

Tailgating



No, it wasn't about aggressively driving behind someone else. Nor was it about having a party from the back of one's car in a parking lot—though the latter description is close. What it was, was the AARC August outdoor meeting and tailgate swap/flea market.

The meeting was informal. There was no roll call or meeting minutes taken. Instead, the Club met in the Red Cross parking lot and sold stuff to each other. Mostly small stuff...electronic components, equipment boxes, maybe an antenna or radio...what was one ham's junk was another ham's future junk.

So no major deals were made, and there was no noticeable effect upon the economy. Basically, it was hams looking over old stuff other hams were selling while talking about the items (and other subjects) and enjoying the nice weather.

Toward the end of the evening, the meeting turned slightly formal—at least long enough to hold the raffle (see page 5). After that, the parking lot meeting was adjourned and a post meeting meeting was held at Perkins restaurant on 108th and L Streets by K1AUD, KBØKJV, KCØSVZ, KDØMMG, KØCTU, NØCALL, NØTRK, NØUP, and WBØGBI. Note that this was similar to—but not the same as—the Saturday Night Coffee meeting held a week later (see page 10).

Bill KCØSVZ

Heathkit Making Comeback

Heathkit Company, Inc. announced in mid August that they're getting back into the kit business. Hams in various Internet groups have wondered if the company will be coming out with a new amateur kit line, but so far the only products they've announced are a Garage Parking Assistant (GPA-100) and an upcoming Wireless Swimming Pool Monitor. They are, however, asking for suggestions for other kits. For details, see <http://www.heathkit.com/>.

Ham Hum

Volume LXI, Issue 9

September 2011

(Go Green. Switch to electronic delivery of the Ham Hum.)

Remembering 9/11



This is the tenth year since the September 11 terrorist attacks on the World Trade Center and the Pentagon. It's a characteristic of any major disaster to remember in detail where you were and what you were doing when you first heard of it. If you're old enough, you probably remember in where you were on November 22, 1963 when President Kennedy was assassinated—even though that was nearly 50 years ago. This is also true for 9/11; you'll not likely forget that day: The weather conditions, the tension in people around you, the strangely quiet skies.

Even though these are bad memories, it is nevertheless good that we keep them—not only to remember those who have fallen, but to help in some small way to keep history from repeating itself. For these reasons, you are invited to share your memories of that day at the upcoming AARC meeting this Friday, September 9th.

Many other amateur radio clubs are also honoring the memories of those lost on September 11th. The following are some selections from the ARRL Special Events site (<http://www.arrl.org/news/special-event-stations-mark-tenth-anniversary-of-9-11>) and other places on the web that you may be interested in:

The Pentagon Amateur Radio Club, K4AF, will be on the air September 10-11 to honor all those lost on September 11, 2001. Special remembrance will be accorded to the 184 people who lost their lives at the Pentagon and on board American Airlines Flight 77. Times and frequencies will be posted at their web site, <http://www.k4af.org/>.

The Blair Amateur Radio Society, W3PN, will be operating N3U/FLT93 from September 8-15 in memory of United Flight 93 that crashed near Shanksville, Pennsylvania. For a QSL card, send a SASE to Blair Amateur Radio Society, W3PN, 112 E Wopsononock Ave, Altoona, PA 16601. More information is available at <http://www.qrz.com/db/W3PN>.

(Remembering 9/11 continued on page 8)

HAM HUM is the official newsletter of the AK-SAR-BEN Amateur Radio Club, Inc. in Omaha, Nebraska. It is printed monthly and is distributed to members of the club, local disaster officials, local electronics outlets, and editors of other ham radio newsletters.

Articles about activities of members are solicited. The subject matter must be of general interest to radio amateurs and be understandable to a significant portion of the membership. No payment will be made to contributors and submissions will be subject to the usual editorial review. Articles containing statements that could be construed as libel or slander will not be accepted. No guarantee can be made that an accepted article will be published by a certain date. Send your contributions to Ham Hum, P.O. Box 24551, Omaha, NE 68124-0551 or email hamhum@aksarbenarc.org. Please contact the editor for permission to reprint anything appearing in the Ham Hum.

