



# The BAARCer



August 2007

For Anyone Interested in Amateur Radio

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**Club Call:** WØUJ

Brainerd Repeaters:  
 53.110 MHz- 123.0 Hz  
 147.225 MHz +  
 145.130 MHz- Echo Link  
 Node number 233515  
 443.925 MHz + 110.9 Hz  
 Packet: 145.670 MHz  
 BBS MNBRD, WØUJ  
 Club DX Cluster:  
 147.525 MHz BRDDX  
 144.390 WØUJ-5 APRS  
 Crosslake 147.030 MHz+  
<http://brainerdham.org>

**President:**

Lyle Amundson KØLFV

**Vice President:**

Jim Talbott WØYA

**Secretary:**

Darrell Schneider ABØVP

**Treasurer:**

John Myers W3MQD

**Director At Large:**

John Luce WØJGY

**Repeater Trustee:**

Fritz Bertelt WØKO

**BAARCer & WWW Editor**

Mark Persons WØMH

## Antenna Analyzers Explained



**Mark WØMH** gave a talk on how to use an MFJ-259 Antenna Analyzer. He started by giving a history of antenna impedance matching and the 50-ohm standard by which we measure VSWR (Voltage Standing Wave Ratio). More details on **Page 5** of this **BAARCer**.



The **Annual Fox Hunt** will be August 18th. Fox Hunt Chairman Terry KIØFW is coordinating the event. Details on Page 7 of this **BAARCer**.

The Annual BAARC Picnic and August Membership Meeting will be at the home of Mark WØMH and Paula WØHA starting at noon on August 18th after the Fox Hunt. See **BAARCer** Page 7 for details.

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———— **Events Calendar** ————

- Wednesday, Aug. 1** 1:00 PM to 2:00 PM Monthly siren and civil emergency test.
- Saturday, Aug. 4** 9:00 AM to 10:00 AM Informal breakfast at the Northwind.
- Sunday, Aug. 5** 8:00 AM to 1:30 PM **Cedar Rapids, IA, Hamfest.**
- Sunday, Aug. 5** 8:00 PM to 8:30 PM Sunday Night Net on 147.225+ MHz.
- Saturday, Aug. 11** 10:00 AM to 2:00 PM **Tailgate Swapfest** at St. Cloud, MN.
- Sunday, Aug. 12** 8:00 PM to 8:30 PM Sunday Night Net on 147.225+ MHz.
- Saturday, Aug. 18** 9:00 AM to 10:00 AM Informal breakfast at the Northwind.
- Saturday, Aug. 18** 10:15 AM to 2:00 PM **BAARC Fox Hunt and Meeting.**
- Sunday, Aug. 19** 8:00 PM to 8:30 PM Sunday Night Net on 147.225+ MHz.
- Sunday, Aug. 26** All Day **Baxter Triathlon aided by BAARC.**
- Sunday, Aug. 26** 8:00 PM to 8:30 PM Sunday Night Net on 147.225+ MHz.
- Sunday, Sept. 16** 8:00 AM to Noon **MARA/LARA Hamfest** in Shoreview, MN.
- Sunday, Sept. 23** 9:00 AM to 1:00 PM **Fall-Fest Hamfest** in Carlton, MN.

**July 26, 2007, 4:00 PM - BAARC Board Meeting Minutes – Brainerd Library**

The meeting was opened by President Lyle KØLFV while in attendance were Treasurer John W3MQD with Vi, Al WØRC, Shirley KØDCW, Mark WØMH, Terry KIØFW, and Secretary Darrell ABØVP. The Report of the June Board of Directors and the General Membership Meetings as published in the BAARCer were accepted as written.



Treasurer John W3MQD presented the June 30<sup>th</sup> report to the board. Al WØRC moved approval of the financial reports which after a second by Terry KIØFW was unanimously approved.

The successful Hamfest was discussed. Details are on the BAARC website.

The meeting was adjourned at 5:00 PM following a motion by Mark WØMH.

Respectfully submitted, **Darrell ABØVP**, Secretary

**July 26, 2007, 7:00 PM - BAARC Membership Meeting Minutes – Brainerd Fire Station**

President Lyle KØLFV opened the meeting held in the Training Room of the Main Brainerd Fire Station with about twenty Hams and a guest in attendance.

The Minutes of the June Membership Meeting as published in the BAARCer were accepted as written following a motion by Fritz WØKO that was seconded by Mark WØMH.

The June Financial Report was unanimously approved following a motion by Terry KIØFW and seconded by Skee WØDCY.

The successful Hamfest was discussed. Details are on the BAARC website.

