



News & Views

of the

Lenoir Amateur Radio Club

PO Box 3276, Lenoir, NC 28645 <http://lenoir-arc.org> June 2010

Serving Amateur Radio in Caldwell County

**Note: there is no President's Column
this month**

From the Editor



Greetings.

I am still enjoying the Summer and making progress on some projects.

One thing coming up is the Southeast Linuxfest in Spartanburg next

Friday and Saturday. This two day event covers numerous aspects of the Linux operating system and other open source software.

An interesting project from last year is the Open street map project (openstreetmap.org). Their data package plus a gps receiver and an embedded operating system such as the linux based Android, would have all the smarts for a APRS navigation system.

They are actually having a presentation this year on Ham Radio Software for Linux, that I plan to attend. Many people do not realize the intimate relationship between Linux and Amateur Radio. Since its inception, Linux has been open and encouraged modification by tinkerers. Numerous groups, in particular TAPR (tapr.org) added Ham specific features directly to the operating system. It contains at the system level: full AX-25 (packet)

operations; full NOS (packet) support; soundcard TNC support; and hooks for radio direct support. With the addition of the ham libraries, applications are available for radio control; soft radio support; digital modes; logbooks; electronic design; antenna design; propagation; satellite tracking; and numerous other packages. All of these are free.

Many of these have been collected on a dvd as Shackbox (also free) at shackbox.net. It includes dozens of Ham applications, word processing, electronic design, and even a few games on a live DVD. The only problem is that it comes from France. The packages are all English but the developer forgot to change the keyboard layout to English. This makes it hard to start up, but once running, it is quite useful. I hope to demo it at one of the LARC meetings soon.

Don't forget Field Day, the last weekend in June. LARC will be running Field Day at Floyd Key's location northwest of Lenoir. Listen for the club as KF4WOD.

Until next time,

73

Michelle, kd4ytu

Starting out in Electronics – units and notation

Volts, Amps, Watts, oh my!

One of the topics included on the Amateur radio exams is basic electronics. Many people simply memorize the answers to the electronics questions or use a few simple formulas, without understanding any of the terms or relationships. This series will attempt to explain electronics, so that, at least, it will not be “magic.”

Units

Electronics is an applied science, meaning, among other things, that it is physical and depends on measurements. *Anything that is measured must have a **unit** attached which indicates the type of thing being measured.* For example, if a length was measured to be 8, without the unit, there would be no way to know if it would fit on a sheet of paper (8 inches), in a room (8 feet), or in a county (8 miles).

Units found in electronics and radio include: meters, feet, Volts, Amps, Ohms, Hertz, seconds, Watts, etc. Units are said to be **compatible** if they can directly be converted into each other. For example feet, inches, and meters are compatible since they are all units of distance; however, feet and seconds would not be compatible since feet is distance and seconds is time so they can not be converted to each other.

Units may be combined to form a **mixed unit**, for example miles/hour is miles divided by hours to get a mixed unit of velocity (miles per hour). Units may also be combined with themselves to form other units. For example meters x meters gives meters² (the ² indicates how many times the multiply is done) or square meters which is a unit of area.

All measured units can have their values traced back to standards which are maintained in the US by NIST.

Units are typically abbreviated when used. The following is a list of common units and

abbreviations. Notice that some abbreviations are upper case and some lower case. Also some use special symbols.

Time – seconds (s), minutes (min), hours (hr)

Distance – feet (ft), inches (in), miles (mi), meters (m), angstroms (Å)

Electrical – Coulombs (C), Volts (V), Amps (A), Farads (F), Henrys (H), Hertz (Hz), Watts (W), Ohms (Ω), Siemens (S)

Temperature – degrees Fahrenheit (°F), degrees Celsius (°C), degrees Kelvin (°K)

Many times, the unit itself is an inconvenient size for the measurement. In that case **metric prefixes** are often used. These come from Latin or Greek and are based on powers of 10 and indicate where the decimal point should be placed. The power is indicated by an exponent showing how many times 10 is multiplied. So 10^3 is $10 \times 10 \times 10$ or 1000 . An exponent of 0 indicates no change in the decimal position. A negative exponent means to divide by ten that number of times, so 10^{-4} is $1 / 10 / 10 / 10 / 10$ or .0001

This has the effect of being able to express very large or very small values easily. For example 4.7×10^4 V is 4.7×10000 V or 47000V (the decimal point is moved 4 places). This is known as a logarithmic scale.

Prefixes are assigned to the three possible values on each side of 1 (0.001 thru 1000) then to every third power following.

Positive exponents are greater than 1 and are usually given capital letters to abbreviate the prefixes. Negative exponents are less than 1 and are give lower case prefixes. Where a conflict of letters occur, a special symbol is used.

On the last page is the common prefix list. The prefixes most commonly used are in bold.

