



W7OEK

Volume 2009, Issue 4 **April 2009**

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Club Web Page:		dave@basden.us	
		http://www.qsl.net/w7oek	

Next Club Meeting
Thursday, April 2, 2009. 7:00 PM
Red Cross Building, 60 Hawthorne St., Medford, OR
Across from Hawthorne Park
Program: (see President's column)

President's Letter

PRESIDENT'S LETTER

Because of an early newsletter deadline this month the program hasn't been finalized. However in my dedication to seeing that good programs are provided, believe me when I say that it will be worth your time on Thursday April 2.

A big "Tnx" to Tom N5EG for his well-illustrated presentation about antenna modeling, with a lot of practical antenna theory thrown in at the March meeting. Also thanks to Mike Bach WB6FFC for providing the video projector (even programs available from ARRL come on DVD now – hint!). The ARRL Northwest director's visit mentioned at the March meeting is now tentatively rescheduled for the September meeting.

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Secretary's Report

MINUTES OF THE 5 March 09 ROGUE VALLEY AMATEUR RADIO CLUB MEETING

The meeting was called to order by president Herb Grey W7MMI at 1905L in the Red Cross building in Medford, OR. 26 people where in attendance.

Three guests where present they are Darrek Barker KE7FNL, Cleeve Mosley KE7USR & Harvey Huntman W7HJ.

Secretary Jack Schock WA7IHU read the minutes of the last meeting and they where approved as read.

Treasurer Lud Sibley KB2EVN told us that the club bank account has \$2078.63 in it.

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President's Letter, Continued

Thanks to Don KG7BP for volunteering to handle the coffee, etc chores, and Jack WA7IHU for bringing the donuts.

It's not too early to begin planning for Field Day June 26, 27, and 28. I'll be looking for participants to organize, set-up, and operate.

73, Herb W7MMI

Editor's note: I also need to put the May newsletter on a one week-early schedule due to work commitments. We will need to wrap it up by April 22nd. This really messes up the program announcements.

Two Meter Repeater Frequency

Some RVARC club members have been heard on the K7RPT 147.62 / 02 repeater in the last month or two. This is an open repeater (no tone or PL access required). The repeater listens on 147.62 MHz and transmits on 147.02 MHz (high in, low out).

Secretary's Report, Continued

OLD BUSINESS:

Tom McDermott N5EG announced that the 2009 club badges are ready.

Don Bennett KG7BP announced that the VE's last testing session, 3 people passed the test for Novice licenses and 1 for the General class. 8 examiners were present to administer the tests. Pictures were taken and will be posted on our web site.

Jack brought up the fact that if you get your newsletter by email it saves the club one dollar. Several people gave their names to Tom to go email only.

NEW BUSINESS:

Herb led a discussion on the club purchasing a video projector. Nothing was decided at this time.

Bud W7LNG reminded us that when a boy scout visits a ham station he gets a merit badge and it might be a way to get young people involved.

Herb announced that this coming weekend is ARRL phone DX contest.

At 19390L Herb put the meeting on hold for coffee and conversation.

At 2000L Herb called the meeting back into session and turned it over to Tom who gave us a very nice presentation on antenna modeling. Herb thanked Mike Bach WB6FFC for loaning us the video projector.

Herb announced that next month's program will be a visit by an ARRL official.

Herb adjourned the meeting at 2100.

Submitted by Jacob O. (Jack) Schock
WA7IHU secretary

2009 VE Exams

Our last local VE exam was February 28th at the VA Domiciliary in White City, coordinated by Harry, AE7NY.

The Southern Oregon Amateur Radio Club (Grants Pass) also offers FCC exams to the public through the ARRL Volunteer Examination Coordinator program four times per year. Each exam session starts at 6:30 PM and is held at the Fruitdale Grange on Rogue River Highway, the same place that the SOARC monthly meetings are held.

The exam fee is \$15.

