

Anchorage Amateur Radio Club

Next Meeting on February 7

John Lynn, KL7CY, will present Packet Radio, a talk and demo

Officers

President Randy Vallee, KL7Z
Vice President Jim Larsen, AL7FS
Secretary Phil Mannie, KLØQW
Treasurer Steve Jensen, KLØVZ
Trustee Jim Feaster, KL7KB
Activities Chairman John Lynn, KL7CY
News Letter Editor Jim Larsen, AL7FS
Membership Chairman Fred Erickson KL7FE
Past Past Past-President John Lynn, KL7CY

Three Year Board Members

Lil Marvin, NL7DL
 Richard Block, KL7RLB
 David Stevens, KL7EB

One Year Board Members

Pat Wilke, WL7JA
 Jimmy Tvrdy, KL7CDG
 Judy Ramage, WL7DX
 Craig Bledsoe, KL4E
 Sue Hilton, NL7AV
 Edie Lynn, KL7EL

AARC web page & Email contact addresses:

Homepage: <http://home.gci.net/~lawson/>
Email Reflector: KL7AA@QTH.NET
Webmaster: lawson@gci.net
President: KL7Z@gci.net
Membership: frederickson@iname.com
Newsletter: JimLarsen2002@alaska.net

News Letter Submissions, Information or corrections:

