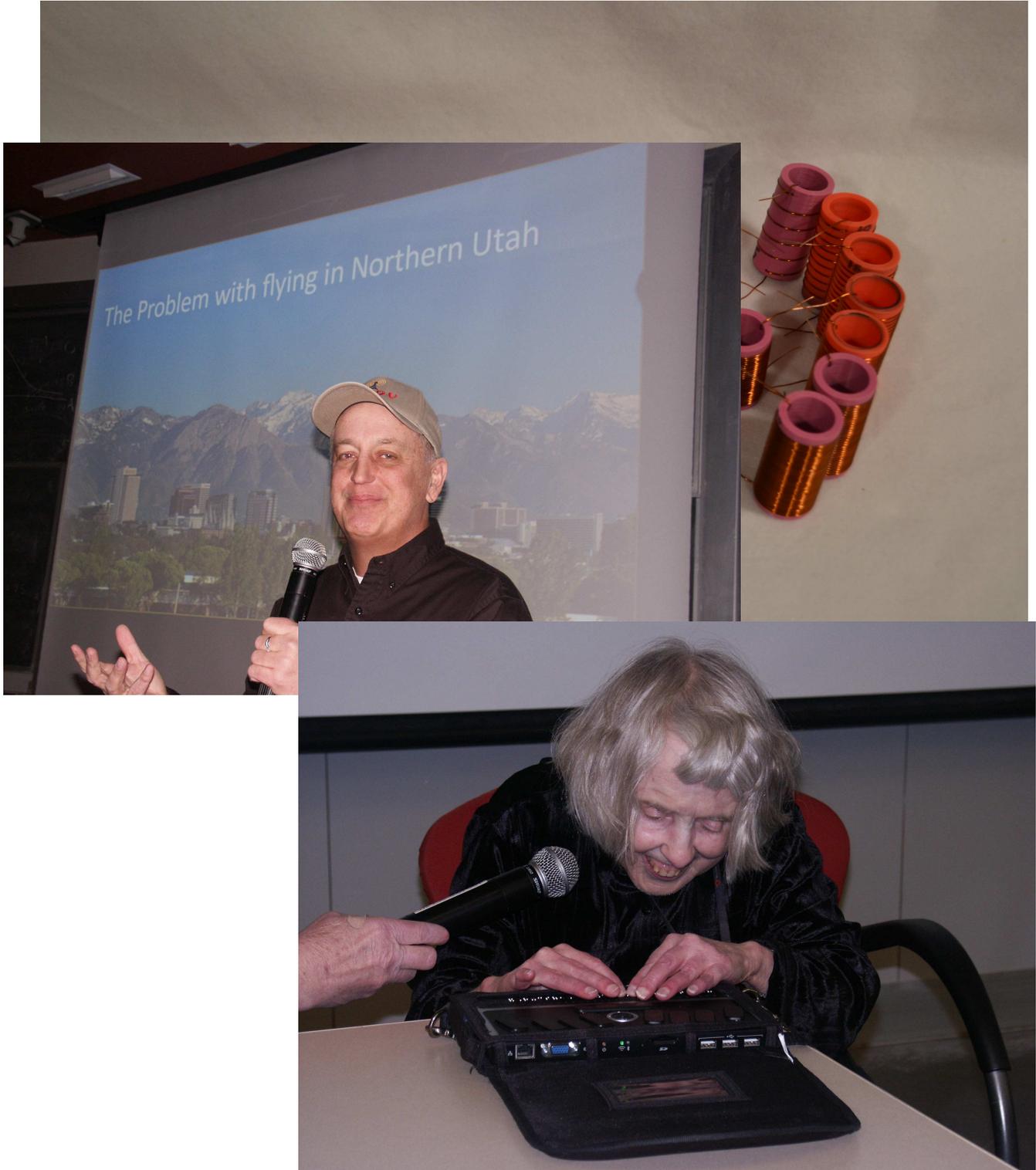


The *Microvolt*

April 2023



Prologue

Publication: *The Microvolt* (USPS 075-430) is the official publication of the Utah Amateur Radio Club, Incorporated, 3815 S 1915 E, Salt Lake City, UT 84106. It is published monthly except August. Subscription is included with club membership at \$20 per year. Single copy price is \$1.50. Periodicals postage paid at Salt Lake City, Utah. Postmaster: send address corrections to The Microvolt, c/o James Bennet, 4960 W 5400 S Kearns UT 84118.

