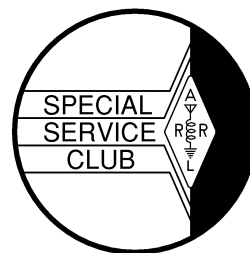




# The *ORC* Newsletter

Official publication of the Ozaukee Radio Club, Inc. Mail all contributions to the editor, Tom Ruhlmann, W9IPR, 465 Beechwood Dr., Cedarburg WI 53012 (phone 262 377-6945). Permission to reprint articles published in any issue is granted provided the author and the Ozaukee Radio Club Newsletter are credited.



AMATEUR RADIO

**ORC Repeaters on 146.97, 224.18 and 443.750 MHz -  
Callsign W9CQO      Web site: <http://www.qsl.net/orc/>**

Volume XXIII

April 2004

Number 4

## The Prez Sez

By Vic Shier (KB9UKE)

Mark your calendars the 26<sup>th</sup> Annual ORC Swapfest is only four weeks away. Set up is on Friday evening April 30<sup>th</sup> and take down is on Saturday May 1<sup>st</sup>. Running a successful event for 26 consecutive years is quite an accomplishment and there are several reasons that our swapfest is successful. Basically, we run a good Fest. We have a good location with ample parking and easy access. The vendors know we will have a good turnout so they can sell their products. Hams throughout the area know there will be a good selection of vendors there so there will be lots of stuff to shop for. It goes hand-in-hand. The efforts of Gene, KB9VJP our current chairman and all of the past chairs have provided the leadership to create this tradition but obviously they didn't do it alone. Contact Gene and let him know you are available to help out in some way.

Dave, N9QA, the chairman of the Scholarship committee, has informed me that he would like to resign as chair. He is unable to attend our monthly meetings and believes the position would be better served with a more active member in that role. The position does not require a big time commitment and he is willing to teach the new chair what is required. Please contact Dave or myself if you are interested in this position. Thanks to Dave for providing many years of leadership in this important community service provided by the ORC.

Our booth at AES Superfest was a success; we signed up a few members and had an opportunity to tell many hams about our upcoming swapfest. We also got to see some new products like the \$11,000 radio from Icom. One of the fun aspects of ham radio is being involved

in the latest technological advances like the D-Star system. The April edition of QST had an amazing article on ESE. New developments have made it possible to bounce signals off the sun using some fairly simple equipment. Sometimes this technology is hard to believe.

73's and remember...It's a hobby!

## N9NNA (Jim Raasch) SK

De WA9JOB, Nels

A few weeks ago, one of the Ozaukee Radio Club members, James W. Raasch, N9NNA, was taken from his family and us at an untimely age.

I first got to know Jim shortly after he, and his son, Jason, earned their Amateur Radio license, in December 1991. Jim and Jason's callsigns were sequential, N9NNA and N9NNB, because father and son took their tests together. At the time, Jason was only 9 years old, and he, and his dad enthusiastically built radio projects, and operated on Ten Meters as well as the Club's repeater. I have a lot of respect for Jim's way of developing a great relationship with his son.

Jim operated Two Meter mobile, usually for short trips to work, and at times for longer trips to go fishing! I often talked to Jim as he went to work, and the time was always short because he only had a four-minute commute! I always enjoyed talking to him, because of his never-ending enthusiasm.

Jim was an avid fisherman! He would get out to fish every opportunity that he could. Occasionally, when work was slack at the Russell T. Gilman plant, Jim would take advantage of three-day weekends and early afternoons to get out

and ply his skills on the several fishing spots that were his favorite. On several occasions, early on a Saturday morning, I would hear Jim calling Ray Weber, N9SQA, a relative, to coordinate their day's fishing trip. Of course most of us were still sleeping when those two were on their way.

Jim's favorite remark was "A bad day of fishing is better than a good day at work!" Jim's always cheerful attitude and outlook was contagious. His friendly, bearded smile was the type that expressed his peaceful soul. I think he made the world a little better for his being here. Jim, you certainly are missed.

Nels....

