



# The Repeater

## Next Club Meeting

Thursday Nov 7 2019,  
7:00 PM

Medford Police Department  
Community Room  
219 S. Ivy St.,  
Medford, OR

Program: Tangerine SDR

Volume 2019, Issue 11

November 2019

John Laybourne AC7S  
 Scott Cummings NA7OM  
 Mike Bach WB6FFC (541) 830-3346  
 John Armstrong KF7UMK (541) 899-1917  
 Tom McDermott N5EG (541) 734-4675  
 Club Web Page:

[johnlac7s@gmail.com](mailto:johnlac7s@gmail.com)  
[kd7ehb@yahoo.com](mailto:kd7ehb@yahoo.com)  
[eaglepoint.or@juno.com](http://eaglepoint.or@juno.com)  
[john@kf7umk.com](mailto:john@kf7umk.com)  
[n5eg@tapr.org](mailto:n5eg@tapr.org)  
<http://k7mfr.org>

President  
 Vice President  
 Treasurer  
 Secretary  
 Newsletter & Membership

## Club Notes

Three current office holders have agreed to run again for their respective offices (Treasurer, Secretary, and Vice President). At this point however we do not have anyone who has agreed to run for President. At the November meeting we need to nominate and elect the four officers for 2020. Please consider whether you can serve. The effort is not that large as the whole team has done a great job in spreading the load around.

*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

RVARC Oct. 3, 2019 Meeting Minutes

7:07PM Acting President Scott Cummings, NA7OM, called the meeting to order. Attendance was about 17 people.

Club Treasurer Mike Bach, WB6FFC, reported the bank balance is \$4714.00, with \$2.20 in petty cash, also \$30 of dues for 2020 to be processed. Still waiting for the CARE club to contribute their half of the 2019 Field Day expenses. The club insurance was renewed at \$200 expense and the approved \$150 donation to the ARRL Spectrum Defense Fund was paid.

Pat Cunningham, KD7MPA, demonstrated the new K7MFR.com website and proposed a shopping page where folks can order Tee-shirts and other swag. There could be the possibility of customization with your own logo or callsign.

(Continued on page 2)

## Secretary's Report, Cont'd.

*(Continued from page 1)*

Don Bennett, KG7BP, announced the next license test will be given on Oct 26 at 9:00 AM at the Fire Dist. #5 location 5811 S. Pacific Hwy. Contact Don at kg7bp@arrl.net for details.

The September 7 RVARC swap meet was a success, but we will have to find another location for next year.

Scott reminded us that the California QSO Party starts at 9:00 AM October 5, 2019. The local group was going to the Montague area, as there is a good propagation zone there.

Pat, KD6MPA, volunteered to order stickers of the new club logo for PR uses.

7:31PM Break for snacks and visiting.

8:13 PM Scott, NA7OM, announced he would be in Luzon, Philippines for next year's CQ WW WPX contest and will be trying for 'worked all zones' status.

8:15 PM This month's presentation on The Raspberry Pi and Ham Radio was given by Pat Cunningham, KD6MPA.

The Raspberry Pi is an inexpensive, credit-card sized, low-power single-board computer first released in 2012 by the Raspberry Pi Foundation (in Great Britain), primarily for educational use. The target price was \$35 and total sales have grown to over 25 million units. The first version had a Broadcom SoC with an ARM 700MHz CPU, 256MB RAM and had interfaces for audio, video, HDMI, GPIO, USB, Ethernet, DisplayCSI & CameraCSI connectors.

Newer RPi 2's & 3's have 1GB RAM, more USB ports and GPIO, and a faster CPU. It runs a variety of Linux operating systems and Windows 10 IOT core.

The official system is Raspbian, a custom-

ized version of Debian Linux. See raspberrypi.org for details and downloads.

Bare-board 5v power draw is around 0.5 amp to 1 amp for boards prior to the RPi4B.

### History:

2012 RPi 1B  
2013 RPi 1A  
2014 compute module on a 200pin SO-DIMM module  
2014 RPi 2B+, RPi 1A+  
2015 RPi 2B+  
2016 RPi Zero, RPi 3B  
2017 Zero W/WH  
2018 RPi 3A+, RPi 3B+  
2019 RPi 4B (1GB / 2GB / 4GB RAM versions)

### Ham radio uses:

Hotspots, WSPR, fldigi, PiTX, Host Websites (AREDN),  
TNC-PI: tnc-x.com www.pigate.net ,  
SDR

Pat went over writing the bootable SD card, command-line vs GUI operation, 'headless' configuration, network setup, basic terminal commands, and accessories.

