

SOLID COPY™



Summer 2004

The Bulletin of the
Richmond Amateur Telecommunications Society
P. O. Box 14828 - Richmond, Virginia 23221



RATS Field Day 2004

By Robert Orndorff, W4BNO

RATS Field Day 2004 will be held at the same location as last year – Laurel Park Recreation Area. The dates this year are June 26 and 27; it's always the fourth full weekend in June. Setup begins at 10:00 AM Saturday morning and the on air activities will start at 2:00 PM and run continuously until 2:00 PM Sunday afternoon.

Come out and join the fun. If you've never been on HF before, or just haven't operated HF in a while, we've got a spot for you. We will be setting up two HF stations and a 2 meter for talk in. Come early Saturday morning and help with the set up.

(Continued on page 2)

RadioCraft

By Mike Gabbert, K4AUR

BACKGROUND

It's amazing what can be done with just a handful of watts. There's already enough QRM (a.k.a. RF garbage) out there you have to fight without being a contributor to it yourself. Saving aluminum cans? Cleaning up after yourself at the park or the campsite? If we want to be environmentally friendly and conserve things, why not let bandwidth be one of them?

It's been just a couple of years now that I've been active in amateur radio, but many of the things I've done have been leading me—whether consciously or not—to a particular area of ham radio: QRP.

(Continued on, page 2)



The KX1. Built in 30M option, built in paddles and internal ATU are for another day. It's basically a CW transceiver, but it also receives SSB on 20 and 40 meters.

FIELD DAY from Page 1 . . .

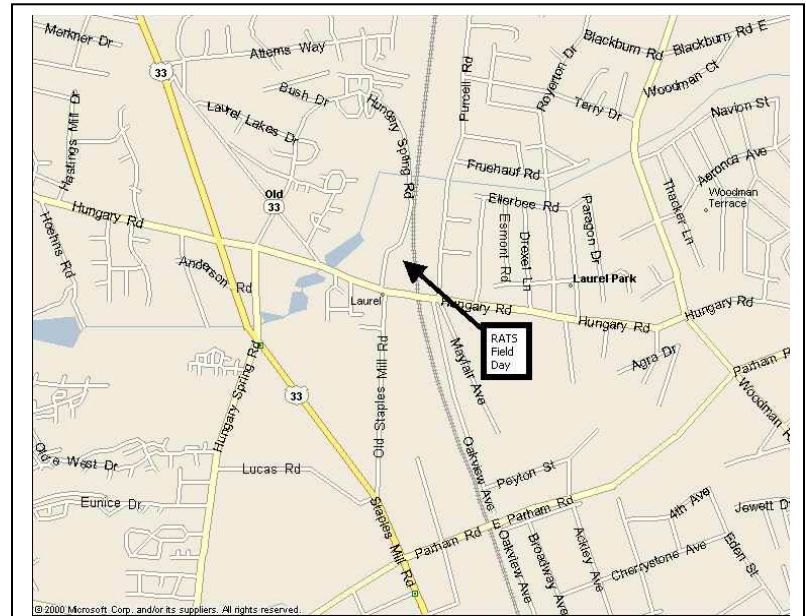
Amateur Radio Field Day has several purposes:

-Emergency preparedness. It's good practice to set up a station and have it completely operational in under four hours. You can learn about some of the practical aspects of setting up a station from the ground up. It's also good practice to quickly, efficiently, and accurately copy information given by the other stations.

-Public relations. Invite some non hams to Field Day and let them know what amateur radio is all about.

-Elmering. Come and learn about amateur radio from other hams, or come and help others to learn, or do some of both!

-Fun. We will have a club picnic Saturday afternoon. When you're not making QSOs, you can enjoy the company of the other hams that have come out to Field Day.



Field Day 2004 site: Laurel Park Recreation Area

-Field Day is also a contest. How many points can you help RATS acquire during Field Day?

