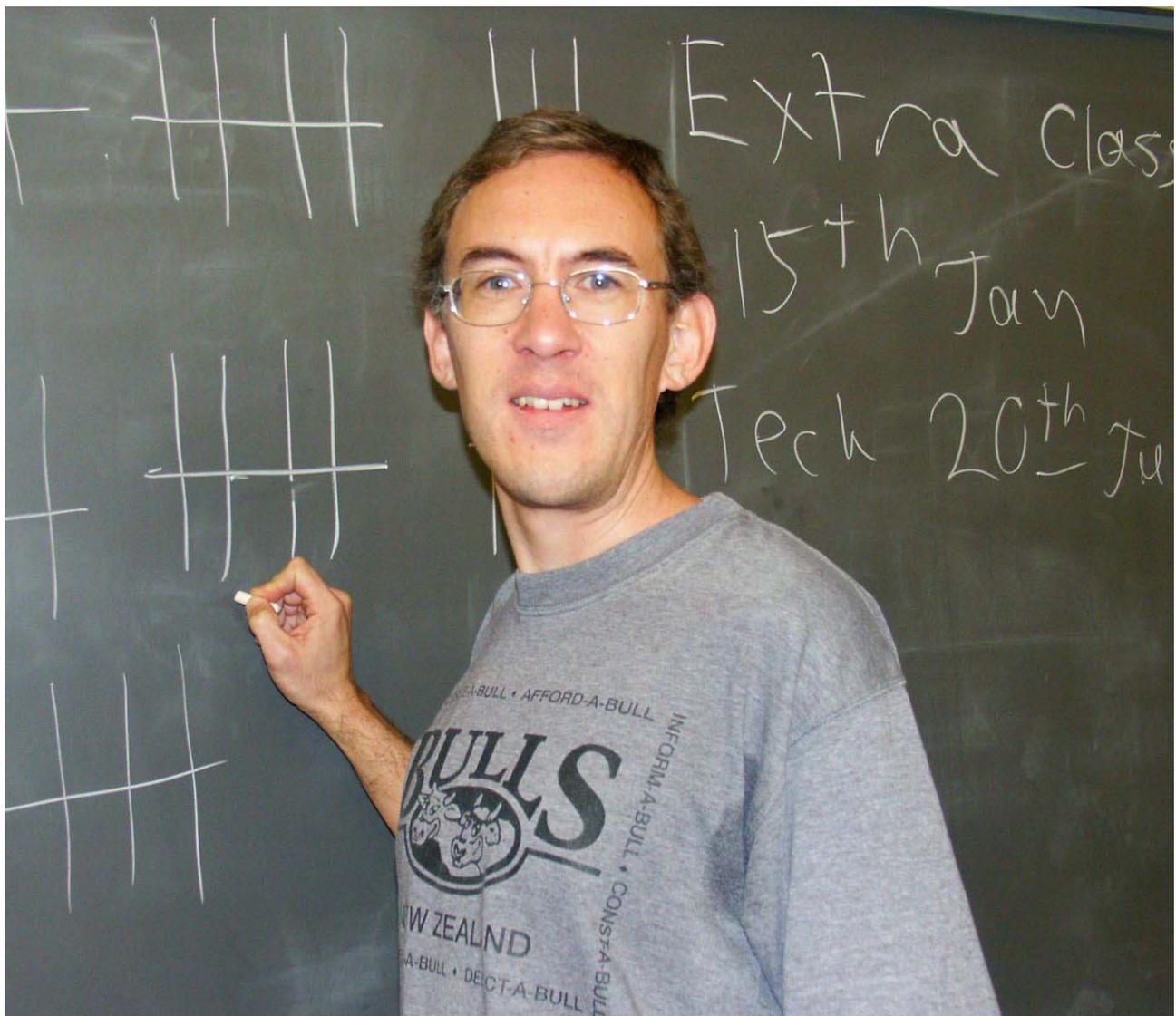


The *Microvolt*

January, 2014



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 \$17 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 Dick Keddington, 5474 Hews Place, Taylorsville, UT, 84129-1416.

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: Dick Keddington, 5474 Hews Place, Taylorsville, UT, 84129-1416.

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 \$17 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 \$17 may obtain a membership without a *Microvolt* subscription for \$9. Send dues to the Club Secretary: Dick Keddington, KD7TDZ, 5474 Hews Place, Taylorsville, UT 84129-1416.