Deadline for submissions is the 24th of each month prior to publication. Reprints are allowed with proper credits to The Microvolt, UARC, and authors. Changes in mailing address should be communicated to the Club Secretary: James Bennet, 4960 W 5400 S Kearns UT 84118.

Club: The Utah Amateur Radio Club was organized under its present name in 1927, although its beginnings may date back as early as 1909. In 1928, it became affiliated with the American Radio Relay League (club #1602) and is a non-profit organization under the laws of Utah. It holds a club station license with the call W7SP, a memorial call for Leonard (Zim) Zimmerman, an amateur radio pioneer in the Salt Lake City area.

Meetings: The club meets each month except July and August. The meetings are usually held on the second Thursday of the month at 7:30 PM in the University of Utah's Warnock Engineering Building, generally in room 1230 or 2230, sometimes in 2250 or 105.

Membership: Club membership is open to anyone interested in amateur radio; a current license is not required. Dues are \$20 per year, including a Microvolt subscription. The Microvolt and membership cannot be separated. Those living at the same address as a member who has paid \$20 may obtain a membership without a Microvolt subscription for \$12. Send dues to the Club Secretary: James Bennet, KK7AVS, 4960 W 5400 S Kearns UT 84118. Let the Secretary know if you prefer the electronic edition of The Microvolt instead of the printed version.

Contributions: Monetary contributions are gladly accepted. Send directly to the Club Treasurer: Chuck Johnson, 1612 W. 4915 S. Taylorsville, UT 84123-4244. For in-kind contributions, please contact any board member to make appropriate arrangements.

Repeaters: UARC maintains the 146.62- and 146.76- repeaters. The repeaters are administered by the UARC Repeater Committee. Comments and questions may be directed to any Committee member. The Lake Mountain repeater (146.76-) is IRLP node 3352.

Ham Hot-Line: The Utah Amateur Radio Club (UARC) has a Ham Hotline, 801-583-3002. Information regarding Amateur Radio can be obtained, including club, testing, meeting, and membership information. If no one answers leave your name, telephone number and a short message on the answering machine, and your call will be returned.

UARC 2023 Board

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Late Breaking News

For late breaking news listen to the UARC Information Net Sundays at 21:00 on 146.62 or set your browser to: <http://user.xmission.com/~uarc/announce.html>

Writing for Microvolt

Submission of original pictures, articles, book reviews, nuggets of humor and responses to editorials are encouraged. Photographs in the highest resolution are best. Plain text without embedded pictures but labeled to correspond to pictures. Have you written a program you'd like to share? E-mail to the editor: martij@xmission.com.

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Latest News

UARC Meetings

UARC meetings are held on the second Thursday of each month except for July (annual steak-fry) and August (vacation). Meetings are held in the “Warnock Engineering Building” on the campus of the University of Utah. Watch the UARC website for the room and topics.

We encourage attendance of the live meeting, but we will also do our best to stream the meeting live on UARC’s YouTube page:

<https://www.youtube.com/c/UtahAmateurRadioClub>

From there, look for the feature that is marked “live.” The meeting should commence at 7:30. There should be some chatter on the channel by about 7 P.M. and you can connect in that period to make sure everything is working.

Thursday April 13, Randy Kohlwey WI7P will discuss Satellite Communications.

Our Cover

March meeting with Linda Reeder on Echolink and Gary Crum on balloons and amateur radio.

Photo Credits

Ron Speirs K7RLS March Meeting. Equipment review, Jed Marti KI7NNP.

