The Repeater

W7DTA AMATEUR RADIO CLUB Rogue Valley SINCE 1936 MEDFORD, OREGON

Next Club Meeting

Thursday
November 3, 2016, 7:00 PM

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

Programs:
1. Ham Radio History in Oregon and the Rogue Valley

Volume 2016, Issue 11 **November 2016**

Scott Cummings	**NA7OM**		**kd7ehb@yahoo.com**	**President**
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Carl VanOrden	**W7NT**	**(541) 326-5871**	**carl@pacificwest.com**	**Secretary**
Tom McDermott	**N5EG**	**(541) 734-4675**	**n5eg@tapr.org**	**Newsletter & Membership**
Club Web Page:			**http://w7dta.org**	

President's Report

No input received by publication deadline.

[Editor's note]:

Our club needs volunteers for the President and Vice President positions for 2017. We have many fine members who take on almost all of the work, so that the two positions require very little time or effort. Please consider volunteering for these positions, you won't need to devote much time at all.

The November, December, and January meeting programs have been confirmed. More information at the November club meeting.

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.

Secretary's Report

Minutes for the RVARC meeting of October 6 2016

President Scott Cummings called the meeting to order at 6:58 PM.

Two visitors (and possible new members) were introduced:

- Don Haynes (no call yet)
- Brooksby Harmon (tech going for general)

Treasurer's report: current balance is $4521.11

A motion was made and seconded (Mike Bach and Raoul …) for the club to purchase a new coffee maker. The vote was unanimous. Mike Bach WB6FFC accepted the role of committee head to research and purchase the coffee maker.

Scott Cummings discussed the recent Ca

(Continued on page 2)

President's Report

Secretary's Report

QSO Party participation of several club members. The group was Mike WB6FFC, Scott NA7OM, John W8WOM, Chris Duncan N7CGD, and Allan K7GT. The field expedition multi-multi effort was held at the Tree of Heaven campground (Klamath National Forest) in the Klamath River canyon. Great meals were provided by Mike and a good time was had by all.

It was noted that Carl Van Orden, W7NT has accepted a career position with the forest service in Cottage Grove and will be moving there soon. Carl's service as secretary was noted. Congrats, Carl!

First presentation was by Tom, N5EG on End-fed Half Wave Antennas.

Tom then conducted a straw poll regarding the RVARC meeting for December. The poll resulted in the club meeting some Saturday in early December for a tour of the radio and other facilities of the Rogue Valley Manor.

The second presentation was by Dan, N6WN on the application of the Raspberry Pi 3 to the radio application of being a callsign server.

The meeting was adjourned at 8:30PM
Submitted by Allan, K7GT in lieu of Carl Van Orden, W7NT.

This Month's Programs

1. Early Ham Radio History with a focus on Oregon and the Rogue Valley

Program: Bob will present the beginnings of ham radio, the equipment used, governmental regulation, growth of ham radio in Oregon and Rogue Valley including club activity up to 1940. Also included will be the spawning of commercial radio in the Rogue Valley.

Biography: Bob Deuel, K2GLO is an avid tube collector, radio historian, and serves as club treasurer.

2.

Program:

Biography:

Shore Station KPH Call Sign Has Returned to the Airwaves

Nearly 20 years after shore station KPH in California went dark, that call sign returned Saturday, October 8. KPH is operating from its original home on its original frequencies using its original transmitters, receivers and antennas, “and even some of the original operators!” said Richard “RD” Dillman, W6AWO, of the Marine Radio Historical Society (MRHS). Dillman explains that KPH began as station “PH” in San Francisco’s Palace Hotel in 1905.

“It moved to several locations after the earthquake, ending up in Marin County north of San Francisco in 1920 with transmitters at the 1914 Marconi transpacific site in Bolinas and receivers at the Marconi receive site in Marshall,” Dillman recounted. “In 1946 the KPH receive site moved to the short wave transpacific receive site at Point Reyes, with transmitters still in Bolinas. It continued to provide radiogram service to ships at sea until 30 June 1997, when the license was sold to a competitor. With the license went the iconic call KPH.”

Dillman said the MRHS began restoring the station in 1999 and obtained another commercial call sign, KSM, continuing to operate the KPH facility on KSM frequencies to provide service to ships. “But, of course, we wanted to get back the KPH call and the KPH frequencies, so the station would be exactly as it was when they closed the doors in 1997,” Dillman told ARRL. That became a reality a few months ago, when the MRHS concluded an agreement with the current KPH licensee to add the Bolinas and Point Reyes sites to the license. That gave the MRHS authority to once again use the KPH call sign and frequencies.

