



The ORC News -



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.

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

Web

Volume XXIII

March 2004

Number 3

The Prez Sez

By Vic Shier (KB9UKE)

A few days ago we learned of the passing of one of our club members, Jim Raasch N9NNA. We send our sympathies to Joan and the rest of his family. I will miss Jim's Port Washington fishing reports.

The Post Everything Party is only a few days away. One of the more fun portions of the party is the gift exchange. Hams bring something from their shack that they no longer use and it is exchanged with a similar item from someone else's shack. Generally you can hear many people saying, "What is it?" This year the spouses will be doing a gift exchange too. Something that they may have received as a gift in the past and don't really want it. Either of these gifts should be easily found in the home without any cash outlay.

The candy store (Amateur Electronic Supply) will be holding their annual Superfest on April 2nd and 3rd. We will be running a booth there along with OZARES. This event gives us an opportunity to introduce hundreds of hams to the ORC. We need volunteers to man the booth. AES has a great line up this year: Gordon West will be interviewed on

the FOX 6 Morning Show; Joe Monie WB0PAW from the FCC will do a Q&A on enforcement; and our very own Gary Bargholz N9UUR will be making a presentation on the latest satellite technology. Pick your favorite topic and schedule some time before or after when you can help with the booth.

Our swapfest is only two months away. Talk it up. Mention it when talking to other hams especially when on a different repeater. Mention it to that person from work that always seems interested in your hobby. A successful Fest takes effort, it doesn't happen by accident.

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

IT'S WISCONSIN QSO PARTY TIME

De Bob Truscott (W9LO)

Next to Field Day, I believe the WIQP is the most popular contest of the year for our particular club. It runs from 12:00 N to 7:00 PM local time on March 14. CW & SSB on 80 thru 2 meters, plus FM on 6 & 2 only. That's 7 hours of fun, and it gives us each an opportunity to hone our operating skills for FD. Work any station once on each band in each mode, and the mobile stations each time they move to a new county. Download rules, forms and the county list from www.warac.org.

It's a little late to suggest it for this year, but it might be fun to run a multi-op station next year. Any interest?

Reported scores:

160 Meter Contest:
W9KHH-----91 QSO's, 35 Mults.

ARRL International DX Contest-CW
W9XT-----1309 QSO's, 418 Mults.
W9LO-----226 QSO's, 97 Mults.
WI9M-----100 QSO's, 60 Mults.

Coming up in March:

March 5-7 ARRL International DX Contest-Phone—Rules in Dec. QST, page 96.

March 14 North American RTTY Sprint—Rules in March QST, page 100.

March 14 Wisconsin QSO Party—Rules in March QST, page 100.

March 27-28 CQ WW SSB WPX Contest—Rules in March QST, page 100

Have fun contesting.

ANTENNA TUNERS! DO THEY?

De: K4FQU & submitted to the ORC Newsletter by Leon, K9GCF.

I am sure that many of our newer licensees and perhaps quite a lot of old timers also, are laboring under false impressions regarding antenna tuners. There is only ONE true antenna tuner. That is YOU! Antenna tuners please DO NOT TUNE ANTENNAS. Nothing can tune an antenna except by physically changing or alternating the structure itself and only the builder can do this. There may be a few mechanical devices out there that can physically change an antenna struc-

ture but they still need a human to tell them that. Today's and yes yesterdays "antenna tuners" only fool your transmitter into believing it is looking at a perfect match or at least a good match. And indeed they are looking at a good match if the tuner is tuned correctly, however all this is done right in that little (or big) box and has virtually no effect on the feedline connected to it nor the antenna at the other end. The structure remains the same; the SWR remains the same. All the transmitter looks at is that little box, and it has a smile on its face because it is "tuned" so to speak. What happens is that the capacitive & inductive load within the "tuner" has been changed so that it is resonant with the frequency that the transceiver is operating on. The antenna or the SWR on the coax feedline has NOT CHANGED. An antenna CAN BE TUNED if one puts a capacitor right at the antenna feed point and tunes it to resonance, in which case the SWR on the feed line will change. This has been done however it is not an easy job. The losses on the feedline are not that severe on HF to even worry about a tuner at the antenna. What your tuner is actually doing is making the transceiver operate at its peak efficiency, with little or no damage potential to the finals. High impedance's (SWR readings) can harm a final in your transceiver so if your antenna is grossly mismatched then a tuner is recommended. The best tuner is a well-built antenna, which is resonant or nearly so to the operating frequencies.

