



February 2018

(www.k7id.org)

P.O. Box 1765 Hayden, ID 83835-1765

REGULAR CLUB MEETINGS:

Monday, Feb 12, 7:00 p.m.
Search & Rescue Bldg
10865 N Ramsey Rd.
Hayden, Idaho
Topic: DMR 2018 Update
Presenter: Lenny, N7MOT
and Frank, KG7CUI
Refreshments: ???

VE Testing
Monday, Feb 12, 5:30 p.m.
10865 N Ramsey Rd.
Hayden, Idaho

Monday, Mar 12, 7:00 p.m.
Search & Rescue Bldg
10865 N Ramsey Rd
Hayden, Idaho
Topic: DVD of DXpedition.
Presenters:
Refreshments: ???

VE Testing
Monday, Mar 12, 5:30 p.m.
10865 N Ramsey Rd
Hayden, Idaho

Upcoming Events

Puyallup Hamfest
March 10, 2018
Puyallup Fairgrounds

QRM FROM THE PRESIDENT

Larry Telles, K6SPP

It's February already and that means only two more months of winter. That is music to my ears. I know this part of the country has four seasons and that is one reason I moved here. I also know that winter is harder on wire and beam antennas. But I know that the snow will be gone shortly and we will need to find something else to complain about.

Our upcoming February meeting will be Lenny, N7MOT with Frank, KG7CUI. They will cover all of the advances in DMR since Lenny's talk several months ago. If we are lucky, Mike, KG7KSJ will join them in their talk from a heavenly perspective.

We have moved ahead with moving our Hamfest from the second Saturday in June to the second Saturday in July. That date is July 14th, so circle your calendar. That also means the July KARS meeting will be the Friday night before the Hamfest, or July 13th. More on this as the months go by.

I am switching the March and April programs. So, in March we will have a DVD of a Dxpedition. For all you new hams, it's a chance to work DX. That is a term that was borrowed from the telephone company many years ago. Simply put, the prefix on your phone is coming from an exchange nearby. If you talk to a different telephone prefix in you town or a different state, that's a distant exchange. The Dxpedition consists of a group of amateur radio operators that pay thousands of dollars to go to a very remote part of the world. Their goal is to set up transceivers and antennas on perhaps an island hundreds of miles from land to see who they can contact. Some Dxpeditions have watched Chinese gunboat cruise by the island while they transmitting. That also happened to a DXpedition in a different part of the world off the coast of South America. Some islands are inhabited with birds and some with nothing but mosquitoes. Some are just large rocks in a pile in the water, while some have sandy beaches and palm trees. We have several Dxers in our club and maybe they will enlighten us as to what Dxpeditions are currently out there, or planning to go out.

The April meeting will be yours truly. I am having minor surgery on February 28th and don't know if I will be 100% for our March meeting twelve days later on March 12th. But I wanted to make sure. We have a lot of new hams that are now new members. I gave this talk about ten years ago on making QSL and Eyeball QSL Cards using free software. For some new hams, an eyeball QSL card is an amateur radio business cards with your name and call, etc. Several of our older hams have them in their pockets which makes them quite handy.

Both Jim Petersen, AD0AZ, and I are looking for program ideas. If you are a new ham or have been for less than a year, I would like to hear from you. If you have an idea that may take longer than one hour, then we could schedule it on a

Saturday during better weather. If you want to know about a certain subject, there might be someone else in the club with the same question!

See you at our next meeting. Thanks for taking the time to read this.

73, Larry Telles, K6SPP

p.s. 73 is singular, not plural.

Kootenai Amateur Radio Society (KARS)
January 2018 Meeting Minutes

The January 8, 2018 KARS meeting was held at the Search & Rescue Building located at 10865 N Ramsey Rd. Hayden, Idaho.

The meeting was called to order at 7:02 pm by Club President Larry Telles (K6SPP). The Pledge of Allegiance was led by Lindy Bryant (KE0AZD).

VE Testing:

Lindy Bryant, KE0AZD	Passed General
Holly Nadeau	Passed Technician
Brad Nadeau, KI7QXH	Passed Extra
Johnny Smith, KI7PMP	Attempted General
David Hale	Attempted Technician
Caleb Hale	Attempted Technician
Kenneth Gairson, W7AHX	Passed Extra

Larry Telles (K6SPP) introduced the new board members:

- President: Larry Telles, K6SPP
- Vice President: Jim Petersen, AD0AZ
- Executive Director: Lindy Bryant, KE0AZD
- Treasurer: Rod Anderson, K7ZBE
- Secretary: Sheila Waller, KG7SAA

Mike Slothower (KG7KSJ) moved to accept the December 2017 minutes; Lindy Bryant (KE0AZD) seconded; the motion passed by member vote.