“The crack MRHS Transmitter Department has shifted all the KSM transmitters back to their original KPH frequencies, retuned the antennas, tested the keying and advise that all will be in order for the resumption of KPH service,” Dillman said. Doors will open at the RCA receive site in the Point Reyes National Seashore at 1900 UTC.

Ray Smith — the operator who signed KPH Bolinas/Point Reyes off the air in June of 1997 — was scheduled to do the honors. KPH will then pick up the thread and resume operations, just as it did for so many decades. Dillman said KPH will provide the same services coast stations always have — radiograms to and from ships, high seas weather, and news of interest to the maritime community.

KPH transmission frequencies include 426, 500, 4247, 6477.5, 8642, 12808.5, 17016.8, and 22477.5 kc. KPH and Amateur Radio station K6KPH will be on the air every Saturday and Sunday. KPH will monitor 500 kc and ITU HF channel 3 for calls from ships, as well as on 4184, 6276, 8368, 12,552, 16,736, and 22,280.5 kc.

Amateur Radio station K6KPH will be in operation as usual, listening for calls on 3550, 7050, 14050, 18,097.5, and 21,050 kHz. K6KPH has remained operational throughout the history of the restoration project, “giving amateurs a chance to work the last remaining commercial Morse code coast station,” Dillman said. K6KPH uses the original KPH transmitters, throttled back to 1.5 kW, antennas and receivers.

KSM ceased operation after October 8, but several KSM transmitters will remain on the air a few weekends to provide information about the switch to KPH. “When we began our project we would never have believed this day would come,” Dillman said.

Thanks to the ARRL News [Ed Note: changed tense in multiple places because the original article came out before Oct 8th].

[Ed Note: KPH was loud and clear on 6477.5 KHz. on the afternoon of October 8th here in Medford.]

D-layer and E-layer Ionospheric Absorption

One factor that makes propagation seem strange is that there are two ionospheric layers below the commonly used F-layer on HF, namely the D-layer and the E-layer. They are not named the A and B layers, because at the time they were discovered, scientists assumed there might be more, so they left some letters open just in case.

Normally, we would like our signals to reach the highest ionospheric layer (the F-layer) and then be reflected. By reaching the highest layer, we achieve the greatest range of signal transmission

During the daytime, both the D-layer and E-layer contribute to absorption of signals passing through on the way to the higher F-layer. There are competent web sites that alternatively claim that the D-layer or the E-layer are the most responsible for HF signal attenuation. Well, what's the right story?