Club Officers & Board Members

President	Mary Joseph	NØTRK	402-492-9156	n0trk@arrl.net
Vice President	Bill McCollum	KEØXQ	402-690-7965	ke0xq@cox.net
2011-2012 Board (Secretary)	Bill True	WA9ASD	402-426-2813	williamtrue@aol.com
2011-2012 Board (Treasurer)	Marvin Taylor	AEØEG	402-556-3668	AEØEG@arrl.net
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2011	Claudia Peterson	K1AUD	402-593-1950	kc0sqx@arrl.net
Immediate Past President	John Gebuhr	WBØCMC	402-932-3443	wb0cmc@cox.net

Club Committees

Courtesy Committee	Bill McCollum	KEØXQ	402-690-7965	ke0xq@cox.net
Education	Mary Joseph	NØTRK	402-492-9156	n0trk@arrl.net
Field Day	Claudia Peterson	K1AUD	402-593-1950	kc0sqx@arrl.net
Membership	Mary Joseph	NØTRK	402-492-9156	n0trk@arrl.net
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Control Operator	Mary Joseph	NØTRK	402-492-9156	n0trk@arrl.net
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Other Contacts

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ARRL Midwest Vice-Director	Rod Blocksone	KØDAS		
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Exams/Vol. Council	Brian Zdan	KMØY	402-553-2610	bzdan@novia.net
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Official Observer Coordinator	Bill McCollum	KEØXQ		ke0xq@cox.net

September Meeting

The next meeting of the AARC will be on Friday, September 9th at 7:00 PM. The location is the Heartland Chapter House of the American Red Cross at 81st and Spring (near 81st and Center). The subject will be 9/11 memories.

AARC on the Web

Club Web Site: <http://www.aksarbenarc.org/>

Facebook: <https://www.facebook.com/aksarbenarc>

Yahoo! Groups: <http://groups.yahoo.com/group/AKSARBENtalk/>

Ham Radio on the Web

Practical Amateur Radio Podcast by Jerry G. Taylor, KDØBIK. Interesting information for beginners and old timers alike. For people with iTunes compatible equipment/software, go to:

<http://itunes.apple.com/us/podcast/practical-amateur-radio-podcast/id280274099?ls=1>
(alternate: <http://tinyurl.com/3txyj23>)

You can also listen to the talks at the following URL with most standard browsers:

<http://www.myamateurradio.com/>

Ham Radio Podclass by Michael Dell, N7LMJ and John Martin, KF8KK. A *podclass* is Dell and Martin's description for a podcast that teaches amateur radio. Available for iTunes at:

<http://itunes.apple.com/us/podcast/ham-radio-podclass/id83112453?ls=1>
(alternate: <http://tinyurl.com/4xqsnau>)

For standard browsers: <http://hamradioclass.org/>

QRZ.com describes the amazing collection of radios in the ham shack of George Ulm, W9EVT, on Washington Island, Wisconsin. Pictures and text are available at:

<http://forums.qrz.com/showthread.php?311312-Washington-Island-s-Ham-Radio-Treasure>
(alternate: <http://tinyurl.com/3b8556d>)

Denny, KØLGI

Correction to July Issue

In the article "Ham Radio Invades Pop-Culture Convention" (*Ham Hum*, July, 2011) the last paragraph on page 11 failed to mention Joe KØNEB, who greatly helped the presentation by donating the use of his hand-cranked radio, a low power FM transmitter, and a QRP rig. Our apologies to Joe.

AARC Treasurer's Report 9/3/2011

Account	Balances
Main checking	\$423.13
Repeater checking	\$535.18
Savings	\$5,377.47
CD life members	\$8,246.15
CD life members*	\$8,055.14
Repeater CD	\$3,007.99
Total	\$25,645.06

*Separate account.