License Classes

Utah County:

In-person license classes will be offered at the City of Orem during 2023. Each course will cost \$10. Register at: <http://psclass.orem.org/>. These are “homework” courses; You’ll be expected to complete an assignment (and email me the results) by the start of every class period, even the first one. No course textbooks are required. Then again, these courses will be casual, hands-on, and fun for those who remain awake.

Please contact Noji (nojiratz@hotmail.com or 801-368-1865) with any questions about the courses.

Salt Lake:

Technician: Zoom with KI7MTI and KK7AVS every Monday from 6:30 PM. Contact KI7MTI@gmail.com for invite.

General: KK7AVS 147.16 mHz, positive offset, tone 127.3, every Tuesday 7 PM – 9 PM.

Extra: In person, contact Ron Speirs K7RLS@comcast.net.

Local Beacons, SDR

K7JL: 10 watts, 28.2493 mHz CW, Sandy.

KK7AVS: SDR 33, 70 cm, 1.25M 2M 6M 10M 20M 40M, Kearns.

Rating Chasing

You’ve worked long and hard, upgraded through the FCC license exams and passed the Extra. Now what? The challenge of the exams and accumulating the ratings are the ego trips some of us are addicted to.

I’ve finished the amateur rocket certifications, I have all the upgrades on my pilot’s license I can afford, finished all my CS degrees and can scuba to the limits of reasonable gas mixtures anywhere in the world where the water is sort of warm. But what next? Do I abandon the ride once the apogee is reached? Short of becoming a professional, many challenges await the eager amateur radio chaser with rewards both financial and confidence building. I offer a few thoughts on extending the run with the same sorts of challenges.

Awards: The ARRL offers a lot of wall decorations suitable for framing and boasting.

- *Code Proficiency:* by my standards, this is the hardest one of the bunch. No amount of studying works; it’s a lot like learning to play a musical instrument. Listen to W1AW CW at 10, 15, 20, 25, 30, 35, and 40 WPM. Copy 1 minute by hand, send it with \$10 and you get mentioned in QST, a certificate suitable for framing (I don’t have one, yet).
- *Worked All States:* get a contact in all 50 states, get a certificate, and a pin. Even more prestigious is *Worked All Continents* and 5-band WAC.
- *Contests:* The QST Contest Corral lists contests and websites around the world. Go ahead, win them all.

- *DXpeditions*: You need money, health, and willingness to travel to a really out of the way place and set up a station. You should probably practice first – Utah's a good place to start, much of it is nearly as remote as Ellesmere Island.

Continuing Education: Couldn't stand algebra in high school? Have math phobia? Groups are looking to the future of amateur radio and that future is digital. There's hope for those of us with math phobia. Salt Lake Community College and others provide beginning course work and workshops. Did you know that MUSIC is more than sound?¹ Digital signal processing, the basis of the newest radios is the wave of the future. For more than a basic understanding of electronics you need enough mathematics to make a go of it. If you're past your sell by date, the University of Utah will let you audit classes for free if the instructor OK's it.

Teaching: The old saw "To really know something, teach it to someone else" applies here. There are many enthusiastic amateurs out there that need help passing the exams. For many, it's been a long time since they took a written test on anything, or, like myself, don't test well. In person classes are no longer necessary and you can reach a wider audience with Zoom and GoTo meeting.

Writing: The ARRL magazines QST, QEX, NCJ and On the Air, as well as CQ Magazine <https://cq-amateur-radio.com> are written by amateurs for amateurs. That means you. ARRL pays for content and will even edit your text to suit their needs. CQ publishes as is.

If you're really ambitious, IEEE publishes journals on specific topics. These are peer reviewed, facts, experimental method, and outcomes are ruthlessly examined and critiqued but your contribution may be just what's needed for the next generation of communications.