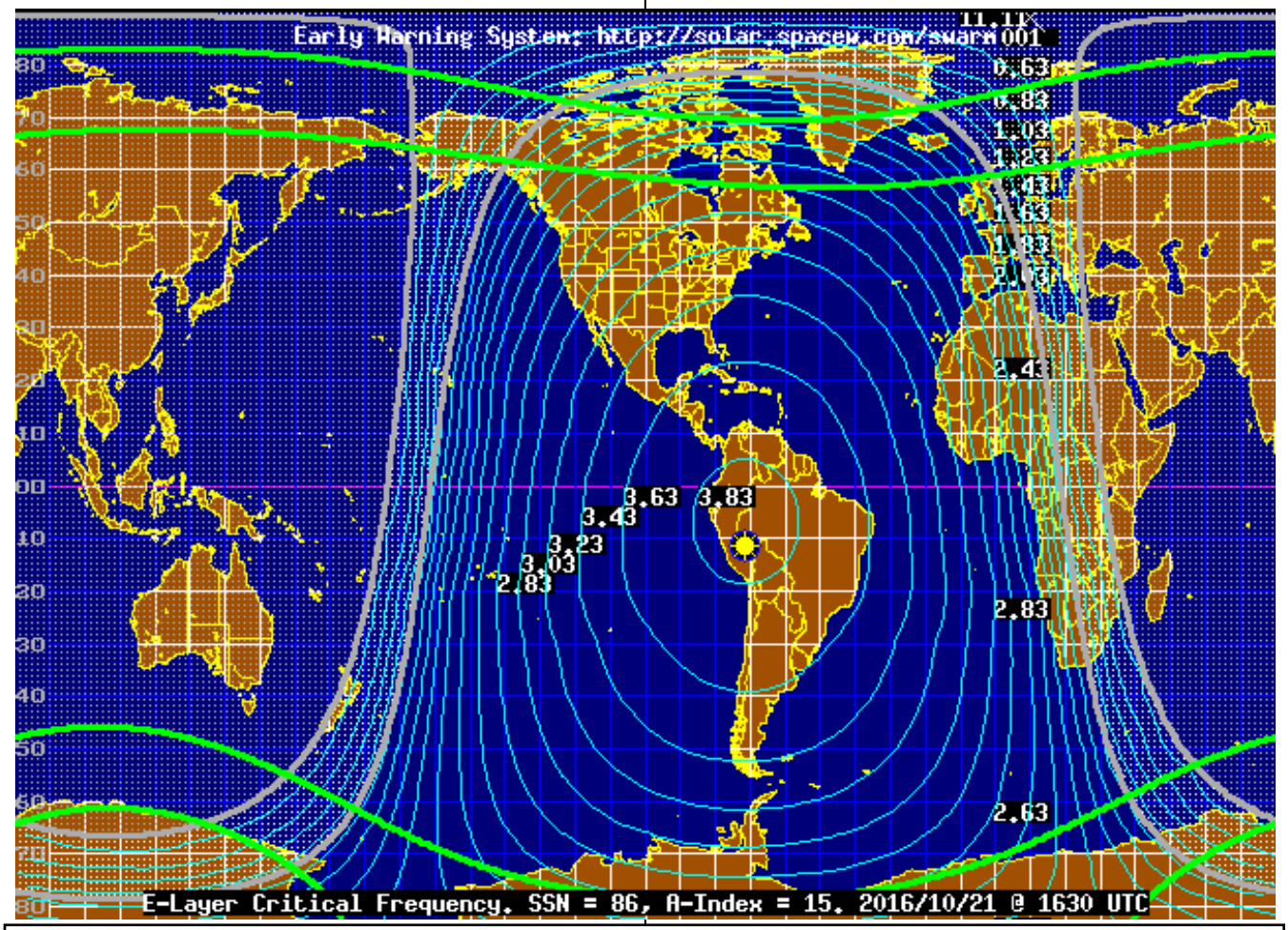

Figure 1—E-layer critical frequency (FoE). The E-layer FoE is quite stable, and depends mostly on the sub-solar point. This chart retrieved October 21, 2016. See reference (1).

It turns out that there were measurements done in the 1950s on layer absorption characteristics. The method used was to measure radio noise coming from distant stars and galaxies and see how it is attenuated while passing down through the ionosphere, as a function of time, date, sunspot cycle, and frequency. The measuring method system is called a Riometer.

The lowermost layer, the D-layer is in an ar-

ea of the atmosphere where the molecular density is higher than either the E-layer or F-layer (these layers are much higher, and thus in a region of much lower pressure).

Radio reflection is caused by free electrons (which have very low mass compared to ionized atoms and molecules). In the D-layer, due to the high density, the free electrons can hardly move any distance at all before they bump into an ion and recombine to form an un-ionized atom (or molecule). This means a couple things:

1. The lifetime of the D-layer after the sun sets is very short.
2. The D-layer absorption decreases as the square of the signal frequency. Meaning it has a huge level of absorption in the AM broadcast band, but very little absorption at 14 MHz.

Thus the D-layer effectively blankets the ionosphere at AM broadcast frequencies during the daytime. Once the sun sets, it quickly de-ionizes, and the AM broadcast band opens to longer propagation. The D-layer never completely disappears because at night cosmic rays very slightly ionize the layer.

The E-layer in contrast is higher up than the D-layer, and the density of atoms is lower. This means that the E-layer de-ionizes after sunset, but more slowly than the D-layer, taking something like 90 minutes or so to de-ionize. The E-layer ionization is very strongly dependent on the direct solar radiation—thus it depends on the geometric angle of the sun more than anything. It turns out to be only weakly affected by the solar activity level, the number of sunspots, etc. Thus the E-layer MUF is more predictable (compared to the highly unpredictable F-layer).

The E-layer critical frequency (highest frequency where it will reflect an HF signal straight up and down) reaches the 80m amateur band at moderate latitudes (below about 50 degrees) at local noon. Figure 1 shows a typical map of E-layer critical frequency (FoE) during late October. Note that the highest FoE is about 3.83 Mhz at the sub-solar point on the earth. During the northern hemisphere summer, the sub-solar point reaches 23 degrees north latitude, and this chart can just be rotated northward by about 30 degrees from Autumn.

Thus during the summer, 80m propagation will be strongly attenuated during the daytime by the E-layer.

Now lets look at figure 2, which shows both the theoretical D-layer attenuation (dark solid line) and actual Riometer measurements of the attenuation (open circles) of the ionospheric versus frequency.

