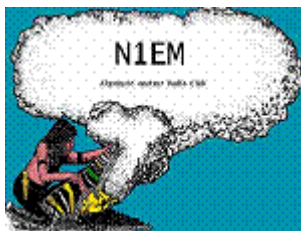


Algonquin Amateur Radio Club

Founded 1976



QRZ – The Newsletter for AARC members

www.n1em.org
December 2007

Meetings!

General club meeting : The next AARC meeting is scheduled for Thursday, January 10th at 7:30 pm in the Marlborough Middle School's Library (on Thresher Drive). This will be a joint meeting with members of the Minuteman Repeater Association (MMRA). Greg Algieri, WA1JXR will provide a presentation on antenna analyzers and demonstrate their uses in the shack.

MEMA: The next MEMA meeting is scheduled for January 15th at the Marlborough E.O.C. More MEMA information is available at: <http://www.qsl.net/n1em/EOC/EOChome.html>

December holiday banquet

The 2007 holiday banquet will be hosted at Linguini's (south along Rt. 20, west of I-495) on Thursday, December 13th, from 6-9 pm. In case we have to cancel because of poor weather, the alternate date is December 18th. Please monitor the AARC List (email) or the N1EM repeater for updates if we have snow on the 13th. Contact Ed Fitzgerald if your plans change for attending the dinner.

Mark your 2008 calendar:

February 16th – Flea market

This holiday break is an excellent time to evaluate your gear and figure out what you can toss to make room for next year's fleamarket *treasure* (It's all in the eye of the beholder).

Futzing around

Are you futzing around with anything? Are there any projects that are currently occupying your time? Maybe you'd like to write a paragraph or two for this column, which will appear when contributors have articles to contribute.

Microprocessors for beginners... (T.lkeda KA1OS)
Recently, I've started playing with small microprocessors and seeing how they could be used around the house and in amateur

radio. These chips are ubiquitous and often inexpensive. They also appear in many radio projects such as battery charge monitors, antenna analyzers, frequency counters, filters, automatic antenna line impedance transformers, keyers and frequency synthesizers. Thanks to high levels of integration, most of these processors are "complete" by themselves, meaning that they often require no additional chips or "glue" peripherals to interface with the outside world. There are also many special-purpose components such as frequency synthesizers, sensors and displays that microprocessors can easily control through standardized protocols. Even better, one can find many high-quality programming environments that are free or low-cost and so the entry barriers to working with these systems are quite low.

In these articles, I'll first try to describe a few of these systems and highlight some used in amateur radio projects. We begin with systems that use BASIC programming language interpreters. What 'interpreted' means is that their programs are not compiled directly to machine language, the actual code understood by a microprocessor. Instead, another layer of software interprets the program as it runs. This slows performance, sometimes by an order of magnitude or more, but for many uses it is not limiting and the ease of use offsets the deficit.

The Basic Stamp

The Basic Stamp line of boards is made by Parallax. Their products include Stamps with 8-32 I/O lines, 16-32 bytes of RAM, and storage for 80-4000 lines of program memory. These are normally not sold as 'naked' chips but as PC boards with power regulators, microprocessors and memory ICs soldered into compact packages that fit easily into breadboards. They can also be purchased with development kits, i.e. plug-in boards that include DB9 connectors for programming and connectors for battery packs or even motor control and sonic rangefinders. This integration makes Basic Stamps robust and quite easy to use. The programming environment is free and clean but the prices for the modules range from \$30-\$80 each, making them a bit expensive for what they actually deliver. Development boards range from about \$25-\$150. You pay a little more because someone makes their use much easier for you. Because they use a language interpreter their operations are a bit slow. One important advantage is that Parallax has a long history in the hobby microprocessor field and there is a large community of enthusiasts and several good books to help get one started. The programming language is also easy to learn and includes many built-in functions that make interfacing with the other chips (e.g. sensors, displays & motors) a snap. This makes the Basic Stamp a good 'starter' system for novices.

The Picaxe Family

The PICAXE microprocessors are another series of chips programmed with a variant of BASIC. These chips are all based on the PIC line of processors from Microchip and include a custom interpreter and bootloader created by UK-based, Revolution Education, Ltd. This company offers a line of chips with 8, 14, 18, 28 and 40 pins. Picaxes vary in capability from the 8M (8-pins, with up to 5 I/Os or 3 analog to digital converter lines (ADC) and ~80 lines of program space) up to the 40X1 (40-pins, 8-20 inputs, 7-19 outputs, 3-7 ADCs, ~1000 lines of program space, and >256 bytes of EEPROM & RAM). Clock speeds range from 4-20 MHz. Chips are available from several

suppliers in the US and are sold individually with prices ranging from about \$3.50 for the 8M to \$12 for the 40X1. Although plug-in development boards are available, many users seem happy to forego those extras and 'wire up' their own systems for specific applications. The bare minimum number of additional parts required to program and operate one of these chips are three resistors and a 5V power supply. Some of the Picaxes may also require a 4-20MHz ceramic oscillator. Overall, the initial investment required to start using these chips is quite low, under \$20.

