Official Publication of the
West Allis Radio Amateur Club

Hamtrix

click here to go to web site

Volume 62, Issue 2 February, 2015

FEBRUARY CLUB HAPPENINGS

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

Club Meeting

St. Peter's Episcopal Church,
7929 W. Lincoln Avenue, West Allis
February 10,2015 **7:00pm**

Program

Frank&Erwin update on Radio merit badge
Arduino projects by Howard WA9AXQ
video "trailers" showing Wis. QSO party activity

Join us for a pre-meeting dinner
at Johnny V's Classic Cafe
1650 S 84th St at 5:00pm

Wisconsin QSO Party
March 15, 2015 - 1800Z to 0100Z

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

WARAC 2-meter net
Every Wednesday at 8pm
MATC repeater 147.045 standard offset
127.3 Hz CTCSS

Swapfest 2015
$200 Grand Prize
Elroy W. Shelley, Jr.
WB9GIE.

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 February 2014

Our Midwinter Swapfest is behind us and the switch to the Arena building went smoothly by most accounts. Although attendance was off a bit, the event had a busy feel to it. We'll have a more complete wrap-up at the meeting.

We'll be trying a little different approach at the upcoming meeting in that, instead of one main program, we will have three shorter topics on different subjects.

First will be a short presentation by Erwin and Frank about upcoming Boy Scout Radio Merit Badge classes. In March we will be holding a class for a troop to give us some experence before we do a clinic.

Second, we will talk about Arduino processor projects plus Howard will briefly go over the CW keyer project that he showed us a couple years ago. Also, we will be doing a group buy of Arduino boards for those interested. Here's your chance! Price is less than $15.00. Thanks in advance to Steve, NO9B, who will handle this.

And thirdly, we will have a couple of video "trailers" showing Wisconsin QSO Party activity. This will be a warm-up for our March 10th meeting, which will be right before our contest on March 15.

Future programs will include a presentation by West Mountain Radio, but so far we have been unable to schedule a date (maybe April?). Also, we are planning another pizza meeting in May and rumor has it that we will have an auction that night. And we will have short Arduino show-and-tell updates each month to highlight various member's projects.

Our Wisconsin QSO Party is only a month away – Sunday, March 15! This contest focuses the attention of hams all over the world on Wisconsin, and our club is privileged to be the sponsoring organization. If you haven't done so, it's time to start thinking about your operating plans - possibly operating mobile? - or setting up a portable station in another county?. Or, how about a group of members getting together to do a multi-op station? Anyone interested in spearheading this? Please let me know if you are. Along with this, it would be great to activate our club call, W9FK.

I'd like to mention that the MRAC/MAARS Swapfest is coming up on February 14th at the MPTV Auction Site, 12560 W Townsend St. (just west of 124th St between Burleigh and Capital). We will have a club table there and need some volunteers to man it.

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! Come to have fun!

Tom, K9BTQ

From the Editor

After a weekend blizzard and drop of temperatures it looks like we are getting a taste of a normal Wisconsin winter. It's nice to stay in and work on Hamtrix. Lots of pages this month. Tom Nickel KC9KEP sent in a nice article on his home-brew SSB transmitter and receiver. I only had room for two of the five pages this month but will publish the rest next month.

The merit badge clinic Erwin WI9EV and I are working on for the Boy Scouts is coming along. It looks like we will try it on the troop of a friend of mine in March. We're still finalizing how we will break it up and what help we will need. Since one of the requirements is to have a QSO on the air I'm sure we will be asking for help with that.

I'll keep it short this month

73

Frank KA9FZR

WARAC General Meeting Minutes
January 13, 2015

Introduction
The meeting was called to order at 7:01 pm by President, Tom Macon, K9BTQ. Overall meeting attendance was 30 including 3 visitors.