Downsides: the RPi needs a network connection to get the current time (no RTC), is not fully open-source (binary blob for BCM SoC low-level operations), and older units had some power stability and possible SD card corruption issues

Overall, good stability on newer versions when using quality power supplies.

Hardware is available through Canakit, Adafruit, Newark/Element14, Microcenter, etc.

You need a 5v power supply, a microSD Card to hold the operating system, and for connectivity: either:

1. A USB keyboard, mouse, and HDMI cable to your display, for direct access.

*(Continued on page 3)*

## Secretary's Report, Cont'd.

*(Continued from page 2)*

2. Or a network connection so you can sign-in over SSH, for 'headless' access via another computer / keyboard / display.

Some reference links from google:

[www.g0hwc.com/raspberry-pi-ham-radio.html](http://www.g0hwc.com/raspberry-pi-ham-radio.html)

[dl1gkk.com/setup-raspberry-pi-for-ham-radio/](http://dl1gkk.com/setup-raspberry-pi-for-ham-radio/)

[www.stargazing.net/david/rpi/hrrpi.html](http://www.stargazing.net/david/rpi/hrrpi.html)

[www.hamblog.co.uk/top-10-amateur-radio-uses-for-raspberry-pi/](http://www.hamblog.co.uk/top-10-amateur-radio-uses-for-raspberry-pi/)

Lots of questions and answers followed the presentation.

9:06 PM Scott adjourned meeting

- John Armstrong, KF7UMK secretary

## This Month's Program

### 1. Tangerine SDR

- **Program:** Tangerine SDR is a cooperative project between the HAMSCI amateur science project and TAPR (Tucson Amateur Packet Radio). TAPR is developing hardware for a science package to be used in ionospheric research that will be aided by the HAMSCI project. This is a citizen-science initiative to deploy numerous low-cost science packages in order to improve data collection for scientists to study ionospheric physics.

Recently this project was funded by a grant from the National Science Foundation. This instrument has been nicknamed the 'Space Weather Station'. The Principle Investigators are from University of Scranton, and the Massachusetts Institute of Technology Haystack observatory.

The hardware is planned to consist of a dual-channel 0.1-30 Mhz SDR receiver, FPGA board for signal processing, a single board computer for control and local data storage, and a 3-axis magnetometer.

Scientists will be able to trigger and capture data from these space weather stations over a wide geographic area, and store annotated data in central servers. The program will cover some key aspects of the hardware, and some project objectives.

- **Biography:** Tom McDermott, N5EG is club newsletter editor. He is active in the system engineering and analysis of the Tangerine SDR equipment, and is designing the dual-channel receiver unit.

## Microwave Update (MUD) 2019

I had the chance to attend and present at the 2019 Microwave Update Conference in Lewisville, Texas, October 3—5. The conference was hosted this year by the North Texas Microwave Society ([www.NTMS.org](http://www.NTMS.org)) who did a great job with all the activities.

The conference started Thursday afternoon with a 3-hour workshop on Gnuradio. Attendees installed gnuradio on their Windows laptops, then went through training, core concepts, and exercises leading to a tunable SSB receiver implemented in software. Then there was a SSB QSO on 2304.1 MHz using gnuradio and an Ettus radio on one end, and gnuradio and an ADALM Pluto radio on the other end. Tom, N5EG wrote the workbook and presented the workshop with the able assistance of Bob Stricklin, N5BRG, and Jenner Lochridge KK6RUM.

Friday morning had an antenna gain measuring event out in the hot, muggy parking lot, and receiver preamp noise figure measuring (indoors). Friday afternoon started the paper presentations.

A couple of the notable papers were on setting terrestrial DX records on 47 and 75 GHz. Given by Barry Malowanchuk, VE4MA. At those high frequencies atmospheric water vapor adds a lot of attenuation, so the event was held in Arizona in the winter to achieve the lowest dew point, and tallest mountains consistent with low moisture.

The teams were able to complete 207 km QSOs on 47 and 74 GHz, using the low frequency of 10 GHz (!!!) to coordinate the two ends. Unfortunately this did not exceed the current record distance. See photos.

There was an interesting paper on the 74 GHz radio design. The original radio used a transceiver chip. Unfortunately the few millimeters of electrical connection from the die inside the chip package to the PCB patch antenna is too high. A new version of the chip with on-die transmit and receive patch antennas was procured. The package has a quartz window in front of that portion of the die with antennas on it which reduces the loss significantly.

