

The Monitor

Voice of the Twin State Radio Club

April 2008



Message from the President

It's not too early to start thinking about Field Day. I would like members to consider what role might be appropriate for each of us. I will be handling the computers, logging and networking. With AA1KL's radio we will have 3 high-quality contest-caliber radios so as to mitigate the front-end problems we had with our digital station last year. I would very much like to have a PR person this year. I don't think we had any mention in the local papers in recent years.

Rules have changed a bit. The GOTA station apparently is not as restrictive. I'm sure we'll find a few more odds and ends while reviewing the FD kit from ARRL.

There was some mention of a Sunday breakfast. I think that's a great idea. I have a two-burner coleman stove that could be pressed into service. Speaking of food, I think we could use a food and beverage coordinator. Volunteers? This could be nothing more than someone to get a cooler for some soft drinks and a cooler with some fruit, snacks and sandwich components (yes, I said "components". It's a ham thing.) Simple, cheap and enough to fend of starvation for those of us who just can't leave.

For anyone who hasn't been to our Storr's Hill FD site, you are in for a treat. It is really spectacular. It's the best FD site I've ever seen. No trees, but nothing in the way of those beautiful towers of ours. Wide-open spaces and outstanding takeoff angles in all directions. There is lots of room for camping overnight if you are so inclined. I will probably sleep over myself. Dean did last year I think even though the wind almost destroyed his tent during setup.

Upcoming Events

TSRC Meeting	April 12, 2008, 9:00 am EBA's, Hanover, NH
TSRC Meeting	May 10, 2007, 9:00 am EBA's, Hanover, NH

I would encourage everyone to think about a role. Operating of course is the core of the event but it takes a lot of before, during and after support to make that operating possible. Don't get me wrong: we've had a lot of people help out in recent years but I think we can make it even better.

Please let me know if you are interested or if you have any other ideas for the event.

Field Day 2008 is June 28-29 with Friday setup beginning mid-day. We normally meet for lunch somewhere near "World Headquarters" in Canaan and then adjourn to WHQ to load gear and transport everything to the FD site in Lebanon. We are usually wrapped up by late afternoon Friday. Operating starts at 2 pm (??) Saturday and runs for 24 hours. Teardown and returning equipment to WHQ is usually complete by 6 or 7pm Sunday.

Here's the URL for the 2008 event from ARRL:

<http://www.arrl.org/contests/announcements/fd/>

See you at the meeting!

William Daugherty
KX1Y

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This Month's Meeting -- Flying high

Bill, KB1MOV, is endeavoring to arrange for a member of the Dartmouth college faculty to attend our April meeting to describe their high altitude balloon project. Those of us who attended last month's meeting learned that some professors and students are working toward the launch of a ham radio equipped balloon later this Spring (if Spring really does materialize this year).

I've seen reference to two other radio equipped balloon launches in New Hampshire - one in the Keene area in 2000 and several at Hosstraders in 2002* - but the Dartmouth project will be a first in Upper Valley. Plans include equipping the balloon with APRS so the TSRC may have an opportunity to cooperate with the Dartmouth team in tracking and recovering the balloon. After the

balloon project is in the record books the team at Dartmouth has their eyes on a 'cubesat' launch using similar radio and telemetry technology. You can get the straight scoop on these projects at our meeting on April 12.

Before coming to the meeting try to imagine what might be involved in the balloon project. How big can the balloon be? How much weight is it practical to carry? How high might the balloon go? Are cold temperatures an issue? Who must give permission for a launch? [KA1CRP should know the answer to this one] Would you worry that it might fall onto someone or something? [No, you can't get the Navy to shoot it down.]

Ken Tentarelli AC1H

[* Did any TSRC members attend the launches at Hosstraders in 2002?]

W1FN on-air resources

The following is an excerpt from an email sent by Dave McGaw, N1HAC, our club repeater manager to the new site manager for Moose Mt. I have reprinted it here since it gives a clear, concise explanation of our club repeaters and other resources on Moose.

