

# The Open Feed Line

A Publication of the Michigan Amateur Radio Alliance (MARA)

Volume 17, Issue 4 - Friendship, Community Service & Advancement of the Hobby - Oct -- Dec 2008

## Technician Class

*By Larry Dells KC8KVR*

What better way to start the New Year than with a class to help folks earn their Amateur Radio license? Larry Dells, KC8KVR started planning this several months ago with the Northview Adult community education program and just received word that it is a go!

If you are interested, there will be an informational meeting on Monday January 12, 2009 at the Northview Crossroads School at 7:00pm. The school is on the dead end of Ambrose St. NE. (Ambrose runs east off Woodworth and is north of Plainfield Ave. approximately 3 blocks.)

The classes will be held on Mondays 7:00 to 9:00 PM. The class will run 8 weeks and the exam will be on the 9th week. Cost is \$29.00 for the course and includes study material. Cost for the exam is \$15.00.

The class is open to the public. You do not need any previous knowledge about Ham Radio. Just bring a desire to learn and to get on the Ham bands!

If you have any questions, please check the Mara web site under Club Events or give Larry KC8KVR a call. You can also E-Mail Larry at [W8USA@ARRL.NET](mailto:W8USA@ARRL.NET). Please put either Larry or Ham Radio class on the subject line.

If there are any updates, we will announce them on our Thursday night net and also on the DVR of the Club's repeater.

What better way to greet the New Year than with your first Ham license!

## Happy Birthday to Leonard W8SPX 94 Trips Around the Sun!



At this past November's Mara club meeting, the members got together and held a surprise Birthday party for Leonard Schaafsma W8SPX. Leonard, who is a young 94, missed the gala event due to Mr. and Mrs. Arthritis visiting him. While Mike K8OOK placed and lit the candles on the cake that Nancy N8IPG baked for the special event, we all got in voice to sing "Happy Birthday". Leonard is a special friend of all of our members and Ham Radio too. He goes out of his way to help who ever he can. No matter what the problem is.

If you would like to read more about Leonard, visit our club's web site <http://www.w8usa.org>, and click on "Ham of the Year". Leonard was a recipient in 2007.

We all think Leonard is a special friend. If you hear him on the bands, please take the time to wish him a happy 94<sup>th</sup>.

## **The Open Feed Line**

The Open Feed Line is published quarterly. It is the official journal of the Michigan Amateur Radio Alliance, or MARA for short.

MARA, an American Radio Relay League affiliated club, was created to provide opportunities for friendship, community service, increasing technical knowledge, and upgrading our skills in the hobby of Amateur Radio.

You may freely reprint any material in the Open Feed Line, but please credit the Open Feed Line, the original author, and the original publication, if given.

Everybody is encouraged to submit original articles on topics relevant to the hobby of Amateur Radio to the editor. The deadline for submission is the end of January, April, July, and October, and the newsletter will be published within the following month.

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### **Membership Information**

Annual dues to MARA are \$20. Family memberships are an additional \$5. Persons aged 70 and over - \$5.00. Membership is free to students under 21. Memberships expire on December 31<sup>st</sup>, and club dues are due on January 1<sup>st</sup>. MARA membership is open to all interested persons.

Please send change of address information and membership applications to the club secretary.

### **Great Lakes Award**

Send inquiries regarding the Great Lakes Award to the Awards Manager  
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\* Some of these positions become open occasionally. If you'd like to volunteer, contact one of the board members and let them know what your interested in. \*

## **Club activities**

MARA holds their weekly 2-meter Net, every Thursday, at 8 PM on the MARA W8USA repeater, 145.230 MHz -600Khz PL. 94.8. MARA holds their monthly meetings on the 2nd Wednesday of the month at 7:30PM, at the Steepletown Building, located on the SW corner of 5th street and Davis NW, in Grand Rapids. This site is handicap accessible, with additional parking on the West side of the building. All are welcome to attend our meetings.

## Spaghetti Dinner!

*By Richie K8JX*



This past September, Mara members decided to try their hand at putting on a Spaghetti Dinner as a means to raise funds for the club. This was a learning experience for the club on how to put this on, but also it was fun! In the above photo, left to right, Mike K8OOK is talking with Bruce WD8KPQ (out of sight) while Marian, KB8VOZ's XYL prepares salad and right, Larry KC8KVR, starts to repair one of our coffee urns. It was a joy to see everybody working together. Did we make any mistakes? None that we're aware of. The only problem was the weather. It was on a Friday night and the day temp was 70 degrees! The greatest part of putting this on was that we only had to spend 7 ½ hours operating it. This is a far cry from the 73 hours for the other fund raising event.

We have thought about changing menu items, but that will have to wait till we get more input from the community.

This was our first effort and we're going to be holding another one towards late winter or early spring. Stay tuned for the exact date!

## The Grand Rapids Home for Veterans Special Event Operation.

*By Richie K8JX*



(Above, Left to Right, Bruce WD8KPQ takes time to eat pizza, A staff member talks with Jerry W8MSK while Mike K8OOK, far right, supervises a Veteran participating in Amateur Radio.)

