Contesting: Amateur Radio On-the-air Competition

Photo: Ron Speirs, KC7MYS

A man (Alan Brubaker, KO7X, *Contester Extraordinarius*), his horse (actually his wife Eileen's miniature mare, Burgundy) and his antennas (top down: three element 15M monobander; three element 20 M monobander; four element 10 M monobander on a 71 foot tower).

Volume XLIII Issue 4, April 1999

The MICROVOLT

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THE MICROVOLT (USPS 075-430) is published monthly except August for $15.00 per year or $1.50 per issue by the Utah Amateur Radio Club, 632 University St. Salt Lake City, UT 84102. Periodicals Postage Paid at Salt Lake City UT. POSTMASTER: Send address change to " *The Microvolt*" 2684 Kenwood Street, Salt Lake City, UT 84106

Prologue

The Utah Amateur Radio Club was organized under it's 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 first Thursday of the month at 7:30 PM in the Doxey-Hatch Medical Building located at 1255 East 3900 South in Holladay, across the street from St. Marks Hospital.

Membership: Club membership is open to anyone interested in amateur radio; a current license is not required.. Dues are $15 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 $15 may obtain a membership without a *Microvolt* subscription for $9. Send dues to the Club Secretary: Russell Smith, KD7ZDZ, 2684 Kenwood Street, Salt Lake City, UT 84106 ARRL membership renewals should specify ARRL Club #1602.

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 following repeaters: 146.62 (-), 146.76(-), and 449.10. 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(-) has Autopatch facilities on both the Orem exchange (covering Santequin to Lehi) and the Salt lake City exchange (covering Draper to Layton). The 449.10 repeater has autopatch facilities into Salt Lake City only. Due to the volume of traffic, only mobiles should use this autopatch. Autopatch use is open to all visitors to our area and to all club members. Non members who wish to use the Autopatch are encouraged to help with the cost of maintaining the equipment by joining the club.

Ham Hot-Line: The Utah Amateur Radio Club (UARC) has a Ham Hotline, 583-3002. Information regarding Amateur Radio can be obtained, including club information, testing, meeting information, 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 10th of each month prior to publication. Submissions by email are preferred (bbergen@xmission.com), but other means including diskettes and typewritten submissions can be mailed directly to: Bruce Bergen, 3543 Fieldstone Cir., SLC, UT 84121. In order to maintain ease of conversion it is suggested that you contact Bruce at 943-1365, or via e-mail before making electronic submissions. 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.□

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□

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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 ISP, for the donation of this Web-Page service. □

For account information go to:
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The Microvolt

The Official Publcation of the Utah Amateur Radio Club, Salt lake City, Utah

Volume XLIII, Issue 4, April 1999

Photo: Steve Perry, N7SWP

QST from the Prez

I would like UARC members to be aware of the new opportunity they have in the club.

The best thing that could happen with this club is to see it's membership grow. There are plenty of licensed hams and those who are not licensed but interested in ham radio. I receive calls all the time from individuals who say they have been interested in getting licensed for a long time. I listened to ham radio operators on a police scanner for one year before I took it upon myself to get licensed.

The UARC Board has made it possible for you to bring a ham radio friend in the club and receive a free month's membership for yourself. If you bring two friends to join the club that would be two free month's.

For UARC to accomplish all the projects it wants to reach the club certainly needs new members.

We also need members who are willing to give some time. I hear people all the time complain about the club, the board, individual members of the board, the auto-patch not working, or that the board is not doing things right, and yet these same individuals still won't offer to help with the problem and undertake any of the many things which can or need to be accomplished in the club.

One thing all of us can do is some recruiting for membership in the club.

Please try and bring one or more potential new members and introduce them to the club.

Thanks to all those who do so much on behalf of UARC.

Thank you. and 73.

Gary Openshaw, KC7AWU ❑

Notice!

To make things easier for all of us please notice this Important Notice About Notices. You may have noticed the increased amount of notices for you to notice. We notice that some of our notices have been noticed. On the other hand, some of our notices have not been noticed. This is very noticeable! It is noticed that the responses to the notices have been noticeably unnoticeable. This notice is to remind you to notice the notices and respond to the Notices because we do not want the notices to go unnoticed!

-Notice Committee for Noticing Notices ❑

Photo: Larry Powell, KC7AVY

Ron can often be found at swap meets selling his portable 120 Volt systems.

Featured Member of the Month
Ron Speirs, KC7MYS

This month's featured member is Ron Speirs KC7MYS. Ron has been licensed as a Ham for four years with his technician license. He is studying and working hard to upgrade and hopes to do so in the near future. Ron was interested in amateur radio as a teenager, but didn't know anyone in the hobby. He enjoyed listening to Hams and foreign broadcasts on an old Zenith short wave radio he had as a youth. It wasn't until years later when his son Daland, KC7LNR, obtained his technician license that Ron decided he was going to get his. There was no way he was going to let his son show him up. With that as a challenge he obtained his license a couple of months later.

Ron studied at the University of Utah earning his bachelors degree in electrical engineering. He currently works for the OEC Medical Systems as an engineer with the fluoroscopic x-ray systems.

He is an active member of UARC and is serving us as the club Historian. Ron has been taking photographs for years of many of the UARC activities, so the board determined it would take advantage of Ron's skills and interests and asked him to continue doing that and expanded it a bit. Among "other duties as assigned" he now acts as a photographer for *The Microvolt*. He provides invaluable photographic skills and material for the Editor of *The Microvolt*. He has been of great assistance since taking on this job in making this column even more interesting by going on assignment to get photos of the subjects of my column. With his own home darkroom, Ron has been involved in amateur photography for 18 years.

He also faithfully performs the duties of net control once a month (Fourth Sunday) for the UARC information net.

Ron has also been involved in music throughout his life. He enjoys playing the piano and the organ and is a member of the Salt Lake Symphonic Choir which, incidently, will be giving its 50th anniversary concert on May 14th in Abravanel Hall.

In addition to their son Daland, Ron and his wife, Judy have two other children, Raja and Beringer, male and female Irish Wolfhounds.

