

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



FIRST CLASS MAIL



THE COMMUNICATOR THE COMMUNICATOR

February 2012

Upcoming Events

- Sleigh Bell Race: Saturday February 4, 10 am, 9 am for radio ops; Greenfield
- E-board mtg: Monday February 13, 6 pm; Greenfield High School
- Program Meeting - Ellis Rud, N1MWJ "Living Off the Grid": Monday February 13, 7:15 pm; Greenfield High School
- Club breakfast: Saturday February 18, 8 am; Denny's restaurant, Greenfield
- VE license test: Monday February 27, 7 pm; Northfield Unitarian Church
- E-board mtg : Tuesday: March 13, 7 pm
- Club breakfast: Saturday March 17 , 8 am; Location TBA
- Program Meeting: Monday March 19, 7:15 pm; Greenfield High School - program TBA

February 2012

Calendar

THE SLEIGH BELL RACE: SATURDAY, FEBRUARY 4TH, GREENFIELD

The FCARC will be helping out, as we have done in past years, by providing communications for the Sleigh Bell Run, a four mile road race, on Saturday, February 6. The Sleigh Bell Race is a part of Greenfield's Winter Carnival. Volunteers should report for assignments at 9 am. Race time will be 10 am.

Net control will be set up in the Greenfield Public Library in the LeVanway meeting room, where runners register for the event. Radio communication will use the KB1BSS 2 meter repeater (146.985, negative offset, PL 136.5). Net control will be on the air starting after 8.30 am. Radio volunteers are asked to be present at 9:00 a.m. for assignment to race route sites. Enter from the back of the library (on Main St). Parking for ham radio operators can be found beside the Greenfield Fire Department, in the lot of the businesses behind the Firehouse or in the YMCA parking lot on Hope Street.

Chris, KB1NEK, is coordinating FCARC volunteers. Please contact him so he will know how many people he'll have. There will be tee shirts for volunteers. When you sign up please note your shirt size.

PROGRAM MEETING: FEBRUARY 13, 7:15 PM, GREENFIELD HIGH SCHOOL

The speaker at the February program meeting will be Ellis Rud, N1MWJ, who will be talking about living off the grid. Note that this meeting is a week earlier than usual due to the President's Day holiday on February 20th.

CLUB BREAKFAST- FEBRUARY 18, 8:00 AM, DENNY'S RESTURANT

The February monthly club breakfast will be back at Denny's restaurant on Federal Street in Greenfield.

Secretary's Report

E-BOARD MEETING, JANUARY 10, 2012 - BOB DICKERMAN WA1QKT

1. Chris KB1NEK split up the go-kit, giving 2m base station and miscellaneous radio equipment to Bob W1SRB, and divided vests between other e-board members. This was prompted by trouble Chris had getting to Montague race and the thought that it would be better to spread the equipment around.

2. Al N1AW reported on 440 MHz repeater bug - symptoms are "no audio" or "broken audio" - repeater still down, Al has been very busy with little time to work on it, but has started testing spare receiver.

3. January 14 Breakfast to be held on at the Wagon Wheel, but next breakfast tentatively back at Denny's; some members heard Denny's missed us.

4. Chris KB1NEK is organizing Winter Carnival radio coverage, February 4, still needs a few more volunteers.

5. Al asked for members to make special effort to check into info net on Thursday, January 12, because as Net Control he intends to run the net from the classroom of our Technician License Class at Greenfield High School.

6. Hoping to have Ellis Rudd N1MWJ, President of NoBARC Greylock club at our next meeting. Ellis was inspired by Walt W1ZPB, to move "off-grid".

7. Discussed plans for our Technician License Class at Greenfield High School. Bob W1SRB and Al will lecture in first session on Thursday, January 12. Al has page on website dedicated to class. Chris KB1NEK has purchased and received books.

PROGRAM MEETING, JANUARY 23, 2012 - BOB DICKERMAN WA1QKT

The meeting was called to order at 7:15 PM by Chris KB1NEK.

We have started the Technician Class licensing course and have about a dozen students. Gary Bunker, who is a student in the Technician License class, was introduced, and introductions were made all around.