Known bills to be paid in September: Publications \$173.49

Marvin AEØEG, Treasurer AARC

Market To Market Relay Volunteers Needed

The 4th annual Market To Market Relay will be held on October 1st. This is a fund-raising long distance running relay race from Omaha's Old Market to Lincoln's Haymarket. Due to flooding in many of the areas the race went through before, the route this year will start from Memorial Park in Omaha but still end in the Haymarket in Lincoln.

There are 20 relay points along the way. Amateur radio support is needed at each relay point. The relay points are between 3 and 5 miles apart. The 78-mile course is divided into legs of 3.5 to 5.5 miles. Each team selects a runner for three or four legs of the course.

Omaha area hams will cover the first 11 to 12 relay points. The Lincoln Amateur Radio club should take over from there and see the runners safely into the Haymarket area in downtown Lincoln.

Volunteers will be needed throughout the morning with various start times. The earliest volunteers will be needed about 5:30 AM and all runners should be past our coverage area by 2:00 PM. The early volunteers generally cover two or more of the exchange points over the course of the race. Mobiles and handhelds will be needed.

Racers come from around the country and around the world. Sign up at:

<http://tinyurl.com/market2market2011>

The Market To Market Relay has given more than \$17,000 to support local Nebraska non-profit and community organizations including but not limited to the Nebraska Trails Foundation, Arbor Day Foundation, Bellevue Kiwanis Club, Omaha Running Club, and Lincoln YMCA. The race attracts participants from around the country.

Mary NØTRK

Saturday Night Coffee

On August 20, 2011, members of the Ak-Sar-Ben Amateur Radio Club met for coffee and food at Perkins restaurant on the corner of 108th and L Streets in Omaha. Present were Pat KØCTU, Dick KBØKJV, Claudia K1AUD, Bill KCØSVZ, and Mary NØTRK. Christina NØRIS, arrived somewhat later.

While eating, members talked about a wide range of topics. Ham radio and related subjects were high on the list. This included OMMRS/ARES, K1AUD's first QSO via satellite link, and the W5KUB web broadcast of the hamfest in Huntsville, Alabama over the August 20-21 weekend. NØRIS, who was one of the moderators, told us of some of the activities and people who were there.

Other subjects included recent storm damage, budget cuts, the Missouri River flood, tales of birds teaching themselves how to break out of escape-proof cages, and discussions of what politicians should be paid and where they should be housed.

The Saturday Night Coffee get-together takes place on the third Saturday of the month, normally one week after the regular AARC club meeting. The next meeting is planned for September 17th from 6 PM to 8 PM—though the latter time is not an absolute—discussions usually carry on to well past 10 o'clock. Feel free to stop by, everything is highly informal and both the food and company are good.

Bill KCØSVZ



Prez Sez

Football is on television and the river is receding; fall must be around the corner.

There are lots of things still going on. The nominating committee will be meeting soon, please consider volunteering to serve as an officer or director for the club. It doesn't take a lot of time and is really a rewarding activity.

I have recently re-created the Property Committee. This committee will be responsible for creating an inventory of all club-owned equipment. This group will also make recommendations on the acquisition and disposition of donations of equipment. I am looking for volunteers to be on this committee and will be making my decision before the next board meeting. I am also proposing that this position be added to the by-laws as a standing committee. The club has a large amount of assets and there needs to be consistency in knowing what we have and where it is.

At the last meeting I formed the Trailer Committee to determine the needs and wants of the club as we replace the old Antenna committee. They have met and will be presenting their proposal at the October meeting. This is an item that the club has needed for many years and I am excited to see it finally moving towards a completion.

Hope to see you all at the meeting!

73, Mary NØTRK, President AARC

Mail From Susan Lockwood

Thank you for mentioning my husband as a Silent Key in the August 2011 *Ham Hum*. Bob was still a ham radio enthusiast until the day he died. I often suggested he get more involved, and I know he would have liked that but it seemed that there were always things that kept him from it. He elmered me so that I could get my dad's call (KØIAC) and we had plans for further elmering. He had so many stories and fond memories of his time in AK-SAR-BEN Radio Club. Thank you for remembering him.

