click here to go to web site

DECEMBER CLUB HAPPENINGS

Club Meeting
St. Peter's Episcopal Church,
7929 W. Lincoln Avenue, West Allis
December 8, 2015 **7:00pm**
Program
2016 Swapfest Phil, W9NAW
Arduino projects
Join us for a pre-meeting dinner
at Johnny V's Classic Cafe
1650 S 84th St at 5:00pm

NUT NET
3.985mhz
Monday-Saturday
8:15am CT

Milwaukee-Florida Net
Every Day on 14.290 Mhz
7:00AM - 9:15AM ET
6:00AM - 8:15AM CT

Soon after the next general club meeting, Erwin von der Ehe (WI9EV) erwinv@wi.rr.com will place an order for W.A.R.A.C. name tags for new members and for those of us who need replacement nametags. New member tags are purchased by the club. Replacement nametags cost $7.75. Please let Erwin know if you need a replacement club name tag – supply your call and your name as you want it to appear on your nametag. The fastener will be a pin. Please pay our club treasurer, Howard Smith (WA9AXQ) at the December 10th meeting. No unpaid replacement nametags will be ordered."

December Board meeting cancelled

SWAPFEST
**SATURDAY - JANUARY 9, 2016   8:00AM
- 1:00PM**
WAAUKESHA COUNTY EXPO ARENA
WARAC 2-meter net
Every Wednesday at 8pm
MATC repeater 147.045 standard offset
127.3 Hz CTCSS

Club jackets and hats!
Go to club Web site and click on
The GOLD MEDAL IDEAS block
For more info or click here

The President's Shack December 2015

Our **Swapfest** is less than a month away - right after the Holidays! **Saturday, January 9, 2016**. At the upcoming meeting, chairman Phil will take us through the planning details. **Everyone's help is needed** to pull off our Swapfest, which is our big fundraiser of the year. Anybody is welcome to help – you don't need to be a club member, or even a ham. Just be there! The more help we have, the more time we'll each be able to spend looking for treasures. So be there, dark and early!

Also, the weekend after the upcoming meeting is the **ARRL 10-meter contest** is coming up - **December 11-14, 2015**. As you know, our club sponsors a "piggy-back" contest just for our members that enter this contest. To participate, all you need to do is to submit your log to the ARRL as usual and also submit your log to Chuck, W9WLX. During the contest, work as many club members as possible for points in the club competition.

To get as many club members as possible, you need to know who they are! Use your 2014 club roster as your master list. At the meeting, we'll provide a list of newer members.

The piggy-back 10 meter contest was Chuck, WA9PUB's brainstorm a quite a few years ago and we have been doing it ever since. A couple of years ago, Chuck, W9WLX picked up the reins and is now doing the log checking, etc. Thanks to Chuck and Chuck for continuing our private little contest for all these years.

This meeting will also be **Arduino projects night**. After we talk about the Swapfest, there will be several fairly short presentations on various microcomputer projects. If you want to talk about your project, please do! Better yet, bring it and demonstrate it.

"Son of Zero Beat" - an improved zero beat detector - Howard Smith, WA9AXQ

A CW decoder - Frank Humpal, KA9FZR

RF power and SWR meter - Jim Casamassa, WB9IXS

It's time to start making plans for the **Wisconsin QSO Party**! Make sure Sunday, **March 13** is on your calendar and start thinking about possibly operating mobile, setting up a portable station in another county or activating our club call, W9FK.

I want to wish you and yours a happy and safe Holiday Season. In keeping with the WARAC holiday tradition, the **December Board meeting has been cancelled**, but also note that the Nut Net breakfast on December 22 **is still on**!

And, as always, don't forget our before-meeting dinner at **Johnny V's Classic Café, 1650 S. 84th St.** at 5:00PM.
See you at the meeting! Bring a friend!
Tom, K9BTQ

From the editor

 December Hamtrix turned into a larger then normal contest issue. It has articles on four different contests which are coming up this month and next year. The Ten meter contest December 12 and 13 can be two contests for club members. The normal ARRL contest and the club contest that piggy-backs off of it.