Especially interesting was that the small difference in position of the two on-die antennas moves the beam of the parabolic dish antenna too far to keep it properly aimed for both transmit and receive.

Two different approaches were used to solve this problem:

1. The radio was mounted on a stepper-motor controlled X-Y stage, and physically moved when T/R switching!
2. A custom dual-waveguide to single was machined that had just the right aperture separation to align the T and R antennas on the die to a single waveguide aperture at the sweet spot of the dish.

Rex Moncur, VK7MO, from Tasmania Australia showed his work on 24 and 47 GHz moonbounce. He has worked both North America and Europe from Australia via microwave moonbounce. The advantage of microwave frequencies is that the dish gain is very high. However the pointing accuracy can be difficult to achieve.

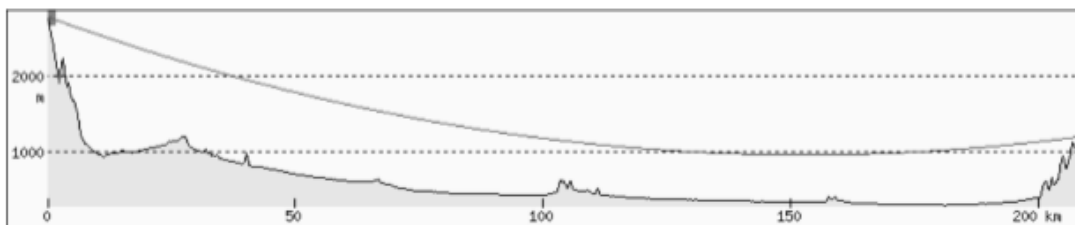


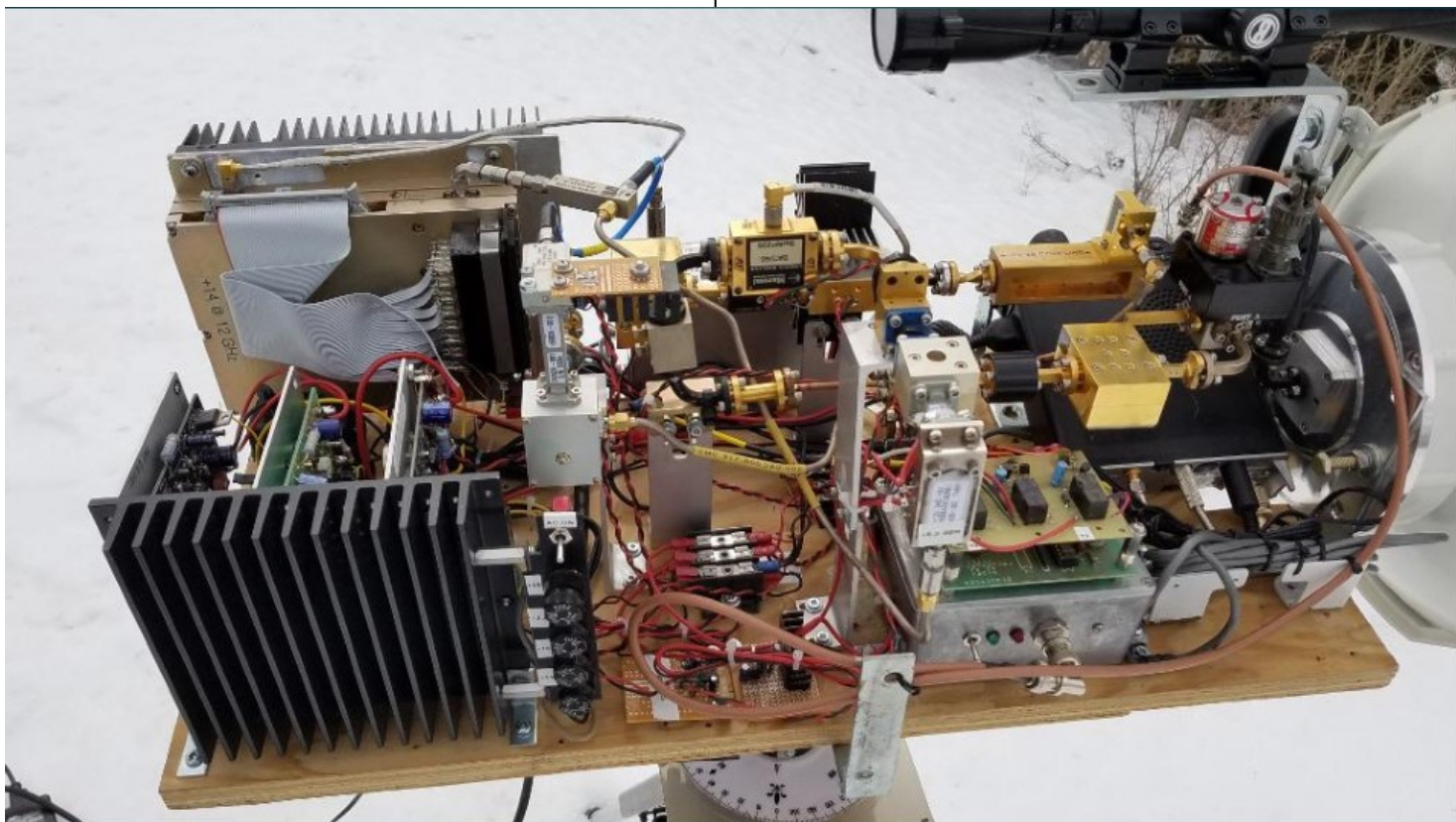
Figure 3 Mt Lemmon to White Tanks 207 km Path Profile