## WISCONSIN QSO PARTY

De Bob Truscott (W9LO)

Jake and Ed were coming over to help me out with a multi-op effort in the WIQP but it never happened. I was sick that weekend and had to cancel. Never even turned the rig on. Lousy timing--I never get sick on contest weekends. However, from what I've been hearing, ORC was well represented in the party, and a good time was had by all.

Reported Scores:

		<u>QSO's</u>	<u>MULTS</u>	<u>SCORE</u>
W9XT	CW	251	96	99,360
	SSB	325		
WI9M	CW	80	48	45,216
	SSB	51	MOBILE	
K9GCF	CW	65	68	28,560
	SSB	150		
K9LO	SSB	139	66	13,761
K3GGN	SSB(?)	1	1	At least he showed up.

K9QLP Participated, but no reported score.

W9LO No show

Have fun contesting.

## OZARES Exercise

De: Jon Gilmore (KB9RHZ)

On March 25 thirteen hams, members of OZARES, participated in a mock emergency exercise at St. Mary's-Ozaukee Hospital. Providing communications throughout the hospital was the objective. The simulated emergency was a high wind event that caused a major accident on I-43 resulting in 15 serious injuries and the closing of I-43.



**Jim (N9WIU), Tom (AA9XK) and Ed (AA9W) raise to portable 2mtr antenna at St. Mary's Hospital during the ARES emergency test exercise March 25<sup>th</sup>.**

OZARES is developing an emergency response team to help SMO when there are breakdowns in communications. A major problem at SMO is the structure of the building prevents radio and cell phone signals from reaching various sections from other sections or departments.

OZARES is using crossband repeating to overcome the problem. The exercise revealed some technical problems, but the message traffic went well.

Much equipment is housed at SMO. There are ham radios, antennas, packet equipment, and an 800-system radio. Kent(N9WH) reprogrammed the ham radios and Stan(WB9RQR) made some cables that should help with some of the technical problems.

Joanne Schmidt, Emergency Room Supervisor and Head Nurse, observed the exercise and described emergency conditions that may overwhelm the hospital's communications. She welcomed the efforts of the hams and thanked them.

## 2004 ORC Technician COURSE

De W9IPR, Tom Ruhlmann

The first of 8 sessions starts on April 10<sup>th</sup> at 9 AM at the Justice Center in Port Washington. Presently there are only 2 students so contact your interested friends and neighbors if you wish to share your hobby of "ham" radio. Have them call Tom at 262-377-6945.

## For Sale, Trade or ?

Beam Antenna with Alliance HD-73 rotor  
\$350 OBO. Contact Mark Simms (W9MS) at 414-352-6954

## Upcoming Events

De N9VSV (Jeananne Bargholz)

Milwaukee ARES and Waukesha ARES need your help. ALL hams are welcome! We've been providing communications for the MAACC Fund's "Trek 100" and the Miller Lite "Ride for the Arts" for years. These two events have traditionally been at least a week apart. NOT THIS YEAR. This year, the "Trek 100" is Saturday, June 5 (begins and ends at WCTC in Waukesha). The "Ride for the Arts" is Sunday, June 6 (begins and ends at the PAC in downtown Milwaukee). Please consider volunteering for sag

vehicles, shadows and rest stops for either event. Contact Jeananne, N9VSV by phone: 414-355-6922 or by e-mail: [n9vsv@wi.rr.com](mailto:n9vsv@wi.rr.com) to volunteer or to ask questions. Thanks, Tom - and 73, Jeananne

**April 10<sup>th</sup>** – Start of 8 session Technician Class training course at the Justice Center in Port Washington – contact W9IPR @ 262-377-6945

**April 17<sup>th</sup>** – Second session of the Technician Class training course at the Justice Center.

**April 18<sup>th</sup>** – Madison Swapfest at Mandt community Center in Stoughton WI.

**April 25<sup>th</sup>** – SEWFARS Swapfest at the Richfield Chalet. 1271 Hwy. 175 in Hubertus, WI

**May 1<sup>st</sup>** – ORC Swapfest at the Circle B in Cedarburg at 5 corners.

**July 10<sup>th</sup>** – South Milwaukee Swapfest at the Legion Park on Shepard Avenue in Oak Creek.

## Club Static

De W9IPR (Tom Ruhlmann)

I did manage to go to the Grays Lake swapfest on March 28<sup>th</sup> and it did seem a bit smaller than usual..