There are also two contests, that run all next year: The DX marathon contest is for the DX crowd looking for a new challenge, 100 countries in a year. The other year long one is the ARRLs way to help the National Park Service celebrate 100 years.

Anyone interested in more information see the articles in this Hamtrix.

To round off the newsletter there is an article on the 2016 swapfest. Howard WA9AXQ also shares the second installment of his adventures working at   Heathkit.

EDITOR pg13

WARAC General Meeting Minutes
November 10, 2015

Introduction
The meeting was called to order at 19:02 by President, Tom Macon (K9BTQ). Overall meeting attendance was 27 including 2 visitors.

Awards dinner was recapped as a success.

Tom (K9BTQ) discussed and gave an invitation for Arduino project presentations at future meetings.

Program
The evening's program topic is "Installing and Using Linux Alternative Computer Operating System with Ham Applications" by Frank Humpal (KA9FZR) and Steve Dryja (NO9B).

Tom Macon (K9BTQ) presented a demo of the RigExpert AA-30 Antenna Analyzer.

Business

Motion was made and accepted to approve the October meeting minutes as published in Hamtrix.

Mike Johnson (WO9B) presented the ARRL National Parks "On the Air" event, encouraging W.A.R.A.C. to be an "Activator".

Chuck Craven (WB9PUB) did show & tell on his air gun, used for stringing antenna lines through trees.

Erwin (WI9EV) will order replacement nametags for all those who need them and want to pay $7.75 per tag. Attachment will be pin. Price includes postage to Erwin.

The meeting was adjourned at 20:50.

Respectfully submitted,
Erwin von der Ehe (WI9EV)
Secretary, W.A.R.A.C.
2015-11-10

W.A.R.A.C. Board Meeting
November 24, 2015

Howard Smith (WA9AXQ), called the meeting to order at 19:08.

Present: Tom Macon (K9BTQ), Steve Dryja (NO9B), Howard Smith, (WA9AXQ), Erwin von der Ehe (WI9EV), Dave Garnier (WB9OWN), Al Hovey (WA9BZW)

Howard (WA9AXQ) distributed 2015 Swapfest tickets to (4) persons for entry into the 2016

Swapfest e-mail spreadsheet.

Howard (WA9AXQ) gave the monthly Treasurer's report. The general fund and scholarship fund are in good shape.

Amendments to W.A.R.A.C. Constitution and Bylaws were discussed and changes recommended for final draft. Changes will be reviewed at the next board meeting.

Programs
December, 2015: Arduino Projects, Arduino "Son of Zero Beat" example by Howard (WA9AXQ), CW decoder by Frank, - See Board meeting agenda
January, 2016: Spotting & DX Software by Steve
February, 2016: Hex beam by Mike??
March, 2016: QSO party

Future Program Ideas
Arduino Show & Tell Hamtrix article by Frank (KA9ZWF)
Spotting by Gary (W9XT)
FM38 Repeater System by Dave (KA9WXN)
DSP examples using MathCad® by Steve (NO9B)
Kreg Jig Fastener System by Steve (NO9B)
SO2R Contest operating – Mike (WO9B)
AMSAT – Dick Wood?
Arduino project: Serial port monitoring of photocell
Arduino project: Interfacing to Mic inputs
Three-phase power monitors by Steve (NO9B)
Badger Weather Net – Sullivan

Club financial audits
2014 audit report by Bill Reed was read to, and approved by, the board

Other Items
Implementing a "Search for the Queen of Hearts" game for adding extra interest to meetings and raising some money for the club was discussed.
Replacement badge order to be announced in Hamtrix and names list finalized at next general meeting.
Steve led a discussion regarding succession of Swapfest organizer from Phil to someone else.
2-meter net continues and needs some more check-ins.
Meeting was adjourned at 21:41.

