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

CHEESE BITS

ARRL Affiliated Club

W3CCX
CLUB MEMORIAL CALL

Volume LII **May 2011** **Number 5**

PREZ SEZ:

Time has a way of not waiting for us to make up our minds. Sometimes putting this little missive together requires a little extra time.

Since time got this all started: it is Springtime and we are coming into the prime time for antenna work and other outside projects. In addition to needing to climb the tower and examine all the connections at the rotor for broken connections and the invasion of water I need to give serious thought to a second structure. This will move the collection of vertical antennas off the main tower. All this is mixed in with full time work and other necessary projects required when you keep critters bigger than a dog at home.

Time also marches briskly along for the PACKRATS and one of the big time savers (and **SCORE BUILDERS**) for the PACKRATS is the now popular **CONTEST CLOCK**.

The Contest Clock was conceived about 1960 to help PACKRATS work PACKRATS in a mega effort to beat SJRA in the January VHF Contest. Over the years it has leaked out of the "Super Secret War Chest" into the general contest community and now many clubs use the clock to know when to look for PACKRTAS during the contest on specific bands at specific times. This is a terrific idea as it helps our efforts to remain a winning performer in the January VHF Contest.

Over the years, operating styles have changed, antennas have been improved as well as transverters and preamps. Most everyone now "runs the bands" when making microwave contacts rather than trying to make random contacts above 432 MHz. With this thought in mind it was suggested during the post January follow-up meeting, that perhaps the Contest Clock needs to be brought up to date to better reflect the current operating style.

During the May meeting we are planning to review some of the ideas and ask you all for your input – This is your club and we are going to be using what ever evolves from these discussions to update the clock. Since this could be a rather emotional discussion, I have cleverly scheduled a week of vacation at a remote site in New Hampshire and I will leave the Past President K1DS to catch all those flying eggs and tomatoes. Hi Hi.

After the meeting a small group will review all your input and hopefully we can generate a **revised CONTEST CLOCK** incorporating your ideas and get it into your hands for a test flight during the June VHF Contest.

Meantime the TROPO, E-Skip and Meteors are keeping many busy along with construction projects for the add a band

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PACKRAT BEACONS - W3CCX/B
FM29jw Philadelphia, PA
50.080 144.284 222.064 432.286 903.072 1296.245 MHz
2304.043 3456.207 5763.196 10,368.062 MHz (as of 1/08)

MONDAY NIGHT NETS

TIME	FREQUENCY	NET CONTROL
7:30 PM	50.145 MHz	K3EOD FM29ll
8:00 PM	144.150 MHz	N3ITT FN20kl
8:30 PM	222.125 MHz	K3TUF FN10we
8:30 PM	224.58R MHz	W3GXB FN20jm
9:00 PM	432.110 MHz	WA3EHD FN20kd
9:30 PM	1296.100 MHz	K3TUF FN10we
10:00 PM	903.125 MHz	W2SJ FM29LW

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

projects that have helped PACKRATS improve their contesting scores.

I will be adding more power on 50 MHz and 2.3 GHz before September. The only challenge here is the "local zoning officer" (XYL) in the discussion on the 2nd tower. I know some have difficulty just getting permission to put up new antennas let alone a tower. Well I am sure a solution will be worked out.

Keep your eyes peeled for the official date for the **PACKRATS FAMILY PICNIC** in August at the QTH of N3ITT in Ottsville, PA and the dig through your collected ham radio treasures for goodies for the **WHITE ELEPHANT SALE** at WA2OMY in July.

LISTEN FOR THE WEAK ONES !

73, de W3GAD

Editors Column

Greetings Packrats!

One of the few privileges of being editor of Cheese Bits, is being able to indulge in a few sentences of a personal nature every once in awhile. I'd like to thank the members for their good wishes after my recent encounter with the surgeon. It has been a painful, uncomfortable and trying six weeks so far and, though I'm feeling **much** better, there's more healing to go.

Besides the relief from knowing I have a reasonable chance of being rid of cancer, the last few weeks allowed me to engage in a bit of fruitful springtime Es / TE activity on 6 meters, as well as a few hours working on the MMDS 2304 transverter!

Things continue to return to normal, as I return to work, probably as early as Monday.

Thanks for your support. .

73, Lenny W2BVH

Meteor Scatter: How Much Antenna is Too Much?

By Joe Taylor, K1JT

Can your antenna be too big, or have too much gain? In some circumstances the answer is a definite "Yes."