Once again, our member's strung up antennas and set up radios to operate on Veteran's Day. This year, we operated on November 8<sup>th</sup> and 9<sup>th</sup>. Being allowed to operate for two days was a first and we made about 120 contacts. Larry KC8KVR said what was great was seeing all the "Thank-you's" that folks wrote out on their QSL cards.

The crew consisted of Larry KC8KVR, Jerry W8MSK, Mike K8OOK, Wayne KB8VOZ, Bruce WD8KPQ, and John NF8P. An old friend, Bill N8VWI stopped by to help out and see how the operation was working. This is a great way to show our Veterans how much we care about them. Keep next November's Veteran's day in mind.

## **Ham of the Year**

*By Richie K8JX*

It's that time once again, when we open up the nominating process for "West Michigan Ham of the Year". This year, we've extended invitations to both the Lowell ARC and GRARA to participate more fully than before. The MDXA has declined due to having their own acknowledgement award, "The Pillars of Society". If you think you know somebody who you think should be considered for the HOTY, please write out the information about the candidate and tell why you think they should receive it. If you want more information on this award, please visit our web site, <http://www.w8usa.org>, and click on the Ham of the Year button. You can read about who has already received this award and get a better idea of what they did to be considered. Please keep in mind that once a name has been submitted, we keep the name on our list. That way, if somebody thought enough of a hams achievement to warrant submitting his or her name, we'll consider it each year we give the award.

## **Mara's After-Christmas- Dinner**

*By Richie K8JX*

Yes, it's almost that time once again when we get together and enjoy an evening out with our friends.

This year, it will be on January 17<sup>th</sup>, 2009. It will be at the same restaurant we've held it at for the last few years, Brann's on 28<sup>th</sup> St. We will once again be holding a "White Elephant", so please wrap up your "Treasures" and bring them with you. There is one change this year. Due to the economy, each person will be responsible for their own meal charge. Please RSVP to Marian by January 14, 2009. You can call Marian at 957-4641 or Nancy at 363-4998 . You can also reach Marian through Wayne Dowling's e-mail, [waynedowling@att.net](mailto:waynedowling@att.net). Let's have a great beginning to Next Year!



## Waves IV

By Jim ki8jd

*This is the fourth installment of a series that began in the February 2008 issue. You can view the previous articles on the club's website. These articles all appear on page 6.*

In our previous articles, we discussed resonant antennas. What does the word "resonant" mean? Simply put, an antenna is resonant when its inductance and capacitance cancel each other, leaving only pure resistance, with no reactance.

When current flows through a conductor a magnetic field is produced around the conductor. We will now explain how this field resists any change in current flow. When the current increases, the magnetic field resists the increase by taking some of the electrical energy, and storing it in the field. Obviously, this makes the field stronger. When the current decreases, the field resists the decrease by returning energy back to the current flow, and the field becomes weaker. This process causes what is called inductance. Normally, only a very small amount of energy is lost in this process.

When the AC signal leaves your transmitter, the voltage and current should be "in phase" with each other. This means that the voltage and current reach their peaks at the same time. If you made a drawing of this, the voltage and current could be represented by a single sine wave. Inductance has the effect of delaying the current peaks. We say that voltage leads the current through an inductor. Conversely, you could also say that current lags voltage through an inductor.

The capacitance towards the ends of the antenna is a result of the high voltages present there. (To review the relationship between current, voltage, and impedance, see Waves III.) The voltage at one end is opposite of the voltage at the other end, and the ends act like plates in a capacitor. A capacitor resists a change in voltage. As the voltage increases, the capacitor resists the increase by taking some of the electrical energy, and storing the energy in an electrostatic field. When the voltage decreases, the capacitor resists the

decrease by returning the energy to the conductor. Again, only a very small amount of energy is lost in this process.

Capacitance has the effect of delaying the voltage peaks. We say that current leads the voltage through a capacitor. Of course, you could also say that voltage lags the current through a capacitor.

The old memory aid is "ELI the ICE man". In the word "ELI", the letter E represents voltage, the letter L represents inductance, and the letter I represents current. The letter E comes first, so voltage leads current through an inductor. Similarly, the letter C represents capacitance in the word "ICE", so current leads voltage through a capacitor. You may wonder why we don't just use "V" for voltage, "C" for current, etc. The answer is simple; these letters come from a language other than English (I believe it might be Italian).

We use the word "reactance" to describe the effect that capacitance and inductance present to an AC signal. Reactance impedes the flow of current without converting electrical energy to a different type of energy. So it is a loss-less type of resistance.

The word "resistance" usually describes a situation where electrical energy is converted to heat. An example would be the filament in an incandescent light bulb, or any conductor that will only pass a fraction of the current that is trying to flow. The electrons are rushing through the obstruction, and colliding with atoms in the conductor. These collisions donate kinetic energy to the atoms, and this increased energy of the atoms is heat. It is similar to friction.

