



The objectives of the Willits Amateur Radio Society are:

- to promote interest in fellowship and fun in Amateur Radio;
- to further the cooperation between Mendocino County Amateur Radio Operators;
- to provide emergency or public service communications when normal means of communications are disrupted;
- to advance the state of the Amateur Radio art through individual and collective research;
- to conduct programs and activities so as to increase the general interest and welfare of Amateur Radio in the community including classes and testing;
- to support lawful, responsible conduct by its members and the amateur fraternity in general.

WARS OFFICERS for 2008

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The Willits Amateur Radio Society meets at 7:00 PM on the **fourth** Monday (not the last Monday) of each month except for December. The normal meeting location is the Brooktrails Fire Station on Birch Street in Brooktrails.

There is a weekly informal breakfast meeting held every Tuesday morning starting at 9 AM at Perko's Restaurant in Willits.

On the coast, there is also a weekly Koffee Klatch starting at 10:30 AM on Tuesdays at the Tradewinds Restaurant in Fort Bragg and a informal breakfast meeting held every Friday starting at 8:30 AM at Denny's Restaurant in Fort Bragg.

MEMBERSHIP ROSTER

You may be reading this newsletter because it is available to anyone that cares to look it up on the web site but you may not be a member of WARS. That is OK because we want everyone that cares to know what we are doing but we do encourage membership. If you have a questions, look on the Membership Roster of the web page and see if you are listed. If you are not listed, you are not a member of WARS for 2008.

If you have not already done so, please send your check in the amount of \$15 or more to Post Office Box 73 in Willits. If you are a new member or if some of your personal information has changed (phone number, address, email address, etc.), please download a membership application from the JOIN US page on the WARS web site, fill it out, and include it with your check.

From the prez – March 2008

Spring training time is here....

While many parts of our country are still in the icy grip of winter, big time athletes (and some wannabes) head south to participate in the cactus or grapefruit leagues. Even the most seasoned athlete understands the need to shake off some of the rust to get ready for the season ahead. Just a few months away from regular practice is enough for even a pro to lose some of their edge.

Baseball players really aren't that different than hams that support emergency communications. Sure, you may think you've done it before and can go at it again at the drop of a hat, but in order to be really effective at emergency communications, you need practice. Participating in a local net is a great warm up exercise, not too strenuous, but a good way to stay loose and connected. There are weekly simplex nets throughout the county, one in most of the communities. There is also a county-wide weekly net that meets every Wednesday night at 7:30 PM. Information about local nets in Mendocino, including day of the week, time, and frequency can be found at <http://mcarcs.org/>. If you can't find a local net in your area, then start one!

For a bit more of a workout, try volunteering for a community service event which utilizes amateur radio. While currently there are not many planned in Mendocino County, there are ample opportunities in Lake and Sonoma Counties. The organizers of these events have indicated that Mendocino County hams are welcome to participate. Check out the WARS website for more information about these events and to obtain contact information.

I've seen first hand how simple workouts can better prepare hams for emergency communications. In just the past few months, I've heard relatively new hams go from a hesitant check in during a weekly local net to a comfortable and confident net control operator on the county-wide net. More frequent and broader practice yields even greater results. Take advantage of the opportunities available this spring and get some practice under your belt.

Tim – WB9NJS

LAST MEETING

The last regular meeting was held on February 25, 2008. The program was a presentation by our own George Burton, K7WWA, about repeater systems and construction.

A group of very interesting photographs were shown on the projector showing a number of repeater installations including the K7WWA repeaters on Laughlin Ridge as well as a number of others. A collection of repeater duplexers was shown ranging from a 4-cavity 2 meter duplexer occupying about 4.5 cubic feet to a 902-928 4-cavity duplexer that you could hold in the palm of your hand. Your cell phone also has a duplexer inside it that is much smaller but has to handle a much lower power level accounting for some of the size differences.

There was a discussion about a revival of the annual WARS campout. The former location for this campout in the Noyo River area is still available for reservation for a fee. A minimum reservation number is for 25 persons for 2 nights at \$1 per person per night, \$100 maximum. Camping opens May 1 and the Memorial Day weekend is already booked. The consensus was that a date in July or August might be preferable. If you are interested in this, please come to the next meeting or register your preference at one of the breakfast meetings for relay to the regular meeting.

NEXT MEETING

The next regular meeting of the Willits Amateur Radio Society will be held on Monday, March 24 starting at 7 PM in the Brooktrails fire station. The program will be the postponed program originally scheduled for the February meeting.

