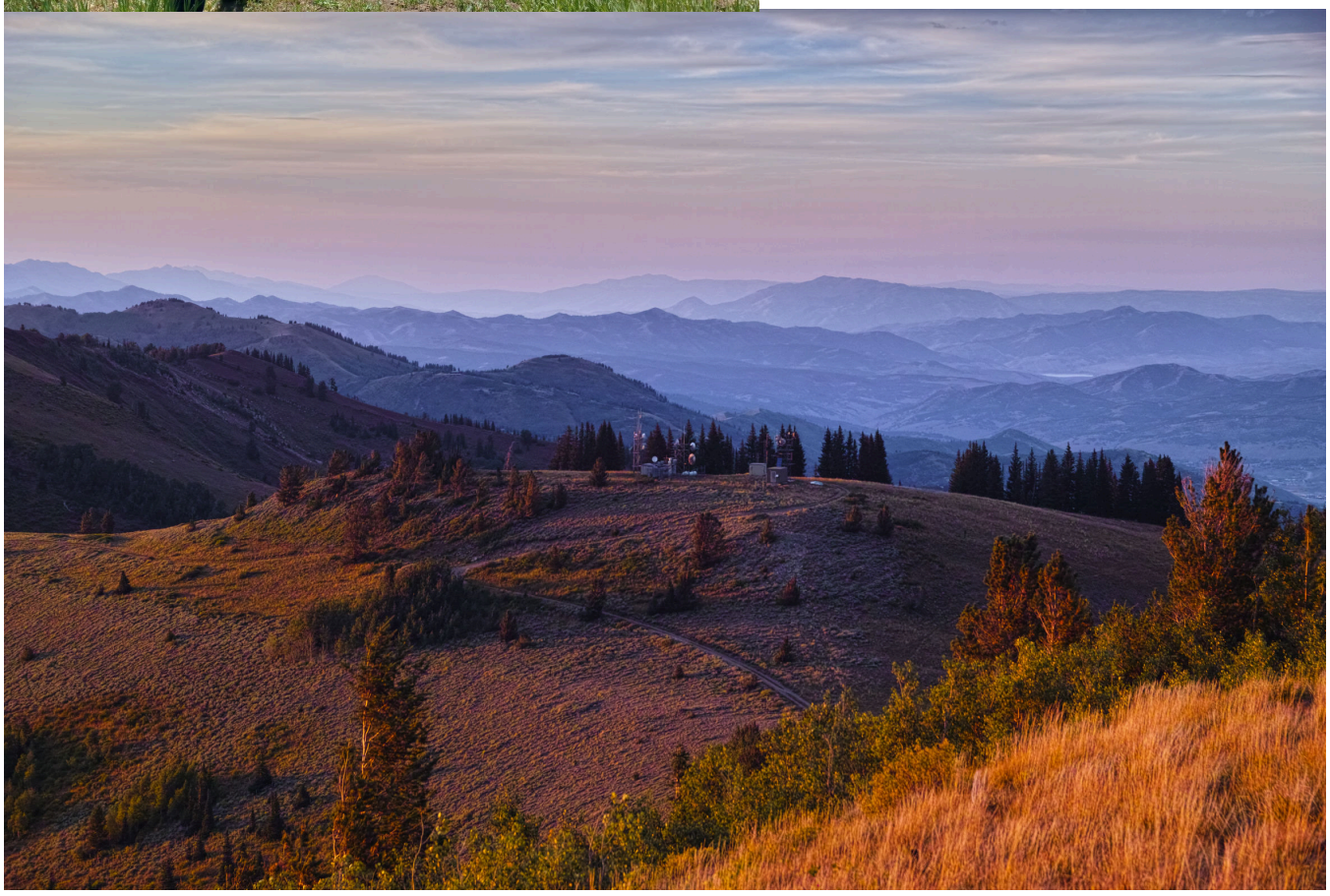
The *Microvolt*

June 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

President: Marvin Match, KA7TPH	801 328-3641
Executive VP: Linda Reeder, N7HVF	801 364-7006
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Program Chairperson: Mike McAinsh KI7MTI	385 246-3981
Imm. Past President: Morris Farmer	

Committee Chairpersons and Members

Bookseller: Rick Gregory, KG7GOW	801 582-7783
Historian: Ron Speirs, K7RLS	801 904-3587
License Trustee: Brett Sutherland, N7KG	801 298-5399
Repeater Engineer: Clint Turner, KA7OEI	801 566-4497

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

We encourage you to submit original pictures, articles, book reviews, software and hardware descriptions, nuggets of humor and responses to editorials. Photographs in the highest resolution are best. Send plain text without embedded pictures but labeled to correspond to pictures. E-mail the editor: *microvolt@utaharc.org*.

