



# Waved Newsletter

Inland Empire **VHF** Radio Amateurs, Inc.

## Club Officers:

### President:

Rick Anhorn, AA7AD

### Vice President:

Dave Carleton, K7DSR

### Secretary:

Rick Nungester, WA6NDR

### Treasurer:

Mike Grounds, KE7PG

### Director (2019):

Karl Shoemaker, AK2O

### Director (2017):

Gerald Bosch, KG7RRG

### Director (2018):

John Barnett, W7JRB

### Trustee: Harold Hepner,

AD7QJ

### Technician:

Karl Shoemaker, AK2O

### Webmaster:

Harold Hepner, AD7QJ

### Net Manager:

Bob Peterson, KE7RAP

An **ARRL** affiliated club

### Monthly Club Meet-

**ings** are held the 2nd Thursday of the month at 6:30 p.m. at Spokane Community College, the LAIR, Building 6, Room 004. Park in the P1 area; there are handicap spots near the LAIR. The meeting is in Room 004 which is downstairs; an elevator is available.

**Club Net**, Wednesday at 7:30 p.m., on the 146.880 repeater, tone of 123.0. Please join us.

## President's Corner

# Gearing up for Hamfest

Greetings Fellow Hams,

As our 2017-18 season of The Inland Empire VHF Club begins, I would like to tell you about some exciting opportunities for the upcoming year.

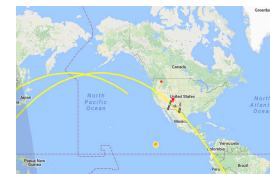
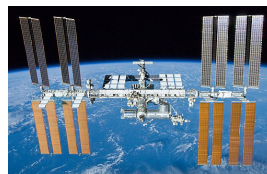
First, as a major sponsor of The Spokane Hamfest, I would encourage you to attend the event on September 23rd at University High School located at 32nd and Pines Road in the Valley. There will be speakers, swap tables, the opportunity to order T-shirts, and prizes. See the article on page 2 regarding the *test table* that will again be available to check out gear you are interested in purchasing or to check up on your own equipment. And licensing exams will be held at the Fest!

We also need volunteers for Hamfest! Would you be willing to lend a hand in any one of the following areas?

- **Parking lot directing** – in shifts, from 8 to 8:30 a.m. to around noon on Saturday to get people around to the front.
- **Security** at the door from 7-9:30 a.m.
- **Admission or coffee shop** during the hamfest.
- **Manning the Club's booth** – in shifts, from 9 a.m. to 3 p.m.
- **Cleanup Saturday afternoon** – from 4 to 4:30 p.m.

If you are interested, and we hope you are, call Betsy at 389-9543 or sign up at our club meeting on September 14th. Volunteering would be a good way to meet other club members or catch up with folks.

We are looking forward to some exciting events and meetings this year. For example, we are exploring the possibility of



satellite tracking as well as doing a hands-on session on the skill of soldering. But what about you? What topics would you like to see covered as we go forward? What kind of presentations would you be interested in? What problems are you trying to solve? What ideas do you have for guest speakers and activities? And on the other hand, what kinds of things do you not want? And what about you personally? Do you have a skill, talent or knowledge that would make a good presentation? Please let us know at the club meeting in September.

Lynn Lambert will be assembling, editing and publishing our newsletter which will provide information about our activities so that we can plan ahead and get involved. Thank you Lynn for efforts in this matter.

Rick

## Next Club Meeting

- **VHF Club Meeting** on September 14 at SCC

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## Spokane Hamfest

### The VHF Club Will Sponsor a Test Table at Hamfest

One of our club members, Jack Tiley, AD7FO, will have a radio and general electronics test table set up again this year at the Spokane Hamfest on September 23rd. This is an opportunity to check out your rigs or the item you are going to purchase from one of the flea market tables.

The test table will have an HP 8920A communications test set, 30 amp 13.8 volt power supply, an oscilloscope, frequency coun-

ter, audio function generator and a hand held voltmeter. For HT testing there is a shielded test box with cables for a number of standard manufacturers' radios. Available RF connectors for radio testing include PL259, BNC, SMA, Reverse SMA (for BaoFeng), mini UHF and SMA RP (in some Icom HT's)

#### Bring Batteries, Cables, Microphone

If you have an **HT** you wish to test it will need a **fully charged**

**battery and you must be able to set it to the necessary simplex test frequency and be able to fully open the squelch** (continuous noise). If you have a **mobile or base radio** you will need the **power cable and microphone**.