Chris announced that the West River Radio Club in Vermont is conducting a General Class licensing course that is open to anyone interested.

Chris KB1NEK is organizing radio coverage for the Greenfield Winter Carnival Sleigh Bell Race, February 4. He still needs a few more volunteers.

Al N1AW reported that 440 MHz repeater is still down and work is still in progress to get it back on the air.

A few times in recent cold days the 2 m repeater has temporarily locked into a condition in which it transmits an echoing, feedback-like sound. Al has reset the controller and PLL tone, with mixed results. It may be receiving interference, or another unknown mechanism may be causing feedback.

Al has T-shirts for those who worked at the Sawmill River Race, either for 2011 or 2010.

The next Club Breakfast will be held at Denny's in Greenfield.

Our speaker was Bob Solosko W1SRB. Bob was first licensed in 1960, and his interest in ham radio led to a long career in electrical engineering. Several years ago he retired from Bell Laboratories where he was responsible for the system engineering of optical telecommunications network equipment. Bob is the editor of the FCARC Communicator and is a director of the club.

Bob gave an excellent presentation on Software-Defined Radio (SDR). He displayed two actual SDRs and an SDR kit. He demonstrated the use of an SDR by post-processing, with his laptop, a data stream representing radio signals that he had earlier collected on-the-air. Bob discussed the history of the evolution of the SDR concept, and presented a block diagram and the mathematics that describes the operation of the SDR. The hardware front end of such a radio generally consists of a quadrature sampler or mixer that has two Local Oscillators (LOs) close to the r.f. frequency that are phase-shifted by 90 degrees, and two multipliers or mixers. The mixer pair produces two outputs, the In-phase signal (I) and the Quadrature signal (Q); the signal pair is generally referred to as the "I/Q outputs", and can be represented as a pair of vectors at right angles. The I/Q outputs are baseband outputs, and the radio is therefore a type

of Direct Conversion (DC) receiver. One great advantage of the quadrature mixer over the traditional, more primitive single-LO DC receiver is that the I and Q outputs may be combined in such a way as to eliminate imaging, and produce a "single signal response". This is in contrast to the traditional DC receiver that will hear signals both slightly above and below the single LO frequency, if they both happen to be present in the radio band; if received, the undesired signal is called an "image", and will constitute QRM. In addition, demodulation of an I/Q output can be straightforward; for instance, taking the magnitude of the vector sum of the I and Q vectors demodulates AM. Taking the phase between the vectors demodulates FM. To demodulate SSB, one can phase shift the Q signal 90 degrees and then add the I and shifted-Q for USB, or subtract for LSB (this is actually a digital implementation of the traditional analog "phasing" method of SSB demodulation). All of these demodulation processes occur in software in a SDR. To modulate a carrier for transmitting, all of the above processes are reversed. Some of the possible advantages of SDR are:

1. You can have any modulation mode imaginable, including digital modes, for free
2. You can invent new modes, and implement them if you write the software.
3. You can have a pandapter display for free. This is a simultaneous display, by frequency, of all the signals in a band or sub-band (a live spectrum analyzer display).
4. Lower hardware cost is possible, because you can "re-use" the PC hardware you already own for the audio in/out, modulation/demodulation, controls and display. One receiver that Bob showed us cost less than \$20.00.

13 people attended the meeting.

News, Activities & Articles

THE SECOND 2011 SAWMILL RIVER RACE, DECEMBER 31, 2011 – CHRIS MEYERS KB1NEK

Yes, this was the second Sawmill River race in 2011. When New Years Day comes on a Sunday the perennial New Years event is held on December 31st. It's about parking in Montague Center, and about being good neighbors with the local churches. So, for the second time in 2011, FCARC volunteers turned out to provide communications for the 10k (6.2 mile) run in Montague Center.

Weather at this time of the year is likely to be a surprise. It wasn't too cold, it wasn't raining or snowing during the event. But the night before the race brought widespread freezing rain to our area, and this disrupted our plans. Some who had volunteered to participate couldn't make it up (or down) a hill near home and were unable to come. State highway officials were apparently surprised by icy roads, and Route 2 west of Greenfield was a real mess. KB1NOG, Belle, coming from Colrain and KB1NEK, Chris, coming from Shelburne were delayed for more than an hour because Route 2 was essentially closed until sand trucks arrived. With the difficulties that people in Franklin County had we were pleased to have Eric, N1QKO, come up from Ware, at the far end of Hampshire County, to help us out.