We are grateful to the management of XMission, our Internet Service Provider (ISP), for the donation of this Web-Page service.

For account information go to: *http://www.xmission.com/*
Or call 801 539-0852

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.

June Meeting

The in-person UARC June 8th meeting at 7:30 MT will be devoted to Field day. This will be held at room #2230 in the Warnock Engineering Building.

UARC Steak Fry

UARC's Steak Fry will happen on July 15, 2023 and will occur at the usual place - the Spruces Campground in Big Cottonwood Canyon in Group Area 7. Despite inflation, dinner - which will be a steak, salad, corn-on-the-cob, ice cream and all of the 'fixins will cost a measly $15 per person - the same price for the past several years. There are signup links at the bottom of the page at *http://user.xmission.com/∼uarc/announce.html*.

Our Cover

Field Day 2022, Scott's Hill at Sunset, Clint Turner KA7OEI.

Photo Credits

Scott's Hill, Chuck Johnson WA7JOS, Clint Turner KA7OEI. Arduino 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.
K7AVS: SDR 33, 70 cm, 1.25M 2M 6M 10M 20M 40M, Kearns.

The Arduino Cult

My View

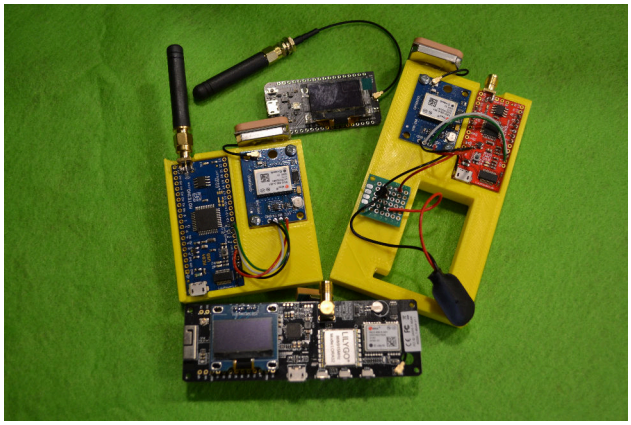
Nearly every issue of QST has an Arduino project[1], this month a bird detector. It's worth investigating why these boards and software is so popular. It was originally designed in Italy for impoverished students wanting to learn programming. It's migrated from simple beginnings to a large infrastructure supporting different micro-controllers and peripherals. So why is this important for radio amateurs? It's an easy to swallow entry into the world of programming, enabling projects to control motors, compasses, keyers, battery monitors, GPS, timers, low power transceivers and other simple devices for the shack. Prebuilt boards are

[1] Arduino is the name of an Italian bar

available with a wide selection of prewired peripherals.

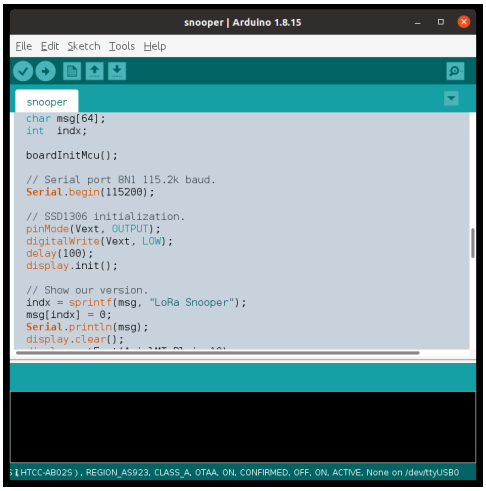
Consider the Arduino as a step below the Raspberry PI and its look alikes. They're more useful for real-time tasks without the overhead of a complex operating system and without the protections they provide. If you need internet access, multiple-tasks, a complex user interface - the PI is your answer, if not, get an Arduino.

Shown are some medium size Arduino devices with LoRa transceivers and GPS modules. Represented are various Atmel chips and ESP32's.



What is the Arduino community? Originally based on the Atmel (now Microchip) low cost AVR MCUs, these had a small flash memory for program storage and very limited RAM. Peripherals included serial ports, the small peripheral interface (SPI), the inter-integrated circuit bus (I^2C), pulse width modulation (PWM), timers and analog to digital converters (ADC). More modern versions include extra serial ports, more SPI ports, more code space, more RAM, EEPROM, more general purpose I/O pins (GPIO), multi-core processors, and a larger code library.

