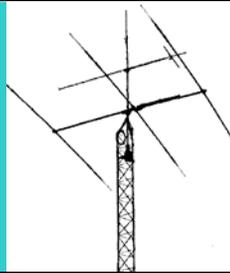


The AARC Beacon



*Serving radio enthusiasts
and communities in
Central Virginia –
The Radio Club for
Central Virginia*

Volume 2009, No. 9



September 2009

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Meeting Notice

The next AARC meeting will be held on **September 8 at 7:30 PM at the NRAO Building on the UVA Grounds.** The program will be presented in two parts with **Dave Damon explaining D Star and Dennis Mennerich will talk about Whisper.**

Sounds interesting – see you there!

The President's Letter

Dave, K4DND

Hello everyone. I hope you were one of the lucky AARC members able to attend the August Picnic and Auction. What a fun time it was, and in my opinion the best picnic gathering ever. When you combine a great turnout of AARC members, lots of good food and incomparable entertainment provided by Gordon WW4GW, you know you have the makings of a fun time. Gordon is so talented, who knew the extent of his above average auction acumen replete with rapier-like and resplendent repartee? Many thanks not only to Gordon, but also to Jim K4JEC, Patsy K4PMC, Don N4UVA, Linda KI5LLB and OM Roland, and John, KI4DJT for all the hard work and preparation that made the evening the success and fun that it was. I am sure that I am not alone in looking forward to another picnic auction next year.

Saturday, August 29 several of us had the opportunity to participate in the **Devil's Backbone Mountain Cross Bike** event. Greg N4PGS, Elmer KF4UCI, Kenneth KJ4KIH, Linda KI5LLB, Jim K4JEC, Patsy K4PMC and I met out in Nelson County for this inaugural bike event that the organizers hope will be an annual affair. Over 130 riders turned out for the day that consisted of a single course for all riders of approximately 66 miles. Much of the route was on gravel roads, which took the riders from the Devil's Backbone Brewery up onto the Blue Ridge Parkway and ultimately back to the Brewery. Communication by radio was problematic in several parts of the course, but that is the fun, as they say. Doing the job under difficult circumstances is much more

rewarding and a better learning opportunity than doing the job when there is little to no challenge.

Our next public service event comes toward the end of September and is the Great Eastern Endurance Run. I hope to see a good turnout of volunteers for this event; the organizers have previously made generous contributions to the AARC in recognition of our participation. After the GEER, the last remaining event on our calendar that involves the public is the October Open House at NRAO, to which we have been invited again this year.

My remarks this month will be unusually brief; Bob W4RQ has been nagging me to get my article submitted since we only have a week and a day before the AARC September meeting and Bob likes to have the Beacon out at least a week prior to the scheduled meeting date. Tomorrow, September 1, I will have the pleasure of providing transportation for W4RQ as he completes his final (hopefully) chemotherapy treatment at Martha Jefferson Hospital. Many of you may not realize how much extra effort has been required to keep the AARC Beacon on time over the past many months. I am sure there have been days when Bob really didn't feel like working on anything, much less the AARC Beacon, but still he got the job done, and deserves a round of applause from the AARC membership for his extraordinary efforts to keep us informed on time. Many thanks, Bob.

I look forward to seeing as many of you attend the September AARC meeting as possible. As this meeting precedes the October Annual Business meeting, the **September gathering will have some important business to conduct including presentation of the Bylaws changes, and appointment of the nominating committee** responsible for securing a slate of hosta ... I mean candidates for the 2010 year.

Meanwhile, if it has been a while since you participated in a local net, please try to do so. Every Monday evening at 7 PM, Harry W2HD and Joe W2PVY are on the 146.760 repeater with the Monday Night Information Net and Amateur Radio Newslines. Check it out, and then check in so Harry and Joe know that their work is appreciated. Then on Thursday nights 8 PM also on the WA4TFZ 146.760 repeater, join the Northern Piedmont Emergency Net and see what is going on around the area with ARES and other emergency communication matters.

See you soon de K4DND...

73 de K4DND

Veep Peeps

Jim, K4JEC

The date of August 11 will be remembered for a long time as one of the most successful member activities of the year to date. We will have to work hard at exceeding that as a member activity.

