Dixie Amateur Radio Club

April 2010 Volume 34, Issue 4

A new Super Antenna?

A must-read letter from Joe Speroni, AH0A/7J1AAA of the Tokyo International Amateur Radio Club

Dear Fellow Amateurs:

Greetings from Tokyo and all the members of TIARA (Tokyo International Amateur Radio Association). I know I promised you a series of articles on Japanese amateur radio, but there is something so exciting I just have to take a break and tell you about it.

It all started with the work that Ed Coan (AH7L/7J1AAE) did on antenna pattern plotting using his personal computer and the A-to-D converter in his FT-1000. The circular, and even backward antenna patterns of some of our local TIARA club members brought home the point that what a good station needs is a good antenna. Ed's antenna looks great and the results verify it. He works regular schedules into Colorado and Maine, just like sunspots don't mean anything. My mini-beam just could not compare.

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April 17, 2010

Licensing Class Scheduled!

Do you know someone who would like to become an amateur radio operator? Your Club can help!

We have scheduled a Technician License Class to be held starting Saturday, April 17th. Learning about amateur radio couldn't be easier. This class will be held every Saturday for 3 weeks and culminate in an exam session to get the participants licensed as Technician Class Amateurs. All ages are welcome and encouraged.

And later in the year, the Club's Training Committee is scheduled to present a General Class Upgrade class. The General Class license opens up many new avenues of enjoyment for any amateur radio operator.

Keep your browser glued to our website for more information about these exciting opportunities.

Who Are We?

The Dixie Amateur Radio Club, Inc. is a non-profit IRS 501(c)(3) association of federally licensed Amateur Radio operators (also known as "ham radio" operators) who primarily reside in southwestern Utah, mostly in the greater St. George City metropolitan area. We also have members who live in rural areas of Washington County and in areas outside of the county. The Dixie Amateur Radio Club, Inc. is a formally "Affiliated Club" with the American Radio Relay League (ARRL) "The National Association for Amateur Radio".

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Affiliated Club

2010 Board Members

President...C. R. "Nick" Nickle W7CRN

Vice-President....Kory Talbot KE7MMH

Secretary..... Kevin Merrill KE7TLW

Treasurer.....Harold Wells KE7OZG

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Board Member..Bruce Bissell KE7LGD

Board Member....Ken Forshee KE7DZI

Past Presidents of DARC

2009.....Ken Forshee KE7DZI
2008.....Ric Wayman K7DLX
2007.....Hal Whiting KI2U
2006.....Hal Whiting KI2U
2005.....Gary Zabriskie N7ARE
2004.....Dan Farwell W8EQA
2003.....Dan Farwell W8EQA
2002.....Ron Sappington WI7Z
2001.....Travis Lofthouse KD7FRN
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Can anyone help me complete this list? Please contact Ric Wayman at k7dlxham@gmail.com

SUBMISSIONS WANTED!

Send your ideas, bios, articles, cartoons, etc. to Ric Wayman at k7dlxham@gmail.com.

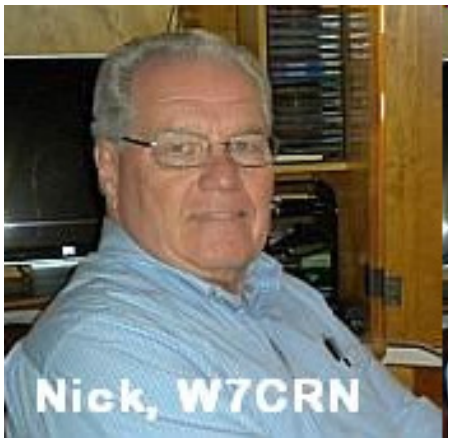
ALL HELP WILL BE APPRECIATED!

Nick Nickle, W7CRN

President's Corner

The April Board of Directors meeting will be held on Thursday, April 1st at 7:00 PM in room E of the Community Arts Building, 86 South Main Street in St George, members are welcome to attend.

At our March Club meeting our members voted to adopt the amendments to the Bylaws that: a) change term of membership to 12 consecutive months; b) make honorary members full members for all purposes of the DARC; and c) provide designation of a chairperson for committees at the discretion of the Board of Directors.