Other open access journals provide these services, but require payment for publication. Microvolt doesn't pay, but will work with you, and your name and call sign appear no matter how much help we supply. Why go to the bother and long hours just to face rejection and despair? The rest of us want to see your ideas even if our reading is only done in the bathroom.

Entrepreneurship: You've gone through the magazine ads, asked Amazon and Google for just the right piece of equipment – it's not to be found, way overpriced, or has bad reviews. Large successful compa-

nies make a few recognizable products with the best sales potential. If you wanted it, chances are there are others that also want it. That's an open invitation to start a business in a niche market.

There are enough challenges to satisfy the most die hard rating chaser. You may not get a plaque on the wall for your teaching, or earn millions of dollars from your business, but the satisfaction from setting a goal and reaching it may be the same.

KI7NNP

Equipment Review

Gasoline powered generators are noisy, heavy, stinky and generate lots of power. While certain members of our armed forces can carry these to a mountain top, it's beyond most of our capabilities. Rechargeable Lithium cells with solar, water and wind turbines can be lugged anywhere there's sun, flowing water or wind. The battery, charging, and power generation is normally encompassed by a *power station*. I review 3 of varying power and weight.

Goal Zero Yeti 500X, Newpowa 100 watt Solar

Total Weight (Yeti only): 13 lbs, 12 oz.

Cost (REI): Yeti \$550, Newpowa 100 W monocrystalline 12 v solar \$105.



I use this to power my Kenwood TM-V71 2 meter, 70 cm rig. A two hour UARC roundtable with lots of 5 watt FM transmitting, I used less than 10% of available battery life.

Pro: Nice display, blinking blue light, easy to use buttons. It's hooked directly to the solar panel on the roof, 20' away. 110 volt AC output is pure sine wave. I added an indoor voltmeter to show the solar output. Solar panel easy to install with mounting hardware included.

Con: Heavy, power button needs to be pushed twice, LCD display has to be shut off manually, 12 volt output jack doesn't use any known connector. Solar panel is fixed (portable ones are available).

¹Multiple Signal Classification used for cleaning up signals and spectrum analysis.

Jackery Explorer 500

Total Weight (station only): 19.3 pounds

Cost (Amazon): \$424, \$735 with solar panels.



Pro: The Utah Rocket club has used one for two years. It powers 10 watt stereo PA system all day and is rugged enough to be used in many nasty settings. The portable solar panel folds up for storage in a trailer full of other heavy stuff like fire extinguishers, launch pads, and wireless launch controllers.

Con: Heavy, not really useful for backpacking.

Takki 83 Watt Power Station, 30 Watt Solar Panel

Total weight: 5 lbs 1 oz with solar panel.

Cost: \$160 (Amazon).



This is bargain basement and easily transportable. I'm going to use this to run a Raspberry PI recording forest sounds for a week.

Pro: Low cost, low weight, bright LED light, USB output, 110 V AC output, solar charging. You can use it to recharge cell phones, lap tops and HTs, or read the night away in your tent. Recharge by solar. It can be schlepped to a reasonable mountain peak if you're in shape.

Con: AC output is not a pure sine wave, less than 2 amp. drain limit, leaving solar connected to unit may cause overcharge. USB output is 5 volts, not 5.1 volts as required by a Raspberry PI (but it will get over it).

Conclusion Battery operating your station is possible and even desirable. But the more power and duration you need, the more it costs.

KI7NNP

Amateur Radio Classes for Individuals with Disabilities

Linda Reeder N7HVF

After Randy Finch K7SL convinced me to get into amateur radio I found out about The Hadley School for the Blind <https://hadley.edu>, a correspondence school in Winnetka Illinois. They would send you assignments and you would send them back when finished. The school had classes on amateur radio, so I took the novice class and got an A-.

I called Bill Gibson at the blind center and asked if they could put the technician pool questions in Braille. He did and I was so happy about that. Randy gave me my first test at KSL where we both worked. Back then an Extra-class VE could give a Novice test. I passed the code test but I messed up on the theory. Back then you had to wait 30 days before taking the whole thing all over again. I wasn't happy about that.