Ron, we would like to thank you for the excellent job you do as UARC Historian and I, personally, wish you the best, especially in your pursuit of upgrading.

73 N7HVF, Linda Reeder ❑

A Blast from the Past

Salt Lake City, Feb. 12, 1931.

The regular meeting of the Utah Amateur Radio Club was held at the home of Mr. Vogeler, 1150 Princeton Ave.

The minutes of the last meeting were read and approved.

Bulletins of the A R R L were read for the benefit of the club.

Mr. Carman called for suggestions as to the most desirable plan for conducting our meetings and it seemed to the the consensus of opinion that the existing plan of assigned subjects for papers was profitable as well as satisfactory.

After reading the financial report by the secretary it was decided to retain the dues as they are, namely $1.00 per year.

Mr. DePuy passed a Universal microphone around for inspection and gave the characteristics of the instrument which is suitable for the use of amateurs.

Mr. Stearns gave complete information of the work of the Naval Reserve, its advantages and disadvantages togetherwith requirements for joining. Several were interested in the Naval work and Mr. Stearns agreed to obtain application blanks and was appointed Chairman of a Naval Reserve Committee.

Mr. Stanley completed his paper on light which called for informal discussion.

The Low Power contest was officially started at midnight of February 12th.

Mr. Yeates consented to give a talk on Television at the next meeting to be held with Ed Runsham at 3603 South State street onFebruary 26.

Initiation of candidates for membership was also announced for the next meeting.

After refreshments the meeting adjourned.

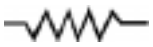
W D Green Secr-Treas.

Tigger's Corner

Last month we covered the basics of Ohm's Law and the column became too long to include any questions to quiz you. Not so this month.

First let's introduce you to some electronic symbols. We'll be using:


Battery


Resistor


Lamp

Ammeter (current)


Switch (open/off)


Switch (closed/on)

Now lets refer to Figure 1 below:

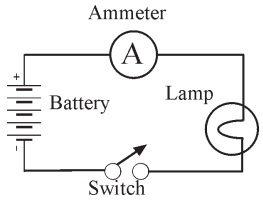


Figure 1.

Quiz - (A) Is any current flowing in the circuit shown in Figure 1?

(B) Does current flow if the switch is moved to position B? Why?

(C) If: Battery Voltage + 12 Volts;
Resistance of Lamp + 12 Ohms (Ω);
How much Current (measured on the Ammeter) is flowing in the circuit?

(D) If: Battery Voltage = Unknown;
Resistance of Lamp = 6 Ω;
Current = 3 Amps;
What is battery Voltage?

(E) If: Battery Voltage = 6 Volts;
Ammeter reads 2 Amps;
What is the Resistance of the Lamp?

Try figuring these out and check yourself using the answers and explanations found elsewhere in this issue. Now something a little harder, but practical.

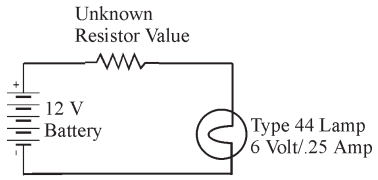


Figure 2.

Lets assume you burn out the dial lamp on your favorite 12 volt rig. It's Sunday, all the Radio Shacks are closed and in your "junk box" you just happen to have a lot of common 6 volt dial lamps and not a single 12 volt. Wouldn't it be nice to use one of these in a pinch? (Instead of guessing to what frequency you're tuning the rig. You can if you know Ohm's Law.

Notice how a resistor has been connected between the battery's 12 volts and the 6 volt lamp. We know from looking at the printing on the lamps base that it requires 6 volts ant .25 amp. All we need now is a way to "drop" 6 volts from the battery and limit the battery's current to the 1/4 amp (.250). Remembering Ohm's law in which we have the two quantities, we can solve for a third. Thus we would calculate the appropriate resistor as follows: you already know the voltage and current the lamp requires, so you begin by subtracting the lamp's voltage (6 volts) from the supply voltage (12 volts) to arrive at the voltage that you will need to "drop" or lose through the resistor (resistors aren't magic, they just convert the wasted energy through them into heat). You also know that .25 amps will have to pass through the resistor, so you would calculate:

Resistor value = voltage we need to drop in resistor/amps (current) through the resistor

or

R = V/A or 6/.25 = 24 ohms (Ω)

So you can see that by placing a 24 ohm resistor in line with this 6 volt lamp will allow you to run it from a 12 volt source.

This is enough to get you lost for now, I'll cover how to calculate the current wattage for this resistor in a later column next month when I cover series and parallel circuits.

Bye for now,

KA7TGR, John ❑

Those Mysterious Transforms – So Where's The Fun?

For Starters...

I'd like to take a follow-on look at the transform theory presented in a prior article. In using our ham radio equipment all of us have used technology and equipment that someone else designed (we may not really understand the design and that is OK). But *sometimes*, how about creating something from scratch – and learning the *root science* behind it all? In my opinion, this should dig deeper than finding a slick schematic or coming on to a computer program that somebody else invented. After all, how did that person conceive the original notion? Professionals in high-tech industries dig deep all the time because it flushes out ideas for better products (and it is fun to learn!). We amateurs also deserve some fun.

Let's Have Some Fun

OK, let's suppose I want to do a little old fashioned code work on 40 meters. There'll probably be times when a distant signal is weak – the beat frequency audio that my receiver generates from the signal is at or below the noise audio level caused by background atmospheric hiss. The signal is hard to hear. what can I do? A better antenna really is the best answer, but maybe I can't go that route. The power (and probably the tendency to cover up the desired signal) from the atmospheric hiss is proportional to the audio bandwidth. Can I lower the audio bandwidth, shrink the hiss, and not hurt the code signal? I probably can, but only if I'm careful not to shrink the bandwidth of the audio beyond whatever is needed for the code. Otherwise, my wanted signal will become muffled.

What is the required spectrum (= bandwidth) of the code? Is there a mathematical expression that describes this spectrum? What is a circuit topology that emulates that expression? What actual electronics parts can realize that topology? Finally, how can these transforms (that I'm so keen on) help? I realize that this problem has already been looked at and that one can buy a commercial solution. Remember, the object of this whole study is to rehash the root science – and learn something (translated "Have fun!"), and also see if existing solutions may have missed something.