The Laurel Park Recreation area has a picnic shelter, parking, and restroom facilities. The facility is located near the intersection of Hungary and Hungry Spring Roads. Talk in will be on the RATS 146.88 repeater.

If you are interested in participating in this year's Field Day, just show up! If you want to help with the planning of next year's Field Day, contact Robert Orndorff at w4bno@rats.net.

RADIOCRAFT from page 1 . . .

One of the first radios I bought was Yaesu's FT-817. One of my first QSOs on this rig was with about 2 watts to France. I must admit I thought I was on high power (5W), but I misread the power icon when using external power. The documentation indicated **||||** for high power. That's where I had it, but this was for internal batteries. A blank in place of the icon means high power for external power, in this case a 12V, 5Ahr gel cell. The QSO was a struggle, but finally completed. I thought, "Wow, France!" When I discovered I was using half the power I thought I was—really Wow!

Over the past few months I've been practicing Morse code. I'm by no means very good at it—yet. I was like many of you though, stuck at five to six words a minute. I leaned it just enough to get my Novice license. (Did I say active in hamming for only a couple of years? Well, I've been licensed since November 15, 1988—took the test on my birthday the month before—but was not active the first 13 to 14 years).

The practice paid off. I doubled my speed in just a few weeks time. I'm not saying 10 to 12 WPM is especially good, but it's double what I was doing before. It also dispels a myth I had held about my abilities in this regard. A few weeks of practice and I doubled my speed, a miracle. But it was an easy miracle. I'm not saying doubling it again will be particularly easy, but *it is now conceivable*. If you're making this attempt, find a Morse buddy. Forget the tapes* and other panaceas. Get on the air. Tune to the Novice portions of the bands and listen. Yeah, yeah, that's what everyone says. There's a reason. It works.

Another interest I have that leads me down the QRP path is a desire to build things. The first thing I built was a portable AM/FM radio during an electronics course I was taking. That was a lot of fun, but that was in a classroom setting where I could compare my work to other's, and get feedback from the instructor as I progressed.

* I must give Gordon West, WB6NOA, credit. His tapes are entertaining as well as effective in teaching basic Morse code. However, getting on the air and doing the "real deal" can't be beat for developing speed.

It's been a dozen years since I did that, and a few days ago I just completed another kit. A ham radio kit, the Elecraft KX1. This is a 4W transceiver which will receive CW or SSB on 20M and 40M. It will only transmit on CW. I have completed the basic radio. I also have the built-in paddle, the ATU and the 30M options to add to it. More about that next time.

If you like to build things and lament the passing of Heathkit, you've got a friend at Elecraft. They offer four major radio projects from the handheld trail radio I have, the KX1, to the K1, a larger QRP CW radio (which Robert Orndorff, W4BNO, recently built), to the K2 which includes SSB up to 15W, and finally the K2/100, a fully featured rig producing 100W of power—one that you build yourself.

KX1: THE KIT

The rest of this story is my impressions and experiences while constructing my KX1. If you're curious, the total time I spent on this project was 25 hours of spare time over the course of two weeks. It's easy to mark where you are in the text instructions which makes it's convenient for stopping and starting again later. Be sure to unplug that soldering iron.

Each assembly step has a box to check off when you complete it. Most of the steps are very easy solder installations, well described, in the text of the instructions with the part outlined and labeled on the printed circuit board.

The parts are tiny, but the only three surface mount components are preinstalled by Elecraft. Still, these fifty-something eyes can only focus to a certain limit. The writing on the diodes is way too small to see at 12-inches. Closer, and it all goes blurry. I suggest a visor-type magnifier. I used OptiVISOR's #5 which gives a 2.5X magnification and keeps your hands free to work. A good light is also essential.



One thing that has changed in soldering technique from when I was taught a dozen years ago until now is lead trimming. And it certainly differs from the old boat anchor days. When I was learning you trimmed the leads about 1/8 inch above the board. You left a nice, shiny, concave fillet of solder on the solder pad. These days you don't leave a fillet at all and trim the leads flush to the board. Can't have any little wires extending above the board, no matter how short. Either capacitively or inductively, they act like little antennas radiating RF to other components. Don't want that.

