The *Microvolt*

February, 2010

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Prologue

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 in room 1230.

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, 1933 Woodside Drive, Holladay, UT 84124-1632.

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.

Publication: *The Microvolt* is the official publication of the club. Deadline for submissions to *The Microvolt* is the 24th of each month prior to publication. Submissions by email are preferred (uarc@xmission.com), but other means including diskettes and typewritten submissions can be mailed directly to: Gordon Smith, 632 University St., Salt Lake City, UT 84102-3213. All submissions are welcome but what is printed and how it is edited are the responsibility of the Editor and the UARC board. 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, 1933 Woodside Drive, Holladay, UT, 84124-1632.

UARC 2009 Board

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Historian: Ron Speirs, K7RLS	801 968-4614
Field Day Chair:	
Club Trustee: Brett Sutherland, N7KG	801 298-5399
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:
www.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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http://www.xmission.com/
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The Microvolt

The Official Publication of the Utah Amateur Radio Club, Salt Lake City, Utah

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February Meeting: Software for Circuit Design

When you set out on a new homebrew project, are you letting your computer do as much of the work as possible? There are computer programs to assist with every stage of electronic circuit design, from the very earliest conceptual steps right until assembly and testing is complete. In the next meeting (on Thursday, February 11th), we will be discussing electronic design automation software, and the gEDA suite in particular.

The meeting's topics will include tools for schematic capture, circuit simulation, and PCB layout. We'll go over how to obtain and use the software, some examples of how to design a circuit which will do what you want it to, how to test the way it should behave, and how to send off a layout to a board manufacturer. We'll even mention some tricks on how to avoid, or at least survive, the fact that Murphy's Law dictates that your circuit (which behaved perfectly under simulation) must immediately fail once it's actually built.

Again, meetings are now on the *second* Thursday of each month, so the coming meeting will be Thursday, February 11, at 7:30 P.M. Our meetings during the spring semester are being held in room 2230 of the Warnock Engineering Building on the University of Utah campus. Room 2230 is in the same position as 1230 where we have been meeting, but one floor up. Our traditional parking on the east side of the building is limited due to construction, so another recommended parking area is near the southeast corner of the Merrill Engineering Building lot. Go south along the east side of Merrill, then go in the north door of Warnock. See the map for information on finding the building. For a map and directions for finding the building, check the club web site at http://www.xmission.com/~uarc/ab1ip_meetmap.html

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

- Availability of ARRL books from Fred, 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 February get-together will be at "Su Casa," 516 E. 300 South in Salt Lake City.

Latest News

Our Cover

Our cover this month features a few scenes from the January "Review Your Equipment" meeting as captured by club historian, Ron Speirs, K7RLS.

Clockwise from top left are Jed Petrovich, AD7KG, showing his K-3; Gene Deal, KF7BSF, with his ICV-85; Dick Leining, W7DML showing slides of the E-Z Kw antenna tuner; and Gary Wong, AB1IP, and his THF-6A.

Help Needed

Brett Sutherland, N7KG, has agreed to be our temporary "Book Lady," but he is very anxious to find an assistant. If you would like to help out and learn the business, contact Brett or any of the other officers (see the inside front cover).

Another position for which we need a volunteer is Field Day Chairman. Field Day is the annual nationwide contest to test portable operating skills and is held on the fourth full weekend in June. UARC has traditionally entered from a site near Payson Lakes running at least two stations. The Chairman needs to coordinate activities and make sure all the required jobs get done. We will certainly need many kinds of help but we need one person to bring it all together.

2009 UARC Income and Expenses

INCOME	
ARRL Dues	$693.00
Book Sales	4779.40
Donation	182.00
Dues	3628.00
Future Dues	311.00
Interest Income	218.78
Steak-Fry	658.00
Total	**$10,470.18**
EXPENSES	
ARRL Memberships	$628.00
Books	2965.85
Capital Equipment	141.38
Field Day	911.16
Ham Hotline	60.00
Liability Insurance	249.00
Meeting Expense	497.20
Postage	400.00
Printing	1909.06
PayPal Fees	44.93
Repeater	1727.23
Sales Tax	304.31
Steak-Fry	687.00
Total	**$10,525.12**

Income – Expenses	**-54.94**

VHF Society Swap Meet

The Utah VHF Society has announced that its annual membership meeting and swap meet will take place Saturday, February 27, starting at 8:00 A.M. The location is the Zion Building in the Utah State Fairpark, the same place as in recent years. This event is generally the largest swap meet for amateur radio gear in Utah. It is also the occasion for election of VHF Society officers and handling of any other necessary business.