In my mind's eye I see a strategy to use A) the Fourier transform to determine the code spectrum, B) the Laplace transform to demonstrate a topology which emulates a desired mathematical expression for an analog solution (op amps or transistors), and C) the z transform to migrate the solution into the computer. Refer to the introductory article published earlier for those transform definitions. The total job at hand is way too much material to tackle in this second writing, but let's flirt with some of it. If you are a "bottom line" kind of person skip the next couple of headings, and jump down to some interesting results – but you will miss some "fun" if you do!

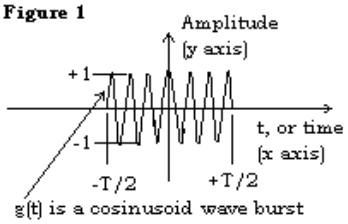
Morse Code Time Signature.

The Fourier transform requires us to have an expression for code as a function of time. Since the main objective is to figure out how to collapse the audio bandwidth for improved signal to noise ratio, this time function can be simplified to the worst case "part" of a string of code. It will be seen later that a smaller time duration of a signal requires a wider bandwidth for that signal. Therefore, we need to discover the time length of a "dit" of code, since a "dit" is the shortest "thing" that would ever be sent.

Let's suppose the maximum code speed I want to receive is 30 words per minute, which is 150 letters (assuming 5 letter words). Using the first 150 letters in the first paragraph of this article, I counted up 211 dits and 164 dahs and 34 actual words. A pleasing code sound occurs when dahs are four times as long as dits, the space between dits and/or dahs (within a single letter) is the same as a dit, the space between letters is the same as 6 dits, and the space between words is the length of 12 dits. (I came up with these rules by just thinking about it, and also playing with a little sound program that I wrote to vary some spacings and listen to the results – maybe somebody out there knows of better research.) Multiplying all of this out results in 2196 equivalent "dit times" for 150 letters to be sent in 60 seconds. That is about 0.027 seconds per dit, for each audio tone burst.

We need to pick an audio frequency of the burst. I suggest 800 Hz because a received signal will also give this same pitch if the "CW reverse" function is enabled (at least on my receiver – probably on yours too). It is also the same pitch that I hear when keying my transmitter in CW mode, so I can easily pretune a received signal to that same audio tone using my receiver frequency knob. The time function to be used in the Fourier transform is crudely sketched in Figure 1.

Figure 1



g(t) is a cosinusoid wave burst lasting T seconds and centered about the y axis with amplitude of ±1 unit. Where fc = 800, T = .027

$g(t) = \cos(2\pi f_c t)$ for $-T/2 < t < +T/2$

$g(t) = 0$ elsewhere

Morse Code Spectrum – hold on to your hat!

Finally we have enough information to take the Fourier transform of our "dit" pulse! Hold on to your hat (this article isn't focused so much on math mechanics, but rather on the *application* of mathematics). Just dust off that old trig/calculus book, and make use of some trig identities and integration properties.

From the prior article on transforms, recall that Joseph Fourier invented the following nearly 200 years ago:

$$1)\ G(f) = \int_{\pm\infty} g(t)e^{-j2\pi ft}dt$$

Plugging in g(t) from figure 1, using non-zero-valued limits of ±T/2, and invoking Euler's identity:

$$2)\ G(f) = \int_{\pm T/2} \cos[2\pi f_c t]\{\cos[2\pi ft] - j\sin[2\pi ft]\}dt$$

(There are easier ways to solve this equation other than the "brute force" method shown here, but they are not as straight forward in concept – for brevity of theory we'll just grind it out.) Because of odd symmetry about x = 0, the imaginary ("j") sine term cancels when integrated. The remaining cosine term has an identity which results in:

$$3)\ G(f) = \int_{\pm T/2} (1/2)\cos[2\pi(f+f_c)t]+(1/2)\cos[2\pi(f-f_c)t]dt$$

After integrating, substituting in the +T/2 limits and doing a little arranging we get:

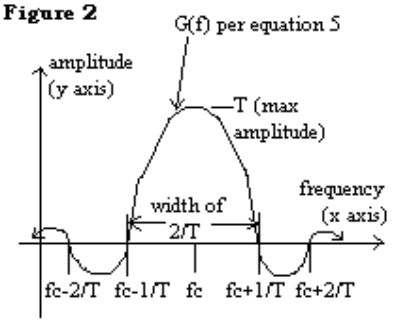
$$4)\ G(f) = (T/2)\sin[\pi(f+f_c)T]/[\pi(f+f_c)T] + (T/2)\sin[\pi(f-f_c)T]/[\pi(f-f_c)T]$$

Finally, converting the double-sided spectrum into a one-sided (physical world spectrum we get:

$$5)\ G(f) = T\{\sin[\pi(f+f_c)T]\}/\{\pi(f+f_c)T\}$$

Equation 5) is the spectrum of our "dit." It is crudely sketched in figure 2.

Figure 2



Picking Parameters of the Audio filter and Calculating the signal to Noise Improvement.

Notice that the "dit" frequency spectrum goes on forever in both directions, starting at f_c. However the bulk of the energy is contained in a bandwidth of 2/T, centered at f_c. We calculated earlier that our T is 0.027 seconds, and we picked an f_c of 800 Hz. Thus we determine that the audio filter should be centered at 800 Hz, and have a 3 dB bandwidth of, say, 2/0.027 = 74 Hz. When sending a string of code that is more complicated than a single dit, the spectrum will end up having some gaps, rather than the continuous spectrum shown in figure 2. Nevertheless, figure 2 indicates the broadest envelope of frequency that we will need to accept for reasonable fidelity. Obviously, the smaller the value of T, the wider the value of 2/T shown in figure 2, and a dit is the shortest value of T that we are allowing.

My receiver has its narrowest filter (used for SSB) set at 2400 Hz. The improved signal to noise ratio I can expect from the 74 Hz filter is 10 log(2400/74) = 15.1 dB. The real world may not quite yield this ideal result because actual noise and clutter is not as uniform as these calculations assume. Still, adding the filter will make it seem as if that distant operator you are trying to copy increased his signal power by quite a bit!

