I actually tested it preparing for the PA QSO Party, the Auragen shut down as soon as I put the van into drive gear. Paul WA3GFZ confirmed that because the Auragen controls the van's engine RPM, it can only operate while parked.

This meant I either had to use the noisy gasoline generator in motion just for battery topping, which was probably a highly inefficient use of gas, or charge from the normal van alternator. In my previous minivan rover, this is how I charged the single station battery between stops, but I had installed 2 Ga cables back to the separate station battery from the engine compartment. It was switched with a solenoid controlled by engine ignition. In the TV van, I had access to its existing high current DC distribution binding posts in the large distribution wall panel in the back. But, I was highly reluctant to add any cables because there are about a dozen large-gauge cables tied together on one ground and two positive posts that haven't been touched in almost 20 years. Fortunately, there was one unused 8ga solid pair that used to be connected to a burned-out (literally!) power supply that I removed from the bottom of the center rack where my station batteries are now mounted. In principle, I thought 8ga ought to be enough for the current needed to top off a station battery from the van alternator, though if I ran my own cables they probably would have been substantially larger.

The 8ga cables are not visibly protected against over current; in fact none of the high-current cables are protected. Apparently there are self-fused cables that are sometimes used for high-current applications, but I have no idea which if any are protected. (This is another reason why I didn't want to disturb the existing binding posts.) I nervously terminated the "hot" 8ga cable in an Anderson SB Series-like connector, intending to mount its mate on my distribution layout board.

System Functions and Design

Including that last-minute function of charging the station batteries, my station battery distribution system implemented the following functions:

- Single connection point from the battery selection switch. [In the project completed last month, I have two high-current switches each side of which are connected to the two batteries: one switch's "output" goes to the inverter/charger, the other switch's output goes to the input of the station DC distribution board described here.] I used 00ga cable because it was leftover, but is otherwise overkill for the max possible 160A.

- A single component (*Blue Sea Systems SafetyHub 100*) provides fused distribution to the following:
 - Boost regulator, fused at 80A
 - Van alternator charging subsystem, fused at 40A
 - High current 4ga raw battery voltage output, currently un-fused
 - 5A terminal screw output, also connected to ammeter light
 - 25A terminal screw output, probably for future low-current 12vdc and 5vdc supplies

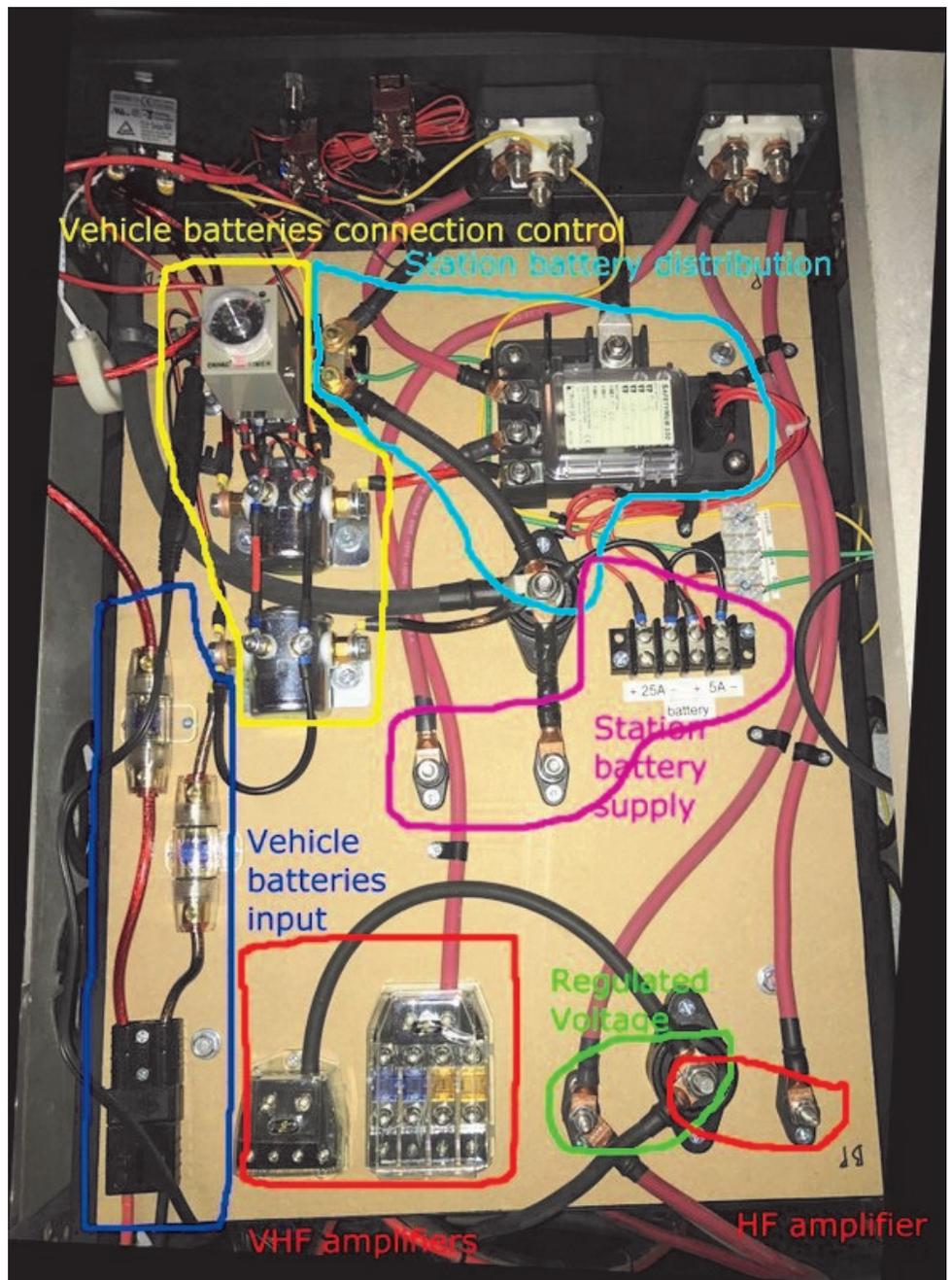
- A common station battery negative binding point, which in turn is connected with 00 ga cable to the overall DC negative binding point below.