Respectfully submitted,
Erwin von der Ehe (WI9EV)
Secretary, W.A.R.A.C.
2015-11-24

2015 West Allis Radio Amateur Club 10 Meter Contest
Summary Sheet for WARAC sponsored contest portion

Saturday, December 12, 0000Z to Sunday, December 13, 2359Z

Rules: ARRL General Rules and Rules for HF contests apply.

Operator Name:_____   Call Used:_____

| Entry Category (Check one) | CW Only: ___ | Phone Only: _____ | CW & Phone: _____ |

| Power Level (Check one) | QRP _____ (0-5 watts) | Low Power: _____ (5-150 watts) | High Power: _____ (>150 watts) |

Scoring

CW QSOs   _____   X2   = _____   CW Points

Phone QSOs   _____   X1   = _____   Phone Points

CW Points   +   Phone Points   = _____   Contact Points

Class	Power Range	Power Multiplier
QRP	0-5 Watts	2.0
Low	5-150 Watts	1.5
High	>150 Watts	1.0

Contact Points   _____   X Power _____   = _____   Total QSO
                                 Multiplier   Points

Bonus
Number of Club   _____   X5   = _____   Club Member Points
Members Worked

Total QSO   _____   + Club Member _____   = _____   Final
   Points   Points   Score

Send this summary sheet and a copy of your log to:

Chuck Dellis
3542 S. Massachusetts Ave.
Milwaukee, WI 53220-1118

Or submit electronically at cjd@wi.rr.com

WARAC Ten Meter Contest—Dec 12-13, 2015
Chuck Dellis, W9WLX

The ARRL 10 meter contest is coming up, 0000Z, December 12 to 2359Z, December 13, 2015. WARAC members have the opportunity to join in a friendly club competition.

To participate in the club event, work the ARRL contest as you normally would. Simply follow the standard ARRL rules for the contest and bonus points will be awarded for every club member worked. The club's piggy back event has three categories, CW only, Phone only, or Mixed Mode, CW & Phone. Power level multipliers are used in determining the final score, QRP (≤ 5 watts), Low Power (> 5 but ≤ 150 watts), or High Power (>150watts). See the summary sheet for final score calculations.

Submitting your entry is easy. Send a copy of your contest log and a completed summary sheet pg 5 to Chuck Dellis at the address on the summary sheet. Electronic submission is encouraged and if you send your Cabrillo log, your entries will automatically be checked against the club roster to insure no club member bonus points were missed. Certificates will be awarded at the 2016 Awards Dinner.
Have fun!

Tales from HeathKit
By Howard, WA9AXQ

If you are going to sell electronic products as a bag of parts and an instruction manual, you will need lots of parts, and the group creating that instruction manual will be the largest department in your organization.

Parts, Parts, Parts.

Yes, HeathKit had lots of parts. There was a long hall next to the engineering labs that had bins and bins of all of the resistors, capacitors, tubes, tube sockets, screws, nuts, bolts, connectors, etc. The list goes on. These parts were used by the engineers and technicians as they developed the products. They were also used to create the proof build kits to check out the instruction manual. They were there for the taking with no requisitions, and no questions. And, if the part bin for the part that you wanted was empty, you could check it tomorrow, and the part would be there. They had a full time person whose job was to keep the part bins full. And, if you were working on a pet project, they did not mind if you used these parts.

While the engineering wall of parts had lots of parts, that was no match for the number of parts that were needed in one of their products, like the SB102 Transceiver. When I was there, they had just installed a new part storage system. It was based on a pallet stacker, a device that ran between two 6 story high pallet shelves that were probably 400 feet long. There were 3 stackers, so there

were a total of 6 pallet shelves. The Stacker ran on punched cards, and to retrieve a part, a punch card was created that told the stacker which pallet to retrieve. It would fetch the pallet and place it on its pallet receiving space. To store a part, the opposite occurred. The pallet was placed on the pallet receiving place. The punch card now told the stacker where to place the pallet.