Well, we've used the Fourier transform to determine how wide the audio filter should be. The Laplace and z transforms can help in coming up with actual circuits and computer programs for such a filter. This "fun" will just have to wait for another time!

73, Steve, AB7LF □

Contesting -Amateur Radio On-the-air Competition

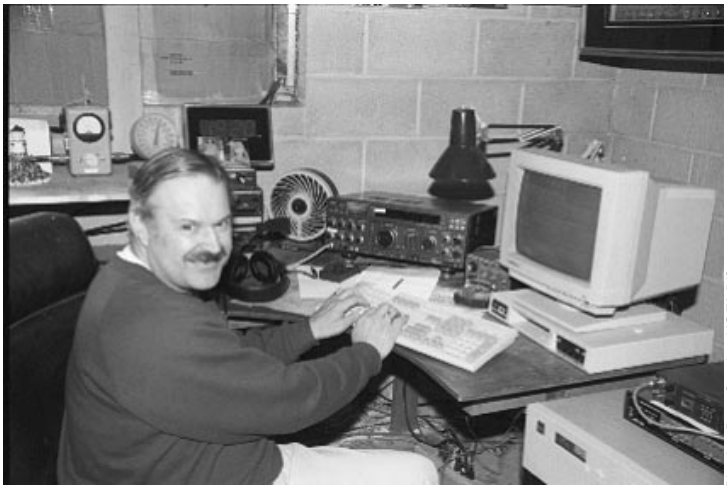


Photo: Ron Speirs, KC7MVS

Alan Brubaker, KO7X, at his operating position. He has available a Yaesu Ft1000 transciever and an Ameritron AL1200, a legal limit amplifier.

Contest -n. 1: a struggle for superiority or victory : COMPETITION, 2: a competition in which each contestant performs without direct contact with or interference from his competitors

Also known as radiosporting in some parts of the world, contests are more popular than ever among a growing number of radio amateurs all over the globe from nearly every active country on the DXCC list. Let's take a look at contesting in the '90s and see what the excitement is all about.

Why do we do this at all?

Generally, we humans have a natural urge to compete with one another. Whether it is for food or a mate, or a game of skill or luck, we enjoy winning and do not always lose gracefully. Contesting is yet another game.

What were the first contests?

Historically, radio contesting goes back to the first trans-Atlantic tests which were conducted by radio pioneers in the 1920s. Not unlike today, large antenna arrays were erected at a remote site, powerful transmitting equipment was built, sensitive, state-of-the-art receivers were carefully aligned and skilled operators spent long hours listening for weak signals through strong static and other atmospheric noise. There were no prizes then, but the success of the participants led to routine trans-Atlantic radio communication.

Today we can purchase powerful transmitting and excellent receiving equipment and antennas and put together a competitive station. We still have to spend the time operating the equipment skillfully for long hours to obtain a competitive score. Many contesters around the world have invested a great deal of time, energy and money to construct the best station that they can afford in order to be competitive. However, many of us have limited budgets and have modest stations. A world class contest station installation is a sight to see indeed.

In the 1930s the ARRL began sponsoring a DX contest and a contest called the Sweepstakes. The object was to make as many contacts as possible during a certain period of time. In those days, the contest lasted for a week or two and was CW only. The winners only made one to two hundred contacts. As time went on, more contests were added to the calendar; VHF contests and an event called Field Day, which is technically not a contest since there are no awards for the winners. Speaking of awards, the overall winner in most contests usually wins a Trophy or a Plaque, and the winners of each section or region are awarded certificates by the contest's sponsor.

How many contests are there?

There are now over 200 separate events on the contest calendar. These include DX, VHF, QRP, EME (moonbounce), County Hunters', various CW, RTTY and SSB contests, state QSO parties and the list goes on. There are so many events that on some weekends, there will be several contests taking place concurrently. However, on some weekends there is what we refer to as a major event and it will be the only contest running. The major events include: the CQ World-Wide DX contest (CW and SSB), ARRL DX and Sweepstakes (CW and SSB) and Field Day. The CQ World-Wide DX SSB contest which takes place on the last full weekend in October is the most popular world wide competitive event in Amateur Radio, but it still does not come close to Field Day, which is by far the most popular event even though it is not really a contest at all.

What about contest clubs and conventions?

There are dozens of contest clubs all over the country, mostly in the major metropolitan areas. The largest clubs are located in the Washington DC area, New England, Philadelphia and the San Francisco Bay area. Some contests offer a concurrent club competition on several levels (depending on the size

of club). The winners receive an engraved gavel. We have a small contest club here in the Salt Lake City area; the Utah Contest Club.

The largest gathering of contesters in the world takes place at the Dayton HamVention each year. There are numerous hospitality suites sponsored by the various contest clubs from around the country and there is a contest forum and a contest banquet. As yet, there is no Contest Convention but it has been discussed from time to time.

What about the heavy QRM on the HF bands?

The ARRL gets anti-contest letters all year long - particularly after Field Day. Despite the heavy traffic, there really is room on the bands for everyone. The WARC bands (30, 17 and 12 meters) have been declared "contest free zones" by most contest sponsors. Most major contests operate on one mode or another, so if the SSB bands are busy, the CW bands usually are not, and vice versa. Now that 15 and 10 meters are opening up again, the load has been taken off of 20 meters to some degree.

How do I get started?

The best way is to start like I and many of my friends have -Field Day. My first Field Day was in 1957. I operated the 6 meter station and at the time held a Technician class license. The following year I operated on 40 CW. I started entering contests from my home station about this time. I did not have a KW or beam but I got on anyway and did as well as I could with what I had to work with. Over the years I gradually improved my station and my operating skill. I learned one thing -if you are running low power and a dipole you cannot compete against the operator across town who has a KW and a beam. The most important component of your station hardware is the antenna system. Unfortunately, many of us are unable to put up a beam antenna at home.