UARC Information Net

Every Sunday Evening

9:00 P.M. Mountain Time

146.62 MHz

The Utah VHF Society is a statewide organization devoted to support of VHF and UHF repeaters throughout the state. Because its membership is geographically scattered, UVHFS keeps in-person meetings to a minimum. Dues help keep repeaters on the air throughout Utah.

The fee schedule for the 2010 event is as follows:

Entrance fee for UVHFS members:	Free
Entrance fee for non-member adults:	$5.00
Entrance fee for non-members 12 and under:	2.00
An 8-foot display table:	5.00
Space for a user-provided table:	3.00

Membership in the Utah VHF Society is $12.00 per year and runs for the calendar year. Members planning to attend the swap-meet are encouraged to join or renew in advance. (You will get to start looking through the goodies much faster.) Dues should be sent to:

Utah VHF Society
P. O. Box 482
Bountiful, UT 94011-0482

For more details including directions for finding the site, see www.utahvhfs.org/fairpark_2010.html.

The ARISS Antenna Project

Part 1

By June Anne Olsen

Author's Note: In the January, 2010, issue of *The Microvolt*, you may read the official article on this event, entitled "Midvalley's Space Station QSO." This is more of the same story, but from a different perspective.

December 2, 2009, not long after nine in the morning, the call went out:

"November Alpha 1 Sierra Sierra, this is Whiskey 7 Sierra Papa."

We were being very formal.

And again: "November Alpha 1 Sierra Sierra, this is Whiskey 7 Sierra Papa."

We were all gathered at Midvalley Elementary School, in Midvale, Utah. Still no reply.

Randy Kohlwey, WI7P, put out the call again. And again. And again.

Silence. More silence. And then….

But before we go any further with the story, it is time to go back in time, back to a dream. The dream was that of Carla W. Burningham, KC7HON, principal of Midvalley Elementary. She had dreamed of contacting the International Space Station for years, and finally got all the paperwork together, only to have her first request turned down. NASA felt that her proposed electronics support would have been incapable of handling the call. To quote from the article in last month's issue, "Transmitter power on two meters needed to be between 80 and 170 Watts. Antennas had to be circularly polarized and rotatable in both azimuth and elevation. There had to be a complete backup station capable of operating without commercial power."

Carla is not a woman to give up, and she soon called on Randy Kohlwey for help. Since Randy specializes in things like moon-bounces, it was felt that he would certainly have the experience necessary to build an antenna that would meet with NASA's approval, and so it did.

That's when Randy roped in Steve Olsen, AE7AC. Not only is Steve a fine engineer, but he and I have, arguably, the best ham shack around for working on a job like this. Our "ham shack" is an old AT&T Longlines station, down near Oak City. Leamington Station is only a couple of hours out of town, but

not only is the radio "noise" much lower there, but the ceilings are fourteen feet high. The racks that originally held all kinds of old microwave equipment upright now hold little but lights, but they came in very handy for such things as hanging long Yagis at eye level while the crew worked on them.
The problem with contacting the International Space Station (ISS) is that it is moving through space very quickly. It crosses from horizon to horizon in nine and a half minutes. This requires the use of an antenna that can track a moving target. As stated in last month's issue, it had to be circularly polarized and rotatable in both azimuth and elevation. The building of this antenna began with the acquisition of a couple of eleven foot long eight-element Yagis. These were being offered for sale by John Wilson, K0IP, a member of the Pocatello Amateur Radio Club. The two Yagis were listed as being for sale on the club web page. He sold them to us for one of two prices: $150 if we could get them to work, and $0 if we couldn't. They didn't work for him, but Steve and Randy had hopes. I am happy to report that after removing a year's worth of corrosion and having most of the cabling replaced, those two Yagis worked out just fine.

The rest of the primary antenna consisted of the top section of a Rohn 25-G tower, or 9 ½ feet of tower, topped with a Yaesu azimuth/elevation rotor. This was attached to the middle of a length of aluminum pipe. The ends of this pipe were fastened at right angles to the centers of the Yagis. In order to induce the desired circular polarization, the Yagis were tipped so that they would be at a 90-degree angle to one another, and a quarter wave delay was put into one of them. To keep the Rohn tower section stable, long scraps of Unistrut were bolted onto the bottom crosswise. These long lengths of Unistrut were then weighted down with five-gallon containers filled with water.

