

August 2007

(www.k7id.com)

P.O. Box 5222 Coeur d'Alene, ID 83816

## REGULAR CLUB MEETINGS:

### Monday, August 13

Sheprock Building

7:00 to 9:00 P.M.

Speakers: John Hollar Jr N7JU

Program: All Things Cosmic!

Refreshments: Jean Carlson

### Monday, September 10

Sheprock Building

7:00 to 9:00 P.M.

Speakers: Larry Telles K6SPP

Program: Principles of Direction Finding and Transmitter Hunting Techniques.

Refreshments: Gabbee Perry

### Circle your Calendar!!!

August 11, 2007

The KARS Ice Cream Social at the Kesson's QTH. Coming Soon: A Direction Finding Antenna Construction Project & Transmitter Hunt are planned for Later in September 2007.

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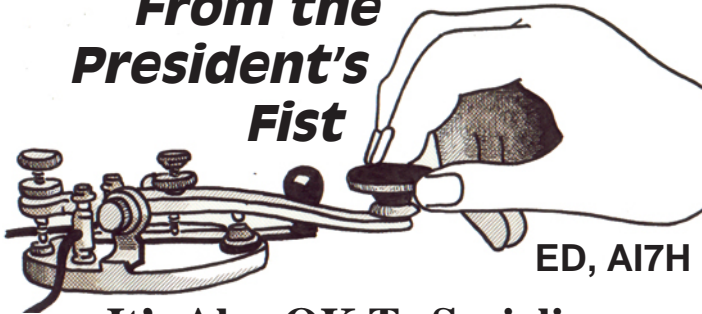
# Space: The Final Frontier?

*John Hollar Jr., N7JU KARS VP*

August Program: "CQ ET" If you gather up all the space communication technologies there are quite a few that can be explored by hams and for much less \$ than in the old days. For example, a few years ago QST published an article on moonbouncing radio signals using an 11-element Cushcraft (2-Meter beam) and a 100-watt transmitter. One third of the process was an optimized receiving and transmitting system; another third was a fancy technique of targeting the moon on the horizon at rise and set; and the final third was the use of a pretty sexy piece of software that can hear stuff when we can't. We'll be briefly looking at several of these modes, meteor scatter communications, working the OSCARs and SST, and SWLing suitsat & satellites (Try saying that three times in a row!). Radio Astronomy is also on the menu for a quick look at the sun, the bongs on Jupiter, and perhaps a pulsar or two from the center of the Milky Way galaxy. Sorry folks, our neighbor's electric fence has no intelligent data worthy of decryption. Once again the computer helps this part of our hobby and serves as an instructional tool as well. Several years ago I devised a serendipitous plan for my personal SETI program. I thought it was brilliant but I never heard anything. Absence of evidence is not evidence of absence. Won't you come and share your experiences and take 30-minutes to get lost in space. – N7JU



## From the President's Fist



### It's Also OK To Socialize

Greetings to Club members and friends,

Last month my message discussed how the Club is fortunate to have a lot of new members, and encouraged the experienced people to offer assistance to the new people.

This month I will hardly touch on Amateur Radio at all – in fact, it's about “socializing”. KARS has been identified as a “General Interest” radio Club. (An ongoing joke is that the members are generally interested in eating!) Since “eating” is more natural than “hamming” it is presumed that “New Members” will have an equal opportunity experience, compared to “Old Members”



Our recent social (eating) events have included the 2006 Christmas pot-luck, with attendance of 54; the 2007 Ham-Fest pot-luck, attended by 33; and the 2007 Pancake breakfast, with attendance of 27. Many thanks to our event coordinators for these events, particularly Pancake-Masters Randy (KB6YAV) and Jean (KD7RVY) Carlson, aided by their sons Dane and Eric (KD7RVZ), who opened their home to Club members and friends, made us all feel at home, and fed us a fabulous breakfast.

Looking to the immediate future, our annual Club Ice-Cream Social is planned for Saturday, August 11th. Our gracious event coordinators Bob (K7CGA) and Bonnie (KE7FPA) Kesson will open their home and beautiful lawn to Club members and friends from 2 to 5PM. (See details and map at the Club web site, [www.k7id.com](http://www.k7id.com)). This year there will be a slight change to the details of the event, as follows: We will serve quality (but not home-made) ice cream and soft drinks. We will ask for a small donation of \$1.00 per person, to defray event costs. (Any donations beyond expenses will go to the Club treasury. The reason for this change is that there is a lot of work involved with preparing home-made ice cream, and the ice cream makers {people and machines} must work several days in advance in order to create enough for the horde of guests.) As in the past, attendees are invited to bring

a favorite dessert item that goes with ice cream (cookies, brownies, fruit topping, etc.). Please help us plan for this event by sending an RSVP e-mail to [k7cga@arrl.net](mailto:k7cga@arrl.net) by August 6th. Please note that our three Club Charter Members will be attending this event.