This eventually worked really well, but there were some issues during the startup. The stacker was ready to do its work before the computer system was ready to produce the punched cards, and keep track of where a particular part was located. But they were anxious to use the new system, and started storing parts. Unfortunately, the method of tracking where the parts were stored was not done well. When they finally started using the computer system, they seemed to have 'lost' parts valued at several million dollars. It was far too expensive to unload the whole system and start over.   So, every time a pallet was retrieved, it was inspected to see that it had the correct parts on it. And, it was almost like every day brought a Christmas present in the form of some 'lost' part. Over time, this problem was resolved, and the system worked very well.

When your HeathKit arrived, there were lots of brown kraft bags that contained all of the parts needed to complete the kit. This included electronic parts, screws, nuts, and lockwashers, brackets, etc. Getting those parts into the bags was an interesting operation. There were a number of very large (40 ft diameter?) round tables. The parts going into a single bag were placed on the table, and the persons packing the kit would sit around the table. As the table rotated, a new part would appear in front of the kit packer, and he would take the required number of that part to go into the bag. Typically, one rotation of the table would produce the same number of specific bag of parts as there were kit packers. A 40 ft diameter table could accommodate perhaps 50 kit packers. There were always a couple of empty positions. If you applied to work as a kit packer, you had to sit in one of those empty positions and go through several rotations of the table. Some people were adversely affected by the rotation of the table, and did not want the job. Something about getting dizzy watching the table rotate.

Later on, they replaced the rotating tables with lines that were straight, and the parts were in bins that were on a conveyor. The kit packers sat along the conveyor line, and took the parts out of the bins as they went by. This caused less problems than the rotating tables.

Originally, HeathKit packed parts according to the part type. All resistors in one group of bags, all capacitors in another group of bags, etc. Later on, they changed to having each brown bag having the parts for a specific assembly or printed circuit board. This was a huge improvement because it helped insure that the right part went into the right location. Imagine this problem. You went to choose the next resistor, which was to be 100 Ohm, ½ Watt, and there was not a 100 Ohm resistor available. Sometime you must have used the 100 Ohm resistor for some other value, maybe like a 1K Ohm resistor. You now had to find where you mistakenly installed the 100 Ohm ½ watt resistor. This new way of packing the parts made this less likely to happen. This was a huge improvement!

Do any of you readers have any HeathKit experiences that you would like to share?

Another tale next month.

ARRL WARAC 10 Meter Contest
By Mike Johnson, WO9B

So if you are on the fence about the 10 Meter Contest coming up on December 12th and 13th, well maybe this will help. One of the guys who runs the QRP Tuesday/Thursday Foxhunt Group (http://www.qrpfoxhunt.org/) just passed along a picture of an ARRL Award Certificate he received for working this contest. It was really nice and it came as a complete surprise to him. He had no idea, and that is the whole point. You just might get lucky and win something. Wouldn't that be cool.

So I thought, well what does it take?   Last year I tossed a vertical wire antenna up in the tree, dusted off the old TS-850 and made a bunch of contacts. It was great fun and not real hard to do. The best part is everyone is talking to everyone, so it is not difficult to make QSO's. They want to talk to you.

So, really now, what does it take to do decent in that contest. Well, lets turn to the 33 page ARRL Full Contest Summary and find out. It is available on this page, under results: http://www.arrl.org/10-meter .   Pretty surprising stuff if you dig in to the details, like:

The Central Division QRP Mixed Mode (Phone & CW) won with 278,216 points. However, the Central Division QRP Phone Only winner posted a score of 23,140.
It gets even better for the Central Division QRP Mixed Mode Unlimited winner who had only 10,584 points.
And the best of all is that NO ONE entered the Central Division QRP CW Only category.
If QRP isn't your thing, than you should know the Central Division High Power Phone Only category was taken with a score of 55,512

So check it out and enter the contest smart this year. You can do it.

