Dixie Amateur Radio Club

May 2010 Volume 34, Issue 5

Breaking News

Hal Whiting, KI2U, takes helm of county ARES

At the April club meeting, it was announced that Tom Oliphant, KC1EMS, has stepped down as Washington County ARES coordinator. He will be succeeded by Hal Whiting, KI2U. The appointment is immediate.

Whiting inherits a well structured, active group. “It was quite the surprise to me”, said Whiting at the April meeting. “The responsibility is great, but I’m ready. We’ll get ARES organized again. Count on it.”

Hal Whiting, KI2U

The Amateur Radio Emergency Service consists of licensed amateurs who have voluntarily registered their qualifications and equipment for communications duty in the public service when disaster strikes.

Every licensed amateur, regardless of membership in ARRL or any other local or national organization, is eligible to apply for membership in ARES. Training may be required or desired to participate fully in ARES. Please inquire with KI2U for specific informaton. Because ARES is an Amateur Radio service, only licensed radio amateurs are eligible for membership. The possession of emergency-powered equipment is desirable, but is not a requirement for membership.

Oliphant has been ARES coordinator in Washington County since 2002. He is resigning to spend more time with his family. The Dixie Amateur Radio Club offers a sincere thank you to Tom for his work in the past and wishes for all the best in the future.

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

Board Member.....Scott Taylor KE7YIQ

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 May Board of Directors meeting will be held on Thursday, May 6th 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 May Club meeting on Wednesday, May 19th Ric Wayman will provide us with a presentation on PSK31 operation.

On Saturday, May 22nd we will have a Dutch Oven Dinner and Hamfest in Rockville, Utah, from 2 PM to 7 PM. All Hams, family members and friends are invited to attend. The dutch oven dinner will be chicken and potatoes with salad, cobbler and ice cream and homemade root beer. The price is $12 for adults and $6 for children under 12 years. Activities will include a tailgate swap meet, fox hunt, antenna construction – 2 meter tape measure beam and 2 meter slim jim antenna (about $15 each for materials). Family fun things include a treasure hunt for the kids, horseshoes, river fun, ride the zip line and swing on the whirly gig. If you are interested in attending this event, please RSVP or contact Harold KE7OZG at 628-3119. If you want to build an antenna please so indicate when you RSVP. Dinner tickets must be purchased in advance at our May 19th club meeting or by contacting Harold. Volunteers are needed to help with: radio talk-in; welcome and parking; food preparation; swap meet; fox hunt; antenna construction; kid's activities; publicity and maybe more. Contact Nick at w7crn@crnick.com or Harold KE7OZG at haroldewells@hotmail.com. Or see the club website. 73 until next month! *Nick*

ARES EC Hal Whiting, KI2U

ARES Overview

by Hal Whiting, KI2U

Washington County ARES Emergency Coordinator.

"The Amateur Radio Emergency Service® (ARES) consists of licensed amateurs who have voluntarily registered their qualifications and equipment for communications duty in the public service when disaster strikes."- ARRL Website.

The changes in the Washington County ARES group leadership occurred over the past couple of weeks and my appointment as the Emergency Coordinator (EC) was not confirmed until Wednesday morning in an email from the Utah Section Manager. So my knowledge of it was not much ahead of the rest of the club. I would like to thank Thom Oliphant, KC1EMS for the leadership and support he extended to the Washington County ARES.

During the past three years ARES has been directly involved with the following activities: Meet with Dixie Regional Medical Center (DRMC) emergency planning staff and develop MOU. Assign two operators to be liaisons with DRMC for communications emergencies. Participation in Intermountain Health Care emergency exercise Teaching Technician Class course to DRMC personnel. Teaching General Class course to DRMC personnel. Teaching General Class course to public (held at Dixie Ambulance Station). Coordination with Southwest Utah Public Health (SWUPHS) to set up EOC. Erection of antennas on roof of SWUPHS building. Participation in SWUPHS "Operation Sphere" exercise. Participation in the SWUPHS flu shoot-out. Attendance at Local Emergency Planning Committee meeting. Attendance at Utah ARES conferences in Salt Lake City. Radio commu-

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Ladder Line to Eternity...or...

SWR Meters Make You Stupid!