Now, I need the help of our Club members on deciding whether or not to hold a picnic event with a proposed date of September 8th (a Saturday). The proposed outing would be held at the city park in Murray, ID, an easy one-hour drive from CDA. Murray is an old mining town, with an interesting museum adjacent to the park. We would dine early in the afternoon, so that everyone could drive home before dark. There are a lot of details to be ironed out, but I am soliciting a “straw vote” on how you like this idea. Please send an e-mail to [ai7h@arrl.net](mailto:ai7h@arrl.net) by August 12th with your comments.

Lastly, I presume many of our Club members and friends are having out-of-town company during the fabulous North Idaho summer season. (We are having two batches this year at my house). Be sure to show your Ham Radio rig to visitors, particularly kids. If we're lucky that exposure will create a positive impression that may result in future Amateur Radio operators!

73 to all,  
Ed Stuckey, AI7H, Club President

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# LOGBOOK

## VE Examinations:

**Testing for August will be August 13th. Starting at 5:30m PM until 7:00PM** at the Sheprock Building CDA airport by appointment, call N7JU at 208-765-5470 or e-mail [n7ju@arrl.net](mailto:n7ju@arrl.net) for your appointment. Bring a photo ID, a check to the ARRL in the amount of \$14.00, and a copy of your current FCC license if you are upgrading. Renewals and COA's for ARRL members is free.

**Special Licensing Notes:** If you passed the Technician exam before there was a no-code Technician, you actually passed the General Class exam and will now qualify for an upgrade if you have a copy of your old license showing you as a straight Technician Class. The reason is that you would also have had to take the 5 WPM code test. New rules allow an upgrade to General with no new exam if you can prove you were licensed as a Technician. More later if you have questions.

## SPOKANE, WA

Register to test in Spokane this month by calling **Mary, AA7RT** at 509-991-2192 or e-mail [aa7rt@arrl.net](mailto:aa7rt@arrl.net) for dates, locations and times.

### DIRECTIONS TO KARS MEETING:

Take U.S. Highway 95 to Miles Avenue (Miles is about 1 mile North of Hayden Avenue). Go West on Miles to airport gate. Gate requires access code (call Ed, KARS President at area code 208 699-7743). Once past gate bear left to the Shep Rock Building.



## LEAGUE BULLETINS FROM NEWINGTON

August 2007

### Pennsylvania University Undertakes Morse Code Study

A psychology professor at the University of Pittsburgh is conducting a study involving short-term memory and how it correlates to Morse code. Julie Fiez, the study's principal investigator, said she got the idea of using Morse code in her studies from a family member who is an Amateur Radio operator. She said she liked the idea of using CW in her experiments to see how people process audio tones.

"Our interest is in verbal working memory," she said, "which is the ability to keep 'on-line' for a short time, information you can access later." An example of short-term memory retention, Fiez said, is when people look up a number in a phone book, then close the book and a minute later dial the number, remembering a number they've seen in the book. "We use neuro-imaging and behavioral studies to try to understand what brain areas contribute to a person's ability to perform a task," she said.

Two hams, John Shannon, K3WWP, and Tom Mitchell, WY3H, both of Kittanning, Pennsylvania, took part in the study. Shannon said that while he never considered short-term memory ability in relation to Amateur Radio, a study of the idea has merit. While most CW operators can copy 20

words per minute, or even 35, Shannon says he can copy 55 words per minute.

"You don't hear letters," he said. "You hear words or sometimes short sentences. You have to use a keyboard to copy because no one can write that fast and you always copy 'behind,' meaning that you are typing in what was sent several seconds earlier, so you're definitely using short term memory."

To date, Fiez and two assistants, Maryam Khatami and Sara Guediche, have tested nine radio amateur volunteers. Khatami said, "At the moment, we are specifically seeking people with expert knowledge of Morse code. They should be able to receive and send Morse at 15 words per minute or above. The experiment will consist of two parts and will last approximately 2 hours."