Susan Lockwood KØIAC

CROP Hunger Walk Volunteers Needed

CROP Hunger Walks to fight hunger will be held on Sunday, October 9th. The Ak-Sar-Ben Amateur Radio Club has helped with this event for years providing communications to keep the walkers on the route and the water stops stocked. Volunteers are needed during the afternoon hours. Either handhelds or mobiles may be used along the route. Contact Pat KØCTU to volunteer. For more information, email cropwalk@aksarbenarc.org.

Address Change?

If you've changed your mailing address, or would prefer to receive the Ham Hum via email, please contact Mary NØTRK (Membership) or Bill KCØSVZ (Publications) with your new information.



Veep Speaks

I apologize for not being at the August meeting. I had a dinner to attend with the other examiners at the DMV. My job is finished until April. I have been under the weather since the 16th with an intestinal bug. Fortunately, I am on the road to recovery.

I understand that attendance was very sparse at the August meeting. I will serve out my term as Vice President, but will not seek another term or another office, or a club appointment for that matter. There are plenty of members who could step up and volunteer, but always have some sort of excuse not to.

I have not lined up a program for the September meeting, but I thought we could talk about where we were on September 11, 2001.

See you at the meeting.

73, Bill KE0XQ, Vice President AARC

You may be a ham radio operator if: You have told your child, "One day, all this will be yours," and he or she did not respond at all.

It's Back to School Time...for Ham Radio, too!

By Dan Romanchik, KB6NU

As I write this, it's about 85 degrees, and I'm sitting on the patio of a cottage overlooking Elk Lake in northern Michigan. This idyllic spot is about as far away from school as you can get. And yet, in less than a month, kids will be back in school, and if kids are going to be back in school, why not ham radio operators?

The fall is a good time to begin teaching a new group of Technicians. I favor the "Tech in a Day" or "Ham Cram" type of class. This type of class focuses on teaching students the answers to questions on the test rather than the material itself.

There's a lot of controversy about this, and many decry this method of teaching, but I think the best way to learn about ham radio is by actually doing it, and you can't do if you don't have a license. Besides, how much more instruction will students actually get in a more traditional eight-week or ten-week course, maybe 16 hours? Will those 16 hours make that much of a difference?

For the sake of argument, let's say that you've decided to offer a one-day Tech class. Now what? Well, the first thing you have to do is to find a place to teach it. Possible sites include your local public library, a township hall, a community college, perhaps even your church.

Now that you have the place, you need to find some students. Your local emergency-management group would be a good place to start. Also, make sure a notice gets published in your amateur radio club's newsletter. Chances are most of the subscribers already have licenses, but they may have friends or relatives who would be interested. Also, make sure the class gets listed in the upcoming events section of local newspapers or magazines.

(Back to School continued on page 5)