- My existing boost regulator is the single most important component, providing a regulated 14v at up to 80A peak as the lead-acid battery is depleted from ~13v potentially down to 10.5v.

- Analog ammeter to monitor dynamic current usage by the 14v station equipment like amplifiers.

- The 8ga wire pair described earlier is connected to a permanently-mounted Anderson SB Series --like connector on the circuit board, and then both positive and ground sides go through 60A fuses. These 60A fuses are in addition to 40A protection later in the circuit because I'm paranoid that there is no known overcurrent protection from the very high current existing van DC binding posts ... though of course I know these extra fuses aren't a substitute. The negative/ground fuse output is connected to a common van DC negative distribution, and the positive fuse is connected to a rack panel-mounted 40A circuit breaker through a Hall-effect current sensor. The addition of the 40A accessible circuit breaker is because I cannot be *sure* how much current will be flowing from the van alternator to the station battery(s). Between the circuit breaker and the current meter, I guess I'll find out during my first serious contesting effort.

- The most complex subsystem is the in-motion charging system. The 40A circuit breaker output (van DC positive) and the van ground/negative are connected to the inputs of a pair of solenoids. An ignition signal (+12v while the engine is running) was extended from the existing van power panel through an added inline fuse to a rack toggle switch and then to a timer relay. If the toggle switch is



already closed, the solenoids will be energized 6 seconds after the engine ignition signal is high, and de-energized immediately if the ignition signal goes low. The solenoid outputs are connected to the station battery(s) and a common negative. In this way, the van alternator will supply current to the station battery(s) when the engine is running; the 6 second delay is intended to allow the van DC to stabilize after starting the engine. It will be “interesting” to see how all this works in practice.

- A vehicle battery charging system uses the same 8ga DC pair from the existing power distribution panel as the station battery charging system. When the van is not used for an extended time, like any stored gasoline vehicle, the starter battery should be kept topped off to assure a strong engine start and to maximize the life of the starter battery. As mentioned earlier, there used to be a burned-out DC supply and battery charger. This supply had a single screwed-down AC supply line controlled by a dedicated switch/breaker on the existing van power control panel. I attached a NEMA 5-15R to the end of that unused AC circuit, and plugged a low current (1A DC) *Battery Saver* brand vehicle battery maintainer into it. The battery side of the maintainer was connected to the same DPDT front panel switch also used for solenoid control, but on the other pole and other throw. In this way, I have a mechanical “interlock” to only allow vehicle charging if the station battery solenoid connection is off, and vice-versa.
- The positive input to the boost regulator is supplied from the common output of a front panel 200A switch. One input to the switch comes from the *SafetyHub* via an 80A fuse. The other input to the switch is currently not connected, and is intended for a possible future addition of an 80A DC power supply that can be used when 120vac is available.
- The 80A boost regulator has a remote control panel that displays both supply (battery) voltage and regulated output voltage. This control panel is mounted high in rack #1, alongside the DC ammeter described previously, and the inverter/charger remote control panel. The booster itself is relatively heavy and just happens to fit well between the station batteries on the floor of rack #2, wedged in between the battery tie-down straps. The booster input and output cables are 4ga “welding” cables which I also use throughout my systems for 80A peak DC distribution.
- The negative output of the booster is connected to a 3/8” binding post for a common ground point for all 14v regulated DC use. The positive booster output is connected to a smaller 1/4” binding post. This positive post is used for un-switched supply such as to radios, but most current will flow to the common of a rack switch. One output of the rack switch goes to the high current HF amplifier, the other output to high current distribution blocks for VHF amplifiers and other VHF-only components.
- The VHF-side DC distribution blocks were previously used in the minivan rover. This distribution supports the 4 low bands’ medium power amplifiers, 3 transverters, and other lower-current VHF-only components. The positive side contains 4 MIDI fuses and accepts large-diameter wires. Two circuits are fused for 60A and go to the 6m and 2m 350w TE amplifiers, one 40A circuit to a new 220 MHz 225w TE amplifier, and the last 40A circuit to my old *RIGrunner* fused PowerPole DC distribution block. The *RIGrunner* supplies the regulated DC to lower-current components including the 70cm 180w TE amplifier, three transverters, a Flex 1500 radio and 10MHz reference subsystem, WaveNode RF power monitor, and amplifier fans. [None of those components are connected yet, I’m just describing the intention for the VHF DC distribution block.]
- The HF-side DC distribution blocks are identical to the VHF blocks, but overall the HF DC distribution is much simpler than VHF, with only the 400w HF amplifier taking



high current.

- A control panel consists of components mounted on a 3U rack blank. The panel is attached to front of rack #2, above the horizontal circuit board to allow large gauge cables to pass to the battery compartment below. The functions include many already described earlier:
 - A pop-out panel-mounted 40A DC circuit breaker for the vehicle DC current. This is intended to protect the 8ga wires supplying current from the alternator to the station batteries, as well as to indicate when more-than-expected charging current is flowing to the station battery(s) from the alternator. [Note again I was unwilling to “do it right” by adding protection at the start of the 8ga wires on the existing van DC binding post.]
 - A digital current + voltage meter to measure the vehicle DC voltage and the current flowing from or to the vehicle alternator or batteries. This meter is the same type used in the battery switch panel, with a Hall Effect current transducer around the positive vehicle DC wire. The meter is supplied and the vehicle voltage is measured after the 40A circuit breaker.
 - A DPDT center-off switch for vehicle DC connection control. When the switch is in the up position, the engine ignition signal can flow to the 6-second timer relay which in turn controls the solenoids that connect vehicle DC voltage to the station battery(s). When the switch is in the down position, the battery maintainer is connected to the vehicle DC circuit which in turn keeps the vehicle batteries topped off. By using the double-throw switch, the circuit is configured in only one or the other direction.
 - An LED that lights when the vehicle voltage connection solenoids are energized.
 - An LED that lights from the battery maintainer output (or when the switch is in the down position so the LED sees the vehicle battery).
 - A SPST switch to control illumination on the panel, including the voltage/current meter and the LEDs. This switch simply controls the ground return of all the lit components, similar to what I did on the battery switch panel.
 - A high-current DC switch to select the source for the input to the boost regulator. Mostly intended for possible support of a future AC-input power supply, the only source today is the station battery from the *SafetyHub*.
 - A high-current DC switch of the output of the boost regulator, to select either HF-only or VHF-only DC output circuits. The un-switched booster output is also available on binding posts in the back of the rack.
 - One each unconnected LED and DPDT switch for possible future use.