Since NASA requires the presence of two completely independent antenna systems, Randy brought along a standard "egg beater" style antenna, to be used in case the primary antenna system failed. It took at least five weekends at Leamington Station to get all the parts assembled and working.

This is the earliest log entry from Leamington Station relating to the ARISS project, made by Steve.

"10/29/2009 Friday: Steve Olsen and Randy Kohlwey arrived to set up the radio system for the Midvalley Elementary ARISS project.

"Saturday: David Bettinson, a teacher at Midvalley, Brent Olsen, Steve, and Randy joined forces. We put the two-axis rotor on [the] portable tower. We also mounted the antennas. Randy stayed until three and the others left at four. I stayed and made more cables. The preliminary test was disappointing. VSWR was good but the contact via the intertie with June in SLC was not as good as the OMNI on the tower. Much more work to do."

We could have had a rubber stamp made up with that last phrase on it, and stamped it on every page.

I came down with Steve the next weekend — Friday, November 6th, through Sunday, November the 8th — and discovered that the ARISS project was well on its way towards taking over the whole station. We have a couple of eight-foot long work tables down there, and these were covered with various bits of wire and miscellaneous tools, as was Steve's desk and the counters over by the Faraday cage. Pieces of Unistrut were lying here and there around the place, and long lengths of thin aluminum tubing wound up out in the old generator room. (I taped these to the top of the truck to get them down to Leamington Station. Steve brought them along in case the Yagi antennas could not be made to work. If that had happened, Steve and Randy had planned to build some other kind of antenna, using the ten-foot lengths of thin aluminum tubing.) Long lengths of cable were lying here and there along the floor. Little bits of wire, cut from cables and from Heaven knew what else, were everywhere.

Randy came in on Saturday morning, and stayed until long after dark. It was, as I noted in the log book "as nice a day as you could want for this time of year." Just as well. By this time, they had hauled large pieces of the antenna up onto the roof. The roof at Leamington Station is nice and flat, thankfully, but the only way up onto it is by use of a metal ladder on the outside of the building. All the pieces were taken up by rope, often in a bucket. I may not know much about assembling antennas, but my belaying skills are just fine, so I was often the one on the ground tying things on, or unclipping them from the carabiner at the end of the rope, and then making sure that they didn't knock into the side of the building on the way up.

Putting the parts together was just the first part. (Well, the second part, if you count cleaning all the corrosion off the Yagis, and replacing all the cables.) The newly assembled antenna received two kinds of testing. That first weekend that it was all assembled, we listened to satellite signals. Later on, receiving was tested using the beacon at Glen Worthington's cabin.

To test transmission, Steve put together a Remote Signal Strength Meter. This contains an Analog Devices broadband RF log amplifier, which allowed the guys to digitize information which was then telemetered via ISM Band radios at each end. The whole thing was then displayed on the computers. The Signal Strength Meter was mounted on a length of unistrut along with Dave Bettinson's Arrow portable Yagi antenna. It was then lugged a ways up the hill, and was fastened onto one of the trees. A range fire swept through the Canyon Mountains back in 1996, and our station is surrounded by dead trees. We call it our "ghost forest." These trees have weathered to gray. The first time Steve went up to retrieve the

meter, the only way he could find it was to follow his own earlier footsteps in the snow. We put a bunch of reflective tape on it after that. The receiving antenna was oriented vertically and then horizontally for the testing.
The performance of the new antenna was compared to a quarter-wave vertical antenna Randy brought with him to the station.

The next Saturday, the 14th of November, Dave Bettinson arrived at the Station by 9:00. He left by 3:00, and passed Randy as Randy was driving up. Randy stayed over until Sunday. I noted in the log that it was cold with some snow.

The next-to-last major push was the weekend of Friday the 20th through Sunday the 22nd of November. I wasn't able to make it for that one, but Dave, Randy, and Steve were all there. Time was getting short.

Friday, November 27th was the day after Thanksgiving. Steve and I set out from Salt Lake City early, and got down to Leamington Station by 10:00AM. Dave was already there at the gate, although he told us that he'd only been there for six or seven minutes.

By this time, we'd set up the long gray folding table and it, too, was covered with bits of wire and miscellaneous tools. Steve's brother, Brent Olsen, got in just after noon. John Stodt, who'd been working on this project with the rest of them from time to time, also arrived on Saturday. Steve and I had ordered some ACX1516 connectors from Digi-Key. FedEx delivered the order after we'd gone down to Leamington, so Randy picked them up and brought them down with him. He arrived about 8:30 that evening.