A multi-part tutorial by
Eric P. Nichols (KL7AJ)

It may have already occurred to you that it might be desirable to locate your amateur radio antenna at some distance from your transmitter and/or receiver. In fact, unless you intend to operate your station from the top of a tree or a tower, it is very likely that you will be employing some form of transmission line. The purpose of a transmission line is to convey radio frequency energy from a radio set to an antenna, or vice versa, in as painless a fashion as possible. You can think of a transmission line as an extension cord for R.F. In fact, for the lower regions of the radio frequency spectrum, actual extension cord can serve reasonably well, for reasonable distances.

Like so many other facets of Amateur Radio, the transmission line seems to have taken on a life of its own, accumulating a vast, sticky, woolly hairball of misinformation along the way. This is all so unnecessary. A transmission line is a means to an end, never an end in itself. And don't let anyone tell you otherwise.

A Bit of History In the early years of radio, there wasn't much of a line of demarcation between a transmission line and an antenna. In fact, let's look at a very typical amateur radio antenna of days past. It consisted of an array of parallel wires, or "flat-top" arranged much like a clothes line, and a SINGLE WIRE leading from the flat top to the transmitter. This single wire "transmission line" typically radiated as much signal as the flat-top antenna itself, which wasn't necessarily a bad thing. Anything you could hang out there in space that radiated a signal was a help. Countless hundreds of thousands of long-distance radio contacts were made with such contraptions.

If it Ain't Broke, Fix it Anyway Despite the unquestioned effectiveness of such an arrangement for much of amateur radio's history, for some mysterious reason, sometime around the end of the First War to End All Wars, it was decided that life shouldn't be so simple. This bizarre concept of "specialization" began to infiltrate life on Planet Earth. The specialization Nazis decided that an antenna should radiate and a transmission line should not. It was discovered that a single wire transmission line could be made to not radiate by placing another single wire transmission line next to it, and grounding it at the "bottom" end—the end nearest the transmitter. Add twice the copper to disable half the antenna...such a deal! Sounds like a government project, doesn't it? Well, this is one concept that, alas, couldn't be blamed on the government. It was actual radio amateurs who came up with this "idea." The end product of this was what was called the "Zepp" antenna, because it was used on Zeppelins.

Actually, we shouldn't be too harsh. The whole idea of a non-radiating transmission line was to somewhat remove one source of high voltage R.F. from the immediate vicinity of a gasbag the size of Milwaukee filled with hydrogen. For some peculiar reason, certain white-smocked hand-wringers were a bit nervous about sources of high voltage R.F. being right next to said gasbag the size of Milwaukee filled with hydrogen. Since the onboard radios at the time were spark gap transmitters, it probably wasn't too bad an idea to keep this fact under consideration, after all. We still ended up with the Hindenburg disaster, but at least it wasn't caused by the radio on board! (At least as far as we know).

After hams resumed their post-war operations, and had better things to do with their skills than preventing dirigibles from bursting into flames, they discovered that the Zepp antenna actually worked fairly well on the ground, as well. (Well, actually a few feet OFF the ground, but you see our point). Now, in order to keep the two halves of the Zepp transmission line fairly parallel, under which condition they did the least amount of radiating, the two wires were held together (or apart) with uniformly spaced insulators, giving the transmission line a somewhat ladder-like appearance. Oddly enough, it came to be called ladder line. Of course, once again, they couldn't leave well enough alone. Some genius somewhere imagined that the TOP end of the second wire of the ladder line should actually go somewhere. In the conventional Zepp configuration, it didn't. It just ended. This bothered some people. The fact that it actually worked was immaterial. Some people just hate things like lopsided antennas and the number Pi, no matter how well they work. So, once again, they decided to try to fix something that wasn't all that broken.

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SWR Meters Make You Stupid! (continued)

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After a lot of pondering about exactly WHAT the free end of the ladder line should go to, one of the aforementioned someones decided that if that went to an antenna wire as well, things might be more symmetrical. And so was born the `Double Zepp" antenna, actually two Zepp antennas fed end to end with just one transmission line. The symmetry gods were pleased. And to be honest, the antenna actually worked slightly better than the single-sided Zepp...it had a slight amount of actual gain over the original incarnation. But, perhaps more significantly, the function of the antenna and the transmission line were now two entirely separate entities. Everything was wonderful...actually, not. Our troubles had just begun.

