



The Repeater

Next Club Meeting

Thursday, October 3, 2013,
7:00 PM

Red Cross Building,
60 Hawthorne St., Medford, OR
Across from Hawthorne Park

Program: Meteor Communications
and Ham Radio on 6 Meters

Volume 2013, Issue 10

October 2013

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Club Web Page:		NEW :	http://w7dta.org	

President's Letter

Our annual swap meet which is now officially held in September was well attended and a lot of fun. I would like to thank our Vice President Scott Cummings, NA7OM for all of his work in getting everything organized. We had quite a few visitors and a lot of gear found a new home.

Todd Carney, K7TFC has been working to produce a brand new web page for the club. If you haven't had a chance to check it out yet you can find it at: <http://w7dta.org>. Todd has done a fabulous job producing a very professional looking web site. Also Todd has set up an email reflector through Google

(Continued on page 2)

Secretary's Report

We did not have a formal meeting called to order in September, so there are no meeting minutes this month.

The Repeater is the official newsletter of the Rogue Valley Amateur Radio Club, Inc. It is published 10 times a year—once per month excluding July and August.

President's Report, Cont'd.

(Continued from page 1)

groups which should make club communications more efficient.

At the October meeting an officer nominating committee will be named. New officers will be elected at the November meeting and installed at the December event.

Our presentation at the October meeting will be delivered by Dennis Recla, WA5KTC, former President of the SOARC. His topic will be "Meteor Communications" and "Ham Radio on 6 Meters".

I hope to see you all there.

73,

Jeff W7KNX

DCC 2013, Seattle

The 32nd ARRL/TAPR Digital Communications Conference (DCC) was held September 20-22, 2013 in Seattle, Washington. My wife and I drove to Seattle to attend, my wife to do some sight seeing, and I to attend and present a paper. There were an all-time record 160 registered attendees this year.

The conference was held at Cedarbrook Lodge, a truly beautiful place and fabulous facility; XYL heartily approved. It is about a 5 minute walk from SeaTac airport.

Highlights of the presentations:

John Hays, K7VE discussed the use of DNS (Domain Name Server) to return service records, protocol types, host, ports, etc. for ham applications rather than hard-coding all of the information into networked apps. He also discussed the use of Zeroconf autodiscovery for these applications which makes it much easier to manage and more scalable.

Heikki Hannikinen, OH7LZB the operator of the phenomenal APRS website aprs.fi, discussed a ham radio text message capability on aprs.fi. Some countries, such as Ireland require strong authentication that people sending communications over ham radio are actually hams. He discussed a lot of difficult, unscalable problems (meaning too much effort if a lot of people sign up), and a scalable authentication approach. He allows hams to authenticate using their LoTW certificate. The ARRL uses standard X.509 certs and aprs.fi trusts ARRL as a root certificate authority. No work is required of ARRL, and they have given aprs.fi approval to use their LoTW certificates. Doing so does not give aprs.fi your private signing key (in fact, the ARRL doesn't have your private key either, just your public key), Providing your LoTW certificate gives aprs.fi the ability to validate that you are an amateur radio operator, and

(Continued on page 4)

New RVARC Webpage, New RVARC email reflector.

Todd, K7TFC has put together a new webpage for our club. It is located at <http://w7dta.org> (note there is no www at the front). Todd built it using a package called Wordpress which provides a lot of features.

Todd will speak about the new page at our club meeting, as it has a lot of features.

One feature is a for-sale / swap page where members can place their own ads. It also contains a copy of the current club newsletter, the Repeater. That page has a small scrollable copy, but it can also be expanded (button in the upper right corner) or you can download the PDF version to your desktop. There's also a link to our archive of past club newsletters. Our page contains real-time propagation forecasts, solar flux readings, and other items of interest.

There's a news section, where members can post news of interest. Another page contains the club roster, in a password protected place. We won't write down the password on the web or in print. But it will be made available at club meetings where you can write it down for yourself. The intention is to make getting our club member's personal information a little bit more difficult for those who might use it to spam us.

To post information to the page each club member will need a page login. Todd, K7TFC has been handling getting members signed up.

Additionally, Todd has setup an email reflector for club members. It is housed by google groups, and all club members have been entered into the list. You can opt-out at any time if you wish by following the opt-out link in the welcome email. You do not need to be a member of google groups to use it, just sending an email to w7dta@googlegroups.com will send a copy

to all RVARC club members. Please be sure the mail is of general interest if you send it to everyone.

