

WIRELESS HILL BEACON

Delaware Valley Radio Association



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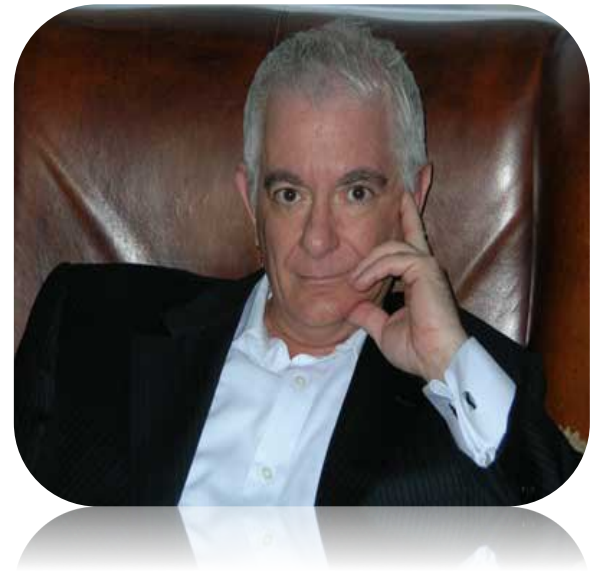
Meeting – February 12th 2013

The regular monthly meeting will be held at 7:30 PM on Wednesday, March 12th, at Our Lady of Good Counsel Church, on Upper Ferry Road at Wilburtha Road in West Trenton. The site is easy to reach from I-95 or NJ-29. Talk-in is available on the 146.67 (PL 131.8) and 442.65 repeaters.

BALANCED LINES 2014 Installment 3
by Bob Schroeder, N2HX
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JAMES CLERK MAXWELL- OUTSTANDING IN HIS FIELD

Author's note: While doing my research for this series of articles on Maxwell's equations, I had the good fortune to attend a lecture about Maxwell at TCNJ given by Dr. James Rautio, AJ3K, founder and CEO of Sonnet Software, Inc.. I am indebted to Dr. Rautio for providing me with some good biographical information about Maxwell and how his equations evolved into what we use today.



I plan to organize this series of articles about Maxwell's equations so that you have a better understanding of the mathematical tools we use in Amateur Radio. Like it or not, we all had to learn the various formulas and equations in order to pass our exams. Some of us actually use these as we practice our hobby. Every time we design a circuit or an antenna, we use formulas that evolved from Maxwell's work. Without them, radio, as we know it, would simply not exist. Period.

By way of a little background, James Clerk (pronounced "clark") lived from 1831 until 1879 and was a Scottish mathematician and physicist. When he inherited a country estate in Kirkcudbrightshire, he was obliged to take the additional surname Maxwell. Both a polymath and autodidact, Maxwell wrote his first scientific paper at the age of 14. He attended both the University of Edinburgh and the University of Cambridge in 1847 and 1850 respectively. He became the chairman of the Natural Philosophy department at Marischal College in Aberdeen in 1856. From 1860 to 1865 he taught at King's College London, and then ultimately became the first Cavendish Professor of Physics at Cambridge in 1871. Maxwell did not originally work with electromagnetism. He was more interested in the physical properties of things. But with the groundwork going on in the previous centuries, he became interested in light, magnetism, and the heady phenomenon of force at a distance.

It may come as a surprise now, but electrical fields and magnetic fields were originally considered to be two different things. An example of an electric field was when you rubbed an amber rod on your sleeve. The rod would magically attract little slivers of paper. Or if you scuffed your feet across a rug on a cold dry day, you could draw a small arc when you touched a metal doorknob. The magnetic field was the property whereby a magnet could pick up a piece of ferrous metal or deflect the needle on a compass- in other words, “force at a distance”. The seventeenth and eighteenth centuries were the Golden Age for experimenting with electric and magnetic fields, until one day it was discovered that they were really quite similar to each other. A lot of famous people worked with these two kinds of fields. Here are a few names you may recognize: Gilbert, Franklin, Galvani, Cavendish, Coulomb, and Volta. Eventually it was discovered that electric and magnetic fields were very much related when they went from being electrostatic (having no time varying quality) to electrodynamic (having a time-varying quality). In other words, it was eventually discovered that when you moved a magnetic field across a wire or a coil, you could make an electric field. Conversely, when you move an electric field near a coil, you can create a magnetic field.

With this new property on the table, other scientists in the nineteenth century began studying and modeling these time-varying electromagnetic fields. These names may also be familiar to you: Oersted, Ampere, Faraday, Henry, Hertz, and of course, Maxwell. Of particular interest to Maxwell was the importance of being able to predict the propagation of these electromagnetic fields. Maxwell originally had twenty equations in twenty variables! Neither did they look like the four equations that we use today. It took scientists like Faraday, Heaviside, Gauss, and others to refine them into how they look today.

