Umpqua Valley Radio Club

WATT'S UP

October 2016

Watt's Up Staff: **Editor, Email & Mail out Distribution –*LaDon KA7AAR***

Newsletter for the Umpqua Valley Amateur Radio Club

P.O. Box 925 Roseburg, OR 97470

Club Officers

President

Dennis Riggs WA7RIG

1st Vice President Hutch, KE7JFQ 2nd Vice President Rick, W7DFV

Secretary Russ, *W7DUR,* Treasurer Jim Stuntz KF7FIB

Member-at-Large Lynn W7HDU, Lee K7AZW

UVARC Club Net Info 146.900 (-) PL 100.HZ Wednesday at 1900 hours

HF Club Net Wednesday at 1930 hours at 28.400 MHZ (This is an open Net)

Club Call Signs *KC7UAV, KC7TLY*

ARES Nets

Douglas County ARES District 5 ARES

***District 5 Ares 3964 KHz Sundays at 5:30 PM Mondays at 7PM* 146.900 repeater PL 100.**

President's Message

Greetings,

The last meeting was a very interesting meeting to say the least. We had to say good bye to Tom KG7KQP who has moved to Texas. Tom you will be missed greatly. Then we had nominations at which both the President as well as the Vice-President has decided not to run next year. This years elections for officers should be very interesting. I am looking forward to the outcome.

Christine AE7OK, did a session on building a 2m J-Pole hosted by Jim KF7FIB. I heard the turn out was good and a good time of learning was had by all. Thank you Christine and Jim for stepping up and making this happen. I think it would be good to have more and similar events next year.

73's to all

Dennis Riggs

Umpqua Valley Amateur Radio Club Minutes

Meeting October 20, 2016

President Dennis opened meeting, Pledge to Flag.

Roll call by name and radio call sign. 23 present.

Reading of September minutes by sec, Russ. Motion to accept by Lynn seconded by Rick. motion passed. Treasure report by Jim motion to accept by Hutch , seconded by Ralph. motion passed.

Early bird dues (membership) being accepted.

There were five letters for Ham of Year award nominations received.

Lee K7AZW is at home recovering from heart surgery.

Members signed (get well) card to be sent.

Nominations for 2017 officers open . Pres. Dennis will be stepping down. also Vice Pres. Hutch stepping down, The Treasure and Secretary agreed to stay.Twenty nominations were received. These will be announced at our November meeting. Pres. Dennis would like to have a meeting at the High school for students to be involved in Ham Radio.

No further business. Dennis adjourned meeting .

Sec. Russ.

From Christine Masters (AF7OK)

As part of the MARS Exercise, I decided to have a VHF Net this next Monday, Oct. 31, at 3pm to give everyone a chance to participate in the exercise by providing the status of county services, such as power, cell phones, etc. and then everyone who participates will receive a QSL card. This is similar to what I was talking about with the 60m nets during the MARS exercise. The VHF net is for everyone, but especially Technicians who can't use HF.

Testing Antennas

...a few thoughts

Making antennas is one of the most popular aspects of our hobby - and for good reason. Even the most "practically-challenged" radio amateur can make an antenna. And the great thing about antennas is that it's almost impossible to make an antenna that does not "work" to some extent. By "work" I mean radiate radio waves. To that extent, antenna projects are always a success!

But how do we test our antennas? The most common measure of a "good" antenna is its Standing Wave Ratio. Good antennas have a low SWR, right? Unfortunately, although SWR is easy to measure and a low SWR at the output of our transmitter is a good thing, SWR tells us virtually nothing about how "good" the antenna is. In fact a good (low) SWR can be an indication of serious antenna problems!