Submissions must be received 2 weeks before meeting
 Email: JimLarsen2002@alaska.net
 Mail: 3445 Spinnaker Drive, Anchorage 99516

~~~ **HOT LINKS** ~~~

### **KL7G CODE PRACTICE SCHEDULE**

Schedule: 7:00am, 10:00am, 4:00pm, 7:00pm, 10:00pm  
 AK time, every day on 145.35 MHz @ 7 wpm

### **Nets in Alaska:**

The following nets are active in South-central Alaska:  
 Alaska Sniper's Net 3.920 MHz 6:00 PM daily  
 Alaska Bush Net 7.093 MHz 8:00 PM daily  
 Alaska Motley Net 3.933 MHz 9:00 PM daily  
 Alaska Pacific Net 14.292 MHz 8:00 AM M-F  
 No Name Net 146.85/.25 repeater Sundays 8:00 PM  
 Grandson of SSB Net 144.20 USB Mondays 8:00 PM local  
 Big City Simplex Net 146.520, 446.0, & 52.525 FM  
     With Packet 145.01 Tuesdays 8:00 PM local  
 ARES net 147.30/90 repeater Thursdays at 8:00 PM local  
 PARKA net 147.30/90 Thursdays at 7:00 PM local

### **Anchorage & Mat Valley Area Repeaters**

KL7AA systems at Flattop Mt., 2,200 ft  
146.94/34 MHz, 80 watts, autopatch, 141.3 Hz PL  
224.94/223.34, 25 watts, no patch, no PL  
444.70/449.70, 25 watts, autopatch, 141.3 PL  
**147.27/87 MHz, no patch, Mount Susitna 100.0 Hz**  
 KL7CC, Anchorage Hillside, SCRC & QCWA  
146.97/.37 MHz, 30 watts, autopatch, 103.5 Hz PL  
 KL7M Anchorage Hillside  
147.21/.81 MHz, on IRLP, 97.4 Hz PL  
 KL7ION at Mt. Gordon Lyon, PARKA 3,940 ft  
147.30/90, MHz - 80 watts, no patch, 141.3 Hz PL  
 KL7AIR Elmendorf AFB, EARS  
146.67/.07, 107.2 Hz PL  
 KL7JFU, KGB road, MARA club  
146.85/.25, autopatch, no PL  
 KL7DOB, Alcantra (Wasilla Armory)  
146.64/.04, simplex patch, no PL  
*KL7DJE at Grubstake Peak, 4,500 ft. <down >*  
*147.09/.69 MHz, 25 watts, no patch, 100 Hz PL*  
*444.925/449.925, 10 watts, no patch, 141.3 Hz PL*  
*KL7AA, Mt. Alyeska, 2,400 ft. ??down??*  
146.76/16 MHz, 25 watts, no patch, 141.3 Hz PL

### **South Central Area Simplex Frequencies**

146.52 Mhz Calling and Emergency frequency  
 147.57 / 447.57 (crossband linked) HF spotters & chat, 103.5 HZ PL  
 146.49 Mhz Anchorage area simplex chat  
 146.43 MHz Mat Valley simplex chat  
 147.42MHz Peninsula simplex chat

## Internet Links, the favorites from our readers:

QRP and Hombrew Links

<http://www.njgrp.org/data/links.html>

<http://www.qsl.net/al7fs>

AARC <http://home.gci.net/~lawson/>

SCRC <http://www.KL7G.org>

EARS <http://www.qsl.net/kl7air>

MARA [www.kl7jfu.com](http://www.kl7jfu.com)

Moose Horn ARC <http://www.alaksa.net/~kl7fg>

ARES <http://www.qsl.net/aresalaska>

KL7J <http://www.alaska.net/~buchholz>

Fairbanks AARC: <http://www.kl7kc.com/>

Yukon Amateur Radio Association:

<http://www.klondike.com/yara/index.html>

HAARP Project: <http://www.haarp.alaska.edu/>

Amateur Radio Reference Library

<http://www.area-ham.org/library/libindex.html>

Hamradio: <http://www.hamrad.com/>

Solar Terrestrial Activity <http://209.130.27.95/solar/>

ARRL <http://www.arrl.org/>

Propagation Report Recording 566-1819

*Please let us know if there are other clubs pages or good starting points that should appear here. Report dead links or bad info to [JimLarsen2002@alaska.net](mailto:JimLarsen2002@alaska.net).*

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**NEWSLETTER ARTICLES;** All articles from members and interested persons are very welcome. If you wish to submit any articles, jokes, cartoons, please have it typed or neatly handwritten. It can be submitted by mail, computer disk or E-mail to the newsletter editor at the address listed above. Submissions must be in the hands of the editor **no later than the 14 days prior** to the meeting or it may not be included.

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## Regular HAM Gatherings:

**Alaska QRP Club, Third Friday - 7:00 PM:** Hams with QRP (low power under 5 watts) and Homebrewing interests meet for a social meeting monthly. Meet at Denny's on DeBarr & Bragaw in the back room. Hungry QRPers start showing up about 6PM. Info contact Jim Larsen, AL7FS, [JimLarsen2002@alaska.net](mailto:JimLarsen2002@alaska.net) or 345-3190.

**Tuesdays Lunch, 11:30 AM to 1:00 PM:** Join the gang for lunch and an eyeball QSO at the Royal Fork, "South, on Old Seward Highway. Attendance varies from 8 to 24 each week.

**Saturdays Breakfast, 7:30 AM:** Here is a good way to get started on the week-end come and meet with some of the locals and have a great breakfast at Phillips Restaurant, at the corner of Arctic and International. Great Fun.

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## THIS MONTH'S EVENTS

**February 7: AARC general meeting at 7:00 PM** in the Carr-Gottstein Building, on the APU Campus. 1<sup>st</sup> Friday of each month. Talk in will be on 147.30+ repeater.

**February 4: VE License Exam 6:30 PM,** 1<sup>st</sup> Tuesday of the month at the Hope Cottage offices, 540 W International. Bring photo ID, copy of license (if any) and any certificates of completion.

**February 4: EARS general meeting at 6:30PM** Ears meets the first Tuesday of the month at 6:30pm in the club house/shack in the basement of Denali Hall (building 31-270) on Elmendorf AFB. Talk in on 147.67- repeater.

**February 8: VE License Exams at 2:00 PM.** 2<sup>nd</sup> Saturday of the month at Hope Cottage 540 W. International. Be sure to bring photo ID, copy of license (if any) and any certificates of completion

**February 8: PARKA Meeting at 11:00 AM.** 2nd Saturday of the month at Peggy's, across from Merrill Field

**February 14: SCRC general meeting at 7:00 PM** the 2<sup>nd</sup> Friday of the month at Denny's on DeBarr & Bragaw. Talk in on 147.57 simplex.

**February 18: AARC Board meeting at 7:00 PM** 3<sup>rd</sup> Tuesday of the month at Hope Cottage 540 W. International. All are invited and encouraged to attend.

**February 21: Alaska QRP Club. 7:00PM** at Denny's on DeBarr in the back room. Info: Jim Larsen, 345-3190. Bring projects to share with the group. Some show up at 6:00PM.

**February 22: ARES General meeting 9:30 AM to 12:00 PM.** 3<sup>rd</sup> Saturday of the month. Call Dick Block at 277-7260 for questions.

**February 28: MARA meeting at 7PM** the last Friday of the month in the MTA business office in Palmer.

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## **Elmendorf AFB Radio Club (EARS)**

Ears meets the first Tuesday of the month at 6:30pm in the club house/shack in the basement of Denali Hall (building 31-270) on Elmendorf AFB. Talk in on 147.67- repeater. EARS has a club shack with two HF operating positions, one packet position, and a VHF position. For more information contact John Murray, NL7WW at [nl7ww@corecom.net](mailto:nl7ww@corecom.net) John is the current club President.

## Alaska QRP Club 4th Meeting

Despite the Ice Storm, nine hams showed up for the Alaska QRP Club meet at Denny's Restaurant at 3950 DeBarr Road on January 17<sup>th</sup>.

The January meeting featured many different CW keys including a J-38, KL7FHX's Vibroplex Bug, Ring Key and a PC Board homebrew key costing \$3.50 for the RockMite. Many forgot their favorite key but we all tried the ring key on the TIK keyer. Some did better than others. We did not get a chance to try our hands (fists) at the bug because we lacked a oscillator, maybe next time.

Remember that the QRP Club is only interested in having fun and fostering QRP so nothing is formal. Bring your project ideas and questions. With several RockMites arriving this month we can expect discussions about building this excellent project. See you at the meeting.

John Hendricks, AL7OK

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## QRP... Getting Started

by... Jim Larsen - AL7FS AK/QRP #003

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QRP essentially means you reduce power. As a definition, further defined by the Amateur Radio Club International (ARCI), QRP is operating your station at less than 5 watts output on CW or 10 watts peak power on SSB. (ARCI is the International QRP organization)

I have been involved with QRP since about 1970. From the beginning it has always been fun to work another station while running 5 watts or 2 watts or 50 milliwatts. More than fun... it is exciting!

In the past at Anchorage Amateur Radio Club (AARC) Club meetings and at the Hamfests in Anchorage and the Valley I have presented a comprehensive program titled "Why QRP?". The program gave very complete overview of QRP operating and equipment, however, here is a nice way to get started.