Treasurer's Report:
November 2017

Checking	\$3,591.96
Savings	\$2,351.83
Petty Cash	\$ 90.55
TOTAL	\$6,034.34

Income: Savings interest (\$0.06), 50/50 Raffle (\$7.00), Miscellaneous (\$6.00), Memberships (\$56.00)

Expenses: Luggage cart (\$4.00), Life membership tag for K7UIH (\$9.54)

December 2017

Checking	\$2,799.62
Savings	\$2,376.89
Petty Cash	\$ 90.55
TOTAL	\$5,267.06

Income: Savings interest (\$0.06), Silent Raffle (\$100.00), Memberships (\$68.00)

Expenses: Plaque for Dave Boss (\$51.78), Mica Peak rental (\$300.00), Christmas party rental (\$250.00), Christmas party decorations/supplies (\$83.56), CdA Shrine Club donation (\$250.00)

Mitch Killebrew (KB7BYR) moved to accept the Treasurer's report; Gary Roth (KE7IAT) seconded; the motion passed by member vote.

Melissa O'Neal (KI7QFJ) will be the new Sunshine Lady for the Club. Melissa will be in charge of sending out greeting cards for birthdays, illness, etc. Expenses will be paid by the Club.

The Club will have a refreshments committee. Two people will be responsible to bring refreshments to each Club meeting. A sign-up sheet was circulated.

The February meeting will have a presentation by Lenny Gemar (N7MOT) and Frank Ten Thy (KG7CUI) on what is new in DMR since Lenny last gave a presentation on this subject. In March, Larry Telles (K6SPP) will give a presentation on QSL cards.

Ed Stuckey (AI7H) gave a presentation entitled: "Amateur Radio: Something for Everyone".

Jim Petersen (AD0AZ) recognized the Christmas party committee as they had done a very nice job with the arrangements: Lindy Bryant (KE0AZD), Melissa O'Neal (KI7QFJ), and Terri O'Rourke.

This year's Idaho QSO party will be held March 10-11 from 11AM to 11AM. Go to www.idahoarrl.info and click on "Idaho QSO Party" to see the rules.

Key dates for 2018 were announced:

Field Day—June 23rd

Hamfest—July 14th at the Shriner's Event Center

Christmas Party—Second Monday in December at the Shriner's Event Center

Girl Scout Jamboree—June 23rd

There was discussion regarding adding a third repeater. Anyone interested in discussing how to grow the KARS system should see Adam Crippen (N7ISP).

Raffle Results: 50/50 \$4.50 Mitch Killebrew, KE7BYR (claimed)

Membership \$118.00 Dan Walker, N7BRD (not claimed)

Mike Slothower (KG7KSJ) moved to adjourn; Lindy Bryant (KE0AZD) seconded. The motion passed by member vote and the meeting was adjourned at 8:32 pm.

China Students' "Zhou Enlai" CubeSat Launches with Ham Radio Payload On Board

Launched on January 19, China's "Zhou Enlai" CubeSat is that country's first to involve primary and middle school students. Named in honor of the first Premier of the People's Republic of China, Zhou Enlai, the CubeSat was developed in Huai'an Youth Comprehensive Development Base in Jiangsu Province. Zhou Enlai was born in Huai'an. The 2-kg, 2U CubeSat carries an Amateur Radio FM transponder and has SSTV capability, in addition to a high-definition optical camera. An SSTV beacon will post date, time, temperature, and location information on an SSTV frame. The launch was the 100th orbital launch attempt from the Jiuquan Satellite Launch Center.

"A scientific satellite like this is like a teacher in space, carrying cameras or spectrosopes to study the upper atmosphere or to shoot space pictures of the stars. Students can grasp the mystery of the universe through the messages transmitted by the teacher," said Zhang Xiang, chief designer of the satellite and a professor with Nanjing University of Science and Engineering.

The Amateur Radio transponder has a downlink at 436.950 MHz, and an uplink at 145.930 MHz. Telemetry will be 9.6 k BPSK on 437.350 MHz.