2009 remaining exam dates are:

- May 22, 2009
- Aug. 28, 2009
- Nov. 20, 2009

Remember to visit the <http://www.arrl.org> website to get the latest information about testing requirements. Some changes are coming down the pike. The website for Grants Pass exam schedules is:

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

The right hand side contains lots of hyperlinks covering most of the questions about exam sessions.

73, Bill (WX7U), VE and Liaison

(Thanks to SOARC Wireless Gnus).

The Band Has “Gone Long” ?

There’s been a lot of discussion about solar cycle 24 lately, mostly “When is it going to show up?”

While solar cycles may be of academic interest to scientists and researchers, it’s a pretty practical concern for amateur radio operators. Lack of sun spots means that propagation on the higher bands (15 and 10 meters) is pretty rare, and even 40 and 80 meters are suffering a bit during this lull in activity.

One of the symptoms that we see on 40 meters is that the band “goes long” in the afternoon (rather than in the evening). What does “going long” mean, and why does it happen?

Most HF communication takes place via the ‘F’ layer of the ionosphere which is located about 150—250 miles above the earth’s surface. Radio waves in the HF region can be refracted back to earth by the F layer. Like most optical surfaces, the more obliquely that the waves strike the surface, the better they are reflected. Thus, a radio wave that goes straight up is refracted most poorly, while those that come off the antenna at very low elevation angles (just above the horizon) will be refracted more easily.

Many of us have heard the term **Maximum Useable Frequency (MUF)**. That refers to the highest frequency that the F layer will refract back to earth for the particular path length that we want to use. We can’t specify a single MUF because it depends on the path geometry. Instead, we can specify a single parameter, the **Critical Frequency (Fc)**, which is the highest frequency that can be successfully refracted from a signal that is sent straight up to the ionosphere (a 90 degree elevation angle). The critical frequency is always lower than the MUF, but if we know Fc then we can compute MUF for any desired path length.

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“Gone Long” Continued.

A rule of thumb is that the MUF needs to be at least: $MUF = F_{critical} / \sin(\text{elevation})$. The following table shows range, elevation angle, and ratio of MUF to F_c for several distances.

If we want to talk to our friends in Portland on 40 meters, (250 miles) then the required minimum critical frequency is $7.3 / 1.55$ or 4.7 MHz.

and 10 meters will be open.

At this point in the sunspot doldrums, the sunspot numbers are near zero every day. The critical frequency is sitting around 3 MHz during the early evening, and it starts dropping off slowly later at night.

The solar flux is a more accurate way of recording the activity of the sun that affects our ionosphere. We have been averaging a solar

Range to station	Elevation Angle	MUF compared to $F_{critical}$
250 miles	40 degrees	MUF is 1.55 times higher than F_c
500 miles	30 degrees	MUF is 2.00 times higher than F_c
750 miles	20 degrees	MUF is 2.92 times higher than F_c
1000 miles	15 degrees	MUF is 3.86 times higher than F_c

If instead we want to talk to our buddies in southern California on 40 meters (750 miles) then the required minimum critical frequency is $7.3 / 2.92$ or 2.5 MHz.

That means that a much lower F_c will support our path to southern California than to Portland, thus **F_c needs to be higher for a shorter path.**

As we are talking to our friends in Portland, the F_c drops below 4.69 MHz. We lose propagation. However, since F_c is still higher than 2.5 MHz, we still have a path to Los Angeles. This is what it means when the band “goes long” - the F_c has dropped too low for close-in contacts and will only support contacts further out in distance. This is sometimes called the “skip zone” because our signals skip over these shorter distances.

The F_c is dependent on the number of sunspots—the more sunspots the higher the critical frequency and the better the close in propagation will be on 80 and 40 meters in the evening. Also, the higher the critical frequency the better then chance that 20, 15,

flux of about 68 most days. As I write this, the smoothed sunspot number is 7, and the solar flux is 69. Looking at the real-time F2 Critical Frequency map predicts that F_c is 3.0 MHz over southern Oregon at 9 PM.