High gain means narrow beamwidth. Even supposing that a sharp beam can be directed just as desired, you may sometimes want your transmitter to illuminate a larger range of directions, and to receive signals with reasonable gain over a wider range. Such situations can exist even for point-to-point communication — for example, when station A wants to work station B, at a known location some 800 – 1200 km away, on a VHF band using meteor scatter.

The **most probable** path geometries for random meteor scatter are offset by angles of about 8° – 16° either side of the great circle path. **Smaller offsets** apply to the longest paths, 2200 – 2400 km, while **paths under 1000 km** have optimum offsets near the high end of the range. The largest number of meteor-scatter reflections will occur when Stations A and B use antenna beamwidths that overlap throughout most of the potentially useful scattering volume. **This implies beamwidths at least twice the offset angle**: around 32° for 800 km paths, or 16° for the longest feasible paths. Of course, antennas with higher gain and narrower beamwidth may yield stronger signals, when they produce any at all; but for efficient completion of their desired contact, the operators at A and B may be interested in getting ***more frequent*** meteor reflections, rather than *stronger* ones.

A Yagi antenna with 30° beamwidth has boom length of about 3 wavelengths and gain 13 dBd. Three wavelengths at 50 MHz is nearly 60 ft, so few if any 6-meter antennas are "too large" for effective meteor-scatter use. On this band, the rule of thumb must be "bigger is better." At 144 MHz, however, Yagis of 5 wavelengths and even more are

practical. Their beamwidths are significantly less than 30°, so according to the above arguments they will be sub-optimal for making meteor-scatter contacts at moderate distances.

Out to about 1600 km, an optimized 10–12 element Yagi (length 1.8 – 2.5 λ, or 12 – 17 ft) is probably close to optimum. Takeoff angles for meteor scatter are always less than about 15°, so a vertical stack of two such Yagis (producing the same beamwidth as a single antenna in azimuth, but half the width in elevation) would be even better. Horizontal stacking of a pair, or a 2 × 2 box of four such Yagis, should work well beyond about 1600 km, but will be sub-optimal at shorter distances.

I can confirm that real-world meteor scatter experience confirms the theoretical picture outlined above. Between 2002 and 2006 my main 2-meter antenna was a 2 × 2 array of 9-element Yagis on 14.5 ft booms, stacking distance 10 × 10 ft, up about 80 ft. Calculated beamwidths of this array were 19° in both azimuth and elevation. For most meteor-scatter work on 2 meters, it was a great antenna; however, I noticed that on paths less than about 1500 km, a single 11-element yagi at 32 ft height was about as good, and sometimes even better. In 2007 I erected my present EME array: a 2 × 2 array of 14-element Yagis on 34.5 ft booms, stacking distance 15 × 15 ft, up 70 ft. Its beamwidth is about 12° in each coordinate. It makes a superb EME antenna, but except for the very longest paths it is truly "**too big**" for the most efficient completion of meteor-scatter contacts. I may need to work out a way to use only two of the long Yagis, when doing meteor scatter.

Ham Radio URL of the Month

This month we present a video describing the Rockwell/Collins Turbo-Encabulator. Originally developed in the 1940's by GE, it was evidently licensed and refined by Rockwell in the 1970's. These devices are rare and seldom are available on the surplus market. If one becomes available at reasonable prices it could be adapted for powering ham radio equipment. See http://video.google.com/videoplay?docid=5125780462773187994# for the Rockwell promotional video. See http://www.prc68.com/I/DRTE.shtml for a more detailed written description. A very nice Wikipedia article can be found at http://en.wikipedia.org/wiki/Turboencabulator.

These URLS were meant for inclusion in last month's Cheese Bits but we simply ran out of room in the April issue.

ENJOY! — Lenny W2BVH

A Ride to Reading

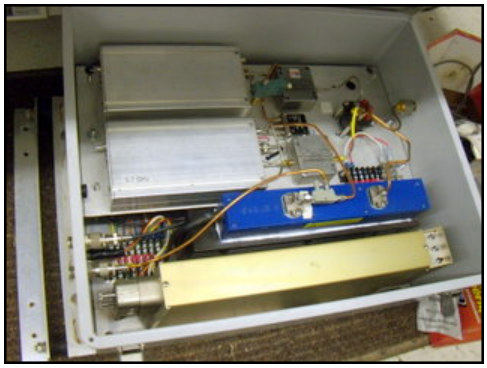
By Rick K1DS

Roger Rehr W3SZ and I share a few things in common. We are both on bands through 24GHz, we are both Packrats, and we both have Worthington trailers for our EME dishes. There the comparison stops. My station is in my rover van, his is in a spacious mountain-top building. I use an FT736R and a TS2000x with a few solid state bricks. His VHF station is all SDR with a dedicated SDR and computer for each band. My first impression, gazing at the four large flat screens that surround the operating position was that this resembled a NASA Control Center.