**W9NAW with his rotors and antenna at Grays Lake – Some good deals on good equipment**

We did get flyers for our May 1<sup>st</sup> event distributed so perhaps that will further increase our attendance.

# AES Superfest



The ARES and ORC tables were well manned at the AES Superfest April 2<sup>nd</sup>. Here ready to answer questions are Ron (W9BCK), Gene (KB9VJP) and Kent (W9WH) while Jon (KB9RHZ) examines the new emergency radio he had just won.



There was a good crowd at the Superfest and plenty of vendors showing their wares and answering questions. There were seminars on equipment as well as operating procedures. Something for everybody.



Our own Gary Sutcliffe (W9XT) was exhibiting his “Voice/CW Message Keyer” to other avid contesters at Superfest

## Just Another Shack

De Todd Sprinkman (KB9BQA)

This month’s Just Another Shack visit is with Gary Sutcliffe – W9XT. Gary lives just outside of Slinger and has a great DX’ing and contesting QTH. When I called to set up an interview, Gary made this month’s article a cinch.

He steered me toward his own bio as part of the National Contest Journal (NCJ) team. Gary has been writing an article on Contest Tips, Tricks and Techniques in the NCJ for 16 years now.



Here is Gary’s ham radio story, in his own words:

“For me, getting my ham ticket was only a matter of time. My uncle, W9FJ (SK), gave me my first ARRL handbook when I was only 7 or 8. I

got my novice ticket in 1970 (WN9FRG) and upgraded to Advanced the following year. The Extra followed two years later.

My first exposure to contesting came during the 1971 Field Day. I went down to help a friend from school set up the Novice station. I planned on staying only a few hours but got so interested that I didn't go home until it was over! Since then I have missed only two Field Days. During the summer of '74 I was WB9FRG/6W8, and one year in the early days of packet I programmed my computer to make QSO's while I had to work.

My real push into contesting came while in college at the University of Wisconsin where I majored in Ham Radio with a minor in Electrical Engineering. The UW club station, W9YT, was one of the contesting big gun stations from the late 1960's through the mid 1970's, and I got to operate with some of the best contesters of the time. W9YT has produced some of the top operators including K3ZO and K6NA. Both of them were there before my time, but their legacy inspired those that followed.

The main reason I like contesting is that you can set goals and compete at whatever level you want. Unlike things such as DXCC, everyone starts out at ground zero at the beginning of each contest. Even common states or countries are needed for the multiplier. More and more I favor contests that require more strategy and knowledge of propagation and operating techniques as opposed to contest that are more or less CQ marathons.

My contesting activity has been down the last few years due to a young daughter and a job that keeps me late more often than I would like. My favorite contest is the ARRL 10-Meter Contest. I also operate the DX contest and SS whenever I can, as well as the Wisconsin QSO party. My latest push is to get equipment on the air on the VHF and higher bands.

Between contests I chase DX and home brew (both the electronic variety and the liquid fermented malt beverage variety). From time to time the electronic projects appear as articles in QST or NCJ. I also raise tropical fish (40 aquariums) and enjoy gardening. During the day I am the engineering manager for a contract electronic design and manufacturing company."

I asked Gary about his rigs and antennas. He has a Yaesu FT-1000MP for his main HF rig and uses an Ameritron AL-1200 amp. The backup rig is a Kenwood TS-930, paired with a Heathkit SB-200. For VHF work, Gary uses a Yaesu FT-847.



Gary has 2 towers. A 50' tower has SSB beams for 50, 144 and 432 MHz. This tower also has a TH-7 for 10, 15 and 20m. Dipoles for 80 and 40m, along with a small vertical beam for 146 and 223 MHz FM fixed toward Milwaukee round out Tower 1.