The program will be our own Danny Richardson, K6MHE, presenting a program on his findings about common balun designs. The presentation will center on balanced HF antennas and specifications for the baluns that the manufacturers won't give you or want you to know. Some information will be presented on the big screen.

TEST SESSIONS

To locate posted test sessions, go to <http://www.arrl.org/arrlvec/examsearch.phtml> and enter your ZIP code and mileage radius for which you are interested in traveling to.

To schedule a test session in the Willits area, please contact Jay Haegele, K6AFL, using the contact button on the WARS web site. If a group of 5 or more wish to be tested, Jay can arrange that.

NETS

A number of communities have been holding a weekly local net. Here is a listing of what is known at this time:

Albion	Monday	3:00 PM	147.570 Simplex
Brooktrails	Wednesday	7:15 PM	146.580 Simplex
North Coast	Wednesday	7:00 PM	146.520 Simplex
Gualala/Point Arena	Tuesday	7:00 PM	147.825/146.610 Linked
Piercy/S. Humboldt Co.	Monday	7:00 PM	146.790/146.940 Linked
Redwood Valley/Ukiah	Wednesday	6:00 PM	146.490 Simplex
Willits	Wednesday	7:00 PM	146.460 Simplex

All stations within the range of the net control station are invited to check in either on a regular basis via roll call or as a visitor. Net control duties usually rotate among the regular participants. The use of simplex frequencies for local operations is being emphasized in order to reserve the repeater facilities for wider area communications in the event of a major disaster.

There is also a county-wide net at 7:30 PM on Wednesdays using the linked facilities of the 147.390 repeater on Laughlin Ridge, the 145.430 repeater on Cahto Peak near Laytonville, and the 145.470 repeater on Sanel Mountain near Hopland. The initial roll call for this net is for the net control operators of the various communities although there is usually an open call following the initial roll call. Net control duties for this net are rotated between the various communities participating.

All of these nets are organized under the auspices of the Mendocino County Amateur Radio Communications Service (McARCS), an association of amateur operators interested in preparing for communications in the aftermath of a disaster. There is a new web site for McARCS. Please check out <http://mcarcs.org>.

2008 CALENDER OF EVENTS

Here are some of the interesting events in ham radio this year. Check out the web sites listed for more information.

If you know of some more interesting events, please communicate that to the editor of this newsletter.

<u>MONTH/DATE</u>	<u>EVENT</u>	<u>CONTACT or INFO</u>
May 3	VOMARC Hamfest, Sonoma	www.vomarc.org/
April 25-27	DX Convention, Fresno	www.dxconvention.org
May 16-18	Dayton Hamvention, OH	www.hamvention.org
May ??	Noyo River Campout	Open
May 31	Fresno Hamfest, Fresno	www.w6to.com/
June 7-8	SF Section Conv., Ferndale	www.humboldt-arc.org
June 6-8	VHF Contest from Walker Ridge	WB9NJS
June 28-29	Field Day	Open
July ?	WARS Picnic	Open
August 30	W6OMF Hamfest, Vacaville	www.grz.com/W6OMF
September 12-14	SW Div. Convention, Mesa, AZ	www.azhamcom.org
September 12-14	VHF Contest from Walker Ridge	WB9NJS

PUBLIC SERVICE OPPORTUNITIES

Tim's column mentioned some public service communications opportunities this year. Here is a list from the Sonoma County Radio Amateurs (SCRA) schedule plus two that we know of in Mendocino County.

You might want to put these events on your calendar and plan on participating. Please contact Craig Gaevert, K6XLT, at 545-4133 for more information on the Sonoma County events.

April 12 Lake Sonoma 50 mile Footrace

This event will involve simplex communications from various locations around the lake. Some hiking may be involved and one station will be positioned via a boat ride. Google "Lake Sonoma Footrace" for more information. (Be sure that you are looking for the footrace, not foot race or Lake Sonoma 50) The event will last from 0600 to about 2100. (6 AM to 9 PM) They anticipate a need for approximately 12 stations on the route.

April 20, Potter Valley Cancer 5k/10k Walk/Run. This event in Mendocino County is still in the planning stage with the ham radio involvement not yet set. We just found about it on March 20. Registration starts at 7 AM, the walk or run starts at 8 AM.

Breakfast starts at 9 AM for \$5. More information will be posted on the WARS and the McARCS web sites as it becomes available. Be sure to check these often.

May 3, Wine Country Century

This is a bicycle ride (not a race) with some 2500 riders covering various courses of 35 miles, 100k, 100 miles, and 200k respectively -- rider's choice at registration time. Start and finish at the Wells Fargo Center for the Arts north of Santa Rosa. Start time 6:30 AM for the longest route. This is a fund raiser for various causes although the event organizers admit that the majority of the entry fees go for food and other supplies. SCRA gets a donation for providing radio communications. Google "Wine Country Century" for more information.

