

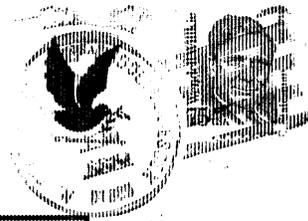
January 1995

72

THE NEW ENGLAND QRP NEWSLETTERS



NE-QRP Club  
P.O. Box 2226  
Salem, NH 03079



TO:

94NE1

Jim Fitton, W1FMR  
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Salem, NH 03079

72 ☺

THE OFFICIAL NEW ENGLAND QRP  
NEWSLETTER

# Write For 'Your' NEWSLETTER

The goal of **72** is to make it easy for you to submit your ideas and suggestions for all to read. Send your materials, hand written or typed or MS-DOS to **72**. Floppy diskettes, MS-DOS Windows gladly accepted, and be sure to put your phone number and return address in case a follow-up is necessary. Real technical articles may be sent to John Collins, KN1H, **72** Technical Editor, at the address below.

THE DEADLINE FOR THE NEXT ISSUE OF **72** WILL BE APRIL 1, 1995.

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Kkkkkk



## IT'S MY TURN!!

You have read it, talked about it and even smiled occasionally with it, but have you ever heard from your ZZ editor? Up till now, you have not heard anything and I must say, I did take a back seat to all that went on around me. Now, I am on the keyboard and I want to say, "It's my turn to say what's on my mind."

I would like to address the topic of other QRP club newsletters I have received or seen, either because I am a member of other clubs, or because the newsletter is an 'exchange' with the New England Group. I have read the NorthWest QRP newsletter by Bill Todd - N7MFB and it has to be one of the nicest in his territory. A lot of good work goes into his material and I enjoy it. The Oklahoma QRP Group has an exceptional newsletter which teaches you a bit as well as entertains. Les McGinnis, the editor, is truly on top of things with his material. The QRP Quarterly, ARCI, is reorganizing with the help of Les Shattuck - WN2V. In time, this flag ship organization will have the same ingredients as the ARRL. Has to all amateurs who receive QST. The hefty publication is going to attract a lot of QRP'ers and we should contribute an abundance to the ARCI newsletter, for our own sake. The Michigan QRP Club, spearheaded by Lowell Corbin - KD8FR always has a first class newsletter for his members. They have been changing staff positions with a new editor on board, but the Club and its members have a slick presentation. The QRPP, NorCal QRP Club always has a plenteousness of material which satisfies even the most hungry reader. Doug Hendricks - KI6DS works feverishly making sure his members get a lot for their newsletter. It never ceases to amaze me, again, how much material and effort goes into his newsletter. You might even classify it as a small magazine. Good for you, Doug. Also, there is THE LOW DOWN newsletter, put out by the Colorado QRP Club. It's format is the same as the NorCal group but doesn't have the same number of pages. (Pages cost money!) Their composition and arrangement are pretty neat and eye-catching. Rich High - W0HEP has done a great deal of work for his club and newsletter and it shows. Again, KJUDOS to you Rich, and keep it coming. The PEANUT WHISTLE, published by the St.

Louis, MO QRP Society is still another QRP bulletin in the making. Their open discussions and careful reviews make for very interesting reading. They started off with a small force of 14 members and it has swelled many times over. In Illinois, Donald Kozlovsky - KE9GG has initiated a single page, three column bulletin for the NEIQS, which stands for the North Eastern Illinois QRP Society. It's a beginning and with the enthusiasm which has been built upon other QRP groups, Don's will catch on fire and pour forth with exciting, interesting and worthwhile QRP narratives. Keep me on your list, I'd like to see your club newsletter soar.

I have not mentioned the other QRP clubs across the country and across the oceans because the list just goes on. There is the CW Operators QRP Club in St. Marys, Australia, the G-QRP Club, headed by Mike Kilgore - KG5F in Carrollton, TX, the U-QRP Club in Saransk, Russia, Chuck Adams - K5FO newsletter from Lewisville, TX, EA QRP Club in Barcelona, Spain, WI QRP Club in Brandon, WI, the Central Pennsylvania QRP Society in Mount Wolfe, PA, and the Arizona QRP Club in Scottsdale, AZ. I think you have a feel for what we're doing...the editors, presidents and QRP leaders in each area. QRP is alive and kicking hard. Appreciate what you're seeing and hearing and give praise when you feel something hits you just right. Keep your destructive comments locked up in your mind and carefully choose your words. I feel it in my bones, QRP is a new wave of amateur radio which isn't new, but simply in it's renaissance. Let's all go for it!