### Simple QRP

One simple aspect of QRP operating that is often overlooked is that it can often be done with your existing QRO (high power) radio. In my case, until I built my Elecraft K2, I largely operated with my 100 watt Kenwood TS450S. One nice thing about Kenwood radios is they are capable of reducing power (going QRP) right from the front panel. My power can be reduced down to zero or up to 100 watts. I most often run from three to five watts.

Some radios will not tune down to less than five watts and often bottom out at 7-10 watts. You can still get a feel for QRP by running at these levels so don't pass up the opportunity because you can only get down to 10 or 15 watts. Later you can learn how to enter into the ALC circuit and apply voltages to allow even lower settings.

QRP for the CW operator is an especially friendly place to go to improve Morse code. Many of the QRP operators prefer more modest speeds and are very willing to slow down to whatever is needed. As you improve, there are also high-speed operators who will move up in speed with you. I often operate from 15-18 wpm and feel no pressure to move up to high speed.

### QRP Works

An example of what can be done was described by WE6W in his email to the QRP-L mail reflector, a major hangout for the QRP crowd. (More than 3000 QRP operators are subscribed and regularly communicate on this mail reflector.)

Subject: Pixie2:Nor-Cal to Acworth, GA at 400mW!  
From: we6w@juno.com (Ed Loranger)  
To: "Low Power Amateur Radio Discussion"

Oh my Goodness!! Was tiddling around playing with bias levels on the Pixie2 oscillator and heard KE4GBE calling CQ dead on 7040. As I listen to my soldering iron cycle between temps I thought, don't hear many '4' calls, so I called him!

Kaboom! WE6W? de KE4GBE ur 339 etc....

First code out the door was: WOW 400 mW, pwr 400mW  
QTH Santa Rosa, Name Ed, RST 579 KB4GBE de  
WE6W/QRPp KN.

Then he came back with a monologue and 'WI6W'. Oh heck, QSB is gonna lose him for me.... But he adds Call? WI6W??? call agn pse. BK And he got it right on the next exchange.

So I tell him it is a full transceiver, basic unit has 2 transistors..... He either fainted straight away, measured himself on the floor, or the QSB ended the excitement.

Folks, this wasn't over saltwater, we are talking 400 milliwatts for this one and over land!

Maybe we need a warning on these rigs:  
"Frequent use causes increased excitability."  
Non-users subject to fainting spells :)

Disclaimer: My pixie is homebrew, I'm not pushing kits here. Just sharing late-night joy of radio! Just about knocked me out of my chair to catch Georgia on 400 mW on 40 meters.

Yowsa!

-Ed

72, Ed WE6W QRP-Z#106 (72 is the QRP version of 73.)  
Enjoying Ham Radio every day! Santa Rosa, CA.

## How to Know QRP

So how do you know if you are QRP? I feel QRP is largely an attitude and a sincere effort to get under five watts. If you have no wattmeter then guess by turning your power control to near the minimum power output setting. A Yaesu FT-990 seems to bottom out at 7-10 watts at the zero setting. A Kenwood rig will turn down to zero so tweak the control up just a little from zero. If you have a wattmeter you can get close. Many power meters are not very accurate at the five watt level but you can get "close enough" and feel justified you are working to the intent of QRP.

## Oak Hill Research QRP Wattmeter



## OAK HILLS RESEARCH QRP HEADQUARTERS

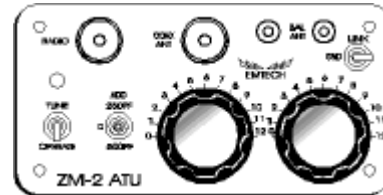
One very nice method of knowing your power output is to build a wattmeter designed for QRP operation. Oak Hills Research (OHR) provides a wonderful QRP wattmeter kit. It has 10 watt, one watt, and 100 mw scales and is designed to be accurate to 5 percent of full scale. I have built this wattmeter and use it in almost all of my QRP operating to assure I am under five watts. I used it to assure I was 900 mw when I worked W5JAY in Arkansas QRPp 2-way (QRPp = less than one watt.

The Oak Hills Research WM-2 was designed specifically for the QRP operator. The unit operates from 300 KHz to 54 MHz. It will measure forward and reflected power at QRP levels down to 5mW. You can select from three full scale power ranges of 10W, 1W or 100mW with an accuracy of 5% of full scale. A rear panel switch allows you to select the internal 9V battery or external power jack for the operating voltage. The WM-2 now uses a very high quality American-made 3" meter movement with a large easy to read scale. The meter circuit current drain is typically 1mA, making it great for portable use. The wattmeter can be left in-line permanently with very little loss. The kit is supplied with high quality Amphenol SO-239 connectors. The WM-2 is easy to build and align. The alignment consists of setting three voltages with your digital voltmeter. A source of RF is not required for alignment. The completed wattmeter measures (HWD) 4 1/2"

x 3 1/2" x 4" and weighs 16 oz. The kit is complete with cabinet, high quality silkscreened and masked PCB, all components and instructions (less 9V battery).

OHR can be contacted at 20879 Madison Street - Big Rapids - MI - 49307; Phone: (616) 796-0920 - 24 hr. Fax: (616) 796-6633 Send mail to OHR: [qrp@ohr.com](mailto:qrp@ohr.com)

## EMTECH Tuner and LED SWR Indicator



## EMTECH

One other QRP accessory that enhances operation is an effective QRP antenna tuner. One such unit that can be used both at home and in the field is the EMTECH ZM-2 Z-Match Antenna Tuner. Good for up to 15 watts, this kit also incorporates a unique LED SWR Indicator designed by N7VE. This LED SWR system can also be built as a stand-alone unit from parts around the workbench or from Radio Shack (Frigid North). (<http://www.extremezone.com/~nk7m/n7veswr.htm>)

\*\* Visual SWR Indicator \*\* Tunes wire antennas such as -- Random, Long, Short \*\* Tunes balance fed antennas such as, Loops, Deltas, Dipoles, Verticals, V's. \*\* Tunes (from field reports) gutters, window frames, swing sets, and -- bed springs? \*\* Tunes out coax fed antenna mismatches to make the radio happy . \*\* Does all the above at 80-10 meters, and usually much faster than other ATUs. \*\* 15 WATTS MAX!

This is an evening project for many, maybe two evenings for others. It is very easy construction, via pictorial drawings. All parts are furnished, including a stick-on panel layout as shown. The big knobs are provided for vernier tuning because the ZM-2 tunes so sharp. One large toroid to wind using a unique method that is fast and extremely easy. One small toroid to wind. Wire is furnished. Kit is complete, no other parts to try to find. Size is 5-1/16" x 2-5/8" x 1-5/8".

EMTECH can be contacted at: EMTECH; 1127 Poindexter Ave W; Bremerton, WA 98312 Send mail to KC7MAS: [emtech@steadynet.com](mailto:emtech@steadynet.com)

## QRP Wrap Up

In this first of several QRP articles I have discussed very basic concepts of QRP and QRP techniques that you can try with your current rig. As you move further into QRP you may wish to build your own monoband or multiband QRP rig, many of which are available as kits. Future articles will address more

details of QRP and QRP kits. The program in April will fill in even more information.

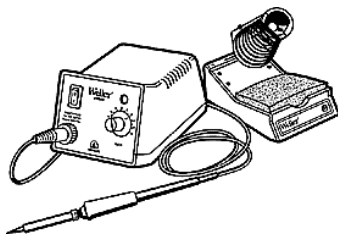
If you are in a hurry for more please check the following Internet URL (addresses) or have a friend look them up for you.

- QRP-L Message Archives ... <http://listserv.lehigh.edu/lists/Archives/qrp-l/date.html>
- Oak Hills Research ... <http://www.ohr.com/>
- EMTECH ... <http://emtech.steadynet.com/>
- Small Wonder Labs... ... <http://www.smallwonderlabs.com/>
- Wilderness Radio... <http://www.fix.net/jparker/wild.html>
- New Jersey QRP ... <http://www.njqrp.org/>
- NK7M ... <http://www.extremezone.com/~NK7M/>
- ARCI ... <http://www.qrparci.org/>
- Elecraft ... <http://www.elecraft.com/>



**AL7FS** was originally licensed as WN0LPK in March 1965 (WA0LPK from 1965-1985). Jim is a member of AARC and SCRC and he has participated in HF from 160-10 meters (CW and SSB), packet, satellite, 6 meter, UHF, VHF, ATV, EME (2 meter WAS #36), DX, and QRP. QRP has lasted the longest and the strongest - 1970 to the present.

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### The MARA Club up in the Valley

This is a club has grown some 80% in the last year. More info can be found at [www.kl7jfu.com](http://www.kl7jfu.com)

President: Len Betts, NL7LB  
Vice-President: Woody Duncan, KL0TS

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(Approved)