The scale is a little strange, as it shows transmission (the opposite of attenuation) and the scale is inverse square-root nepers. I've added a scale converting the strange units into decibels (which we are a lot more familiar with these days, than inverse root nepers). The reason for the strange scaling is that the theoretical D-layer absorption versus frequency is a function of the 1 / f^2. By plotting the chart with the strange scale, the D-layer theoretical model becomes a straight line (the heavy line in the figure).

We can see that at the broadcast band the dark black line shows is very low on the chart—meaning that there is very little transmission through the ionosphere at those frequencies. At higher frequencies, the line slopes upward, and there is more transmission through the ionosphere, in fact a lot more transmission.

Figure 2 was taken at about 52 degrees north latitude, and the downward bump at 3.5 MHz shows less transmission vertically through the ionosphere at that frequency.

What the bump means is that signals at 3.5 MHz are being attenuated more strongly than what we would expect just from the D-

layer alone. It is caused by the attenuation due to the E-layer. Note that the bump is rather broad, excess E-layer attenuation occurs roughly 0.5 to 1 MHz around the peak FoE frequency. During the summer, at lower latitudes than where this measurement was taken, the E-layer vertical attenuation is higher in frequency, and covers the 80 meter amateur band. Note that this chart of transmission (and my added scale of attenuation) is for a single pass through the layer. For an amateur signal that reflects of the F-layer, our signal transits these layers twice, and the attenuation must be doubled

Thus the answer to the original question: is the D-layer or the E-layer responsible for HF signal attenuation? For vertically incident signals, the answer is: it depends. During the summer (and, depending on latitude, spring and fall), on 80 meters, the E-layer is the big resistor in the sky. During the winter the attenuation is less, and the D-layer is the dominant attenuation in the 80 meter band for vertically incident signals. The E-layer vertical attenuation peak moves down below the 80 meter band during the winter.

For signals that propagate at lower than vertical incidence, the MUF is higher than the critical frequency, likewise, the attenuation impact of E-layer absorption is higher in fre-