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 2014 Board

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Historian: Ron Speirs, K7RLS	801 904-3587
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License Trustee: Brett Sutherland, N7KG	801 298-5399
Repeater Engineer: Randy Finch, K7SL	801 556-7565
ATV Engineer: Clint Turner, KA7OEI	801 566-4497
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IRLP Information

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

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The Microvolt

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January Meeting: Interference Sources

Have you been bothered by strange hisses, squeals, or growls while tuning your favorite ham band? Are you unable to hear anything on certain bands because there's a continuous 10 dB over S-9 noise level 24 hours a day? Our January meeting, to be held Thursday, January 9, may give you some clues about what's going on. John Lloyd, K7JL, will be telling us about the sources of radio frequency interference (RFI), and how to identify and cure them.

John has many decades of experience both in amateur and commercial two-way radio, and has experienced many kinds of interference and devised ways to eliminate or mitigate them. He serves as frequency coordinator for the state of Utah.

The meeting will be on Thursday, January 9, at 7:30 P.M. in room 2230 (the "Clark" classroom) of the Warnock Engineering Building.

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 to the second floor to call the elevator. The second is to find your way to the elevator in the southwest corner of the building 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 winter and spring, 2014, meetings are scheduled in room 2230 or 2250. 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, the "book lady"
- 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. The January get-together will be at "The Sizzler," 371 E. 400 South, in Salt Lake City.

Latest News

Our Cover

Our cover this month shows Program Chairperson Gary Wong, AB1IP, at the December meeting tallying up scores of the “Alpha team” and the “November Team” in the annual “Ham Quiz.”

Questions ranged from “What radio pioneer declared radio waves of no practical use?” to “What does handling instruction ‘HXC’ mean?”

License Classes

Morris Farmer, AD7SR, tells us there will be amateur license classes during January for those interested in getting a first license and those upgrading to the highest level.

Extra Class: Starting Wednesday, January 15th, Ron Speirs, K7RLS, and Morris Farmer, AD7SR, will begin an Extra Class upgrade course. The course will run each Wednesday starting at 7:00 PM at Morris' home and will continue for approximately 16 weeks. There is no charge for the course other than the text. The text will be the ARRL Extra class manual which will be available at the class for \$25.00 which goes directly to UARC. If you are interested in taking the course please let Morris know at <mailto:ad7sr@comcast.net>, or Ron at <mailto:k7rls@comcast.net>, so they can send more details to you.

Technician Class: Starting Monday, January 20th, Morris Farmer, AD7SR, and Bill Rouleau, AE7UI, will begin a Technician course. The class will run each Monday starting at 7:00 PM at Morris' home. The course will run for approximately six weeks. There is no charge for the course other than the textbook. The text will be the ARRL Technician class manual which will be available at the class for \$25.00 which goes directly to UARC. If you are interested, or know someone who is interested in taking the course, please let Morris know at

<mailto:ad7sr@comcast.net>, or Bill at <mailto:wrouleau@comcast.net>, so they can send more details to you.

General Class: Ron Speirs, K7RLS, is tentatively planning to give a class for those wanting to take the General Class test. The class would start on Tuesday, January 14. If you are interested, contact Ron at <mailto:k7rls@comcast.net>.

VHF Society Swap-Meet Feb 22

The annual swap meet and business meeting of the Utah VHF Society will be held this year on Saturday, February 22, 2014, at 9 A.M. This is typically the largest swap-meet in the state each year.

The location is the Events Center in the Davis County Fair Park, in Farmington, the same site as in 2013. The address is 151 S. 1100 West in Farmington. The strategy to get there from the south is basically as follows:

1. Take the Farmington exit from I-15. This should put you on 200 West.
2. Turn left on State Street. Follow State Street over the freeways and through some turns until it becomes 100 North.
3. Turn left on 1100 West. The Fair Park will appear soon on your left.

Note the time: 9 A.M. This is an hour later than almost all previous runs of this event. The folks that have to drive up from the southern part of the state requested the change at last year's swap meet and those present voted in favor of it.

Admission is free for VHF Society members. Fees for non-member admission and for display space have yet to be announced.

The Utah VHF Society helps support VHF and UHF repeaters throughout the state. This particularly helps small communities whose repeaters are used by those passing through from throughout the state.

For more information see the Society's web site at <http://www.utahvhfs.org/>.