Implementation

I used an adjustable-length rack shelf with pre-cut air holes whose maximum extended to the 24 inches between the front and rear threaded rack screws. I cut an MDF board to fit snugly on the metal shelf, and drilled holes aligned with shelf holes to bolt down the board. The MDF board is a good substrate for the many wood screws used to hold components, although I was unprepared for the amount of dust generated by cutting the MDF.

Because of the multiple layers needed for all the circuits, including some large gauges up to 00, I spent hours in trial-and-error layouts before starting to screw down components and cut wires. (In one small area, there are six layers of wires). The 8ga flexible wire I had on hand was hard to work with because it uses some sort of soft transparent insulation that I think is intended more for looks than practicality. That same wire also seemed to be undersized; though that did make it easier to find and attach 10ga ring connectors with 3 different inside diameters for snug fits on bolt terminals.

The 3U rack blank used for the control panel was very difficult for me to cut for the two large holes for the high-current DC switches. Probably didn't help that I have a small and cheap tabletop drill press. I'd rather not have to do that again.

Mounting the shelf + board and the rack panel in the van rack was non-trivial, owing to the fairly inflexible large-gauge cable runs, especially the 00 cables from the shelf to the lower battery switch and ground

point, and the 90° tied-down bends of 4ga cable leading to the panel switches. Another challenge was having to remount the panel when I realized an internal switch in the digital meter needed to be repositioned. Screwing down the 00 cable to the battery switch circuit was an anxious operation because it was a tight squeeze and the battery cables had to be live, so one wrong slip of the metal socket driver could mean a horrible short circuit of a battery that can deliver a kiloamp for a few seconds.

When testing I was relieved that the most complicated part, the delayed solenoid switches when the engine turned on, worked the first time. However, there were two issues. One was that the booster was indicating a lower than expected output voltage, which could mean that the internal switch of the now “buried” booster somehow was in the wrong position (I had worked on it earlier) or that the output voltage was somehow adjusted down. Luckily, it was the latter, and after disconnecting the booster from the new board, I was just barely able to get a short screwdriver into the downward facing screwdriver-adjusted output voltage pot, and adjusted the voltage upward again through several rounds of connecting and reconnecting. The other problem was easier to fix: I had misunderstood the polarity standard used for the SAE battery/charger connector. A quick order from Amazon got me a gender changer that allowed me to install that component inline rather than having to unmount the entire system to correct the wiring.

Milestone and Project Suspension

Getting this final bespoke power distribution system successfully installed is a **major milestone**. Not only is it a satisfying end to a complex project I undertook with little relatable skills or experience, but it was also important to allow me to largely pivot away from the van work. I need now to work on cleaning, painting, and re-occupying the basement ... not the least of which will be setting up my home ham station again. By having the van power distribution in place, I can now keep both my station batteries and my vehicle batteries voltage-maintained while the van is in garage storage.

Station power distribution is by no means done, because all this work on the DC systems simply means I am now able to wire the high-current amplifiers and the lower-current Anderson DC distribution systems. However, those should be fairly straightforward, using off-the-shelf equipment, wires, and connectors that I mostly already own.

While my main focus will now turn to the basement project, I intend to spend some time on van progress. This includes verifying and characterizing microwave equipment by Gary WA2OMY (thanks!), learning to make my own RF cables, repairing my HF amplifier's sticky output relay, and maybe some more van progress.

E M_{ars} E ?

Some of you may remember that there is a medal languishing at League Headquarters, reserved for the first earth - Mars contact by a Ham. Long thought to be un-achievable, the current work by NASA may provide the wherewithal. If you want to read the details, check out the link:

https://spectrum.ieee.org/aerospace/robotic-exploration/how-nasa-will-use-robots-to-create-rocket-fuel-from-martian-soil?utm_source=roboticsnews&utm_campaign=roboticsnews-11-06-18&utm_medium=email

Bert, K3IUV

On The Bands

By Jerome Byrd – K3GNC

Tropo Scatterings: “The great equalizer”.

To continue with the September “On The Bands - Heavy Lifter or Heavy Load” topic, let’s look at what we can do to become less of a load: we can run more power, put-up larger arrays, higher arrays, better feedlines, better preamps .. AND .. we can **go digital**. Few of us can make all of the desired improvements but all of us can incorporate the key digital modes.

Six meters has gone to the “dark side”. If you don’t do MSK144 and FT8 you better have a very powerful six meter station and a voice keyer, because cqng on ssb will at best produce sporadic and patchy responses. This is decidedly true when the band is not open for long haul ssb contacts. Two meter operators have not been as enthusiastic about using digital modes as the six meter crew, but that is changing rapidly. Using MSK144 will give results many times superior to SSB/CW scatter attempts. Small-medium stations will likely outperform super stations in this regard (MSK144 vs SSB/CW). FT8 CQ’s will often return greater success than even CW. The JT65B mode will often garner successes unobtainable by any other means.

Our own AA2UK is the torch bearer for demonstrating the massive improvement to station performance possible by using the key digital modes. Bill is “Killing It” on six and two meters on the digital modes. (He still also successfully works SSB/CW). Yes he is “Bill” and runs QRO, BUT, his antennas are a Moxon on six meters and a 9 element M2 on two meters, neither more than 30ft high! He has also worked some impressive MSK144 contacts on 222! I have never worked a meteor contact on 222.

My goal for the coming January Contest is to double my “normal” grid counts on six and two meters by using the key digital modes. What’s yours?