One of the primary objectives of our hobby is to make our expertise and equipment available for communications in the event of an emergency. The Amateur Radio Emergency Service (ARES) is an ARRL program specializing in emergency communications. Washington County ARES (WCARES) was organized about three years ago to better prepare the local amateur radio community to serve in the event of a disaster – unfortunately, due to some past disagreements, WCARES has been limited in their activities the past two years.

In an effort to put past disagreements behind us, we have invited WCARES to the April 21st Club meeting to share with us information about ARES and Emergency Communications. If you, like many other local amateurs, would like to do more than just chew the rag over the air, if you want to really make a difference in your community with your new skills and develop a strong camaraderie with others like yourself, then you will want to learn more about ARES.

The Technician License Class is scheduled to begin on Saturday, April 17th and continue each Saturday thru May 8th. Check our website for more details.

Thanks & 73,
Nick Nickle – W7CRN

June 26 - 27! Mark your calendars!

Field Day 2010 is only 2 months away!

Any ham licensed more than a year can probably tell you the significance of the fourth full weekend in June... It is ARRL Field Day. It is the most popular on-the-air operating event, as annually tens of thousands of amateurs participate. Some enjoy the pseudo-competition that accompanies Field Day. Others enjoy planning and setting up temporary stations. Many come to enjoy the camaraderie and food, while others come to experience and learn. But no matter what the reason -- Field Day is a unique 24 hours for amateur radio.

Since the early 1930s, amateurs across the US and Canada have tested their mettle, packed their gear and supplies, and headed out to fields and forests, mountains and deserts, parks, malls and back yards to participate in what is the most popular on-the-air operating event. Many groups begin planning next year's Field Day sitting around in the long hours of the current one. "Next year we should add a digital station." "Why don't we try getting the satellite bonus next time?" "You know, the field out on the old highway would be a perfect site for a Field Day set-up." Similar thoughts are bandied about in clubs continuously from year to year.

"I'm a Ham – My Playground Is The World!"

Since 2002, stations from across the Americas have actively participated. In 2004 logs were received from 12 DXCC entities (don't forget that the US and Canada are DXCC countries!) And as if that wasn't enough, since 2001, ARRL Field Day has been "out of this world" with contacts to the International Space Station!

Flexibility is the goal for Field Day. Dipoles and inverted Vees dotted the landscapes. Verticals were raised on temporary masts. Some clubs assembled a wide variety of beams, hoisting them up on tower sections brought in for the event. Some creative groups used their contacts to raise antennas from cranes, fire department ladder trucks or power company bucket trucks. (If you ever run into some of my friends in Bellingham, WA, ask them about the spud guns we used to fire lines into the tall trees to support antennas —Ed.) Many clubs use Field Day as a teaching day: learn how to solder, put together an antenna, lay out radials for a vertical, log, use an antenna tuner, and complete contacts. The list goes on and on as this is a perfect education venue -- share the expertise of those in your club with new or interested operators.

Anyone who has even participated or visited a Field Day operation will attest to the enthusiasm and fun that abounds at the site. As 12:00 Noon approaches on Saturday, the pace becomes a bit more frantic. Are the band pass filters hooked to the proper antennas? Why isn't the radio tuning properly? Is the generator properly grounded? Let's make one last check of the computer interface and network for logging? What do you mean your keyer's plug doesn't fit my radio's socket?

Photos by GARY ZABRISKIE

Budding amateur radio operator 11-year-old Breanna Talbot made over 80 contacts with other HAM radio stations across the country from the temporary station set up by the Dixie Amateur Radio Club for Field Day, June 23-24

It wouldn't be Field Day without Mr. Murphy throwing a small challenge at the group. But after all that is what Field Day is about. We set up stations in less than normal circumstances and situations to test our abilities -- including problem solving. Many people participate for many reasons, but all seem to have as an underlying principle testing their emergency capability. That is the Field Day cornerstone.

Field Day offers something for everyone. Those who get

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Field Day 2010 (cont.)