For us hams, we’re usually more concerned with the basic fields themselves. Here are some of the fields and their symbols that we typically encounter.

Electric field intensity	E defined as Newtons/Coulomb or Volts/meter
Magnetic field intensity	H defined as 1 Ampere/meter measured in Oersteds
Magnetic induction field	B measured in webers (SI) or maxwells (CGS)
Electric flux density	D or displacement, proportional to E

1 weber/meter squared is defined as 1 Tesla, and 1 Tesla = 10^4 Gauss.

The symbols for the various fields are usually written in bold face type because they are vectors, and vectors are normally written in this way.

These fields are not trivial. There is great significance attached to how electric and magnetic fields are oriented with respect to each other, how they exert their forces on each other, the medium they are operating through (usually air), and of course their type-varying frequency. Without the equations that predict these fields, we would not have the familiar electrical rules that we use today, such as the Right Hand Rule for Conductors, the Left Hand Rule for Motors, and Ohm's Law. Indeed, we would not even be able to design antennas of any kind.

In the next installment, we'll talk about the charge and how it is measured and located in space.

All for now.

Comments invited.

Bob Schroeder, N2HX

Past President, DVRA

DVRA Nets

2-meter & 70-cm nets on the club repeaters 146.670 pl 131.8, 442.650 pl 131.8

2-Meter Nets:

The Pepper Net 10:00 PM Daily

Mercer Co. Emergency Net 7:30 PM Tuesdays KB2EGI, coordinator.

Training & Upgrade Classes

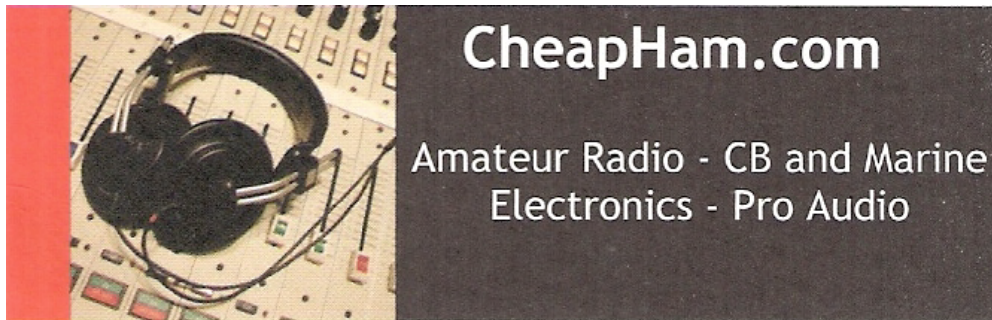
Don Wright, AA2F, periodically holds Technician and General classes.

Classes are held at various locations. Call Don at 609-737-1723 to register.

Exam Schedule

For 2014 exams will be held on Jan 18, March 15, May 10, July 19, Sept 13 and Nov 15. All Exams will be at 12:15 on the listed Saturdays at the Hopewell (Twp) Branch of the Mercer County Library, 245 Pennington-Titusville Road, next door to the Hopewell Valley Central High School. Bring \$15, cash or check, and 2 forms of identification, at least one being a photo ID. For further information, contact Don/AA2F at 609-737-1723 or aa2f@arrl.net.

Please Visit Our Sponsor



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Toms River, NJ 08755

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sales@cheapham.com

Fame and Fortune Await

Want to become rich & famous – write an article for the DVRA Beacon. Fame among local hams almost guaranteed – fortune is up to you (and your luck in Powerball). Deadline for submission is one week before the monthly meeting (that would make the deadline the first Wednesday of the month). For details contact Alex / AB2RC – ab2rc@ab2rc.net

Help Wanted

Our club treasurer, Ron KC2PQC, is looking for a club member to help with the treasurer's duties. If you are interested, please contact him at 609-695-5990 or email ronk@snip.net.

Logbook of The World

Mike AB2IO reports that the current W2ZQ LOTW
5341/16555 Matched as of Feb. 24, 2014

KV2X	2007-06-24 17:56:39	40M CW	7.032	USA
EC1AIJ	2007-10-28 15:28:34	15M SSB	21.44000	SPAIN
EA5VN	2008-02-16 22:46:00	40M CW	7.03810	SPAIN
EA5VN	2008-02-16 18:19:53	20M CW	14.01925	SPAIN
CT3DZ	2008-03-01 01:21:06	80M SSB	3.78960	MADEIRA ISLANDS

Meeting Minutes (January 2014)**DIRECTOR'S AND REGULAR MEETING**

January 8, 2014

President Bob Schroeder N2HX opened the Director's Meeting at 1835 hours. The attendees at the start of the meeting are noted as follows: President Bob Schroeder N2HX, VP Mike Moreken AB2IO, Treasurer Ron Kubinski KC2PQC, Secretary Lance Weight KC2MTO, Dave Norcross K2DRN, Russ Powell KC2OXW, Lloyd Price N2KPC, Gaye Price, Mark Bespalko N2KIV, and Hy Gold AB2VG.