At the scene of the race we faced a shortage of radio operators, no equipment for the net control station (it was in KB1NEK's car), and the absence of the planned Net Control operator (KB1NQL, Beth, was waiting in Greenfield to get a ride from KB1NOG). Also, all of our red vests were in KB1NEK's car. Finally, although this was not strictly speaking a communications problem, the race director did not have a volunteer to drive a pace car. In the end it worked out. Race director Jon Dobosz of the Montague Recreation Department decided to drive his own car as the pace car, and K1SMY, Chris, rode with him to provide communication. We decided to try using an HT for the net control station in the Grange building loft, and that worked out all right.

We didn't really need high power to communicate through the KB1BSS repeater, of course, but we had planned to have a high power station for backup simplex communication if mobile or handheld units on the course had trouble with the repeater.

Several of our operators, including Andrew, KB1TKB, John, KB1NOH, Dan, N1VFN, Bob, W1SRB, and Bruce, KB1TLX, took double assignments, first checking in from stations on the first part of the course and then moving to positions nearer the end of the course after all runners had passed their first stations. Beth arrived in time to take over as Net Control just as the race started, and KB1NEK and KB1NOG also took up positions near the end of the course. The weather didn't delay just the volunteers; it also delayed the arrival of some runners. N1AW, Al, drove as the sag wagon, following what he thought was the last runner, one who actually arrived late and started the race late, but who soon caught up with the slowest runners in the main pack. But it soon developed that there were even more late starting runners – as some of our volunteers near the start of the course were preparing to return to race headquarters, three more fast runners appeared. It wasn't really clear what was happening until they reached Carter, WA1TVS's, position near the middle of the course. Somewhere around mile 4 or 5 these runners eventually passed the sag wagon and the last stragglers of the main group. There were other sources of confusion, as well. Race officials asked Phill N1YPS, to bring materials for a water station to his post along the course, but someone unknown took these things somewhere else, nobody seemed to know where.

Unexpected difficulties can lead to learning. As we talked things over at the end of the race the general opinion was that we got through this OK. Being flexible and repositioning communications volunteers during the course of a race is something we have done before, but we did more of it than we had expected. Having a radio volunteer in the pace car with the race director was useful. In the future we will be sure that not all of the club's equipment will be at one member's home, so we will have more than one person ready to deliver the essentials for a net control station. We are also going to ask that club members who frequently volunteer for events like this keep emergency vests at home, so we will always have at least a few on hand for any event in which we participate.

There will be no Sawmill River Race in 2012. It's a leap year, and New Years Day 2013 will be on Tuesday. We expect the FCARC will once again be there in Montague.



Waiting for assignments



Net control Bob WA1QKT and Beth KB1MNQL



Runners coming and going

A HOMEBREW 2 METER HT ANTENNA – PHILL GRANT N1YPS

I built this antenna a few years ago and presented it at one of our Monday night meetings. A few of you asked me for an instruction sheet... so, here it is. This idea was first published in QST from an article entitled: "Make Your Own 'Rubber Duckies'" by Paul Stump; M0LRF. I am not sure of the year, but the month was March. I decided to make a few changes to Paul's design and his text, because I believe mine to be more rugged. I had no trouble optimizing this antenna for 146 MHz, and I found my transceiver's performance exceeded the stock antenna I received from ICOM.

PARTS LIST.

- 1) BNC rf connector: Cambridge Products part no. CP88 (CP 88 1). This is a 2-pcs crimp connector. Radio Shack has an equivalent.
- 2) Poly tubing 3/8" O.D. x 1/4" I.D. 6 1/4" long. I buy this stuff at Aubuchon's by the foot.
- 3) Heat shrink tubing: 3/4" diameter; ~2" long, any color. Radio Shack and Home Depot have this.
- 4) Plastic end cap 3/8" to fit over the poly tubing. Found at Home Depot and some automotive parts stores.
- 5) Hook-up wire: insulated 20awg (gauge) solid, not stranded.
- 6) Substitutions for the above are OK, keeping in mind that these parts must fit together.