The August Membership Meeting will be held on August 18<sup>th</sup> following the Fox Hunt at the galactic residence of WØMH and WØHA with details on the BAARC website. The September Membership Meeting will be on September 27<sup>th</sup> at the Fire Station.

**VE Coordinator is needed.** Jim WØIRE has served in this important position with distinction for the past six years mustering a record level of newly licensed Hams onto the world stage. Jim WØIRE would like to mentor a replacement to pass on his secrets of success to this new VE Coordinator.

The business meeting was adjourned at 7:25 PM.

Mark WØMH presented an interesting and informative program on VSWR and the use of an antenna analyzer in the design and operation of antenna systems. Brian KØEOU brought the latest model MFJ SWR Analyzer and joined in the discussion of antenna design along with Terry KIØFW and others. Details of the presentation are on the BAARC website.

Respectfully submitted, **Darrell ABØVP**, Secretary



**Mission Statement:** The Brainerd Area Amateur Radio Club is comprised of about 85 licensed Amateur Radio Operators who meet monthly to exchange ideas, improve radio skills, organize activities that are of service to the area, promote development of Amateur Radio, and join together in the mutual interest in Ham Radio. The BAARCer newsletter is provided to club members for information and entertainment as a non-profit service. The material is supplied "as is" and without warranty. Permission is granted to copy and distribute any information published here provided the source is credited.

Because space is limited in the BAARCer newsletter, you will often find more photos and more details for club news stories on the BAARC website at: <http://brainerdham.org>

**7-2-07: The St. Cloud 147.015 MHz+ Repeater** now requires a tone of 100.0 Hz. You need to transmit with that tone frequency in order to get in.

**At Breakfast on Saturday, July 7th:** Fritz WØKO, Jim WØIRE, Skee WØDCY, Greg NØLJY, Greg's wife Brenda (no callsign yet), Charles W5CCL, Paula WØHA, and Mark WØMH.

**5/31/07: The Gull Lake 443.925 MHz Repeater** is down for repairs. Stay tuned for updates.

There was a very nice article in the Monday, July 16th, Brainerd Daily Dispatch newspaper about the Brainerd Area Hamfest. For the full text, go to the write-up page on the Club website at <http://brainerdham.org/2007/7-16-07-dispatch-article.html>

**The Habitat For Humanity** organization used the Brainerd 147.225+ Repeater for coordination on a money-raising bicycle run through the area on Thursday, July 19th, and Friday, July 20th. Fortunately everything went well and no special help was needed to make their event a success.

**Ten years ago in the BAARCer:** Paula WØHA just received her Extra Class license (ABØGB) which was later changed to WØHA. Alan Sherburne KCØBQP was welcomed as a new member. He has since changed his call sign to AAØAS.

**At Breakfast on Saturday, July 21st:** Fritz WØKO, Skee WØDCY, Charles W5CCL and Kathy KD5EGN, Paula WØHA, and Mark WØMH. There was an interesting discussion about the SCUBA diving that Paula does.

**August 10, 1910,** James McCurdy sent the first aircraft-to-ground wireless message.

**One of Crosby, Minnesota's, claims to fame is based on an event that took place on August 19, 1957.** On that day, a manned balloon was launched from the bottom of the 425 foot deep Portsmouth open-pit iron mine just north of Crosby. This was part on an Air Force project called Project Manhigh. Its purpose was to gather data on the behavior of a balloon in an environment above 99% of the earth's atmosphere and to investigate cosmic rays and their effects on man. The pressurized capsule was launched under a gigantic polyethylene balloon that expanded to a diameter of 200 feet and contained more that 3,000,000 million cubic feet of helium. The pilot, Major David Simons, flew the balloon to an altitude of 101,516 feet in 2 hours and 18 minutes.

**Tom WØQF of Hackensak** is at the Mayo Clinic in Rochester, MN, being treated for Acute Myelogenous Leukemia. The illness came on suddenly and is very serious. Tom made 157 CW contacts on Field Day with the BAARC. Learn more at <http://caringbridge.org/visit/thomasjones>

## 7th Annual Brainerd Area Hamfest was a Success



The Saturday, July 14th, Brainerd Area Hamfest went well with great weather and lots of visitors. Club members who worked at or attended the Hamfest included Al WØRC, Shirley KØDCW, Lyle KØLFV, Charles W5CCL, Greg NØLJY, Ed KAØEXB, Mark WØMH, Paula WØHA, Jim WØIRE, John W3MQD, John WØJGY, Jim WØJDS, Fritz WØKO, Curt NØCRM, Art NØTNJ, Marv WØYHE, Ray KBØVSN, Skee WØDCY, Roger WØWUG, Terry KIØFW, Bernie KØIMN, Brian KØEOU, Lyle KØLR, Kathy KØTHY, Tom WBØCZZ, Gary KØPOW, Dave KCØTGT, Arnie KBØVNJ, Mike WAØLVG, Randy KCØEGE, and Mike KCØYSF.