Outside there are motorized 106' crank-up towers. One for his 4 yagi 2m EME array and the other supports his terrestrial antennas from 6m through 24GHz. The microwave transverters are remotely mounted close to the loop yagis and dishes in weatherproof housings. There are bundles of control lines and coaxial cables up to the antennas. It is very clear that considerable time and effort was placed into the planning and construction of this installation.

My trip to Roger's shack was primarily to see his trailer and dish installation and the W2DRZ tracking controller for dish positioning. It looked simple enough, with a USB line out from the computer to the single board which is connected to a series of outboard relays that control up-down and left-right. A pair of cables goes to sensors for azimuth and elevation. Roger also had a pair of high and low level signal converters to enable the control lines to the rotor to span a significant distance. A modest power supply completed the installation.

The 9’ solid prime focus dish is really massive when you are close to it, and the mount itself appears to be very heavy and sturdy. The mount is an azimuth over elevation set-up, which adds a bit of complexity to its control and operation, but Roger has plans for modification in the future to change to elevation over azimuth. The mount includes a shortened section of Rohn 25 on a hinged base with a 5” diameter mounting post welded to modified rotor plates that are bolted to the tower. The tower tilts up and down with a hand winch mounted on an extension on the trailer tongue, very similar to mine. I took a video of the operation of its smooth movement and computer control.



The feed is being prepared and it has a waveguide transition to a Chaparral feed to be mounted once the dish is out of the garage. The RF amplifier and power supply are contained in a large weather-proof box with both 5GHz and 10GHz amplifiers. These were obtained from N3FTI when he downsized his rover station. As we understand, the TWT is capable of at least 40W output.

This radio station is atop a nice mountain, and although there are many trees, the raised towers easily keep the antennas above the canopy and have a clear view in all directions. The trailer and dish will find a nice spot to maximize moon acquisition time. I’m sure that W3SZ will be popular among the other 10GHz EME operators this coming spring.

Here are some links to web pages describing the homebrew software and hardware that make it all work .

The critical piece of work is the Remote Multi-SDR Controller [OS X] and associated hardware [W3SZ design and construction]:
http://www.nitehawk.com/w3sz/osxhpsdrserver.htm

Automatic Bandswitching is accomplished by the PackRats/N3FTI Logging Interface [by N3FTI]:
http://www.nitehawk.com/w3sz/hardware.htm

Transmit while band-switching and vice versa are prevented by the Band-switch/Transmit LockOut Device [W3SZ design and construction]:
http://www.nitehawk.com/w3sz/hardware.htm

Keeping transmit power levels within appropriate ranges and keeping receive noise floor constant across bands is accomplished by the Automatic Band-Dependent IF Rx/Tx Attenuator [W3 design and construction; uses N3FTI Logging Interface codes to set band]:
http://www.nitehawk.com/w3sz/autoattenuator.htm

Photo Highlights from the April Meeting

Featuring a Special Birthday Celebration for Bob Fox, Packrat Awards and a Presentation by ARRL Lab Manager Ed Hare

The Wayback Machine

Gleaned from the pages of Cheese Bits, April, 1961 (Vol. IV Nr. 2)

de K3IUV

(*author's comments in italics*)

- The cover page celebrates the 5th anniversary of the founding of the Packrats (May 15, 1956). Another one of Helen's famous short Poems. "Goody, Goody, We are five, In spite of the cats*, We're still alive". * (*The cats reference is to The Mahanoy Valley Brass Pounders League Cat Farm, which was in the area Frankie and Helen were from*). Next followed a copy of the 1956 Organization Meeting Minutes, *included here for general interest (and education)*:

On the evening of May 15, 1956 a group of Hams met at the QTH of Oscar Jacoby, W3FSC, for the purpose of organizing a V.H.F Club. After serious discussion and the views of each ham present taken into consideration (*just like today!*), the following principles were adopted.