License Examination Schedule

Opportunities to test for new or upgraded amateur licenses

Date	Day	City	Contact Person	Phone
01/15/14	(Wed.)	St. George ²	Gary O. Zabriskie, N7ARE	(435) 674-2678
01/15/14	(Wed.)	Provo	Steve Whitehead, NV7V	(801) 465-3983
01/18/14	(Sat.)	Farmington	Gary L. Davis, KE7MQF	(801) 298-3127
01/28/14	(Tue.)	Salt Lake City ³	Eugene McWherter, N7OVT	(801) 541-1871
02/01/14	(Sat.)	Salt Lake City ^{1,4}	Gordon Smith, K7HFV	(801) 582-2438
02/05/13	(Sat.)	Ogden	Rick Morrison, W7RIK	(801) 791-9364
02/19/14	(Wed.)	Provo	Steve Whitehead, NV7V	(801) 465-3983
02/19/14	(Wed.)	St. George ²	Gary O. Zabriskie, N7ARE	(435) 674-2678
02/22/14	(Sat.)	Hurricane ²	Gary O. Zabriskie, N7ARE	(435) 674-2678
02/25/14	(Tue.)	Salt Lake City ³	Eugene McWherter, N7OVT	(801) 541-1871
03/05/14	(Wed.)	Clearfield	Mike Youngs, KK7VZ	(801) 573-3922

¹Preregistration required. Check with the contact person before the test session.

²More information at <http://www.dixieham.org/meetings.html>

³New location: Senior Center at the Columbus Center, 2530 S. 500 East

⁴More information at <http://www.utaharc.org/Exams/>

Check <http://user.xmission.com/~uarc/testinfo.html> for further exam information.

From the Clipboard of the Editor

The Crossband Repeat Issue

I was on the mailing list recently for a story from our Utah Frequency Coordinator, John Lloyd, K7JL. It seems that a lady called John to report interference to a Draper 70-cm repeater. The interference seemed to be a net happening in a completely different part of the spectrum — the 147.34 repeater. John was able to deduce that someone close to Draper was using one of the dual-band mobile rigs to take the 147.34 net and retransmit it on the Draper repeater's output frequency.

Fortunately, the situation was resolved quickly. John, still on the phone with the lady, suggested that she get on 147.34 and describe her problem. She did so and the cross-band operator identified himself, apologized, and shut down cross-band station. John, however, goes on to say that this is not an isolated instance, but rather an example of a growing problem. He says,

“This is what happens when hams set up crossband repeaters and they don't check out the frequencies thoroughly.”

There are some potential problems involved in the casual use of transceivers as cross-band repeaters, some legal and some practical. Let's look at the typical use of these radios and what can go wrong.

Let's say that Thurman has a great two-meter antenna whose feedline comes into his home station set up behind the water heater in the basement. However, he wants to operate from a more convenient part of the house and he has a rig with cross-band repeat capability that seems to be the perfect solution. He sets up the rig behind the water heater to repeat between the two-meter repeater of interest and a randomly chosen 70-cm frequency. Now he can just take his 70-cm H-T on its lowest power setting, wander about the house as he pleases, and be heard on the two-meter repeater as if he were directly using the full-power rig on the good antenna. This is perfect! The flexibility of the H-T combined with the good quality of a fixed station.

Here's how it works. When Thurman talks on his H-T, he is repeated on the two-meter input to the repeater of his choice. When the repeater is actuated by someone else, the cross-bander operates in the other direction. The two-meter signal is retransmitted on Thurman's 70-cm frequency and heard on his 70-cm H-T.

But all is not rosy. First there is a legal problem. Most cross-band capable radios do not have any provision for automatic identification. Thurman's transmissions on 70-cm from the crossband rig do not contain his call and are therefore illegal unidentified transmissions.

I've heard some folks argue that these transmissions contain the repeater's ID and that's all that's necessary, but that's not the case. Thurman is the station licensee of his 70-cm transmissions from the cross-band rig and they must contain *his* call. If these transmissions cause interference, someone hearing them has no way to know who is responsible for the station. If this person looks up the two-meter repeater's call and

calls the trustee, the trustee will have no idea why the audio from his repeater is being heard on 70 cm, where the 70-cm transmitter is, or who to contact to resolve the problem. This was exactly the problem in the case John described.

One solution to this problem is to realize that it is probably not necessary for the cross-band rig to repeat in both directions. Thurman's H-T is probably at least a dual-band model rather than 70 cm only. It is likely that he can hear the distant two-meter repeater directly on the H-T. The problem is just getting into it with a good signal. So why not set up the cross-band rig to repeat only from 70-cm to two meters and not vice-versa? That takes care of the ID problem. Presumably Thurman identifies as he always would when transmitting on the H-T, and that ID is heard on both the 70-cm frequency and on the two-meter repeater input frequency. The cross-band transceiver is no longer transmitting on 70 cm. So anyone who hears Thurman's transmissions on either frequency will know whose they are.