AES Superfest

De Ray Grenier (K9KHW – AES)

On AES Superfest Friday (April 2nd) from 5:00 to 7:00 p.m. there will be a special two-hour forum and fully operational demonstration on the Icom D-STAR System by Matthew F. Yellen, KB7TSE - Icom Technical Sales Specialist & D-STAR. The D-STAR system is an off the

shelf, 128K open protocol DATA system that combines the analog and digital worlds into a seamless communications network at 1.2 and 10 GHz! Just picture being in your vehicle, helping with emergency communications with the 128K DATA "you can visually communicate what is happening simply by e-mailing a photo or live video. Attend and learn MORE! We are encouraging local area clubs get as many of their membership to AES on Friday night to help fill up our expanded forum area. As an incentive, there will be a \$100 AES Gift Certificate presented to the club with the largest contingent. Icom is bring their new IC-7800 HF/50MHz transceiver to Superfest. It's your chance to see this phenomenal new radio in operation.

Club Static

Congratulations to Jim Russel (KC9ETH) His General Ticket was posted in February!! Passed Element 1 in February and Element 3 last September.

Lightning Protection

(Part 2 of 6)

Conductor Surface and Metallurgy
de Gregg Lengling, W9DHI

Conductor Surface Area:

The most effective material for a ground system conductor is copper strap. Copper as a metal is a good electrical conductor, only moderately attacked by ground and air borne acids, and should have a life span measured in years.

Since lightning has a large portion of its energy in the LF range, it will behave like an RF signal. That means the energy will only mostly conducted on the skin of the conductor (skin effect). Thus, the surge current will only ride on the outermost surface of the conductor. Such cur-

rents following a round-member conductor will not make extensive use of its large cross sectional area. With a 1-1/2 inch [38.1 mm] or larger flat strap of at least 26 gauge (0.0159 inches) [0.4 mm], both surfaces will conduct the surge.

Why Ground Rods are usually Copper-Clad:

The real reason for copper plating is corrosion resistance. Copper, silver, mercury and gold have high resistance to corrosion, while processed metals (never found free in nature) like aluminum and magnesium are easily corroded. Noble metals like copper become the cathode when joined together with less noble metals in the presence of an electrolyte (water). Less noble metals become the sacrificial anode and corrode away.

Not listed in the galvanic table of metals is Graphite, since it is not a metal. Graphite is even more noble than silver and certainly much nobler than copper. Therefore, if a graphite backfill material is to be used as a ground "enhancer" to surround copper, the copper will be sacrificial to the graphite and will dissolve away into the soil.

The following affect the amount and speed of corrosion both above and below the soil:

- 1) **Water:** The presence of water mixed with contaminants is the basis of galvanic corrosion. Pure rain water is slightly acidic (pH 5.5 to 6.0). It picks up carbon dioxide as it falls which creates carbonic acid. It can start attacking some metals, even copper, without being in a junction. The ions etched from the copper go into solution in the rainwater. As this rainwater drips on galvanized

tower sections, it will cause the zinc to combine and wash off. This leaves the bare steel to oxidize away.

2) **Oxygen:** This is the main corrosion accelerator. Rainwater also picks up oxygen as it falls through the atmosphere. Water provides an excellent carrier of oxygen.

3) **Temperature:** Generally, the higher the temperature the faster the chemical reaction.

4) **Texture of the metal(s):** Glass smooth surfaces are less likely to corrode than rough finishes.

5) **Hydrogen Sulfide:** A gaseous product of exhaust emissions, it combines with rainwater creating acid rain.

6) **Chlorine:** Tap water can have an acidic effect on underground materials.

7) **Inert gases:** Helium displaces oxygen and reduces the corrosive effect.

8) **Alkaline:** Although some alkalis tend to increase the rate of carbon dioxide absorption from the air, which creates corrosive carbonate solutions, slight amounts of alkalinity can reduce corrosion rates.

