

The *Microvolt*

January, 2018



Prologue

Publication: *The Microvolt* (USPS 075-430) is the official publication of the Utah Amateur Radio Club, Incorporated, 699 E. South Temple Ste 100, Salt Lake City, UT 84102-1282. 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 Tom Kamlowksy, 4137 Clover Lane, Salt Lake City, UT, 84124-2711.

Deadline for submissions is the 24th of each month prior to publication. Submissions by email are preferred (k7hfv@arrl.net), but other means including diskettes and typewritten submissions can be mailed directly to: Gordon Smith, 632 University St., Salt Lake City, UT 84102-3213. Reprints are allowed with proper credits to *The Microvolt*, UARC, and authors. Changes in mailing address should be communicated to the Club Secretary: Tom Kamlowksy, 4137 Clover Lane, Salt Lake City, UT, 84124-2711.

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 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: Tom Kamlowksy, WA7ZRG, 4137 Clover Lane, Salt Lake City, UT 84124-2711.

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. Instructions for IRLP use are on the club website.

Ham Hot-Line: The Utah Amateur Radio Club (UARC) has a Ham Hotline, 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 2018 Board

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Vice Pres: Bruce Fereday, KF7OZK	801 883-9428
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Asst. <i>Microvolt</i> Editor: Rick Asper, AC7RA	801 865-1693
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Program Chairperson: Laird Severinsen, WB7TGP	801 255-0834
Imm. Past President: Clint Turner, KA7OEI	801 566-4497

Committee Chairpersons and Members

"Book Lady": John Brewer, N7MFQ	801 386-7725
Historian: Ron Speirs, K7RLS	801 904-3587
Field Day Chair: (To be determined)	
License Trustee: Brett Sutherland, N7KG	801 298-5399
Repeater Engineer: Randy Finch, K7SL	801 556-7565
ATV Engineer: Clint Turner, KA7OEI	801 566-4497
Autopatch Engineer: Gordon Smith, K7HFV	801 582-2438

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IRLP Information

For information on using the club's IRLP node on the 146.76 repeater, check <http://www.utaharc.org/irlp>.

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>

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



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The Microvolt

The Official Publication of the Utah Amateur Radio Club, Salt Lake City, Utah
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January Meeting: What Should Be in Your Toolbox?

Want to build kits, build electronic projects from scratch, and/or repair your own gear? One of the reasons hams have been so successful in providing communications in many emergencies is their ability to improvise and to keep their own radios running.

The first step is to build up your tool kit. What's the minimum set of items you should have? How can you tailor your kit to the kinds of work you want to do? How should you expand it if you have some extra funds? These are among the topics to be discussed at the coming UARC meeting, Thursday evening, January 11.

Two of our board members will be collaborating on the presentation: Clint Turner, KA7OEI; and Chuck Johnson, WA7JOS. Both have long experience in homebrew and home repair of ham gear and other electronic products. They can tell us about the basics everyone should have and some labor-saving devices that many of us may not have realized existed.

The meeting will take place at 7:30 P.M. on Thursday, January 11, in room 2050 (the "Robison" classroom) of the Warnock Engineering Building on the University of Utah campus.

The front elevators in the Warnock Building have the second floor locked out in the evening. There are two possible solutions for the handicapped. The first is to get into the elevator and then send an able-bodied person up the stairs to the second floor to call the elevator. The second method is to find your way to the elevator in the southwest corner of the building (the same elevator we have been using during fall semester) and use it to access the second floor.

UARC meetings are held on the second Thursday of each month at 7:30 P.M., in the Warnock Engineering Building on the University of Utah campus. The meetings during the University's spring semester of 2017 will be in room 2050 on the second floor.

See the [map](#) for information on finding the building. The room number varies depending on availability.

Of course, the meeting will include the "standard" meeting features:

- Availability of ARRL books from Brett or John, the "book ladies"
- An opportunity to join UARC or renew your membership
- An opportunity to join ARRL or renew your membership
- The chance to meet face-to-face the people you talk to on the air
- The "Meeting after the meeting": A chance to enjoy pizza or other gastronomic delights with other hams. It happens at Litza's Pizza, 716 E. 400 South.