Contest Calendar

September 2011

QRP Fox Hunt	0100Z-0230Z, Sep 9
NCCC Sprint Ladder	0230Z-0300Z, Sep 9
PODXS 070 Club Jay Hudak Memorial 80m Sprint	2000 local, Sep 9 to 0200 local, Sep 10
Kulikovo Polye Contest	0000Z-2359Z, Sep 10
WAE DX Contest, SSB	0000Z, Sep 10 to 2359Z, Sep 11
Arkansas QSO Party	1300Z, Sep 10 to 0100Z, Sep 11
ARRL September VHF QSO Party	1800Z, Sep 10 to 0300Z, Sep 12
ARCI VHF Contest	1800Z, Sep 10 to 0300Z, Sep 12
SKCC Weekend Sprint	0000Z-2400Z, Sep 11
North American Sprint, CW	0000Z-0400Z, Sep 11
Swiss HTC QRP Sprint	1300Z-1900Z, Sep 11
NAQCC-EU Monthly Sprint	1800Z-2000Z, Sep 12
CWops Mini-CWT Test	1300Z-1400Z & 1900Z-2000Z, Sep 14; 0300Z-0400Z, Sep 15
RSGB 80m Club Sprint, SSB	1900Z-2030Z, Sep 14
NCCC Sprint Ladder	0230Z-0300Z, Sep 16
Connecticut QSO Party	0000Z-2359Z, Sep 17
ARRL 10 GHz and Up Contest	0600 local, Sep 17 to 2400 local, Sep 18
SARL VHF/UHF Analogue/Digital Contest	1000Z, Sep 17 to 1000Z, Sep 18
Scandinavian Activity Contest, CW	1200Z, Sep 17 to 1200Z, Sep 18
SRT HF Contest SSB	1300Z, Sep 17 to 1300Z, Sep 18
South Carolina QSO Party	1300Z, Sep 17 to 2100Z, Sep 18
QRP Afield	1500Z, Sep 17 to 0300Z, Sep 18
Washington State Salmon Run	1600Z, Sep 17 to 0700Z, Sep 18 and 1600Z-2400Z, Sep 18
Feld Hell Sprint	1600Z-1800Z, Sep 17
North American Sprint, SSB	0000Z-0400Z, Sep 18
WAB 144 MHz QRP Phone	1000Z-1400Z, Sep 18
BARTG Sprint 75	1700Z-2100Z, Sep 18
Run for the Bacon QRP Contest	0100Z-0300Z, Sep 19
NAQCC Straight Key/Bug Sprint	0030Z-0230Z, Sep 22
NCCC Sprint Ladder	0230Z-0300Z, Sep 23
CQ Worldwide DX Contest, RTTY	0000Z, Sep 24 to 2400Z, Sep 25
AGCW VHF/UHF Contest	1400Z-1659Z, Sep 24 (144) and 1700Z-1759Z, Sep 24 (432)
Texas QSO Party	1400Z, Sep 24 to 0200Z, Sep 25 and 1400Z-2000Z, Sep 25
QRP Homebrewer Sprint	0000Z-0400Z, Sep 26
SKCC Sprint	0000Z-0200Z, Sep 28
CWops Mini-CWT Test	1300Z-1400Z & 1900Z-2000Z, Sep 28; 0300Z-0400Z, Sep 29
RSGB 80m Club Sprint, CW	1900Z-2030Z, Sep 29

October 2011

TARA PSK Rumble Contest	0000Z-2400Z, Oct 1
EPC Russia DX Contest	0400Z, Oct 1 to 0359Z, Oct 2
Oceania DX Contest, Phone	0800Z, Oct 1 to 0800Z, Oct 2
WAB HF Phone	1200Z, Oct 1 to 1200Z, Oct 2
California QSO Party	1600Z, Oct 1 to 2200Z, Oct 2
EU Autumn Sprint, SSB	1600Z-1959Z, Oct 1
German Telegraphy Contest	0700Z-0959Z, Oct 3
ARS Spartan Sprint	0100Z-0300Z, Oct 4
SARL 80m QSO Party	1700Z-2000Z, Oct 6
YLRL DX/NA YL Anniversary Contest	1400Z, Oct 7 to 0200Z, Oct 9
Makrothen RTTY Contest	0000Z, Oct 8 to 1559Z, Oct 9
Oceania DX Contest, CW	0800Z, Oct 8 to 0800Z, Oct 9
Scandinavian Activity Contest, SSB	1200Z, Oct 8 to 1200Z, Oct 9
Arizona QSO Party	1600Z, Oct 8 to 0600Z, Oct 9 and 1400Z-2359Z, Oct 9
EU Autumn Sprint, CW	1600Z-1959Z, Oct 8
Pennsylvania QSO Party	1600Z, Oct 8 to 0500Z, Oct 9 and 1300Z-2200Z, Oct 9
FISTS Fall Sprint	1700Z-2100Z, Oct 8
North American Sprint, RTTY	0000Z-0400Z, Oct 9
10-10 Int. 10-10 Day Sprint	0001Z-2359Z, Oct 10

For details, check: <http://www.hornucopia.com/contestcal/index.html>

(HAM TECH continued from page 6)

For example, if $h = 50$ ft then $D = 10$ mi. Two hams with 50 foot antennas could each see out to the horizon and could be up to $2(10) = 20$ miles apart. If one ham is mobile and his antenna is only 5 feet high his distance to the horizon is only 3.2 miles, so they can only work each other at a distance of $10 + 3.2 = 13.2$ miles. But wait a minute, they are both putting signals right on the ground so there is going to be lots of interaction with the ground and significant fading. Your useful range will be a little less in each case. Even with relatively high antennas, simplex LOS just doesn't get too far.