The students who participated in the project joined the development and ground-based simulation performance of the satellite in their spare time, and learned to assemble and practice voice data transfer and telecommunication

applications. The project was approved in 2016. The administration office of Huai'an Youth Comprehensive Development Base is the main organizer of the project.

A delegation from the satellite development student team in Huai'an was at the Jiuquan Satellite Launch Center for the launch.

On the same launch vehicle were the Xiaoxiang-2 (TY-2) and Yizhuang QuanTuTong-1 (QTT 1/TY-6) CubeSats, developed by Tian Yi Research Institute in Changsha, Hunan Province. These 6U CubeSats will carry out Amateur Radio HF/VHF/UHF re-transmitting experiments in narrowband modes. TY-2 carries four experiments, testing optical fiber sensing technology, space radio software, and image stabilization; TY-6 carries navigation and communication payloads (including AIS). TY2 and TY6 both operate in the 435, 2400, 5650 and 5830-MHz Amateur Satellite bands.

The TY-2 downlink is 435.350 MHz, and the TY-6 downlink is 436.100 MHz. They are part of a constellation of CubeSats, TY-2 through TY-6, which will also carry out inter-satellite communication experiments that include Amateur Radio, Li-Fi high-speed LED digital downlink, and CW lamp signal communication experiments. Downlinks are on 70 centimeters using 9.6 kbps GMSK and on 2.4 GHz and 5.8 GHz using 5 Mbps OFDM.

The IARU Amateur Satellite Frequency Coordination page has details on frequencies. - *Thanks to AMSAT-UK*

FOR BOATERS, IT'S RADIO TO THE RESCUE

PAUL/ANCHOR: We now hear an example of amateur radio doing what it does best: Neil Rapp WB9VPG brings us this dramatic story of a ham radio net and a sailboat rescue off the coast of Jamaica.

NEIL'S REPORT: This was one of those times when all that practice paid off. As ham radio operators, we often spend time communicating on our favorite modes and participating in our favorite activities. But the Maritime Mobile Service Net recently had the unfortunate need to make use of their preparation. It's just another example of the phrase from the bumper sticker, "Ham Radio Saves Lives." On January 4, net control Ken Porter, AC0ML, received an emergency call on the net's usual frequency, 14.300. Jim Matusiak, VE0KMP, and his wife were aboard the sailing vessel "Solar Flair" dealing with high winds. Jim reported that the ship had lost the two head sails, and was operating only with the main sail. Ken informed them that the net would be listening in case there were any additional problems. The next day, the main sail was also damaged, and the ship's motor wouldn't start.

Both Jim and his wife were exhausted and needed to be rescued. Assistant Net Manager Jeff Savasta, KB4JKL, tells us the rest.

JEFF: With the help of additional net control stations here on the Maritime Net, we were able to in fact effect a successful rescue via the Jamaican Coast Guard ship HMJS Middlesex that was dispatched to the area and they came on frequency. They actually came on frequency on 14.300 to speak with both AC0ML and the Solar Flair to confirm the positions. And, they're not licensed amateurs. But of course, in times of emergency, they can come on at anytime. Or, any station can come on at anytime if it's a declared emergency.

NEIL: The rescue was completed, and everyone is just fine thanks to the help of all who assisted. The net is celebrating its 50th anniversary this year and meets on 14.300 daily from 1700 to 0200 UTC. Jeff sums up the purpose of the maritime net.

JEFF: Our agency motto is "Where emergency communications is a commitment." And, I think this really exemplifies the fact that the Maritime Mobile Service Network operates daily to just listen for these types of emergencies. And, we're there serving the public since 1968. And like a lot of the operators who rely on us for this service have said many, many times... "It's our lifeline." And it truly is.

NEIL: Reporting for Amateur Radio Newsline, I'm Neil Rapp WB9VPG.

Fox-1D (AO-92) Now Commissioned, Open for Amateur Use

AMSAT Vice President-Operations Drew Glasbrenner, KO4MA, has declared that Fox-1D (AO-92) is now open for general Amateur Radio use. That word followed an announcement from AMSAT Vice President-Engineering Jerry Buxton, N0JY, that AO-92 had been commissioned and formally turned over to AMSAT Operations.

Initially, the U/v FM transponder will be open continuously for 1 week. After that, operation will be shared among the U/v FM transponder, L-Band Downshifter, Virginia Tech Camera, and the University of Iowa's High Energy Radiation CubeSat Instrument (HERCI).