Tower 2 is at 60' and has a pair of 3 el tri-banders. The upper one is rotatable and the lower fixed on Europe. Gary also has a 2 el 40m beam and a rotatable dipole for 12m. A dipole for 160m is attached and the tower is shunt-fed for 80m work. There is also a tuning box with capacitor and motor for remote tuning between the CW and phone portions of 80m. To improve performance on 160 and 80, Gary has about ¾ miles of radials buried. He also has 2 350' beverages on his property. One is oriented toward Europe and the other toward Japan.

Gary joined ORC a year ago. He stated that he was interested in joining a club that didn't just specialize in one narrow aspect of ham radio. He also went out of his way to say he enjoyed Field Day.

W9XT also has a company called Unified Microsystems. His company designs station accessories like CW and voice keyers. Unified Microsystems can be found at [www.qth.com/w9xt/](http://www.qth.com/w9xt/).

## Program April 14<sup>th</sup>

Pete, KB9URH, will present a program titled "Grounding and Guying for Hams: What the National Electric Code Says".

## Lightning Protection

(Part 3 of 6)

### Soil Doping, Radials, Materials and Measurement

De W9DHI, Gregg Lengling

Since most soils are stratified, the best way to determine the effectiveness of a ground system is to measure it. The simplest way to determine the sub-layer conductivity is to measure the first ground rod, one foot at a time, as it is hammered into place. This technique can provide a profile of the lower layers relative to the first foot. Most earth resistance meters measure only dc or low frequency ac resistance of the ground system. Although the lightning strike is dc, due to the fast rise time to peak current, there is significant RF energy. Since there is a high frequency component, the inductance (affecting transient response) of the ground system is important. Without using very expensive specialized test methods, the only way to ensure a low impedance ground system is to follow the suggestions given for conductors, doping and radials.

Any properly applied lightning protection device is only as effective as the ground system attached. Ground resistance is usually measured using the 3-stake fall of potential method. Theoretically, the final measurement achieved on the completed ground system is the same resistance to any other ground system on earth. A good ground system measurement would be between 5 and 10 Ohms. A well-designed 5-Ohm ground system is usually considered optimal for a lightning ground system.

A 4-stake resistivity measurement should be done ahead of the actual ground system installation. This procedure tells the engineer which areas within the system's geographic confines have the most conductive soil and at what depth this occurs. The results will be expressed as resistance (in Ohms - cm/m) and will determine the ground system's design.

The ground system's final 3 stake fall of potential ground resistance reading is the impedance of the system measured with approximately 100 to 300 Hz source potential. The obvious concern of this measurement is how well the ground system will handle electric utility ground faults. There must be enough current flow in to the earth to trip the applicable ac circuit breaker. Unfortunately, there is yet no way we can directly relate this 100 Hz measurement to the energy/frequency distribution range of a lightning event. When a

single long "ground well" is used in rock or poor conductivity top soil, the series inductance of the top section of pipe "chokes off" current flow to the more conductive lower section causing rapid local ground potential rise. Outbound currents from this higher potential can cause damage to circuitry bridging both potentials.

From a practical point of view, grounding specifications at ac power line frequencies must be met using the fall of potential method. But to be effective as a lightning ground, the ground system must also be designed for a rapid response in the RF range between 10-100 kHz. This usually means large surface area low inductance conductors connected to multiple ground radials with ground rods along their length.

Very high potential differences can occur from "point a to point b" on the same ground system due to the ground system/earth's combined impedance at the strike's higher frequencies (Ground Potential Rise - GPR). Since this is a complex topic, I'd best refer the reader to [www.gpr-expert.com](http://www.gpr-expert.com). They offer a complete explanation beyond this document's scope.

### Soil Testing Steps:

Testing soil pH is simple. You will need a swimming pool pH tester, some clean cloth, a glass

and distilled water. Take one teaspoon of soil at your grounding system depth. Place in a clean glass and add water to cover the sample by 1 inch and mix well with the spoon. Let sit for ten minutes, then, keeping the sediment in the glass, strain the liquid through a double or triple thickness of the clean cloth into the pool tester container as per the test equipment's instructions. Test normally. This should provide a coarse level of soil pH.