Let's switch to the BEARS UHF repeater (444.2 MHz) in Bensalem, PA. This repeater antenna is 550 feet high and the horizon point is slightly over 33 miles. Add to this the 10 miles for your base station antenna and you could reach the repeater at a distance of almost 43 miles, 36 miles while mobile. Two base stations could be up to 86 miles apart if the two stations and the repeater are on a common straight line path. I use the KK3L 2 meter repeater located on a 3000 ft. mountain in Berkley Springs, WV while on the PA turnpike just west of the twin Blue Mountain tunnels. I have no trouble working other mobiles 125 to 150 miles away calling into this machine. This KK3L machine is linked to the W3WGX mountain top repeater in Seven Springs, PA. With the two I have coverage from where I lose the BEARS linked network at Blue Mountain all the way to Pittsburgh. Repeaters and height makes 2 meters our most popular band and most of it is LOS. In the next article, we add to our equations to determine the impact of transmitter power, antenna gain and receiver sensitivity in fighting the signal attenuation of LOS propagation.

Do you have questions or comments? Call into the K2AA 2 meter repeater on Monday 8 November at 8:00 PM and I will answer them right after the net closes, about 8:45PM, or E-mail me at the address listed at the beginning of HAM TECH and I will answer on the air followed by an E-mail reply.

John WY2J

(Remembering 9/11 continued from page 1)

The Northeast Wireless Radio Club, N2WC, will be on the air Sunday, September 11 from 1700-2300 UTC on the General bands using CW, phone, and digital. A Special Event QSL card is available for a \$2 donation to Northeast Wireless Radio Club, 213-37 39th Avenue, Suite 175, Bayside, NY 11361. See the web page at <http://www.nw2c.org/911.html> for details.

The Kings County Repeater Association, KC2RA, will be on the air 1300-2100 UTC on Saturday, September 10 on 7.250 and 14.295 MHz. See <http://www.kc2ra.org/> for other communications modes and QSL card requirements.

The Symbol Technologies Amateur Radio Club, W2SBL, will be on the air September 10-11 on 3.911, 7.240, 14.070, and 50.135 MHz, as well as D-STAR REF10C. With every QSO, they will read the name of a person killed in the attacks. For a QSL card, send a SASE to Symbol Technologies Amateur Radio Club, W2SBL, One Motorola Plaza, B-13, Holtsville, NY 11742.

Note that the above information is subject to change. Check the ARRL Special Events web site for updates (<http://www.arrl.org/news/special-event-stations-mark-tenth-anniversary-of-9-11>).

Bill KCØSVZ

(Back to School continued from page 4)

Once people start signing up, you should suggest that they either purchase a study guide or download my free study guide (www.kb6nu.com/tech-manual). Because I use my study guide when teaching the class, I always advise them to get a copy, but if you'll be using other materials, then your advice may differ.

I counsel the students to read through my study guide a few times and take some online practice tests before coming to class. That will make them familiar with the material, especially areas they may be weak in or have questions about. By bringing those questions to class, we can address those areas in a little more depth, which will, hopefully, give them the help they need to pass the test.

The class itself is six hours long, running from 9 AM to 3 PM, at which time we give them the test. This is not a lot of time for the amount of material I have to cover, so I move along at a pretty brisk pace. I concentrate on giving them the answers, but with enough context to that it all makes sense.

OK, let's say your class was wildly successful, and you now have a group of newly-minted Techs. What do you do now?

Well, you might consider offering some short sessions on what ham radio operators do—Ham Radio 101, so to speak. The topics could include how to choose your first radio, the basics of FM repeater and net operation, and building your first antenna (say a 2 meter ground plane). They'll be more enthusiastic about these classes now that they actually have a license.