What are the advantages of signing up for such a simple slow processor? Why not use a Raspberry PI or Beagle Bone? Programming your application is a requirement and an opportunity. You can do everything on the command line, or use the provided Integrated Development Environment (IDE), the Arduino one is easy to use, has a limited number of options, and parameters are in a single file and editable. If you don't like their editor, you can use your own (as a command line warrior, I prefer emacs). Unlike the replacement, Eclipse, it's easy to learn and doesn't get in your way much.



The hardest part of programming any micro-controller is learning the complex input/output systems that vary from manufacturer to manufacturer. The Arduino environment provides software drivers for these systems with a uniform interface. You set the serial port baud rate with `Serial.begin(9600);` no matter what chip you're using. The details of clocks, port pin setup are taken care of without the tedious, error prone initialization required by an ARM processor or other large MCU.

Pro	Con
+ Inexpensive	- Bare bones
+ Easy to program	- Must know minimal C, C++ programming
+ Easy to design low frequency circuits	- Small flash and RAM
+ No need for expensive programmers	- Slow
+ Minimal power required	- Requires PC support for programming
+ Large library	- Code quality variable
+ Different MCU's supported	- Different MCU's supported
+ IDE well organized, easy to use	- Newer versions switching to Eclipse
+ No complex operating system	- Minimal operating system

ARRL publishes project books [1, 2] and many more from Amazon [3] that are self published (edited?). Numerous beginner kits are available at modest prices, even at the local electronics store.

KI7NNP

References

[1] G. Popiel, *More ARDUINO Projects for Ham Radio*. The American Radio Relay League, Inc., 2017.

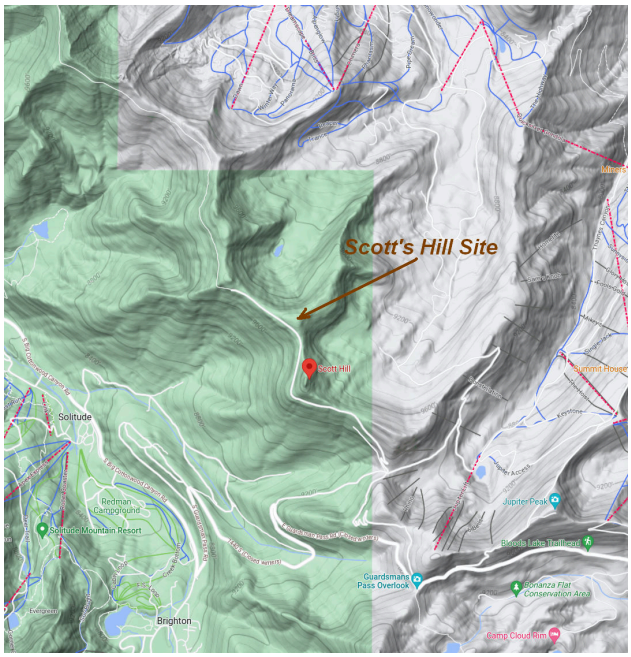
[2] ——, *More ARDUINO for Ham Radio*. The American Radio Relay League, Inc., 2021.

[3] D. Saini and M. Jaur, *Arduino Solutions Handbook*. London: BPB Online, 2022.

History of Scott's Hill Repeater Site

Chuck Johnson WA7JOS

Scott's Hill is the site of a UARC 146.620 repeater connected to the Farnsworth peak repeater extending coverage to Evanston and the Park City/Heber area. It sits on the ridge across the road from the Solitude ski resort and above the Canyons resort area (or whatever it's called this week).



UARC recently renewed the Forest Service permit for the Scott's Hill repeater site. In the process of filing the necessary paperwork and reviewing the correspondence history, an interesting story emerges.

Bruce Bergen KI7OM discovered the site in the mid 90's while mountain biking. The building was in poor condition and obviously abandoned.

Bruce did some investigating and learned that the building was originally built by Moon Lake Electric and later taken over by the State of Utah. They ceased using it about 1978 and it had been left to rot. The Forest Service had asked the state to demolish the building and reclaim the land.

This site would service Solitude, Brighton, and parts of Park City and I-80. It also had line of sight to Farnsworth Peak, but most of the Salt Lake valley was in shadow. A linked repeater to '62 was an early idea (now a synchronous '62 repeater). The UARC board approved the project and the permit process began.

Bruce was appointed Chairman of the Scott's Hill project. Lots of letters and meetings ensued. Permission to take possession of the building was needed from the state. A permit was required from the Forest Service. Access to the site crossed Silver King Mine property, which required permission and keys. Bruce wrote letters, made phone calls, and arranged meetings.