Don't Try This at Home With a few very rare exceptions, the early impoverished radio amateur usually had little if anything that resembled actual test equipment. In fact, most of the diagnostic equipment that modern hams take for granted was not available at any price for much of amateur radio's existence. This was actually a good thing, for a few reasons: Amateur radio station performance was based strictly on...well...performance. The only indication that things were working as they should was the fact that one was making a lot of contacts. The lack of test equipment kept the end goal well in sight.

Ham radio was cheaper. Why use an expensive plate current meter when you could check your transmitter's tuning by seeing how long an R.F. arc you could draw from the final tube's plate cap to the tip of a lead pencil held in your bare hand? YES! Hams actually DID this...and most lived to tell about it. You were likely to make a useful accidental discovery from time to time. Theory is great...up to a point. It helps explain what you already discovered by accident, but it doesn't often lead to new discoveries, at least on its own. You need to get knocked on your keister a few times and singe a few eyebrows to really understand radio. (Don't tell OSHA I said this, by the way). The salient point is that having a lot of "tools" around usually gives you more information than you need to know, and unless you know how to USE that information, it can be worse than ignorance, as we shall shortly see.

Sometime between the two wars to end all wars, radio amateurs discovered that you could make a transmission line radiate almost NOTHING if you kept the currents in each leg of the ladder precisely equal in magnitude, and OUT OF PHASE. This allowed the antenna to behave more like a pure antenna, and the transmission line to behave like a pure transmission line. The original Zepp was a half-step in this direction, but the double Zepp really completed the task. Hams started worrying about transmission line current balance a lot...whether they could afford to or not. If you were really cheap and/or poor, the instrument of choice was a pair of incandescent lamps, one in each leg of the ladder line. If you were really high-falutin' you had an actual R.F. ammeter in each leg. (You can see these instruments in a lot of ancient ham station photos; they were about the size of modern watt-hour meters). If the currents were equal in each leg, it meant your antenna was doing most of the radiating, and the transmission line wasn't, which was generally a good thing. With but one small rub.

The antenna current meters, whether they were just a couple of light bulbs or high-falutin' R.F. ammeters, told you nothing about the relative phase between the two legs. However, it was generally assumed that if your double Zepp antenna was PHYSICALLY symmetrical, and your ladder line was relatively perpendicular to said double Zepp, the current phases WOULD be, indeed, equal and opposite. So, though not really scientifically rigorous, the R.F. ammeter pairs turned out to be quite useful. At the very least, tuning for MAXIMUM R.F. current always resulted in the strongest radiated signal. In the case of light bulbs, you just tuned for maximum brightness, and all was right in the world. For a while, at least.

However, hams being who they were, weren't content unless they had something new to worry about. At this point, we need to take a small departure, and introduce yet another Dead Ham, an obscure German electrical engineer by the name of Ernst Lecher. He lived at the turn of the century...the 20th century, that is. His work had already, for the most part, been learned and forgotten by much of the radio world by mid century. Alas, poor Ernst did much of his great work before anyone had a use for radio. He was well ahead of his time. Unfortunately, if you look up Ernst Lecher on the Internet, you will be inundated with all sorts of really bizarre "information" about things like psychic energy and even dowsing rods, for Pete's sake!

Let me set the record straight on behalf of poor Ernst, who is undoubtedly spinning in his grave and unable to defend himself against his brainless "disciples" and various other tin-foil-hat groupies. Ernst Lecher had ABSOLUTELY NOTHING