Thus, at 9 PM the MUF to Portland is 4.6 MHz. that’s enough to work our friends on 80 meters, but not on 40 meters or even 60 meters.

According to W6ELPROP, the MUF to Portland will drop from 4.5 MHz at 9 PM to below 3.5 MHz at 10:30 tonight, so we will lose 80 meters during that time. But we will stay open to Los Angeles on 40m until 9:30, and the MUF is high enough to support 80m around the clock. But 80 has too much path loss from 8 AM to 6 PM (due to E-layer absorption) to be able to use it.

There’s a lot of free tools and aids available on the Internet.

You can get Solar Flux and K-index values from WWV at 18-minutes after the hour. The

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“Gone Long”, Continued

K-index will affect the MUF values a little bit. Also, you can log in to a local DX Cluster and get WWV spots (see the February RVARC newsletter for details).

A free real-time F2-layer Critical Frequency map is available at what use to be called Space Weather, now labeled Solar Terrestrial Dispatch. The website for spacew.com is:

<http://www.spacew.com/www/fof2.html>

The home page at Spacew has a lot of interesting information, including links to Aurora predictions and real-time maps as well. The aurora map is at:

<http://www.spacew.com/www/aurora.php>

W6ELPROP tool is a free tool that provides many useful functions and it's pretty easy to use as well. The current version is 2.70, and it has not had any changes in several years.

You won't have to remember any formulas to use it, but you will need to know the current solar flux and K-index as well as your own latitude and longitude, and the latitude and longitude of the station you want to talk to.

It also can provide a graphical map of the world with MUF to different parts of the world from your station shown in real time (or at any time and date that you want).

You can download W6ELPROP from:

<http://www.qsl.net/w6elprop/>

Solar Cycle Forecasting

(If you are good at this, you should also consider attending the horse races).

Cycle 24 was supposed to have already started by now, but because of the very long stretch of zero-sunspot days that we have had, it's been difficult to call an upswing. Additionally even though several cycle 24 sunspots have been seen, sunspots from cycle 23 also continue to be seen—there's normally a bit of overlap between cycles.

There is an interesting website with a number of papers on Cycle 24, but as with all forecasting, take the results with a large grain of salt. The site holds technical papers from the meeting on “Solar Activity during the Onset of Solar Cycle 24”. It's located at:

<http://sprg.ssl.berkeley.edu/RHESSI/napa2008/>

The first paper by David Hathaway of NASA gives a good background of predicting solar cycles (it's easy to do looking backwards, and miserable to do looking forwards).

There are 4 models that have given extremely good results in predicting sunspots over the last 8 cycles. Unfortunately they substantially disagree with one another when predicting cycle 24. The four leading model predictions are:

- **135 ± 30 in year 2012**
- **75 ± 30 in year 2013**
- **165 ± 15**
- **75 ± 30**

Thus all we know for sure is that several of these models will make wrong predictions for cycle 24. The smoothed peak for cycle 23 was 120 sunspots in 2001.

It's interesting to note that the 4 highest sunspot cycles ever recorded have all occurred in the last 61 years—1948, 1958, 1981, and 1990. The peak in 2001 was down quite a bit

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Gone Long, Continued

from 1990. Prior to 1940, there were many spotless days between cycles, we appear to perhaps be heading back to that behavior in the gap between cycle 23 and cycle 24.

Badges are available

The 2009 RVARC badges have been printed. Those that have not already been picked up will be available at any of the RVARC club meetings. If you have not received your badge please let me know so I can print another one and correct any errors in the club database.

RVARC c/o
Tom McDermott, N5EG
3950 Southview Ter.
Medford, OR 97504

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Across from Hawthorne Park
Program: (see President's column)

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c/o 3950 Southview Ter.
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