F.C.A.R.C. Inc.
P.O. Box 773
Greenfield, MA 01302

FIRST CLASS MAIL

THE COMMUNICATOR
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May 2019

<u>Upcoming Events</u>

      FCARC Events, May 2019

- May 11 Sat 8:00 am Breakfast, Denny's; 10 am
- May 13 Mon 6:00 pm E-Board,GCC East Building Room 110 (No General Membership meeting this day; Picnic on May 25)
- May 25 Sat 11:30 am FCARC Picnic, Leyden Pavilion, Brattleboro Rd, Leyden (See note below)
- May 27 Mon 7:00 pm VE License Exams GCC East Building Room 110.

FCARC Picnic May 25th

We plan for a Saturday picnic instead of a Monday evening meeting in May. The location this year will be the same as the last several years, the Leyden Pavilion behind the Pearl Rhodes Elementary School in Leyden. Save the date: Saturday, May 25th.

As in the past this will be a partial pot-luck - soft drinks, hot dogs, burgers, etc., will be provided, but other items - deserts, salads, whatever you feel like bringing will be welcome. When we get closer to the date a food coordinator who can offer suggestions will be announced, but uncoordinated pot-luck is OK.

Activities may include a mini flea market, local fox hunt, a demo portable HF station. Want to sell or trade something, show off a mobile rig, or test a handheld or a kit you built? Bring it along.

If you don't know the site, Directions page (http://www.fcarc.org/directions.htm) on the website has driving details and a link to a Google map. It is less than five miles from the Greenfield - Leyden town line.

April 2019

Secretary's Report

Unofficial notes by Al, N1AW

On April 8th there was a conflict for several people between the next-to-last session of the General license class and the scheduled E-Board and General Membership meetings. At 6 p.m. only Treasurer Howard N1LUP, Past-president Al N1AW, and Anne N1YL were present for the E-Board. There was no prepared agenda.

Previous to the meeting I conferred with Aaron KC1CXX, who was preparing for the license class, as to whether he favored having our May picnic on the 25th at the Leyden Pavilion, as we had been doing for several years, and he agreed. Howard, Anne, and I also agreed and I offered to arrange for the date and location.

In our informal meeting we agreed that the main business of the next E-Board meeting should be Field Day. Opinion is strong for again having a Porta-Potty. Anne is going to ask for shirt orders to be made by June 1st in order for items to be available by Field Day. We also discussed the need to assign various jobs ahead of Field Day.

Similarly, but with more urgency we agreed that important jobs for the May picnic should be assigned ahead of time. Specific items mentioned were food-shopping and cooking.

Anne mentioned that she expects there will be another YL picnic soon. No details available yet.

Some ideas for future program meetings were discussed. Suggestions included satellite and balloon experiments, digital modes, and PIO (my notes don't say what that means).

Since a regular membership meeting (without a topic) was scheduled for 7:15, we stayed until we were sure nobody else was going to show up. Nobody came.

Follow-up: The Leyden Pavilion has been reserved for Saturday May 25th. The cost will be the same as last year, $75. This should be officially ratified at the May E-Board meeting.

News, Activities & Articles

New England QSO Party - May 4-5

Tom Frenaye, K1KI, sent this message to all New England radio clubs:

The NEQP is a great time to check out antenna systems and offers a moderately paced opportunity to work new states and countries. You'll find a wide variety of participants, from newcomers to experienced contesters, all interested in making contacts with New England stations...

Oh yes, the NEQP is also lots of fun when mobile. Every time you cross a county line the action starts over again. It's amazing what a 100w radio and mobile whip can do. The QSO Party is 20 hours long overall, in two sections with a civilized break for sleep Saturday night. It goes from 4 pm Saturday until 1 am Sunday, then 9 am Sunday until 8 pm Sunday. Operate on CW, SSB and digital modes on 80-40-20-15-10 meters. For each QSO you'll give your callsign, a signal report and your county/state. Top scorers can earn a plaque and everyone who makes 25 QSOs and sends in a log will get a certificate.

