Mt. AIRY V.H.F. RADIO CLUB, INC.

CHEESE BITS

W3CCX
CLUB MEMORIAL CALL

ARRL Affiliated Club

Volume LVIII | September 2017 | Number 9

PREZ SEZ:

September is here already! What happened to the summer?

August 13th was the Packrat Picnic at Michael's QTH. Weather reports midweek forced the decision to use the rain date. This did not dampen the enthusiasm as many Packrats attended on Sunday. There were Hot Dogs, Hamburgers and great selection of covered dishes, all this with plenty camaraderie and conversations. I was glad to see an increase of the number of XYLs attending this year.

If you find some time Sunday morning, September 10th, Gloucester County Amateur Radio Club is holding it's Hamfest in Mullica Hill. It is the NJ ARRL Convention site this year with multiple guest speakers.

Many Packrats will participate in the September VHF contest from High Knob. Others are encouraged to get on the air from home and have fun. Be sure to look for and work W2EA. Dates are September 9th and 10th. There is usually a lot of activity on 6M thru 10 GHz and a good chance to check out the station. Now is time to plan those tower and antenna fixes before the cold weather arrives.

The Packrat web site saw updates to the HK1TL web pages and the disposition of some of the remaining artifacts. This was due to lots of hard work by Elliott K3JJZ, Bill Olson K1DY, Al Katz K2UYH, Ron Whitsel W3RJW, Bert K3IUV and others.

But Packrats aren't only about past accomplishments. Joe Taylor K1JT continues to make great contributions in the field of digital communications with the latest versions of WSJT-X. With declining HF propagation conditions, JT65, JT9, and the new FT8 digital modes allow for contacts even when bands appear to be dead! If you haven't used it, give it a try!

Other Packrats are making noise too. Pete Kobak K0BAK, Rick Rosen K1DS and others have had articles in QST in recent months.

HAM radio continues to grow in many directions. It is a much larger and more diverse hobby than in the past. The old ways still are fun and work well but we need to embrace the new and continue to push the boundaries. Without new practitioners and new ways the hobby will become only history.

Last but not least you should be signed up for the 2017 October VHF Mid Atlantic Convention (October 6th 7th and 8th).
There is a special bonus seminar Friday this year on Station Automation led by Roger W3SZ with additional help from Phil K3TUF and Ed WA3DRC. Friday night is the Hospitality and Table top selling. Saturday is a full day of seminars followed by a Buffet Banquet. Sunday morning is an outdoor mini-fest. If you haven't registered yet do so soon on the Packrat web site.

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

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Pack Rat Web Site: http://www.packratvhf.com

SUBSCRIPTION/ADVERTISING MANAGER:
Bob Fischer, W2SJ 23 Morning Glory Circle, Mullica Hill, NJ 08062
(609) 440-2916 bobw2sj@gmail.com

EDITOR:
Lenny Wintfeld W2BVH 709 Lincoln Av., Cranford NJ 07016
(908)-272-0559 lennyw@comcast.net

CLUB TREASURER:
Dave Mascaro, W3KM 1603 Mink Road Ottsville, PA 18942
(215)-795-2648 w3km@verizon.net

TRUSTEE OF CLUB CALL - W3CCX
Mike Gullo WB2RVX
(609)-743-6643 MGullo3@comcast.net

PACKRAT 222 MHz REPEATER - W3CCX/R
222.98/224.58 MHz (PL 136.5) Hilltown, PA

OFFICERS 2017-2018
PRESIDENT KA3WXV, George Altemus ka3wxv@yahoo.com
VICE PRES: WA3DRC, Ed Finn edfinn11@gmail.com
CORR. SEC: WA3EHD Jim Antonacci jjantonacci@verizon.net
REC SEC: KB1JEY Michael Davis kb1jey@arrl.net
TREAS: W3KM Dave Mascaro w3km@verizon.net
DIRECTORS:
K3JJZ Elliott Weisman (2019) k3jjz@aol.com
K0BAK Pete Kobak (2019) rxr978-vhf@yahoo.com
KB3MTW Michelle London (2018) mal61@comcast.net
W3SZ Roger Rehr (2018) w3sz73@gmail.com
Honorary Director K3TUF Phil Theis phil@k3tuf.com

COMMITTEE CHAIRMEN
January Contest Bill K3EGE billk3ege@gmail.com
Bob W2SJ bobw2sj@gmail.com
June Contest: Phil K3TUF phil@k3tuf.com
VHF Conference: CoChairs
Rick K1DS rick1ds@hotmail.com
Guy WA3JZN wa3jzn@gmail.com
Awards Chairman Joe WA3SRU wa3sru@verizon.net
Quartermaster: Bert K3IUV bsoltoff@comcast.net
Membership Chairmen: Rick K1DS rick1ds@hotmail.com
Griff NE3I signalnaut@aol.com
Jim WA3EHD jjantonacci@verizon.net

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:

TIME	FREQUENCY	NET CONTROL
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
8:30 PM	224.58R MHz	W3GXB FN20jm Bob
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

What's the latest project? I found a mini powered speaker in the dollar store. Runs on two AA batteries.
I had no idea what use I might have for it but I couldn't resist a complete amplifier for only a dollar.
I told a friend about it (Bill K3ZMA) and he suggested it might make a good code practice oscillator!

Have some fun, learn more.

Build something

73, George KA3WXV

PACKRAT PICNIC 2017

This year the annual Packrat Picnic was once again hosted by Michael KB1JEY.

Sorry that I did not get a picture of the host <laugh> I was behind the camera for all the pictures. We had threatening reports of rain so the "Picnic Executive Committee" made the decision to switch to our rain date, Sunday August 13th. The count was 17 Packrats and 10 guests. No kids this year so the pool did not get any swimmers. Everyone appeared to get enough food, beverages, sun, and conversation.

Special thanks go to George KA3WXV, who acquired the beer and helped with the planning and set-up of the canopies. Guy WA3JZN stayed after everyone left to help me put my entertaining gear back into the shed and Florida Room. Thanks to Bruce WA3YUE who has lent his big canopy the last three years and helped me break it down and pack it up for the return journey to Collegeville. Thanks to George NE2U, the volunteer grill master, and to Joe KC2TN and Ted W2TAG, who brought the K2WB corn cooker from Southern NJ along with the corn.

Given all of the other parts of our busy lives, I am glad that 25-35 folks make time for this picnic. I am glad to continue this tradition, which honors our longtime host Al N3ITT and my late XYL, Carol, who loved to feed and entertain guests. They tell me that about 100 people use to attend the picnic when it was hosted in Fort Washington Park. If that many folks ever descended on my QTH, I have no idea of how I would handle it!!

73, Michael KB1JEY

Long shot view of the picnic set-up. Thanks to the loan of the WA3YUE canopy, all the guests and the food found some shade.

Diane Diamond (my guest), Marie Seibel, Joe WA3SRU, Sally Katz, Al K2UYH. Seated behind them are Beccie Loss and Jeanmarie KB3UWN .

Foreground: Doc W3GAD, Arlene Whitticar

Back Row: Jon W2MC, Abbie MacMillan, Bonnie Drexler, Drex W3ICC

Michelle KB3MTW, Guy WA3JZN, and Neil W2GTV

Joe KC2TN is preparing corn on the cob for the K2WB Corn Cooker and George NE2U volunteered to be the Grillmaster (thanks George !!!)

Bruce WA3YUE enjoying the food with his harmonic, Jeanmarie KB3UWN

Foreground: Doc W3GAD, Arlene Whitticar, Russ K2TXB, Barbara Pillsbury. Seated in background: Jon W2MC, Abbie MacMillan, Bonnie Drexler, Drex W3ICC

Tnx KB1JEY for Pix (and of course for hosting!!!)