⇒ Membership shall be by invitation only, and a limit is to be set.

⇒ To qualify for membership, a Ham must be active on the V.H.F bands, 2 meters and up. (*just like today*) (*What happened to six? Who knows the answer?)*

⇒ The purpose of the club shall be to promote interest in V.H.F. activity, and the improvement of existing equipment *(Just like today*).

⇒ To help one another, and join in any club sponsored event 100% (*Just like today, but note that percentage*).

⇒ The club shall meet once a month (*yep*).

⇒ The club frequency shall be 144.2 MC, and club members will be provided with crystals (*who knew from a VFO then*).

⇒ W3IBH (*Charlie*) appointed President, and W3SAO (*Frankie*) Secretary.

⇒ CHARTER MEMBERS AS OF MAY 15, 1956:W3CL, W3FSC, W3IBH, W3SAO, W3CPT, W3HWV, W3ZEY, W3OHH, W3HYO, and W3RZU

- Helen notes that "at this writing, the 11 charter members have grown to 90, plus 3 student members"

- MEET YOUR BROTHER RAT. The "first" in an expected series of articles about our members appeared in this issue. The selected member was Jules, K3MSV. *Synopsis :* Science Teacher in Philly schools, 2 daughters, M.A. in Education. Also runs summer day camp for kids, which features ham radio as one of the activities. Uses a Harvey Wells receiver, home brew transmitter on 6, and a Gonset II for 2. (*Might not be a bad idea to restart this article idea, to provide familiarity with the new club members*).

- Frankie reminds members to be familiar with the Club Constitution, citing several paragraphs for home study this month.

- Ladies Night. Lengthy report on the Ladies night, held at the Southwark A.C...105 Hams, XYLs and friends attended. Ladies of course got favors. The Roast Beef dinner was excellent. Joe Slotnick (W3HYJ) received an award for top score in the country, in

the January contest. The evening included entertainment in the form of a dancer who performed in "Black Light", followed by the Jay Brothers. Telegrams (*remember them?*) were received from Stan, K3IPM and Al, K3AUH who were unable to attend.

- Announcement that "the club has decided to operate portable for the June contest. Site not yet picked. Those interested should contact the Contest Chairman, Bert, K3IUV. We need tents and cots, all other equipment is available". (*Was I the 1st June Chairman?*).
- Announcement: MARS abandoning the use of AM on HF and VHF nets, in favor of SSB (*basically this era saw the demise of AM*).
- Helen still looking for Green Stamps!
- Club looking for a replacement "volunteer" to teach code class on the air. (*Might be another good idea to reactivate. I learned my code through on-the-air sessions with Harry, W3CL*).
- A light "scolding" of those members that check "in and out" on the nets.
- SMEL A. RHAT's comments included praise for the Ladies night affair, a reminder to mark calendars for the August picnic, and a reminder about club elections coming up. 6-meter activity has dropped off but is compensated for by an increase in 220 activity. In fact, "it is now possible to hold several QSO's per evening" on 220 (*Wow!*). Recent Aurora openings provided Maine to North Carolina contacts on 6, and several "8s" on 2 meters. He concludes with an admonition to "keep your rig warmed up for your share of new states". (*Still a good idea.*)
- Frankie reminds members about attending the picnic on August 13th to be held in Ft. Washington State Park. Call-in transmitters to be operated by W3GXB, Bob, on 6 meters, and K3IUV, Bert on 2-meters.
- W3KKN's report on 220 activity notes that W2AXU (Jack) solved his rotator problem. It was the cable (*haven't we all had that problem?*). He also notes that W3FEY in Lancaster holds nightly 220 schedules with K2EGA in Syracuse, on 220.7
- Three new members voted in. K3IPM, Stan (*formerly a "student member"*), K3IUZ (John Hannes), and W2UZN/3 (Jim Throop).
- April Home-Brew meeting report. (*No prizes mentioned.*).
- Notation that "12 members are mobile, and 3 others are using Teletype".
- Condensed equipment summary as follows: Lee (W2KFC) displayed a 3-band rig covering 6, 2, and 220. Russ (W3ZEY) spoke on 2-meter converters using a 416B or 417A (*used to be the pinnacle of equipment.*). Ed (W3HKZ showed a transmitter and panadapter made from surplus hardware, and costing no more than $16.
- Numerous "one-liner" quips (*a good Scrabble word)* about members ham and social activities helped to lighten the pages of this month's Cheese Bits.