AMSAT News Service, AMSAT-BB, AMSAT's Twitter account (@AMSAT), the AMSAT-NA Facebook group, and the AMSAT website will report any updates.

AO-92 was launched from India on January 12. For the past 2 weeks, the AMSAT Engineering and Operations teams have been testing the various modes and

experiments on board. Testing has shown that both the U/V FM transponder and L-Band Downshifter are working well. The Virginia Tech camera has returned photos of Earth and data from HERCI has been successfully downlinked.

AMSAT thanked the 178 stations around the world that used FoxTelem to collect telemetry and experiment data from AO-92 during the commissioning process. -

Thanks to AMSAT News Service

'YL-OM CONTEST' IS NO WAR OF THE SEXES

PAUL/ANCHOR: Now here's a twist on boy-meets-girl. It's ham-meets-ham and we'll let Geri Goodrich KF5KRN explain.

GERI's REPORT: Let's face it: OMs are almost always out there in search of a good YL — and it seems a lot of YLs often can't resist a good OM.

If you are thinking this is a prelude to hearts and flowers, however, think again: We're talking about the YL-OM contest so the real nitty-gritty here is all about signal reports and points. Between the 9th and 11th of February, a benevolent battle of the sexes known as the YL-OM Contest will enliven SSB, CW and digital modes.

It's being run by the YLRL - the Young Ladies Radio League - and its popularity has been proven through the years. It's a pursuit that is as old as Adam and Eve perhaps except neither one of them had radios. In this contest, YLs count OMs and OMs count YLs - and everyone counts.

For more details, visit [ylrl dot org \(ylrl.org\)](http://ylrl.org)

For Amateur Radio Newsline I'm Geri Goodrich KF5KRN. (YOUNG LADIES RADIO LEAGUE)

Secretive "Numbers Stations" Persist on HF

For many years, unidentified radio broadcasts have been transmitting coded messages, using numbers, such as "6-7-9-2-6. 5-6-9-9-0." Even today, tuning across the HF spectrum typically will yield a "numbers station," a mechanical-sounding voice (male or female) methodically announcing groups of single-digit numbers for minutes on end. According to *Radio World*, you may have tuned into a spy agency's numbers station transmitting coded instructions to their minions worldwide. Shades of "The Americans" TV spy drama, where characters routinely receive coded messages via radio.

Numbers station transmissions typically consist of a voice "reading out strings of seemingly random numbers," explained Lewis Bush, author of *Shadows of the State*, a new history of numbers stations. "These are sometimes accompanied by music, tones or other sound effects," he

said. Paul Beaumont, an associate editor of *Eye Spy Intelligence Magazine*, a publication dedicated to espionage and intelligence, is quoted in the *Radio World* article as saying, "Voice (numbers) stations are known to be spy messages."

The article said that one of the best-known numbers stations was "The Lincolnshire Poacher," so called due to its use of "The Lincolnshire Poacher" folk song played on a pipe organ as an identifier. Radio amateurs used direction-finding equipment to pin down the station's eventual location to an RAF base on Cyprus, the article said. (ARRL News)

Wisconsin FT8 Enthusiast Completes DXCC on New Mode

Denny Berg, WB9MSM, of Watertown, Wisconsin, reports that he achieved his goal of completing DXCC on December 31, 2017, using the new FT8 digital mode. It took him just 4 months.

"I can tell all of you that this mode is spreading like wildfire throughout all the HF bands," Berg told *The Daily DX*. "I have also noticed that most of these FT8ers use Logbook of The World (LoTW) for their confirmation process."

Berg, an ARRL member, said his current DXCC count stands at 104 entities, all confirmed via LoTW. He said he was able to work all states on FT8 in about 6 weeks of operating. A radio amateur since 1970, Berg was among the stations activating W1AW/9 from Wisconsin during the ARRL Centennial in 2014. - *Thanks to The Daily DX*

"Quantum Radio" May Offer New Twist on Communicating in Problematic Environments

Researchers at the National Institute of Standards and Technology (NIST) have demonstrated that quantum physics might enable communication and mapping in locations where GPS, cell phones, and radio are not reliable or don't work at all, such as indoors, in urban canyons, underwater, and underground. NIST announced the technology advance on January 2. The technology may have marine, military, and surveying applications. The NIST team is experimenting with very low frequency (VLF) digitally modulated magnetic signals, which propagate farther through buildings, water, and soil than conventional electromagnetic signals at higher frequencies.