The word "impedance" describes the combined effect of reactance and resistance. While reactance and resistance can each be expressed by a simple number of ohms, impedance must be expressed by a "complex number" of ohms. But that is some goofy higher-mathematics, and we aren't going there.

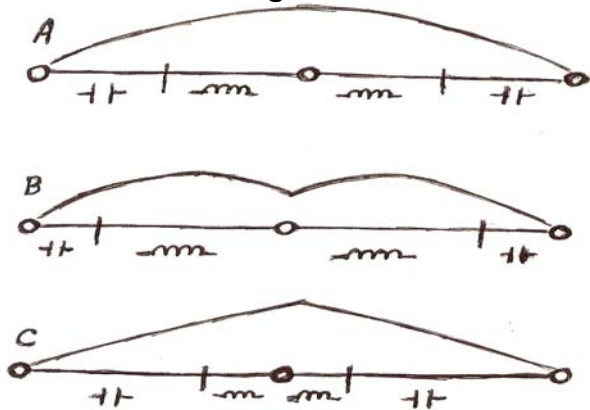
There is also a special type of resistance, called "radiation resistance", which expresses the amount of electrical energy converted to radio waves. It is similar to regular resistance, except the electrical energy is not converted to heat.

## Waves IV

Continued from page 5

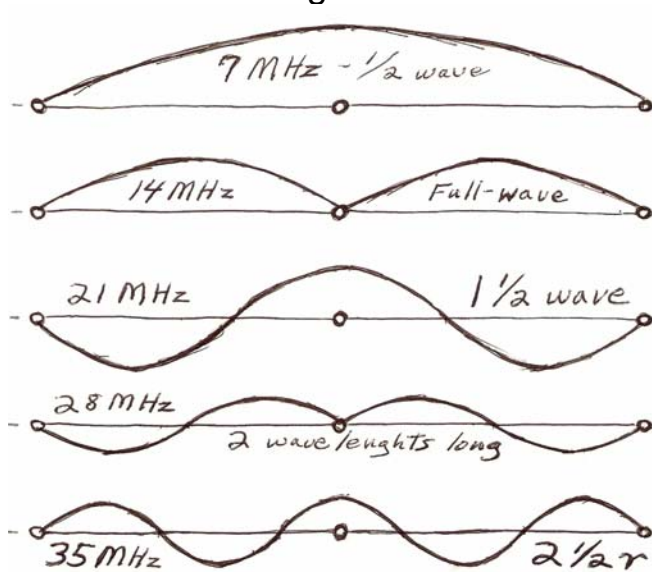
Figure 3 shows an antenna being operated at 3 different frequencies in the same band. The curved line above the antenna shows the magnitude of the current. The symbol beneath the antenna that looks like a coil represents inductance, and the other symbol represents capacitance.

Figure 3



A half-wave dipole will be resonant at only one frequency in the band for which it is cut (see A). If you increase the frequency of the signal going into the antenna, the antenna becomes too long, and becomes inductive (see B). If you decrease the frequency of the signal, the antenna becomes too short, and becomes capacitive (see C).

Figure 4



Let's say that your half-wave dipole is resonant at 7 MHz. It will also be resonant at multiples of 7 MHz, such as 14 MHz, 21 MHz,

28 MHz, 35 MHz, etc. When you operate this antenna at 7 MHz, you are operating at its fundamental frequency. When you operate on one of the higher frequencies, you are using the antenna as a harmonic antenna (so named because it is operating on a harmonic of the fundamental frequency). I underline these words because we will use them again.

Before you try to use your antenna on any of these harmonics, there is one more important thing that you need to know. Let's say that you are feeding this antenna with coax, and without any kind of matching network. Your SWR will be sky-high on 14 MHz and on 28 MHz, because you are trying to feed a low impedance signal into a high impedance load. Notice that on 7, 21, and 35 MHz, you are feeding into a high current portion of the antenna, which translates to low impedance, and coax will work just fine. (To review the relationship between current, voltage, and impedance, see Waves III.)

As a point of discussion, you could physically move the center insulator to a current peak on 14 or 28 MHz, and obtain an impedance match for your coax. Of course, the drawing would have to be changed to portray this feed-point change. The sine wave in the new drawings would look like what is pictured at 21 and 35 MHz, in other words, a continuous sine wave. In addition, your antenna would no longer be a harmonic antenna.

If you are lucky enough to figure out how to feed the antenna in Figure 4 with 450-ohm ladder-line and a manual tuner, it will work well anywhere above 7 MHz. It will also work to some degree below 7 MHz. It might even work on 160 meters, but performance will probably be very poor on that band, since the antenna would only be 1/8 wavelength long. In theory, and in a perfect lossless world, a 1/8-wavelength dipole would work just fine. But in reality, the SWR would be astronomically high, and even ladder-line has great losses at ridiculously high SWR. Any matching network used, such as a tuner, would also have significant losses in such an extreme situation.

We plan to discuss antennas fed with ladder-line and a tuner in an article yet to come.