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their kicks out of "pounding brass" will find hundreds of like-minded operators on the air. With operating RTTY, PSK and other digital modes made so easy because of the fast interfaces through sound cards on laptop computers, more and more opportunities are emerging for people discovering those modes. Phone is by far the most popular mode, because of its ease of operation and use. SSB or FM enthusiasts will find opportunities to make QSOs

The demonstration bonus modes give lots of opportunities for people with specialized interests in the hobby to share their niche with others. Is APRS your thing? Hundreds of Class A stations put on an APRS demonstration. Satellite QSOs abounded, as did demonstrations of some of the new modes like JT44. Amateur TV is a popular Field Day demonstration. Remember a mode is not the same as a frequency band. 10 GHz may not be used normally in your area, but it is a frequency, not a mode of operation, so making CW or SSB contacts on those frequencies would not count for the bonus. And as an Emergency Preparedness exercise, demonstrating a mode's usefulness in an emergency setting is the general benchmark for its qualification for the bonus. And as the Field Day rules state:

"2. Object: To work as many stations as possible on any and all amateur bands (excluding the 60, 30, 17, and 12-meter bands) and in doing so to learn to operate in abnormal situations in less than optimal conditions. A premium is placed on developing skills to meet the challenges of emergency preparedness as well as to acquaint the general public with the capabilities of Amateur Radio."

Everyone is a winner when they participate in Field Day!

It is about demonstrating our emergency communications capabilities to city, county and state officials. Over 1000 Class A stations claimed the 100-point bonus for being visited by an official from a served agency or local government. We demonstrate what we can do to supplement their existing communications in times of need. By doing so, we meet part of the responsibility that our amateur radio licenses entail.

It is about educating the public and promoting our hobby. Each participating station has a role to play in Field Day. But the stations that set-up in public places, that make the effort to try and get new media involved, that go the extra step to get people on the air, perhaps make the greatest impact on Field Day. When the public sees what we are about -- Public Service and Emergency Communications at the forefront of Field Day -- we begin to tap a new pool of potential amateurs. Helping our hobby grow is a responsibility all of us should accept as our own.

It is about testing our readiness. All of the written plans and ideas are great -- but if they don't work, then what is their worth? Would you rather discover the coax on the emergency antenna is bad at Field Day or as you set up in the aftermath of a Category 3 hurricane? Is it better to discover the club generator won't power the command post while testing during Field Day or while plugging it in at the Red Cross shelter after a tornado knocks out power?

And along the way, another reason comes across loud and clear. It is about having FUN in our hobby. Some will find that fun in having a high claimed score (although by its nature no single entry "wins" Field Day). Some will find it in the socializing at the Saturday night dinner. Operating all night will be the impetus for fun for some while seeing a technically well prepared station on the air will do it for another. Don't forget the basis of Field Day is "FUN-damentals.

As always Field Day is the fourth full weekend in June, which in 2010 will be June 26-27. It may be April, but now is the time to start planning how you will be involved. Because, after all, YOU are the most important part of the DARC Field Day this year! Save the date!

A new Super Antenna! (cont.)

(Continued from page 1)

Well, I got to thinking about what we Tokyo apartment dwellers could do and realized that space is THE problem. How do you fit a full-sized beam on a balcony? Loading coils are the answer and the problem at the same time -- the antenna radiation resistance drops as reactance is substituted for length. High current loops develop and the power is dissipated in the antenna instead of being radiated. If only the antenna didn't dissipate the power. Hmmm....let's see, P=E2 /R; now if R were 0 then...

From my work, I have some contacts in research groups over at Tokyo University. Better yet, I knew a Japanese ham that is a graduate student there. The thought running through my head was to build a super-conducting antenna. This requires cryogenics, i.e. temperatures around minus 279 degrees Centigrade. I was able get the university folks interested in the project and we built a 10-meter dipole test silicon wafer. They put together a lot of serial coils by "re-work" on the wafer; they were able to connect them so we had a super-conducting yagi. I took my TS-930 transceiver down to the lab for the first tests, but before we could test it, actual measurements showed it was resonant on 3.126 MHz. It seems that the normal equations for inductance don't work with super-conducting materials -- you need a lot fewer turns to get the same results compared to room temperature. Many measurements and trials later, we had a ten-meter resonant wafer. This time we put a 40-element beam on each wafer and stacked 4 wafes in the same assembly. That made a 160-element array on 10-meters in less than a half-foot cube (15 cm3).

The first test didn't go too well. I connected my TS-930 to the super-conducting wafer antenna and tuned it for 10 meters. At room temperature, we couldn't hear anything. Using a heat pump, the lab technicians started lowering the antenna's temperature toward the super-conducting region. I was really impressed by how small the equipment is, and started thinking it might all fit in the shack. Just then, the TS-930 froze solid, which had a negative effect on its operating characteristics. This wouldn't be so easy after all; the coax connection would need some study!