Our repeater system on Moose Mountain has 3 radios linked through a common controller. The primary repeater transmits on 145.33 MHz and receives on 144.67 MHz with 100 Hz PL (TX and RX). Our secondary repeater transmits on 443.55 MHz and receives on 448.55 MHz with 136.5 Hz PL (TX and RX). This is usually linked to the 2M repeater but can be unlinked and used independently. We also have a half-duplex link radio that transmits on 224.32 MHz and receives on 222.72 MHz with 136.5 Hz PL. Our system is all in one cabinet just to the left from the door in the shack. The 2M duplexer is hung from the ceiling above

the cabinet. The 2M radio is a GE Mastr II at 100 W output, the 440 radio is a GE Mastr II at 75 W output, and the 220 link radio is a Midland 13-509 at 5 W output.

Our antenna system is on the southwest leg of the tower on a sidearm at about 285 ft. We are currently using 3 DB Products (Andrew) open-dipole arrays, a DB224 4-bay on 2 meters, a DB408 dual 4-bay on 440, and a DB222 2-bay on 220. We have 3 runs of 3/4" hardline going up to it.

We also have a packet digipeater on 145.570 MHz, call sign W1FN-8. Its antenna is currently an AEA Isopole on the generator shack.

As part of our agreement with Bill Bumpus, since first installing our repeater we have been mowing the grass and clearing brush around the site.

We also help W1UWS with their 147.15 MHz repeater and K1JY with his 449.15 MHz repeater linked into the K1JY system.

VE Information

At last month's TSRC meeting there were some questions about the Volunteer Examiner (VE) process. Here's a quick summary of the ARRL VE program:

Anyone 18 years of age or older with a general or higher class of ham license is eligible to become a certified volunteer examiner. To earn certification you must pass a test. There is no fee for the test or the certification. Once you become certified your certification is automatically renewed provided you maintain a current email address on file with the ARRL VE coordinator, and you can do that simply by sending email to vec@arrl.org.

Complete information about the VE program is available on the ARRL web site.

There you can download a copy of the VE manual in pdf form or you can try to read it online. [I say try because the online display is the most poorly human engineered presentation I've ever seen. The presentation tries a technique that Apple uses successfully but the ARRL attempt falls far short -- at least for me.]

Having VE certification allows you to participate on teams with other VEs to administer tests to new ham radio license candidates. Test sessions require a team of three VEs. When/if the TSRC runs another license class we will need VEs to administer the tests and having more VEs in the club would give us flexibility in scheduling exams so consider getting your certification.

Ken Tentarelli AC1H

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==> GET READY FOR WORLD AMATEUR RADIO DAY ON APRIL 18

Each year on the anniversary of its founding, April 18, the International Amateur Radio Union (IARU) marks World Amateur Radio Day. On this 83rd anniversary of its inaugural meeting in Paris, the IARU dedicates World Amateur Radio Day to the future of Amateur Radio with its theme, "Amateur Radio: A Foundation for Technical Knowledge."

It is no secret that many professionals in the field of radio, TV, communications and electronics have started their technical education as young radio amateurs. Although Amateur Radio has a different

face nowadays -- Digital Communications, Voice over Internet Protocol, Satellite up- and downlinks and more -- it is even of greater value as a foundation for technical knowledge for youngsters. And much more -- it is and should be used as a unique attraction for future young radio amateurs.