Program
The evening's program was a discussion of the Arduino Micro-Controller board by Howard Smith WA9AXQ with demo projects by Steve NO9B and Jim WB9IXS, and Don K9AQ

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

Swap Fest Wrap Up: Phil Gural W9NAW gave a nice run down of the swap fest. Thanks to everyone for all the help. Financially the event was about the same as last year. Scholarship fund sales were about $500. VE Testing completed 17 Exams.

2015 Membership Applications and dues should be completed. All non-life members need to fill out the renewal form and return with the annual dues.

Wisconsin QSO Party is 2 months away. Stay tuned for more info as it gets closer.

MRAC and MAARS Swap Fest is Feb 14th. AES Superfest will be March 21st.

Need to perform an audit of the Clubs Books for 2013. Two volunteers are needed. Bill Reed, N9KPH, volunteered. Tom will make another volunteer selection for the January Audit.

Next month's meeting will be Higgins Tower service or West Mountain Radio. Following month will be QSO Party related.

Revised 2014 Membership Booklets are available at the meeting. Members welcome to a copy.

Announcements
2 meter net every Wednesday at 8:00 pm on 147.045, + offset, PL 127.3. Join in!

CQ Tuesday, 1:00 pm, 3rd Tuesday, in Waukesha at the New China Buffet.

The Nut Net breakfast is at Genesis Restaurant, 8:30 am, 4th Tuesday of the month.

Dinner at Johnny V's, 5:00 pm before the WARAC club meeting.

The meeting was adjourned at 9:10 pm.

Respectfully submitted,
Mike Johnson, WO9B
Secretary WARAC

WARAC Board Meeting
January 27, 2015

Howard Smith, WA9AXQ, called the meeting to order at 7:05 pm.

Present: Tom Macon, K9BTQ, Steve Dryja, NO9B, Howard Smith, WA9AXQ, Erwin von der Ehe, WI9EV, Frank Humpal, KA9FZR and Mike Johnson, WO9B.

Membership Renewal Forms and Dues
HOWARD Smith WA9AXQ presented the summary of membership renewals. Non-renewed current active members will be contacted.

Swapfest
Swapfest overall went very well. The balcony vendors voiced some dissatisfaction, but otherwise the new venue worked well. The financial results are not quite ready at this time. For next year, the date desired is Jan 9th. Only the Arena building is available on that date. We will approach Waukesha to confirm the arrangements for next year and possibly beyond.

2015 Budget
Budget was discussed. Howard will incorporate the Swapfest results into the budget.

WI QSO Party
Tom K9BTQ sent out notifications to Wisconsin Ham Clubs trying to generate interest. Award Plaques are still being investigated.

Radio Merit Badge
Erwin, WA9BZW reported they have a tentative date to commence training in March. Possibly set for Tuesday nights. Program and location details are being worked out.

Program
February – Arduino Group Buy by Howard, Radio Merit Badge, WIQP Demo Presentation
March – WIQP, Arduino Group
April – West Mountain Radio, 3 Phase Power Monitors
May – Pizza Night,
June – Field Day, Chuck W9WLX

Future Program Ideas
Milwaukee Astronomical Society (early spring)
Logbook of the World
Spotting – Possibly in the Fall
3 Phase Power Monitors
Balloon Projects
FM38 Operations
Yaesu Fusion System
Kreg Jig Fastener System

Club Operations Manual
Tom, K9BTQ updated component documents on the FTP site. Board members should review on the FTP site. No further update.

2011 Audit
Was completed, report filed.

2012 , 2013 and 2014 Audit
Tom has selected volunteers and will schedule the review event.

Other Items
2 meter net has been well attended. Mike keeping the momentum rolling.

Meeting was adjourned 9:30 pm.
Respectfully submitted,
Mike Johnson, WO9B
Secretary WARAC

On Board with Arduino

I certainly enjoyed presenting the Arduino to all of you at the last club meeting. I also enjoyed the presentations by Steve, Jim, and Don.

I will have another short presentation at the next meeting. I will talk about your first sketch, which is called Blink. Yes, it will blink a simple LED. Maybe you could tell me how to change the appearance of the blink by a simple program change. I will also have the CW keyer to demonstrate that I presented back in 2010, based on a QEX article.