FIELD DAY: Per QST December 2013, 562 points for 2D.

TREASURER'S REPORT: DVRA Member participation in ARRL is 62%. End of Year Balance \$3324. Ron KC2QPC reminded us that there are significant expenditures such as electricity, insurance, oil for heating which will put significant drains on this amount. IRS was sent an E-Card update.

HAMFEST EARNINGS: \$1225 thanks to Frank Palacek's KC2TKD leadership, coordination and hard work!

MEMBERSHIP: The membership is 45 as of October 2013.

PHYSICAL PLANT: Dave Norcross K2DRN did significant grounds and building work during the last year.

RADIOS: Mark Bespalko and Lloyd Price: The contest auto was taken down from the South Tower.

-Lloyd Price N2KPC said he is a sales rep for Ten-Tec. He needs a letter from the club to VP Jim Worton to attempt to get the donation of an HF rig from Ten-Tec. He believes the donation may be possible because of the work he has been doing on the 20m/40m Ten-Tec net.

REPEATER: ERP: They are trying to raise the ERP with a higher structure for the repeater antenna. John Bissal (sp.) is in the process of changing the lock on the repeater cabinet.

MEMBERSHIP: Bob and Lance will work to access the database on new hams so Lance can send invitations to come to DVRA as the database is updated (~monthly). We are looking to access the information for Bucks, Burlington, Hunterdon and Mercer Counties.

FIELD TRIPS: The following trips were suggested ARRL, Battleship NJ.

WEBMASTER: Mark Bepalko N2KIV is moving to the West and therefore the Club will need a new webmaster.

GMAIL: The club is using GMAIL.

PACKET: We will provide DC backup.

CLUB TRUSTEE: Mike Moreken AB2IO received the FCC letter making him the official FCC contact.

COMMITTEES: We need committee volunteers for the following committees: Field Day; Hamfest fund raiser; Contesting; Walks and Rides fund raisers; Picnic and Holiday Party.

WINTER FIELD DAY: Lloyd will be running "Winter Field Day" at the shack on Jan 24, 25 & 26.

TRAINING: Don Wright AA2F will have exams at noon at Penington Library.

THE DIRECTOR'S MEETING CLOSED AT 1928 HRS.

REGULAR MEETING

Bob Schroeder N2HX started the meeting at 1939 HRS

REPEATER FUNDS: The repeater director and club trustee should approve the release of funds from the anonymous donor.

SOLDERING STATION: Joe Lauricella KD2CFR donated a soldering station to the club.

SOLDERING CLASS: Joe KD2CFR will teach a basic soldering class this Saturday at 10 am.

PHONE PATCH: Lloyd Price N2KPC donated a phone patch.

FUEL OIL: 150 gallons purchased for \$450 from Scott fuel.

REGULAR MEETING ENDED AT 1952 HRS.

Respectfully submitted by Lance E. Weight, KC2MTO, Secretary

Meeting Minutes (February 2014)
DELAWARE VALLEY RADIO ASSOCIATION

FEBRUARY 12, 2014

COMBINED DIRECTOR'S AND REGULAR MEETING MINUTES

At 1830 hours President Bob Schroeder opened the meeting. The following were in attendance at the beginning of the meeting: President Bob Schroeder N2HX, Russ Powell KC2OXW, Don Wright AA2F, Lloyd Price N2KPC, Gaye Price, Gary Wilson K2GW, Treasurer Ron Kubinski KC2QPC and Secretary Lance Weight KC2MTO.

Treasurer Ron Kubinski KC2QPC reported that Mike Moreken was added as Trustee and \$50 was paid for the association's updated business registration with the State of NJ. For the insurance members were advised it was only general liability and did not cover equipment. Ron explained the need for an Assistant Treasurer to learn the position and act as a backup for him.

The Laptop Fund Raiser conceived and run by Joe Lauricella AD2DX led to a \$1125 profit to the club. Thanks Joe!!

Don Wright explained he is teaching Boy Scouts and their parents on a Tech Course. Also he is looking forward to teaching a Tech Course with the Princeton Learning Center. The next exam will be March 15.

Gary Wilson K2GW will reach out to the Girl Scouts to see if they are interested in learning about amateur radio. The club members lead by Gary and Don do various amateur radio activities (Merit Badge, Tech teaching, basics of amateur radio, JOTA) with the Boy Scouts.

Lloyd Price N2KPC said that he had received a certificate from TEN-TEC for 100 hams checking in. Lloyd explained that a control box is needed for the Step-IR.

Immediate Past President Dave Norcross K2DRN said that the shack requires about \$700 for sand blasting, painting, fascia, etc.

Fin

Lance Weight KC2MTO, Secretary