May 4, MS walk in downtown Santa Rosa

I have no information about this event.

May 10 Human Race

This event is occurring in many cities on this date.

This volunteer organization fund raising event also is occurring in Ukiah and is being coordinated by North County Opportunities. For information on participating on this 5k/10k walk or run event, contact Christine Dektor, KI6ISH in Ukiah at cdektor@ncoinc.org or 467-3200.

June 21 The Terrible Two

According to the SCRA newsletter, "(if you only work one event a year, this is the one)" This is a 200 mile bicycle ride starting in Sebastopol, going through Santa Rosa and east into the Napa valley and back, up to the Russian River near Cazadero and back to Sebastopol. 5:30 AM start, finish 11 PM. This is a fund raiser for various causes although the event organizers admit that the majority of the entry fees go for food and other supplies. SCRA gets a donation for providing radio communications. Google "The Terrible Two" to get all the details.

August 23, The YWCA Ride

This ride of 10k, 50k or 100k (rider's choice) is a fund raiser for the Sonoma County YWCA. As with many of these rides, the riders get a BBQ lunch out of the contributed funds and entry fees. A Google search of "The YWCA Ride" yields only sketchy information about the 2008 ride but there is more information about the 2007 ride.

September 13-14, Waves to Wine.

Another bicycle ride. This is a two day bike ride from AT&T park in San Francisco to Sonoma County (with an overnight festival) ending up in Sonoma. Two legs, each of 75 miles. This is a fund raiser for MS. Google "Waves to Wine" for more information.

If you like to support bike rides with communications, these events are for you.

BUY, SELL, TRADE, OR GIVE AWAY

This space can be made available for your ham radio related equipment that you wish to transfer ownership to another. Please provide your ad as a Word or compatible format as an attachment to an email to the editor of this newsletter,

CONTRIBUTIONS WANTED

If you have written an article relating on any way to ham radio and are looking for a publisher, please submit it to the editor of this newsletter. Just send it as an email attachment in a Word or compatible format. (I can open nearly all modern word processing programs but may have to edit some of them into a Word format.)

If you have run across a published article in another medium that you think should be published here, let me know. We may have to obtain permission to publish it but this is generally not a problem for ham radio related publications.

Is Your Computer Screen Dirty

Here is a link to help you keep it clean. Requires the Shockwave Flash Player. This is best seen with the display window set for the full screen.

www.tcvh.com/screenclean.swf

If you don't have the player, here is a link to download it. About 2.3 MB so you dial-up users may want to pass.

www.adobe.com/shockwave/download/download.cgi?P1_Prod_Version=ShockwaveFlash

INTERMODULATION INTERFERENCE

With the increased (if still infrequent) use of the multiple amateur 2 meter repeaters on Laughlin Ridge, a nasty problem has reared it's ugly head. Some people have incorrectly called it "bleedthru" or "bleedover" whereas the true problem is actually three signal intermodulation distortion producing a 4th signal giving the interference.

If you will recall, mixing of two signals together in a non-linear circuit produces not only the harmonics of the two signals but also signals consisting of the sum and difference of the two input signals. The problem that we are hearing is the result of the mixing of three signals together giving a whole host of resulting sum and difference signals. The particular mode of interference that we are hearing consists of the sum of two signals mixing with a third signal and the difference causing the problem.

Here is an example: Suppose the 147.120 MHz repeater is being used. The input signal is at 147.720 MHz. Now suppose that someone kerchunks the 145.130 MHz repeater (yes, I know that is illegal). The sum of 147.120 and 145.130 is 292.25 MHz. Subtracting the signal at 147.720 results in a signal at 144.530, exactly on the input of the 145.130 MHz repeater.

The same thing occurs on the sum mix of 147.720 and 145.130 minus 147.120 resulting in a signal at the same 144.530 MHz. This signal may keep the repeater keyed up and the resulting interference may actually produce an audio feedback effect.

Of course, the same thing occurs at the input of the 147.120 MHz repeater. The repeater with an output at 147.390 has exactly the same problem differing only in the actual frequency produced resulting in the interference.

Another way of looking at the problem is that the difference between the signals on one repeater, 600 kHz, mixes with the output of the other repeater to produce a signal on the input frequency. A similar effect makes it nearly impossible to locate a 2 meter repeater near a 600 kHz AM broadcast station.