I got my Novice license in November, 1985. My first call sign was KA7WGF so they called me "the wild girlfriend". I didn't like that and was glad to get rid of it when I upgraded. I obtained my Technician license in December of that same year. Randy read me the questions, Gordon Smith K7HFV/SK wrote my answers down and another VE sat and observed. I couldn't believe I passed!

My first contact as a Technician was Ron Jones, K7RJ who used to work with us at KSL. Randy wanted me to surprise Ron so he gave me Ron's call sign. I called him and kept calling him. Finally Ron asked who kept calling him. I said, "This is KA7WGF." I had not received my new license and call sign yet. Back then, you had to wait for it to come in the mail. Ron said that he had never heard that call sign before. I told Ron that I worked with him at KSL. He still didn't know who I was so I finally told him. He was so excited, we talked for quite a while. I had so much fun talking on 2 meters and 70 centimeters.

After passing my Technician exam, Randy and Gordon asked me if I would like to become a member of the Utah Amateur Radio Club and I said yes. My second call sign was N7HVF so I went from "wild girlfriend" to "high voltage female." I still have this call sign today. I tried to get a call sign with my initials, but somebody had it already.

In 1986 I attended my friend Pam's college graduation. She lived in Long Beach California. While I was there, I met Anne N6BOP. She made shirts, hats and mugs and put ham call signs on them. I wanted to get

shirts for my friends at KSL who got me in to amateur radio. While I was there, Anne let me talk on her low-band rig. She was on a net called Kadiddlehopper, named after the Clem Kadiddlehopper character on Red Skelton's TV show. The net was on 7.2685 MHz. It was so much fun talking to these people and I wanted to be a part of it. I told Randy all about it when I got home.

I bought an a Kenwood 4040 HF rig. I started working hard on gaining a code speed of 13 words per minute so I could get my General license. Then something unsuspected came up and put a wrench in my plans.

In 1987, A group of us decided to go on a trip to Jackson Hole, Wyoming over the Labor Day weekend. On the way home, disaster struck. I developed a splitting headache. I thought it was a migraine. We stopped in Star Valley to get something to eat. My friends hoped that it would help if I ate something; instead, the headache intensified. My visiting teacher companion had me lie down in the back seat of her car. The next thing I remember was being pulled out of the car. We were in Montpelier, Idaho. I was vomiting and saying things that didn't make sense. Fortunately, one of my companions was a nurse at Primary Children's Hospital. If she had not been there, I'm sure I would not be here today. Marcia knew there was something seriously wrong with me.

The doctor in Montpelier told her It was probably a migraine headache. Marcia became very firm with him. She said, "Listen, this woman needs a neurosurgeon, and I want one here, pronto." I was sent by ambulance to McKay Dee Hospital in Ogden. The neurosurgeon told my parents that I had an aneurysm on the left side of my brain. Somehow the blood vessels came apart and put themselves back together again, forming a blood clot. He told my parents that if it couldn't be dissolved with heavy medication, they would have to operate and I would have a 50-50 chance of making it through the surgery.

Fortunately, the doctors were able to dissolve the clot with medication. I spent three weeks in the hospital and another three weeks at my parent's home in Roy, being slowly withdrawn from the medicine.

Because I was an amateur radio operator, my visiting teachers, along with my mother, encouraged me to get on the radio and talk with ham friends who I used to talk with every day. I said I was afraid I would offend them because I couldn't remember their names and call signs. A few days later, Otto, one of my ham friends, called and said, "Linda, I am on the 62 repeater. Please get on and talk to me." I did and it

wasn't as bad as I had anticipated.

In November I went back to Salt Lake. I went back to work at the Salt Lake County Health Department. My doctor allowed me to work part time, but in December I went back to full time.

I had to relearn Morse code and was not happy about it. It took a long time and several miserable failures. When I cried, Randy said that I had been through a lot and I should just be patient.