We reworked the wafers to put inductive coupling on them, but I could find no way to efficiently couple to it from the conducting array. Fortunately the lab technicians came up with a new ceramic material that passed RF but not heat. Probably something that Kyocera invented just for this use. I sent the TS-930 to the ham shop in Akihabara and asked them to touch it up for me. My friend Suzuki-San, JH1WWC (store manager at the ham shop), asked exactly how the paint had been peeled off around the coax connector -- lightning maybe? No, I assured him -- just low temperature exposure, without saying how low the temperatures were. The project had to stay secret and besides, Suzuki-San can repair anything!

Since it looked like it might be a while before the TS-930 would be repaired, I brought out my TS-940. I had already placed an order for a Yaesu FT-1000 anyway. After verifying that in the super-conducting range the antenna was resonant on 10-meters, we connected the TS-940. The ceramic material worked and the rig operated well as we began the cooling cycle. The band seemed dead even with the antenna at -150 degrees C. It took another 10 minutes to get to the super-conducting range -- then the TS-940 blew up. It seems our antenna had a bit more gain than the TS-940 front-end could take. Later measurements showed 500 volts coming out of the coax. A little hard to believe, but then what do I know about cryogenic LSI antenna technology? The TS-940 was also returned to Suzuki-San, but this time he frowned a bit -- the front-end board did look like it had been hit by lightning. Not to worry, Suzuki-San can repair anything!

The FT-1000 arrived just in time to be able to continue experiments. We built a QSK attenuator to protect the receiver. With the LSI wafer antenna still inside the lab, we decided to try to make a contact on 10-meters. What a shock when we got it working! The first thing we heard was a couple of W2's talking locally on 10 meters and that was with 80 dB of attenuation. We had the antenna array on a rotatable mount; I moved it about a half-degree and the W2's disappeared. What beam width! We tuned them in again, and they were just about to sign off, so we thought we would try to work them. The rig was tuned up at 50 watts on a dummy load; we switched in the wafer antenna and gave N2BA a call. The noise was unbelievable -- an ionized ray shot out from the antenna and hit the wall of the building. Before we knocked a hole in the band, we took a piece out of the lab wall! Ever wonder what an antenna pattern looks like in three dimensions? There was a oval hole in the wall of the lab -- about 1-cm high by 2-cm wide. We cut power quickly. N2BA came back on frequency a few minutes later and said he was using his back-up rig; something had taken his main rig off the air. For some reason, the station he was talking to never came back, so we decided not to transmit again until we knew for sure what was going on.

As near as we can tell, the antenna array has 620-dB gain over a dipole, but with a beamwidth of 0.75 degrees using the 60-dB points. With 50 watts output, the effective radiated power is 55 quadrillion watts at the center of the beam (5.5 with