The Picaxe programming environment is also free and includes many built-in functions such as I²C, SPI or asynchronous serial communication, timers, pulse-width modulation and character-based LCD display control. The Picaxe has a smaller user-base than the Basic Stamp – at least in the USA – but it is growing rapidly. There is a lively and helpful support forum available on the web. To date, every question I've had about the chips was answered by searching the forum's archives.

Of these microprocessors, the Basic Stamp and the Picaxe, which do I favor? Mostly the Picaxe, because I am comfortable breadboarding individual components for development and I can imagine a lot more useful applications for \$3-\$10 chips than \$40-\$60 ones. The Picaxe system is a little less polished but it isn't significantly lower performing or less flexible than Basic Stamp's offerings.

Of course sometimes the necessary performance or functions are simply not available in chips with language interpreters. At other times one needs to control the hardware of the microprocessor directly. For those cases, there are other systems that use program compilers and assembly code to create machine instructions that the microprocessors can natively 'understand'. Once again, there are several organizations that have assembled programming environments and prototyping platforms that make it easier for users to work with microprocessors at this level. One system is called the 'Arduino' and it includes an open-source programming environment and chip platform that was created, in part, for artists as well as hobbyists. That's for another article...

Web references:

www.parallax.com (Basic Stamp)

www.picaxe.co.uk (Picaxe)

Picaxe vendors:

<http://wulfden.org/stamps/picaxe.shtml>

www.phanderson.com/picaxe/

www.sparkfun.com

Remote base station with Basic Stamp:

www.scribd.com/doc/267435/Inexpensive-Basic-Stamp-Controller

Picaxe-based VK5JST aerial analyzer:

www.scarc.org.au/projects.html

Operating activities...

There are not as many contests in December as there are in other months, but there are some fun ones! Lighthouse enthusiasts will be freezing their keys off during the last half of the month in a two-week QSO party. And don't forget the New Year's tradition of Straight Key Night where the goal isn't the number of QSOs but their *quality*.

A selection of contests in December

Dec 8-9

ARRL 10 Meter Contest: 0000Z Dec 8-2400Z Dec 9. (See Nov QST p 102 or www.arrl.org/contests/)

Dec 15 to year's end

Lighthouse Christmas Lights QSO Party: by the Amateur Radio

Lighthouse Society, 0001Z Dec 15-2359Z Dec 31. Frequencies

(MHz) CW: 1.830, 3.530, 7.030, 14.030, 21.030, 28.030, SSB:

1.970, 3.970, 7.270, 14.270, 21.370, 28.370, plus VHF and

repeaters. <http://arlhs.com>

Dec 26-Jan 6

RAC Winter Contest: CW/Phone, by the Radio Amateurs of Canada,

0000Z-2359Z Dec 29. Frequencies (MHz) CW: 25 kHz up from the

band edge (check on the half hour), SSB: 1.850, 3.775, 7.075,

7.225, 14.175, 21.250, 28.500, 50 and 144 MHz.

<http://www.rac.ca/service/infocont.htm>

DARC Christmas Contest: CW/SSB, by the Deutscher Amateur

Radio Club, 0830Z-1100Z Dec 26. Frequencies (MHz) CW: 3.510-

3.560, 7.010-7.040, SSB: 3.610-3.650 and 3.700-3.775, 7.040.

<http://www.darc.de/referate/dx/fedcx.htm>

ARRL Straight Key Night: from 0000Z-2359Z Jan 1, 2008. (See

page 98 of this issue of QST or www.arrl.org/contests/.)

Worked All Britain Christmas Party: CW/SSB/Digital, from 0000Z

Dec 26-2359 Jan 6, 2008. [www.worked-all-](http://www.worked-all-britain.co.uk/Christmas%20Party%20Award.php)

[britain.co.uk/Christmas%20Party%20Award.php](http://www.worked-all-britain.co.uk/Christmas%20Party%20Award.php)

(Special event and contest information courtesy of the ARRL)

Algonquin Radio Club - P.O. Box 258, Marlborough MA 01752

The Algonquin Amateur Radio Club (AARC) holds meetings on the second Thursday of each month (No meetings in July and August). Meetings are open to all in the community with an interest in Amateur Radio. For directions, contact a club officer or visit our web site at www.n1em.org. Meeting times are listed in this newsletter. The AARC also operates the N1EM repeater on 446.675 MHz, -offset, PL 88.5 Hz. This machine is open to all licensed amateur operators. An informal open net on this repeater is conducted Sundays at 8:00 PM.

We publish QRZ monthly from September through June. The deadline for submissions is the 25th of the preceding month. Text files are preferred and can be mailed to newsletter@n1em.org. For further information about QRZ and the AARC please send inquiries to the address listed above.

Current club officers

President	Ed Fitzgerald (K1DIN)
Vice President	Ron Wood (W1PLW)
Treasurer	Frank McInnis (K1IX)
Secretary	Tim Ikeda (KA1OS)