Francis Boyer WA7PNZ told me about Handiham <https://handiham.org>. He was putting the advanced pool questions into braille. He didn't want to see me do all of that work if it had already been done, so he gave me Handiham's number. I called and talked to Sister Alverna O'Laughlin WAØSGI, a Catholic nun. We talked for 2 hours. She wanted me to come to the Handiham camp in August. I was scared since I didn't know anyone in Minnesota. Sister Alverna and my parents told me that I couldn't live my life in fear.

I went to the camp and it was the best thing I did that whole year of 1988. Before going to the camp, I got a call from Wayne Keeney N6CCU. He said he would be my teacher for the advanced class, and would be sending me some braille material. He said I'd need to study, study, study or I wouldn't pass the test at the end of the week. He reassured me that when I attended his class, he would go over questions that I was having a hard time with.

Camp was a lot of fun. We would have breakfast at 8 every morning, and then have classes until noon. After lunch there were activities, such as riding on the pontoon boat and going to Itasca State Park where the Mississippi River begins.

The first year I was there I didn't participate too much in the activities because I was so concerned about passing the license exam. However, I did ride on the pontoon boat, and I enjoyed talking to England on the low band rig while sailing Lake George. Then it was back to class until 5 PM.

My code instructor was David Rutledge W9KRQ. He worked with me 3 times a day for a half hour then I spent the rest of my time in Wayne Keeney's advanced class. Wayne was a tough instructor. He would get angry if you couldn't answer his questions. You are supposed to know the answer. Yes, you are! He had a loud voice that you could hear all over the campus when he was teaching class.

Well, test day finally came. They had 4 different recordings of the code test. I passed on the 4th try. When they told me I passed I just sat there. I was

so tired. I was happy that I finally passed 13 words per minute for my General license, but I didn't pass the Advanced test. However, two weeks after arriving back home, I passed the Advanced test. Yay! I wouldn't have to take Wayne's class any more. (Actually, Wayne and I became good friends.)

Next year at the Handiham camp, I was in Dave Justis, KNØS' Extra class. Dr Justis is a professor of medicine. I was so impressed! Dave had things made of cardboard and wire to teach us the differences between capacitors, resistors and transistors. He brought all kinds of antennas to class for us to feel.

In 1990 there was a gentleman in Pennsylvania who called the FCC and told them that he couldn't pass the code test because he was epileptic and had seizures. He wanted a waiver of the code test for the disabled. The FCC decided to let Handihams deal with the issue.

Bruce L. Humphries, KØHR was the director of Handihams at the time. He told the gentleman that they would help him. If he couldn't receive the code, he could send it. The gentleman got very angry and refused, saying he couldn't do that. This guy knew all of the right buttons to push to get what he wanted.

His next step was to write a letter to King Hussein of Jordan, a ham radio operator with the call sign JY1. Well the king sent a message to the US President George Bush and Bush sent a message to the FCC ordering a waiver of the code for the disabled. This opened a can of worms. First of all, this did not affect all disabled individuals. All a disabled person had to do was have their doctor give them a written statement saying that because of their disability they could not take the code test. Quite a few people took advantage of it.

Sister Alverna called me to her office and asked me if my church believed in being honest and of course, I said it did. "Then you have to take the code test," she said. "This is not a visual test. It is a hearing test and there is nothing wrong with your hearing." I knew what I had to do. I am supposed to be a representative of my church. I also knew I would be a disappointment to Gordon and many others if I accepted a waiver.