222 & Up Distance Contest Comments

From Phil, K3TUF:
Formerly the UHF contest, this remains my favorite contest. In spite of the fact that I was only able to be on for 7 of the 24 hours, it is a fun event. There were some circumstances that kept me from operating on Saturday until late at night. One benefit of that was that I got to experience the 'fresh meat' effect and was very busy until very late (or should I say early in the morning). Conditions were nothing special, but I did enjoy a couple of 400 and 500 mile contacts on the lower two bands, and a couple of 300 mile contacts on the 902 bonus band. The Packrat chat page proved to be a valuable tool, as I was able to find and liaison with the Packrats that were on this contest. More Packrats should dig into it. It is really fun to gain more points for a 222 or 902 contact than a 432 or 1296 contact. Roger was on for a short time and I really enjoyed completing with him on 24GHz once again. Since I was on for only 7 hours, there were many contacts that I could have made just sitting there waiting for a contact. My score is 48,344 points with contacts on the following bands: 222 - 30, 432 - 31, 902 - 15, 1296 - 16, 2304 - 7, 3456 - 7, 5760 - 6, 24192 - 1 Yes, my 10g was not working. A surprise for sure. I just think this concept is going to sink in and get better and better. I will make sure my calendar is clear next year and will work this one to the bone. Lets get more 222, 902 and 5760 gear on the air.

From Bob, W2SJ:
I also had a great time in this contest. Conditions were poor after the previous week with super conditions on the micros. It's always this way; when the contest starts the good conditions disappear! This has always been my favorite contest. With the new scoring it was really hard to gauge how good or poorly I did. The distance scoring adds a new dimension and gives me the incentive to add 5.7 & 10 GHz back in to my station. The ARRL band factors were designed to promote activity on underutilized bands like 222, 903, and 5.7 GHz. This is a good idea to get more hams on those bands with more points for Pack Rats! I had 116 contacts for a score of 46,645 points with contacts on the following bands: 222 - 32, 432 - 31, 903 -18, 1296 - 22, 2304 - 8, & 3456 -5. Not too bad, but it just is not fair Phil...You beat me only working 7 hrs and I had to work 15hrs to even get close to your score :-)) Don't forget the September Contest is just around the corner for more fun!

From Bill AA2UK:
I had fun with the new UHF contest. I operated about 12 hours. 222 - 30Q's 432 - 41Q's for a total distance of 32,913.

From Dave K1RZ:
The 222 and up distance contest format was long awaited and worth the wait. I really enjoyed the score by distance process. The only thing that could have been changed would have been the contest weekend. If it had been a week earlier we would have had some phenomenal conditions with lots more operators on for a much longer duration, and we would have all had a lot more contacts. But, alas, that was not to be. Needless to say conditions in the Mid-Atlantic were abysmal. A storm front moved through Friday evening and swept away a weeks worth of really good, "August heat" type uhf-microwave conditions. Lessons learned. For myself, and by the admission of many other close associates, I know I for one have to go back to calling lots of cq's. The new assisted rules are good to assure that two randomly pointed antennas are pointed at each other. But the downside noted by several people is that there are not enough rf signals on the bands anymore to find contacts unless you have cell coverage or Internet / ON4KST. Unfortunately on some of the best mountaintops where the rovers go, often there is no cell coverage. Rovers have found in some cases where they could not call or text, and therefore had no Internet. They were then out of business with no qso's to show for their time, energy and gas money. I for one vow to go back to making an even split of cq'ing and texting/on4kst-ing. Thanks to everyone who got on, and particularly thanks to the rovers -w2rma/r, kd3pd/r, ve3cru/r, n9zl/r, kf2mr/r, nn3q/r and

...222 cont'd

wb2sih/r. So fun to have rovers show up in the next grid to see if you can work them again. See you all next year on first weekend in August for the 222 and up distance contest. Score - 150,844. Band - Q's: 222 - 51, 432 - 63, 903 - 30, 1.2-35, 2.3 - 21, 3.4 - 7,
5.7 - 3, 10G - 11.

From Tom KA3FQS:
I worked the 222 & Up Distance contest and really enjoyed it. The pace was a lot slower than many of the other contests so operators spent the time required to help people like me make the contacts and also chat a little. Speaking of chatting the chat room was a big help in finding people and coordinating contacts. Thanks Roger. I used the latest version of VHFLOG and outside of the contest name it worked flawlessly. Thanks Dave. Thanks to all of the ops that tolerated my poor CW skills. My score came out to be 11479 using the 6 bands that I have. Some work needs to be done to hear better on 1296 and to get more power on 2304 and 3456. The amplifiers are here but not wired up. Maybe September or hopefully by January.

From K1DS:
I had a good excuse. The road to hell is paved with good intentions. Despite having only a few hours open in my hectic schedule on Saturday afternoon, I planned to get the rover out and operate on three bands. Having sold off most all of my rover microwave gear, I still had my FT736R with 222MHz and 432MHz, and my TS2000X for 1296. I had all of my rover antennas, and I planned to make a run to FM29hx and then to FN20he to operate for about 90 minutes each. I even put my plans up on the website that K1RZ and W3SZ had engineered. Long before we knew the date of the contest weekend, we agreed to host a friend from out-of-town for dinner, limiting any air time on Saturday evening, and I had also booked a 3-day medical quality survey trip to Minneapolis, leaving on Sunday morning. So what happened? As Packrats who came to the board meeting at my QTH in July can attest, we were having the roads in our development blacktop refreshed. One of the additional things that they were doing was repairing any driveway damage caused by the winter plows. Since there were a few gouge lines on my driveway, they came and filled in the cracks and then recoated the driveway. But that's not quite the end of the story. The machine that they used to fill the cracks laid a sloppy pile of hot tar right in the middle of the driveway. The XYL complained bitterly about the mess they made—the repair and recovering looked worse that the original problem. We contacted the homeowners association (HOA) and they in turn contacted the company to come and see what could be done. The supervisor saw the issue and explained that they would re-heat the area of concern, then flatten and recoat it after that weekend. Time went by, the rains came; we thought they forgot about us. I re-contacted the HOA and the contractor said they would be there Friday to do the resurfacing. Yes, the Friday before the contest. They did a nice job and placed a barrier across the driveway, preventing any vehicles from moving in or out of the garage or the driveway. The rover van was trapped!

Always have a plan B. I used the TS2000X from the home QTH, paired with an IC-375, the 220MHz all-mode that I acquired last year. The log-periodic antenna in the attic, fixed to the northeast was the only antenna in play. Using SSB and CW, I was able to make the following QSOs:

Band	QSOs	Points	
222MHz	11		
432MHz	13		
1296MHz	5		
Totals	29	4192	Best distance was K1GX on 222 & 432 at 305Km

Despite the reduced power, limited antenna and operating time, I felt that I made a contribution to the club's activity and added my call to the number of hams who participated to resurrect this fun event.

From W2BVH:
Worked the contest for an aggregate of around 7 hours with a score of 16078. Band - Q's: 222 - 18, 432 - 22, 902 - 9, 1296 - 12, 2304 - 3. The Packrat chat page was very helpful; in fact I'd call it essential. (Thanks Roger!). Next time I'll try the Packrat Finder and ON4KST too. I was thrilled to hook up with 3 stations on 2304: K1TEO was 569, W2SJ was 519; very weak but easy to copy and WA3DRC was around 579. Shooting thru the trees (and leaves) on 2304 makes things very iffy. Glad to have the Q's!! Tnx to all the participants!! CUL.