This problem potentially occurs at any site with multiple repeaters having the same offset between receive and transmit frequencies. I have even heard this problem on repeater sites where the other interfering repeater was 10 or more miles away. The problem is not the exact frequencies chosen, the problem is that the difference between 2 meter repeaters is most often 600 kHz.

So what causes this mixing effect to occur? There are two causes, a non-linear circuit element and sufficient power to drive the circuit into non-linear operation.

Where is this non-linear circuit located? In all likelihood, this is caused by one or more corroded joints in the metal structure of the tower or other supporting structure. Some references say that this is unlikely but I have actually located and corrected such a problem on another repeater in San Clemente, CA.

The filters and other isolating elements in the various receiver and transmitter signal paths generally keep these interfering signals out of the direct path.

How can the problem be avoided? It seems unlikely that the offending non-linear circuit can be found and fixed by electrically bonding across the corroded joints on this very

complicated installation. So the only solution involves reducing the amplitude of the signals causing the problem.

Recall that the problem requires two repeater output signals and one repeater input signal to trigger the effect. The repeater output power is what it is but the repeater input signal is affected by the user. In general, a user transmitting the minimum power required to maintain satisfactory communications will not cause the problem.

An HT will generally not cause the problem but a mobile at 60 or 70 watts might depending on its proximity to the repeater and the propagation path. Remember that §97.313 (a) of the FCC Rules and Regulations requires us to use the minimum power to carry out the desired communications.

If we were to strictly follow the rules, we would operate our mobiles or base stations at the minimum power level required to produce a full quieting effect at the repeater input. I'll bet that most of us don't do that.

The resulting intermodulation product signal may cause the repeater to be kept keyed up if it contains a sub-audible tone. Perhaps removing the re-transmission of the tone could cure the problem but the user's input signal must contain a tone to activate the repeater so the tone would still be there.

Even if the resulting intermodulation interference did not contain a sub-audible tone or used a different tone frequency, the resulting signal could cause a capture or blocking of the desired signals. At least the tone keys up the repeater and gives us a clue as to what is happening.

So keep your transmitters at the lowest power level to do the job. If we all do that, there will not be a problem.

If you want to read more about this effect, simply Google "Intermodulation" and read the resulting references. There is a lot of stuff there, some good and some bad, but you will learn a lot more.

John Lemmer, W6FQX

The following article is adapted from Emcomm Monthly, April 2007. Check out the links at the end of the article.

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Antenna Tips for HF Operators

Many new HF operators are appearing on the bands. Many are checking into emcomm and traffic nets and are displaying some excellent operating practices. These former VHF and/or UHF only operators are finding out that HF operation and propagation is a somewhat different "ball game". Occasionally, we hear someone say, "I'm using a simple dipole and it is only 30 feet in the air. I need to get it up higher."

Not so fast! It all depends on what you are trying to achieve, and how long the ranges are you wish to "work". Unlike VHF and UHF, increasing height above ground may actually decrease your effective range. Most emcomm nets are in the 40 and 75/80 meter bands. (The 30, 60 and 160 meter bands are less commonly used for emcomm--but we probably will be seeing more utilization of those bands as the number of amateur stations increase.)

NVIS (Near Vertical Incidence Skywave) is simply the technique of using *horizontal*, low-to-the-ground, antennas for short range (0-300 miles) HF communications. It will get a signal up and out of a deep canyon, etc. It is a simple and VERY useful technique.

NVIS is less directional. The signal is going UP and back DOWN to earth...a form of "scatter."

NVIS not only allows HF stations to work each other at closer (regional) distances, but it reduces interfering with stations at longer distances. Two nets that are far away from each other, can even operate on the same frequency ***if they are far enough apart and every station in the net is using NVIS.*** As soon as one station comes on that is using a vertical or high beam antenna, that luxury may go out the window. But consider this: One station located between the two nets can effectively serve as a valuable relay! Example: A station in the MTZ (Mountain Time Zone) could relay traffic from the CTZ to the PTZ, and back, on 40 or 75/80 meters!

The NVIS Antenna is NOT a specific type of antenna. It can be a simple balanced doublet, a G5RV, a resonant end-fed Zepp, or even a random wire. Factors such as ground moisture and the sub-surface water table are (of course) *variable* factors. Generally speaking NVIS antennas are effective that are from 10 to 30 feet (about 3 to 9 meters) off the ground.

Making your own antenna a very useful emcomm skill. It is one of the most enjoyable and satisfying projects a new ham can do. Give it a try!

FOR MORE INFORMATION ON NVIS ANTENNAS:

<http://www.emcomm.org/antenna/>

<http://www.emcomm.org/projects/default.asp>