The September 8 meeting comes early in the month so don't get caught off guard. **The program will be presented in two parts with Dave Damon explaining D Star and Dennis Mennerich will talk about Whisper.**

The meeting will also be the **first presentation of the Proposed Amendment to the Bylaws** to bring them in line with present procedures and economic times. The proposal does not contain any major changes in policies or operating procedures. The Bylaws require changes be presented at two club meetings to be voted upon at the second presentation. The Bylaws Committee has recommended to the Board that the proposals be presented at the September meeting and voted upon at the Annual Meeting in October. The Board has approved that recommendation and therefore they will be voted upon at the October Meeting during which we will require a quorum so lets plan a BIG turnout, not only for that but also for the annual election of officers.

I have been hearing great reports from the **Photo Gallery** on the club website by Kenneth (KJ4KIH). If you haven't seen it yet, go to <albemarleradio.org> and from the home page look to the list at the right and down near the bottom you will find the link to the Photo Gallery. Click on that and you will be looking at the various albums located there. If you have pictures you would like to submit to be posted to the Photo Gallery you can email them to: jecrosby@comcast.net.

And while we are talking about the website, every member is urged to check it frequently because copy can change daily and it always carries the latest member news, reports and up-coming activities.

Members have been participating in a survey as to whether or not the club should sponsor a **Virginia Ham Radio Cruise-In**. Your response has been overwhelmingly favorable and we now have a commitment from eight members to work on the committee should the board elect to take on the project. If you have not responded to the many emails discussing this project, please do so and especially if you are willing to join the committee. This could be yet another feather in the club's cap for innovative projects. The summary is: "Join the cruise to Charlottesville (the geographic center of the state) and pick up a "Certificate of Participation" just for showing up – no mobile rig is required. Come to meet and greet, show off your rig, see others rigs and share in the fun and camaraderie – a favorite activity for all hams. Certificates would be presented to the most innovative mobile rig present in a car, a truck, an RV, a motorcycle and a bicycle. We could also present a certificate for the ham traveling the longest distance to

attend. The target date, and time, at this point, is May 1, 2010, Saturday, 10 a.m. till 4 p.m. While all details would be subject to the Board's approval to sponsor the event, such details as to where would have to be negotiated afterward.

This could double as a public event where Ham Radio is showcased as the communications system that takes over when all others fail. Virginia ARES should fall right in line to support such a showcase and demonstration of the ham community's investment in time, money and resources in providing the state with a superior emergency communications system. I believe this to be a win-win situation for all hams and one we should pursue with all our resources. What an opportunity this represents for our club.

AARC Picnic 2009 in Pictures

The AARC Annual Picnic and Hamfest were held August 11 at McIntire Park and was one of the best ever. Here is just a sampling of the activities there...



Checking out goodies at the auction table...



Gordon WW4GW at the auction table...



Checking out culinary delights at the picnic table...



Gordon WW4GW (auctioneer par excellence) selling items of interest...



Scarfig down the goodies



Bidding was intense!!!



Loading up the auction table...

Club Business

Submitted by: Alan Swinger K9MBQ, Secretary

AARC Board Minutes – August 11, 2009

No minutes – Annual AARC Picnic.

Alan Swinger – K9MBQ, Secretary

Regular Meeting – August 11, 2009

No minutes – Annual AARC Picnic.

Alan Swinger – K9MBQ, Secretary

For Sale and Wanted...

Tnx Ron, K4RKA

Please notify K4RKA when an item has been sold or pulled from availability and can be deleted from this list.

Scanners for Sale -- 2 Uniden 760 \$50.00 Each. 1 Radio Shack 95 Portable \$100.00. 1 Bearcat 240xlt 40 channel \$25.00. 1 UHF-VHF Radio Shack 16 channel \$25.00. 1 Bearcat 240XL 20 channel 20.00. 1 Bearcat 200 16 channel \$15.00. 1 Uniden 100xlt 100 channel 50.00. 1 Pro 2051 Radio Shack Desktop 1000 channel \$150.00. Thanks, Jerome, KI4DLA

Old tube console radios. Philco 620F (1937) - \$ 50. Call Carter Elliott, WD4AYS at 434 566 8767 or via email at celliott14@aol.com

MFJ-4103 Power Supply for FT-817. New, never used in original packaging. Call Bob W4RQ at (434) 990-2659 (home), (434) 980-7143 (office) or via email at w4rq@yahoo.com.