There's certainly a lot that has to be said for deadlines on any newsletter, and this is the single biggest problem with any publication. Also, the proofreading department is tedious and time consuming, however, it has to be done. Good newsletters just don't roll off the press and into your hands, they're groomed, manicured and garnered to suit the club's needs. When you're writing a story or a technical article, take a few minutes to have it 'proofed' or give it a few extra minutes to make sure it's truly what you wanted to say. A few minutes now will save you headaches in the long run. Furthermore, to those people helping put together a newsletters, the tertiary help—the contest managers, the technical editors, the membership editors who contribute to the newsletter, don't rely solely on one person to do your job but GET ACTIVE. Make sure your materials are presented in time for every issue, and make sure you have done an honest job of your area. If you need an assistant, recruit and get going, but don't sit back and wait for the 'happenings' of QRP radio to fly on to your bread plate. It just doesn't work that way. Help your editor to help your club and gather all the information you're able to in order to produce a fine newsletter.

Let me digress a little and say who your editor is. I was first licensed at the latter part of the 1950's and haven't stopped enjoying my hobby for a second! I am the proverbial fisherman...hook, line, and sinker. Once that rosin flowed under my nose, I knew I had a hobby for life and I am still going strong. I have lived in New Hampshire all my life, went to an infamous college in Iowa (Parsons College) for a BA in English and studied for my Master's degree in English at Fitchburg College, in Massachusetts. I have taught English for twenty-three years and have two grown boys, who don't much care for Dad's hobby, ages 17 and 22. A lot has happened in the last four

years that has upset my life, my life style and my whole outlook on where I am.

I have often wondered how many marriages were succumbed to divorce partly because of radio. I often wonder this because my ex-wife totally hated radio to the point where if my panel light was lit on my handy, she wouldn't sit in the same car with me (no volume...just ON). A lot of QRM and QRN developed, however, the hobby never died...only rested. As with the American dream, I was divorced last year, after a bitter, bitter legal run-around, which left me without my home and I am now living with my retired parents. I had nothing in my pockets and only the clothes in a paper bag when I moved back home. My job became increasingly difficult for me to perform, with my ex-wife working directly across the hall from me. (Yes, she was a teacher, also.) But I still had my radio. Thank God!

I packed all my ICOM gear into their respective boxes and stored them away for 'just a short while.' I had a new Kenwood TS-450-SAT, but my home-made G5RV harmonic antenna at my parent's house was all that I was allowed to raise into the sky. At least I was on the air. As each day went by, and the summer months came upon me, I decided to leave my school and search for another. Was I surprised to find that nobody wanted to hire a veteran with 23 years experience in English and a couple of degrees. I was out of a job! I had nowhere to turn. I was losing my mind...well, not exactly. I still had my hobby and radio kept me in good therapy.

There were days when I couldn't understand why anything was happening to me and my 'SWR' would overload, but I always had my CW and RF to keep me alive. I met up with the New England QRP Club at Deerfield, NH one day and talked to WIFMR - Jim Fitton. The following fall, I met more of the QRP gang at the ARRL convention in Boxboro, MA and signed up for a club which has never ceased to amaze me. At one point, in the 72 newsletter, there was a plea for an editor to come aboard. I had the time, I had the skills and I had a pretty slick 486DX33 Turbo Tornado. (That was the name for my previous work station...I don't have it anymore. I have the Pentium 90. A little faster.)

I talked a little more with Jim - WIFMR, who in turn talked with the other members of the QRP gang and was told I 'had the job.' The rest is history, for I have been editing your newsletter for over a year and a half, however, this is my first "editorial." The response from most of the members I meet is positive, but there is always room for improvement. Send me your views and let's see how far they'll go in the newsletter.