Friday the 27th it was "all hands on deck." I got to make my first cable. Since every horizontal space in the Station was already covered and cluttered with the other parts of the project, I did the cable at my drafting table. I put it flat first. (One good way to make sure nobody takes over a drafting table is to leave it set at so great an angle that anything placed on it will roll right off.)

Brent went out to his truck about 9:30 to go to sleep. Randy was going to sleep in his truck, too, but I went to bed after midnight and the four of them — Randy, Dave, John and Steve — were still at it, fiddling and testing, and filling the air with weird radio sounds.

(To be continued)

Member of the Month

Gene Deal, KF7BSF

By Linda Reeder, N7HVF

Note: For Gene's photo see the front cover. He is the person in the upper right.

This month we are featuring Gene Deal, KF7BSF. Gene is new to the hobby. He received his General license in April 2009. Gene was interested in electronics starting when he was a small child. When he was ten years old, Gene had a favorite cousin, Michael, who was really active in amateur radio. Gene would visit Michael and watch him making contacts. Michael would give him *QST* magazines. Gene learned a great deal from these magazines. He even built his first shortwave radio in 1977.

For some unknown reason Gene's dad did not like Michael. Gene said he couldn't figure out whether it was Michael or amateur radio that his father was so against. Gene's dad didn't want Gene to have anything to do with it.

For the next several years Gene busied himself with his studies in automotive electronics, raising a family, and his 20-year career in the automotive and motorcycle industries. He last worked for BMW motorcycles as a service manager. Gene has two grown children, a boy and a girl.

In 2003 Gene went back to college to study linguistics. Clipped speech dialect has always fascinated Gene. Gene says every facet of life has its own clipped speech; school, the work place, church and even amateur radio. An amateur radio example is the word "destinated." This word is

not found in the American English dictionary. Other words one might hear are 73 and break. Gene hopes to do a presentation on words used in amateur radio for one of the UARC programs this year. Gene has been elected as one of the program chairpersons for UARC for the year 2010.

Gene said for his 50th birthday he received his Bachelor of Arts degree in linguistics. He is currently working on getting his Master of Arts degree in linguistics. Now, Gene is also working for a computer company called Intensity Corporation.

It was linguistics that led Gene to amateur radio. When Gene discovered that Morse code had clipped speech, he immediately went out and bought an HF rig. He saw an ad on Craig's List for a Kenwood FT-430ness. A gentleman who lived close to the University of Utah had this rig boxed up in storage for many years. Gene paid 450 dollars for the transceiver, a speaker, mike and power supply. Gene had an indoor antenna which was all he needed because, not yet being licensed, he could not transmit. He would listen to 80 and 40 meters and would keep a log of the contacts he heard. He did this for a whole year before he got his license. At the computer company where Gene now works there is a co-worker who has his ham license. His name is Barrie Campell, AD7PE. Barrie kept asking Gene when he was going to get his license. He even gave Gene study materials. Gene would take the test on line to see how he was doing. He scored well on the Technician test but fell short on the General and that was the one he wanted. After all, he needed the General to operate the radio he had. Finally in April in 2009 he passed the General test. Gene was at Gordon's K7HFV test session. After Gene passed the General they asked him if he would like to try the Extra. So, Gene tried the Extra and missed by four questions. Well, Gene said he will try again later..

The thing that attracted Gene to UARC was Fred DeSmet, KI7KM., the “book lady.” Gene was having a hard time finding books on amateur radio and Fred the book lady had everything Gene could ever want.

Gene also has an Icom IC-V85 2-meter handheld radio and uses it for his base station.

Gene, congratulations on your new office as program chairperson and we wish you the best in all your endeavors.

Examination Schedule

2/17/10	(Wed.)	Provo	Steve Whitehead, NV7V	(801) 465-3983
2/23/10	(Tue.)	Salt Lake City	Eugene McWherter, N7OVT	(801) 541-1871[1]
3/03/10	(Wed.)	Clearfield	Mike Youngs, KK7VZ	(801) 573-3922
3/06/10	(Sat.)	Salt Lake City	Gordon Smith, K7HFV	(801) 582-2438[1]
3/17/09	(Wed.)	Provo	Steve Whitehead, NV7V	(801) 465-3983
3/30/10	(Tue.)	Salt Lake City	Eugene McWherter, N7OVT	(801) 541-1871[1]

[1] Preregistration required. Contact the indicated person.