TOWER MAINTENANCE AT W3GAD

8/2/2017 - Michael KB1JEY and George KA3WXV (El Presidente) arrived Sunday about 1 PM. George is a real glutton for punishment. He spent many hours on the tower removing the 6 meter beam for repair, replacing the loaner rotor with my spruced up Tail twister and helping with repairing the 6 meter antenna, all under the watchful eye of Michael. Beam is ready to go. We rebuilt the gamma match and a installed a new feed line and rotor loop, all are awaiting another weekend without mother nature acting up.

Ground coordinator

Getting ready to remove the rotator

Several weeks later (8/20/17): Well the antenna restoration is finally completed. Friday even bode well for the project. After a heavy downpour we had a long lasting and intense rainbow.

Saturday SPIDER MAN in training George (KA3WXV) and Michael (KB1JEY) arrived and after 4 hours of tower work and a hearty lunch we are pointed correctly and all the antennas are OK. I will be running a final scan on each and recording the results for reference.

Needless to say I am most grateful for George's willingness to spend all those hours on the tower to get all the repairs completed. Thanks too to Michael without whom we would not have had use of the necessary safe tower climbing equipment. One of my bonus checks will have to go into getting a harness and accessories for use here. Now to get ALL the bands up and running properly. The 6 meter transverter still seems to have issues. I hope September does not require using the near deaf YAESU FT857 for 6 meters.

A good sign for the day's work

Safety briefing before the climb

That is W3GAD on the roof, positioning the 6 meter beam for KA3WXV prior to the final raising to the mounting position on the mast.

KA3WXV on the way down

September VHF Contest with Packrats and South Jersey Mountain Toppers

Dear Fellow Pack Rats,

What are you doing the weekend of September 9th & 10th?

The South Jersey Mountain Toppers ARC consisting of several Pack Rats and SJRA members will once again trek to High Knob, a remote location in grid FN21KH in the Poconos, operating as W2EA for the September Contest. We will be at 2047 feet ASL on bands 50 MHz thru 10GHz with good antennas and power. With the help of Roger, W3SZ and his Aircraft Scatter program, we learned that we had an obstruction to the south/southwest that severely limited our ability to work many of you on the micros. Roger's program revealed that we needed our micro antennas on a 32 ft tower to work those directions. So we will be putting our micro antennas at 50 ft this year!

The W2EA operation is a club function and **all scores add to the Packrats score** for the club competition, just like the January contest. Please plan to spend some time working the club station on as many bands as possible! Just like we all support the June operation from Camelback mountain. We know that some of you may only be on for a short time, so we will be monitoring the Packrats **Members Only Chat Page** for any Packrats that want to work W2EA as well as the ON4KST chat page. If you are running Roger's PackRatFinder program our 6 & 2 meter frequencies will be available there in real time. We are generally on 50.133 and 144.185 + or - QRM. Give us a call there and we will run you up the bands! In addition, any other acceptable assistance methods can be used to alert us of your availability during the contest.

Those of you who come up to Camelback in June know it takes quite an effort to plan, set up, operate, and disassemble a mountain top station. Please help support the group going up to High Knob again. You did a great job tracking us down last year! Help us make the Club score this year an all time high for the September Contest in the ARRL club competition!

We look forward to working many of you!

Tnx es 73, Bob, W2SJ
& Bill, K3EGE, for the W2EA team

KOBAK Eclipse with Ham Radio

At almost 60, I finally saw a total solar eclipse. Others have written much more eloquently than I ever could, but the words “magic” and “magnificent” come to mind. The difference between 99% and 100% coverage is more than the difference between 1% and 99%! **For all the time and expense of just seeing a 2.5 minute eclipse event, it was worth it.**

XYL Gerry and I traveled to Santee South Carolina, having made hotel reservations in December … almost too late. Arriving Sunday and leaving Tuesday allowed us to miss the huge traffic on Monday. The 11 hour drive down was reasonable, with only Washingotn DC being painful on the way back. HamSCI (hamsci.org) organized an eclipse QSO party, which the ARRL also promoted. HamSCI also encouraged wideband recordings. Being within a couple miles of the eclipse centerline, I wanted to contribute to this effort. I set up a loop antenna in the hotel room to record the digital/ CW portion of the 17m band. The 17m band was chosen because I thought the contest would gather lots of data on 20m and below, but since the WARC bands weren’t included in the QSO party, it would be good to cover one of them too. My spare Flex 1500 took 10 hours of IQ recording, yielding almost 13Gb of data. This

recording was uploaded to HamSCI’s community on the Zenodo web site.

Our viewing location was a grassy strip between the hotel and the street, with the lift back of the minivan providing a little shade and a place to hold ice water. The well of the minivan also held my backpack radio station. I set up my hamstick dipole next to us, so I could view the eclipse with Gerry while participating in the QSO party. Unfortunately, a previously intermittent radio problem became a solid failure, so I could not make contacts … the radio is now in Washington State at the ICOM repair depot. At least I answered questions from passersby about what hams were doing on the eclipse day, promoting the hobby a bit as a scientific data gathering service.

6 Meter Fall Sprint Results

From K0BAK/R:
Operating Time: 2.5 hrs. 20 Q's, 13 Mults, Score = 260. Where was everybody? Remarkable lack of contacts. I was planning to stay out the whole 4 hours, but there just were not contacts out there. Activated 4 grids. (FN20, FN10, FM19, FM29). Contacted 6 unique grids. Blah.

From W2BVH:
Had company over and didn't get on until 9:30. I found Q's were few and far between, but I did work semi-rare local grids FN22 & FN23. Other than FN31 no New England heard or worked. Thanks to all participants! Maybe things will heat up as the weather cools (I hope so). Results 12 Q's, 8 Grids, 96 Pts 1 1/4 hrs on the air.

From K1DS:
Better than my experience. I started at 7PM and worked 10Qs in 4 grids by 7:45, and after putting W2SJ in the log, heard nothing except for N2NT continuing to call CQ. Of course my 100w into my G5RV dipole in the attic doesn't attract a lot of attention.

As a special part of the Mid-Atlantic States VHF Conference we will be auctioning 903 MHz filters. Register, come, bid, learn. Go to Packratvhf.com for all conference info and Registration

How to retire comfortably after serving for 5 years as Packrat President

Tnx K1DS for pic

Packrats in CQ Magazine this month:

Nice tribute to Joe K1JT and FT8, along with an article on FT8 on p74.