Commercial Vendors included Radio City, Donn ADØN, the hat maker, and Pat WØOPW with his NEC2GO antenna modeling software.



Three Hams representing the ARRL were there too. (photo l-r) is Frank N1UW, MN Section Emergency Coordinator for the ARRL. In the middle is Skip KSØJ, ARRL MN Section Manager. On the right is John W3FAF, ARRL MN Section Technical Coordinator and Official Observer Coordinator.

John WØJGY is shown giving away prizes. Ted Felguson of High Bridge, WI, won \$50 in cash. Daniel Landweir of Wadena, MN, won \$100 in cash. Elvin NØOYW of St. Cloud, MN, won an ARRL Repeater Directory. It was donated by the ARRL. Steve WØTNT of Baxter, MN, won an ARRL Antenna Handbook donated by the ARRL. Harlan Heinen of Bloomington, MN, won a \$25 gift certificate from Batteries Plus in Brainerd. Perry WDØFET of Sturgeon Lake, MN, won an AM/FM/TV Radio donated by Radio City. Curt NØCRM of Aitkin, MN, won an ARRL book entitled From Spark to Space, donated by Radio City. Terry KIØFW of Crosslake, MN, won a \$25 gift certificate from Batteries Plus in Brainerd. Donna Beaman of Perham, MN, won an ARRL book entitled From Spark to Space, donated by Radio City. Joyce KCØJRM of Park Rapids, MN, won a copy of the 2007 ARRL Handbook donated by the ARRL. Del KØDEJ won a current ARRL Repeater Directory donated by the ARRL. Al WØRC won two VCR movies





## Speech by Mark WOMH at the July 26th BAARC Membership Meeting

When I was a 16-year-old Novice Ham in 1963, one of my first transmitters was a one-tube CW rig. The trick was to put the key down and then tune as quickly as possible for minimum glow on the tube. Was I tuning for low VSWR into a 50-ohm load? No, I was tuning the transmitter output section to match the antenna impedance. One antenna was a dipole at about 70 ohms and the other was a long wire with a very unknown impedance. Regardless, this tuning got the rig on the air.

What is different today? Well, our solid-state rigs are designed and built to a 50-ohm standard. We could use a 75-ohm line impedance as the television receiver industry does. There was a 51.5-ohm standard at one time too, along with a few others. Through a process of elimination, 50 ohms has become the standard for two-way radio, radio broadcast, television broadcast, and most of Ham radio.

There is nothing "magic" about 50 ohms except it is the "standard" to which most of our equipment is built. Impedance matching and transferring power is more than just having an antenna with a 50-ohm feed-point resistance. The equation almost always includes a transmission line (coaxial cable). If you have a 50-ohm antenna and a 75-ohm transmission line, then your rig will probably not see 50 ohms. In this case, the length of the line will determine the impedance the rig sees. To keep it simple, you should use a 50-ohm line on a 50-ohm antenna. Many rigs are fix-tuned and need to see a 50-ohm load. If the rig does not see 50 ohms, then it will not deliver the expected power to the antenna. The final power amplifier could overheat and fail or go into VSWR fold-back. This is a common problem on HF mobile rigs.

Conversely, your receiver will not have all the apparent sensitivity it could have if the input is not 50 ohms. Try this for yourself someday: On HF, adjust your antenna tuner for low VSWR on transmit. Listen to a weak signal on or near that frequency. Then misadjust the tuner. The signal will fade down. Yes, that's right, you need a good impedance match to effectively couple power from the antenna to the receiver.

What are we doing with an antenna tuner? Well, we are adjusting the transmission line and antenna combination to 50 ohms impedance so the rig is happy. The tuner is a "variable transformer."

What is VSWR? It is Voltage-Standing-Wave Ratio, sometimes known as SWR (Standing-Wave Ratio). The strict definition is, "The ratio of the maximum voltage to the minimum voltage resulting from the interaction of the forward and reflected waves."

How do we get reflected waves? It is the lack of proper impedance matching. A good example is an open or a shorted transmission line where the RF power gets to the end of the line and has no way of being consumed, so it is reflected much like light is reflected in a mirror.