**** Please edit your QRZ.COM page to at least list your station rundown (see Aa2uk, K3tuf, Wb2rvx, etc.)**

Nets and Schedules: The following is a rundown of the nets and group meetings in the ‘local area’ (<= 250 miles, only nets that don’t conflict with the Packrats nets are shown).

Mondays: 2130 local – 1296.110 (group schedule with WA2LTM, K1PXE, WZ1V, N2SLO, WA2ONK, WB2SIH, K3GNC, W2BVH and others. All are welcomed.

Tuesday: 2000 local – “Mud-Toads Net”, KD8UD fm17uv net control. 144.175, all are welcomed.

Wednesday: 2030 local - 432,150 – group schedule, WA2LTM, K1PXE, WZ1V, N2SLO, WA2ONK, WB2SIH, K3GNC and others. All are welcomed.

Thursday: 2030 local - 144.250 – N.E.W.S club net, W1COT fn31st net control. All are welcomed

Saturday: 144.205 – 2130 local - Chesapeake Net, W3BFC net control. All are welcomed

Sunday: 1030 local – 144.250, Sunday Morning Memorial Net, Bill AA2TT fn30br net control, all are welcomed, 2030 - - 432,150 – group schedule, WA2LTM, K1PXE, WZ1V, N2SLO, WA2ONK, WB2SIH, K3GNC and others. All are welcomed.

The Luna-tic Fringe: EME is on hold for me. I missed the recent EME contest, both sessions. My 144 MHz, 432 MHz and 1296 MHz antennas are now working, but I haven’t figured how to get WSJT working amidst all the remote software and sound card demands. I had hoped to operate at the remote site, but that proved not possible. As James Garner said in an old “Maverick” episode .. “I’m working on it”

EME Tidbits – For the first 6 hours of a moon-pass Europeans stations are available. The next 3 hours are limited to NA and SA. The final 3 hours feature the Pacific islands, AU, ZL, Japan and the far east at the very tail end of moonset.

Until next time please stay/get radioactive!

2018 ARRL 10GHz and Above Contest Results

By Dave Hallidy K2DH with thanks to Ken KA2LIM for forwarding this report to Cheese Bits

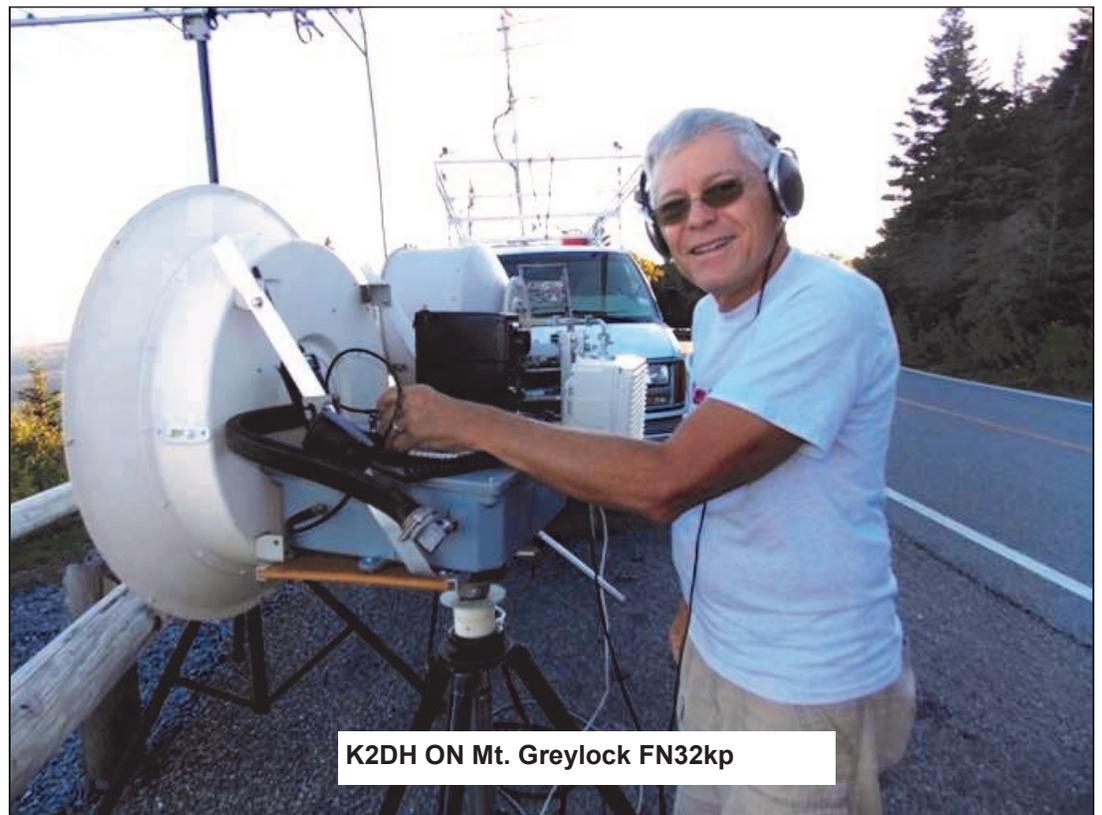
The recent ARRL 10GHz+ Cumulative Contest is history having run over two weekends in August and September. I love this contest, and try to participate every year. The following article recounts my effort this year, along with my two cohorts: Russ K2UA, and Ken KA2LIM.

I started alone on the first Saturday of the contest at FN02nu on the shore of Lake Erie just south of Buffalo, to work the VE's and W8's who collect along the lake to work each other. I was joined a bit later by Ken KA2LIM who then spent the rest of the two weekends with me as I roved around NYS and later, New England. We worked many stations, including some 24GHz QSO's across the lake.

On the first Sunday, I returned to one of my all-time favorite spots- FN02xu, known as Transit Road, in the town of Pavilion, NY. It's very high and the farmer who owns the property happily lets us park on his lawn to operate! Ken and I got there early and were joined later in the day by Tony K8ZR (ex-WA8RJF), Steve KB8VAO, and Warren WB2ONA. We had a blast there, making our longest distance QSO's of the entire contest from that location! In addition to many other QSO's, I managed to work from there to Mt. Washington, NH (FN44ig) at 568km, to Block Island, RI (FN41ee) at 563km, and to Mt. Wachusett, MA (FN42bl) at 505km! Those, plus the many other shorter range QSO's provided my best score ever for the first weekend of the contest, at over 15k!