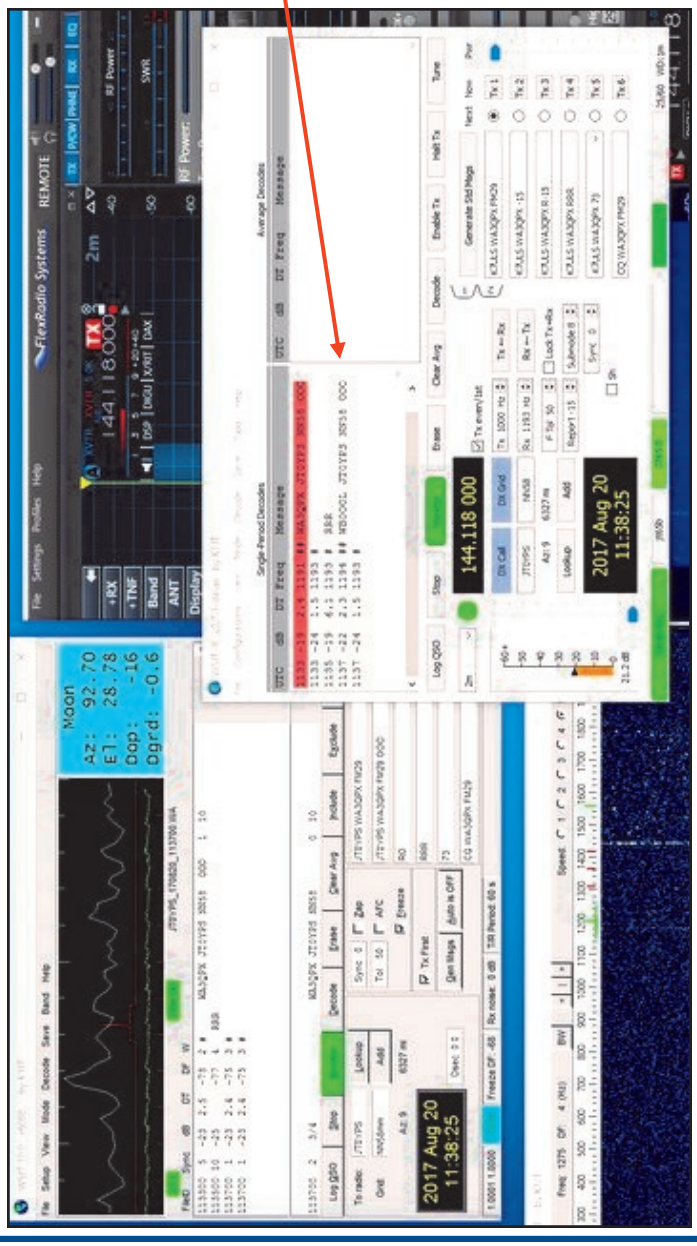
W3CMP operating the 4V1G station in Haiti while doing some of that antenna restoration work we hear about from him and Phil K3TUF. P.76

CONGRATS!

Tnx K1DS for heads up on these articles!

WA3QPX works JT0YPS (Mongolia) on 2M Aug 20th

CONGRATS Paul!!



W2KV 10 GHz (Portable Station) Progress; (Fixed Station) Trouble

(8/30/17) Got the portable rig set up on the deck in Ship Bottom NJ and heard the CCX beacon immediately, so the receiver is working better now. Some slow QSB but generally good copy. Set up a sked with N3RG for later this evening. Unfortunately the home (fixed) rig is fluking out even worse now with wobbly RX in addition to no TX.

Worked Ray with strong SSB signals both ways from the portable rig (Tried with K1RZ but nothing). Beacon and Ray now both much weaker so band is going down. I will listen to the beacon over the next few days to see how things change. I should be here until the middle of next week.

(8/31/17) Ray is 53 miles and was loud on SSB yesterday. The beacon was also strong and now today nada so far, so conditions seem changeable. When the fixed 10 G rig comes down off the tower it is getting a complete rebuild, N5AC synth, all solid state switching. This will also eliminate the negative power supply. I will put in a dc-dc voltage inverter for the fet gates. But it won't happen before the contest.
73, CUL, Dave

Lots of Archived Homebrew Articles

I periodically get questions about homebrew stuff from the old days.

If you can`t find it in the Cheese Bits articles:
http://www.packratvhf.com/Cheese%20Bits/cheesebits.html

Also:
http://www.packratvhf.com/techinal.htm

Look here also:
http://www.qsl.net/w3km/other.htm

73, Dave W3KM

WA2FGK Shack Plans

We tried to work JE2UFF on Saturday with no results but had a nice CW contact with KL6M. What a way to end better than 50 years of contacts on 432 MHz. The 8938 amp is now sold and will be picked up in a few days. We started construction on our next project which is 50 MHz EME. We will be using two vertical 7 element yagis spaced at 23 feet. A 4 inch horizontal tube will be laid on the elevator. Thank you everyone for thousands of 432 contacts over the years. We will continue to do EME on 144 - 1296 - 2304 and the new 50 MHz. Enjoy the rest of the summer.
--Herb

Several 70 cm HT's available for < $ 20

G3XBM has an opinion type article about inexpensive 70 cm HT's available from China. The article is in the August 30 issue of Amateur Radio dot com. Find the article at http://www.amateurradio.com/just-how-do-they-do-it/

To get an idea of pricing you can type "**BF-UV8D"** into your favorite search engine and there will be lots of choices you can make from there. For instance Banggood.com has them for $17.99

These will desense easily and become useless in high rf fields, but they're probably ok in more benign environments. And there are other product choices at $40-60 with better performance.

What does this mean to the top quality manufacturers? It's an open question that's worth thinking about.

Take a look, you decide.
--W2BVH

KOBAK ARDUINO STATION AUTOMATION SOFTWARE INFRASTRUCTURE

Introduction

I continue to work on the slowest station automation project ever. Having first bought some parts for an Arduino-driven VHF rover station IF band switch (also with support for HF amp band switching) near the end of 2015, the project has been taking a back seat to park activations and contest participation.
After testing the Arduino to receive and process band change messages directly from the serial CAT interface of my Flex 1500, as well as messages generated by DDUtil (a 3rd party software utility that processes CAT messages particularly from Flex radios), I thought it was safe to go forward and use the Arduino at the center of this long project.

Software Architecture

The next stage of the project was to write some software services to support real-time processing. As those who've worked on the Arduino know, the Arduino (unlike the Raspberry Pi and BeagleBone boards) does not support a full-blown operating system. The challenge and advantage of the Arduino is programming "close to the hardware", without the help and complexity of an operating system. Libraries callable from C++ may be loaded to help avoid coding at the machine level, but services useful in a real-time environment like asynchronous message processing and preemptive multitasking are not available.
I definitely wanted to stay at the C++ language level (which allows plain C as a subset), avoiding machine-level programming, and also wanted to take advantage of C++ objects when possible. However, without dynamic memory management, objects can only be created on the stack, or statically. After decades of OO programming in C++ and Java, this was difficult to get used to.
In order to encapsulate and prioritize the different real-time events that need to be handled, I thought the most important service to write would be a message processing service that supports multiple priority levels and timers. The use of message-oriented programming in the Arduino environment enables an architecture of multiple services that in effect cooperatively multitask. Each service processes a real-world or artificial event as quickly as possible, passing messages to other services as necessary. This design encourages state and processing roles to be distributed among the services reduce the complexity of individual services, enabling a higher quality implementation than would be possible if all state was universally available to a single service.

Implementation

A single large static object supports multiple doubly-linked lists with 2 bytes of payload. The structure starts with a single list from which list roots and list items are allocated, and to which structure members are returned when a list item is removed from a list. These doubly-linked lists are further specialized to support message queues, and multiple message queues support priority levels.
Services use a common sub-classed method interface so messages can be de-queued and "sent" to a service by calling the overridden method with the message. Messages are sent to a service via one of the priority queues by using the memory address of the service stored in a field of the primitive queue so that when the message is de-queued, the correct receiving service is called with the message.

One complication of the message queue implementation was supporting queue operations during an interrupt. If a queue operation was in progress in normal sequential processing and an interrupt occurred with a service routine that processed the interrupt with a queue operation, the result could be corruption of the queue structures. I downloaded a library that supports stacked interrupt disabling/enabling, and surrounded the key code of the queue implementation with an interrupt disabling block to assure interrupt

handling code cannot call the queue state changing logic. This also enables interrupt handling code to use message processing so that enqueing messages can be a part of interrupt handling logic.

Interrupts and Buzz Loops

By writing machine code, the Arduino can be set up to perform precise and flexible interrupts. For instance it will allow for real time clock timing and serial input and output interfaces. Luckily, both timers and serial ports have fairly simple requirements for station automation, such that standard library calls can be used … if done with proper attention to the rest of the architecture.