- The “Meeting *before* the meeting”: A similar get-together for those who can leave work early enough to get there by 5:15 P.M. It is held at “The Village Inn,” 910 E. 400 South in Salt Lake City.

Latest News

Our Cover

Our cover this month features Bob Carter, WR7Q, giving the program at our December meeting on “Learning the code for those past puberty.” Bob’s message was that anyone can learn the International Morse Code if they really want to. It will take some work and some consistency, but it can be done. He also offered his help to anyone who is having trouble. Bob, himself, learned the code just a few years ago and has been using it very successfully in his DX exploits.

VHF Society Swap Meet Coming

The annual business meeting and swap-meet for the Utah VHF Society has been announced for Saturday, February 24, 2018. This is typically the largest swap-meet in Utah each year. It will start at 9 A.M. Those that need to set up display tables may come as early as 8 A.M. Location is the Legacy Event Center in the Davis County Fairgrounds, 151 S 1100 West, Farmington.

The VHF Society is a state-wide organizations that provides Utah frequency coordination, supports many repeaters across the state, and maintains the Intermountain Intertie. For prices, maps, and more information, see <http://www.utahvhfs.org/>.

Election Results

Annual elections were held at the December UARC meeting. Most of the officers remained in their 2017 positions, but there were a few changes.

Morris Farmer, AD7SR, who has served as one of our Program Chairpersons for several years, becomes the new club President, replacing Clint Turner, KA7OEI, who is grateful to have a vacation

after having served in the position for five years in a row, possibly the longest term ever for a UARC President. Clint now assumes the Board position of Immediate Past President.

Our new Program Chair Persons are Robert Jelf, KG7OHV; and Laird Severinsen, WB7TGP. For more information about Laird see our “Member of the Month” article on page 8. Robert was featured in our April, 2016 issue. (It can be found on line at <http://www.utaharc.org/Microvolt>.)

License Classes in Salt Lake Valley

Bill Rouleau, AE7UI, and I will be teaching a Technician and a General license course. Ron Speirs and I will be teaching an Extra license course. The Technician and General license courses will last approximately nine weeks and the Extra Course will last about 16 weeks. The Technician course will be held on Mondays, the General course on Tuesdays, and the Extra course will be held on Wednesdays. All courses are taught in my “Shack” where Ham and test equipment is readily available for demonstrations. Classes are free of charge except for the manual (about \$33 which goes to UARC). They start at 7 P.M. and run until 9 P.M. If you have mobility problems, my home is fully handicapped accessible.

If you or someone you know is interested, please contact me by email at ad7sr@arrl.net . I need a count by January 9th so I can have the books available at the first class.

— Morris Farmer AD7SR

License Classes in Orem

Noji Ratzlaff, KN0JI, reports the following upcoming courses sponsored by the City of Orem:

All courses are held on Tuesdays at the Orem Public Safety Traffic Training Room, 95 E Center St. Sign up at <http://psclass.orem.org/> for \$10 per person per course. Instructor is Noji Ratzlaff, KNØJI. Students must bring a smart phone or laptop to each class. Nothing else is needed at class time, but your brain would be helpful. There are no pre-requisites for any of the courses. Previously licensed hams are welcome to sign up for a fun refresher, but they have to pay, just like everybody else.

Technician: Four Tuesdays, 6:30 to 8:30 pm (Jan 23, 30, Feb 6, 13)

Extra: Five Tuesdays, 6:30 to 9:30 pm (Mar 13, 20, 27, Apr 3, 10)

Technician: Four Tuesdays, 6:30 to 8:30 pm (May 22, 29, Jun 5, 12)

General: Four Tuesdays, 6:30 to 8:30 pm (Jul 31, Aug 7, 14, 21)

Technician: Four Tuesdays, 6:30 to 8:30 pm (Sep 18, 25, Oct 2, 9)

Questions? Call or text 801-368-1865 or email <mailto:kn0ji@arrl.net>.