### Anchorage Amateur Radio Club Board Meeting, December 30, 2002

The AARC Board meeting was held on Tuesday, December 30, 2002 at Hope Community Resources Administrative Building, 540 West International Airport Road. The meeting was called to order by President Randy Vallee, KL7Z, at 7:00 PM. The following officers were in attendance: President Randy Vallee, KL7Z, Vice President Jim Larsen, AL7FS, Secretary Phillip Mannie, KLOQW, Treasurer Steve Jensen, KL0VZ, Activities Manager John Lynn, KL7CY and Trustee Jim Feaster, KL7KB. Also in attendance were Directors Richard Block, KL7RLB, David Stevens, KL7EB, Edie Lynn, KL7EL, Judi Ramage, WL7DX, Jimmy Tvrdy, KL7CDG, and Pat Wilke, WL7JA. VEC Chairman Jim Wiley, KL7CC, was also present.

Randy Vallee rescinded the appointment of Jimmy Tvrdy as Board Parliamentarian.

#### Gaming

Richard Block discussed the Letter of Opinion from attorney Chuck Dunigan on the reserve account and the revision of the Gaming settlement.

#### VEC

Jim Wiley inquired as to the status of the AARC VEC as a corporation.

#### 2003 Budget

Richard Block moved to approve the 2003 budget as amended. Phillip Mannie seconded the motion. Discussion was opened.

Richard Block moved to remove Raffle Prize line item from 2003 budget. Jim Feaster seconded. The motion was not carried.

Richard Block moved to increase Auto Liability line item to \$3500/year. John Lynn seconded. The motion was approved unanimously.

Steve Jensen moved to increase Rent line item to \$13,200/year to provide for year-round CCV storage. John Lynn seconded. The motion was approved unanimously.

Jim Feaster moved to amend Repeater Maintenance line items to reflect costs associated with the APRS digipeater and Mt. Susitna, in the amount of \$1200/year, and rename the Right of Way Rent line items to Space and Power. John Lynn seconded. The motion carried unanimously.

John Lynn moved to increase Office Supplies line item to \$130. Jim Feaster seconded. The motion was approved unanimously.

Richard Block moved to increase Utilities line items \$1200/year to reflect costs associated with CCV storage. Jim Feaster seconded. The motion carried unanimously.

Jim Larsen moved that the 2003 budget include line items for donations to Hope Community Resources and Alaska Pacific University in the amount of \$5000 each. Jimmy Tvrdy seconded. The motion was unanimously approved.

John Lynn moved to set the Welfare line item at \$540/year. Judi Ramage seconded. The motion was not carried.

Richard Block called the question to approve the 2003 budget as amended. The motion was carried unanimously.

There being no further business, Jim Feaster moved to adjourn. Phillip Mannie seconded. The meeting was adjourned at 8:31PM.

Submitted by Phillip Mannie, KL0QW, Secretary.

(Unapproved)

### **Anchorage Amateur Radio Club Board Meeting,** January 21, 2003

The AARC Board meeting was held on Tuesday, January 21, 2003 at Hope Community Resources Administrative Building, 540 West International Airport Road. The meeting was called to order by President Randy Vallee, KL7Z, at 7:00 PM. The following officers were in attendance:

President Randy Vallee, KL7Z, Secretary Phillip Mannie, KL0QW, Treasurer Steve Jensen, KL0VZ, Activities Manager John Lynn, KL7CY and Trustee Jim Feaster, KL7KB. Also in attendance were Directors Richard Block, KL7RLB, David Stevens, KL7EB, Craig Bledsoe, KL4E, Sue Hilton, NL7AV, Judi Ramage, WL7DX, Jimmy Tvrdy, KL7CDG, and Pat Wilke, WL7JA. Kyle Sandel, AL7J and Dave Cloyd, KL7M were also present.

Minutes from the December 17 and 30 Board meetings were reviewed and accepted.

#### Reports

**Treasurer's Report:** Treasurer Steve Jensen, KL0VZ reported that the Club's finances are healthy and proceeding in accordance with the approved budget. No special events in December affected the Club's financial condition.

**Gaming Committee Report** Richard Block, KL7RLB reported that the gaming settlement with the state had been signed. He was uncertain of the exact date of the signing. He suggested that Note 7, relating to the state's intention to revoke the Club's gaming permit in the Notes to Financial Statements section of the Treasurer's Report should be removed from the December 2002 report.

John Lynn, KL7CY went on to report that, as part of the settlement, each partner in the Boniface Bingo operation will donate \$11,000 to the Alaska Childrens' Trust in 2003 and

again in 2004. Additionally, the settlement stipulates that the Club is free of the risk of prosecution for events prior to the year 2000.

The partners and management of Boniface Bingo have agreed to the placement of a Club trophy cabinet in the facility.

#### VHF Committee Report

The 94 repeater was reported to be operational last weekend but is currently reported be down. Packet dial-in down. UHF phone patch down. (see report later in newsletter)

#### VEC Report

Randy Vallee has been running the VEC during Jim Wiley's absence. Randy recommends the purchase of a Morse code generating computer program for code testing. Pending approval of the Hope Community Resources IS Department, the program will be installed upon the PC in our testing area.

#### ARES Report

John Lynn reported on the January ARES meeting. Richard Block also reported that there will be no Fur Rendezvous Gran Prix auto race this year and that progress is being made in ARES' relationship with the Iditarod Trail Committee, who have agreed to sign a Memorandum of Understanding with ARES. Gordon Heartleib, AL1W has agreed to coordinate the Iditarod Start and Dan O'Barr, WL7BD will coordinate the restart. Other coordinators are still being sought.

Due to questions regarding licensing, GIS software has not yet been acquired.

#### HAMfest

David Stevens, KL7EB reported that we are on the ARRL list to be approved as a state convention, opening the way for ARRL speakers to appear.

#### Old Business

John Lynn reported on the Mt. Susitna repeater. The new antenna has been installed and is working well. We will need to move the control receivers to a different CTCSS tone. Site managers are cooperative.

The Grant Committee recommended the approval of \$1,000 to the Susitna Girl Scout Council for a radio education project. John Lynn moved to accept the committee recommendation. Jim Feaster, KL7KB seconded the motion. In the discussion that followed John Lynn moved to amend the grant to approve all but the \$480 budgeted for food. Craig Bledsoe seconded the motion to amend. Judi Ramage, WL7DX called the question for the amendment: the motion failed. The original motion to grant \$1,000 carried with the proviso that the Girl Scout Council be informed of Club grant guidelines and requested to adhere more closely to them in future grant requests.

#### New Business

Dave Cloyd, KL7M proposed to move the 146.76 repeater in Alyeska to his site to be incorporated into the IRLP (Internet Relay Linking Project) system. This would link the Alyeska repeater into Anchorage as well as the state and world-wide

IRLP system. He further proposes to act as repeater Trustee, moving the repeater to the KL3K call sign and to be the technical contact for the repeater. The repeater would remain the property of the Club with a Memorandum of Understanding to be drawn up to specify the rights and obligations of both parties. John Lynn moved to accept the proposal; Phillip Mannie, KL0QW, seconded. The motion carried. Randy Vallee will notify the VHF Committee and arrange for the MoU to be drawn up.

Corliss Kimmel, AL1G, Special Events Coordinator, requested a Special Events budget in the amount of \$900 for four (4) events in 2003. Phillip Mannie moved to accept the proposal, Pat Wilke, WL7JA seconded. The motion was passed.

Attorney Chuck Dunagin has presented the Club with a letter of opinion stating that the Club can legally allocate gaming income in the amount of \$75,000 for CCV maintenance.

Randy Vallee directed Secretary Phillip Mannie to email Club Officers and Directors contact information for the 2003 Board.

There being no further business, Judi Ramage moved to adjourn, seconded by Pat Wilke; the meeting was adjourned at 8:50 PM.

Respectfully submitted by Phillip Mannie, KL0QW, Secretary

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N2CQ QRP CONTEST CALENDAR
February 2003
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**40 METER FOXHUNTS**

Fox Hunt - Thursdays - 9pm EST, 8PM CST, 7PM MST and 6PM PST.

Info: <http://www.cqc.org/fox>

Truffle Hunt - Thursdays - 30 min before Fox Hunt

Info: [http://fpqrp.com/pig\\_hunt.html](http://fpqrp.com/pig_hunt.html)