If you have a pH of 4 and are using copper, the soil will make the materials short-lived. Typically, good ground rods only have about 0.02 inch of copper cladding. Additionally, corrosion or galvanic (mixed metal unions) will also reduce the life of a metal in soil. Knowing the soil pH is a start to determining how long your grounding system will last.

Government-sponsored testing of various backfill grounding materials shows "coke breeze" as the number one choice based on the conductivity as well as the cost. GTL Inc. completed tests for Fluor Daniel with results submitted to NEXRAD (Next Generation Weather Radar), a Doppler weather radar project of a tri-agency (NWS, FAA, and U.S.A.F.). Findings indicate that of the three materials tested; only two were conductive when frozen with no moisture. Coke breeze was one of the two.

Backfill material is often used for mountaintops where grounding conditions are poor. Coke breeze offers a backfill solution since it can be compacted to 95% and offers the best conductivity at moisture levels between 5% and 20%. Above this level, the coke breeze came in a close second. The testing followed ASTM G 57-78 in performing the Wenner Four-Electrode Method of Soil Resistivity Measurement.

Coke breeze is a waste material from burning coke (byproduct from coal), and is very economical.

#### Soil Doping:

Water in its purest form is an insulator. Ionic salts when mixed with water make ions. The earth is a conductor because of the number of ionic salts present in the soil. Therefore, con-

ductivity can be improved by adding more ions to the soil.

Soil doping can be done by either adding water or a saline solution to the soil around the grounding system. If the soil already has a sufficient amount of naturally occurring salts, adding water will free the ions and improve conductivity. The more ions (salts) available, the less water that will be needed to reach a given level of conductivity.

If few natural ions are available, salts, such as Epsom salts, can be added to the soil to increase the conductivity. Depending on the amount of rainfall, doping the ground system radials with 4 pounds of salt per linear foot and 20 pounds per rod may last approximately two years.

#### Ground Radials:

Radials are the most cost-effective grounding technique considering system impedance, material cost, and installation labor. If one radial gives "X" resistance, then two will deliver an equivalent "parallel rule" plus 10%. This rule only holds true when the soil has the same conductivity over the entire radial area. After the first two radials, you will need to double the number of radials each time to continue with the parallel-plus rule.

Radials do have a limit on their effective length. If the surge energy has not been launched into the soil within the first 75 feet [22.86 meters], the inductance of the radial will prevent any further effective prorogation. Therefore, as a general rule, all radials should be at least 50 feet 15.24 meters] long and no longer than 75 feet.

Ground rods should be placed along the entire length of each radial. The most cost effective spacing between rods for normal (grassy) soil is two times the length of a rod into the ground. If 8-foot [2.44 meters] rods are used, they should be placed on 16-foot [4.88 meters] centers.

If the soil is not normal (e.g., very dry or sandy), the separation may be reduced in order to minimize the interconnect inductance. It doesn't hurt

to have the rods too close, it only costs more in material and labor.

In the May Newsletter we will discuss "Tower Considerations and Antenna Supports.

## Minutes – March 10, 2004

De Carol Szudrowitz, KC9CBC

**Announcements** – Vic KB9UKE repeated the announcements from the PEP Party – Jim KA4UPW is Turkey of the Year and Gary WI9M is Ham of the Year. Also Ed AA9W received confirmation in an IRS letter that the club is classified as a Public Charity under Code 501C3 therefore exempt from Federal Tax. Congratulations and thank you for all your hard work.

**Super fest** is April 2, 3 at AES. Coverage is needed Friday and Saturday. There will be special seminar on Digital Radio D Star, info on FCC enforcements, etc. N9UUR will give a talk on Satellite Communications. Gordon West will be there on the Morning Show.