You can also join google groups, and if so, find past email postings to the club, and edit your membership properties, but that's optional.

Emails from non-members will be rejected (bounced) by the reflector so it can't (in theory) be spammed by outsiders.

One consideration is the hidden email problem. Some RVARC club members have an email alias that they use. For example, yourcall@arrl.net is an alias — it isn't a real email address. When someone sends an email to yourcall@arrl.net, it is received by ARRL who swaps the alias to your real email address, and then sends it to you. This is handy if you want to change email providers—the alias doesn't change. Note that yourcall@arrl.net cannot send a valid email from that address — it's a receive only address. So no one can ever receive a valid email from yourcall@arrl.net, only one that was spoofed by spammers.

It means however that google groups can't ever receive an email from your alias either (because you can't send from your alias). Google groups must know about your real email address, not about your alias. Thus the club needs your real email address rather than your alias for your membership in our email reflector. This problem in fact exists for all email reflectors, not just google groups, or the RVARC reflector.

For questions, logins, etc. for both the webpage and the email reflector, please contact Todd Carney, K7TFC at k7tfc@arrl.net

(Continued from page 2)

that you are who you say you are. Heikki gave a demo of how to install your LoTW certificate into Firefox, and how you can then sign up at aprs.fi (and authenticate also to qrz.com) using it. Many other ham sites may start using this process.

Steve Hicks, N5AC, VP of Flexradio talked about the new Flex6000 series radio. I had the chance to talk offline with Steve about ionospheric chirp sounders.

John Hansen, W2FS discussed Raspberry Pi, and a TNC board that he designed and is now selling called TNC Pi, that plugs into the header on Raspberry Pi, and can be stacked for multiple channels. He also mentioned a GlobalSat BU-353 USB-based GPS unit so that you can put together your own APRS / GPS radio at a small fraction of the cost of a commercial product. Raspberry Pi can use the Debian Wheezy distribution of Linux.

Bryan Hoyer, K7UDR discussed his UDR56K radio that puts out 25 watts on 430-450 MHz and operates at a data rate of 56k baud. It's still in development.

John Ackerman N8UR (past president of TAPR) discussed the open hardware license for people who want to create an open source hardware project and prevent problems (much like open source software).

John Ronan, EI7IG discussed use of RFC3626 link routing for mobile ad-hoc packet networks, and the problems he had. He took performance graphs in his country in Ireland and discussed some improvements to routing timers.

John Gibbs, NN7F Discussed some improvements to PSK31 that involve looking at the statistics inherent in English. Although PSK31 uses varicode (where the letter e is a

much shorter series of bits than Q for example) John added some logic that knows for example that a space character is even more common than 'e' and looks at the relatively probability of symbol sequences and impossible sequences and a way to improve the error rate by about 2x using essentially a Markov tree. By incorporating this into PSKCore.dll, almost all PSK31 programs could pick up the receive improvements. No changes to existing PSK31 is required (it's backwards compatible).

Bruce Perens, K6BP (well known in the open source software community) discussed improvements he has been making to FreeDV, an open-source audio codec for digital voice over HF and VHF. His original work was meant to replace the proprietary (and expensive) AMBE codecs used by DSTAR and in some HF products with a free, open product. His first try resulted in a modulation that required about an S7 signal on HF for good audio. His new version gets it down to about 2 dB SNR required on HF, Bruce says that SSB sounds worse than his digital codec at that same SNR. I talked off line with Mel Whitten K0PFX, who said that with his equipment he needs about S2-S4 signal on HF to get good digital voice copy. Bruce said that he optimized the forward error correction (FEC) for voice rather than adapting existing digitally optimized FEC approaches. He only FEC codes the most important voice characteristics and does not FEC code less important ones. Traditional approaches code the entire set of bits regardless of whether or not they are critical to intelligibility. Bruce will next look at a better performing error correction code called LDPC (Low Density Parity Check) and interleaving to help with deep fading, although at the unfortunate cost of about 0.5 second delay). Deep QSB causes some problems, and I discussed off-line with Bruce some possi-

(Continued on page 5)

(Continued from page 4)

ble approaches to HF polarization separation to try and improve the performance.