The Electronic *Microvolt*

Last month we revisited an old plan allowing members the possibility of getting this publication electronically instead of on paper via postal mail. A few members have now signed up for that option. We are happy to set it up for any others who would prefer it. The advantages are that you will get to see

each issue sooner, not have to worry about storing or disposing of old paper issues, see more color, and be able to follow links with a mouse click.

We want to emphasize that signing up for the electronic version is entirely optional. We know that some (your editor included) prefer the paper medium and we don't intend to stop publishing in that format any time soon. But some may prefer the electronic format for its speed of delivery and the ability to read it on a variety of devices.

Here's how it would work: As soon as each month's edition is ready, an email will be sent out to all members who have signed up. This email will contain a link to the on-line edition. This link would not be available to the general public. The link would go out at about the same time that the paper edition was being printed and mailed, so the electronic subscribers would be the first to have access to it.

If you would like to take the electronic option just get in touch with our club Secretary by phone (see inside front cover), e-mail (<mailto:wa7zrg@yahoo.com>), or in person at a meeting. Give him the email address at which you would like to receive your notifications, and that's all there is to it.

For those who would prefer to keep receiving the printed edition, you need take no action. Utah Section Manager Mel Parkes, NM7P, tells us that we are the only club left in Utah to publish such a thing. We intend to continue as long as there is interest.

Getting On 630 Meters

By Clint Turner, KA7OEI

While in the works for years, it wasn't until mid-October, 2017, that U.S. amateurs were first permitted on the 630- and 2200-meter amateur bands, their way having been paved by previous "Part 5" (experimental licenses) and the unlicensed "LowFers" for decades

before, plus other amateurs elsewhere in the world that have had these bands available to them for years.

Unusually, operating on this band requires prior notification — and approval — by the UTC (Utilities

Technology Council) to determine if such operation, *from a specific location*, has the potential of causing interference to “Power Line Carrier” equipment used by some utilities. What this means is that for every location from which one wishes to operate, a separate notification is required. The online form for the UTC is easily found with a web search. If, after submitting, one does *not* get a notification within 30 days that one *can't* operate, you are good to go — but it would be a good idea to take a screen-shot of the form and save it before you submit it! Recently, the UTC has been sending emails to applicants stating whether or not they are “good to go” and if you are in the latter category, it would be a good idea to print and save it! I would suggest that *if you have any possible, future plans of transmitting on either of these bands, you should go ahead and register.* If you have several possible locations (house, cabin, etc.) then register *each* of them.

The rules on these amateur bands are a bit different from others: No antennas higher than 60 meters (about 197 feet) with restrictions on ERP (Effective Radiated Power) as well as transmitter output power. On 630 meters (472-479 kHz) U.S. amateurs are limited to a maximum of 5 watts ERP and 500 watts transmitter power. On 2200 meters (135.7-137.8 kHz) the limit is 1 watt ERP and 1500 watts of transmitter power. In a typical suburban “back yard” installation, it is quite reasonable to be able to use an existing HF antenna, albeit used in a “different” manner (to be discussed in the next installment) and achieve respectable results on 630 meters. Perhaps counterintuitively, operating at 137 kHz, despite it being only about 1/3rd the frequency, literally requires ten times the effort to produce a comparable signal, so we'll deal mainly with 630 meters.

On these bands most modes permitted on the HF bands are also allowed — but, due to their small size and limits on radiated power, the emphasis is on narrowband modes such as CW, QRSS, WSPR and JT-9 to name a few: Voice is permitted on each band, but generally discouraged and typical band conditions and other practicalities would usually limit this to local operation, anyway.

Reception:

Many of us who operate HF have, included in our arsenal, a humble wire antenna such as a dipole and that is the first one we should use, being preferred over an HF gain antenna such as a Yagi which may have too little wire in the air and/or some sort of balun/transformer that

quashes low frequencies. Many HF transceivers claim to be capable of reception below 500 kHz — and many do, but not many do so really well as this coverage is somewhat of an afterthought by the manufacturer. But, you might as well try.