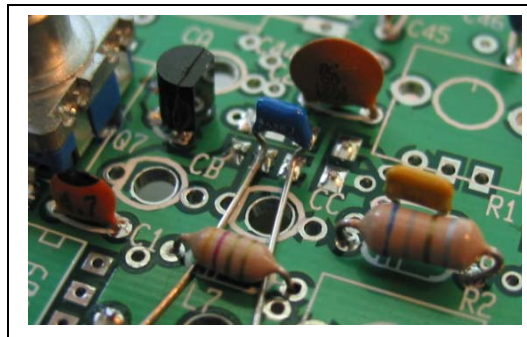
This means you've got to ditch those old diagonal cutters. If you look at the jaws of this type of wire cutter you will note that they are beveled on both sides. This will not allow a cut flush to the PCB. They now make a wire cutter which is beveled only on the top, the bottom is flat.

No other particularly special tools are required if you have a reasonable electronics tool kit. You will need a digital multimeter, a dummy load and a signal generator. The latter can be another HF radio transmitting into the dummy load on low power.

I began by installing R8, a 6.8K resistor on May 20th. My first concern didn't come until I got to X1, a 3.995 MHz crystal. If you are familiar with crystals, they come in an all-metal package, a metal "can." The text warns of using too much solder. The PCB is through-holed with traces on both sides of the board. This means it is plated within the hole. When you apply solder to the solder pad, it wicks through to the other side. For most parts this is of no concern. With the crystal you only want the two leads in contact with the solder. If the solder wicks back through the hole and comes in contact with the body of the crystal, since it is metal, it will short out. In addition, since the crystal sits flat on the PCB, you won't be able to see it if this happens. And there are four other crystals to install. And all five use discarded lead trimmings as a jumper from the crystal's external "can" to ground.

Other parts like ICs, electrolytic caps and diodes are simple to install. Even though they have to be oriented according to polarity or according to pin 1 with regard to ICs, it is well explained and clearly indicated on the PCB.

A couple of capacitors have to be installed without the aid of holes in the board to hold their leads. These two components sort of "piggy-back" onto the leads of other components. These can be pre-tinned and one of the leads can be tacked where it goes. When anchored in place the other lead can be soldered, then the tacked lead soldered securely.



"Piggy-backing" a capacitor:
With leads properly pre-shaped, Tack one pre-tinned lead in place, solder the other, then solder the first lead securely. Then trim.

Care must be use in making sure all components do not extend above a certain height. This is a tiny radio. If you leave them sticking up too high, there won't be clearance for the case to close or to accommodate the options like the ATU or 30M option. To

accomplish this some of the capacitors, an LED and several transistor have to be “folded” back on their leads to lay flat on the PCB. You have to perform the leads to accomplish this.

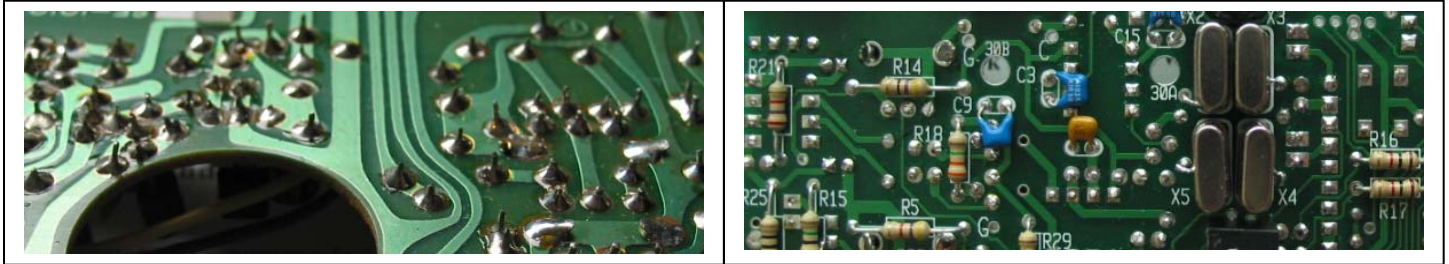


Image on the left is the way I was taught a dozen years ago. That was on a small hand-held AM/FM radio. On the right is the KX1. Note the difference in lead length and the fillets of solder on the left. Note, too, the traces—how big they were, and how much smaller they are now.