Incoming characters on serial ports, where real-time processing is not an issue, can be handled with built -in library calls to see if a character is available. In a system with real-time requirements, this is normally not acceptable because any call that could block, in this case waiting for an incoming character, would bring the entire system to a halt (except for other interrupts). By writing machine code, this can be handled with great flexibility; however I did not want to do this unless there is no alternative. Here, the message processing architecture I had designed paid off. I can detect when all services are inactive when there are no messages on queues. This allows logic to check whether a serial character is available only when no other work is being performed. Since characters arrive on slow serial ports much more slowly than other work can be performed on the CPU, this is sufficient to pick up characters without the slowdown of waiting for a character.

There are a small number of hardware timers available on the Arduino Mega 2560. Each one can be programmed for any timing requirement. But again, I wanted to avoid machine code. The standard library includes a simple call that returns the number of milliseconds since the Arduino booted up, which hides all the messy interrupt handling. Since my timing requirements need to wait for tens of milliseconds, the precision of this standard library call is sufficient in theory. However, there is a problem similar to the serial port calls, in having to potentially make many calls to know when one more millisecond has gone by. The solution was the same as for the serial ports … when queues are empty, the milliseconds library call may be made without slowing down running real-time code.

I wrote two types of timer APIs, based on my code knowing how many milliseconds have expired from an initial event, as described in the previous paragraph. In the first API, services can register themselves to receive a message each time the millisecond clock ticks; in this case the service itself must keep track of the time of the initial event and perform processing when enough time as expired. This technique is good for hiding state, but needs to process many messages. The second timing API can be called to send a message to a service when a certain number of milliseconds have expired. This simplifies the service, but makes it more difficult to account for situations when the timer is no longer needed. I wrote both types not knowing which one will be more natural for services to use.

Progress

It was fun to write these services as a transition from the software world I'm comfortable with to the hardware needed for station automation. I intend to continue working on the system, but also realize that mobile operating and other ham activities will be a distraction from this project, and that will continue to slow progress on this station automation project.

I'll keep you posted with progress report in Cheese Bits as the project evolves.

73, Pete K0BAK

On The Bands

By Jerome Byrd – K3GNC

Tropo Scatterings: The Perseids meteor shower has come and gone and so has a bygone era. I remember many years ago making schedules on 75 meters, working random, with the eastern stations calling first portion of a minute and the more western stations calling the second part. Voice was only a slightly more popular mode to high-speed cw. Meteor activity waned for several years before being revived in recent years by stations using digital modes. I estimate that ninety percent of the meteor qso's completed during this past Perseids meteor shower were completed using a digital mode. The current mode of choice for meteor work is MSK-144 from the latest WSJT-X suite. A few of the "regulars" made a ssb random contact or two on 144.200 and 205, and on 50 MHz ssb. As far as 50 MHz is concerned the rapid embracing of digital modes for tropo and e-skip is growing even faster than meteor scatter. The new WSJT-X mode "FT8" is getting more popular by the moment. Dozens of contacts are made each day on 50.313 MHz, while 50.125 is silent.

Some of us embrace the new digital modes and others of us dread it like a coming apocalypse. No matter whether your opinion is extreme or in the middle, those seeking to be competitive on 6 meters and to a much lesser extent 2 meters in the January 2018 VHF Contest, will almost certainly have to use a digital mode or two.

Digital modes enhance the range of stations, but the tried and true cw mode still never fails to amaze. I work one or two 400+ mile contacts each morning on cw as do several others. Gary - N1GC has to be the greatest over-achiever among the group, often working four or more 400 mile contacts each morning. He uses an old 16 element KLM antenna at 85 feet with 300 watts of power. Just as impressive is Jay – W1VD's consistent breaking of the so-called 500 mile glass ceiling each morning with Bob – K8TQK. Yes, Jay is on a 1000+ foot "hill" with good drop-off and K8TQK has a "big" station, but it is a 560 mile path! Jay has height and a Kilowatt, but his antenna is a single FO-12!

Nets and Scheds: 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 sched 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 sched, 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 – Chesapeake Net, W3BFC net control. All are welcomed. Sunday: 1030 local – 144.250, Sunday Morning Memorial Net, Bill N2FKF fn30br net control, All are welcomed; 2030 - - 432,150 – group sched, Wa2ltm, K1pxe, Wz1v, N2slo, Wa2onk, Wb2sih, K3gnc and others. All are welcomed.

The Luna-tic Fringe: If you are a new station on EME you will be pursued with a passion by the Big Gun stations. If your station is larger than a single, small Yagi, almost everyone else will be also be pursuing you. The EME community takes great pride in helping someone with or working someone for their first eme contact. If you have an FO12 type antenna and a couple hundred of watts, you can work 2 meters EME. Several have worked EME with even less. Once you have worked a few contacts, either you will be hooked and escalate your stations capability or you will move on to the next "bucket-list" item. I only "get on the moon" the days which promise good conditions, because of my small setup. I can't succeed in conditions requiring maximum brute force. Whatever money you allocate for an EME setup **put most of it in the antenna** system and feedline. Dual polarity systems is the way to go if possible. Hearing well is the goal, as one, at least theoretically, can always run more power. You cannot work them if you cannot hear them. 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!

73 K3GNC

3 cm EME with a Single Yagi

(From “432 and Above EME News”)

by VK7MO

Rex sent the following article about his reception of the DL0SHF 10 GHz EME beacon with a yagi.

G3WDG and I have shown that it is possible to receive the DL0SHF 10 GHz beacon on a 20 dBi horn; this led to thinking that it might be possible to receive it on a single yagi. VK5DJ’s program for DL6WU yagi design shows that it is potentially possible to achieve a gain of 20 dBi with a 40 cm (16 inch) long yagi at 10 GHz. However, given that 10 GHz is well outside the normal design parameters for a DL6WU yagi and the likelihood of construction errors, I settled on a 80 cm (31 inch) 72 el yagi. This yagi should have 2.4 dB in reserve for errors. The yagi was constructed on a 1.5x15 mm rectangular fiber glass batten (as used on sailing boats) so as to avoid the need for boom corrections. The elements were 1 mm brass and around 10 mm long. The driven element is a split dipole combined with a half wave sleeve choke.

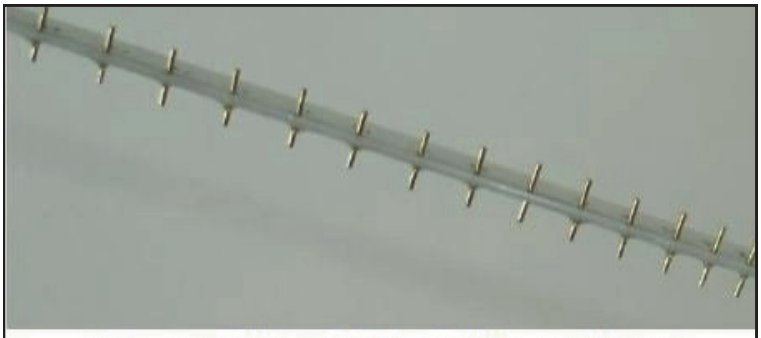
While a horn of 20 or 25 dBi is much easier to construct this "just for fun project" shows that it is possible to receive the DL0SHF beacon via EME on a single yagi. It is possible to build a DL6WU yagi at 10 GHz using the VK5DJ program that is within a dB or so of the calculated gain. Ref: [1] . http://www.vk5dj.com/yagi.html.