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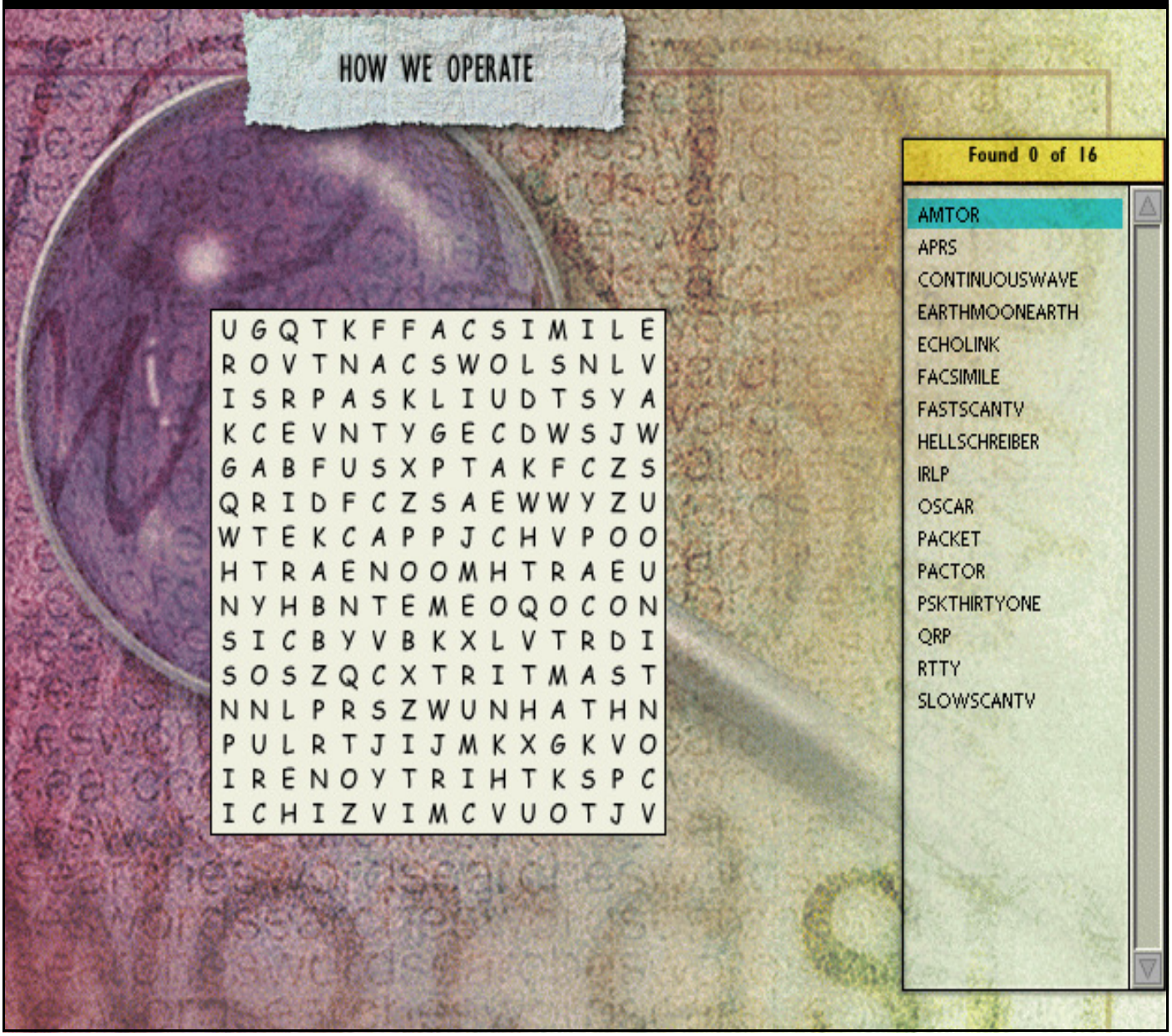
K7DLX's Word Search



A new Super Antenna! (cont.)

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13 zeroes). As soon as the University realized what we had built, the entire project was taken away from us and turned over to the Japanese Self-Defense Force. Amateur radio "tinkering" has contributed to something, but I am not exactly sure what. I haven't the slightest idea what was in those wafers or how to build another set. Do you think someone may be interested in this idea for Star Wars/SDI?? What I'd give to use a much smaller set in the next CQ World Wide Contest!

As I am writing this, I have been informed that my friend Suzuki-San can't fix everything after all. He's written off the TS-930 and TS-940, and I just found out that before the university terminated the project, they tried one more time with my FT-1000, but without the 100-dB attenuator to protect the receiver. Its front-end now matches the 940's and it looks like it will be a while before I am on the air again.

Best 73,
Joe Speroni, AH0A/7J1AAA
Ex-Technical Adviser TIARA
1 April 2007

Thanks to Joe Speroni and the Tokyo International Amateur Radio Association for reprint permission. And we hope you noted the date of the letter.

Farwell and Good

Ham Radio - Reborn

By Dan Farwell
W8EQA

In previous installations we followed Dan through his first exposure to ham radio, knocking on a neighbor's door with the help of his mother to find out what those large things were on the roof of the house, his first license and rig, and learning how to run DX like a champion. The last we heard of Dan he had discoverred girls, sold his radios to buy a car, and let his amateur radio license expire. Through the magic of the DARC time machine, let's fast forward 28 years for this month's installment.

After 28 years I was a bit rusty. I had no idea of where ham radio had been or where it was now. While I was driving in town one day I spied a tri-band beam on a tower and boldly walked up and introduced myself to the ham of the house (we hams sometimes lose all social inhibitions and do stuff like that!!)

The gentleman who answered the door was very cordial and receptive and invited me to have a look at his rig. He explained that he was going blind and having difficulty operating. As we talked I explained that I had been an operator once upon a time and now REALLY wanted to get started again by catching up on the Morse code and going at least for my general class license.

Dan W8EQA:
"Within six months I had my extra class ticket and I vowed to NEVER let that license expire again!"