The WARAC board had an interesting Arduino discussion at the last board meeting. The discussion was about how to make it easy for you to get an Arduino board, and to jump feet first into programming a sketch of some project that you would like to experiment with. The solution was really simple. There will be a signup sheet at the February meeting for a group purchase of the Arduino board, a couple of 'shields', and a couple of the books. Prices will also be indicated on the signup sheet. You can sign up for any of these. Steve D. has offered to take the list and order the items which should be available at the March meeting. You can pay for the items that you ordered when they are picked up. Now, that should make it easy. Gentlemen, start your Arduino's!

If you are interested, I would consider making this a monthly column in Hamtrix. I would need some help with suggestions about what topics to write about. Let me know your thoughts...

73..
Howard, WA9AXQ

Swapfest Price Trivia

Mike Johnson, WO9B

The WARAC Swapfest has drifted into the upcoming events for next year category and for the most part, we've moved on to the WI QSO Party or ??? The Swapfest was a great time and naturally we all hovered over some nifty shiny bauble perched on a vendors table that was calling out our name. Maybe the price was just a bit too high. Maybe the thought was to circle back and see what the end of show price would be.

Deep down, let's face it, we all want to get a great deal. So lets see how good we are at getting that great deal. I wandered around and picked out a few items with the challenge being who among us can guess the closest to what the **Asking Price** was on the items shown.

Ready to give it a try and play Swapfest Price Trivia?

Item 1: Classic Drake 2B-Q Receiver in "Mint" condition.

Item 2: KB9VBR 2 Meter J-Pole Antenna. The right price is the Show Special pricing!!

Item 3: Drake MN-2000 Antenna Tuner.

Item 4: Who said they had to all be Ham Radio items? How about 18 Used Golf Balls?

Item 5: As a tribute to Howard's Jan Club Meeting presentation, here is the Arduino Uno board. They had a Show Special Price. How Special was it?

So there you go. To enter is really easy. At the next club meeting drop your best estimate into the jar. The winner will be the one who is closet to the total **without going over** and will be announced at the end of the meeting. We've got a $10 Gift Card from Speedway on the line, and for now at least, that's enough gas to be worth it. You only get one entry, make it count!!

HBR-11 and 1962 ARRL HF Crystal Filter SSB Transceiver Station

A Vintage Homebrew Transmitter/Receiver by KC9KEP

The 1960's were the years that Ham Radio made an impression on me. I've always found vacuum tube technology intriguing. Like the old coal burning locomotives, they're high maintenance, inefficient and run hot, but they have character that cannot be denied.

So, when I returned to ham radio, I knew I had to build my own equipment, and it had to be done with tubes!

The Receiver - I had constructed several tube receivers starting in the year 2000, but my best performing receiver was the Ted Crosby "HBR" or Home Brewed Receiver. Ted's receiver designs first appeared in QST magazine in 1957[1] and again as recently as 2009[2]. A quick search on the ARRL's QST archive indicates at least a dozen different references to this design, so it was quite popular in its day!

The SSB Transmitter - I had considered several different technologies before selecting the design that I decided to replicate. I shied away from the SSB phasing methodology as well as the DSSC (Double Sideband Suppressed Carrier) designs and decided to go with a filter rig. I located the earliest filter-SSB transmitter featured in the ARRL handbooks. The transmitter design of choice first appeared in the 1962 ARRL Handbook[3]. My goal was to replicate the Handbook transmitter in appearance as well as in functionality.

Construction - For both units, I created my chassis on a sheer and brake and utilized 0.090" aluminum. Black anodized aluminum was used for the front panels. The graphics on the panels were created in CorelDRAW and laser engraved, which produces a nice factory finished appearance.