VK7MO’s 3 cm yagi vert pol & used Guys to keep the boom in line

Sub-millimeter Receiver In Hawaii

Ham radio is great! Through ham contacts I was able to visit some of the radio telescopes on top of Mauna Kea at almost 13,500 feet while in Hawaii for a conference. There are more than a dozen telescopes at the top of Mauna Kea. The most interesting one that I visited was the James Clerk Maxwell Telescope (JCMT). It operated at submillimeter-wave up to 1.3 THz. Its primary mirror is 15 m across and is the largest single-dish telescope that operates in submillimeter wavelengths. It is used to study the solar system, interstellar dust and gas, and distant galaxies. I have attached a picture of myself at the telescope. 73, Al - K2UYH

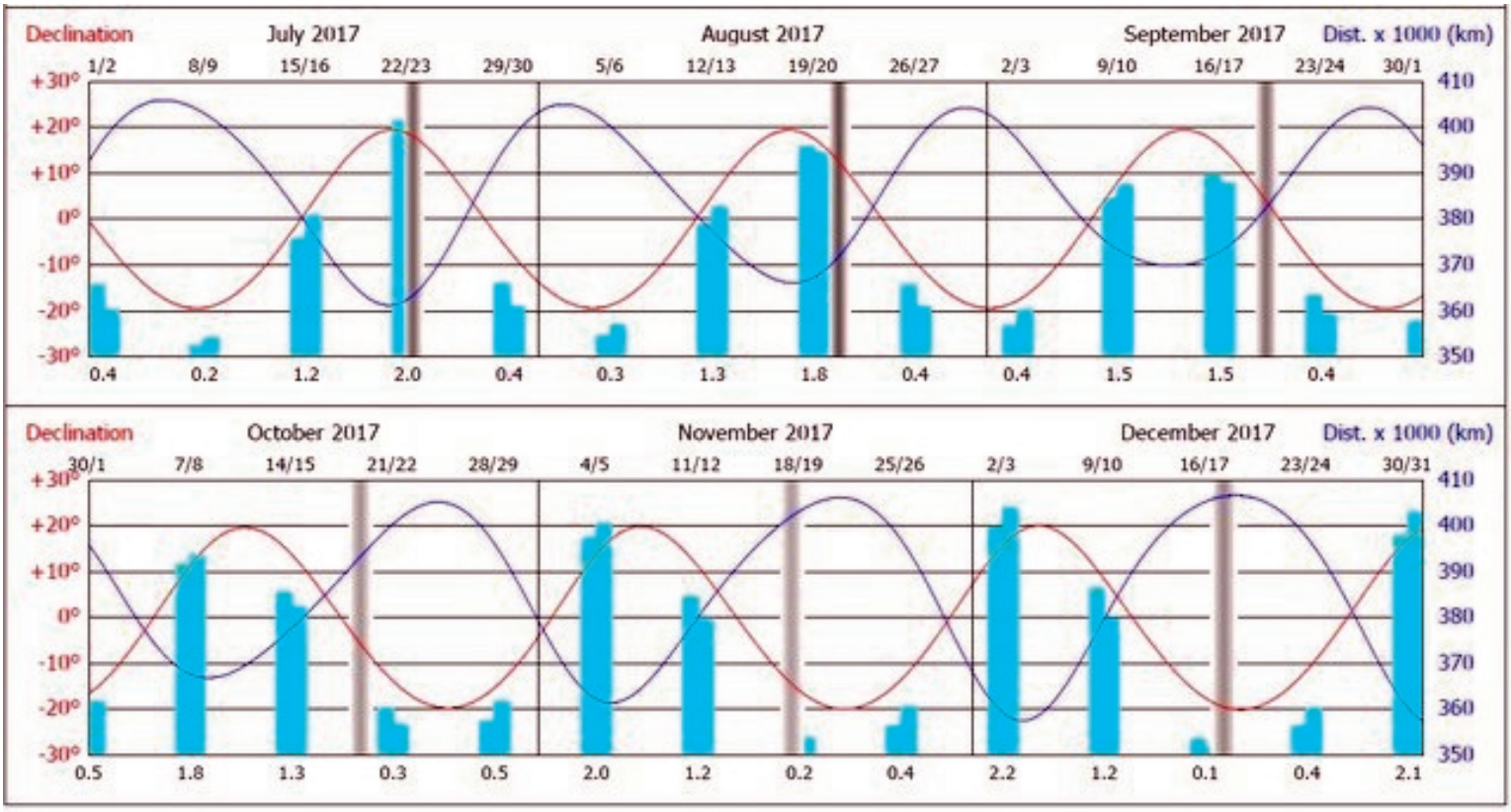
...3 cm cont’d



1 mm elements on 1.5x15 mm fibre-glass boom

Moon Ephemeris for Remainder of 2017 by Franck F5SE

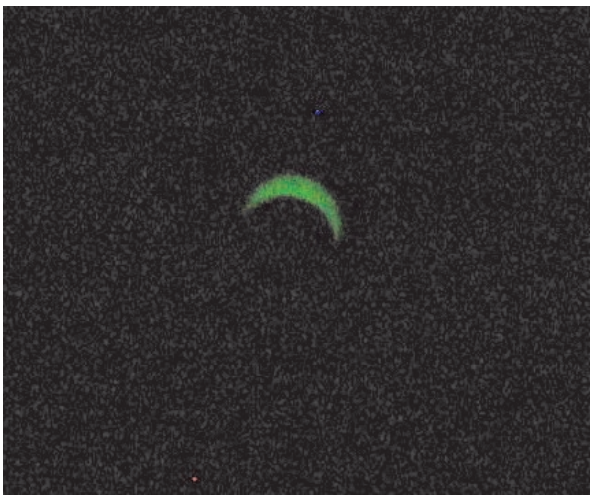
Sent to Cheese Bits by W3SZ / K2UYH



- Vertical blue bars show the overall "quality" of each week-end for EME. The higher the bar, the "better" the week-end.
- Figures below bars show expected signal improvement, in dB, referred to apogee path loss, for Sundays at 00:00 UTC.
- Full scale span: 2.4 dB. Scale step: 0.4 dB per division. 0 dB level = Band path loss figure at apogee, as quoted below:
- 144 MHz: 252.8 dB, 432 MHz: 262.3 dB, 1296 MHz: 271.8 dB, 2.3 GHz: 276.9 dB, 3.5 GHz: 280.4 dB, 5.7 GHz: 284.8 dB,
- 10.4 GHz: 289.9 dB, 24 GHz: 297.2 dB, 47 GHz: 303.0 dB. Data computed for an apogee around 406500 km.
- To get the week-end path loss on a given band, subtract to band apogee figure the value printed under the week-end bar.
- The shading pattern below shows how close the Sun is to the Moon, at any time - the darker, the closer.
- Shading is only visible around New Moon date, appearing as a vertical gray bar.

WA3QPX back yard 8/7/17

Solar Eclipse from my front stoop at around 2:45PM EDT. Taken with a Canon “point and shoot” camera and stacked #10 & #11 welding filters.