Coleman Series 54 Generator; 4KW 120V/240V. Briggs & Stratton 8HP engine model 190432. Very clean and mounted on cart. Purchased about 1985 and used very little. Has new carburetor, plug, air filter, fuel lines, fuel filter & fuel cutoff valve. However I can't get it started. Has compression, fuel and I believe good spark. Maybe new carburetor just needs adjustment. I'm tired of pulling the rope! And anyway it won't run my heat pump. \$199.00 Jim K4CGY 434-296-3044

WANTED: I'm looking for a **2m mobile radio, preferably small** (comparable in size to modern mobile rigs). **Can be commercial VHF as long as it can tune down to 144.39 MHz.** Contact Mike Benonis KI4R1X.

The Sun - The Earth - The Ionosphere ...

Carl Luetzelschwab, K9LA via Alan, K9MBQ

What the Numbers Mean, and Propagation Predictions -- a brief introduction to propagation and the major factors affecting it.

The **sun emits electromagnetic radiation and matter** as a consequence of the nuclear fusion process. Electromagnetic radiation at wavelengths of 100 to 1000 Angstroms (ultraviolet) ionizes the F region, radiation at 10 to 100 Angstroms (soft X-rays) ionizes the E region, and radiation at 1 to 10 Angstroms (hard X-rays) ionizes the D region. Solar matter (which includes charged particles -- electrons and protons) is ejected from the sun on a regular basis, and this comprises the solar wind. On a "quiet" solar day the speed of this solar wind heading toward Earth averages about 400 km per second.

The **sun's solar wind significantly impacts Earth's magnetic field.** Instead of being a simple bar magnet, Earth's magnetic field is compressed by the solar wind on the side facing the sun and is stretched out on the side away from the sun (the **magnetotail**, which extends tens of earth radii downwind). While the sun's electromagnetic radiation can impact the entire ionosphere that is in daylight, charged particles ejected by the sun are guided into the ionosphere along magnetic field lines and thus can only impact high latitudes where the magnetic field lines go into the Earth.

Additionally, when electromagnetic radiation from the sun strips an electron off a neutral constituent in the atmosphere, the resulting electron can spiral along a magnetic field line (it spirals around the magnetic field line at the electron gyrofrequency). Thus Earth's magnetic field plays an important and critical role in propagation.

Variations in Earth's magnetic field are measured by magnetometers. There are two measurements readily available from magnetometer data--the **daily A index and the three-hour K index.** The **A index is an average** of the eight 3-hour K indices, and uses a linear scale and goes from 0 (quiet) to 400 (severe storm). The **K index** uses a quasi-logarithmic scale (which essentially is a compressed version of the A index) and goes from 0 to 9 (with 0 being quiet and 9 being severe storm). **Generally an A index at or below 15 or a K index at or below 3 is best for propagation.**

Sunspots are areas on the sun associated with ultraviolet radiation. Thus they are tied to ionization of the F region. The **daily sunspot number**, when plotted over a month time frame, is very spiky. Averaging the daily sunspot numbers over a month results in the monthly average sunspot number, but it is also rather spiky when plotted. Thus a more averaged, or smoothed, measurement

is needed to measure solar cycles. This is the **smoothed sunspot number (SSN)**. The SSN is calculated using six months of data before and six months of data after the desired month, plus the data for the desired month. Because of this amount of smoothing, the official SSN is one-half year behind the current month. Unfortunately this amount of smoothing may mask any short-term unusual solar activity that may enhance propagation.