The next best thing is a simple dipole for your favorite band -as high and as much in the clear as you can get it. Some people operate mobile or portable if they cannot have a station at home. If you can put up a beam on a mountain or hilltop you can do quite well. Once you have a station to use, get on the air and make contacts. Don't be afraid to submit your log. You might be the only entry from Utah and many sponsors will award a certificate even if you were the only entrant in your classification. The rules for most contests are printed each month in the "Contest Corral" column in QST. Just follow the instructions and submit your log to the address indicated. Some station owners like to enter the multi-operator categories and are looking for operators to keep their stations on the air throughout the contest period. Offer to help with the operating if you are interested. This is a good way to get started and gain some experience. Even if you are a Novice, there are contests that you can enter and participate in, or you can operate at a multi-operator station under the supervision of a control operator.

What's in it for me?

For me, my contesting activities have been a great learning experience and an opportunity to get acquainted with other contesters around the world.

HF propagation generally follows somewhat predictable patterns; I found out that you can contact Europeans and Africans in the mornings on the high bands, South Americans and South Pacific stations mid-day, and Japan and the Far Eastern countries in the afternoon and evening. As the sun sets, the pattern repeats on the low frequency bands until sunrise the next morning. However,
now and then, the ionosphere plays tricks and we will either get no openings or poor openings, or sustained openings over a particular path. You never know what will happen.

I have learned a lot about geography and where the countries of the world are located and where to point the beam and when to point it there.

I have gone on contest DXpeditions to Mexico and the U.S. Virgin Islands.

As a member of a team of up to a dozen operators I have operated from several well equipped world class contest stations.

I have logged as many as five stations in one minute on CW -that is one complete QSO each 12 seconds for a full minute. I have logged more than 200 stations in one hour.

I have learned how to build antennas that work.

I have had the pleasure of sharing some of my experiences with friends from around the world in person at conventions.

I have contacted new countries and new states.

One of the great things about ham radio is its diversity. There is something for everyone. My choice is HF contesting, and my favorite mode is CW. It's not for everyone, but I enjoy it -perhaps you will too.

Where can I find out more?

If you have access to the world wide web, there is an excellent web site which will give you much more information about contesting. Check KA9FOX's web site at http://qth.com/KA9FOX/

Scott's web site has links to many other sites which have excellent information about contesting.

There are two publications devoted to contesting; The National Contest Journal which is available from ARRL, and CQ Contest which is available from CQ Magazine. Or, get in touch with me.

Alan, KO7X

Alan can be reached via email at: alan@es.com or landline at: 571-7009. ❑

UARC News

Gary Post, KB7DH, SK

Gary Post, KB7DH, died on March 2nd after a long illness. An Extra-Class licensee, Gary had been active on 2-meter simplex and on the 449.65 repeater. He had been responsible for
many amateur radio classes, the most recent of which would have ended slightly over a week after his passing.

Gary had also been active in the volunteer examiner program. Between his VE work and his classes, he was responsible for many people getting amateur licenses.

Gary had operated a successful business doing brass and other metal work. He was also a fine musician and at one time served as oboist with the Utah Symphony.

A Note From the Secretary

I am in the process of changing my residence. So long Kenwood Street. Please note my new mailing address:

UARC
c/o Russell Smith
3267 East 3300 South #115
Salt Lake City UT 84109

Please check the expiration date on your *Microvolt* label. If your membership expires soon please mail (to the address above) or bring your dues to a club meeting along with any corrections. This will save you and the club postage and handling. Do not wait for a renewal letter before you renew and update your membership.

Help us keep your information accurate. Please notify the Secretary (me) or any other Board members of any changes. If you have an e-mail address and we don't seem to have it, please e-mail the info to rws@utah-inter.net

The membership roster is updated on or before the second Thursday of each month. It usually takes two to four weeks to have the roster updates reflected on the club web page. Please be patient.

73 Russ KC7ZDZ

Red Cross - Club Station Open House Set

On Friday, April 23rd the Greater Salt Lake Chapter of the American Red Cross along with the Utah Amateur Radio Club (UARC) and the Salt Lake Amateur Radio Emergency Service (ARES) will host a media open house at the Salt Lake Chapter. The purpose of this open house is to introduce members of the local media and local officials to disaster services and the vital role amateur radio plays for the Red Cross. The Red Cross public relations firm is handling Media relations.

On the following day, Saturday April 24th, UARC will host another open house for its club members to see the station and become familiar with the functions it will perform. HF operating, station tours, and informal meetings regarding the vital role amateur radio plays in assisting during times of disaster. The Saturday open house will occur at 10:00 AM. Talk-in is on the 146.62- repeater.

The station is the result of an agreement among UARC, Salt Lake County ARES, and the American Red Cross. The station is expected to be used for training and casual operation in normal times, and for

emergency communications in times of emergency. UARC is providing the equipment and the Red Cross provides space in their building on the corner of Fourth East and Fifth South in Salt Lake City.

The station's first contact was made last fall on 40-meter CW. Since then, it has been used for HF, APRS, and even for a Red Cross exercise. This has been possible due to many Saturdays of hard work by volunteers running conduit and semi-rigid feedlines past four stories of the Red Cross building.

It is expected that, soon, a schedule will be worked out where the station will be open on a regular basis and by appointment for members to drop in and operate. There is still some work to do to complete antenna installations. If you are interested in helping, contact Alan Seyboldt, K7OPT, at 572-8112. For more information on the Open House, please contact Tom Schaefer, NY4I at 801-501-0899

Tom, NY4I

Volunteer Needed To Take Money

The largest organization of radio amateurs in the United States is the American Radio Relay League, ARRL. It publishes QST, the leading Amateur Radio magazine, works for rules and laws favorable to Amateur Radio, sponsors many awards and contests, and provides technical assistance, reciprocal licensing information, and legal advice to members.

UARC is an ARRL-affiliated club. As such, we can actually get a percentage of our members' ARRL dues back, provided the members join ARRL or renew their memberships through the club. We haven't been promoting this program much, lately, mainly due to the lack of someone willing to administer the program.

If you have wanted to get involved with the club, and are good at keeping paperwork straight, maybe this is the job for you. We need someone who can attend most club meetings and occasional other functions, signing up ARRL new members and renewals. After each meeting you would have to complete the paperwork and send the appropriate amount off to ARRL.