73, Bert

Events

For inclusion, please direct event notices to the editor.

50 MHz Sprint - Spring Sprints - May 14, 2011 2300Z - 0300Z May 15 th.

Dayton Hamvention Convention /Hamfest - May 20-22, 2011 One of the largest ham events in the US. See http://www.hamvention.org/ for details.

June VHF QSO Party - Contest Jun 11-13, 2011 - **Second major club contest activity of 2011**. Please participate. Volunteers still needed for Camelback operations on all 4 days (Fri loadup and setup, Sat-Sun operation, Mon teardown). If you can't make it to Camelback, please plan to operate with your own equipment and get/give out points to everyone and especially your fellow 'Rats. See **http:// www.arrl.org/june-vhf-qso-party** for additional details

Valley Forge Hamfest and Computer Fair Hamfest - July 17, 2011. See http:// www.marc-radio.org for details

CQ WW VHF Contest - Jul 16-17, 2011. See **www.cqww-vhf**.com/ **CQVHF**ContestRules**2011**.pdf for details

August UHF Contest - Aug 6-7, 2011. See http://www.arrl.org/august-uhf for details

10 GHz and Up Contest (Round 1) - Contest Aug 20-21, 2011. See http://www.arrl.org/10-ghz-up for details

10 GHz and Up Contest (Round 2) Contest Sept 17-18, 2011. Details to follow.

International EME Competition (2.3 GHz +) - Contest Sept 24-25, 2011. Details to follow.

Microwave Update 2011 - Conference October 13 -16, 2011. Crowne Plaza Hotel, Enfield CT. Rooms $99. Sponsored by N.E.W.S. Group. This is the location where the Eastern VHF/UHF Conference has been held for the past 10 years. Additional info to follow or email n2liv@arrl.net and w1ghz@arrl.net for details.

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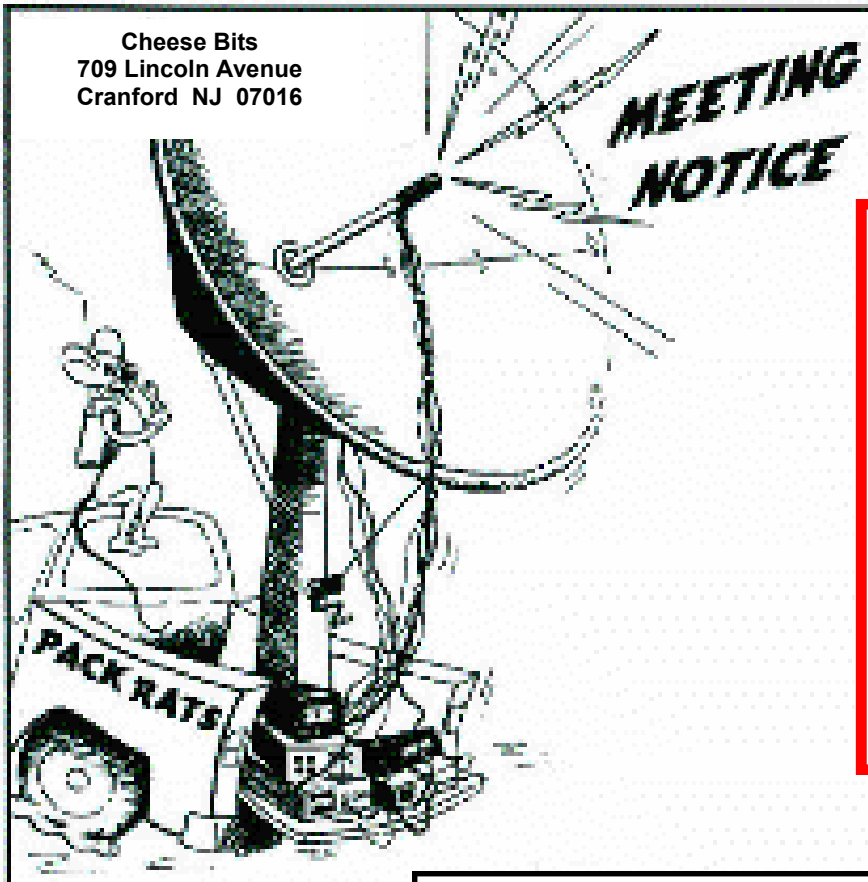

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