HAM RADIO FRIENDS

UR INVITED

CRABS

SATURDAY, SEPTEMBER 30

12:00 p.m. - Dusk

Rain or Shine

(in barn/picnic tables also outside)

Crabs, hamburgers, and sodas provided

Paul & Judy Domanski's Home

987 Dexter Corner Road, Townsend, DE

Bring: A covered dish
Your favorite beverage to share
A chair

Wear: Your callsign - badge, hat

RSVP Not Necessary

Directions: South on Rt. 1. As you come over the Rt. 1 bridge, near the bottom, take the right exit (to take old Rt. 13) (before toll). Follow south on Rt. 13. Approx. 5 mi. south of Odessa, turn right on Rt. 71, (at Valero gas station). Go to next road, Ratledge Road, and turn left. Go to the end of Ratledge Road and turn left on Dexter Corner Rd. We are approx. 1/4 mile on left—split rail fence, tall trees, pond in front. Look for the aerials. Paul's cell **302-388-2679**

73 WA3QPX Paul

SAVE THE DATE

MID-ATLANTIC STATES VHF CONFERENCE

Friday October 6--Sunday, October 8, 2017

*****PAPERS AND PRESENTATIONS SOLICITED NOW*****

Register on-line at www.packratvhf.com

Conference Early Bird** Registration only $40
Saturday Evening Early Bird Banquet $40
Contact Rick1ds@hotmail.com or www.packratvhf.com

Friday Afternoon seminar "Station Automation"
Friday evening hospitality and table-top selling
Saturday conference presentations & auctions
Registration includes pizza lunch and snacks
Rohde & Schwarz Technical Testing Room
Saturday evening Banquet buffet dinner with door prizes*
Sunday morning free outdoor mini-flea market

TENTATIVE SPEAKERS AND TOPICS:

Roger Rehr	W3SZ	Station Automation Seminar (+K3TUF & WA3DRC)
Phil Theis	K3TUF	Automation for VHF/UHF/uW Contesting
Jerome Byrd	K3GNC	"Apartmentyranous Station Rex"
Steve Gross	N4PZ	Yagis: Tales, Tricks and Truths
Russ Lamm	NN3Q	Building and Operating the NN3Q Rover+K3WGR)
Gary Hitchner	WA2OMY	The GPS Project and Packrat Beacon Update
Joe Jesson	W2JEJ	Dongle Developments
Al Katz	K2UYH	Getting started on microwave EME (+K1DS)
Joe Horanzy	AA3JH	Talking on 440 THz- Easy LASER! (+AC2CL)
Michael Davis	KB1JEY	Enhancing your Test Bench Capabilities
Ray Golley	N3RG	Practical Solutions for Station Automation
Steve Simons	W1SMS	RF Tower Safety and Construction
Pete Kobak	K0BAK	Rover Adventures and Automation
George Holubec	NE2U	Chasing the Propagation
ADD YOUR NAME,	CALL and	TOPIC HERE!

DETAILS AND UPDATES: www.packratvhf.com

** Early Bird price good through Sept 20.

The Wayback Machine
In CHEESE BITS, 50 Years Ago

Nibbles from September 1967. Vol. X Nr. 7
de Bert, K3IUV
(*author's comments in italics*)

- "**Our Prez Sez"**. Dave, W3LHF (later W3ZD) commented on 3 items. 1) A reminder that the summer was almost over, and it was a good time to get your outdoor rotor and antenna projects completed. 2) A summary of the picnic (more later). 3) The new editor of the Cheese Bits will be El, K3JJZ (our auctioneer). 4) The upcoming September QSO party will be a good time to sharpen your operating skills and check out your station. (*It seems like the same items are true 50 years later*!)
- **New Members**. 1 new member was voted in. WA3PAA, Howard Nevitt. An application was submitted by Elwood, W3PST.
- **ARRL Bulletin. Nr 128, 8/67**. In early 1966, the FCC had proposed a Part 17 amendment which would tighten controls on tower height. If applied to amateurs, it would place a difficult burden on the applicant. This bulletin reported that through the efforts of the ARRL and others, that section of the proposal had been dropped. (*Another good reason to be an ARRL member*!)
- **Newspaper Article**. From the Mishawaka, IN "The Bison", a gasoline fume explosion injured the driver who was the chief photographer for WNDU-TV. He reported that he had just activated the car's two-way radio, when there was a blast in the trunk which blew the rear panel into the car and caused a flash fire inside. He then reported that "he had noticed the smell of gasoline in the car for several weeks"! (*Apparently, having brains is not a pre-requisite to being a TV photographer*!).
- **TVI report**. The Philadelphia FCC "Engineer-in-Charge" received a call from someone reporting "severe interference to table and car radios in the area. The engineer told him to walk around the neighborhood with a portable radio to find the worst location for the interference. A short walk identified the culprit as a defective thermostat on a fish tank heater, at a neighbor's home. Case closed.
- **Two Meter Activity Report**. W3LHF, Dave (later W3ZD) revived this popular feature. He reported that he had upgraded his station to 500 watts, and a 32-el quad antenna. However, he went on to say that you could still have a good time on the air using a gooney box (*the Gonset rig of the time*) and a halo. So "don't be discouraged if you don't have a big signal. Get on and enjoy some fine contacts". Dave reported nightly contacts with Maine and New Hampshire, using CW. And, a few with Maine, on AM. He also listed a few nightly schedules with Pittsburgh and Akron, OH.
- **Packrats Picnic Report**. The 12th annual picnic was held at the Fort Washington State Park on August 13th. Helen (Mother Rat) provided a detailed

synopsis of the day. Despite the on and off showers, 370 people attended (Michael, take note.). The included list of prize donors (24) included several that "are not there anymore". For nostalgia (*see how many you remember*), among them were: A.G, Radio Parts; Barry Electronics; Heath Company; PSFS; RESCO; Tasty Baking Co (*OK, someone uses the name, but they don't taste the same*!); Almo Radio; Whippany Labs; Gimbels; and F.W.Woolworth (*although there is still one in Puerto Vallarta*!). At least one member from 27 Radio clubs was present at the Picnic (*a list of the clubs was included*). Children's games were conducted despite the showers.

- **Technical Article.** "Getting on 6 meter SSB the easy way", by K3GAS, Doc Cutler. Doc reported that he bought a Heath HW32A, a 14 mc (MHz) ssb rig to use as an exciter. He built a mixer described by W6RET, in QST, August 1965. He needed to reduce the output power of the HW32A, so he just dropped the plate voltage and changed the grid bias on the output tube (*remember those*?) and then fed the output to the mixer. He used the oscillator signal from the exciter to replace the oscillator in his converter, and "now he had perfect transceiver operation".
- **Humor?** An article penned by WA3BIV, Carl, was titled "Velocity Diversity". Better suited to an April issue, reading it will give you some good laughs. (*Find it in the archived issue on-line at W3CCX.com)*.
- **ARRL Headquarters Visit**. The bus to ARRL headquarters was scheduled to leave on September 16, at 7:00 am, from the N.E Airport, where parking was available. Total cost was $12.50 p/p, which includes dinner. *(Note to the Board. Would it be a good idea to repeat the trip*?**)**
- **Swap Shoppe**. A long list of items for sale by Mrs. Wilson (*probably from an SK, but I don't recall who*) included: Gonset Communicator II (2-mtr); Hallicrafters S-38 and S-53; Hammarlund HQ-129x; Superior Tube Tester (*the make, not the performance*); and several other ham "goodies". Also available was a Harvey Wells TBS-50D (*known as The Bandmaster*) from W3ZRR, Ray (*the editor of the column*).

Miscellany. *Postage back to 5c this month (went from 5 to 4 sheets 8-1/2" x 14). 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 www.W3CCX.COM and read the full issue scanned by K3IUV, and posted there by our Webmaster, Ron, W3RJW).*

***thirty*, de K3IUV**

Events

For inclusion, please direct event notices to the editor.

"MWL Microwave Luncheon, a semiformal biweekly lunch meeting of hams in the FN10 - Elizabethtown, PA area. We meet at 11:00 at Hoss's Restaurant on Route 743 about 1 mile towards Etown. Those interested in microwave communications and wanting to attend please contact John Jaminet, w3hms@aol.com for details."

September VHF QSO Party - Contest - September 9-11, 2017. See http://www.arrl.org/september-vhf for additional details.

EME 2.3 GHz and up - Contest - September 9-10, 2017. See http://www.arrl.org/eme-contest for additional details.

Gloucester County ARC & NJ State Convention - Hamvest / Convention - Gloucester County 4-H Fairgrounds, Mullica Hill, NJ. See w2mmd.org fordetails.