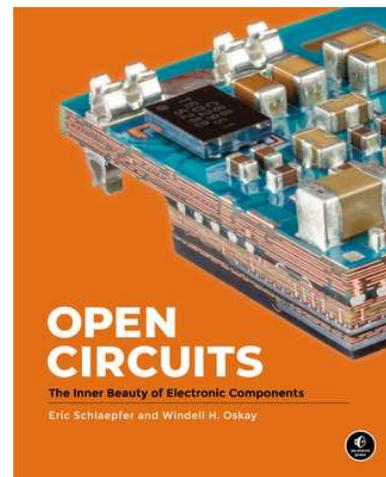
Marcilla and I took the code test and we barely missed passing, so the VEs told us that we would be their guinea pigs. They wanted to prove to the FCC that this could be done. We had to send 20 words per minute. They told us what to send. I am so glad they let us use paddles. I don't think I could have passed it with a straight key. Marcella and I passed the test. So in

September of 1990 I obtained my extra class license. Bruce Johnston, NK6C and I taught a novice and technician class at the California camp in Malibu for four years. Then I became a VE and helped with the code test. Handihams is so wonderful in the way they helped me along the way through my journey in amateur radio.

73 from N7HVF Linda Reeder

Open Circuits

The Inner Beauty of Electronic Components



The authors have the gall to desecrate all sorts of electronics with diamond saws and polishers to reveal the innards we take for granted and probably don't know about anyway. Toggle switches, a high speed USB cable, LEDs, resistors, and the venerable 12AX7 vacuum tube are sliced, diced, and dissected. Some are beautiful in their own way, others mystifying and some reveal that automated processes don't always generate the most symmetrical and inspiring engineering. Many capacitors appear quite haphazard. A great book for your coffee table, if you still have one.

W. Oskay, E. Schlaepfer, 301 pages, No Starch Press, 2022, \$43 with tax at The King's English.

KI7NNP

Member of the Month

Vickie Chaplin KI7PQR



Vickie's husband Sheldon (KI7JVH) wanted her to get an amateur radio license so she could be ready for an emergency when they and friends are out camping. Vickie promised to study for the exams when she retired.

Vickie taught swimming before attending the University of Utah receiving a degree in clinical laboratory science. She worked at Holy Cross Hospital (now Salt Lake Regional Medical Center) as a technologist doing all the tests doctors ordered. After working there four years, she worked for Myriad Genetics for 20 years retiring in 2017.

It was time for Vickie to get her radio license. Vickie said it was hard enough for her to talk to strangers on the telephone much less on the radio. But she promised her husband she would study for those exams as soon as she retired and got busy on *ham-study.org*. Sheldon was so excited he gave Vickie a B-Tech handheld radio to listen to. He was hoping she would hear some interesting conversations.

While Vickie was studying, Sheldon introduced her to a program called Utah Shake-Out. This is a program to help individuals to be prepared for an earthquake. Individuals throughout Utah participate in this program. Fire and police departments, hospitals, health departments and amateur radio participate in the Shake-Out drill www.shakeout.org/utah. Vickie really enjoyed taking messages and sending them to the right individuals. This was when she decided she wanted to get involved with emergency communications.

Vickie received her technician and general license in the same day in 2017. At this same time, Sheldon was

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studying for his extra class license that he received in 2019.

Vickie enjoyed working the Intertie net. One day she was talking to an individual on the radio. She was so excited as she thought she was talking to another woman. But it turned out to be an 11 year old boy. Vickie was so embarrassed she put her radio away for a year.

Last summer Vickie and Sheldon attended the DIY Festival at Craft Lake City where engineers and other professionals demonstrate how to build things: soda bottle water rockets, cases, candles and all kinds of crafts. Vickie and Sheldon were helping with the Douglas Space Camp www.douglassciencecenter.org. They met James KK7AVS and Mike KI7MTI and told her there was much more to amateur radio and told her about the Salt Lake Crossroads Amateur Radio Club social net. Vickie tried it and loved it. She said it was so much fun talking to different people and learning new things about amateur radio. She even joined the club. Vickie is also a member of UARC and the VHF society.

Vickie and Sheldon have 2 grown children; a son and a daughter. They have four grandchildren; two teenagers and two adults.

Vickie is excited about getting involved in emergency preparedness and she and Sheldon are taking a CERT class.

Vicki, we wish you the best in all of your endeavors.

73 N7HVF Linda Reeder