And when you do enter the contest, make sure you list our club correctly, as West Allis RAC. We had 161,000+ points last year but I am pretty sure I messed up the club name on my entry. That won't happen this year.

The ARRL National Parks on the Air
By Frank KA9FZR

2016 will be the 100 year anniversary of the National Park Service. The ARRL decided to help the National Park Service by coming up with a year long event. It involves activating up to 433 National Park sites with Ham Radio on site.

We can help be part of this by getting on the air as a Chaser and contacting as many units as possible.   The other option is to be an Activator who goes to the various units and activates them.

Looking at the units that are available to activate, Wisconsin has three. The Apostle Islands, Saint Croix National Scenic Riverway and the Ice Age trail. The Ice Age trail is the closest to Milwaukee going though the south and North Kettle Moraine State Forest and many other parts of the state. Lapham Peak state park seems to be a good place to operate on the trail.

We are in the preliminary stages of planning but Mike Johnson WO9B, me and a few others are looking into what would be required to set up some QRP radios and go to town. Might be a fun time.

If you interested in being a Chaser and/or Activator there is more info in the December 2015 QST pg 87-88 and on the ARRL web site www.arrl.org/NPOTA

We will be talking more at the December meeting and on the Wednesday club net on the 147.045 repeater at 8pm.

New Life for DX'ers – The CQ DX Marathon by Brian Cieslak K9WIS

The ARRL's DXCC program is the premier operating award in the DX community with the ultimate goal of reaching the top of the 'Honor Roll' by working all defined DX entities available to Ham operators. The First DXCC awards were issued in 1937.In the early days of radio with few countries supporting amateur activities and few operators, just earning DXCC was a monumental feat. Today with over 300 countries and millions of operators actively on the air, DXCC can be had in a single contest weekend.

With the advent of DX spotting nets, first on Packet and then the Internet, finding DX contacts is like shooting fish in a barrel and the DXCC scores rolled up. As you get to the top of honor roll new DX contacts come few and far between. While computers watch the spotting nets for 'new ones', DX operators spend more time watching the news for a military coup or some island government declaring independence in hopes of a new DX entity being born. Just kidding, but when a ham has worked all there is to work, activity tends to wane between the rewards of working a new country.

To keep activity on the DX bands the ARRL at one time suggested that the DXCC program be reset and everyone made to start over, but the outcry from membership was so loud that idea was scrapped. Instead they introduced several new DXCC options including the 5-Band DXCC, mode specific and band specific awards to rekindle interest. There is also the ARRL DX Challenge that tracks the DX lifetime of operating

by scoring DX entities per band and mode where the top scorer holds the 'Desoto Cup' trophy.

There are, of course the DX contests sponsored by the ARRL and CQ Magazine, but these only offer opportunities for a couple of weekends a year. Between contests rigs can sit idle and the doldrums set in. Maybe even some DX'ers lose interest and take up hobbies like model railroading or knitting.

Enter the DX Marathon
The DX Marathon, run by CQ Magazine, is a unique year long DX contest that starts at 00:00 January 1st and runs until 23:59Z December 31st every year. The goal is simple, work as many unique DX entities and CQ Zones as you can during the year. This is a contest that tests operators' skill more than their equipment capabilities. Classes of operation are organized to pit similar station set-ups against each other.

The DX Marathon was originally started in 1939 by Radio Magazine but ran only one year before World War II curtailed radio activities. It was restarted in 1948 by CQ Magazine, but was later replaced by what we now know as the popular CQ WW contests. In 2005 the DX Marathon was revived and has been growing each year. It has been popularized by the book 'A Year of DX' by Bob Locher, W9KNI. If you really want to get juiced up for running this marathon, read the book.

The Basic Rules
Here is an abridged version of the rules. I suggest you go to the DX Marathon website (http://www.dxmarathon.com/) and review the official rules in case they have changed since I put this article together or if by some slim chance I made a mistake.