TOOL LIST: see photo.

Also, you will need an Antenna Analyzer or some sort of SWR meter that will work between 144 MHz and 148 MHz for tuning your antenna. The MFJ-259 and 269 analyzers are excellent for this.

Begin by drilling two holes near one end of the poly tubing with a 7/64" or 1/8" drill bit. Don't go through both sides. The first hole should be 5/8" from the end of the tubing. The second hole should be 7/8" directly above the first hole. These holes are for the antenna wire.

Next, you want to strip about 1/4" of insulation off the 20awg wire and push that end into the BNC connector (discard the connector crimp sleeve). The fit will be snug and the wire will be 'captured' and won't easily come out.

Insert the other end of the wire into the drilled hole nearest the end of the poly tubing FROM THE INSIDE GOING OUT. Continue this until the tubing reaches the end of the BNC connector where the wire is inserted. This is where your butane torch comes in handy. Notice mine is a Radio Shack torch. CAREFULLY heat the end of the tubing just enough for it to snugly slide over the connector body and come to rest at the shoulder. This is the hardest part as you want to keep the wire in place so it won't bunch up inside the tube.

Close-wind the wire tightly around the tube until you have eleven (11) turns. You should be near, or at the next drilled hole. Insert the wire into that hole... and pull the wire out of the end of the tube. Make sure you haven't pulled the wire out of the BNC connector.

It is now time to position the heat-shrink tubing over the wire coil. Use your butane or other heating device to shrink the tubing enough so you can see the individual turns of your coil.

Install the new antenna on your antenna analyzer or SWR meter and tune the antenna for the lowest SWR at 50 ohms impedance on frequency 146 MHz. Tuning is accomplished by shortening the wire, in small segments. The lowest SWR will begin at a low frequency. As you snip off pieces of wire, the 'resonance' of the antenna will increase in frequency. As you near 146 MHz, snip off only 1/16" at a time and check your readings. Also, during this phase, installing the end cap each time is important as it will affect the final readings. If everything is working out properly, the end of the wire will be about at the end of the tube.

Unlike those commercial rubber duck antennas as seen in my photo, your antenna is tuned for 2 meters. That means better performance and the satisfaction that you made it better than ICOM.



Partly assembled



Finished antenna



Tools



Antenna package

FCARC TECHNICIAN CLASS LICENSE COURSE

On January 12, four members of the FCARC started a six week training course for prospective new technician licensees. The class started with thirteen people, ranging from a sixth grade student in Greenfield to a retired doctor living in Erving. Many members of the class have participated in the Community Emergency Response Teams (CERT) and Medical Reserve Corps (MRC). One woman is also a fire fighter and member of the Civil Air Patrol. Two students are select board members in their respective towns.

With so many students connected to emergency response groups, the first class focused on using repeaters. Other classes have covered basic understanding of antennas and electronic circuits. Upcoming classes will cover operating procedures, modulation, equipment, and regulations. The last class in the series will be a review, followed by an actual exam.

Recently we received word that a neighboring amateur radio club in Vermont has scheduled a course for holders of a technicians license who want to upgrade to General Class license. The classes will be held in Brattleboro starting the first week of February.

Information about that course, including contact information, is posted on the FCARC web page. This is an unusual opportunity for people who want to upgrade but find their lives too busy or distracting to study the material on their own.

THE COMMUNICATOR is an informational publication for members of the Franklin County Amateur Radio Club. Officers: President: Chris Myers, KB1NEK (camyers_1@verizon.net), Vice President: Al Woodhull, N1AW (n1aw@arrl.net), Treasurer: Howard Field, N1LUP (howfield@comcast.net), Secretary: Bob Dickerman, WA1QKT (rld@dickermanelectronics.com), Director: Belle Dyer, KB1NOG (bdyer58@mtdata.com), Director: Bob Solosko, W1SRB (w1srb@arrl.net)

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 Bob Solosko at w1srb@arrl.net.

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