It might also be a good idea to schedule a General Class license course for sometime shortly after the Tech class. This will encourage them to upgrade while they are enthusiastic about the hobby.

I hope that this has encouraged you to offer some ham radio courses of your own. If you have any questions, feel free to e-mail me at cwgeek@kb6nu.com or phone me at 734-930-6564. Good luck, and let me know how your classes turn out.

Dan KB6NU

When not preparing for his next ham radio class, Dan publishes the "No-Nonsense" study guides for the Technician and General Class license exams. Free versions and print version are available from his website at www.kb6nu.com/tech-manual. E-book versions are available for the Kindle and devices that run the Kindle app on Amazon.Com and for the Nook on BarnesandNoble.Com.

August Door Prizes

Three items were up for raffle at the August meeting: A 23-piece elastic tie-down package (bungee cords), a package of 350 cable ties, and the (in)famous Brown Bag Prize. Andrew NØCALL was present to draw the winning tickets. Both the bungee cords and cable ties were won by Elmer, WBØTTB. The Brown Bag Prize turned out to be a seven-function digital multimeter, which went to

Claudia, K1AUD.

Note that the proceeds for each month's tickets go for buying next month's prizes. Each month's tickets are kept and included in the Grand Prize(s) drawing in December. The more tickets you buy each month, the better your chances of winning at the end of the year.

HAM TECH v1n1: Line of Sight (LOS) Propagation

By John Fogleboch Sr. WY2J
Email:wy2j@arrl.net

(Reprinted from the South Jersey Radio Association <<http://www.sjra.org/>>
newsletter, Harmonics, Ted Groke, W2TAG, Editor.)

Those of you that read my introduction to HAM TECH in the September issue of *Harmonics* will be aware that I am starting the series with propagation and focusing on it for 7 issues. You may wonder why. The simple answer is that no technical factor has as much impact on achieving the performance you expect from your station as propagation. Antennas are next in line in impact and will be the subject starting in the spring of 2011. By a year from now you should have the background, the tools including simple equations, charts and computer software and some experience in using them to evaluate your station and trade off your next big investment. Should it be a kilowatt amplifier, a new antenna or a new tower? You will know what each of these will do for you in terms of making QSOs.

VHF/UHF line of sight propagation is relatively simple to understand and calculate as long as you can keep the effects of the earth and its obstructions out of the signal path. Even with antennas near the earth this propagation is rather predictable as long as you don't try to stretch the distance between antennas to the point where the signal is sitting on the horizon. Examples of LOS propagation are short range simplex, ground based repeater and earth to amateur repeater satellite. Of the three the ground repeater is the most widely used. Note also that I am only referring to VHF and higher frequencies for LOS propagation. Below 50 MHz the antennas are electrically too close to the earth to meet the criteria of LOS.

So what limits the range of LOS propagation? For the simplex and ground repeater case the limit is the antenna heights and the earth curvature. For the earth satellite case the satellite must be in view of both stations and the limits are satellite transmitter power, antenna gains, ground receiver sensitivity and signal bandwidth. Let's look at the first two cases.

There is a geometric horizon which is sometimes incorrectly referred to as the optical horizon and a radio horizon. They would all be the same if the earth had no atmosphere like the moon, but it does. Most of us have watched a sun set where we can see the horizon. The sun grows in diameter and changes color due to the effect of the atmosphere. You actually see the sun finally disappear well after it has fallen below the geometric horizon. The atmosphere bends the light and radio signals over the horizon. This is not insignificant since the distance to the horizon grows by about 33 percent for radio signals. To avoid having to draw curved lines when plotting LOS signal paths, convention has for decades been to increase the size of the earth by 33 percent. This is the basis of the 4/3 earth model. In addition, if this model is used and height is measured in feet and distance to the horizon in miles, the calculation of the horizon distance is very simple.

$$D = \sqrt{2h}$$

Where h = antenna height in feet and D = radio horizon in miles.

(HAM TECH continued on page 8.)