I have kept a running policy in my mind when doing the newsletter and that it had to be fresh! Not too much of the rehash, and I tried to stay away from the hand written schematics...that only the author knew what they meant. I wanted to make sure the grammar was half way decent and that, for the most part, the spelling was correct. On every issue, I spend over 50 hours "getting" it together, so you'll have a fine newsletter to read. I tried graphics to make the newsletter come alive and even went to the extreme of 'spending' a lot of money to present the finished newsletter on a laser printer. Ah, what a

man must do to get his work finished, nonetheless, it had to be done and I did it.

Another topic worth mentioning is restricting the number of members who belong to any QRP club, or organization. It's suggested that a cap of maybe 300 be imposed to belong to the New England QRP Club, and this I totally OBJECT to. If we limit the last member to our club, we may be blocking off another great RF designer, or another fine writer, or perhaps a fellow who simply wants to belong, but can't because there are already too many on board. I see no merit in establishing numbers and see detriment in the long run. It would be cataclysmic to NOT BELONG when you have so much to offer. Imagine what it would be like if you were member 301 and you couldn't 'come on board.' There's too much to lose and little to gain for such thinking, plus it would be one giant leap on your face for all mankind. Let's think this idea through and see what we'll benefit in the end.

I am not one to be too critical, however, I just cannot understand one more thing. I have to say that a lot of members throughout the country are referring to us as The New England QRP Club, and by right...it's easier to think of us that way. You have the North West QRP Group and we're just the weights of balance on the East coast. What is our official name...? Well, the name someone came up with initially was QRP New England, which is similar to QRP ARCI, but every other club everywhere in America, and more, are referred by the proper adjective

followed by the location, e.g. The St. Louis QRP Society, Michigan QRP Club, NorCal QRP, the Colorado QRP Club so it would seem logical that the six states in the upper northeast be cited as the New England QRP Club. Just when you thought you had enough to worry about, another problem arises.

I have just about used all the space I can afford in this newsletter and will not be as vociferous the next issue. I felt I hadn't spoken to the membership

since I took on the helm of editor and I wanted you to know I am alive and well. *There is one thing you can do for me*, and that is to see if there are any English teacher openings in your area. I still need a job where I can be gainfully employed and carry on the tradition of making and using QRP rigs. If there's a place in your organization for a technical writer, better still, a top of the line sales representative in your company (did you see me at the ARRL QRP forum in Boxboro?), or a technical trainer, I certainly want to hear from you. Maybe it's about time I did, so drop me a line and "we'll do coffee." I couldn't be more serious than I am right now. Give me a call or drop me a line and share some words of wisdom. I'd like to hear from you. I certainly would like to start a newsletter for your organization, if I could work for it. Don't let a good mind go blank.

**72 & 73 Dennis Marandos - K1LQ**

**Editor 72 Newsletter**

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## FIRST SILICON A TRIP DOWN MEMORY LANE

Joseph H. Everhart, N2CX - NE#280  
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Some recent postings on the InterNet QRP mail list and an article about simple QRP rigs by Jeff Herman - NH6LL, brought back memories of my early QRP attempts. During the sixties, I was in high school and I was adventurous, so I was intrigued by thoughts of building a QRP rig with transistors! Those of you who date from that era may remember that few germanium transistors were good for RF power, and the earliest silicon 'jobs' were useless for anything above audio frequencies—and, they were darn expensive. Then, the day of the plastic case transistor arrived...and changed the whole picture.

I had a friend who worked at RCA and who got me a couple of the plastic packaged 2N2711 transistors. They were, in fact, pre-production samples that didn't even have package markings. My friend also got for me a copy of the GE Transistor Manual, which was a treasure-trove of circuits and application ideas for GE transistors, and other semiconductor devices.

One of the circuits was a "LOW POWER VFO CW TRANSMITTER," and it used two 2N2711's. WOW, what a blast! It was what the pre-WW2 guys called a MOPA design, with a variable oscillator and an output amplifier. I built the circuit in an old bread baking pan (inverted, of course). I guess that was a step-up from a breadboard . . .