With the assistance of Utah RACES, a permit application was filed in July 1997. Forest Service policy didn't like multiple buildings at a single site. They wanted everything consolidated into a single building. Demolition of the building was scheduled for October.

Bruce contacted then Representative Merrill Cook's office asking that they intervene. In November, the Forest Service said no.

But an early winter prevented the demolition of the building from occurring. In February 1998, Bruce met with a new Forest Ranger requesting reconsideration. Some clarifications to the permit were made and an engineering case was presented that physical distancing was important to prevent interference.

In July 1998, the State of Utah deeded the building to UARC. Permission to cross the Silver King Mine and a key to the gate were also procured.

In August an intermodulation study was conducted in conjunction with other site users. John Lloyd, K7JL, was instrumental in completing that step to satisfy the Forest Service requirements. At this point, we had verbal assurances that USFS would approve a permit. With that assurance, reclamation of the site began. Several weekend work parties were formed. The decaying lean-to generator shed was demolished and removed. A hole in the building was repaired. A lock box was added to the door. Bruce met with the USFS landscape architect to choose an acceptable color to paint the building. The building was painted, and the concrete roof was sealed with a waterproof membrane. Two tower holes were dug, which required an electric jack hammer. A small ready-mix concrete truck delivered enough concrete for the towers so we didn't have to mix it on site.

In May 1999, our official permit was filed. By August, the permit had still not been issued. Bruce wrote a letter to USFS. At this point, we had spent over $3000 on restoration based on verbal permission. Finally, we received our permit on August 18 1999.

This spring, our permit was due for renewal. That has been completed, and we should be good for another 30 years.

If you want to read more about the system's operation you can start at *http://www.utaharc.org/rptr/uarcrpt.html*. There are long explanations, coverage maps, and how to identify which repeater you're talking to.

ARRL Field Day is Coming

The object of Field Day is to set up portable operations and contact many other stations over a 24 hour period. If you need to know more, the June issue of QST is helpful as is the in person June UARC meeting. If you intend to come, please sign up from the link on the front page of the UARC website https://user.xmission.com/∼uarc/.

ARRL Field Day is always on the 4th full weekend of June. This year, that's June 23-25. But you can come early and/or stay late. Someone will probably be at the site as early as Tuesday June 20. Setup begins Thursday evening at 6:00 PM and continues until the beginning of operations at noon Saturday.

Set-up and tear-down require lots of manpower and some instruction and training. If you can, please come early and/or stay late to assist with these activities. Those of us who have been doing this forever, need to train the next generation of Field Day participants.

UARC Field Day has been held near Payson Lakes. Assuming that the snow melts and the road doesn't slip (it has in the past, it did), this is where we'll be.

Directions

1. Make your way to Payson, UT - I-15 Exit 250 from the north or exit 248 from the south.

2. Go south on 600E which leads you up Payson Canyon.
3. Follow the Mt. Nebo Scenic Loop signs. Proceed up the canyon approximately 15 miles.
4. Continue past the Payson Lakes Campground for another 1/2 mile. At the Guard Station sign, turn left onto a dirt road.
5. After about 100 yards, you will crest a hill and the clearing will come into view.

The road loops around the clearing. Operations are conducted inside the loop. Shown below is a section of the Mt. Nebo loop road and the Field Day location.

Choose a camping spot anywhere around the perimeter of the loop. This is an inclusive event. Bring family and friends and enjoy the fun. This is a ”dry camping” area with no water, no RV hookups. Bring whatever you need to sustain yourself for the duration. The club will provide Porta-Potties. There will be a group dinner Saturday evening (sometime after 4:00). The club will provide the main dish. Please bring a potluck dish to share.

The Field Day site is at 8000 feet elevation. While warm in the day, it can get cold after the sun goes down. Bring a coat. Some years, there have been fire restrictions. The club owns towers, antennas, radios, computers, tables, and tents. Bring whatever you like, rigs, tools, equipment, but most of all, we need YOU!

Operations conclude at noon Sunday, after which, we pack everything up, put it away for next year (or an emergency).

Final Note

The road to the site is partially washed out. UDOT hopes to have this fixed by Memorial Day, but this may not happen. Check the UARC website for updates before leaving.

Sassy Classy Women’s Net

Linda Reeder N7HVF

Do you know any women with amateur radio licenses and microphone fright? Here is an opportunity for them to overcome it. Missy, KC7FMW is starting a women’s net called the *Sassy Classy Women’s Net*, held every Wednesday at 8 P.M. on the 147.160 MHz repeater with an offset of 600 kHz and tone of 127.3. We will be talking about women’s issues and how you feel about amateur radio. So, come and join us. It will be lots of fun.