Testing will be available from the hamfest opening till 2 p.m. Any questions prior to the hamfest can be sent to Jack at [ad7fo@arrl.net](mailto:ad7fo@arrl.net).

### A Special Thanks

Our club member Jack Tiley recently received the following letter of thanks for his ham study guide:

Jack,

From the **geographical south pole in Antarctica**, a cordial thank you for publishing your ham radio study guides. This morning we had a remote examination.

Your study guides were a tremendous help for me (and a few others) to pass the exams and to get ready for using the ham equipment we have down here.

Thanks very much for writing the guides and making them publicly available.

Kind regards,  
Daniel

### Recent VHF Club Meetings

In March, Randy Cruz presented his research on propagation and sunspot cycles.

In April, Aaron Noack, AD7DD, spoke about cross band use: ways to operate cross band, how to coordinate with others such as the

repeater controller or control operator to employ this method as a temporary repeater to extend reach, especially for handhelds. See his presentation at <http://spokares.org/Presentations.html>.

In May, Randall Jones, talked about using a new modulation scheme to create digital phone called C4FM -- continuous 4-level frequency modulation.

In June, Robert Zavrel, W7SX, a professional antenna engineer, spoke about his book *Antenna Physics: An Introduction* in which he explores the math and theory behind antennas. The book is available from ARRL for \$29.95.

In July, the VHF Club had a great barbecue thanks to grill master Jerry Bosch, KG7RRG!

### ARES/RACES

Since one of the purposes of amateur radio is to have a group of people ready to help with communication in a time of need, you may want to get involved with the local Spokane County Amateur Radio Emergency Radio Service (**ARES/RACES**) as well. The group meets

the **third Thursday** of the month at 7 p.m. at the Spokane County Fire Training Center Auditorium at 1618 N. Rebecca next to SCC -- turn north onto Rebecca from Mission just east of Greene St. The building is midway down, to the right through chain-link fence gates.

ARES hams helped with the Greenbluff Cherry Picker's Trot and the Cheney Eight Lakes bicycle race -- and attended Field Day.



Setting up an antenna at the ARES/RACES Field Day in June

# Calendar 2017

## September

S	M	T	W	Th	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

## October

S	M	T	W	Th	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

## November

S	M	T	W	Th	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

## Activities

**September 9** — **ARES/RACES** from 9 a.m. to noon -- Second Saturday **Winlink digital training session**— at the Fire Training Center at 1618 N. Rebecca.

**September 16** — **ARES/RACES** is holding an extended training exercise called Hazard City from 9 a.m. to 2 p.m. at the LDS Chapel at 14111 E. 16th in the Valley. Hands-on operators are needed for the exercise which will include digital; contact David Carleton (davecarleton@gmail.com). The event is open to non-hams so that people can know what goes on in such situations and what role radio plays in the community, so please feel free to bring a friend.

**September 23** — **Spokane Hamfest**, sponsored by VHF Club and others, will be held from 9 a.m. to 4 p.m. at University High School in the Valley. **All three license exams**, technician, general, and extra, will be held during the Hamfest.

**November 2** from 6-9 p.m. and **November 18** from 9 a.m. to noon —

Dave Carleton will give two new ham classes, both *spine red* for Greater Spokane Emergency Management — at the Fire Training Center at 1618 N. Rebecca.

### Fall Classes, Tests

✓ A **technician class** and **testing session** will be held by Jack Tiley, AD7FO, an ARRL TC, TS, and VE instructor, as follows:

**Date:** October 7

**Location:** Fire Training Center, 1618 N. Rebecca (just east of the SCC Campus)

**Time:** 8:30 a.m. to 3:30 p.m.

**Testing:** Optional testing will start at the end of the class (approximately 3:30 p.m.)

**Cost:** No cost for the class, but there is a cost if you wish to take the exam

**Registration:** Registration is required! Send an e-mail to ad7fo@arrl.net for registration information.

✓ There will be **testing for technician, general and extra licenses** at the Spokane Hamfest on Saturday, September 23.

### Upcoming Amateur Radio • Classes

Send an e-mail to Jack Tiley at ad7fo@arrl.net for information.

### • Testing

Please contact Mary, AA7RT, at (509) 991-2192 or e-mail her at AA7RT@arrl.net for test information. Also, e-mail Rick Anhorn, AA7AD, at rickanhorn@live.com for information about testing via W5YI.