"The big issues with very low-frequency communications, including magnetic radio, are poor receiver sensitivity and extremely limited bandwidth of existing transmitters and receivers. This means the data rate is zilch," said NIST project leader Dave Howe, AD0MR.

"The best magnetic field sensitivity is obtained using quantum sensors. The increased sensitivity leads in principle to better range. The quantum approach also offers the possibility to get high-bandwidth communications like a cellphone has. We need bandwidth to communicate with audio underwater and in other forbidding environments," he said.

NIST researchers have demonstrated detection of digitally modulated magnetic signals by a magnetic-field sensor that relies on the quantum properties of rubidium atoms. The NIST technique varies magnetic fields to modulate or control the frequency - specifically, the horizontal and vertical positions of the signal's waveform - produced by the atoms.

NIST developed a direct current magnetometer that uses polarized light as a detector to measure the "spin" of rubidium atoms in a tiny glass cell induced by magnetic fields. Changes in the atoms' spin rate correspond to an oscillation in the dc magnetic fields, creating alternating current voltages at the light detector that are more useful for communications.

"Atoms offer very fast response plus very high sensitivity," Howe said. "Classical communications involves a tradeoff between bandwidth and sensitivity. We can now get both with quantum sensors." Howe speculated on an Amateur Radio application.

"The quantum radio is great fun, far better sensitivity than any other receiver, at room temperature, anyway," Howe told ARRL. "The atoms in the gas cell replace the 'antenna' and detection in the classical sense. It would be nice to try modulation in the 2200-meter band using the quantum receiver for detection." In the future, the NIST team plans to develop improved transmitters.

In the NIST tests, the sensor detected digitally modulated magnetic field signals with strengths of 1 picotesla - one millionth of Earth's magnetic field strength - and at frequencies below 1 kHz.

To further improve performance, the NIST team is building and testing a custom quantum magnetometer. Like an atomic clock, the device will detect signals by switching between atoms' internal energy levels as well as other properties, Howe said. The researchers hope to extend the range of low-frequency magnetic field signals by boosting the sensor sensitivity, suppressing noise more effectively, and increasing and efficiently using the sensor's bandwidth.

The NIST strategy requires inventing an entirely new field, which combines quantum physics and low-frequency magnetic radio, Howe said. (ARRL News)

Puerto Rico, US Virgin Island Amateurs are International Humanitarian Award Winners

The ARRL Board of Directors has conferred the 2018 International Humanitarian Award jointly on the Amateur Radio population of Puerto Rico - served by ARRL Section Manager Oscar Resto, KP4RF - and the radio amateurs of the US Virgin Islands, served by ARRL Section Manager Fred Kleber, K9VV. Radio amateurs in Puerto Rico and in the US Virgin Islands aided in relief and recovery after a punishing hurricane season in the Caribbean.

The Board noted that radio amateurs in Puerto Rico and on the US Virgin Islands were “pressed into immediate service before and during the devastating storms” during the 2017 Hurricane Season. “The efforts of the local amateur communities continue to support the relief and recovery efforts even now,” the Board said, “and the ARRL leadership in each section continues to do extraordinary service to their communities.” ARRL established the International Humanitarian Award to recognize “truly outstanding Amateur Radio operators in areas of international humanitarianism and the furtherance of peace.”

In a separate motion, the Board recognized the outstanding work and service and commended all involved with the various hurricane relief communication efforts during 2017. The Board cited the Amateur Radio communities of Puerto Rico, US Virgin Islands, the Caribbean island, and in south Florida and Texas for “outstanding service during the 2017 Atlantic hurricane season, calling their efforts “a demonstrable exhibition of Amateur Radio public service.

With the recommendation of the ARRL Technical Advisors Committee and the ARRL Programs and Services committees, the Board conferred the 2017 Doug DeMaw, W1FB, Technical Excellence Award on Joe Taylor, K1JT; Steve Frank, K9AN, and Bill Somerville, G4WJS, for their articles, “Work the World with *WSJT-X*” (parts 1 and 2), which appeared in *QST* for October and November 2017. (ARRL News)

HAM GRANTED PATENT FOR “INVISIBILITY CLOAK”

STEPHEN/ANCHOR: It’s no secret that hams are inventive. Paul Braun WD9GCO tells us about one ham in New England whose latest invention has won him yet another U.S. patent.

PAUL: The U.S. Patent and Trademark Office has granted a Massachusetts radio amateur a patent for an

invisibility cloak that provides deflective electromagnetic shielding for ships, spacecraft, antennas, satellites, rockets, towers and other structures.