~~~~~10-10

Int. Winter QSO Party (SSB - Ten Meters) ... QRP Category
Feb 1 - 0001z to Feb 2 - 2400z

Rules: <http://www.ten-ten.org/>

~~~~~North

American Sprint (Phone) ... QRP Category

Feb 2 - 0000z to 0400z

Rules: <http://www.ncjweb.com/sprintrules.php>

Adventure Radio Society - Spartan Sprint (CW) ... QRP Contest!

Feb 4 - 0200z to 0400z (Monday Evening US/Canada)

Rules:

[http://www.natworld.com/ars/pages/spartan\\_sprints/ss\\_rules.html](http://www.natworld.com/ars/pages/spartan_sprints/ss_rules.html)

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FISTS Winter Sprint (CW of course) ...QRP Category

Feb 8 - 1700z to 2100z

Rules: <http://www.fists.org/sprints.html>

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North American Sprint (CW) ... QRP Category

Feb 9 - 0000z to 0400z

Rules: <http://www.ncjweb.com/sprintrules.php>

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QRP ARCI Fireside Sprint (SSB) ...QRP Contest!

Feb 9 - 2000z to 2400z

Rules: <http://personal.palouse.net/rfoltz/arci/firesid.htm>

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ARRL International DX Contest (CW) ... QRP Category

Feb 15 - 0000z to Feb 16 - 2400z

Rules: <http://www.arrl.org/contests/rules/2003/intldx.html>

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FBYO Winter QRP Field Day (CW/SSB) ... QRP Contest!

Feb 22 - 1600z to 2400z

Rules: <http://www.extremezone.com/~nk7m/fybo2003.htm>

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Colorado QRP Club Winter QSO Party (CW/SSB) ... QRP Contest!

Feb 23 - 2200 Local to Feb 24 - 0359 Local

Rules: <http://www.cqc.org/contests>

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Ken Newman - N2CQ

N2CQ@ARRL.NET

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Technical Committee

this month in review.

Doug Dickinson, KL7IKX

I have ordered and am waiting on some new audio filter components for the 146.94 repeater in order to upgrade the audio quality. I guess when you get older the low frequencies begin to degrade as the coupling caps get old. I had to command 146.94 and 444.70 off the air on the 13th, when I noticed that the battery voltage was dropping on both repeaters. I called the site owner, and was advised that they were not sure what was going on, some systems were working fine and some were not, however the first time that we all could get together and get to the site (weather, and other reasons) was this Friday morning. I replaced a weak AC breaker that had dropped, once that was done, the AC chargers began to re-charge the backup batteries. I suspect that the breaker dropped when we took numerous power hits over the last weekend, I had the same problem at my office. One side of the 240 line took more hits than the other, and one side of the 94 site had numerous popped breakers, and the other side did not. This of course apparently was so fast that the backup generator didn't get started and on line. I have installed a new breaker, to replace a breaker that was probably 10 years old, and probably a bit weak. Everything is back on line as of 1030 on the 17th.

73 Doug

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**Anchorage Amateur Radio Club
Summary of Financial Affairs**

January 2002 thru December 2002

Assets	
Gaming Account	\$167,226
All other current assets	\$120,325
Fixed assets	\$195,874
Boniface Bingo	\$19,989
Total Assets	\$503,414
Liabilities	\$0
Equity	\$503,414
Operating Income	\$9,305
Operating Expenses	\$33,367
Gaming Income	\$145,439
Contributions	\$10,890
Gaming Funds Transferred to General Account	\$152,500

This summary does not include notes or other information which are integral part of a complete Financial Statement and should not be relied upon as a complete or accurate statement of the Club's Financial Condition.

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Great QRP web pages

<http://www.njqrp.org/data/links.html>

<http://www.qsl.net/al7fs/>

QRP - Getting Started - Using your current rig on QRP
<http://www.qsl.net/al7fs/AL7FS1.html>

Elmer 101 and Low-Cost QRP Transceivers - SW40+, SST
<http://www.qsl.net/al7fs/AL7FS3.html>

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Mount Susitna Repeater!!

The Mount Susitna 2 meter repeater is on the air on 147.27 with plus offset and a tone of 100.0 Hz. It's really way up there so give it a try. This is a KL7AA repeater that is being operated by ARES for the benefit of SouthCentral Alaska hams.

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Ham Stuff for Sale

Patcomm PC-500, 80/40/17 meters, w/keyboard, 15W max., \$325.00
Radio Works CAROLINA WINDOM 80LP Antenna, \$85.00 Alan, KL1HC 907.745.6482
abeckett@mtaonline.net

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**New For classified Ad page
An Announcement from KL7G Sysop**

The KL7G webpage url, <http://www.kl7g.org> will be hosting a classified ads page software donated by the FAA Amateur Radio Association (KL7FAA) for all hams to use..also there DXCluster is up and running smoothly now on telenet.. to access the cluster just telenet to **24.237.4.235 port 8000** and **login with your callsign**. The Telenet program that came with windows is lame..I recommend using a free program call puTTY it is downloadable from the net..just search for puTTY.. The 2 meter radio access is going to be back online soon. A full set of instructions are online for the cluster at the KL7G webpage..Also, any members wishing to host a webpage on the KL7G server is welcome..just drop me an e-mail I will set them up with an account. Accounts also come with an e-mail address @kl7g.org .
73 es have fun!

Frank KL7FH sysop KL7G

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A Few Notes:

1. Remember the Anchorage Amateur Radio Club (AARC) **newsletter** can be read **online** at:

<http://home.gci.net/~lawson/>

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2. **Alaska QRP Club** meets the Third Friday of every month - 7:00 PM (Some show for dinner at 6PM): Hams with QRP (low power under 5 watts) and Homebrewing interests meet for a social meeting monthly. Meet at Dennys (in the back room) on DeBarr near Bragaw. Contact is Jim Larsen, AL7FS, JimLarsen2002@alaska.net or 345-3190. Information on the QRP Club and what kits we are building can be reviewed online in the past two AARC newsletters at <http://home.gci.net/~lawson/>

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SEC Report

From the desk of the SEC

A number of amateurs in the Alaska Section are taking the Level 1 and 2 courses from ARRL. Those who have just completed Level 1 are: KL7PB and KLOSW in Kenai. We have AL1P in Seward who is nearly done. Both KL7PB and KLOSW have enrolled in the Level 2 course. There is still space available to take the course under the Homeland Security Grant. Courses open every month and I encourage you to avail yourself of this opportunity.

We now have a full time IGate for the Section at Healy. KL1SF, Sean, now has the gate up and operating. He is also gating wx information from wx stations located near Wiseman in Anaktuvuk Pass and at Wainwright up on the NW coast. You can also do a search on findu.com to see all the stations that are going thru the gate. He is also putting earthquake information on the map. The earthquake strength is in the beacon and there is an earthquake symbol on the screen.