She said the experiment is broken up into two parts: "Part 1 of the experiment is an assessment of the participant's Morse proficiency. First, participants will be asked to accurately copy sentences as they are presented in Morse at three different rates (16, 19, and 25 words per minute). Then they will be asked to listen to the entire Morse sentence and recall the sentence from memory. This part of the experiment may be unusual and difficult for participants; however, we believe that it will provide an additional measure that we can better relate to the memory performance in the second part of the experiment."

For the second part, she said, "Participants will be asked to recall lists of letters from memory. The letters will either be in English or in Morse. Participants will either hear the letters through headphones or see them on a computer screen. We will be looking for differences in memory performance between Morse lists and English lists. We believe that differences between these conditions will be useful for improving our understanding of certain aspects of short-term memory."

The research study is expected to continue through the fall. If you would like to participate, please contact the research team via [e-mail](#).

## FCC Denies Petition for Vanity Call Sign

On Friday, July 20, the FCC denied the petition of Quinten R. Erickson, N0RD (formerly N7GXA), of Big Lake, Minnesota, requesting a reconsideration of his application for vanity call sign N7AZ. The FCC granted N7AZ to Jon F. Goering (formerly NJ7I) of Apache Junction, Arizona on February 13, 2007.

*(Continue on page 9)*

# 146.98 is BACK ON THE AIR!

*(Kinda-Sorta)*

On Sunday afternoon, July 29<sup>th</sup> a work party consisting of KARS Repeater Committee members, advisors, and helpers, met at Hunter's Restaurant, packed their gear and tools into two 4X4 vehicles and headed for the K7ID site in an effort to return "98" *to the air* after eight months of being QRT. Two months of ordering, planning, construction, wiring, programming and testing the new repeater equipment was compromised by **antenna system and mounting** issues. This report sets forth those issues both from a site and technological base and will attempt to describe the considerations if we are ever to develop an effective amateur repeater system.



## Repeater Site Location

*Mica* peak (one of many "Micas" it seems) is truly an unusual and certainly **not an optimum** site for a simple amateur repeater operation. KA7RNX, Jerry, & K7ID Trustee, using some very sophisticated GPS equipment, finally documented the exact site configuration. The K7ID repeater site is exactly 10.5 miles from downtown Coeur D'Alene. The coordinates are 47° 37' 35" North Latitude, and 116° 54' 27" West Longitude. The ground elevation was measured at 5,248' AMSL (Above Mean Sea Level), and the AGL (Above Ground Level) for the **only antenna** we were able to install, was 16'. Although the site appears to be relatively high at 5,248' AMSL, the height above average terrain (HAAT) proved to be deceptive if not disappointing. One could surmise that with the ground level of Coeur D'Alene city being around 2180' AMSL, the net site elevation of 3000' should provide superior coverage. If one runs the *vertical profiles*, however, negative service site characteristics become immediately apparent e.g. there are no *line-of-sight* pathways to critical population centers as influenced by subsequent *close-in and interfering topography* causing deep shadows and spotty coverage in the Post Falls area, along the Spokane river, and in the city of CDA itself, not to mention to the East & South along CDA lake. It wasn't as if this were not known for years but very few club members have ever been to the site to observe this topography

for themselves. What all this means is that our site may be a fairly good *point to point* site for microwave backbone *shots* (mountain topping) but it is not so hot for low power portables or mobiles in the valley as one might be inclined to feel is essential to a primary radio amateur repeater. Several photos below tell the story.



To the left of the photo is an intervening peak shadowing Post Falls, and to the right of center (near the old telephone pole) is Blossom, (the former K7ID site) which completely shadows the city of CDA and the resort area. The portion of the *valley* that can be seen in light brown provides excellent coverage because it is *line-of-sight*. The “junk pile” is typical at this site.

## Getting There

The logistics of the K7ID site access is a primary consideration for those of us who need to tweak, correct, or add additional options planned for the station such as the linking system, ancillary UHF control receiver, autopatch, some connector and ground cleanup before the first snowfall. It is also a pity that club members can't tag along and see a working repeater and help with some of the tasks. The present K7ID site access is a hassle, when under more desirable conditions a 15 minute trip in the family car could be made to correct a problem, add an option or make a simple adjustment. However in this case it is no cake-walk to the top. Most of the road is fairly passable until the final 5 miles is encountered. Severe and sharp tire shredding rocks are strewn along the way and switchbacks that make anyone who is not an accomplished mountain road driver quake with the fear of a truck-rolling plummet over the edge followed by an 800' drop to the valley below. What guard rail? This is a pity because not only is the site

not passable for a good part of the year from October to May but even under optimum conditions only special vehicles and drivers can make the trek. We have N7ESU and KB7BYR to thank for providing shuttle service to the top...but frankly Scarlet, this is just a hobby for me and I don't find the prospect of several more trips attractive at all.