He suggested that the best way to get back into the code was to get some kind of a receiver. I pled monetary ignorance and explained that this was still a pipe dream and no ham radio fund existed at home. He looked at me and said, "Follow me".

We made our way out to his workshop / garage / ancient ham radio repository. He pushed some pieces around the bench top and finally uncovered a huge dust covered receiver. It was a WWII unit that had been rack mounted and had no outer cabinet. There was a very neat little mouse nest situated among the tubes. I wiped away the dirt "Hammarlund Super Pro" A *Hammarlund* receiver? I knew that name but of course this was way before my time.

"Take it, let me know if it works or not, I may have a tube or two for it." I didn't ask twice, I hardly noticed that it weighed nearly 80 pounds.

I got it all cleaned and turned it on to warm up. (He had said that was a good idea as it hadn't been turned on for a while.) I hooked up a piece of zip cord to the antenna connector, plugged in an old pair of headphones and the old receiver sprang to life!

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Days of bliss ensued as I recalibrated my mind to where the cw bands were and rediscovered the W1AW code practice sessions. I started thinking hard about the theory…now where can I get a current license manual? Of course, the library!

I consumed every book on ham radio the library had to offer in a week or so. Then I finally sent away for a brand new license manual just to make sure the question pool would be accurate.

And so Ham Radio was reborn in me after lying dormant for 28 years. There was no turning back. I was thoroughly motivated to have my own station again one day soon!

Within six months I had my extra class ticket and I vowed to NEVER let that license expire again!

Dan Farwell, W8EQA, is a past president of the DARC, and an honorary life member. His contributions to the club are numerous. He lives in St. George with his wife Melody, W7RRR (see page 8 for Melody's bio), and when not working for the Wal-Mart Distribution Center can be found on the HF bands running the rare DX stations. This is part of a series Dan has written about his life as a ham operator and knowledge he has gained through the years he would like to share.

Melody Farwell. W7RRR

Farwell and Better!

Hi, my name is Melody Farwell. I was born 1960 in the entertainment capital of the world: Las Vegas, Nevada. Though I arrived at Nellis Air Force Base, I did not live the enchanted life of an Air Force Brat, and simply grew up traveling between Nevada and Arizona. Then, in the fantastic year of 1988, I moved to St. George, and in the ultra-fantastic year of 1991, I married my best friend, and unbeknownst to me, ham radio Elmer extraordinare, Dan Farwell, W8EQA. My life quickly turned into DXCC chases, Field Day events, etc. I knew I had to get in on this fun.

We traveled all the way to Kanab, Utah, to take my first ham test. I seem to remember that St. George had a license testing event only every quarter year or so. I passed the General and was issued the KC7SIB call. After working hard to break DX pile-ups, Dan suggested I apply for a vanity call sign that would pierce the pile-ups much easier. He also suggested I study for the Extra Class license which offers a wider band width to search for those elusive countries DXers like to collect QSL cards from. By this time, our own Dixie Amateur Radio Club conducted monthly license testing events, and this particular test was conducted at the Dixie College radio station studio. I did not do so well on the Morse code section, but at 13 words per minute, I had what I needed to eventually earn the Extra license and quickly applied for the vanity call of W7RRR.

I enjoy the radio Field Days most of all: getting to know everyone better, BBQ, understanding that all around the country thousands of other radio enthusiasts are awake and pouncing or working pile-ups. One of the memorable field day events was at the Hurricane Mesa Test Site last year. Jack Reed (WA7LNW) hosted the event, and Dan and Bob Peterson (W7UT) helped work the pile-ups. It was a real honor to work with operators of massive radio knowledge and we landed top five position in the 3A UT class.

My first long distance (DX) contact was with a missionary in Cameroon, Africa. The second contact was equally exciting at the time, but now we laugh and giggle about it: the special event station at then-President Clinton's inauguration.

Lots of fun equipment to choose from in our shack: Let's start with the Yaesu FT2800 for our Sunday evening DARC check-in and scanning the bands. The daily Beehive check-in utilizes a TenTec Orion with the Tucker Tuner (and Kenwood Amp if necessary). This and a little more from our 45' tower sporting a beautiful Yagi array and inverted "V" wire antenna.

Looking into the future, I see us working DX on a warm sunny beach of the US Virgin Islands (hint hint, Dan???). 73!