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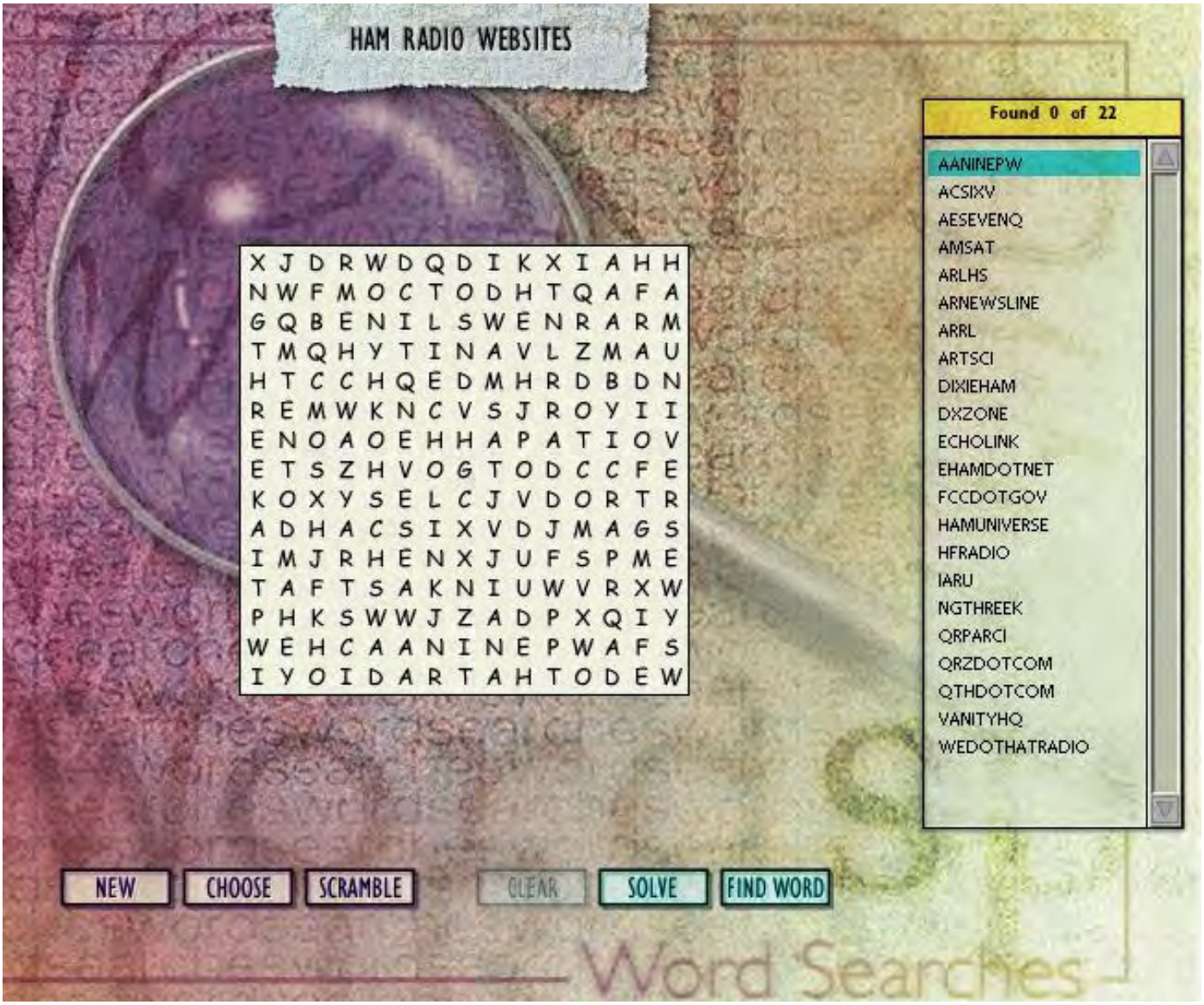
K7DLX's Word Search



ARES (cont.)

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nications training of SWUPHS staff. Construction of broadcast radio for SWUPHS use during shoot outs and disasters Operator availability information to ARRL Utah Section Emergency during fire season. Creation of a website for Washington County ARES. Coordination of emergency communications with southwest Utah counties. Coordination of emergency communications with Civil Air Patrol. Coordination and MOU between Washington County ARES and Clark County ARES. Establish frequencies and procedures manual for Washington County ARES

The meeting that I had recently with the new Washington County Emergency Services Director, Pete Kuhlmann was very positive. He sees an increased role of the ARES here in the county. This will require training, exercises and readiness. The things we discussed are both short term and long term in planning.

The population of the county is significant and as it broadens its horizon there is greater need for the communications support. It appears that the role of the amateur radio operator in a communications disaster will be a role of health and welfare traffic. We have awesome local emergency responders and they will have plenty to do. We can support their efforts by helping with health and welfare traffic.