Field Day

The 2010 Field Day is a 24 hour period from Saturday, June 26 @2pm local to Sunday, June 27 @ 2pm local. The purpose is to use portable and emergency equipment to make contacts. This serves to :

- Test emergency operations
- Promote Amateur Radio to the public
- Check out equipment, antennas, generators, etc.
- Allow Hams to experience a contest environment
- Allow Tech Hams to experience HF
- Have fun

This year's field day site is at the home of Floyd Key – AF4FK, 1196 Key Craft Place, Lenoir, NC.

Directions:

- Go to Collettsville via Abington Rd or NC 90.
- Turn left at the store onto Adako Rd.
- After about 2.4 miles, turn left onto KeyCraft Pl.

Needed:

- Radios
- Computers
- Cables
- Power Supplies
- Food
- Operators

Details will be discussed at the LARC meeting on Thursday.

Hamfests

July 24 – WCARS (Asheville) Hamfest

www.wcars.org

Labor Day Weekend – Shelby Hamfest
(Dallas)

www.shelbyhamfest.com

Contests and Events

June 19-20 -- 80-10m – WV QSO Party

June 19 – Kid's Day

June 26-27 – HF, 6m+ - Field Day

July 1 – HF, 6m, 2m – Canada Day

July 17 -- 6m, 2m – CQ WW VHF Contest

For more information see

<http://www.arrl.org/contests/#corrall>

Next Meeting

Thursday June 10 @7pm at
the Gamewell Fire
Department

Bring a friend

Ideas Needed

Program ideas are needed for the LARC meetings. If you have an idea for a program you would like to see or present, see one of the LARC Officers

Your 2010 LARC Officers



President
James Bradshaw, N4NIN



Vice-President
Warren Gruber, WU3Y



Secretary
Jerry Gragg, AD4JG



Treasurer
Susan Bradshaw, N4OJN



Editor
Michelle Suddreth, KD4YTU

LARC 2009 Membership Roster **2010 Dues payable by March**

Aldridge, Joy, KI4SLT
Aldridge, Mike, KI4RPM
Andrews, Tony (no call)
Bradshaw, James, N4NIN
Bradshaw, Susan, N4OJN
Branch, Greg, KI4GZD
Bruner, David, KI4KWT
Bruner, Elaine, KI4QYA
Crump, Clayton, KE4VJH
Crump, Pat, KE4LWD
Gragg, Jerry, AD4JG
Griffin, Shawn, KI4ZKP
Gruber, Timothy, KB3IYJ
Gruber, Warren, WU3Y

Holder, Dyke, KC4HIX
Key, Floyd, AD4FK
Land, Tom, KA4HKK
LePierre, Dorney, KG4YNM
LePierre, Mary (No Call)
Livingston, Scott, KC4SWL
McDaniel, Buck, N4PGW
McDaniel, Catherine, WB4CAT
Mooney, Art, KI4KVY
Reid, Robert, W4UNC
Roark, Bobby, W4BLR
Rogers, Ruby, KA4CLI
Suddreth, Michelle, KD4YTU

**2010 Dues are payable
January – March**

**Dues are pro-rated after
March**

Individual: \$15

Family: \$25

Metric System

The metric system is based on powers of 10. Prefixes are used to represent common values. By convention, prefixes starting with a capital letter are used for values greater than 1 and prefixes starting with small letters are used for values less than 1.

Prefix	Symbol(s)	Power	Value	Common Name
Yotta	Y	10^{24}	1,000,000,000,000,000,000,000,000	Septillion
Zetta	Z	10^{21}	1,000,000,000,000,000,000,000	Sextillion
Exa	E	10^{18}	1,000,000,000,000,000,000	Quintillion
Peta	P	10^{15}	1,000,000,000,000,000	Quadrillion
Tera	T	10^{12}	1,000,000,000,000	Trillion
Giga	G	10^9	1,000,000,000	Billion
Mega	M	10^6	1,000,000	Million
Kilo	K	10^3	1,000	Thousand
Hecto	H	10^2	100	Hundred
Deka	D	10^1	10	Ten
		10^0	1	unit
deci	d	10^{-1}	0.1	tenth
centi	c	10^{-2}	0.01	hundredth
milli	m	10^{-3}	0.001	thousandth
micro	u or μ	10^{-6}	0.000001	millionth
nano	n	10^{-9}	0.000000001	billionth
pico	p	10^{-12}	0.000000000001	trillionth
femto	f	10^{-15}	0.000000000000001	quadrillionth
atto	a	10^{-18}	0.000000000000000001	quintillionth
zepto	z	10^{-21}	0.000000000000000000001	sextillionth
yocto	y	10^{-24}	0.000000000000000000000001	septillionth

Conversion Hints:

1. If the prefix becomes smaller, the number must become bigger
2. If the prefix becomes bigger, the number must become smaller
3. For values greater than 1, the exponent indicates how many places to move the point to the right (filling with zeros)
4. For values less than 1, the exponent indicates how many places to move the point to the left (fill with zeros)
5. The most common values use exponents that are multiples of 3