Michael Ossman of HackRF discussed a new low-cost SDR radio "Jawbreaker" that covers from 30-6000 MHz. Michael started a kick-starter project and has raised about \$600,000 to fund the radio development and initial production. He discussed his use of the receiver to find and troubleshoot WiFi, Bluetooth, and other radio based industrial security problems. Michael also talked about product availability, and ham related uses for the radio, which is half-duplex (can transmit or receive, but not both at the same time). The DSP is mostly done on the attached PC, not on the Jawbreaker board. Gnuradio drivers are or will be available.

Tom, N5EG presented on Gnuradio and the development of software that allows the HPSDR (High Performance SDR radios) to run full-duplex with Gnuradio. In the demonstration room, John Petrich, W7FU setup posters, and Gnuradio running on a Linux laptop talking to USB-TVB dongle, Ettus radios, and Tom's Hermes SDR radio. Off-line, we helped people install and get Gnuradio running on their personal laptops.

Bart Kus, AE7SL presented on Seattle Ham-WAN work deploying 5.9 GHz ham-band transceivers. These are 802.11 units that have been reprogrammed. A \$91 transceiver running 1.3 watts and a \$85 directional antenna are available, the group is using them to provide 30 megabits/sec links in the Seattle area. They are testing various antennas, cellular configurations, and routing to make it accessible to the ham 44.x.x.x IP address range. Their webpage provides a great resource for those wishing to copy their designs, software configurations, and equipment lists.

The Saturday night banquet talk was by Tom van Baak on high precision time and frequency in a humorous way. Tom talked about powers-of-ten in timekeeping, and a short history of timekeeping. He then talked about the effect of gravity on time, and the predictions of general relativity. A clock at higher elevation will run more slowly than one near sea level. He conducted an experiment by taking three cesium beam clocks up the side of a mountain and staying with them overnight while camping with his kids. The clocks did indeed run 24 nanoseconds slower compared to the clocks at sea level.

On Sunday, Rob Fronhe, KL7NA provided a 4 hour tutorial on Android application development. He used the free Eclipse development environment and the free Android Development kit SDK. During the course of 4 hours the class coded an antenna rotor application in Java that runs on Android tablets and smartphones to display the heading and control the direction of a ham antenna remotely over the internet.

The presentations were videotaped by Gary Pierce KN4AQ and his crew from HamRadioNow.TV and should be available in several months at <http://arvideonews.com/hrn/>

Solar Dynamics Observatory, Researchers find fundamental error in solar model.

Researchers from Stanford University recently used data from the Solar Dynamics Observatory (SDO) (discussed several years ago in the RVARC Repeater).

They found that the basic model of solar interior gas flows is in fact too simple, and needs to be modified. Previous theory suggested that gas flowed from the sun's equator in two flows, one equator to north pole and another equator to south pole at a depth of about 125,000 km. At that depth the flow takes about 11 years to cycle from equator to pole and back again. This has been the basis of several previous sunspot prediction models. These models have proved not to model the current sunspot cycle too well.

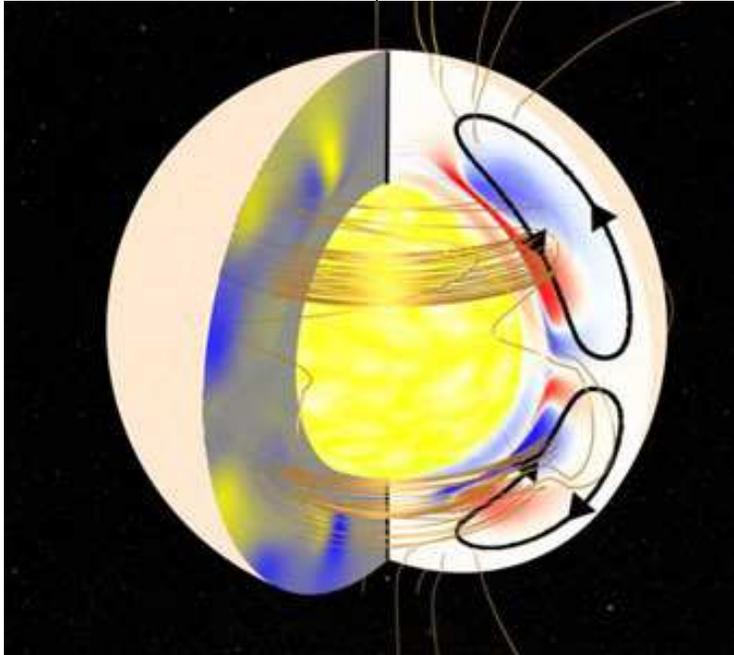
By watching gas bulges and timing the flows, the researchers discovered that the flow actually consists of four flows, two coupled flows from equator to north pole, and similarly

two from equator to south pole.