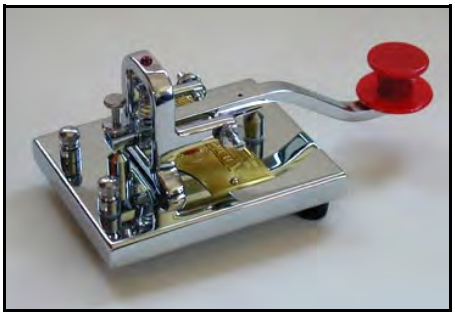
I will be updating you on the organization of ARES and our training goals in the weeks ahead. There will be a recall roster established that will provide for emergency contact and responsibilities assigned. I thank you in advance for your willingness to participate and encourage each of you to be prepared and in a state of readiness.

Farwell and Good

Know Code!

By Dan Farwell
W8EQA

Give me the old days. About 1958 will suffice nicely. Chevy made a beautiful Impala. We were standing on the doorstep of space and reaching out in awe. Elvis was the King.



I was eleven going on eighteen.

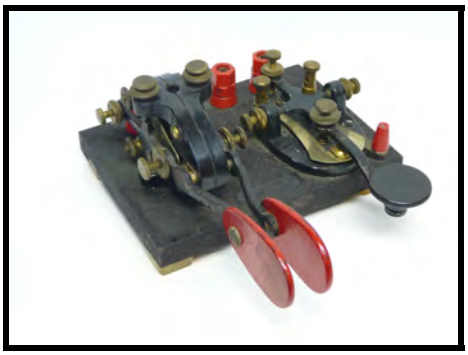
I learned the International Morse Code on a WWII Instructo-Graph. Every afternoon I couldn't wait to get home from school and put on those old headphones and play those Morse code tapes. My brain ached as I strained to keep up with the impossible 5 words per minute pace.

One day at a friend's house I sat down in front of an HRO-50 receiver. I marveled at how it seemed to spread out 40 meters as though it went on forever.

The owner watched intently as I copied the dots and dashes into an occasional word. He said, "Put down that pencil and paper son…close your eyes and try to *see* the code in your mind."

He was right it worked, slowly at first, and later whole words and thoughts came through with ease and clarity because I wasn't distracted with writing it down.

I operated through High School always preferring the code and my speed skyrocketed. Morse Code has been my buddy, my comforter-yea my salvation as an operator.



Today some 50 years later I treasure this talent. Morse Code *IS* Ham Radio to me!

It was a sad day in my life to see Morse code abandoned as a requirement for any amateur license! We've become a people who would rather have a freedom *from* the code rather than embrace and treasure that legacy for the operators who will follow. We fail to comprehend where we've come from and have lost our direction as to where we must go.

Morse Code was our Ham Radio Heritage. It has been who we were and why we became a force to be reckoned with but now to most hams it is a distant memory.

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, 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.

Field Day 2010

A Letter from Dan Henderson ARRL Field Day Manager

Dear Field Day Participant:

The Amateur Service has as one of its Part 97.1 purposes "the continuation and extension of the amateur's unique ability to enhance international goodwill." We are more than casual observers or bystanders on this global stage – we are participants in that magical playground. And I am proud to say:

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

At times, the focus of the Amateur Radio community is rightfully on how we can work with our towns and communities by providing Public Service and Emergency Communications. However, deep down anyone who has picked up a microphone, tapped out a callsign on a brass key, or descrambled a digital Baudot or PSK-31, understands there is fun here. That fun knows no borders.

The thrill of the chase of adding new states, countries or grid squares to our WAS / DXCC / VUCC totals underscores that when we play "radio" (as some friends of mine used to say) we are there in large part to enjoy our hobby.

That is just one of the messages we find in ARRL Field Day. Each year tens of thousands ofparticipants bring an element of fun with them as they combine the public service aspects of the Amateur Service with the experimental nature our hobby. As they build relationships with served agencies and local officials at Field Day sites across the US and Canada – and beyond – they learn new skills as they make or renew friendships both on and off the air.

As you prepare for what many consider the best "total Amateur Radio" experience of the year, keep in mind the old adage – "All work and no play makes Jack a dull boy." Let your "inner child" out as you embrace ARRL Field Day 2010. Do something new this year… Build a different antenna… Try one of the newer digital modes… Operate on a band that you rarely utilize… Serve as a GOTA coach for your club… Show some neighbors what this "radio" thing is all about… Organize a Scout or Youth Group visit to your club's set-up… The borders of your mind only limit the list. But then again – is there a limit?

After all – OUR Playground Is The World! See you on the air June 26th and 27th. 73!