Of course, the position is not without benefits. At each UARC meeting you would get to sit in a prominent position near the famed Secretary and Book Lady (and, perhaps, become as well-known). You could even take time at each meeting to promote ARRL membership.

The most important benefits, however, would be to the club and to ARRL. UARC can use the money and ARRL can use the members to further programs to benefit all of us. If you are interested in the position, contact any of the officers.

Membership Incentive Program

The club needs more members, and there's no one in a better position to get some than the current members. Here's a little incentive to make it more attractive for everyone to recruit some new UARCians. For each new member you sign up, you will have one additional month added on to your own membership expiration. Whenever you are responsible for someone new joining the club, get him to tell the Secretary that you sent him.

To count, each new member you bring in must be either someone who has never been a club member before, or someone whose membership has expired at least a year ago.

Judging from the number of regular club repeater users who have never joined, we suspect there are a lot of opportunities for “missionary” work out there. Be sure to mention the $2.00 steak dinner at the July steak-fry, the great issues of *The Microvolt*, the wide-coverage repeaters, and the fun-filled Field Day, and it should not be to hard to bag some of them.

One thing we should all pass along to newcomers to the VHF and UHF bands is that repeaters are not a natural resource. They exist only because hams have contributed a large amount of time, money, and effort to put them in place and keep them running. Most groups are nice enough to make their repeaters open to everyone, but anyone who uses one regularly should support the group or individual that maintains it. If you bring someone new into the hobby, make sure the person understands where repeaters come from.

UARC Buys MFJ Antenna Analyzer

UARC has purchased an MFJ 259B antenna analyzer for the use of its members. This will allow us to properly tune and analyze antennas and coax.

This is one of those items that everyone needs for a day or two now and then, but not, perhaps, often enough to justify purchasing one. So the solution is to purchase one together as a club and make it available to any club members who need it.

This unit is particularly helpful to anyone trying to tune up an antenna. It covers all frequencies from 1.8 to 170 MHz and will measure not only SWR, but also complex impedance (either in resistance and reactance or as magnitude and phase angle), feedline loss, distance to fault, velocity factor, and reflection coefficient. It can help tell you which way you need to move your adjustments to achieve a match, whether surplus coax is in good enough shape to use, where along a coax line a discontinuity lies, and how well your antenna survived the winter.

More information about the analyzer is available at http://www.mfjenterprises.com/analyzers/mfj259.html

The unit will always be available at club meetings and all other club functions (Field Day, repeater work, club station work, etc). If members would like to borrow the unit for a few days, they may make arrangements with the person charged with storing the unit for any particular month. The person to contact in any given month will be in that month's *Microvolt*. Members will have to give a $100 check (it will not be cashed if the unit is returned as agreed), and sign a receipt showing they received club equipment.

With a call to the keeper of the analyzer, you will be told what days are available. You need to keep in mind that it must be available at club meetings and functions and thus not available for checking out. We hope that you enjoy the use of the equipment and take advantage of this benefit of UARC membership.

Tom, NY4I

April Meeting: Scouting and Amateur Radio

As the age of the average ham keeps increasing, it becomes clear that one thing we need to do is get more young people interested in the hobby. One very good way to do that might be to encourage more connection between amateur radio and the country's Boy Scout programs. The April UARC meeting will detail some successes in this area.

April 1 will be the date for the next meeting of the Utah Amateur Radio Club. Gary Smith, KC7IHZ, will give us a presentation about the Jamboree on the Air (JOTA) program that has successfully operated in Davis County for several years. JOTA is an annual international event, held on the third weekend in October, that allows scouts and scout leaders wordwide to get acquainted and exchange ideas. It can also be used as a chance to introduce amateur radio to scouts who might otherwise not learn much about it.

Another positive feature of scouting that ties to amateur radio is the Radio Merit Badge. Cliff Jenkins, N7ZTY, from Morgan, Utah, will give us more information about the badge and its amateur radio connection.

Again, the meeting is at 7:30 on April 1. Of course, it will have all the customary features including "eyeball QSOs," a chance to peruse ARRL books, and the famous "Dime Lime" or "Meeting After the Meeting," which allows a chance to check out the most popular kinds of pizza. Don't miss the fun!

Internet Cleanup Day

Please read the following announcement from your advisor.

Every year the International Internet Association sponsors an Internet cleanup day. All the data that is passed through the net leaves debris and dust in the data lines. This debris will slow data flow, and can even pose a fire hazard if not cleaned out regularly. So, every year a day is set aside when powerful network cleaning robots will crawl all around the net blowing out data lines with compressed air. This compressed air will be packetized in the routers and distributed around the network, cleaning the data dust out of even the most otherwise inaccessible data lines.

This year the International Internet Association's cleanup will be held next Wednesday. This is an excellent time to clean up the net, as traffic normally picks up in the first two weeks of April in the USA as tax time approaches on the 15th of the month. A bit of preventive maintenance at the beginning of the month could help everyone get their taxes filed on time. What's all this mean to you? Not much really. But when the air gets to the other end of data circuits

it will escape. You might notice unusual bursts of air coming from the front grilles of your PC's, servers and routers. You might notice some extra data dust around your keyboard, or under your mouse. It's not dangerous, so just wipe it up with a damp paper towel and go back to your normal activities. In some, very rare, cases the blasts of air and the flying data dust can scramble the data passing through the net.

We have software in place to unscramble any email that might get scrambled during the cleanup. You can avoid this inconvenience by shutting down all the computers, servers, routers and other equipment you have connected to the net on April first, and logging in again on the second. If you need the email unscrambling software, just drop us a note and we'll send it to you, or you can get it from our web site http://www.itsajokefolks.com.

Happy April Fools Everybody □.

ARRL Utah Section Manager Candidates

Editor's Note: For those holding current ARRL membership you will be receiving ballots in April and have the opportunity to vote for either of these declared and filed candidates. It is worth noting that both candidates are UARC members.