**Several very steep switchbacks as the road winds back and forth along the edge of the mountain to the peak. Negotiating the turn required backing up to the edge of the road to make it around and up to the next hairpin turn. Note the rocks in the road ready to take out a tire or a brake line. KB7BYR, Mitch, actually backed his truck on this final switchback the site.**

## **Antenna Issues**

Once there we ran into some additional site rules like power sucking **isolators** required on every transmitter and only **hard-line** (no low loss flex-cable RG-8 A/U) permitted even for short runs from the building to an antenna etc. These two conditions escaped our preliminary planning and resulted in our not being able to install our **back-up** antenna and forcing us to use the old hard-line up there for which we were not prepared with the proper coax terminations. We suspect we may have some issues with this cable as it was badly kinked and too short to reach our designated spot on the tower. The previous antenna, as measured by AA7AF, Lee, showed a high SWR at 146.98 MHz. with an impedance of 25 Ohms, totally unacceptable. It was removed and returned to its rightful owner. As a compromise we temporarily mounted the Diamond V2000 3-band base station antenna and suspect that since we are less than 5 feet from an adjacent (rusty tower) loaded with stationmasters; and 3 feet from the MW tower loaded with dishes, we can't say much for any effective directional or beneficial vertical radiation pattern. More than likely this antenna was designed for home base station use not for mountain-tops (no null-fill). The antenna will not survive the winds let alone ice encountered at the site and **must be replaced very soon or we will have no antenna** .



AA7AF, Lee, warms his hands from the non-ionizing radiation being emitted from the 8 MW dishes squirting power in all directions. The rusty tower to the right of the MW tower is 5 feet from our temporary base station antenna which is too low to be seen. The green tower to the extreme right (with the 2 “floppy” stationmasters) is corroded beyond repair and will shortly be removed before it can fall on the building

### What’s an Isolator

Its function is to prevent **rf** energy from a co-located transmitter (without regard to any specific frequency) from entering our transmitter final and being *mixed* to produce third, fifth, or ninth order harmonics or spurious emissions to other receivers at the site. It purportedly prevents intermodulation and *in band receiver channel interference*. Usually it is only employed when needed, not as a *catch-all* for everybody as a general regulation. Apparently the one we previously used (now gone) was “on loan” and must be returned. It is a lossy device from two perspectives. 1) We lost about 1/5<sup>th</sup> of our transmitter power when inserted in the line to test it; and , 2) if we are required to supply our own unit as a **condition of tenancy** the cost from Telewave for a single unit on 146.98 MHz. is \$995.00! Whew! This might be a deal killer for Mica. The isolator “requirement” is usually a result of a dirty-site that has been poorly managed. (N7JU-Opinion)



## What Now?

There is no doubt we have some issues. In the absence of some simple mistakes, possibly made at the site like reversing the duplexer cables or connecting the wrong antenna to the change-over relay, (an easy situation to verify if you are standing in front of the repeater); or even some ratty connectors or a bad piece of old hard-line feeding the wrong antenna; (no back up antenna for comparison); and a less than ideal (actually lousy) location on the tower (if not the mountain itself); de-sense from within the building, circular modulation from the mounds of metal junk lying on the ground nearby; or, a host of other nasty but not totally incurable maladies that could be remedied if we could convince N7ESU that his \$20K Station Analyzer be dragged to the next work party; we might be able to make it to *square one*. (I know it's a long sentence but its all in there).