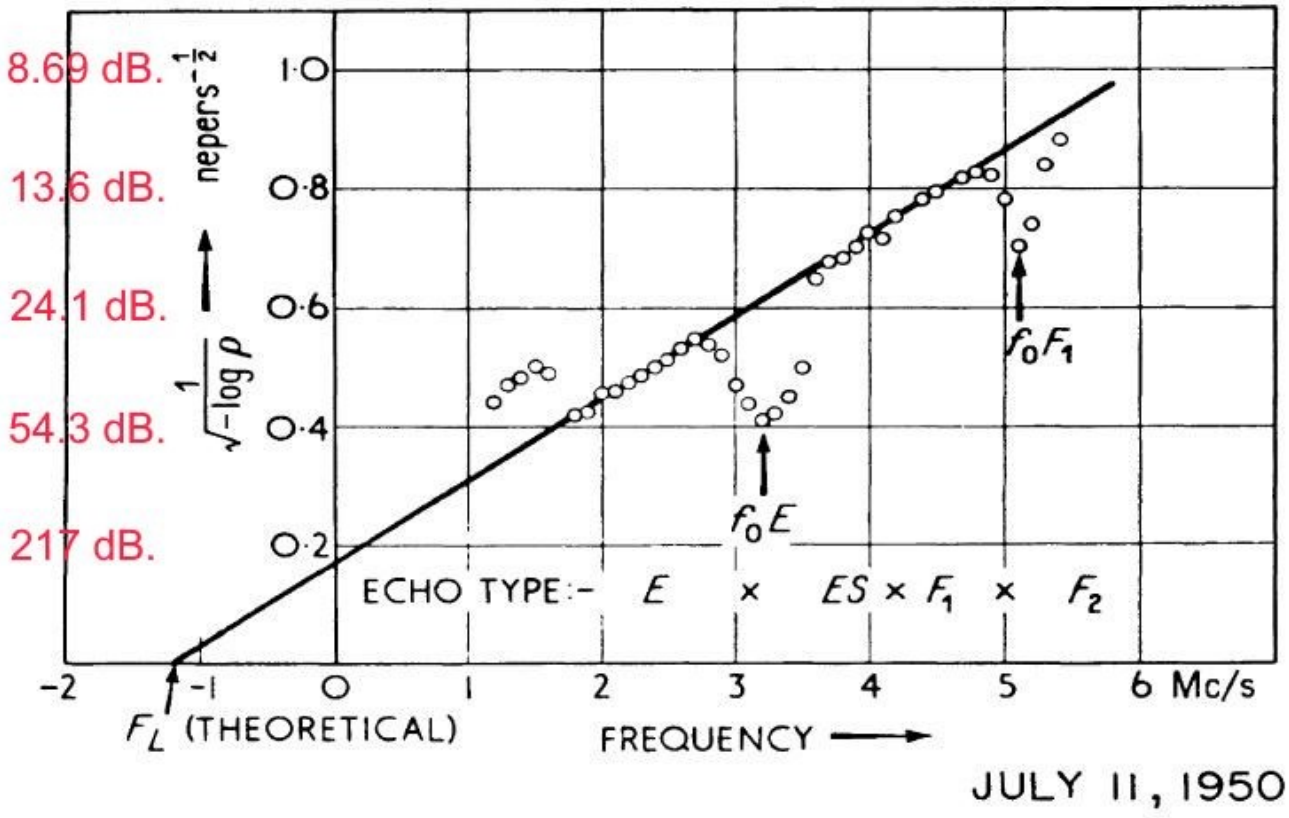

FIGURE 3.26. *Variation of absorption with wave frequency (vertical propagation.)*

(From E. V. Appleton and W. R. Piggott, 1954, Ionospheric absorption measurements during a sunspot cycle, J. Atmospheric and Terrest. Phys. 5, 141.)

Figure 2—from reference (2). The red scale has been added to the figure to convert the unusual attenuation units to more common decibels used today.

quency at well, extending up to about the 40m amateur band, dependent on the path geometry.

Thus for non-vertical signals, the impact of the E-layer even during the winter is significant in the 80 meter band, but is less significant on 40 meters during the winter.

The E-layer usually has a greater impact on 80 meters than the D-layer.

For 160 meters and the AM broadcast band, D-layer attenuation is the dominant attenuation year round.

(1) On-line real-time FoE chart retrieved from http://solar.spacew.com October 21, 2016.
(2) “Ionospheric Propagation”, Kenneth Davies, US Department of Commerce, National Bureau of Standards, 1965, NBS monograph 80.

November 2016

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3 • **RVARC Club Meeting** • ARES Net	4	5 • CW Sweepstakes
6 • CW Sweepstakes	7	8 • Women Hams Net	9	10 • Rogue Hack Lab • ARES Net • Women Hams Net	11	12
13	14	15 • Women Hams Net	16	17 • ARES Net • Women Hams Net	18	19 • Phone Sweepstakes
20 • Phone Sweepstakes	21	22 • Women Hams Net	23	24 • Thanksgiving • ARES Net • Women Hams Net	25 • CQ WW CW	26 • CQ WW CW
27 • CQ WW CW	28	29 • Women Hams Net	30			

Events

- **Thursday, November 3th 7:00 PM RVARC Club Meeting**
- Thursday November 10th — 6:30 PM Rogue Hack Lab, Medford Library
- Tuesdays & Thursdays 7:00 PM—Women Hams Net K7RVM Repeater 147.000 (+) [PL 123.0]
- Thursdays 7:30 PM - ARES Net. K7RVM repeater 147.000 (+) [PL 123.0]
- Next Newsletter: December Issue. Deadline for input: November 17th.
- ARRL CW Sweepstakes—Nov 5 & 6 http://www.arrl.org/sweepstakes
- ARRL Phone Sweepstakes—Nov 19 & 20 http://www.arrl.org/sweepstakes
- CQ WW CW—Nov 25, 26, 27 http://www.cqww.com/rules.htm

RVARC Membership

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 1058 Linda Ave.
Ashland OR 97520

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

For Sale / Wanted

2016 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 2015 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 or our club webpage: http://w7dta.org

Medford—Phoenix, OR

Time: Saturdays, Registration 8:30 AM. Exam session at 9:00 AM. Walk-ins welcome.
Location: Fire District 5 HQ. 5811 South Pacific Highway, Phoenix, Oregon 97535
Dates 2016: Oct 29
Contact: Don Bennett, Email: kg7bp@rfwarrior.com Phone: (541) 973-3625

Grants Pass

Time: Fridays Registration 6:00 PM. Exam session at 6:30 PM. Walk-ins welcome.
Location: Fruitdale Grange. 1440 Parkdale Dr., Grants Pass OR 97527-5288
Dates 2016: Nov 18
Contact: John Stubbe, K7VSU, email: jstubbe7@gmail.com Phone: (541) 218-2244

Roseburg, Bend, Redding, Brookings, Crescent City — Please see our club webpage, http://w7dta.org for updates as we receive schedules for these cities.

Next Club Meeting

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