When transmitting, we want the RF power to be completely absorbed/consumed by the antenna. The antenna in turn radiates the signal into the air. Any RF energy that is not radiated is lost as heat, much as in a dummy load. Yes, a dummy load will have low VSWR if it is 50 ohms too. A dummy load, as you know, will convert virtually all of the input RF directly to heat. Just a little RF will leak out into the air.

A really great tool for testing and adjusting antennas and antenna systems is an antenna analyzer. Because all antennas are frequency selective, the antenna analyzer needs to operate at just one frequency at a time giving antenna impedance data on the frequency of interest.

How does an antenna analyzer do its work? Well, it transmits a very low-level signal and uses a "bridge" circuit to determine what impedance it sees. I use one as a part of my HF Ham station. Rather than putting 100 or 400 watts on the air to adjust my antenna tuner, I use the antenna analyzer to adjust the antenna tuner. Because the power is a low 20 milliwatts (.002 watts), almost no one will know I am tuning-up. It also avoids my being called a "lid." This procedure also reduces stress on my rig and linear amplifier. A simple RF switch allows my rig to work into the antenna or the antenna analyzer.

An antenna analyzer is a great tool and the BAARC has one to lend to members. **Mark WOMH**

## Sage Advice From the FCC Special Counsel in the Spectrum Enforcement Division, Riley Hollingsworth's speech at the 2007 Dayton Hamvention

The Amateur Radio community needs to "lighten up" on the air. Hollingsworth urged his audience to take his message to heart. "All of you can learn from each other," he said, "and you need to work together more and show a little more respect for your diverse interests and for the Amateur Service as a whole. It isn't about you. It isn't about enforcement. *It's about Amateur Radio.*"



As radio amateurs take to the airwaves, he continued, they need to decide what's most important--the best interests of ham radio or their ego, pride or perceived "rights." "I realize I may be preaching to the choir here, but on the air you need to be more cooperative and less argumentative--and I need you to take this message with you when you go home," he continued. As a "homework assignment," Hollingsworth encouraged his listeners to read the "It Seems to Us . . ." editorial, "Most Effective Use," by ARRL Chief Executive Officer David Sumner, K1ZZ, in the May 2007 *QST*. In his commentary, Sumner stressed that interference occurring as a side effect of legitimate Amateur Radio activities in crowded bands "is simply a fact of life" and that it's "unfair to your fellow amateurs to assume that every instance of interference you may encounter is a hostile act."

Hollingsworth offered good news and bad news. "The good news: Nothing is wrong with Amateur Radio," he allowed. "It is a good service that is showing its value to the public on a daily basis." The bad news, he asserted, making a comparison to "road rage," is "that there is an element of Amateur Radio that too often reflects present society generally." Hollingsworth urged all radio amateurs to cooperate more and depend less on the FCC to solve their operating issues.

"We live in a rude, discourteous, profane, hotheaded society that loves its rights, prefers not to hear about its responsibilities, and that spills over into the ham bands," he said. Hollingsworth's bottom line: Be flexible in your frequency selection and make regular use of the "big knob" on the front of your transceiver to shift to any of the "thousands of frequencies and hundreds usable at any given time of day or year" as necessary to avoid problems. "The world is ugly enough -- don't add to it," Hollingsworth advised.

"We can enforce our rules, but we can't enforce kindness and courtesy or common sense," Hollingsworth concluded. "And a very wise person, FCC Wireless Telecommunications Bureau staffer Bill Cross, W3TN once told me: 'You can't regulate stupid.' If we could, we'd be working for the United Nations instead of the FCC."

### Amateur Radio Licensees Responsible for Rule Compliance

In his comments, Cross singled out the controversy that erupted recently over fears that automatically controlled digital stations would overwhelm the amateur bands, eclipsing most other modes. Cross cited §97.7 of the rules, which requires each amateur station to have a control operator and, in essence, to employ a "listen-before-transmit" protocol."

When a station is under automatic control, regardless of the transmission mode, Cross explained, the control operator need not be at the control point, but must employ station control devices and procedures while transmitting that ensure compliance with the FCC rules and does not cause harmful interference to ongoing communications of other stations. The operational rule, Cross said, is: "**Your call sign, your responsibility.**"

(reprinted from the ARRL website)



This year's **BAARC Annual Fox Hunt** will start at 10:15 AM, August 18, after our Club Breakfast (please do not turn your radios on until the 10:15 AM start time). The Fox will transmit on frequency 146.52 MHz, and the signal will have a 15-second Morse Code identifier, followed by a steady tone. The signal will be 5 watts continuously. The transmitter is in an ammunition-style container (please do not disturb).