When I got to the first Alignment and Testing point I discovered my cheap pawn shop digital multimeter was not giving me good readings on all parameters. My DMM was indicating 117mV AC where a maximum of only 20mV AC was acceptable. This was important because there is a danger that a couple of voltage regulators might oscillate. This is bad and could be caused by a bad connection on one of the bypass caps or one of them being misoriented. One of the checks suggested by the text was using a different DMM. I did. 0.0mV AC. No worries.

Perhaps the most challenging part of the project are winding the toroids. There are four, three inductors and a transformer.

At completion on June 3rd I observed a problem of being off frequency according to the display. There are two adjustments called DSS and BFO which are supposed to correct +/- 200Hz. My problems are that on 40 meters the actual frequency is 2.75 MHz above what the display indicates, and on 20 meters I am 2.5 MHz under what's indicated. My suspicion is one or more of the toroids is miswound—either spacing is wrong or irregular and giving me problems.

TROUBLE-SHOOTING

I'll not be wanting one of those pink tickets (are they still pink) from the friendly O.O. for operating off frequency or out-of-band. So I'll rewind all the toroids and see where that gets me. Elecraft included plenty of wire if you have to start over a time or two, but there is a limit. The back of the assembly instructions does have a fairly extensive trouble-shooting section, but does not have an issue that matches mine. If rewinding doesn't work, I check in with the Elecraft techs. They have a very good reputation for being friendly and helpful. I'll report back next time.

Message from the President

By Jerry William, KJ4IT

Hello Fellow RATS Members! It was good seeing all the regulars who attended the meeting in May meeting and welcoming the following new members to the club: Mike Billie, WD8CHP, Roy Davis, WK4Y, Edith Davis, KE4NLJ, Lee Horton, W5IAV, and Dave White, N4LFU.

Good fellowship was had by all especially those who took part in the set up and operation of one of the club Kenwood TS-570 HF Transceivers as a part of 'Club Station Night'. Last year about this time we used one of our Carolina Windom dipoles as an antenna but due to the close proximity of vehicles it was decided to erect an 'Outbacker-Perth' vertical on its own stand. Jay Silvio, N9WMU, very graciously loaned this to me sometime ago. While the Outbacker is a 'compromise' antenna, it is popular with apartment dwellers, mobile-ops and RV'ers. Nonetheless, using written instructions and help from more experienced hams a contact was made in Sioux City, Iowa. While there was not enough time to explain why a dipole is better than an Outbacker if you have the room, or how to tell which band is open and the finer points of HF transceiver operation, there will be other 'Club Station Nights' and Field Day for you to come out and learn more about this part of the hobby.

Nominating Committee Report:
Saturday, June 26, 2004 from 9:00 A.M. to 10:00 A.M

A number of very important events take place in June and you should make plans to attend these events. The first is the report from the nominating committee. This year the meeting to accept this report will be held on **Saturday, June 26, 2004 from 9:00**

A.M. to 10:00 A.M. at Laurel Park in Henrico County just before the set-up for the RATS Field Day. This year the Chairman of the committee is Dave Kiefer, N4DWK, who is being assisted by Jay Silvio, N9WMU, and Rob Smith, K4MAU. They will present nominations for Treasurer, Secretary, and two Director positions. Also at that time nominations from the floor will be accepted for these positions from the General Membership. Directions to Laurel Park appear elsewhere in the newsletter. Please plan to attend.