### VHF Club Regularly Meets

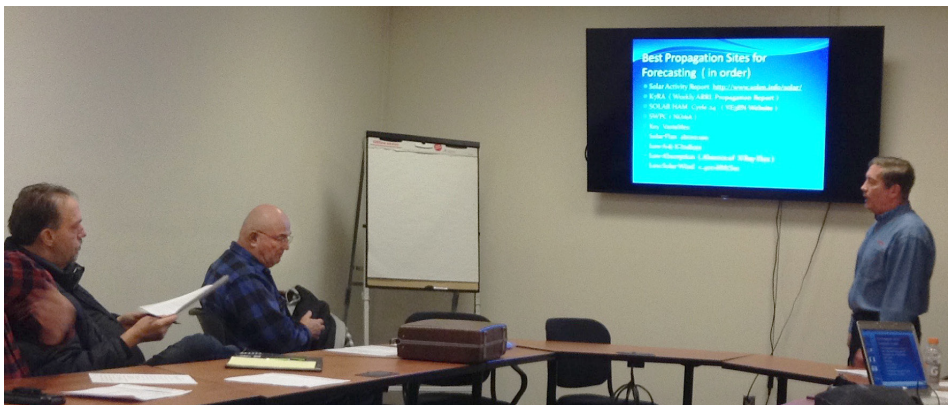
The VHF Club regularly meets from September through June on the **second Thursday** of each month at **6:30 PM** – in Room 004 in the basement of the SCC student lounge, the Lair (Building 6) on the Spokane Community College campus. Park closest to the Lair in the northwest corner of the **P1 Parking Lot** using the entrance on Mission east of Greene.

### VHF Club Membership

Membership applications are available online at the club web site, [www.vhfclub.org](http://www.vhfclub.org). The cost to join is \$15 per year; submit your payment online or give it to Treasurer Mike Grounds at a club meeting. However, **if you join at Hamfest, you will be considered paid up through the next calendar year.**



# Propagation at Solar Minimum



What is so critical about our current sun cycle, Solar Cycle 24?

Randy Cruz researched solar cycle changes to gain insight into what's coming up for HF propagation and found more than he bargained for. The search itself was difficult because the information that is available is not well-investigated.

## Sunspots and Propagation

We reckon sun cycles by the number of sunspots. Those sunspots have to do with how radio waves get from point A to point B — a process called propagation. So what is happening on the sun has a lot to do with propagation and transmitting and receiving on the HF bands.

Sunspots vary in number over a cyclical 11 year period known as the sunspot cycle. We get the number of sunspots by counting the individual sunspots or groups of sunspots that are present on the sun at a given time. The sunspots help determine overall solar activity. Sunspots are measured either visually or magnetically. Generally speaking, when more sunspots are observed, more UV is generated. This in turn creates more ionization in earth's ionosphere and im-

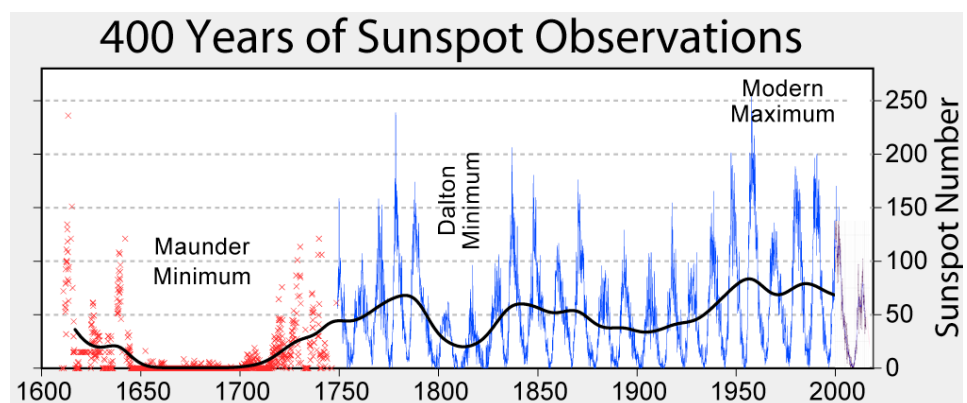
proves propagation on the HF bands above 10 MHz through the low VHF bands. At the peak of solar activity, there may be enough solar UV to allow higher frequency bands, such as the 10 meter, to be open for HF use at night. But on the lower frequency bands, the high ionization increases absorption and thus hinders the necessary refraction for HF radio waves. At the bottom of the sunspot cycle with its decreased solar activity, the lower HF bands have good propagation while the higher HF bands above 20 MHz are often closed. The 20 meter band, however, does well at all times. (*ARRL General Class*)

## Sunspots and Effects

“When the sunspot activity changes, weather changes,” Randy summed up. He challenged his listeners to research the material for themselves. “There are two camps now,” he said. There are people who are confused by the information and there are those who know what’s going on but refuse to connect the dots to see where the sunspot information leads.