9) **Salts:** Sodium chloride, found just about everywhere, increases the soil conductivity and also increases the corrosion process in nearly the same proportion to its concentration. Other naturally occurring salts or non-natural added salts do the same. Only sodium carbonate or phosphate and potassium ferricyanide form a protective film that prevents further corrosion.

10) **Microorganisms:** Both bacteria and fungus can deteriorate metal. Some will give off acids in

trapped water or when they die and decompose into acids.

Dissimilar Metals:

There are many different types of metals and each has desirable properties. However, when two dissimilar metals are joined to make an electrical connection there can be problems. Corrosion will begin when the connection is exposed to moisture or any other liquid acting as an electrolyte.

Corrosion is an electro-chemical process resulting in the degradation of a metal or alloy. Oxidation, pitting or crevicing, dealloying, and hydrogen damage are a few descriptions of corrosion. Most metals today are not perfectly pure and consequently, when exposed to the environment, will begin to exhibit some of effects of corrosion.

Aluminum has an excellent corrosion resistance due to a 1 nano-meter thick barrier of oxide film that instantaneously forms on the metal. Even if abraded, it will reform and protect the metal from any further corrosion. Any dulling, graying, or blacking that may subsequently appear is a result of pollutant accumulation.

Normally, corrosion is limited to mild surface roughening by shallow pitting with no general loss of metal. An aluminum roof after 30-years only had 0.076mm (0.003 inch) average pitting depth. An electrical cable lost only 0.109mm (0.0043 inch) after 51-years of service near Hartford, Connecticut. Copper such as C110 used in our equipment shelter coax cable entrance panels has been used for roofing, flashing, gutters, and downspouts. It is one of the most widely used metals for atmospheric exposure. Despite the formation of the green patina, copper has been used for centuries and has negligible rates of corrosion in unpol-

luted water and air. At high temperatures some copper alloys are better than stainless steel.

If copper were joined to aluminum or copper to galvanized (hot dipped zinc) steel with no means of preventing moisture from bridging the joint, corrosion loss will occur over time. This is the accelerated corrosion (loss) of the least noble metal (anode) while protecting the more noble (cathode) metal. Copper, in this example, is the more noble metal in both connections. (See the Noble Metal Table for a ranking of commonly used metals.)

Where the connection is with galvanized steel, the zinc coating will be reduced allowing the base steel to oxidize (rust), which in turn will increase the resistance of the connection and eventually compromise the integrity of the mechanical structure.

The aluminum will pit to the copper leaving less surface area for contact. The connection could become loose, noisy, and even allow arcing.

This type of corrosion problem can be prevented by using a joint compound, covering and preventing the bridging of moisture between the metals. The most popular compounds use either zinc oxide or copper particles embedded in silicone grease. As the joint pressure is increased, the embedded particles dig into the metals and form a virgin low resistance junction void of air and its moisture.

The use of a joint compound is the recommended means for joining our coaxial protectors to our bulkhead panels for non-climate controlled installations. We have tested this compound with a "loose" 1 square-inch (6.5 sq.-cm) copper to copper joint and have found it to handle a 25,500 ampere 8/20 waveform surge with no flash over and no change in resistance (0.001 ohms). We have even

moved the loose joint before and after the surge and experienced no change in resistance.

The connection of a copper wire to galvanized tower leg should be avoided even if joint compound is used. The primary problem here is the low surface-area contact of the round wire with the (round) tower leg. Consider using a stainless steel clamp. The clamp will help increase the surface area of the connection as well as provide the necessary isolation between the dissimilar metals. Use joint compound on exposed applications of the stainless steel clamps. For an even more effective connection, use copper strap in place of wire with the clamp.

Silver oxide is the only oxide (that we know of) that is conductive. This is one reason why GOOD N-type coax connectors are all silver with gold center pins. Copper oxide is not conductive and the proper application of joint compound will prevent oxidation.

Next Month Soil Doping, Ground Radials and Ground System Materials and Ground Measurement.