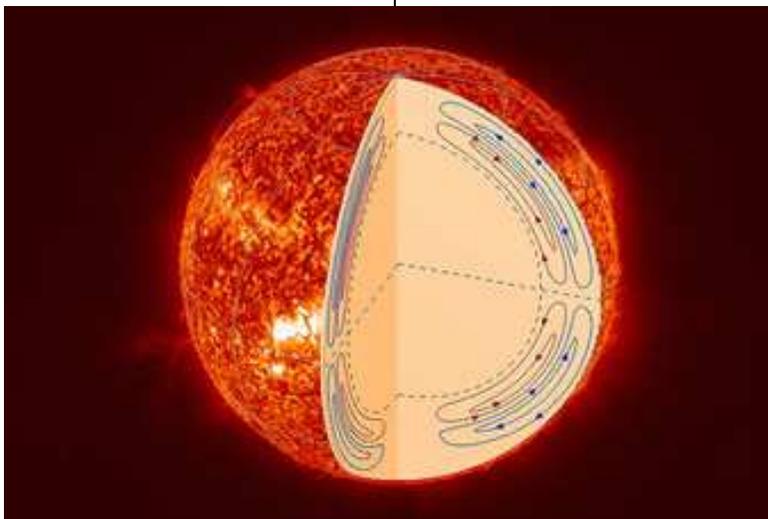
According to David Hathaway, at the Marshall Spaceflight Center said the results are "catastrophic" for current theory. "It indicates the need for revolutionary changes in our dynamo models for the sunspot cycle."

Hathaway has conducted workshops of scientists who have various models to predict sunspot cycles, most recently the Berkeley workshop about 4 years ago. The different models presented at the workshop failed to predict our current very anemic sunspot cycle. The models have a wide divergence of predictions.

Hopefully the new physics can be used to construct better models of our sun and the 11 year sunspot cycle. Obviously there's a lot of work to do. While better predictions are extremely useful, most hams would probably just settle for better and more sunspots!



Old theory of solar gas flows. The flow takes about 11 years to cycle from equator to pole and back again. Courtesy NASA / Solar Dynamics Observatory.



New theory of solar gas flows based on measurements from SDO. Courtesy NASA / Solar Dynamics Observatory.

RVARC Dues are Due

RVARC membership dues run from January 1 through December 31. Please bring cash or a check payable to RVARC to a club meeting, or mail (checks only) to:

RVARC Membership
c/o 102 McDonough Rd.
Gold Hill, OR 97525-9626

Regular Member:	\$20.00
Senior Member (62 and over):	\$15.00
Family Member:	\$20.00
Student Member:	\$10.00

Amateur Radio Examinations

In the Rogue Valley, amateur radio exams are provided by the RVARC and the SOARC. New exam participants need to provide identification, while upgrading amateurs need to **provide a copy of their current license** as well as show identification. The exam fee for 2013 remains \$15.00. All license candidates must provide a picture ID. Upgrading amateurs must also provide a photocopy of their current license to send in with their application. To search for other exam locations, see:

<http://www.arrl.org/arrlvec/examsearch.phtml>

Medford—Phoenix, OR

Time: Saturdays, 8:30 AM. Exam session starts at 9:00 AM. Walk-ins welcome.

Location: Fire District 5 HQ. 5811 South Pacific Highway, Phoenix, Oregon 97535

Dates 2013: Oct 26

Contact: Don Bennett, Email: kg7bp@rfwarrior.com Phone: (541) 973-3625

Grants Pass

Time: Arrive 6:00 PM. Exam session starts at 6:30 PM. Walk-ins welcome.

Location: Fruitdale Grange. 1440 Parkdale Dr., Grants Pass OR 97527-5288

Dates 2013: Nov 15

Contact: John Stubbe, K7VSU, email: K7VSU@arrl.net, Phone: (541) 218-2244

Next Club Meeting

Thursday, October 3, 2013, 7:00 PM

Red Cross Building, 60 Hawthorne St., Medford, OR

Across from Hawthorne Park

Program: Meteor Communications and Ham Radio on 6 Meters