**Program** – Leon K9GCF presented information on contesting. He emphasized to use the official letter code and not make names up like he does "Good Clean Fun" for call letters. This is not understood in the international forum. Local contesting is fun. Download the format from whoever is sponsoring the contest. Keep track of deadlines. Think of scoring multipliers as well as power and where you score best. Zones are important. If you are hand logging, be sure to use duplication sheets. Get forms from organizers. Watch formats and get comfortable headphones. Check with Leon for more helpful tips.

Terry KA9RFM brought in a single piston engine that he is making for show and tell. Vic KB9UKE shared the fun of receiving QSL cards from around the world. W9CQO call sign was identified as the official club call sign given by the repeater.

**Auction** – held by Stan WB9RQR.

**Business Meeting** – Secretary notes were approved with two corrections. Information regarding the CDM750 radios was given by Gary N9UUR not Jon KB9RHZ. Gregg's W9DHI class on Radio Kit Building his not begun as of yet.

**Treasurer's Report** – was approved as printed on handouts given by Tom AA9XK.

**Repeater Report** – Please send any digital pictures of the PEP Party to Nels WA9JOB. Link at Mee-

Kwon is down. The rack bent so now it has been reinforced. The link transmitter needed reprogramming, so it was reprogrammed. It then was swapped with the radio used for receive, just in case there is a bug in it, so that is fine now. Audio level was going up and down at one time this month as a result of Nels' tuning. The 224.180 repeater is in Nels' basement and operating. Gregg W9DHI did some work on it to modify the exciter to transmit PL. PL decoding will be made available on the main site, and also on the Germantown link which will be done this spring. This will satisfy the Wisconsin Association of Repeaters requirements for re-coordination.

**OZARES** – HazMat presentation will be the next meeting. On the 25th, St. Mary's drill took place.

**Committee Report** – Swapfest – table counts are down for this time of the year. Nels WA9JOB heard from Tower Electronics (Scott was sick so late in signing up) They will be there. Gene KB9VJP could use help with advertising, donations, and flyer distribution. Please give him a call.

**Post Everything Party** – Julia KB9WBQ said there have been lots of positive feedback and thanks Tom AA9XK for all his help in organizing this party. Klug's Creekside Inn did a wonderful job with the food. Door Prizes were appreciated by all.

**Field Days** - A short meeting was held by Leon K9GCF and captains after general meeting.

Meeting was adjourned at 8:59 PM

**Attendance** - Gary WI9M, Paul N9PG, Stan WB9RQR, Dave N9UNR, Jon KB9RHZ, Kent N9WH, Ed AA9W, Wil KB9HHR, Tom W9LNL. Gary N9UUR, Nels WA9JOB, Jeananne N9VSV, Jim K9QLP, Joe AA9HR, Gregg W9DHI, Gene KB9VJP, Bernie AA9CI, Jim N9WIU, Leon K9GCF, Joseph KB9URC, Carol KC9CBC, Terry KA9RFM, Gary W9XT, Paul KB9WCC, Chris N9VKC, Ron W9BCK, Bob W9LO, Ray W9KHH, Mark N0OKS, John WA9KNY, Herb WA9UVK, Tom W9IPR, Brian N9LOO, Tom AA9XK, Julia KB9WBQ, Muhammad KC9CPC.



## **AGENDA**

*April. 14th, 2004*

1. Call to order – Vic (KB9UKE)
2. Introductions.
3. Announcements, Upcoming events, Etc.,
4. Program:
5. Fellowship Break
6. Auction.
7. Acceptance of Minutes as printed.
8. Treasurer's report – Tom (AA9XK).
9. Repeater report – Nels (WA9JOB)
10. OZARES report – Jon (KB9RHZ).
11. Committee reports.
12. OLD BUSINESS
13. NEW BUSINESS.
14. Adjournment to ?

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### **The ORC Newsletter**

465 Beechwood Drive  
Cedarburg WI\* 53012

### **First Class**

## **Next ORC Meeting**

**Grafton Senior Citizens Center**

**1665 7<sup>th</sup> Avenue, Grafton**

**Wednesday, April 14<sup>th</sup>**

**7:30 PM**