This month the annual EC/DEC reports are due by the 31st. These reports are important because they tell me how you are doing and where you need assistance. They also go to the Section Manager and ARRL.

We are preparing now for the Jr Yukon Quest, the Quest 250, and the Yukon Quest as you are preparing for the Iditarod and the JR Iditarod. I wish you well in your work.

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ARES Tech Talk The Arrow Antenna OSJ-146/440

The fundamental challenge facing the ARES volunteer in emergency or public service work is to establish reliable communications from a possibly unfamiliar and 'radio challenged' location. It is often helpful to have an ace or two (or more) up one's sleeve in order to cope gracefully with these situations. I've found that a durable, portable and forgiving antenna is just such a card, and one of my favorites is the Arrow OSJ-146/440 2 meter/70 centimeter J-Pole. I own three of them, one of which has been in constant service since 1999. The robust character of the Arrow J-Pole, along with the inherent characteristics of j-poles in general make this antenna an excellent choice for portable public service and emergency use.

Why J-Poles?

The j-pole is an omni directional antenna, and as a member of the end fed one-half wavelength antenna family, j-poles in general exhibit a modest gain (approximately equal to that of a dipole) over an isotropic antenna as well as an apparent gain over

The best thing we can do to help our communities and state is to be trained and prepared to deal with emergencies because we don't usually get advance notice.

Linda, AD4BL, SEC Alaska

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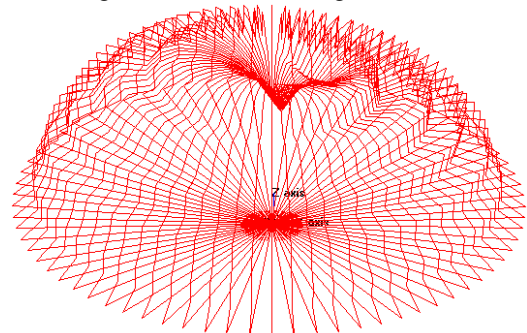
A Word to the Wise, again

<http://www.google.com/> is the place to go for help in finding almost anything. Google is a great search engine and if you go to the advanced search, you can search for exact phrases. Give it a try with your callsign or name. AL7FS

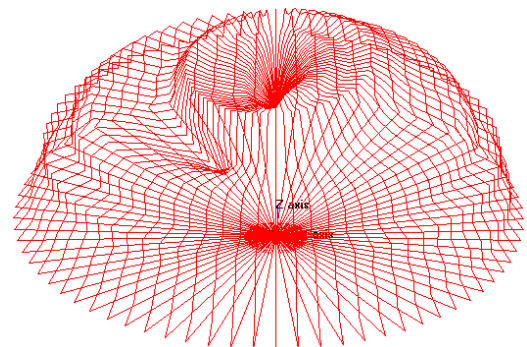


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quarter wavelength antennae, the latter resulting from a nice, low angle of radiation (see figures 1 and 2).



2 meter radiation plot



70 cm radiation plot

This translates directly into an increase in effective radiated power, and rather less directly into the option of using less transmitter power or using longer or more lossy (but often smaller and lighter) feed lines, at least on 2 meters.

J-poles also provide the possibility of getting an HT antenna up above head level. Since j-poles do not require a ground plane, any convenient non-conductive support will do. They are also quite happy with metal masts when the conductive material is kept below the radiating element. As with any antenna, conductive objects in the near field will have an effect on antenna performance, but j-poles in general are unusually forgiving and will often perform adequately even with less than ideal mounting. As always, one should try to get the radiator as much in the clear as possible for optimal results.

It is not overwhelmingly difficult to roll your own j-pole from copper pipe, twin-lead or ladder line. There are a number of plans and calculators available on the world wide web. Among the many I'll just mention <http://www.packetradio.com/jpol.htm>, the basic copper pipe design, <http://www.marktwain.net/~aschmitz/antennas/jpolecalc.html>,

a collinear design that should exhibit a modest gain over a dipole and <http://www.cvarc.org/jpolescl.htm>, the familiar twin-lead j-pole. Flexible roll-up-and-put-in-your-pocket j-poles are also available commercially from MFJ, <http://www.mfjenterprises.com/products.php?prodid=M FJ-1730>, and from Maple Leaf Communications, <http://www.mapleleafcom.com/jpole.htm>, just to name a couple. I've not tried any of the commercially produced roll-up j-poles, so I'd be reluctant to recommend one, but I have had success with the homemade versions. A search on the web for 'j-pole' will reveal a wealth of information, some of it both accurate and useful.

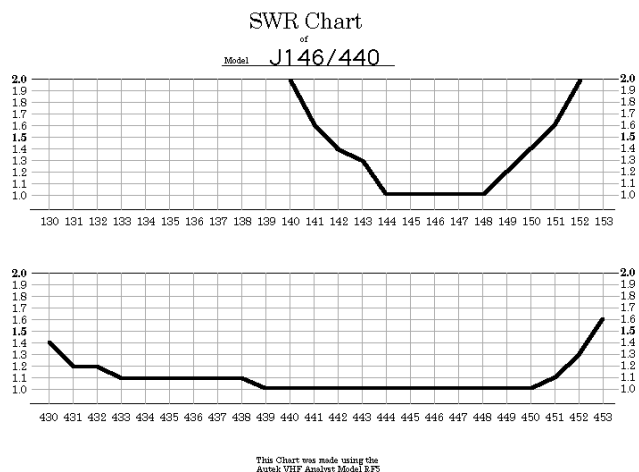
The Arrow J-Pole

The Arrow J-Pole is not quite 5 feet long, five and one-half inches wide and one and one-half inches thick. The three elements (it is a dual band V/UHF antenna) are three-eighths inch solid aluminum mounted on a solid aluminum shorting bar/mounting bracket. A clamp suitable for a one and one-half inch mast is supplied. It is about as weatherproof and durable as an antenna can be, and weighs less than one pound. It requires minor assembly when it comes from Arrow; you'll need a nine-sixteenths and a three-quarter inch wrench. Since there is little to be gained in portability by disassembling it, the initial assembly should be the last time you'll need to take a wrench to it.

The antenna is fed through a single SO-239 connector at the bottom of the shorting bar, making it very convenient for use with dual band HTs and mobiles.

This connector is somewhat exposed, so I recommend taping it well during portable use or sealing the connection in permanent installations. Coiling several turns of feed-line just beneath the connector as an RF choke is often recommended for j-poles in general to minimize potential feed line radiation.

The Arrow's SWR on the 2 meter band (see figure 3) is a flat 1.0:1 between 144 and 148 MHz and less than 2:1 between 140 and 152 MHz. On the 70cm band (see figure 3) SWR is below 1.4:1 from 430 to 452 MHz. The Arrow J-Pole I tested came in at less than 2:1 from approximately 426 to 454 MHz. Of course, SWR is not the ultimate gauge of antenna performance. I'd vastly prefer an antenna that performs well with a higher SWR (within reason, or at least within the capacity of my radio's finals to gracefully cope) to a poorly performing antenna that has a great match, but the OSJ-146/440 is a good performer, and combined with its durability and portability a fine, broadband match merely makes it a more useful tool.



146/440SWR plot

I've seen no published limits or recommendations on the maximum power an Arrow J-Pole can handle. I've run only 50 watts or so through mine, but see nothing about the antenna that would discourage me from putting several hundred watts into it, if I could think of a good reason to put several hundred watts into an omni directional V/UHF antenna in the first place.

The Company

All my dealings with Arrow have been quite satisfactory; the workmanship is excellent, email typically gets a response the same day and orders are shipped promptly. There is very definitely a human being behind the Arrow operation: Al Lowe, NOIMW. While I've never met Al face to face, our email conversations have suggested that he is a no jive sort of guy. The Arrow Antenna web site, <http://www.arrowantennas.com>, reflects this. It is refreshingly free from hype and hyperbole; something I rather appreciate.

In Summary