Inventor Nathan Cohen W1YW, the founder of Fractal Antenna Systems Inc. issued a statement saying that while the company’s previous patent covers an invisibility cloak itself, this technology can deflect electromagnetic waves, leaving an object invisible to those waves. The camouflage occurs at the level of heat and radio wavelengths. A press release from the company noted that the cloaking is possible even over a wide bandwidth. It can be used for defense and intelligence but also has commercial applications for towers and antennas.

According to his QRZ profile, Nathan isn’t just a fractal antenna specialist but an enthusiastic DXer.

This is the latest patent to be granted to the firm.

For Amateur Radio Newsline I’m Paul Braun WD9GCO. (BUSINESS WIRE, QRZ)

New IARU Region 2 HF Beacon Coordinator Named

The International Amateur Radio Union (IARU) Region 2 Executive Committee has named Dennis Stice, WI5V, of Oklahoma City, as the new HF Beacon Coordinator for the region. Former Region 2 HF Beacon Coordinator Bill Hayes, WJ5O, stepped down on January 19, after 10 years in that position.

IARU R2 President Reinaldo Leandro, YV5AM, praised Hayes for his service. “During this period Bill, has advised the IARU R2 Executive Committee and provided detailed reports on the status of HF beacons in the continent,” Leandro said. “The position couldn’t have been in better hands.” (ARRL News)

COFFEE & DONUTS
EVERY THURSDAY MORNING

8:00 A.M.
To
10:00 A.M.



Community Mtg Rm
Silver Lake Mall
Coeur d'Alene

TALK-IN: 146.980, PL127.3
443.975, PL136.5

Bring a writing instrument **Community Mtg Rm**
has the napkins for our breakfast table engineering!

Deadline for submitting articles, stories, reports, etc., is the 25th of each month for the following month’s newsletter.

Kootenai Amateur Radio Society (KARS) MEMBERSHIP APPLICATION

One year membership Rates:

New Member: \$15.00 Renewal: \$15.00 Family Membership: \$23.00

Two year membership Rates:

New Member: \$28.00 Renewal: \$28.00 Family Membership: \$42.00

Lifetime membership:

Member: \$150.00

Information Update Only

Are You An ARRL Member? Yes / No (Please Circle One)

Callsign: _____ Class: _____ Expiration: _____

First Name: _____ M.I. _____ Last Name: _____

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PHONE NUMBER: (____) _____

OK to publish phone number? Yes / No (Please Circle One)

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Note: If this is a family membership, (all members with the same address), please complete the following section for your family.

Name: _____ Call: _____ Class: _____

Name: _____ Call: _____ Class: _____

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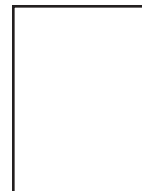
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*RETURN THIS FORM WITH YOUR DUES, (CASH OR CHECK), TO THE KARS TREASURER,
OR, MAIL TO: KARS MEMBERSHIP, P.O. BOX 1765, Hayden, ID. 83835-1765.*

(Office use only.)

Cash:		Check #:		Money Order:	
Membership Card:		Roster:		Newsletter:	

KOOTENAI AMATEUR RADIO SOCIETY
P.O. Box 1765
Hayden, ID 83835-1765



DIRECTIONS TO KARS MEETING:

Take U.S. Highway 95 to Miles Avenue (Miles is about 1 mile North of Hayden Avenue). Instead of proceeding west from the corner of Miles and Ramsey, go north about ¼ mile, to the first building on the left (West) side of the road.

2017 CLUB OFFICERS

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Notice

Propagation is published monthly by the Kootenai Amateur Radio Society (KARS). The club is located in Coeur d'Alene, Idaho and serves the North Idaho and the Spokane, Washington areas.

All opinions expressed in this newsletter are those of the individual contributors and not the radio club as a whole.

KARS operates a voice repeaters on 146.980 and 443.975, and a packet repeater on 145.510 Mhz.

Anyone interested in Amateur Radio is welcome to join. Dues are \$15.00 (individual) and \$23.00 for a family membership. Contact the Treasurer if you wish to join.

If you know of anyone interested in joining KARS, you can notify the newsletter editor as to that parties' email address. A copy of this newsletter will be sent with no obligation to join.

Material can be submitted for publication in Propagation. The deadline for articles, etc., is the 25th of each month for the following month's issue.