Mel Parkes – N5UVP

I first became interested in Amateur Radio when I was a teenager watching my father, Ira Parkes, K7ERR use his radios and talk to people all over the world. I wanted to do that too! Well it took me longer to get started than most, I received my Novice License while I was living in Albuquerque, NM in 1991, with the call sign KB5PWQ. I upgraded to General and got a new call sign N5UVP and Advanced Class in 1992, I then decided to become a Life Member of ARRL. I enjoy being a member of ARRL and I look forward to receiving my *QST* Magazine every month. The single thing I enjoy the most about ham radio is sharing the hobby with others. The finest thing any ham can do is to help a fellow ham get started on the right foot. Since I returned to Utah in 1992 I have served in variety of positions in amateur radio. AFMARS State Director for one and half years and Net control of the weekly AF MARS Utah Administrative Net for five years, President of Davis County ARC in 1996 and 1998, Vice President of the Utah VHF Society 1998 and was recently elected as President for 1999. I am an ARRL VE for the Davis County ARC. I am also a member of the Utah Amateur Radio Club. I also enjoy checking into the Beehive Utah Net and would encourage anyone to join the net daily on 7.272 MHz at 1230 local. I presently work at KJZZ TV and my work provides me the opportunity to visit many repeater sites throughout Utah because that's also where KJZZ has many of their TV Translators.

After much thought about what I could accomplish if I was elected as the Utah SM. I would like to give back some of what I have got out of amateur radio. So many of you have helped me learn and understand amateur radio and now I think its my turn to help others. I was asked what I would like to accomplish if I am elected section manager. I think it is very important to stay in touch with what others want and not so much what Mel Parkes would like to do. Yes I have ideas and thoughts about what would be neat to do, but what is more important is what it is that you want to see done in Utah. I have heard many ideas and the only way they can come to pass is with everyone pitching in to help! So if I was to say what I really want to accomplish and do as section manager it would be to take your ideas and suggestions and get many others involved to make that happen. This may sound vague, but if you want to make something happen it takes ideas and effort. Share with me your ideas and I want to help you make them happen here in Utah.

So if you think you want to consider me as the ARRL Section Manager for Utah I guess I must be honest and tell you to tell me what you want! And if I'm elected I'll certainly be checking with as many of you to find out what your desires are.

73 de N5UVP Mel Parkes

Tom Schaefer - NY4I

I was first licensed in 1980 while in High School. I have been active in many facets of amateur radio and enjoy any form of communication: CW, voice, packet, smoke signals. I moved to Utah in 1994, left for a year, then came back to stay. Having been involved with UARC as President last year was a rewarding experience. It allowed me to see how a club as large as UARC does things. We were able to accomplish many things last year thanks to the help of many club members. I would like to serve the hams of Utah as the ARRL section manager because I feel I

can contribute yet even more to this great hobby of ours. My main goal, if elected, is to see that Utah has a great hamfest in 2000, establish a firm foothold for amateur radio at the Olympics, and make the ARRL more accessible to hams. The ARRL is a good organization, but it needs a major input of new blood. Amateur radio is a different hobby now than it was in the beginning. I hope to show Utah hams the benefits of ARRL membership, but also work to change the organization for the better. With your vote, I will be able to accomplish all these things for the hams of Utah.

Best regards and warmest wishes.

Tom Schaefer, NY4I ◻

Statewide Mailing List Opens

In late February, Clark Dowding, N7TDT, President of the Davis County Amateur Radio Club, established a statewide Internet mailing list for radio amateurs. (In a mailing list, a group of "subscribers" register with a central computer. The group can then communicate with each other via e-mail. Whenever one subscriber sends e-mail to the list address at the central computer, that computer sends copies of the message to all other subscribers.) At this writing, the list has 330 members. To quote Clark's official description of the list:

The purpose of the utahHAM@onelist.com is to give all Hams in Utah an easy way to communicate with each other via email. This is a moderated list which means all messages are reviewed before going to the entire group. (Messages will transmit to the group within 8 hours.) Appropriate topics for utahHAM@onelist.com include: Utah ham radio news, periodic reminders about special Nets and Meetings, Silent Keys, requests for info about other parts of the state, request for "scheds", etc.

In its first few days of existence, the list was unmoderated, but was subsequently changed to a moderated list. This means that the moderator must approve each message before it is relayed to the rest of the subscribers. The intent is to limit the content to items of genuine statewide interest, and keep the traffic volume low enough that subscribers won't be swamped with messages. The list may be particularly helpful to newsletter editors and those maintaining web sites with current news of Utah amateur radio happenings. But it is open to anyone who wants to keep abreast of events around the state.

Early in March, Clark turned the reins of the list over to Tom Schaefer, NY4I, past president of UARC, who now serves as moderator. Tom indicates he will maintain, basically, the same policies and intent that Clark established.

To view recent postings on the list or to subscribe, go to http://www.onelist.com/viewarchive.cgi?listname=utahHAM Alternatively, you can send e-mail to utahHAM-subscribe@onelist.com

Some hams may be been subscribed to the list without having given their permission. If you have been getting a lot of e-mail in your mailbox that says "[utahHAM]", and you'd just as soon have it stop, then send a message to: utahHAM-unsubscribe@onelist.com ◻

Utah VHF Society Elects Officers

The Utah VHF Society held is annual election meeting and swap meet on Saturday, February 27. Major outcomes of the meeting included election of a new President and a dues increase to $15.00 per year. Because the Society has members from all parts of the state, it tries to minimize in-person meetings and conduct all necessary business in the single annual event.

The swap meet, typically the biggest such event in the state each year, was well-attended by all accounts. Starting promptly at 8 a.m., the National Guard armory was abuzz with sales being negotiated. Equipment offered ranged from the newest satellite transceivers, to old tube-type Citizen's Band transceivers.

Newly elected officers were:

President: Mel Parkes, N5UVP
Vice President: Don Blanchard, WA7GTU
Secretary: *John Mabey, W7CWK
Treasurer: *Brent Thomas, AC7O
Frequency Coordinator:
*John Lloyd, K7JL

* Incumbent

Eldon Kearl, KB7OGM, after serving as President of the Society for several years, decided this year to retire from the position. Mel Parkes, N5UVP, takes

the reins as President after having served as Vice President. Mel is also a past President of the Davis County Amateur Radio Club.