The j-pole antenna is a good choice for portable emergency and public service communication and the Arrow OSJ-146/440 is an excellent value among the many antenna possibilities from which to choose. At \$39 it is an excellent deal.

De Phil Mannie, KL7QW

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Jan 23rd MARA Informational Newsletter

With what has transpired during this last week, combined with what will be happening during our upcoming January Club meeting, I felt it necessary to get the following info out to MARA members ASAP.

This last Monday myself and several Board members attended an informational briefing at Fire Station 65, to bring Ms Bea Adler up to speed as to what the comm capabilities are of our radio community in the event of a natural disaster.

For those of you unfamiliar with who Bea Adler is; She is The Coordinator for The Borough's "Project Impact" program, which is responsible for our Borough preparing for "any" possible natural disaster! I had been introduced to her recently, and having found out what Her job title encompassed, I felt it important that She be brought up to speed as to what We are capable of!

The briefing was an unqualified success! Ms Adler stated her gratitude for our having made her aware as to what our community's capabilities are.

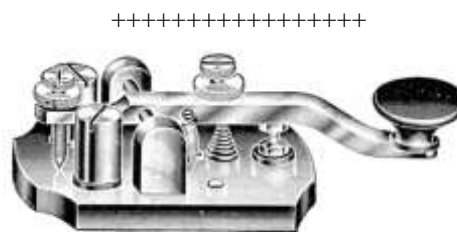
Today, Thursday, myself several Board members also attended the second in a series of briefings on where Project Impact is in its planning curve. We soaked up information given by presenters from MEA, MTA, GCI, Enstar, and The Red Cross! Very well done!

At the meeting a couple of us had the opportunity to individually speak with Mr Dan Tanner, of MEA, and Mr Rod Ewing, who both expressed a keen interest in attending our upcoming Jan 31st Club meeting.

So, here we are, and now everyone is up to speed as to what your Board has been doing on your behalf! The aforementioned gentlemen will be at the 31st's meeting to meet us, and we will be discussing a great many key items as pertaining to disaster preparedness. Also, I have a couple of hand-outs for Club members, concerning individual and family preparedness ideas.

I hope to see as many MARA members as possible for this, our first meeting of the new year. And to "sweeten up" the deal for your attendance we will be having a "special" door prize to draw for. You must be a dues-paid member to receive this one though!

See you soon, Len, KL7LB



STANDARD WIRELESS KEY.

Something to think about....Pass this along.

Any and all interested Radio Amateurs in Alaska. Something to think about....Pass this along. Providing emergency communications when regular communications facilities are unavailable for any reason is one of the prime reasons for the existence of the Amateur Radio Service. ARES operations require well-trained radio operators who should be able to operate with any available mode and any available equipment in an emergency scenario. Amateur Operators who only use VHF FM or HFSSB can not be considered fully trained and capable in all situations, since suitable equipment may not always be available in an emergency. Any of the newer digital modes have all of the advantages listed below, except Nos 1 and 2, but again, this kind of equipment may not be available where it is immediately needed, especially during some kind of emergency. ARES activity in a real emergency situation needs the K.I.S.S. principle to be applied to minimize the opportunity of things going wrong. This is one place where CW shines particularly bright. For this reason, well-trained ARES operators should have a good working ability with CW mode. This means being capable of effective use of the mode, not just passing an FCC license examination once.

CW is a mode that has been shown to be highly useful in performing emergency communications but demands a modicum of operator skill in order to be effective. Advantages of using CW for emergency communications:

1. Simple equipment, or more complex equipment that can be operated in a simpler mode such as turning carrier on and off, can be used effectively in an emergency.
2. Computers, CRT screens, printers and/or other complex and/or power consuming pieces of equipment are not required to encode/decode and produce readable hard copy. All you need is your ears, pencil and paper.
3. Due to the character-by-character transmission of CW, it is much less prone to garbling or misunderstanding and does not require use of phonetic codes or other encoding schemes. Many words sound alike on SSB or even FM. There is no question on CW. .

4. CW offers basic encryption.. CW is probably not readable by the average media or casual intercept, and for this reason, it provides a certain level of security.
5. Low RF power output levels and simple antennas can be useful for communications over considerable distances, even when band condition/propagation is uncooperative.
6. Even at fairly low code speeds (around 10-12 WPM), CW can move written traffic rapidly, usually about two to three times as fast as SSB or FM over comparable circuits.
7. Experience has shown that CW has certain advantages over the voice modes when the radio operating position is located in a noisy environment at one or both ends (such as an EOC, headquarters or disaster shelter area). Use of headphones blocks out ambient background noise during receiving, and telegraph keys cannot pick up high levels of ambient background noise which can easily overpower the operator's voice during transmission on FM or SSB.
8. CW can be effectively used with other modes, CW one direction, SSB or FM in the other direction (split, or duplex) or even on different bands (crossband) if necessary.
9. It's fun, once you learn how.

Making effective use of the above advantages requires a certain level of skill on the part of the operators involved. Personnel engaged in ARES activity must be able to handle written record message traffic effectively and accurately, using any and all modes. Regular use of CW for handling traffic will provide message traffic proficiency in general and proficiency in the use of this mode in particular. Any operator who has once attained good CW capability never forgets it. It is like learning to swim or to drive a stick-shift car.... once you know how, you never really will forget. If proper traffic procedures are learned and followed correctly, errors in transmission or reception are extremely rare. The problem is getting to the point of proficiency in CW operating, where it becomes second nature, sort of a "second language". Unless CW is used enough to become like a second language, the skill tends to fade over time. Once the skill is developed sufficiently, operators who have been away from using CW, even for decades, usually will have no trouble getting right back into it. Those who never properly learned in the first place will have to start all over. Additionally, the recent changes in the FCC licensing examinations which reduce Morse Code requirements to ridiculously slow speed levels has seriously affected general amateur proficiency in the CW mode among newer licensees. Today, we have lots of Extra class licensees whom cannot operate CW at all! The Alaska ARES organization badly needs more trained and capable radio operators, including operators proficient in the use of CW for handling written record traffic.