Power Transfer and SWR

For a transmitter to deliver maximum power into the antenna, the antenna impedance must be the same as the output impedance of the transmitter - this is a low SWR. Moritz von Jacobi published the maximum power(transfer) theorem around 1840 and this theorem indicates that maximum power transfer occurs when the load (antenna) resistance is the same as the source (transmitter) impedance. However, the easiest way to get a great match with an antenna is to make it lossy (RF power gets turned into heat, not radiated). A example of this is a dummy load where the objective is to turn all RF power into heat and radiate none at all. A good dummy load is a handy piece of test equipment for any shack, it will have a low SWR over a wide band - but will be a terrible antenna as it will radiate virtually no energy.

To a lesser extent all antenna systems (antenna plus feeder) turn some RF energy into heat and in doing so their SWR is usually improved by losses. Many wideband antennas actually incorporate resistors. Where small antennas, such as magnetic loops, are being used, a good SWR over a wide bandwidth without re-tuning is almost always a bad sign. Curiously at least one loop supplier tries to make low SWR over a whole band without the need to re-tune, into a feature! This is a clear example of low SWR indicating a design fault.

An example of an antenna that has a high SWR is a doublet fed with open wire line. The SWR at the feedpoint of a doublet can be very high (10 or more) but because the feeder losses of the open wire line are so low, the overall antenna system is still a good performer. Interestingly a doublet is an example of antenna that does not even need to be resonant to work well. Low SWR and resonance are two very over-rated measures of antenna performance.
As an aside, another measure of antenna performance is the current flowing in the antenna. Antenna current in the radiating element is what you want to maximise. If using home-made transmitters and "tricky to match" antennas,such as short loaded verticals, antenna current is often the most reliable measure of antenna performance. Despite these thoughts, SWR cannot be dismissed as irrelevant as most modern transmitters have SWR protection circuits which lower the transmitter power if a high SWR is detected at the antenna socket so to keep your transmitter "happy" a low SWR at the radio is a good thing - provided you don't think it is telling you much about your antenna.

Radiated Power

If we accept that a dummy load or an antenna could have a low SWR for a variety of reasons (including losses - excessive or otherwise) how could we decide which was the better "antenna"? The difference is clearly how much power is radiated (and in what direction). In the case of a dummy load it probably gets hot showing that the power is being turned into heat. Measuring radiated power for an antenna is difficult to do in any meaningful way. All parts of the antenna system will have losses but as they are small, measuring heating effects may require specialised equipment and is not generally practical. Even if we can measure those losses, there will be there loss factors due to the environment that the antenna is in, which will mean that identical antennas in different locations will have different overall losses - with subsequent differences

in performance. This moves into the realm of measuring overall system performance. Done accurately, this is a fascinating way to see just how good your antenna really is!

Practical Measurement of Radiated Power

...and a new product

The real test of any antenna is how well it performs in real life. SWR, antenna current and even radiated power only show part of the story. In the past, the performance of antennas has been evaluated in a variety of ways including plying field strength meters around in helicopters! Radio amateurs have occasionally driven round with field strength meters, although measuring the performance of HF antennas by measuring field strength near the ground is not a very good technique and is fraught with problems.One possible way to test performance is using the Reverse Beacon Network. In essence this is a network of receivers with special software that can detect stations calling CQ on CW and pass their callsigns to an internet database. this works well but to use it effectively you need to be a CW operator - and call CQ a lot! It is especially useful for SOTA/NPOTA activators to check propagation.

In many ways, a better system is the Weak Signal Propagation Reporter network (by Joe Taylor, K1JT). Many remote receivers detects signals well below the noise and report back to a central website. The power levels used are low (often less than a Watt) but because of the way the system works, the performance of these low power transmitters is the equivalent of tens, hundreds, even thousands of Watts! Getting meaningful results from this system requires the user to do a lot of additional work though. This is where our new product comes in

We are getting ready to launch something rather special - hopefully in time for Christmas. It will consist of some special hardware and associated software to enable comprehensive testing of real antenna performance in a way never possible before. I will be providing more details soon. At SOTABEAMS we are pretty excited by this development!

73 Richard G3CWI