Nominee biographies will be mailed to all members in good standing along with ballots for the election beginning in July. Members should return their ballots no later than the August meeting where they will be counted and the winners announced. The winners will be sworn in at the September meeting.

Field Day, June 26, 2004

Robert Orndorff, W4BNO is putting together the RATS Field Day plans. The event will be held at Laurel Park Recreation Area off of Hungary Spring Road. A map and event details appear elsewhere in this newsletter. This is an important event; no make that a contest to hone our skills in setting up and operating an emergency station. Once again the club HF stations will be on hand, as well as club experts to guide your operations anywhere on the ham bands using the club call W4RAT. This is a good time to come out and operate with your fellow RATS members. *And bring a prospective member with you to join in the fun.*

Special Olympics, June 11th and 12th, 2004

This year the Special Olympics will be held at the University of Richmond Robins Center on the U of R campus. Andy Anderson, KB4JXS, is heading up this event by coordinating amateurs assisting with the communications. The Special Olympics is a national event featuring athletic events for those with physical handicaps. This will be my first experience with this event but I am told it leaves you with a good feeling to see the effort put out by these athletes in this competition. Please help support your club by calling Andy at 561-3386 and volunteer to be a part of this worthwhile event.

RATS Silent Auction

Deadline: Midnight, June 24, 2004

The RATS owns a lot of communications equipment and I mean a lot, tens of thousands of dollars worth in fact – just wait until you see the inventory that will be published on our website in a few weeks. Be that as it may, we do have one item that definitely in excess to our needs and that is a dual band, 2M – 440 all mode transceiver. By all modes I mean CW, SSB and FM. This transceiver has been used in satellite work and I am told it works very well and that we have all of the documentation. By now you should have received the bid announcement in a separate E-mail with details on how you can bid and possibly win this unit. Don't delay, bid now by following the instructions in the announcement. Remember—this is being sold “AS IS, WHERE IS” and there is no warranty included. Your BID is your word that you will complete the sale on this exceptional piece.

Well that is all for now folks. I'll look forward to talking with you on the air and seeing you at Field Day and other events.

73,

Jerry, KJ4IT

CQ, CQ, SEEK YOU!
**AT THE NEXT
RATS MEETING**

R.A.T.S. meets monthly the third Friday of the month at 7:30 PM at the West End Volunteer Rescue Squad building at 1802 Chantilly Street, Richmond. From Broad Street, Chantilly is the first block east of Staples Mill Road. The WEVRS building is ½ block south of Broad on Chantilly.

There will be no regular meeting in June. Instead we will meet at the Laurel Park Recreation Area for Field Day Weekend as described elsewhere in this newsletter.

VE EXAMS

Exams for licensing or upgrading for the next three months are as follows. There are two locations, the W5YI VEC sessions in Chester and the ARRL VEC testing in Richmond. Bring \$12.00 cash (exact change) and two forms of ID, one of which must be a photo ID. If you are upgrading, you must bring the original of your current license *and* a photocopy of it.

If you have credit for previously passed element(s) bring your original CSCE *and* a photocopy of it unless your current license reflects these endorsements. Arrive 15 minutes early. Preregistration is preferred, but not required (unless you are taking the CW element in Chester, then required). Walk-ins are welcome if seating and materials are available.

The first exam is June 12th at 9:00 AM at J. Sargeant Reynolds Community College, 1651 E. Parham Road, Richmond, Building B. For more info contact Patrick Wilson, W4PW, (804) 932-9424 or go to:

<http://www.w4pw.org/hamtests.htm>

The second testing will be July 7th at 7:30 PM at Pietro's Restaurant at the corner of Jeff Davis Highway and Osborne Road in Chester. For more info call (804) 768-2255 or visit:

http://www.kr4uq.org/V__E__EXAMS/v__e__exams.html

The third test session of the summer will be at the J. Sargeant Reynolds location on August 14th at 9:00 AM.