There are three entry classes, "Formula," "Limited" and "Unlimited."
Formula: An entrant may choose one of two options in this class:
(1) All contacts must be made with a maximum output power of 5 watts, regardless of band or mode.
(2) The operator may run a maximum of 100 watts output to a simple antenna, such as a vertical or Inverted V.
The rules for 'Simple antenna' need some discussion.
Formula Class antennas, option 1: Operators selecting the 5 watt option are limited to antennas on a single tower and whose height does not exceed 65 feet or 20 meters above ground elevation. Wire antennas may also be used but must meet the criteria of the 100 watt option, and may be tower-supported at only one point. I asked, K9EL, one of the organizers, how supporting an antenna with a single tower applies to dipoles. His response was that a dipole supported at two ends is not legal for this class. So I guess 'Simple Wire Antenna' means sloper or inverted V or Discone.

Formula Class antennas, option 2: Antennas for operators choosing the 100 watt option must be either simple verticals or wire antennas lacking significant gain. No arrays are allowed, whether vertical or horizontal. Wire antennas, regardless of type, may not exceed 130 feet or 40 meters in length, may not be higher than 65 feet or 20 meters above ground at any point of the antenna and may be tower supported at only one point.(Inverted V or sloper). The tallest point of vertical antennas used may not be higher than 65 feet or 20 meters above ground. Yagis, quads and rotatable dipoles may not be used in this category. There is no limit on the number of antennas that may be used as long as each antenna meets the above criteria.

 Limited: Limited Class entrants are allowed a maximum output power of 100 watts and simple antennas,

such as verticals or dipoles, plus small directional antennas such as Yagis and multi-element loop, hex and quad type antennas for the 6, 10, 12, 15, 17 and 20 meter bands, and single-element rotatable dipoles for the 30 and 40 meter bands.

Unlimited: Any antenna may be used, along with any power level for which the operator is licensed.

There are no restrictions against using spotting networks.
You cannot establish contact at a higher power and then drop power during the QSO to claim the contact.

Scoring and Log Submission
Scoring is simple. Each new country is worth one point and each new zone is worth one point. You can claim a new country and new zone with one QSO. Just add them all up and that's your score.
Log Submission must be sent in by January 10th of the year following the Marathon. The log must be submitted on a special Excel spreadsheet available from the CQ DX Marathon website (http://www.dxmarathon.com/). I usually compete in the digital mode category using Ham Radio Deluxe to work PSK and RTTY. I set up a fresh log each year to log all my contacts. At the end of the year I generate a '.adi' log file. There are some programs on the web (http://software.ad1c.us/marathon/) that will use the '.adi' file to populate the special excel spread sheet. It's pretty slick. You just have to double check the zones, where there are multiple zones in a country, to make sure it converted them all correctly. Complete the spreadsheet with your personal data and send it as an attachment to 'scores@dxmarathon.com'.

The DX Bug Bites Hard
This is a fun contest and a real opportunity to start a DX discipline if you don't already have one. Typically the first few months are the most productive, but as the year goes on, new countries and sections get harder to find. You start watching the DX bulletins, the DX Clusters, listening for rumors and scanning the bands and supporting dxpeditions. You also start to notice who is in the pileups wondering if they are your competition and if you hear them make the contact you know you have to also.

To make it even more interesting we can compete as club and combine all our scores. The level playing field makes sort of DX support group breaking down the barriers between the DX Honor Roll guys in the club and the newbies. New opportunities to brag at the monthly meetings abound. Use the Marathon for an Intramural competition and offer internal club awards.

Not Too Late for This year
If you just want a taste there are a few weeks left in this year's marathon. The bands are rich with Europeans in morning and who knows what the afternoon and evening hours will bring in. I run Ham Radio Deluxe and just watch the calls roll across the Supersweeper screen. If there is a new one scrolling by, I'll jump on it. It's just that simple and fun.

Hope to see you in the Marathon.....as I look back over my shoulder...hi hi

Brian K9WIS

What, Swapfest time again?