Elements:	MAG	ALUM	ZINC	IRON	CAD	NICK	TIN	LEAD	COPPER	SILVER	PALL	GOLD
MAGNESIUM	0.0	-0.71	-1.61	1.93	-1.97	-2.12	2.23	2.24	-2.71	-3.17	-3.36	-3.87
ALUMINUM	0.71	0.00	-0.90	1.22	-1.26	-1.41	1.52	1.53	-2.00	-2.46	-2.65	-3.16
ZINC	1.61	0.90	0.00	0.32	-0.36	-0.51	0.63	0.64	-1.10	-1.56	-1.75	-2.26
IRON	1.93	1.22	0.32	0.00	-0.04	-0.19	0.30	0.31	-0.78	-1.24	-1.43	-1.94
CADMIUM	1.97	1.26	0.36	0.04	0.00	-0.15	0.27	0.28	-0.74	-1.20	-1.39	-1.90
NICKEL	2.12	1.41	0.51	0.19	0.15	0.00	0.11	0.12	-0.59	-1.05	-1.24	-1.75
TIN	2.23	1.52	0.63	0.30	0.27	0.11	0.00	0.01	-0.47	-0.94	-1.12	-1.64
LEAD	2.24	1.53	0.64	0.31	0.28	0.12	0.01	0.00	-0.46	-0.93	-1.11	-1.63
COPPER	2.71	2.00	1.10	0.78	0.74	0.59	0.40	0.46	0.00	-0.46	-0.65	-1.16
SILVER	3.17	2.46	1.56	1.24	1.20	1.05	0.94	0.93	0.46	0.00	-0.19	-0.70
PALLADIUM	3.36	2.65	1.75	1.43	1.39	1.24	1.12	1.11	0.65	0.19	0.00	-0.51
GOLD	3.87	3.16	2.26	1.94	1.90	1.75	1.64	1.63	1.16	0.70	0.51	0.00

LESS

NOBLE:

Noble Metal Table: Accelerated corrosion can occur between unprotected joints if the algebraic difference in atomic potential is greater than + / - 0.3 volts.

For Sale, Trade or ?

Delta (Unisaw) cabinet saw on mobil base – new motor - \$650 – contact Tom, W9IPR @ 262-377-6945

Clock Repair – contact Kevin, K9VIN @ 262-375-6792

(WI stations only) x2 (< 5 W), 1.5 (<150 W). WI mobiles/portables add 500 bonus points for each county with 12 or more QSO's. For more information: <http://www.warac.org/>. Logs due Apr 14 to k9kr@powercom.net (in WARAC Cabrillo format--see Web site) or Wisconsin QSO Party, West Allis RAC, PO Box 1072, Milwaukee, WI 53201. De Dave, N9QA

Upcoming Events

Wisconsin QSO Party--Phone/CW--sponsored by the West Allis RAC from 1800Z Mar 14-0100Z Mar 15. Frequencies (MHz): CW--3.550, 3.705, 7.050, 14.050, 21.050, 10 meters; Phone--3.890, 7.230, 14.290, 21.350, 28.400; All modes-- 6/2 meters, UHF. No repeater QSO's. Categories: SO, MS, MM and Mobile. Mobile operators may not operate on county lines. Exchange: S/P/C or WI county. QSO Points: Phone--1 pt, CW--2 pts. Score: QSO pts x WI counties (max. 72) + S/P/C

ORC Swapfest – May 1st – If you will be needing a table, or can solicit other vendors to procure a table, contact Gene, KB9VJP @ 262-377-6792

March 28th – Hamfest at Lake County Fairgrounds in Grayslake IL – only 1.3 hours away.

April 2 & 3 – AES Superfest

What a Great Party

This past Saturday, March 6th, marked one of the very best Post Everything Parties yet. Many thanks to the Chairmen, Julia (KB9WBQ) and Tom (AA9XK) Nawrot and all those who worked to make it such a great success.



Julia (KB9WBQ) and husband Tom (AA9XK) Nawrot did a great job in chairing the 2004 Post Everything Party.

The group was pleased to learn that Gary Sharbuno, WI9M, was awarded the ORC "Ham of the Year" cup. Gary has chaired Field Day for the past several years and also provides the volunteer testing services in the area among his many other actives in the club. Congratulations Gary.