RATS ONLINE:

<http://www.rats.net/forums/>

<http://www.frostfest.com/>



<http://www.rats.net/>

<http://membership.rats.net/>

New Look the the Style

As you no doubt have noticed, the pages are no longer divided into three columns. Since we are going to a primarily online newsletter this was done to facilitate reading while online. Thanks to Allan Thorn, N4NLQ, for bringing this idea to my attention. This allows you to read an article continuously from the top down. You no longer have to scroll down a column and then back up a couple of times to finish each page.

You also note the newsletter is no longer limited to three pages of text. This one is twice as long. I hope you like the longer articles and increased use of graphics.

What Do *YOU* Do?

Nature abhors a vacuum. And so do newsletter editors. I don't know what editors call it—I just call it too much white space. Broadcast radio folks call it *dead air*. You could be filling up this white space by sharing your exploits in radio. Are you working to upgrade your license? Have you found a better way to learn? Discovered any cute mnemonics to help you learn the electronics or the FCC rules and regs? I know a few like my friend ELI the ICE Man.

If you've just tried something new, and have really gotten excited about it, share the fun with the rest of us. Don't worry that people will think you can't spell (thank goodness for Spellchecker), or don't tell an interesting story. If it's about radio and you're excited about it, we'll be interested.

Have you just accomplished DXCC? WAS? Made you're first CW QSO (I did that not too awfully long ago)? Tell us how you did it. Give us the details. What was hard about it? Were your waiting three months to get Alaska or some other state to finally achieve WAS?

Are you a contester? Did you finally get *your* score published in *QST*? Even if you didn't win, did you score a personal best in points? What are your 'tricks of the trade'?

I've spent the past couple of years sharing my interests and some of the things I've done. Now it's your turn. Just send me your story by email to me at k4aur@comcast.net or to the club mail box to the attention of the editor.

Solid Copy™ is published by the Richmond Amateur Telecommunications Society, Inc., PO Box 14828, Richmond, VA 23221.
Copyright 2004. All Rights Reserved.

Voice Mail System: (804) 790-0077, mailbox 7287

Internet E-mail Address: rats@rats.net

RATS Web Site: <http://www.rats.net>

Frostfest Contact: Jim Clark, N3JJF (804) 271-1998 or email to: volunteers@frostfest.com

Field Day Chairman: Robert Orndorff, W4BNO, w4bno@rats.net

Editor, *Solid Copy*, Mike Gabbert, K4AUR, k4aur@comcast.net

The purpose of **Solid Copy™** is to provide club information and amateur radio news to members of the Richmond Amateur Telecommunications Society. Information or articles for inclusion must be received no later than the first of the publication month.

Submit via the Internet at editor@rats.net. Opinions expressed in **Solid Copy™** do not necessarily represent the views of the officers, directors, or members of RATS, Inc. Material in this data file may not be reproduced or distributed **IN ANY FORM** without express written permission from RATS, Inc.

Board of Directors

Jerry Williams, KJ4IT, President kj4it@rats.net

Marie Long, K4KML, Vice President k4kjl@rats.net

Charlie Tribble, WA4ERC, Secretary wa4erc@rats.net

Arlo Amstutz, WA4RLO, Treasurer wa4rlo@rats.net

Warren Winner, W4UIE, Director w4uie@rats.net

Jerry Long, K4KJL, Director k4kjl@rats.net

Guy Carlsen, K4CNF, Director k4cnf@rats.net

Parke Slater, N4KFT, Director n4kft@rats.net

Robert Orndorff, W4BNO, Director w4bno@rats.net

The board may also be contacted, as a whole, at board@rats.net. Please feel free to contact any of us regarding RATS business, information, and ideas.

R.A.T.S., Inc.
P. O. Box 14828
Richmond, Virginia 23221

Stamp
Here

FIRST CLASS MAIL

Forwarding & Address
Correction Requested