The second weekend found Rus K2UA, Ken KA2LIM, and I roving the mountaintops of New England. We started the second Saturday at FN42ad, a place called the Bay Path Vocational Technical High School in Charlton, MA. This isn't a mountaintop, but is high enough (1100ft ASL or so) to have a great view in practically all directions from the parking lot, and again, we were welcome there.

Well, Murphy struck me right away when we got set up. For over 10 years, my 10GHz equipment has worked flawlessly, but on my first attempt at a QSO, my TX was intermittent. I managed to squeak out QSO's with K1RZ and W2RMA on SSB (in FN21hd) at 305km, but then no more. I could hear fine, but no one could hear me. We troubleshot the problem to the T/R relay not switching at least I thought it was the relay. Eventually, we figured out that it was the switching circuit that had failed. My relays are 28v units and I switch them (on both 10 and 24GHz) with a "relay kicker" which



provides a spike of 28v to kick the relay into position, then 12v to hold it. There was no "kick", so nothing was happening. I have the same circuit in both rigs, so I stole the kicker from the 24GHz rig and put it into the 10GHz rig, and I was back on the air, at least on 10. While I was working on this, the other guys were continuing to make QSO's from there, so once I was back on the air, I had some serious catching up to do. By the time we left that location, I had done a pretty good job and was only down 1 or 2 QSO's from the other guys.

Saturday afternoon was spent on Mt Greylock, MA (FN32kp) and we worked LOTS of people, finally leaving there just before dark. I had my longest QSO of the contest on 47GHz from there, working KA1OJ on Mt. Wachusett (FN42bl) at 105km. We drove to Bennington, VT to spend the night there and while in the hotel, we troubleshot the broken relay driver. We found the problem (a broken solder joint), repaired it, and put it into the 24GHz box and I was back in business on all bands for Sunday's efforts.

Sunday morning we were up bright and early, had breakfast and headed for Hogback Mountain, VT (FN32ou). We parked near the gift shop on RT9 and it's a great spot, but if you go there, be aware- lots of traffic up and down RT9, so it's noisy. We made lots of QSO's from there and left just before noon, headed for lunch and Mt. Equinox, VT (FN33kd). We spent the rest of the day there, working lots of people before heading down the mountain at 4:30 (they close the road at 5pm).

At that point, Ken left us to head home, but Rus and I weren't done yet. We started heading west towards Rochester, but had previously reconnoitered a spot in Central NY where we thought we could stop and work some people on our way home. This spot is FN23ea and is a stop on the side of the road near the intersection of Peterboro Road and Bishop Road south of Oneida, NY. It was late - after 8pm when we got there, but we knew that the folks on Martha's Vineyard (AF1T/W1MKY), the folks on Block Island (W1GHZ / KB1VC) and a few VE's would be waiting for us. We were successful working all of them from there, even though it



started raining in the middle of our attempts and we got soaked. We left there at about 10pm and got back to Rochester shortly after midnight, tired but very pleased with our weekend results. Rus and I each ended up with our best scores ever - his on 10GHz only, mine on 10GHz and above. I ended up with 134 QSO's with 56 unique calls and distance points totaling 27728, for a final score of 33328. Rus, for a one weekend effort on 10GHz and running much less TX power than me, had 70 QSO's!

It was great fun and we look forward to doing it again next year. If you have 10GHz gear, or thoughts of getting on the band, **PLEASE** talk to one of us - we would love to help you get on and have you join us!!!

73 Dave K2DH

Scenes From the Tear-down of the K2LIM Contest Station



The tower that held the tribander, 10M mono bander and the 2M Quagi is down

A second 6 meter tower is now down with the two long boom 222 yagi and quagi stored here



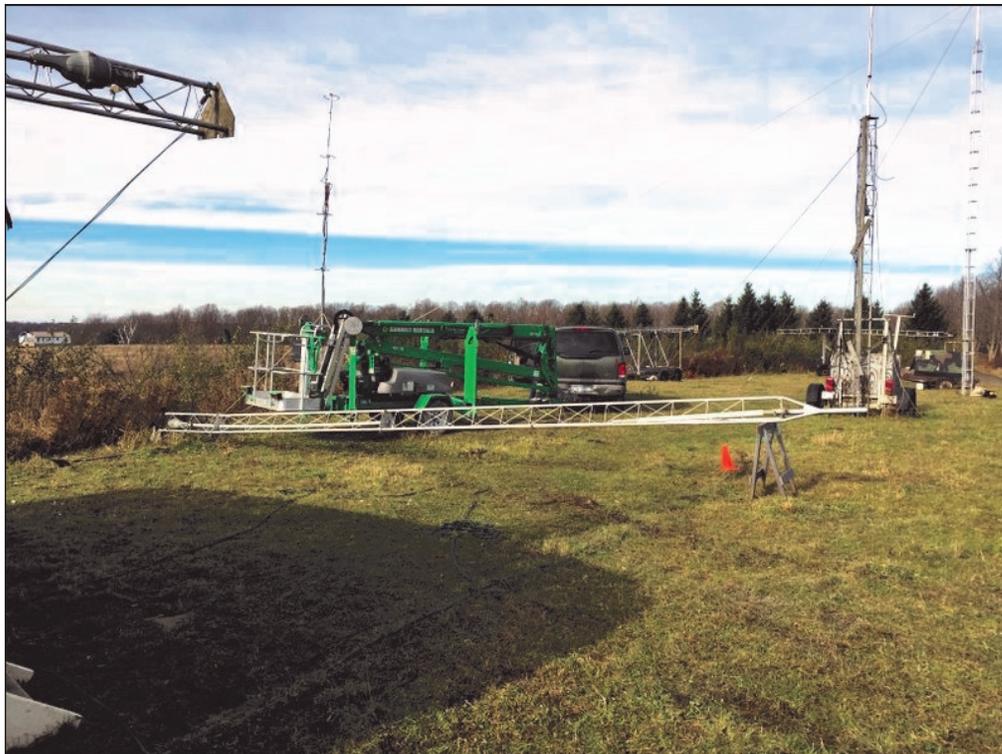
222 position with Warren WB2ONA

Briefly: All of the FT-847's have been removed and... all of the amplifiers have been removed. 3 of the amplifiers have found new homes.