The facts are that at this site we have line-of-sight reliability for about 35% to 40% of a circular coverage (that's about 126° but randomly looking nowhere). We have more than 320° where the intervening hills are in the 3K to 4K AMSL range blocking a direct (visual) path to population centers in the valley below. I did a 360° panorama photo shoot and as soon as I can *stitch it* and make a moving slide, I'll e-mail it to everyone for a look see. It's a real eye-opener. We've not confirmed it yet but the noise floor at the site could also be masking our receiver sensitivity, but more than likely it is an antenna problem, as there is a corresponding significant reduction in received power on a mobile S-meter that corresponds to the same mobile not maintaining full-quieting at the repeater. We actually noted that a 5-watt portable was unable to bring up the repeater less than a mile down the mountain road but now hidden behind the first subsequent peak, blocking visibility to the antennas at the top. Close-in, (within 12 miles of the site), when we couldn't see the top we had a hard time working the machine. No way can we solve this problem without a **voting receiver** located in the valley somewhere, (which is not beyond possibility as we have the capability in the repeater logic). We need to, as a group, discuss these issues and at least consider purchasing the following without delay: 1. A **Comtelco** BS150XL3 Base Station Antenna Tuned exactly to 146.98 MHz 250 Watt, 50 Ohm match, 40 Degree Vertical Beamwidth, 3 dBd gain \$140.00; 2. (2) Mounting bracket kits for above (and below) BSMNT2 35.00; 3. 100' LMR-400 With Type N male mounted both ends 102.25; 4. BS-150UA Unity gain 250 Watts, 50 Ohm, 75 Degree Vertical Beamwidth 110.00 for a total of \$387.25 plus shipping. Even this will not solve all our problems if we remain at Mica. Perhaps an **all KARS member search** to find another, less complicated, and closer-in repeater site **within line-of-sight** of the major population centers is our best plan.



My sincerest thanks to all those who assisted us in testing the system once we got things going about 4:30PM much later than we had anticipated. – N7JU

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## KARS ICE CREAM SOCIAL

The annual KARS Ice Cream Social will once again be hosted by Bob (K7CGA) and Bonnie (KE7FPA) Kesson, on Saturday, August 11, from 2 - 5 PM. (See details and map at the Club web site, [www.k7id.com](http://www.k7id.com)) A donation of \$1/person (to defray the cost of food and drink). They will serve quality (but not home-made) ice cream and soft drinks. Hope to see you all there.

Refreshment Sign-Ups for the rest of the year:  
10/08/07 – Bonnie Kesson  
11/12/07 – Marge Miller  
12/10/07 – Everybody (Christmas Pot-Luck)

**COFFEE & DONUTS  
EVERY WEDNESDAY MORNING**



**8:00 A.M.  
TIL  
10:00 A.M.**

**RATHDRUM  
SUPER ONE**

**All problems solved at the table on a  
maximum of two napkins.**



ARRL continued

Section 97.19(c)(1) of the Commission's Rules provides that a call sign shown on an expired license is not available to the vanity call sign system for two years following the expiration of the license. This two-year period corresponds to the grace period during which the licensee of an amateur station may apply for renewal of the station and operator license. The expired call sign becomes available for reassignment the day after the two-year period ends. Call sign N7AZ expired on January 13, 2005 and was available for assignment on January 14, 2007.

Goering's application for N7AZ was received by the FCC on Sunday, January 14, 2007. Because the application was received on a weekend, the FCC deemed it to be filed on the next business day, Tuesday, January 16.

Erickson argued that the FCC should have dismissed Goering's application for N7AZ as "premature." The FCC said that Erickson "assert[s] that Mr. Goering's application should have been dismissed because the prior license was still reflected in the Commission's licensing records on Sunday, January 14, 2007. We disagree. That the Commission's records were not updated until after the weekend does not change the date on which the call sign became available to the vanity call sign system. Mr. Goering's application therefore was not premature."

Goering and Erickson's applications for N7AZ, the FCC said, were included in a lottery to determine the processing order of applications with a filing date of January 16, 2007. Of the applications that requested N7AZ, Goering's was the first selected. "Consequently, we conclude that his application was properly granted, and your application was properly dismissed," the Commission said.

Erickson subsequently applied for vanity call sign N0RD on April 10, 2007 and received it on April 28, 2007.

## Repeater Mapping with Goggle Maps

I've put together a database of repeaters that are displayed in your web browser using the Google maps API. Anyone can add or edit repeaters, and you can download search results as CSV files. The original idea was to make it easier to search for repeaters in a given area, for instance for planning a trip.

Features:

- \* Search by location such as a city and state or zip code.
- \* Search by tags (for instance, try "OK Link" to search both in Oklahoma and for the "link" tag) and add tags.
- \* Free to use and download data, for as long I can afford the bandwidth.

- \* Click on a point to search near that point or add a repeater.
- \* Click on a repeater to edit it or move it (you can move by clicking on a location - great for zooming in that satellite view).