Dan Henderson, N1ND
ARRL Field Day Manager
fdinfo@arrl.org

The Dixie Amateur Radio Club will be holding our annual Field Day at Highland Park in Washington City June 26 and 27th. Operation will commence at 12:00 noon Saturday, and continue until 12:00 noon Sunday. But your help is needed before and after the event as well. Set up, tear down, cooking, support teams, all are important to a successful Field Day. Please set some time aside this year to help your Club. Contact any of the officers for a list of what needs to be done - and what operator shifts need to be filled, as well. Come out and make the world your playground! See you in June!

SWR Meters Make You Stupid! (continued)

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to do with metaphysics, dowsing rods, psychic energy, or any other kind of New Age wacko pseudo-science. He was a REAL scientist, a REAL engineer, and achieved REAL results in a REAL laboratory. I pronounce a festering POX upon all those who desecrate his name with such unmitigated balderdash and buffalo snot. Let's look, instead, at his REAL contribution to radio knowledge, the Lecher Line, (also known as the Lecher Wire).

A Lecher line is a fabulously simple and revealing instrument. It allows you to measure wavelength of a radio signal directly...the first instrument in existence to allow one to do so. It consists of nothing more than a pair of parallel wires or copper rods, a couple of wavelengths long or so, at the frequency of interest, with a yardstick or (or meter stick) placed along the line. You also have a moveable voltage detector so you can measure R.F. voltage at any location along the line. (I built a really snazzy Lecher Line for my electronics class that always generates lots of ooohs and ahhs from my rapt students). You feed a small amount of R.F. into one end of the line, which sets up *STANDING WAVES* along the line. As you slide the R.F. voltage indicator along the line, the voltage will swing between some maximum voltage and zero each half wavelength. You simply measure the distance between the zero voltage points and voila, you have precisely half a wavelength. Well, almost precisely, since there's a small delay time of a wave propagating through a Lecher Line as compared to free space...that is, the VELOCITY FACTOR through a transmission line is slightly less than that of free space. Just a couple of percent additional delay for a typical set of lines with about 3” spacing between rods. (You can also measure the distance between MAXIMUM voltage points, but these are much less defined, whereas a ZERO or NULL is extremely sharp).

At any rate, it's a very sensitive and accurate instrument...in fact, until the 1950s the Lecher Wire was the most accurate means of measuring UHF signals known. Frequency counters didn't exist.

The Lecher Line also serves as an extremely high Q (selective) circuit in UHF amplifiers and filters. Variations of the Lecher Line (loaded Lecher Lines) have also been used that are a bit smaller than the full sized version. Most high power FM broadcast transmitters still use some variation of the loaded Lecher Line in the plate tuning circuit.

In addition, devices such as the shorted stub tuner, nearly universal in the microwave industry, are based on the Lecher Line. In fact, as any microwave engineer can tell you, ANY impedance can be matched to ANY OTHER impedance using just two stub tuners. All because of Ernst Lecher and his fabulous trained *STANDING WAVES*.

So simple, so educational, so elegant, and so incredibly useful. And yet, sadly, one more source of posthumous Ernst angst.

For, in recent years, *STANDING WAVES* have come to be viewed as something to be avoided like the Ebola virus. This, more than any other misconception, has resulted in the single greatest source of Amateur Radio Stupidity Exchange (ARSE). For some inexplicable reason that will probably never be known, presumably sentient, rational beings become the village idiots of the Petri dish when the term *STANDING WAVE* is uttered, wringing their collective hands, palpitating in unison and hyperventilating in horror.

The fact of the matter is that about 95% of what makes radio work at all is the application of *STANDING WAVES* of some sort. Standing Waves are like water. Just because some Cro-Magnon manages to drown himself in a bathtub is no reason the rest of us need to live on a diet of dry sand. Amateur Radio NEEDS standings waves to survive!

Now, there may be a few readers who have never encountered the term standing wave ratio, or SWR. If you happen to be one of these individuals, consider yourself most blessed, indeed. You will not have to “unlearn” anything. You are a blank slate, unencumbered by countless man-centuries of accumulated collective ignorance pertinent to the subject.

Are you ready? Sorry, it’s going to have to wait for next month’s installment. Stay tuned.

Next Month: Measure, measure, measure. 11.6 million miles long.