Procuring parts was one of the biggest hurdles. Luckily, vacuum tubes are still routinely sold

[1] *QST* July 1957 – (Pg. 11-17, 148, 150) - "Ham-Band 14 tube Double-Conversion Receiver" – Ted Crosby – W6TC

[2] *QST* Feb 2009 - (Pg. 96) – "Ted Crosby W6TC, and the HBR Receiver" - Dilks III, John H., K2TQN

[3] *ARRL Handbook* - 39th edition "A High-Frequency Crystal-Filter Sideband Exciter".

through online vendors and Amateur Radio swap-fests. Frequently, I will purchase a component that is not immediately needed if it appears to be something that could be used for future products. One eventually stockpiles quite an arsenal of radio parts! In some cases, I have utilized my own homebrewed coil-winder[4] in order to create coils that are no longer available.

It was actually easier for me to get the receiver operating than it was to get the SSB transmitter debugged. In the case of the receiver, I was able to simultaneous test and validate the circuitry as I fabricated sections. I started with the audio amplifier and worked backwards towards the front end of the receiver.

The transmitter required a great deal of "tribal knowledge" to get working to an appreciable level. I learned that it is important to use non-inductive disc capacitors with very short leads to bypass all power supply and even filament connections. I also discovered that even short lengths of shielded cable, when used to prevent internal signal leakage, provided more than enough capacitance to de-tune critical circuits. Small metal shielding sub enclosures prevented leakage between critical circuits.

Measuring the performance of tank coils and filters required specialized tools. Some devices, such as a grid dip meter are extremely helpful. A spectrum analyzer is another great tool for verifying filter operation. I quickly learned that I had to fabricate "near field probes" in order to measure circuit performance without loading down the circuit under test!

Operation - But, even when the transmitter and receiver are operational, one is not on the air yet! The operator needs a way to get the equipment operating in unison for the sake of ease of operation. If you think about what happens when you key a transceiver;

1.) The antenna must be disconnected from the receiver.
2.) He antenna connection to the receiver must be "shorted" to ground.
3.) The receiver must be muted in some fashion.
4.) The antenna must be connected to the transmitter.
5.) The transmitter must be keyed.

This process must be followed in reverse when you want to receive again. And, that is just what I was doing manually, during my initial QSO's! Also, the tube equipment will drift off frequency for some time due to heating, until it stabilizes. This requires the operator to perform periodic minor tweaks in the tuning of the receiver while QSO-ing. All this can keep the operator busier than a one legged man in a butt kicking contest!

The station needs a "T/R Sequencer" to manage these tasks for you. I found such a device named "The At Last T/R Sequencer"[5]. It's a really nifty device that is PIC controller operated and is programmable via a serial link to a laptop. I did add a relay to switch over the antenna, but all is controlled by the T/R sequencer and one foot switch. Very handy indeed!

Additionally, one needs a way to select multiple stable frequencies on which to transmit. I started with FT-243 crystals. But, here's the trouble that crystals created;

[4] *YouTube-Video* "Morris Gingery Ham Radio Coil Winder" – KC9KEP

[5] Mar 2007 - QST (Pg. 32) - The "At Last!" Radio TR Sequencer - Zauhar, Bertrand, VE2ZAZ

Tom Nickel's article will be completed next month

Swapfest Photos
January 10,2015

Ham Radio on the Internet
All new this issue (click on red web address)

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

"The New DXer's Handbook"
Second Edition
http://www.k7ua.com/
Free download good ideas for any operating.

Passwords again!
http://www.pcmag.com/article2/0,2817,2475409,00.asp?mailingID=76E76946E280AEC9B9B83827387C4859?mailing_id=1151118

When a hack isn't a hack:
http://www.pcmag.com/article2/0,2817,2475095,00.asp?mailingID=76E76946E280AEC9B9B83827387C4859?mailing_id=1151118

commercial HF digital testing
http://www.tvtechnology.com/distribution/0099/list-of-experimental-licenses-reveals-interesting-hf-data-comm-experiments/274152

One step closer with replacing mechanical relays with solidstae ones
http://www.ecnmag.com/product-releases/2015/01/rf-switch-operates-zero-hertz?et_cid=4390668&et_rid=353748193&type=headline

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.