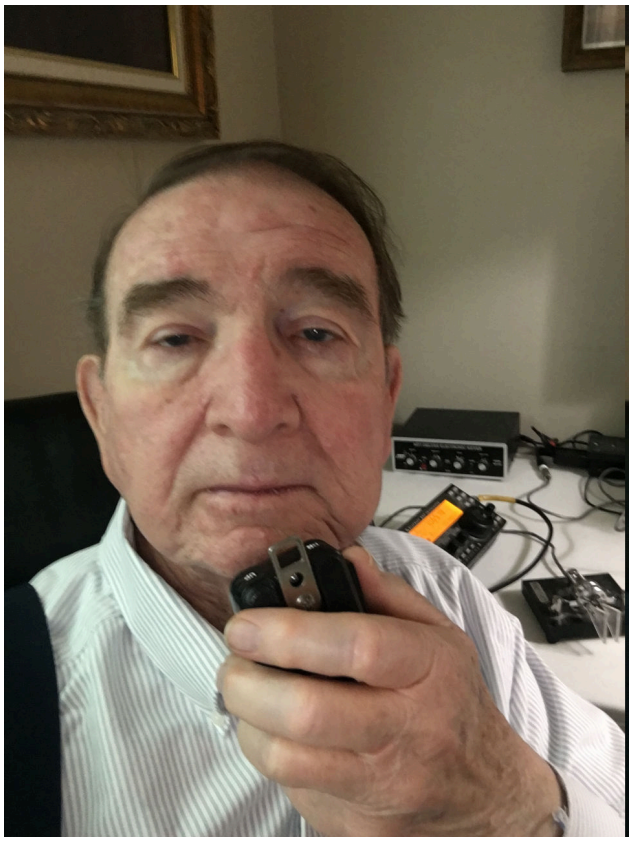
Software

Share your open source software with the UARC community.

KI7NNP caps a program to select from 1 to 4 capacitors from a box of up to 40 to make an accurate capacitance. Source code, executables for Windows and Linux, a sample data base, a required data file and a manual are at *www.cog9llc.com/caps.html*. A descriptive article will appear in the next issue of QEX.

Member of the Month

James Payne N5DEH



This month we are featuring James Payne N5DEH. James was born in Lordsburg New Mexico and his family moved to Albuquerque when he was in high school. James first exposure to amateur radio was around 1951 when his older brothers got licenses. James was about 5 at the time and would watch them operate their home made transmitter and listen on their Hallicrafters receiver.

After graduating from college James got a job working in the California cattle industry for 7 years. While living in California a friend got him started in amateur radio. James learned morse code at 5 words per minute and received his novice license. James traded a deer rifle for a Heathkit HW 101 and stuck a up a 15 meter dipole. James was in business. James continued to study the theory and practiced the morse code. He passed the theory test and the 13 words per minute code test for a general class license. In 1978 James left California for Utah to earn his law degree at BYU's J. Reuben Clark Law School.

In 1981 James moved to New Mexico where he practiced practiced law for 15 years. It was then that his call sign was changed to N5DEH where he was active on 2 meters and the HF bands.

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In 1996 James took a job in Florida working on a large ranch as a property manager. While in Florida James received his extra class license. He enjoyed studying the theory to take the test. James worked in Florida for 20 years and when he retired, he and his wife decided to move back to Utah.

James and his wife Pat have 7 children, four boys and three girls. Four of them and their spouses have their ham licenses. Two of Jame's grandsons are licensed. Among them are three extras, one general, and six technician operators. James favorite thing about amateur radio is learning about electronic technology and the different aspects that amateur radio offers. James is presently trying to improve his morse code as he has for the last years. James I know you can do it! James recently joined the Long Island CW club and has been attending some of their zoom classes. Practice is the key.

James is a member of UARC, the Taylorsville amateur radio club and the VHF Society. James tries to check in to the Utah Beehive net as often as he can. James also strives to check in to the Taylorsville ham net on Monday evenings.

In addition to ham radio James enjoys black and white photography and develops his own film. James takes advantage of Salt Lake community college's reduced tuition for senior citizens. James has taken several classes in geographic information systems, cartography, and computing. Linux is his favorite operating system. James volunteers one day a week at the family search center located on the Salt Lake Community College Redwood campus helping others with their family history.

James we wish you the best in all of your endeavors especially the morse code.

73, N7HVF Linda Reeder