When the Bradford Colony was being established by the pilgrims from 1650 to 1700, sunspots became very rare. The period became known as the Maunder Minimum, named after a husband and wife team of astronomers who published papers on the sun’s varying levels of activity. Another scientist at the time reported that during the years from 1672 to 1699, there were fewer than 50 sunspots. This is in great contrast to the 40,000 to 50,000 sunspots of recent times. The Maunder Minimum was also a time of lower-than-average temperatures in Europe. (*Wikipedia, Maunder Minimum*) Cruz pointed out that during the Maunder Minimum millions starved and froze to death.

*Continued on page 5*



*This chart summarizes sunspot number observations over the last 400 years. It comes from Wikipedia and was prepared by Robert A. Rohde.*



## VHF Club Repeaters

The VHF Club owns and operates a number of Amateur Radio Repeaters and Digital Packet Radio systems within the Inland Empire and Spokane area. Its call sign is **WR7VHF**.

The Club operates the following:

- the **147.34** repeater in downtown Spokane,
  - **146.88** in Spokane,
  - the **444.900** repeater in the Spokane Valley,
  - the **145.09** packet BBS and node North at Mt. Spokane,
  - 145.010 packet node South at Krell Hill,
  - the **145.43** repeater near Chewelah - was transferred to the Spokane Repeater Group,
- All PL tones for the Club's repeaters are the 123.0 Hz tone, including the Chewelah repeater.

## VHF Club Net

The **Club Net** is on Wednesdays at 7:30 PM, on the 146.880 repeater, tone of 123.0.



## Inland Empire VHF Radio Amateurs, Inc.

2910 E 57th Ave., PMB 255  
Spokane, WA 99223

## Propagation - Continued

During a later period of low sunspot activity called the Dalton minimum, from about 1790 to 1830, there again were lower-than-average temperatures. Some credit the chill to increased volcanic activity. Nevertheless, the French invasion of Russia in 1812 failed in the face of a bitterly cold winter, the soldiers' lack of winter clothing, and a scarcity of rations.

## Solar Cycle 24

Cruz said we are now in Solar Cycle 24. He termed it "the weakest sunspot cycle in the space age." He said, "Our present cycle resembles Cycle 14 of 100 years ago." Cruz added that even though the sun goes through cycles of 11 to 13 years, there are even larger cycles than this going on. "Usually there are four up and three down," he said. Rise times are faster during good cycles. Cycles 21, 22, and 23 were good, strong with fast rise times. Cycle 24 is down. How cycles begin and end are key to what is in store. "The magnetic size and complexity of the sunspots are key to this cycle," he said. More generally, sunspots have been in decline since 1955. "If the sun spots drop below 1,500, there won't be any at all," he warned. The drop started in Cycle 23. Spots of all sizes have decreased in cycle 24. Cruz recounted our recent history:

- 2008-2009 - we were trying to get off the ground
- 2011 - we finally got off the ground, then flattened and died
- 2013 - there were 14-15 sunspots each day and great band openings
- 2015 - we reversed and continued to spiral down

So we fell in three years – when it usually takes six. "Sunspots have to have sufficient strength and size to be of use," Cruz said. If you want more information, National Geographic in their July 2004 issue, dealt with the sun and what happens with a change in the polarity of the sunspots.

Cruz said that three things can happen regarding our situation:

- 1) There could be a long, extended minimum to 2021-2022, or
- 2) Sunspots could vanish completely indicating a Maunder/Dalton type of minimum, or
- 3) If this minimum continues, the sun could soon be spotless.

So what does all this mean for ham radio? Low frequency bands can stay open for a couple of hours. For 6 Meters and HF, the sunspots must increase in size and complexity.

"The years from 1950 to 2009 were probably the best years for solar activity," Cruz concluded. We could be on the edge of a Maunder minimum event. During the minimums, the earth's upper atmosphere cools. There is a change in the brilliance of the sun. "The power and complexity of the sun is huge," he said. "If the sunspots go, propagation will be the least of our problems. Cycle 25, beginning in 2019 to 2020, could go the same way or drop even lower than Cycle 24. Cruz stated, "Usually a cycle this low is followed by several low cycles. So, with a cold earth without sunspots, we could have ten years or even another two to three cycles of low activity."

What bands of DX can operate under these circumstances? Ones with 80/160 meter antennas? "We may be using VHF until the situation turns around," Cruz said.