My preference is to have three different start points: One, the original (east side of Brainerd Mall); Two, the parking lot just immediately to the west of Coco Moon Coffee House; Three, the parking lot of Westgate Mall. I don't know how many will participate in the Fox Hunt, so please assign yourselves to the various start points.

The Fox will be on public property, or public-right-of-way, and will not be deeper than 5 feet under water (Ha !) or above 15 feet above ground. When you have discovered the Fox, please note the time, move quickly away from the area, and report the find to me (K1ØFW) via the 147.225 MHz + Repeater. I will be monitoring the repeater, and will not be close by.

After the Fox Hunt, the noon picnic and short BAARC business meeting will be at the home of Mark WØMH and Paula WØHA. To get there from the center of Brainerd where Highways 371 and 210 intersect, also known as the intersection of Washington and Sixth Street, at the famous concrete water tower, go west on Washington Street (Highway 210) about six blocks and cross the Mississippi River. Continue west 0.1 mile and turn north on NW 4th Street, also known as County 20. This is the intersection where Walgreens Drug Store is and there is a stoplight. Go 2.1 miles to Island Drive. There is also an Ellingson housing division sign. Turn left and go 0.3 miles to the mailbox with 10032. The Ham tower and house is on the right. Look for the faces of smiling Hams in the yard. GPS coordinates: 46-19-52 N, 94-12-59 W. Bring your own food. A gas grill will be available for cooking. See you there.

After the picnic, if members wish, they can use their GPS's to find any/all of the following 4 hidden medallions (these 4 are in Brainerd): Look for a 1-inch round aluminum medallion (animal rabies tag) about 3-1/2 feet off the ground at each location. Look for a Fox 1, Fox 2, etc. on one side of the tag. Fox 1: N 46-21.388, W 94-14.800, Fox 2: N 46-21.200, W 94-12.621, Fox 3: N 46-21.527, W 94-13.775, and Fox 4: N 46-20.840, W 94-12.393. Good Hunting !!!!!!! **Terry K1ØFW, BAARC Fox Hunt Chairman.**



Minnesota Governor Tim Pawlenty proclaimed the dates of June 23rd and 24th as **Amateur Radio Operator Recognition Days** in Minnesota. It was Greg KGØU of the Crow River Amateur Radio Club in Dassel, MN, who got the ball rolling on this one.

<http://w0crc.org>



The Brainerd Area Amateur Radio Club will provide communications for the Annual Baxter Triathlon on Sunday, August 26th. The race will begin with a ½-mile swim in Whipple Lake, then switch to a 17-mile bike ride through the rolling hills surrounding the Baxter-Brainerd Lakes Area and end with a four-mile run through a nearby residential area. Sign up with Lyle KØLFV to participate as a radio operator. This is a fun event for radio operators. A great lunch and T-shirts are provided.

Additional event information can be found at:

<http://www.pickleevents.com/events/lctri>

**Sunday Night Net Control Operators on the 147.225 MHz+ Repeater at 8 PM:**

8/5/07	Paula	WØHA
8/12/07	Mark	WØMH
8/19/07	Marcia	WØZMC
8/26/07	Bob	WØZPE
9/2/07	John	WØJGY
9/9/07	John	W3MQD
9/16/07	Terry	KIØFW
9/23/07	Dave	KCØTGT
9/30/07	Jim	WØYA

Can't make the schedule? Find a substitute operator. BAARC Sunday Night Net Control Coordinator is Fritz WØKO. Contact him to volunteer. [finn.kraut@charter.net](mailto:finn.kraut@charter.net) 829-1329.



**BAARC, Inc.**

Ham Radio at its best in the Lakes Area  
Affiliated with the ARRL

Find us on the Web:

<http://www.brainerdham.org>

**- - - Upcoming Membership Meetings - - -**

The **Annual Fox Hunt and Picnic** will be August 18th. Details on Page 7 of this BAARCer.

**Annual Baxter Triathlon will be on Sunday, August 26th.** Hams are needed to help with communications. Contact Lyle KØLFV to volunteer.

The Brainerd Area Amateur Radio Club will handle communications at the **Cuyuna Bike Tour on September 8th**. Contact Terry KIØFW to participate as an operator. Details to follow.

**The September 27th Membership Meeting** will be honoring those who have been Hams for 50 years or more. Stories will be told and cake will be served.

The BAARC is looking for a new VE Coordinator to replace Jim WØIRE who is retiring from the job after about five years of faithful service. Contact Lyle KØLFV to volunteer for the position.

**United We Stand**



**FIRST CLASS MAIL**  
Address Correction Requested

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