Sunspots come and go in an approximate 11-year cycle. The rise to maximum (4 to 5 years) is usually faster than the descent to minimum (6 to 7 years). At and near the maximum of a solar cycle, the increased number of sunspots causes more ultraviolet radiation to impinge on the atmosphere. This results in significantly more F region ionization, allowing the ionosphere to refract higher frequencies (15, 12, 10, and even 6 meters) back to Earth for DX contacts. At and near the minimum between solar cycles, the number of sunspots is so low that higher frequencies go through the ionosphere into space. Commensurate with solar minimum, though, is less absorption and a more stable ionosphere, resulting in the best propagation on the lower frequencies (160 and 80 meters). **Thus, in general, high SSNs are best for high-frequency propagation, and low SSNs are best for low-frequency propagation.**

Most of the disturbances to propagation come from solar flares and coronal mass ejections (CMEs). The solar flares that affect propagation are called X-ray flares due to their wavelength being in the 1 to 8 Angstrom range. X-ray flares are classified as C (the smallest), M (medium size), and X (the biggest). Class C flares usually have minimal impact to propagation. Class M and X flares can have a progressively adverse impact to propagation.

The electromagnetic radiation from a class X flare in the 1 to 8 Angstrom range can cause the loss of all propagation on the sunlit side of Earth due to increased D region absorption. Additionally, big class X flares can emit very energetic protons that are guided into the polar cap by Earth's magnetic field. This can result in a **polar cap absorption event (PCA)**, with high D-region absorption on paths passing through the polar areas of Earth.

A **CME is an explosive ejection of a large amount of solar matter**, and can cause the average solar wind speed to take a dramatic jump upward--kind of like a shock wave heading toward Earth. If the polarity of the sun's magnetic field is southward when the shock wave hits Earth's magnetic field, the shock wave couples into Earth's magnetic field and can cause large variations in Earth's magnetic field. This is seen as an **increase in the A and K indices**.

In addition to auroral activity, these variations to the magnetic field can cause those electrons spiraling around magnetic field lines to be lost into the magnetotail. With electrons gone, **maximum usable frequencies (MUFs)**

decrease, and return only after the magnetic field returns to normal and the process of ionization replenishes lost electrons. Most of the time, elevated A and K indices reduce MUFs, but occasionally MUFs at low latitudes may increase (due to a complicated process) when the A and K indices are elevated.

Solar flares and CMEs are related, but they can happen together or separately. Scientists are still trying to understand the relationship between them. One thing is certain, though--the electromagnetic radiation from a big flare traveling at the speed of light can cause **short-term radio blackouts** on the sunlit side of Earth within about 10 minutes of eruption. Unfortunately we detect the flare visually at the same time as the radio blackout, since both the visible light from the flare and the electromagnetic radiation in the 1 to 10 Angstrom range from the flare travel at the speed of light--in other words, we have no warning. On the other hand, the energetic particles ejected from a flare can take up to several hours to reach Earth, and the shock wave from a CME can take up to several days to reach Earth, thus giving us some warning of their impending disruptions.

Each day the **Space Environment Center (a part of NOAA)**, the National Oceanographic and Atmospheric Administration) and the **US Air Force jointly put out a Solar and Geophysical Activity Report**. The current and archived reports are on the Near-Earth Data Online at SEC page in the "Daily or less" section in the "Solar and Geophysical Activity Report and 3-day Forecast" row. Each daily report consists of six parts.

Part IA gives an analysis of solar activity, including flares and CMEs. Part IB gives a forecast of solar activity. Part IIA gives a summary of geophysical activity. Part IIB gives a forecast of geophysical activity. Part III gives probabilities of flare and CME events. These first three parts can be summarized as follows: normal propagation (no disturbances) generally occurs when no X-ray flares higher than class C are reported or forecasted, along with solar wind speeds due to CMEs near the average of 400km/sec.

Part IV gives observed and predicted 10.7-cm solar flux. A comment about the daily solar flux--it has little to do with what the ionosphere is doing on that day. This will be explained later.

Part V gives observed and predicted A indices. Part VI gives geomagnetic activity probabilities. These last two parts can be summarized as follows: good propagation generally occurs when the forecast for the daily A index is at or below 15 (this corresponds to a K index of 3 or below).