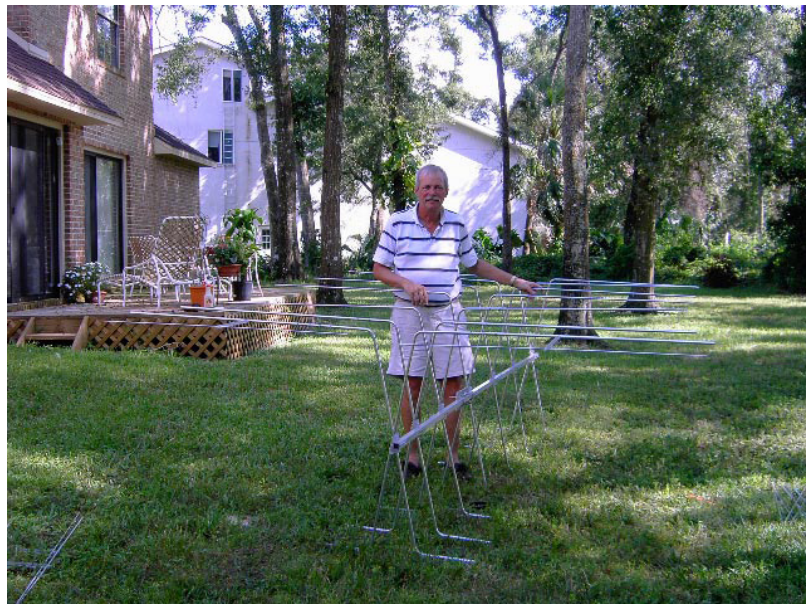
World Amateur Radio Day provides an occasion to promote and publicize Amateur Radio. Amateur Radio clubs are encouraged to find suitable ways of celebrating World Amateur Radio Day. Many ways can be considered -- inviting youngsters to visit radio clubs, showing up on the air with a special call sign, organizing a station in a public area with media coverage or publicly honoring amateurs who have made significant contributions. Whatever method is chosen, clubs should think about publishing a press release for the media, giving the background to World Amateur Radio Day and promoting the value of Amateur Radio as a foundation for a technical career.

The ARRL will be very pleased to hear how Ama-

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teur Radio clubs chose to celebrate World Amateur Radio Day. Share your stories and photos with us, so that they may be shared with the Amateur Radio community. E-mail your submissions to ARRL Affiliated Club/Mentor Program Supervisor Norm Fusaro, W3IZ <clubs@arrl.org>. Please be sure to put "World Amateur Radio Day" in the subject line. -- Information provided by IARU

W1IS and the Box Kite Yagi Dave WA1ZCN



During the week of April 1st, I traveled to Orlando, Florida, to the National Hurricane Conference to display my wares on the trade show floor. I had little time for other activities, but I did meet a former TSRC president for lunch on Wednesday.

Some of us have been around long enough to remember Dave (#3) Schaller, W1IS, formerly of Norwich, VT. Dave is an accountant who owned several companies, including radio stations and a gun oil company, but now runs a small travel agency with his wife in Port Orange, Florida. For those of you who knew him, he's well and doesn't look a day older than when he left years ago. Okay, maybe a day or two. Must be all that golf!

During lunch, Dave told me about an amazing antenna that resides at the top of his tower. It's possibly the only one of its kind in use, and was built for him by Brian Cake, KF2YN in St. Augustine, Florida who hopes to eventually bring it to market. According to Dave, it performs exceptionally well.

The antenna was designed by Cake and described in two 2004 QEX articles. It covers both 6m and 2m with excellent gain, front to back ratios, and low SWR. It also doesn't look like any other antenna on the market. Here are some of the specs:

Gain at 50 MHz	9.72 dBi
Gain at 144 MHz	15.35 dBi
SWR at 50 MHz	1.2 :1
SWR at 144 MHz	1.25 :1
2:1 SWR bandwidth:	
6 meters	49.5 to 51.6 MHz
2 meters	142.75 to 147.75 MHz
F/B and F/R ratio:	35 dB average
Boom length:	10' 6"
Boom	1" square section
Longest element	8' 5"
Maximum height	3' 5"



From the workbench -

Making your own shunts for ammeters

As I worked on my 6M transistor amplifier project this winter, I came to the part where I needed a 20 amp DC meter. The amplifier will put out about 70 wts when completed (I hope!) And runs on 12 VDC, so the DC supply needs to provide 10- 15 amps. The meter on the amplifier allows the user to make sure that the amp is working properly and not overheating, causing excessive DC current drain.

I went through the parts inventory and found that all my DC current meters were 100 MA or less. My first thought was to buy a 20 amp meter, so I went on-line and through catalogs and found that these meters would cost \$15- \$25 apiece. As it turns out, these units are basically low DC current- 1 MA to 100 MA movements with a parallel shunt attached. First, I chose a nice looking 0-10 MA meter to mount on the amplifier box. Since a current meter is a series-connected meter, all the current flows through the meter movement. So, how do you measure 20 DC amps with a 10 MA meter movement?