Club Calendar

Sep 9	7:00 PM AARC Meeting. Red Cross Building, 81 st and Spring St, Omaha, NE.
Sep 13	07:30 PM Lincoln Amateur Radio Club Meeting. 4647 Superior St, Lincoln, NE.
Sep 15	07:30 PM Bellevue ARC Meeting . 1908 Franklin St, Bellevue, NE.
Sep 16	07:00 PM SACMARC Meeting. Wendy's on Galvin Rd, Bellevue, NE.
Sep 17	Pony Express Hamfest. 4826 Frederick Ave, St Joseph, MO.
Sep 18	BVARC Flea Market - CANCELLED
Sep 22	08:00 PM SouthWest Iowa ARC Meeting . 705 N 16 th , Council Bluffs, IA.
Sep 23	07:30 AM PARC Meeting . 1900 E. Military Ave, Fremont, NE.
Sep 25	08:00 AM BARCFest. Boulder Co. Fairgrounds, 9595 Nelson Rd, Boulder CO.
Sep 27	06:30 PM AARC Board Meeting .
Sep 27	06:30 PM VE Testing. Red Cross Building, 81 st and Spring St, Omaha, NE.
Oct 1	Wichita Area Hamfest . Sweetbriar Bingo Hall, 2349 N Amidon, Wichita, KS.
Oct 1	05:00 AM - 03:00 PM Market-to-Market Relay Race. Omaha-Lincoln, NE.
Oct 2	07:00 AM Southeast Iowa Hamfest. 101 N Clay St, West Liberty, IA.
Oct 9	CROP Hunger Walk 2011. Email cropwalk@aksarbenarc.org for details.
Oct 11	07:30 PM Lincoln Amateur Radio Club Meeting. 4647 Superior St, Lincoln, NE.
Oct 14	07:00 PM AARC Meeting. Red Cross Building, 81 st and Spring St, Omaha, NE.
Oct 15	JOTA - Boy Scouts
Oct 16	JOTA - Boy Scouts
Oct 20	07:30 PM Bellevue ARC Meeting . 1908 Franklin St, Bellevue, NE.
Oct 21	Iowa State Convention (Hamboree 2011) . 903 Topaz Dr, Sergeant Bluff, IA.
Oct 22	Iowa State Convention (Hamboree 2011) 903 Topaz Dr, Sergeant Bluff, IA.
Oct 25	06:30 PM AARC Board Meeting .
Oct 27	08:00 PM SouthWest Iowa ARC Meeting . 705 N 16 th , Council Bluffs, IA.
Oct 28	07:30 AM PARC Meeting . 1900 E. Military Ave, Fremont, NE.
Oct 29	Ensor Museum Auction Tailgate & Special Event . 18995 W 183 rd St, Olathe, KS.

For the latest updates and new events, see the Upcoming Events section on the AARC web site (<http://www.aksarbenarc.org/main/>).

Want Ads

Self-Supporting Tower Ready to move and install. Rohn HDBX48 w/40' & 48' rotor plates & thrust bearing, new HDBX hardware package and BXB8 concrete base stubs, extra "flat" steps kit, 10' carbon steel mast, grade 40 rebar (28); (costs for all items if new: \$2050); free hardline included, asking \$550. Contact Ed, KØiL, 402-598-0574

HF Transceiver IC-746 PRO HF transceiver for sale. It comes with complimenting power supply, SP-21 speaker, manual, and a handheld IC mike. All for \$750. Contact Greg, N7JOD, 7619 Belmont Drive, Ralston, NE 68127. Cell: 402-305-2009.

Tower for Sale Still have my 40 ft Rohn HBDX free standing tower. Also included: A Mosley TA 33 Tri Band Yagi, Ham IV Rotor and Control Box, 40/80 inverted Vees, all cables coax. Everything working as it should. Make me a offer and take it down it's yours. Nothing in the way, an easy take down. Call Duke WDØEWH 402-571-4178 or e-mail dukeewh@cox.net. Thanks for looking.

You may be a ham radio operator if: You have grabbed the wrong end of a hot soldering iron.