The full NEQP rules are at http://www.neqp.org/rules.html. The 2018 results are posted (and the results since 2002 are also available) at http://www.neqp.org/results.html

Update: The organizers of the event would like to see every county in New England active. You can operate from home or mobile. Operators planning to be active, even if only for short time, are asked to send a note to info@neqp.org . As of April 26, Franklin County had not been heard from. You could be very popular in this contest.

Free Antenna Book
Al N1AW

I came across this on one of the mailing lists I subscribe to: Palomar Engineers has a free download of KURT SPEAKS OUT by Kurt Sterba. It is a 140 page compilation of columns appearing in WorldRadio 1999-2006, with Selected Additions by Palomar Engineers®

Courtesy of World Radio : Kurt Sterba's Korner

Every month World Radio magazine had an antenna column by Kurt Sterba (ghost writer, I assume).   His monthly columns debunked a lot of the BS being touted as antenna theory and product claims.   He played no favorites.

Straight forward writing and educational on all aspects of antennas as they applied to Ham Radio.

Available here:

Understanding Logarithms and dBs

by Erik Sherman KC1JQN

During the recent (and successful—hats off to the participants) general license class, some people were uncomfortable with the concepts of logarithms and decibels (dB). This is for them, or anyone else who would welcome a refresher.

Math may seem esoteric and confusing to many, but it's only a specialized language to discuss how to solve certain types of problems. One frequently used trick is to phrase things in different ways to make solving problems easier. Instead of writing 3.14159265359… and on to the end of time, we use the term pi or π. They all mean the same thing but writing pi or the symbol π is quicker.

Another example of rephrasing concepts is the use of bases for expressing numbers. We grow up with base-10, in which there is the ones place, the tens place, hundreds place, and so on, each place being ten times greater than the one before. The four-and-twenty blackbirds stuffed into a pie (not pi) is written as 24.

But there are other bases which can become useful. Binary, where you have strings of 1s and 0s and the digits in a number go into the ones place, twos place, fours place, eights place, and more, with each place being two times the previous one, is really base-2. Now we could write 24 base-10 as 11000 base-2.

You could use base-8, or octal, which also is handy in computer science. The digits in a base-8 number are ones, eights, sixty-fours, and more, each time multiplying by eight to get the next place. The equivalent for 24 base-10 is 30 base-8.

The point here is not to learn how to write things in octal but to realize that using different mathematical ways to say the same thing can give you a great advantage in accomplishing a task. Binary allows us to design digital logic with circuits providing on and off signals that represent 1s and 0s.

Sometimes the advantage you gain is, like with π, a more compact way of expressing an idea. You likely remember the idea of exponents being a way to show that you multiple some number by itself that many times: 10^2 is 100 and 2 is the exponent; 10^3 is 1,000 and 3 is the exponent; and 10^4 is 10,000 and 4 is the exponent. However, there is no reason to limit ourselves to whole number exponents. Bring 10 to the 0.3 power—$100^{.3}$—

and the result is approximately 1.995262315, which we'll call 2. Similarly, 10 to the 1.317 power—$10^{1.317}$—is about 20.75.

You can generate any number by finding the appropriate exponent. Looking for 33.16? The exponent you would need is roughly 1.5206. Calculators typically have a 10x function. Type in 1.5206, press the 10x key, and you should get about 33.15889. The result is an approximation because so is the exponent. You might need a much longer number to get 33.16 exactly.

The exponent of 10 that generates the number you want is called the number's logarithm. The logarithm of 33.16 is 1.5206. A more general way of saying that is:

$$\text{If } 10x = N, \text{ then } \log_{10}(N) = x$$
$$\text{Or, } \log_{10}(33.16) = 1.5206.$$

A Scottish mathematician, John Napier, developed the logarithm concept in 1614 to multiply large numbers together. If you add two logarithms and then use their sum as the exponent, you get the same answers as if you had applied each logarithm separately as an exponent and then multiplied the two results together.