Our "Ham of the Year" for 2004, Gary Sharbuno (WI9M), reflects on all the previous recipients of the cherished award.

The "Turkey" was awarded to Jim Hillins (KA4UPW) for having made 2004 a more enjoyable year for his involvement in Field Day, meeting presentations, articles in the newsletter and just being a great, contributing club member.



A great time was being had by Vic (KB9UKE), Ron (W9BCK) and Gregg (W9DHI) as they shared stories of rare DX and whatever.



Kevin (K9VIN) admires the 60,s era 5 channel 5 pound CB-HT received by Bob (W9LO) in the “clean the shack” gift exchange.



Gary (N9UUR) received a certificate in recognition of his operating a satellite station for the 2003 field day event.

An Excuse

You may have wondered why the newsletter was late this month but there was a good excuse. We escaped the cold and snow during February and spent those days in cool rainy Texas. Had a great time visiting family and seeing the sites in Collage Station, Houston, Corpus Christie, Padre Island, San Antonio, Austin, Kansas and Iowa. Over 3000 miles but we did get a few days of sun. Glad to be back.



Pat Ruhlmann getting ready to soak up some sun on North Padre Island TX.

Minutes – Feb. 11, 2004

De Carol Szudrowitz, KC9CBC

Introductions and Announcements

Vic KB9UKE reminded hams that dues are now due. If you have not paid membership dues, please do so.

Deadline for POST EVERYTHING PARTY is February 27 so please call Julia KB9WBQ.

Program

Leon K9GCF is out of town; therefore short program. –Show and Tell- Vic KB9UKE shared the fun and knowledge he received when fixing an old United Engine Co radio that he obtained. It was quite an experience and the sound is getting better each time it is used.

Auction

Held by Stan KB9RQR

Business Meeting

Minutes were approved as printed in newsletter.
Treasurer's Report was approved as given.

Repeater Report

There is still an access problem at the Germantown site. General Communications still doesn't have an easement to get to the tower. Snowplowing turned out to be on someone else's property, and they need to solve the problem. Apparently, a neighbor complained, and wants it resolved. The 220 repeater is not functioning at this time. It is at Nels' house, and work is being done on it. The 440 is OK. Mequon site also has a problem. There is no transmitting from the site.

OZARES

Jon KB9RHZ reported that Milwaukee has new CDM750 radios. MRC bought 5 of them.
4th Thursday is meeting date. HASMAT is topic. Mark calendar for Monday, April 12, the Serve Weather Meeting at 6:30 to 8:30 PM

Scholarship

Ed AA9W told the club about the old Howard Sams Manuals that were donated. They have lots of good information regarding TV, Radio and Circuit information. Please contact him if interested in one.
Tubes are now available on e-bay at \$25.

Swapfest

Needs your help, please call for flyers if you go somewhere or help put out posters. Contact Gene KB9VJP.

Old Business

Gregg's W9DHI class went well

No New Business

Meeting's end was moved and seconded by 8:50.

Attendance:

Jon KB9RHZ, Stan WB9RQR, Kent N9WH, Dave N9UNR, Carl KC9CBC, Wil KB9HHR, Nels WA9JOB, Ernie K9LO, Bernie AA9CI, Gerald KB9IMH, Mike WJ9O, Ron W9BCK, Ray W9KHH, Jim N9WIU, Herb WA9UVK, Mark N0OKS, Ron KC9DKQ, Paul KB9WCC, Don AA9WP, Jake KB9ZOR, Ed AA9WP, Terry KA9RFM, Mark AB9CD, Gregg W9DHI, Tim N9IW, Jeananne N9VSV, Gary N9UUR, Gene KB9VJP, Julia KB9WBQ, Don W9VSC, Bob WQ9N, Fred N9FH, Gary W9XT, Jim K9QLP, Ed AA9W, Gary N9UUR, Gary WI9M.

AGENDA

March 10th, 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 ?

Return undeliverable copies to

The ORC Newsletter

465 Beechwood Drive
Cedarburg WI* 53012

First Class

Next ORC Meeting

Grafton Senior Citizens Center

1665 7th Avenue, Grafton

Wednesday, March 10th

7:30 PM