Don Blanchard, WA7GTU, from the Cedar City area, is new to the UVHFS Board of Directors, but certainly not new to amateur radio or to repeaters. He was part of the group that pioneered the Frisco Peak 146.94 MHz repeater in the 70's and obtained the call WR7AAA, the first one of the series issued in our call area for a repeater.

Another action at the meeting was to "align" a new repeater with the society. The Heber City repeater on 147.20 MHz, operated by Larry Mahoney, KB7YAF, was added to the list of repeaters that may receive financial support from the Society. That brings the total number of Society-owned and aligned repeaters to 15.

Increased site expenses for some repeaters were apparently the major factor causing expenses to exceed income. The dues increase proposal passed, making the dues $15.00 per year. Those attending the meeting, however, were allowed to join or renew at the old rate of $10.00.

Those wishing to join or renew can do so by sending $15 to:

Utah VHF Society
P. O. Box 482
Bountiful, Utah 84011-0482

New members should include their names, addresses, call signs, and indications of whether they would like to be placed on the roster for the Tuesday night net.

The Utah VHF Society is a statewide organization devoted to operation and support of VHF and UHF repeaters. It performs frequency coordination for the state and conducts a net each Tuesday evening at 2000 hours on the 146.94 MHz repeater. It gives financial support to a variety of repeaters throughout Utah.

Check the UVHFS web site: http://www.ussc.com/~uvhfs/ for more information. ❑

The Infamous Arc - The Hidden Interference Generator

It's one of the most pervasive and common sources of telecommunication interference. In fact, it's so common that you can find it in nearly every radio transmitting facility in the world if you care to look. But despite the widespread nature of this "hidden" interference generator it is rarely covered or even mentioned in interference-related technical publications and how-to guides. Even more unusual - it's the only interference case that is tracked down by visual sight, not test equipment.

An arc is an electrical discharge caused by the transfer of energy across a gap of insulating material, commonly air, when the insulator voltage breakdown is reached. Current can be high or low, and an arc is described by any discharge jumping only a single millimeter to a bolt of lightning 3,000 feet long. Arc discharges cause the radiation of a broad spectrum noise that can be heard from the audio spectrum all the way to microwave frequencies. For that reason it's one of the most insidious types of interference, causing interruption to just about any RF device in the vicinity.

A typical radio transmitting station in professional services, broadcast, or Amateur Radio contains hundreds, and sometimes thousands, of individual connected electrical joints. Typically among these are wire connections for control applications, coaxial cables, guy wires and related hardware, the joints between tower or pole sections, ground connections, etc. And each of these joints is a potential arc spot when oxidation or rust enters between the mating conductors. If sufficient RF voltage is induced into the joint during transmission in the near field of the station, current flow across the poor joint will likely occur, often resulting in destructive broad spectrum interference. Unfortunately, when interference occurs the station owner usually looks toward other areas to find the problem, inserting filters or other means to solve the problem. So how can we deal with the "hidden" threat?

First, use anti-oxidant compounds during station construction and as much nonferrous hardware as possible. Stainless steel and brass make fine fasteners for radio use, and they don't rust. Make sure all connections in the station are tight, and if outdoors, covered with convenient weather protective means. Wire brushing of conductors before insertion is

always helpful - and a cheap insurance policy. Use anti-oxidant compound between tower section joints, weld or solder connections where possible, and use at least one insulator close to the tower when employing metallic guy wires.

If you have a station in service, conduct an "arc audit". Here's how. Put the station on the air and transmit as much power as you are able at different test frequencies, especially those that are causing known interference. Do the test on a pitch black night and have a helper turn the transmitter on and off, carrier (CW) or modulated by telephony. Go outside, use binoculars if available, climb up on the roof if helpful, but put yourself in a good viewing position of the antenna system and simply look visually for tiny bluish arcs. Record their positions and effect repairs with new hardware, bolt tightening, etc. Try the same test in the house with all of the lights off, as small arcs can occur just about anywhere in the near field of the antenna system. Run the test every so often to insure long term continuity. The test is easy, requires no special skills or tools, takes only minutes, and it's costless. But it may lead you to a happier life and an easy fix - and even the info about how to do it is free!

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Examination Schedule for April

04/03/99 (Sat.) Salt Lake City
Contact: Gordon Smith, K7HFV
Phone: (H) 582-2438 (W) 534-8116

04/14/99 (Wed.) Mantua
Contact: Niko Takahashi, AA7OL
Phone: (435) 753-9544

04/21/99 (Wed.) Provo
Contact: Steve Whitehead, NV7V
Phone: (H) 465-3983 (W) 225-5200

04/27/99* (Tues.) Salt Lake City
Contact: Eugene McWherter, N7OVT
Phone: 484-6355

*Only Novice and Technician elements (1A, 2, and 3A) given at this session.

For more detail either call the contact or checkout the information on our webpage http://www.xmission.com/~uarc ❑

Tigger's Corner Quiz Answers

A- No. No current will flow because the switch is shown in the "open" or "off" position.

B- Yes. The switch is now shown in the "closed" or "on" position, allowing a complete path for cur to flow.

C- One (1) Ampere. Remember the formula for current is voltage divided by resistance of Amps = Volts / Resistance.

D-Eighteen (18) Volts. Remember Voltage equals Current times Resistance or: Volts = Amps X Resistance.

E- Three (3) Ohms. Resistance = Voltage divided by Current or Ohms = Volts / Amps. ❑

Wanted

Manuals (assembly and operation) for Heath Kit Transmitter HX-20, HX-20 Power Supply, and HR-20 Receiver. Will pay for copying cost and postage. Eugene Hecken, WB5CCF, 1069 E. Turquoise Way, Sandy UT 84094, Phone (801)576-0164. ❑.

Contesting and DXing Taught Here

As the solar cycle improves many Hams will be looking forward to one of their favorite activities: Contesting and DXing. Would you like to learn what their excitement is all about? Darryl, AF7O and Alan, K7OPT have volunteered to conduct some real life training on several of the upcoming contests. Contact them for arrangements. Daryl at 942-3817 and Alan at 572-8112. ❑