How can we help to accomplish this? The ACWN or Alaska CW Net has been started with this need in mind, and it is hoped it will be of some benefit in case a serious communications emergency occurs for any reason. We have begun to invite checkins to the ACWN on Tuesdays and Thursdays between 730 PM and 930 PM Alaska Time at slow (approximately 7 to 8 wpm) code speeds. The CQ call to ACWN is automatically keyed on the hour and approximately each 15 minutes thereafter during the two-hour period. It is sent on both the 80 and 40 meter frequencies of 3534 and 7042 KHz, and the receivers are always on at AL7N. The only way this activity will be beneficial is for Alaska amateur stations to call into ACWN and BRING some formal TRAFFIC along to send. It does not matter where the traffic is destined for. It can be to points outside Alaska, or other points within Alaska, or it can be sent to the Net Manager, AL7N in Fairbanks, Alaska SCM, SEC, EC, or to anyone else you desire. ACWN is an "open" pair of frequencies intended for amateurs to use for third party formal message work, so let's take advantage of it. You may set your own schedules on the ACWN frequencies if you so desire for station-to-station work. Learning to accurately receive such traffic is just as, if not more so, important as learning to send it. That is what the network is for. There is only one rule in ACWN: Send your messages in proper message format, using proper procedures, and properly acknowledge receipt. Anyone who needs information on message handling procedures, email AL7N at l.trump@att.net and information will be supplied via return email.

This is an OPPORTUNITY for any interested Alaskan amateur to gain proficiency in CW traffic work. Those who wish to work at slower speeds can call into the ACWN on Tuesday and Thursday evenings on 3534 or 7042 KHz. Those who wish to utilize higher CW speeds can call in any other time. Effort is made to "guard" the 3534 and 7042 frequencies, plus 14050 KHz in the 20 meter band, as continuously as possible between the hours of 730 PM in the evening until about 1000 AM the following morning, Alaska time, every day. There is no "Net Control" station. If no activity is heard, Call CQ ACWN and see who you might find listening. A regular schedule is maintained with a station outside Alaska which takes traffic to and from the ARRL NTS network in the lower 48. Pass any such traffic to KL5T in Eagle River, or AL7N in Fairbanks. The ACWN should be thought of as a valuable training resource. We need to use it before we lose it. Dig out your key and headphones and join us....it can be lots of fun as well as good training.

Thanks

Ed Trump
AL7N ACWN Net Manager
Fairbanks, Alaska

AARC Committee Overview

Anchorage ARC VEC, Inc.

The Anchorage ARC VEC, Inc. was formed in 1982, shortly after the FCC acted to modify the communications act of 1934, allowing the FCC to accept the services of non-government entities as examiners in the Amateur Radio Service. Roger Hansen, KL7HFQ was instrumental in establishing the Anchorage ARC as a VEC (Volunteer Examiner Coordinator), which was in fact the first VEC in the nation to be certified, and likewise was the first to give an Amateur Radio exam. Originally there were almost 40 VEC's, but that number has decreased over time, until there are 13 active today.

Your VEC consists of a committee of several individuals, headed (at the present time) by Jim Wiley, KL7CC. Other members of the committee include Roger Hansen, KL7HFQ, Gordon Nightingale, KL7GN, Mike McGloughlin, WA7USX, Jim Moody, NL7C, Kent Petty, KL5T, and Len Worcester, WL7IM. We have approximately 200 volunteer examiners around the state that are registered with the AARC VEC.

Exams are offered on a regular basis at several locations in Alaska, including Anchorage, Fairbanks, Palmer-Wasilla, Valdez, and Kenai-Soldotna. Additional exams are given at events such as Field Day, the annual hamfests in Anchorage, Palmer, and Fairbanks, and other locations on an as needed basis.

One of our current projects is working towards a method of offering exams over the internet, an idea that was originally brought to the National Council of Volunteer Examiner Coordinators (NCVEC) by Jim, KL7CC, at the annual meeting, held in Gettysburg, PA, July, 2001, but no action was taken at that time. The idea was further discussed, and approval for the pilot project was obtained at the July, 2002 meeting of this same group. This project is intended to demonstrate that exams can be given in areas that normally would have too few hams to assemble the requisite number of individuals (3 VE's) to offer new or upgraded licenses. If successful, this demonstration project will in all likelihood be adopted nationwide, and could revolutionize the way exams are given in all areas. We are receiving valuable support from Alaska Pacific University in building and hosting the internet web site that will be used for this effort.

Jim Wiley, KL7CC

Key Info - Alaska QRP Club Data Sheet From Jan 2003 meeting

Keys & Paddles

Links to key web sites -

<http://www.zianet.com/sparks/links.html>

White Rook keys -

<http://electronicsusa.com/products/sham.html>

Schurr, Paddlet Palm and Nye Keys -

<http://www.morsex.com/>

Bencher Keys - <http://www.bencher.com/radioequip.html>

Russian Keys - <http://www.qsl.net/kc0afx/cwkeys.htm>

KK5PY Keys - <http://www.njqrp.org/keys-paddles/index.html>

Various Old Keys -

<http://www.ncdxc.org/Ncdxc/Newsletter/Dxer2001/dxer0401.pdf>

Kent Keys - http://www.mountain-ops.com/kent_keys.htm

LTA Keys - http://www.wimo.com/verteiler-e.htm?s77c_e.htm

HB Lever Paddles - <http://www.eham.net/articles/4408>

HB Double Lever Paddle -

<http://www.fix.net/~jparker/norcal/paddle/pa0cmu2.htm>

HB Single Lever Paddle -

<http://www.fix.net/~jparker/norcal/paddle/nb6m.htm>

HB Tip Tapper - <http://www.njqrp.org/tiptapper/index.html>

Keyers

Kanga Keyer - <http://www.bright.net/~kanga/kanga/keyer.htm>

DXKEY Keyer - <http://www.qsl.net/ik5xct/dxkey/>

Tick Keyer - <http://www.embres.com/indexframe.htm>

PIC Keyer - <http://www.xcvr.com/default.asp?view=pk3>

Key Monitor -

<http://www.uoguelph.ca/~antoon/circ/morse2.htm>

PIC Keyer - http://www.qsl.net/dl4yhf/pic_key.html

Logikit CMOS4 Keyer -

<http://www.idiompres.com/cmos4.html>

Smart Keyer III - <http://www.qsl.net/n4yg/>

Touch Pad Keyer -

<http://n4uautoo.home.sprynet.com/kits/touch%20pad%20keyer/Uncle%20Albert.htm>

OHR Keyer - <http://www.ohr.com/keyer.htm>

Voice CW Keyer -

<http://www.arraysolutions.com/Products/superkey.htm>

N5ESE Keyer - <http://www.io.com/~n5fc/keyer.html>

MFJ Keyers -

<http://www.mfjenterprises.com/products.php?catid=86>

Keyboard/Computer

Keyboard Sender - http://www.qsl.net/dl6jan/start_e.html

Palm Pilot Sender -

<http://www.njqrp.org/palmserialsender/index.html>

Windows PC Key Interface -

<http://k1el.tripod.com/wkinfo.html>

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