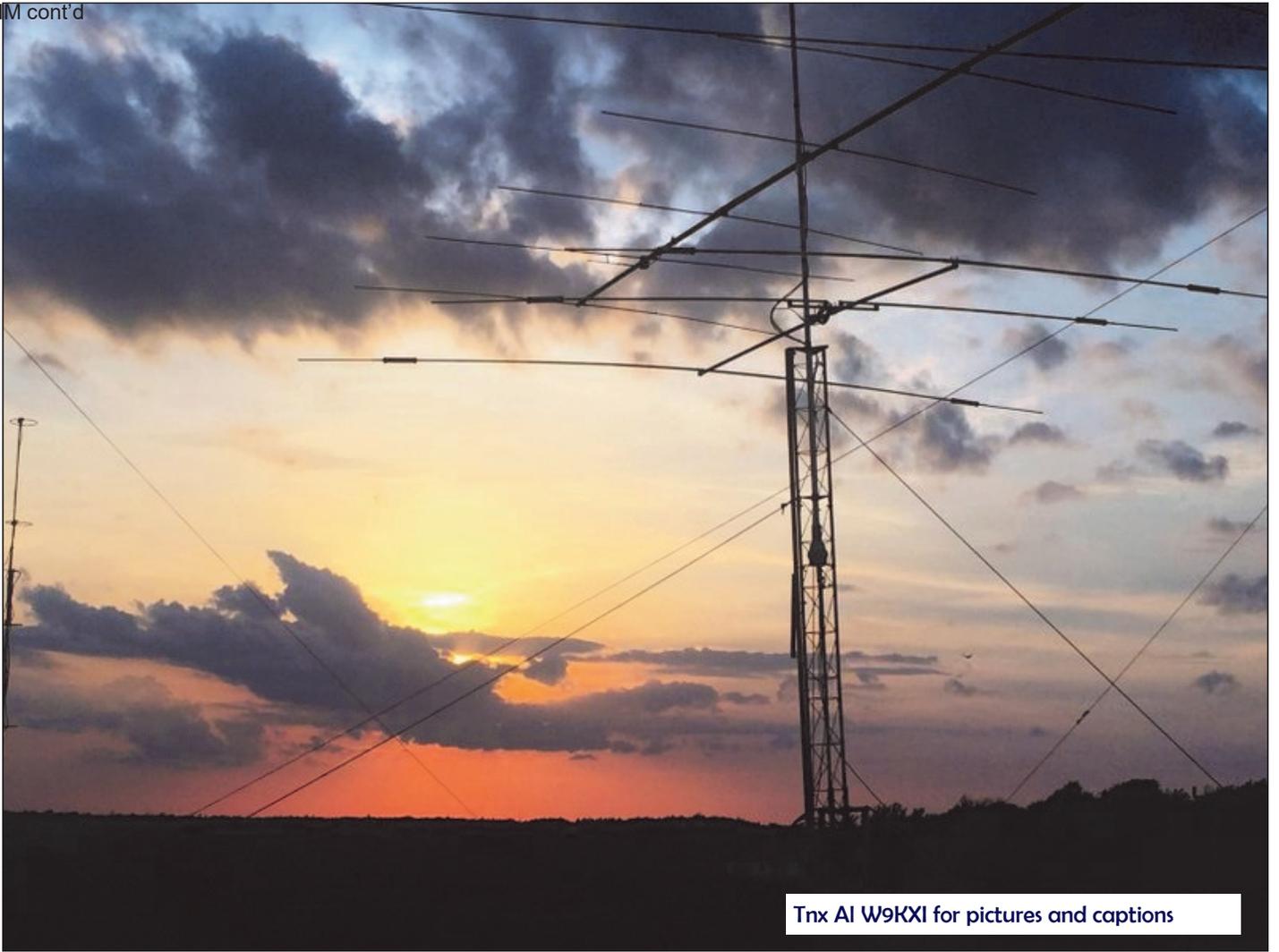


The weather, however, was much much better today

We had sleet to contend with part of the time!



The 2M rotating tower (LVA) is down



Tnx Al W9KXI for pictures and captions

WSJT 10.0 r6088 by K1JT

File Setup View Mode Decode Save Band Help

Moon
Az: 76.95
El: 14.86
Dop: -13
Dgrd: -1.6

FileID	Sync	dB	DT	DF	W	Time (s)	Mon_181031_045600.WAV
045000	2	-24	2.1	148	2 #		WA3QPX 9N7AP NL18 OOO 0 10
045200	10	-24		141	3 RRR		
045400	0	-24	2.1	140	2 #		
045500	0	-31	4.7	127	3 *		
045600	10	-20		139	2 RRR		

045600 1 2/4 WA3QPX 9N7AP NL18 0 10
045600 2 1/1

Log QSO Stop Monitor Decode Erase Clear Avg Include Exclude Tx Stop

To radio: 9N7AP Lookup Sync 0 Zap 9N7AP WA3QPX FM29 Tx1
Grid: n118 Add Tol 50 AFC 9N7AP WA3QPX FM29 OOO Tx2
Az: 20 7566 mi Freeze RO Tx3
 Tx First RRR Tx4
 Gen Msgs Auto is OFF 73 Tx5
CQ WA3QPX FM29 Tx6

1.0000 1.0001 JT6B Freeze DF: 148 Rx noise: 1 dB T/R Period: 60 s Receiving

WA3QPX -> 9N7AP EME 10/31/18
Congrats Paul!