Suppose the cross-bander doesn't have the option of repeating in only one direction? This can be solved by a little creative programming. Let's suppose the distant repeater that Thurman wants to access is the 146.94 which requires a PL tone of 88.5 Hz. He can set the two-meter side of the cross-band rig to transmit on the input, 146.34, but listen on some other frequency than the repeater output, say, the 146.54 simplex frequency. To do that he can set the offset (on that memory channel only) to 400 KHz instead of the usual 600. Then he can enable PL decode as well as encode. He sets the two-meter receive frequency to 146.54. This along with the 400 Hz offset will cause the two-meter transmissions to be on the desired 146.34. Now the rig will only transmit on 70 cm if it hears someone with an 88.5 PL on 146.54 — something that is quite unlikely to happen.

It may seem a little odd to be using the 146.94 repeater without ever programming "146.94," but the system works. Thurman is now legal and less

likely to cause interference. His H-T transmissions on 70 cm with H-T power levels and a “rubber duck” antenna are not likely to be heard at any great distance from his home.

If your cross-bander has two antenna ports, there is another way to achieve the effect of one-way repeating. Simply connect the two-meter port to an antenna and the 70-cm port to a dummy load. You will be able to hear the 70-cm signal, but virtually no one else will.

Probably 90 percent or more of the uses for cross-band repeating involve an H-T a short distance from from the cross-bander. The one-way-only repeat scheme will almost always be adequate in these situations. Depending on the H-T, it may require an extra button-push to switch bands when

going between transmit and receive. That’s a small price for being legal and avoiding unidentified interference.

A practical problem with the whole cross-band scheme is that it is very difficult to find, in the FM part of the band, a 70-cm frequency that is not already in use somewhere. The 70-cm band contains many control links and repeater-to-repeater links whose frequencies are, as a matter of policy, not published. If your cross-band needs really require repeating in both directions, you probably need to have a chat with the frequency coordinator. You will likely also have to buy or build an ID generator and figure out how to interface it to your rig that has the cross-band repeat feature.

Member of the Month

Tanner Maxwell, KF7MGT

By Linda Reeder, N7HVF

This month we are featuring Tanner Maxwell, KF7MGT. Tanner is 16 years old and is a junior in high school. Tanner has been in amateur radio for three years. Tanner obtained his Technician license in October, 2010, and in November of 2012, he received his General license.

It was Tanner's dad, Jon, KC7GGR, who got him interested in amateur radio. One day Tanner heard his dad making a radio contact and started asking him all kinds of questions. His dad let him talk third-party to Richard Heward, K7KGG. Tanner enjoyed it so much that he said “This is for me.” He took the Technician class at BYU in 2010. Now Tanner has his General license. Richard Heward, K7KGG, introduced Tanner to Nate, KF7KGN, who is also a youth and a junior in high school. Tanner says Nate has been a great help to him in this hobby.

Tanner is a very active 76er. When he first got his license the 76ers group hadn't started yet. In fact, Tanner is the one who asked Richard about starting a group. Tanner is the Youth Coordinator. He is net control every four months on the Thursday night net at 7 P.M.. They have a youth net at 7 P.M. on the 146.76 repeater. Tanner and Nate are working hard getting the youth interested in amateur radio.

Tanner loves the camaraderie and friendship of the 76ers. They are so willing to help each other. One day Tanner was talking to Nate, KF7KGN, on the 146.76 repeater. Tanner was telling Nate that he would like to get a ussmcka-bar fighting knife. Doug Maurer, WE7BBQ, broke in and told Tanner that if he would join UARC, Doug would get that knife for him. So that is how Tanner came to join UARC. Tanner would like to thank the UARC members who are responsible for keeping

the '76 repeater on the air. Doug also helped Tanner get a power supply.

Another thing that Tanner enjoys about amateur radio is the challenge of making contacts on low power. Tanner also enjoys special event stations.

Other hobbies Tanner enjoys include fishing, target shooting, ATV riding, and car shows. Tanner's older brother, Gabe, is teaching Tanner how to fix up old cars. It is a tradition in their family to fix up old cars and enter them in car shows.

Tanner and his dad are the only ham radio operators in the family. Tanner hasn't been able to get his older brother or his mother interested in the hobby.

Tanner is a junior at Orem High. His favorite subjects are history and radio broadcasting. Orem High School has a licensed broadcast station. The call sign is KOHS. It is a 1700-watt station.

Tanner has a program on that station once a week.

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The station has an alternative format.

When Tanner obtained his General Class license he got a job as a janitor at a junior high school so that he could earn some money to buy a low-band rig. Tanner now has a Yaesu FT-757. Tanner's big project right now is to get an HF antenna up so he can get on the air.

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



Tanner, KF7MGT, away (we assume) from his hamshack