WWV at 18 minutes past the hour every hour and WWVH at 45 minutes past the hour every hour put out a shortened version of this report. A new format began March 12, 2002. The new format gives the previous day's 10.7-cm solar flux, the previous day's mid-latitude A

index, and the current mid-latitude three-hour K index. A general indicator of space weather for the last 24 hours and next 24 hours is given next. This is followed by detailed information for the three disturbances that impact space weather: geomagnetic storms (caused by gusts in the solar wind speed), solar radiation storms (the numbers of energetic particles increase), and radio blackouts (caused by X-ray emissions). For detailed descriptions of the WWV/WWVH messages, visit www.sec.noaa.gov/Data/info/WWVdoc.html and www.sec.noaa.gov/NOAA scales/.

Normal propagation (no disturbances) is expected when the space weather indicator is minor. A comment is appropriate here. Both the Solar and Geophysical Activity Report and WWV/WWVH give a status of general solar activity. This is not a status of the 11-year sunspot cycle, but rather a status on solar disturbances (flares, particles, and CMEs). For example, if the solar activity is reported as low or minor, that doesn't mean we're at the bottom of the solar cycle; it means the sun has not produced any major space weather disturbances.

In order to predict propagation, much effort was put into finding a correlation between sunspots and the state of the ionosphere. The best correlation turned out to be between SSN and monthly median ionospheric parameters. This is the correlation that our propagation prediction programs are based on, which means the outputs (usually MUF and signal strength) are values with probabilities over a month time frame tied to them. They are not absolutes; they are statistical in nature. Understanding this is a key to the proper use of propagation predictions.

Sunspots are a subjective measurement. They are counted visually. It would be nice to have a more objective measurement, one that actually measures the sun's output. The 10.7-cm solar flux has become this measurement. But it is only a general measure of the activity of the sun, since a wavelength of 10.7-cm is way too low in energy to cause any ionization. Thus 10.7 cm solar flux has nothing to do with the formation of the ionosphere. The best correlation between 10.7-cm solar flux and sunspots is the smoothed 10.7-cm solar flux and the smoothed sunspot number--the correlation between daily values, or even monthly average values, is not very acceptable.

Since our propagation prediction programs were set up based on a correlation between SSN and monthly median ionospheric parameters, the use of SSN or the equivalent smoothed 10.7-cm solar flux gives the best results. Using the daily 10.7-cm solar flux--or even the daily sunspot number--can introduce a sizable error into the propagation predictions outputs due to the fact that the ionosphere does not react to the small daily variations of the sun. Even averaging 10.7-cm solar flux over a week's time frame can contribute to erroneous predictions. To reiterate,

for best results use SSN or smoothed 10.7-cm solar flux, and understand the concept of monthly median values.

For **short-term predictions, the use of the effective SSN (SSNe) may be helpful.** In this method, an appropriate SSN is input to the propagation prediction software to force it to agree with daily ionosonde measurements. Details of this method can be found at www.nwra-az.com/spawx/ssne24.html.

[Editors Note: Sunspot activity has been almost non-existent of late. Up until today, Sept. 1, the sun has gone 52 days without a single sunspot visible!! But it appears a new spot is "trying" to get going... Hopefully spot activity will begin to increase. Cycle 24 is getting off to a VERY slow start indeed...!!]

Contest Highlights - Upcoming

Bob, W4RQ

ARRL-Sponsored Contests

Sep 5-6	
Sep 19-20	

Complete info, rules and log forms for these events can be found online at the ARRL Contest Calendar webpage.

Other Contests of Interest

Sep 5-6	Colorado QSO Party
Sep 6-7	Tennessee QSO Party
Sep 12-13	Arkansas QSO Party
Sep 12-13	WAE DX Contest SSB
Sep 19-20	South Carolina QSO Party
Sep 19-20	Washington State Salmon Run
Sep 19-20	QCWA Fall QSO Party
Sep 20-22	Texas QSO Party

The [SM3CER Contest Service - Contest Calendars](#) has info and rules for these contests and just about every contest that exists.