Another year is about to end and it is time for the WARAC Annual Midwinter Swapfest event. This time it is our 44th and will take place on January 9, 2016. The location will once again be in the Waukesha County Expo Arena.

Pre-event preparations are moving along and we have already had some calls about VE Testing. For the 2016 event, VE Testing will be at a site that is across from the Expo Center and about a ¼ mile east in the Center Court Sports Complex. In the arena, we are using the same table layout as last year and several sellers have already asked for their same tables.

Let's go over some information that is worth repeating:

Advance Ticket sales from members. Club members are encourage to take some advance tickets and sell them to other hams. It is a way for guests to save $1 per ticket and helps our attendance. See Phil, W9NAW, at the December general meeting.

Want to sell or donate something? Again, there are a couple of ways to do this. If it is equipment you want to sell, you need to bring to the table over by the concession area. Other electronic parts/components or donations need to be delivered to Louie, W9GSV. As of this time, table information is not available. Labels are required and available to state your name, call, selling price and other details.

How is the swapfest going to operate? As was done in the 2015 event, sellers will bring their material thru the two loading areas on either side of the stage. **We will start this operation at 6 AM**. Steve, NO9B, will be in charge and assigned WARAC members will man carts and hand trucks. The idea here is to assist sellers in getting their items to their assigned table(s) in an expedited manner. After unloading by the seller, the WARAC manned cart will be returned to the loading area for another assignment. Any sellers in the balcony area will have their material delivered to the nearest balcony stair, unloaded and watched over by a WARAC member assigned to that stair. Movement of material thru the loading dock will require priority help. We request that where ever possible be ready to pitch in.

Assignments: Additional help will be needed at doors, ticket sales/checkers, floor directors as well as the loading dock. Assignments will be discussed at the December general meeting. We are asking members/friends to arrive about 5:30 AM. Please wear your WARAC hat/badge and, if available, bring your HT (tuned to 147.40 MHz simplex). All volunteers will be given a door prize ticket, free lunch voucher and have pre-event coffee/donuts available.

Thank you for helping and hope you have a good time---observing/buying/selling.

Phil, W9NAW
Swapfest Chairperson

Ham Radio on the Internet
  (click on red web address)

Anyone can submit websites for this column. I'll check them out and include them. The editor

This sites were sent in by Ron N9AU well worth reading.
For about ten years, I taught classes at trade shows on the topic of power and grounding for audio and video contractors. Slides for those sessions are at

http://k9yc.com/InfoComm-PowerSystems2012.pdf

http://k9yc.com/InfoComm-Grounding2012.pdf

An extensive "White Paper" on the topic is at

http://k9yc.com/SurgeXPowerGround.pdf

Earlier in this thread I posted a link to a tutorial I have given at Pacificon and at several ham clubs on the topic, this time focused on ham installations. I'll post it again. It's exactly what Matt is looking for, and it' what any ham ought to be studying carefully.

http://k9yc.com/GroundingAndAudio.pdf

73, Jim K9YC

EDITOR

Hope everyone is having a fun holiday season, have their antennas ready for the winter and has a warm, dry place to play Ham radio operator.
73
Frank KA9FZR

West Allis Radio Amateur Club, Inc.
Tom Macon, K9BTQ
3547 S. 95 St
Milwaukee, WI 53228

WEST ALLIS RADIO AMATEUR CLUB, INC.

PO Box 1072

Milwaukee, WI 53201

W9FK

http://www.warac.org

See our Web Page or contact us for more information on

- WARAC Memorial Scholarships
- Wisconsin QSO Party
- Midwinter Swapfest
- Worked all Wisconsin Counties Award
- Amateur Radio Classes

WARAC holds meetings on the second Tuesday of each month and board meetings on the fourth Tuesday of each month. Meetings are held at 7:00 PM at:

**St Peter's Episcopal Church
7929 W. Lincoln Avenue
West Allis, WI**

Entry is off the alley at the rear of the church. A wheel chair ramp and chair-lift are available.