10 GHz and Up – Second Round - Contest - September 16-17, 2017. See http://www.arrl.org/10-ghz-up for additional info.

Fall Sprints 2M - Contest - September 18, 2017, 7-11 pm local. See http://svhfs.org/wp/ for details

Fall Sprints 222 MHz - Contest - September 26, 2017, 7-11 pm local. See http://svhfs.org/wp/ for details.

Fall Sprints 432MHz - Contest - October 4, 2017, 7-11 pm local. See http://svhfs.org/wp/ for details

Fall Sprints 902 MHz & up- Contest - October 7, 2017, 8am-2 pm local. See http://svhfs.org/wp/ for details

EME 6M to 1296 MHz (round 1) - Contest - October 7-8, 2017. See http://www.arrl.org/10-ghz-up for details

Microwave Update 2017

On Line Registration is now open for both the conference and for hotel rooms. Sign up today!

To register, simply go to www.microwaveupdate.org and click on the Registration tab. Registration price includes two days of presentations, conference proceedings book and CD, two lunches, a banquet dinner and drawings for door prizes. We will also have vendor exhibits, a test lab, indoor and outdoor swap meets and a surplus tour.

We have a reserved block of 50 discounted hotel rooms at the conference hotel. Room price includes a breakfast buffet, WiFi and parking, and SJC (San Jose, CA) airport shuttle when available. For more info and to register for a room, please go to the Hotel tab. The deadline for discounts is Oct 12th, but the rooms may run out before then... it's first come, first served.

MUD 2017 is October 26-29 in Santa Clara, California

Microwave Update 2017 will be held on October 26-29, 2017 in Santa Clara, California (Silicon Valley / San Francisco Bay Area). The MUD conference is dedicated to microwave equipment design, construction, and operation. It is focused on, but not limited to, amateur radio on the microwave bands. Since 1985, this annual conference, targeted at microwave radio enthusiasts, generally has attendance of about 100 Amateur Radio Operators from around the world.

For more information on the conference, please check out www.microwaveupdate.org
or email questions to mud2017.info@gmail.com

Please forward this announcement to any friends who may be interested. Thanks and see you at MUD 2017!

ARRL Headquarters Trip Planned

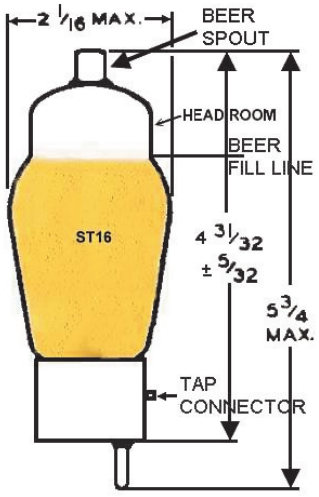
My general-interest club, Pottstown Area ARC, is organizing a bus trip to ARRL headquarters and W1AW.

Date: Sept. 11, 2017 Fee: $55

More info:
http://www.paarc.net/events/bus-trip-to-arrl-2017

If you've ever driven through NYC and southern CT, you know letting someone else drive is a good idea.

-- Pete K0BAK

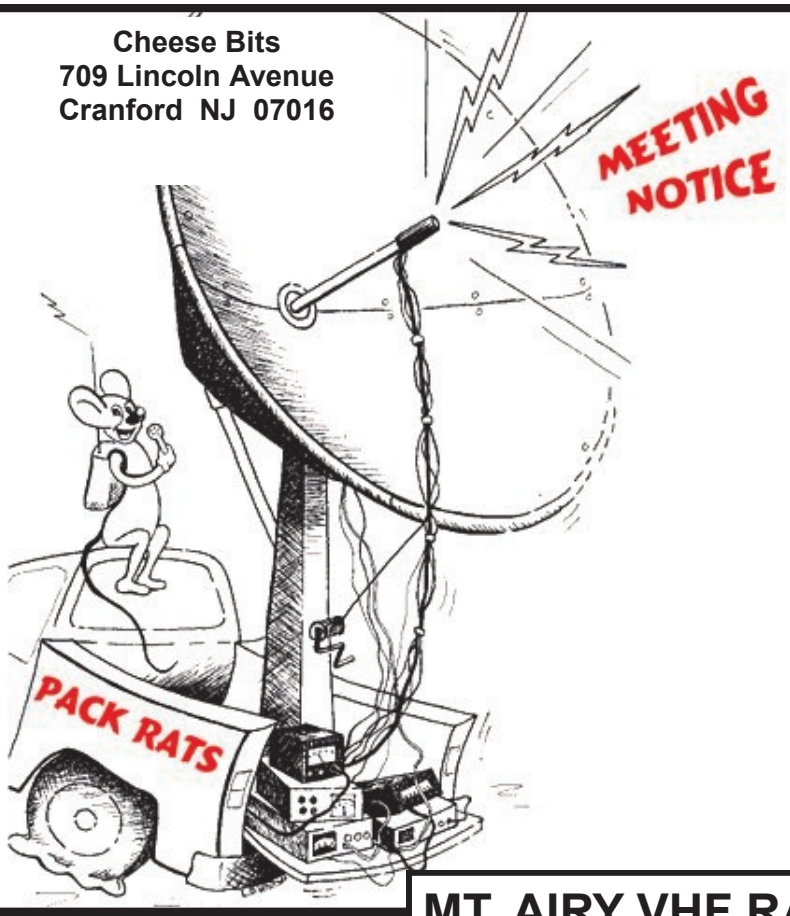


807 Beam Power Beer Container

Datasheet and complete specifications are available at http://www.qsl.net/kb7rgg/rdio/807/807specs.html

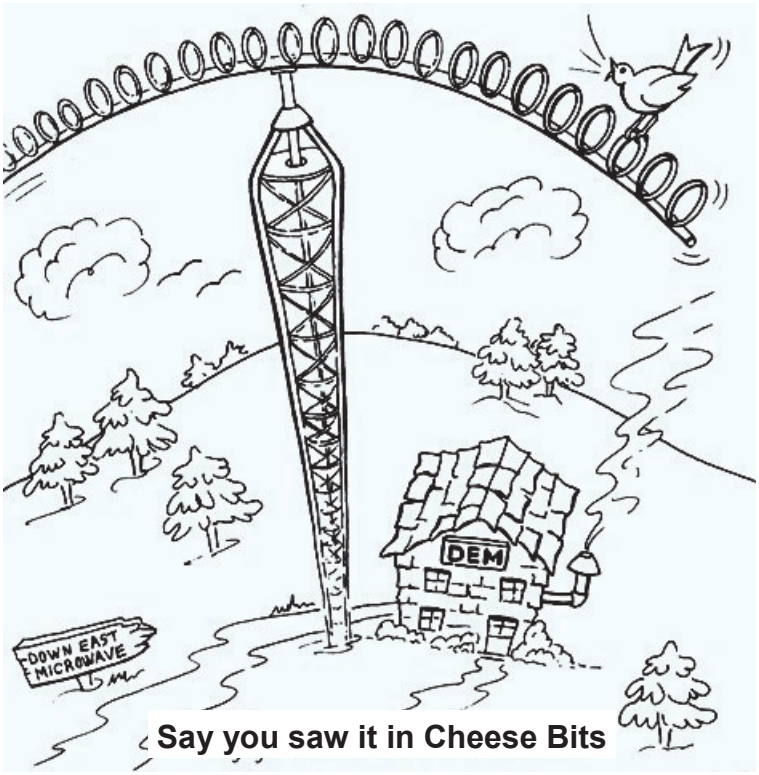
Author notes that "exceeding ratings can cause malt down."

Cheese Bits
709 Lincoln Avenue
Cranford NJ 07016



TO:

MT. AIRY VHF RADIO CLUB, INC.



Say you saw it in Cheese Bits