73, Bob W4RQ

AARC Public Service Schedule	
End of September	Great Eastern Endurance Run

Area Hamfests	
September 12-13 Virginia Beach	<p>THE VIRGINIA SECTION CONVENTION and VIRGINIA BEACH HAMFEST will be held SEPT. 12 and 13 At Virginia Wesleyan College, 1584 Wesleyan Drive in Virginia Beach. The web site is at virginiabeachhamfest.com . Talk-In: 146.970 Contact: Carl Clements, W4CAC 4500 Wake Forest Road Portsmouth, VA 23703 Phone: 757-484-0569 Fax: 757-673-7426 Email: w4cac@arrl.org</p> <p>Special guest speaker is BERNIE MCCLENNY, W3UR, who writes the HOW'S DX column in QST. He will be at the DX Forum and also at the DX Banquet Saturday evening --- 6:30 PM on at the Upton Buffet, 1050 N. Military Hwy, Norfolk, VA. For reservations and more info contact Charlie Chapman, w1wtg, at 757-681-4190 or w1wtg@arrl.net .</p>

FCC Database Updates	
New Calls	
KJ4OEV	Chris Bortz – new General!!
Upgrades	
None Reported	
Vanity Calls	
None Reported	

VE Session Schedule - 2009	
Date Location (ARRL VEC)	For exam sessions in Virginia outside the AARC area, check the ARRL Exam Session Search web page.

For Sale Items	
For Sale	

AARC Club Officers			
President	Dave Damon	K4DND	k4dnd@arrl.net (434) 973-5866
Vice President	Jim Crosby	K4JEC	jecrosby@comcast.net (434) 987-2006
Secretary	Alan Swinger	K9MBQ	awswinger@earthlink.net (434) 975-6237
Treasurer	Don Eason	N4UVA	deason@comcast.net (434) 973-9119
Director	Dennis Mennerich	K4THE	k4the@arrl.net (434) 973-5407
Director	Linda Beard	K15LLB	lindaskyone@earthlink.net (434) 823-2107
Director	Greg Faust	N4PGS	n4pgs@arrl.net (434) 978-1962
Director	Vacant		
Director	Patsy Crosby	K4PMC	patsycrosby@comcast.net † (434) 989-2362

Contest Calendars	
ARRL Contest Calendar 2009	ARRL sponsored contests
SM3CER Contest Service - Calendar 2009	Contests all over the world! Also has links to online rules for most contests
Contesting Online	Just about everything contests!

Albemarle Amateur Radio Club
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September 2009



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ISSUE DEADLINE - 25th of each month

Contact Information
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PO Box 530
Ruckersville, VA 22968-0530
(434) 990-2659
W4RQ@yahoo.com

Next Club Meeting : September 8 - 7:30 PM NRAO Bldg - UVA Grounds

CLUB MEETINGS and NETS

REGULAR Meeting: Second Tuesday of each month at 7:30 PM
BOARD & TECHNICAL Meetings: Prior to regular meeting at 6:30 PM
Meetings are held at the NRAO building on Edgemont Road.
LUNCHEON: Wednesdays -- Area hams gather at the **Wood Grill Buffet** on Rte 29 North from 11 AM – 1 PM
Monday Night Information Net – Each Monday at 7:00 PM
Northern Piedmont Emergency Net: Each Thursday at 8:00 PM
All Nets are held on the 146.760 repeater

AREA REPEATERS

146.760 (-) 151.4 Hz Tone **WA4TFZ**
146.925 (-) 151.4 Hz Tone **WA4TFZ**
224.760 (-) No Tone **WA4TFZ**
444.250 (+) 151.4 Hz Tone **WA4TFZ**
Other Area Repeaters
444.775 (+) 151.4 Hz Tone **KF4UCI**
442.075 (+) 151.4 Hz Tone **KF4UCI**
145.17 (-) 151.4 Hz Tone **W4FCO** (Fluvanna)
146.79 (-) 110.9 Hz Tone **WW4GW** (Buckingham)
145.450 (-) 151.4 Hz Tone **K4DND** (Martha Jefferson Hospital)
224.600 (-) 151.4 Hz Tone **KG4HOT**

AARC CALENDAR OF EVENTS

DATE	EVENT
September 8	Regular Club Meeting
October 13	Regular Club Meeting
November 10	Regular Club Meeting
December 8	Regular Club Meeting

AARC - PUBLIC SERVICE SCHEDULE

DATE	EVENT
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Membership application available in PDF format at http://www.albemarleradio.org/members/AARC_member_application.pdf