**NOTHING IS BUILT IN AMERICA
THESE DAYS. I JUST BOUGHT A T.V.
AND IT SAID "BUILT IN ANTENNA".**



**I DON'T EVEN KNOW WHERE
THE HELL THAT IS!**

The Wayback Machine In CHEESE BITS, 50 Years Ago

Nibbles from December 1968. Vol. XI Nr. 12
de Bert, K3IUV
(*author's comments in italics*)

- **“Our Prez Sez”.** The prez, Charlie, K3HSS noted that “An amendment to the club constitution will be voted on at the next meeting. The purpose is to raise the dues for the different classes of membership.” He also reminded all that the January contest was less than 1 month away, and everyone should be ready to “turn in the best score you are capable of.” (*It seems to me that I have heard that refrain before?*). He also noted that last month’s meeting speaker, Don, WA2EGZ presented an outstanding talk on VHF converters using the latest available transistors.”
- **ARRL Bulletin 192 10/24/68.** The United States concluded a reciprocal operating agreement with Ireland and Surinam.
- **Technical.** Jack, W2AXU, provided biasing and technical information for the General Instruments field-effect transistors that had been sold at the November meeting. He noted that “best operation has been obtained by using them in a grounded source configuration.”
- **Cheese Bits Price increase.** Doc, K3GAS (the “then” publisher) announced that the non-member subscription rate was being increased to \$2.00 per year, to cover increased postage and paper costs. (*Still a bargain, and of course it was free to members*).
- **Constitution and bylaws.** The full text

of changes proposed to both documents was included in this issue. The changes dealt primarily with definitions of the different classes of membership, dues associated with each class and procedures for voting on membership applications.

- **The Book Rack.** K3WEU, Paul, reported on the recently reviewed book “FET Principles, Experiments and Projects.” Published by Howard H Sams, 232 pages, \$4.95.
- **Antenna Measuring Party Report.** Recall that the first Packrat Antenna Measuring Party was scheduled and held at the QTH of Mario, K3UJD, in Ivyland. Walt, K3BPP gave an excellent description of the equipment and procedures used. Tests were done on 6, 2, 220, 432 and 1296. Commercially made and calibrated dipoles were available, and were used to calibrate the readings. A somewhat Rube Goldberg arrangement coupled the antenna rotor to a strip chart recorder. Gain vs. angle recordings were made on a variety of member’s antennas. One interesting comment from Walt “The ink in the pen refused to flow smoothly (also a problem in industry), so the operator (Walt) was required to blow into a plastic tube while holding his finger over the filler hole. Removing the finger from the hole caused ink to squirt over everything (which happened a couple of times). Despite the problems with the setup, a number of successful measurements were made and recorded. Notable reports included a 220 32-element collinear from Bert, K3IUV, 20 dB. A 432 32-element collinear from K3IUV, 8 dB (*I guess my dimensions were a little off!*). Also, an 11 / 11 element 1296 array from

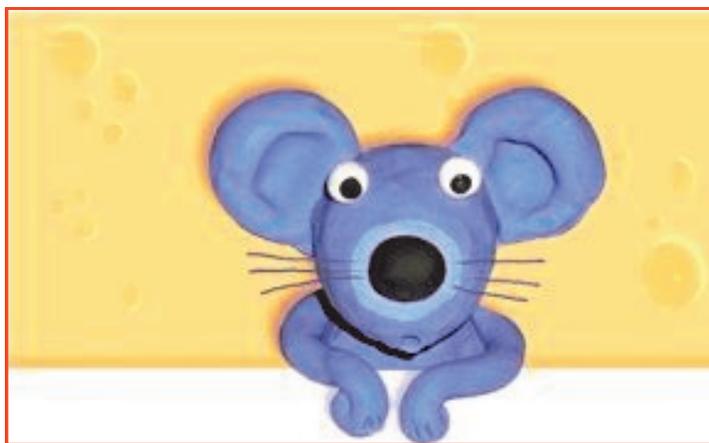
Walt, K3BPP, about 11 dB (*This was long before the "loop Yagi" design became available.*). Walt noted that "the next measurement session will benefit from the newly acquired experience."

- **1296 Status Report.** Lou, WB2IOE, provided a very detailed status report on the activity and happenings on this band, in the local area and up through North Jersey and New York. He identified active stations and described the equipment in current use at a number of these stations. (*Some of these calls were nostalgic for me. W2CQH, Reed, supplied me with the Varactor multiplier I used for my initial operations.*) W3CCY was using a pair of **water cooled 2C39s** to obtain 100 watts output. Lou noted that the APX6 was still being used by a number of stations including himself, K2HQL and K3DYO. They improved the rig by narrowing the if bandwidth from the original 2 MC (MHz). Lou finished by reporting that he built his transistor preamp from the design by Al, K2UYH (*now a Packrat*), in the November 1967 issue of QST! Lou's article occupied 1-1/2 pages in the 11" x 14" format of the paper at that time. You might want to read the full article in the Cheese bits copy posted on the W3CCX website.
- **Swap Shoppe. By W3ZRR.** (*Always nostalgia.*) For sale by John, K3AOT: A UTC S-50 Plate transformer. 3000 volts, 300 milliamps, \$15. (*Russ, is this what you were looking for on the reflector?*) Also, a Heathkit Warrior Amplifier, \$130.

Miscellany. *Postage for this copy (from W3KKN, Ernie,) was a pair of 6-cent Roosevelt stamps. As in previous editions,*

*many "folksy" comments about members, their families, and activities were included in this edition of Cheese Bits. If interested, or for more detail on the above items, visit our website (www.W3CCX.COM) and read the full issue scanned by K3IUUV (me), and posted on the site (All issues have been restored to the new website, by W3SO, our webmaster.). Remember, 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 member. Have 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.***

Thirty, de K3IUUV



The Geminids meteor shower should peak between the 13-15th this month. <https://earthsky.org/?p=187764>
This would be a good time to test the General Release of WSJT-X v2.0. I'd suggest getting on just before daybreak until 10AM local. The 6 meter freq of operation for MSK144 is 50.260 and 2 meters is 144.150. It's also near the peak of the Winter E season. FT8 is not an effective way to work meteors but it's great for weak E's. Most of the stations using MSK144 will be on the Ping Jockey chat page.

Bill AA2UK

New 10 GHz EME World Record!