For many years, there were no calculators that made such multiplication easy. That's why slide rules—measured with logarithmic scales—were used by engineers for such a long time. You could also look through books of logarithms and the numbers that corresponded to them. Just as you can multiply, you can divide by subtracting logarithms.

The reason logarithms became popular in radio electronics is a matter of human perception. We tend to notice when stimuli, whether sound or light, change by multiples of two. Photography changes f-stops (size of the aperture), shutter speed, and sensor or film sensitivity by powers of two. Sound is similar. We start at a low level and, for the convenience of human perception, treat different "levels" as powers of two, whether multiplying or dividing. The differences we look at are multiplicative: having to do with multiplication or division.

The decibel, or dB, is a measure of the relative difference in two power levels and was developed in the telephony business. A decibel is a tenth of a bel (virtually no one uses the full bel unit), which was named in honor of Alexander Graham Bell. The abbreviation for decibel is dB.

When looking at differences in power—it could be how much you turn up audio volume, the increase in power from an amplifier, or the loss of power over an antenna feed line—the following definition applies:

$$\text{Change of power in bels} = \log_{10}(\text{Pfinal/Preference})$$

The ratio between Pfinal and Preference can be large or grow quickly. Taking the base-10 log lets us essentially squeeze the ratios into a format in which a single difference in bels can mean a big increase in power. But remember that we use decibels, not bels. That's because a single decibel represents a power ratio of 10 to 1, or

10:1. The jump is big, so we cut the divisions down into decibels. Because a bel is 10 decibels, the change in power expressed in decibels is:

Change of power in dB = $10\log_{10}(Pfinal/Preference)$

We now have a linear scale with small enough divisions to be useful.

You may remember that when talking about voltage, the equation changes to the following:

$$\text{Change of power in dB} = 20\log_{10}(Vfinal/Vreference)$$

Why 20? First, one property of logs is that when you multiply a log by a number, it's as if you brought it inside the log and turned it into an exponent. For example:

$$8\log_{10}(5) = \log_{10}(5^8)$$
$$\text{or}$$
$$a\log_{10}(N) = \log_{10}(N^a)$$

Power equals voltage * current, which is the same as voltage squared/resistance, or:

P = V*I = V2/R

When the power changes in these equations, the load is the same. So,

$$(Vfinal/Vreference) = (Vfinal2/R2)/(Vreference2/R2)$$

The R2 values cancel out, leaving you:

$$(Vfinal)^2/(Vreference)^2)=(Vfinal/Vreference)^2$$

But remember that $\log_{10}(N2) = 2\log_{10}(N)$. So, the square exponent comes out and multiples the entire value:

$$10\log_{10}(Vfinal/Vreference)^2 = 20\log_{10}(Vfinal/Vreference)$$

Hope you've found this of help. If you have any questions, feel free to contact me at ebs@eriksherman.com.

THE COMMUNICATOR *is an informational publication for members of the Franklin County Amateur Radio Club. Officers: President: Aaron Addison (kc1cxx@arrl.net), Vice President: Joe Henefield, KB1WVO (joehenefield@comcast.net), Treasurer: Howard Field, N1LUP (howfield@comcast.net), Secretary: Chris Myers, KB1NEK (camyers1@verizon.net), Director: Belle Dyer, KB1NOG (bdyer582@juno.com), Director: Ron Niswander, K8HSF (reniswander@gmail.com).*

This is your newsletter! Amateur radio information of general interest, club member project descriptions and doings, radio applications to other activities, corrections, or suggestions are all welcome. Individual submissions make for variety! We need more writers! Send submissions to: Jeanne A. Dodge, KC1DCQ (j.anndodge@gmail.com).

Back issues of the Commmunicator are online at http://www.fcarc.org/commun.htm