This is accomplished by putting a very low resistance in parallel with the meter terminals. This low resistance "shunts" most of the DC current around the meter. When the shunt resistance is set properly you can make a 10 MA meter read 20 Amps full scale- 19.99 Amps of current will flow through the shunt and 10 MA through the meter. You then remark the face of the meter to indicate that full scale (10 MA) now reads 20 Amps.

But how to build a shunt capable of handling almost 20 amps using readily available parts? I turns out that all you need are four small pieces of aluminum, some #22 bare wire, some machine screws, a couple of terminals and a little bit of experimenting! The idea is to connect short lengths of the wire in parallel between the two blocks of aluminum and then connect the blocks to the meter connections. A few years ago, I did build a DC meter shunt for a larger power supply and used a coil of #12 house wire (plastic coated) to get the needed shunt resistance, but it took up a lot of room not available in the amplifier project.

I found some small blocks in the junk box, paired them up and drilled two screw holes so that I could clamp two blocks together. Then I inserted one end of several lengths of the #22 wire between the blocks and tightened the screws. I did that for both ends of the wires- the wires are about 1- 1.5 inches

long. I added a terminal to each block before tightening the screws and soldered a large connecting wire (#14) to each terminal and attached the wire to the meter connections.

Now comes the experiment- these short lengths of wire do have some very small resistance (1.5" of #22 wire = .002025 Ohms) and you just keep adding parallel lengths of wire to get the right shunt resistance. I started with six lengths of wire in parallel and then connected up a power supply and a large wire-wound resistor load to create a current flow of a few amps. With the meter in line, observe the reading on the meter. (A caution- identify the + and - terminals on the meter- the plus terminal should connect to the plus terminal on the power supply) The idea is to divide the meter into four equal parts representing, in my case, 5, 10, 15 and 20 amps. If the meter reading is above the current you calculate is flowing based on the power supply voltage and resistive load, you will need to add more shunt wires so that more current will flow in the shunt. The opposite result means removing some wires so that more current will flow through the meter.

This is an iterative process and several tries are needed to get the actual total DC current to match the meter full scale reading. Start out with a load of less than 5 amps in this case, so you don't peg the meter and damage the movement. The resistance involved in this shunt are so low that most Hams don't have equipment capable of making the measurement, so you use the cut-and-try method.

Is it worth all this effort to save a few bucks? Well, it depends on your view of Ham Radio. Certainly, you can place an order on line, hoping your CC number and identity will not be stolen, and get the need part with a couple of weeks. Or you can wait for NEAR-FEST and hope that you can find the part you need there.

The approach I used is more typical of Ham Radio- learn how the needed item works, search the junk box (es) for parts and do some construction and experimentation. This approach leads to knowledge and satisfaction for the "do-it-yourself-er"... and also saves some money!

A good section on designing meter shunts and determining the internal resistance of a meter can be found in The ARRL Handbook and probably has been in there for many years, so you can find it in older issues.

73, Bill WB1BRE

The Program for our May meeting

There is a rumor being whispered about that Spring time and warm weather may actually arrive in the Upper Valley by the time of our May meeting [May 10, one week after Nearfest]. If that rumor proves to be true we plan to take advantage of the weather by including an outdoor activity as part of the May meeting. Following our usual (but abbreviated in May) business meeting we will exit the place of no anchovies in search of a fox. You heard it right -- a foxhunt. There's been interest among club members for having a foxhunt, but plans haven't come together for an evening hunt so this trial alternative will be to hold a hunt as part of a regular monthly meeting.

The rules may be changed at the last minute just to confuse everyone, but here is the scenario as it stands now: There will be two, or possibly three, entry categories: those with direction finding equipment, those without direction finding equipment,

and possibly a category for those with APRS. What is the point of categories you ask? Prizes my friend, prizes. Small but nice prizes will be awarded to the winners in the two non-APRS categories.

Recall that at last year's direction finding demo WA1ZCN showed it is possible to do direction finding with just a simple HT held near the human body. So even if you don't have direction finding gear you can participate in the non-DF category with others who are similarly equipped. And you unfortunate folks who don't have human bodies can still join the fun by riding along with someone else.

More details will follow, but this will be an easy hunt. The fox will be somewhere in the towns of Hanover and Lebanon and eager to be found. So don't miss your chance to get lost somewhere in the Upper Valley.

Ken Tentarelli AC1H

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