Rex rmoncur@bigpond.net.au reports on his 3 cm ZL grid dxpedition and World Record QSO with G3WDG -- On 25 Oct, operating portable in New Zealand worked G3WDG portable to extend the existing 3 cm EME World Record between WA3LBI and VK7MO by some 156 km to around 19107 km (exact distance still to be confirmed). The key issues are absorption and absorption noise combined with ground noise, which can increase losses significantly at 10 GHz at the low elevations that are necessary to achieve such long distances. To gain an adequate window both stations operated portable with take-offs over the sea. In our case, it was necessary to fly to NZ and develop a flyable dish to fit in the standard luggage dimensions for airline travel. In NZ operations were supported by ZL3RC and ZL3FJ. In the UK, it was a combined operation between G3WDG and his XYL G4KGC. Spreading was 19 Hz and lunar degradation 1.1 dB. ZL/VK7MO from RE46og ran 60 W to a 1.13 M cut up flyable dish. G3WDG from IO80ef ran 65 W to a 1.22 M dish. In addition to the World Record, grid locators were activated at RE66, RE57 and RE46, and the following stations completed contacts at one or more grid locators: W5LUA, UR5LX, OK1KIR, HB9Q, VK3NX, EA3HMJ, UN6PD and OK1CA. A number of these QSOs resulted in new National Records. A 10 GHz EME demonstration was held in Christchurch NZ with W5LUA, who completed QSOs with ZL3RC, ZL3OY, ZL3NW, ZL3TCM, ZL3MH, ZL3OF and ZL2IC.

Reassembly of 1.1M cut up flyable dish. A real jigsaw puzzle problem.



Events

For inclusion, please direct event notices to the editor.

January VHF Contest - Contest - January 19-21, 2019. See <http://www.arrl.org/january-vhf> for rules and details. Also see the Packrat web page for club specific info. (Info will be posted shortly).

Winter Hamfest - Hamfest - February 23, 2019. Big Flats NY. Sponsored by LIM Contest Group. See <http://www.ka2lim.com/7.html> for details

Eastern PA Section Convention and Warminster ARC Hamfest - May 5, 2019. Bristol PA. See <http://www.k3dn.org/hamfest/> for details

June VHF Contest - Contest - June 8-10, 2019. Details to follow.

Murgas ARC Hamfest & Computerfest - Hamfest - July 7, 2019. Plains PA. See <http://>

Upgrade to WSJT-X V2.0 NOW

Everyone using WSJT-X should upgrade to v2.0 ASAP after December 10. Certainly by January 1, 2019. The protocols in use for the January VHF Sweepstakes (also the January RTTY Roundup) will be those in WSJT-X 2.0. This is for good reason. Many of the changes in v2.0 are the result of requests by the VHF Contesting community. In v2.0 all messages will decode properly, independent of whether you have selected the "NA VHF Contest" message format for the automatic generation of Tx messages.

V2.0 supports Rover ("/R") callsigns in any message.

Messages about the need to upgrade after December 10 have been sent everywhere we can think of. It's already on several reflectors. It's on the WSJT web site. It has been in several ARRL News pieces, and the ARRL Contest Newsletter. People tell me they have sent items to QRZ.COM, eham.net, etc. There will be a 2-page article in January QST. What else can we do???

Finally: don't wait until the day before the contest.

-- 73, Joe, K1JT

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Heritage of the 221.4 MHz Packrat Repeater -- by K3IUJ Bert

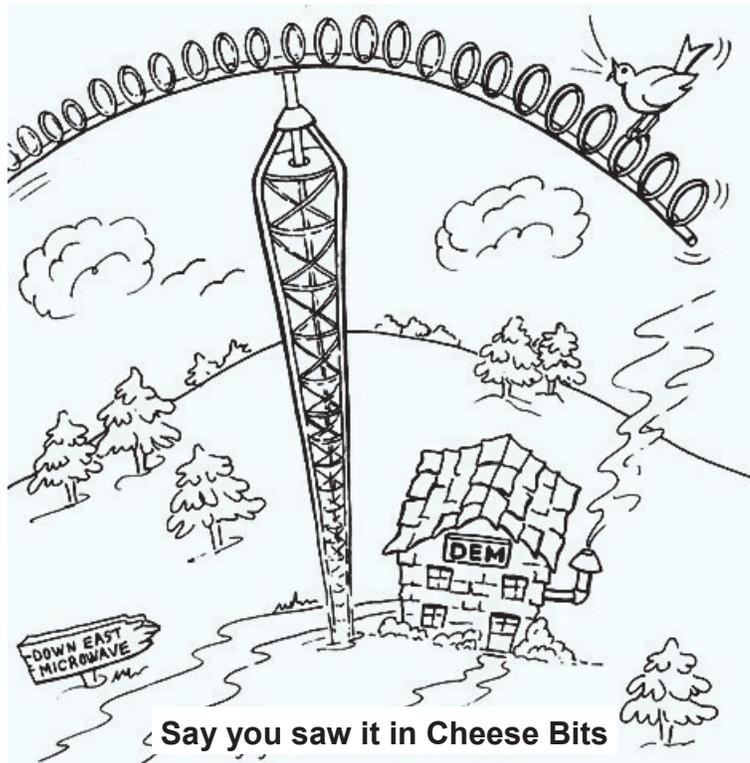
The Board of Directors at the December 13th (1973) meeting authorized the go-ahead for a 220 MHz Packrat Repeater project. A committee was appointed including W2AXU, WA3AXV, W3HKZ and chaired by W3CL. The site location for the repeater station is the QTH of Ron Whitsel, WA3AXV (now W3RJW), located in Churchville, PA. This is an ideal plateau (360 ft. alt.) located northeast of the Philadelphia line. Ron has started to accumulate information to file for a repeater license. Plans include the integration of our present 221.4 MHz AM intercom operation with the future frequency selection for the repeater in the 222 MHz - 225 MHz portion of the FM band. It is expected that we will shift to FM from our home base stations utilizing most of our present equipment. A solid-state FM modulator is being designed and will be mass produced on a club project basis.

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