If you are using an outboard antenna tuner and/or balun/unun, *bypass it completely* — that is, disconnect the cable in and out of it and use a barrel connector to remove it entirely from the circuit, keeping it from blocking these frequencies: The tuner *inside* your radio will automatically be switched out at these frequencies. Now, tune below the AM broadcast band: If you hear some carriers, carefully zero-beat them and listen to see if these are really two or more AM broadcast stations on frequencies being generated spuriously inside your radio as evidenced by multiple voices/music sources being heard simultaneously. If you do hear these, try turning the preamplifier and attenuator on and off and find the combination that best reduces these spurious signals. If you don't hear anything untoward, disconnect and reconnect the antenna connection: You should hear more noise (*but hopefully not too much!*) with the antenna connected. If you hear no difference check to see if your attenuator is on: Hopefully you hear *something*. Only *after* you have successfully heard signals should you re-insert your tuner/balun to determine if they do, in fact, block signals at these frequencies when in or out of “bypass” mode.

If you are listening during hours of darkness, switch to USB mode and tune between 200 and 400 kHz. In this range you should hear some carriers — and if you listen carefully, slow, 2- to 3-letter Morse identifications from aeronautical beacons (NDBs) while in the area of 280-330 kHz you should be able to hear some data signals — 100- or 200-baud FSK that provide differential GPS corrections to users. If, while listening at night, you do not hear any of these types of signals, try a different antenna arrangement — including disconnecting *only* the shield of your coaxial cable to your antenna and leaving only the center pin connected.

If you hear some signals, try decoding!

If you hear some of the NDB and/or data signals at night — when propagation is best — you may be in luck. Many hams have “sound card” interfaces for their radios — that is, a box that will take the receive audio from the radio and feed it into a computer, either via the sound card or another box — typically used for working digital modes like PSK31, JT-65, FT-8. If you don't have one of

these you can run a cable between your headphone/speaker output and a “line input” of your sound card. Download and install the “WSJT-X” program (*Google it!*), tune your receiver to 474.2 kHz and select *UPPER* sideband. Configure the WSJT-X program to get audio from your receiver, for WSPR mode and *also select “630m” as the band (very important!)*. Make sure that your computer clock is set accurately *to within a second* and then let it “listen” for a while. If you are listening during the hours of darkness – and your receiver is actually picking up signals — you should start to see “decodes” from the two-minute WSPR transmissions from other stations on the band.

If you hear too many signals:

If, when you tune below the AM broadcast band (e.g. lower than 530 kHz) you hear signals with overlapping audio indicative of receiver overload you may need to use a low-pass filter that is designed to remove signals above 500 kHz. Such filters are easy and inexpensive to construct, which is a good thing as there aren't many such commercially-available (pre-made) filters. If you have a different receiver that can work at 630 meters, try it, instead.

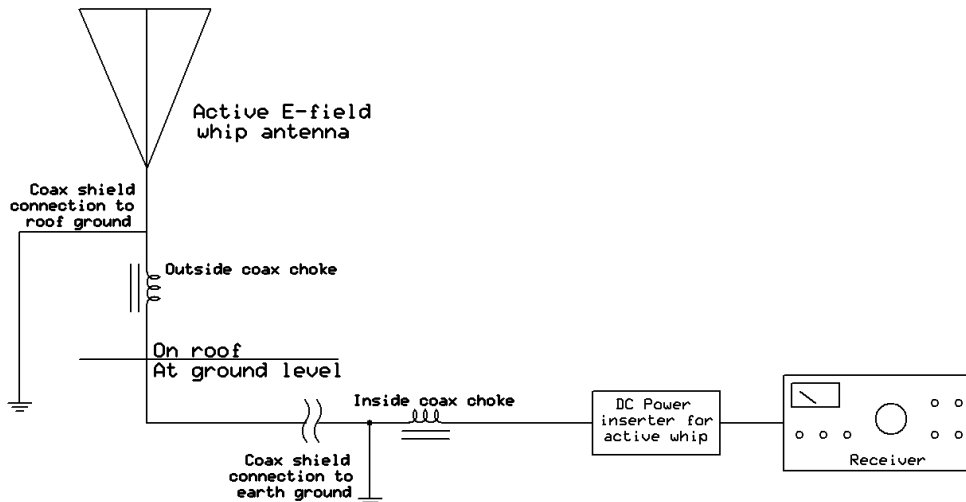
If you don't hear signals:

If you weren't able to hear any NDBs or data carriers at night, either because you are getting no signals at all — or you are getting several S-units of noise — you'll need to do a bit of troubleshooting. If, when you switch to AM mode, all you hear is powerline buzz, you may need to find the offending device — be it a dimmer on a lamp somewhere or under-counter lighting, a “wall wart” located on your shack or somewhere else in the house or

some sort of battery charger somewhere. In some cases using a noise blanker can help reduce impulse-type noise, but DSP noise reduction *should never be used on a digital signal* as it can corrupt it. If you have more than one antenna, you should try them all in various combinations — with and without the coaxial shield connected. If you hear nothing at all, re-check to make sure that you remembered to remove any balun or tuner from the signal path as they can remove signals at these frequencies. Also, check the radio's manual, just in case it says something about reception at and below the AM broadcast band that may be relevant.

It is often the case that even a good HF wire antenna simply does not make a good antenna for reception on 630 meters because it is simply too small to work effectively at this frequency and/or it picks up too much noise. If this is true for you, you may need to use a separate receive antenna, and the most commonly-used and effective is the active whip antenna, such as the “Mini-Whip antenna” that is readily available from Ebay sellers. This antenna is small — only a foot or two long — and is typically placed on the roof, away from interference sources. Power is fed to it via the connecting coaxial cable. A typical installation is depicted in the diagram below. It shows some recommended chokes used to prevent mains-related noise from being conducted from the shack, typically wound with as many turns of RG-58 or RG-174 as will fit on a rather large toroid such as an FT240-77 (available from kf7p.com and other places).

Next time: What it takes to transmit on 630 meters.



Block diagram of Active E-field Whip receiving system

Member of the Month Laird Severinsen, WB7TGP

By Linda Reeder, N7HVF

This month we are featuring Laird D. Severinsen, WB7TGP. Laird has been in amateur radio for 40 years. It was his dad who got him interested in the hobby. Laird's dad really wanted to get into it but he just couldn't pass the Morse Code test. Laird decided to get his license so he could help his dad along, but his dad never did manage to get into the hobby.

Laird received his Novice license in 1967 when he was a sophomore at Skyline High School. His call sign was WN7HIJ. In 1977 Laird upgraded to a Technician license. Laird's ham radio activity was interrupted by education, working, and raising a family. Laird let his license lapse and, ultimately, had to start all over again. In 1997 Laird received his Technician-plus license. Back then a tech-plus license required an individual to pass the Technician written exam and copy Morse Code at five words per minute. In the year 2000 Laird got his General license and in 2003, his Extra Class license. His call sign now is WB7TGP.

Laird is very active in amateur radio. He is a member of UARC, Utah VHF Society, Utah DX Association, and the ARRL. He is interested in HF and digital modes and is very active in DXing. Laird enjoys Field Day and attending hamfests. Other hobbies Laird enjoys are Wednesday night hikes with Gordon and the group, traveling, riding trains, theater, and learning new things.

Laird and his wife, Julie, have two children: one boy and one girl. Both children are married now. Laird said his daughter was interested in amateur radio when she was 13 but never went through with it.

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Laird worked for the telephone company for 43 years. Yes.. Laird worked for *all* of them: Mountain Bell, U S West, Qwest, and Centurylink, where he was office manager. He was in charge of their radio sites and power plants throughout the state of Utah.

What does Laird like best about amateur radio? He likes the challenge of variables and meeting new people. Laird has now been elected as one of the chair persons for UARC in 2018.

Congratulation, Laird! I know you will do a great job.



Laird Severinsen, WB7TGP