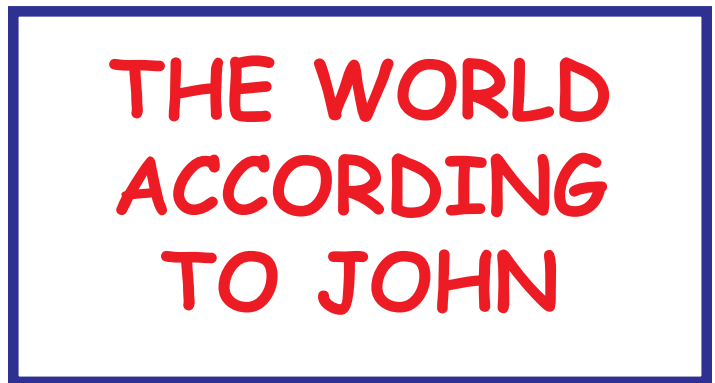
It's been a pet project of mine for a year or so, and it seems to be working well. I have been frustrated by "community repeater" sites that will let you enter data but now download it. Anything in this system can be downloaded. Just do a search and then go to the bottom and click "download results".

The URL is <http://k5ehx.net/repeaters/>

The site was developed for Firefox, I've had some complaint of issues in Internet Explorer. I've not been able to reproduce them in the versions of IE I have available, so if you have a problem please let me know and I'll try and fix it.

There are some known issues with the google maps API such as not printing the polygon circles in Firefox, which are out of my control.

Tom, K5EHX  
Email is tom@ my callsign dot net.



NEW General Class Study Audio CD. This new study aid comes in two flavors, a two-set audio CD for playback in a regular CD player; and a single CD in mp3 format for computer playback. One format can be made into another and burned on any CD with free software. If you'd like a copy of either format send me an e-mail and I'll make one up for you. We could also e-mail you a segment or two to get you started. Good luck on your upgrade to the Radio Amateur General Class License (and all those privileges that go with it). John, N7JU@arrl.net

**August 13<sup>th</sup>. KARS meeting:** All Things Cosmic, will cover back yard Radio Astronomy, Sudden Enhancement Disturbances (SIDS), Meteor Burst (Scatter) DXing, Moon Bounce, and yes folks you too can Search for Extra Terrestrial Intelligence (SETI). Presentation by N7JU.



This is not from the breakfast. Don't you think that all this picture needs is a telegraph key strapped to Ed's leg? Then this rig would be complete.

# Kootenai Amateur Radio Society (KARS) YEAR 2007 MEMBERSHIP APPLICATION

{ } New Member: \$12.00 { } Renewal: \$12.00 { } Family Membership: \$18.00  
{ } Information Update Only

**New! Two year membership Rates:**

{ } New Member: \$22.00 { } Renewal: \$22.00 { } Family Membership: \$33.00

## ARE YOU AN ARRL MEMBER? YES NO ( Please Circle One)

CALLSIGN: \_\_\_\_\_ CLASS: \_\_\_\_\_ EXPIRATION: \_\_\_\_\_

FIRST NAME: \_\_\_\_\_ M.I. \_\_\_\_\_ LAST NAME: \_\_\_\_\_

ADDRESS1: \_\_\_\_\_

ADDRESS2: \_\_\_\_\_

CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_ - \_\_\_\_\_

PHONE NUMBER: (\_\_\_\_) \_\_\_\_\_ **OK TO PUBLISH? YES/NO (CIRCLE ONE)**

EMAIL ADDRESS: \_\_\_\_\_@\_\_\_\_\_

**OK TO PUBLISH EMAIL ADDRESS? YES NO (CIRCLE ONE, PLEASE)**

**DELIVER NEWSLETTER VIA: EMAIL? OR U.S. MAIL? (CIRCLE ONE, PLEASE)**

**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: \_\_\_\_\_

NAME: \_\_\_\_\_ CALL: \_\_\_\_\_ CLASS: \_\_\_\_\_

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NAME: \_\_\_\_\_ CALL: \_\_\_\_\_ CLASS: \_\_\_\_\_

*RETURN THIS FORM WITH YOUR DUES, (CASH OR CHECK), TO THE KARS TREASURER,  
OR, MAIL TO: KARS TREASURER, P.O. BOX 5222, Coeur D'Alene, ID. 83816.*

(Office use only.) CK: \_\_\_ CSH: \_\_\_ Mbr Spreadsheet: \_\_\_

***PASS THIS ON TO A FRIEND!!!***

**KOOTENAI AMATEUR RADIO SOCIETY**  
**P.O. Box 5222**  
**Coeur d'Alene, ID 83816**



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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 repeater on 146.98 and a packet repeater on 145.510 Mhz.

Anyone interested in Amateur Radio is welcome to join. Dues are \$12.00 (individual) and \$18.00 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 send 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.