Microwave Update (MUD) 2019



Figure 12 W5LUA, K8ZR, & VE4MA with 78 GHz on Mt Lemmon



# November 2019

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2 • Sweepstakes CW
3 • CP ERC Net • Sweepstakes CW	4 • CARE Net	5 • 2M SSB Net	6 • 2M SSB Net	7 • <b>RVARC Club Meeting</b> • ARES Net	8	9
10 • CP ERC Net	11 • CARE Net	12 • <b>CARE Meeting</b> • 2M SSB	13 • <b>JC-ARES Meeting</b> • 2M SSB	14 • <b>Rogue Hack Lab</b> • ARES Net	15	16 • Sweepstakes Phone
17 • CP ERC Net • Sweepstakes Phone	18 • CARE Net	19 • 2M SSB Net	20 • 2M SSB Net	21 • ARES Net	22	23
24 • CP ERC Net	25 • CARE Net	26 • 2M SSB Net	27 • 2M SSB Net	28 • Thanksgiving	29	30

## Events

### Meetings

- **RVARC** Thursday, November 7th — 7:00 PM, Medford Police Department Community Room
- **Rogue Hack Lab** Thursday November 14th — 6:30 PM, Medford Library
- **CARE** Tuesday, November 12th — 6:30 PM — New Far East Restaurant
- **JC-ARES** Wednesday, November 20th — 6:00 PM — Jackson County Search & Rescue, 620 Antelope Rd., White City

### Nets

- **JC-ARES** Thursdays 7:30 PM - K7JAX Mt. Baldy Repeater 146.840 ( - ) [ PL 123.0 ]
- **CARE** Mondays 7:00 PM— KB7SKB Jacksonville Repeater 147.100 ( - ) [PL 136.5], open, directed net, visitors welcome
- **2 Meter SSB** Tuesdays 7:00PM and Wednesdays 10:00 AM—144.200 USB
- **Central Point Emergency Radio Communications** Sundays 8:30 PM— KB7QMV Medford Repeater 145.410 ( - ) [ PL none]. Move to simplex net on 147.585 MHz when finished. Directed net.
- **Siskiyou County ARC** Thursdays 7:00 PM—Net K6SIS Repeater 146.79 ( - ) [PL 100.0]

## 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 1940 Stevens Rd.  
Eagle Point OR 97524-6523

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

## For Sale / Wanted

We have had to shut down our Sell / Swap webpage due to malicious attacks using postings and comments.

Please send any For Sale / Swap postings to the newsletter editor for posting in this newsletter.

## 2019 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 2019 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 2019:** Oct 26

(note these dates are tentative until confirmed by FD#5)

**Contact:** Don Bennett, Email: [kg7bp@arrl.net](mailto:kg7bp@arrl.net) 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 2019:** Nov 15th

**Contact:** John Stubbe, K7VSU, email: [jstubbe7@gmail.com](mailto: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**

**Thursday Nov 7 2019, 7:00 PM**

**Medford Police Department Community Room  
219 S. Ivy St., Medford, OR**

**Program: Tangerine SDR**