I used the techniques learned from tube transmitters. I used a #49 light bulb as a dummy load, figuring that its impedance would be reasonably close to 50 ohms. After all, since  $R = E/I$ , it should be  $2/.06 = 33$  ohms. I was too naive to know about cold resistance and inductance of the filament, etc.

The darn light bulb wouldn't light up when used in place of the antenna. My RCA friend pointed out that the bulb's low impedance was swamping out the amplifier's high impedance tank circuit. He recommended I tap down on L2 and feed the bulb through a 0.1  $\mu$ F capacitor. I did and I varied the tap position up and down the coil until I got maximum bulb brightness. (Not full brilliance, since this would have taken 120

mW.) The measured DC collector current to the amplifier was about 10 to 15 mA at resonance with a 12 volt battery supply.

Next, I put my circuit on the air. Disaster! My antenna was a 70 foot, end-feed, long wire with an L-network antenna tuner. It worked fine with my crystal controlled "big rig" (35 watts). But, when I connected the QRP rig to the antenna, my rig wouldn't stay on one frequency. Tuning C3 on the output tank OR adjusting the antenna tuner pulled the transmitter frequency like mad!

I figured that the coils in the two tank circuits, L1 and L2, were coupling to each other, making both the oscillator and amplifier transistors oscillate. In my receiver, it sounded as if several cats and a gaggle of bag pipes were all having a 'jam session.' To fix this problem, I kept the oscillator coil, L1, below the chassis and mounted the output tank, L2, above the chassis. This gave me relatively stable operation.

Then I set up an on-the-air schedule with my friend, who lived only a few miles away from my QTH. Success! However, he told me that my frequency kept changing, apparently from my operating table vibrating from my pumping the Morse key. I made a few mechanical fixes to rigidly mount L1 and put a bottom plate on my bread tin chassis to add stiffness. This gave me a fairly steady signal.

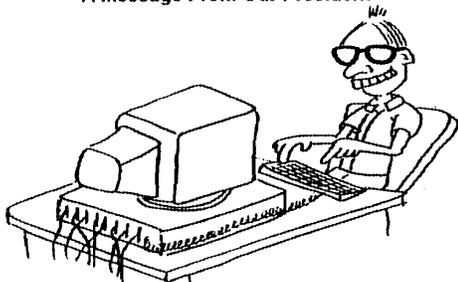
I used the rig for several months, making a number of contacts with local stations, but no real DX. My best effort was to work a fellow on Long Island, something over a hundred miles away, giving me my first 1000 mile/watt QSO. Now, if only I'd kept that QSL card.

72 - Joseph H. Everhart, N2CX - NE#280

### Cheers and Jeers for 1994

- Cheers - Great, nifty QRP rigs from some of the greatest RF designers in this country. We all prospered from their work.
- Jeers - Too many high-priced commercial QRP rigs on the market which sold for 5 times the price of making one yourself.
- Cheers - The DX bands coming alive with DX and coastal contacts. New WAS QRP awards in the wings.
- Jeers - The low sun-spot cycle we're in and the moderate QSO per hour contacts.
- Cheers - The great QRP clubs springing up across the USA. Obviously, we're in a new phase of amateur radio a lot of people thought was idle or forgotten. Even the *major* national/international radio magazines are giving page space to QRP projects, events and most important...people.
- Cheers - For the easier accessibility of parts from local QRP clubs and mail-order houses. If Radio shack would only stock toroids.
- Jeers - To the high-power, fat rigs, packet-loving, noise-producing, scan-imaging signals who simply want to test their signals in the QRP zone of any band. Give me a break!
- Cheers - To the number of fine QRP Club publications cropping up and being read by QRP hungry building gadgeteers who can't read enough about QRP. Hang in there for there's more to come.
- Cheers for those who remembered to renew their membership to the New England QRP Club. 72! Dennis - K1LGG.

### A Message From Our President



**Jim Fitton - W1FMR - NE#01**

Happy New Year from the QRP-NE Team. 'Hope Santa was good to everyone (no KW amps!) A lot has happened since the September issue of 72. W1CFI Paul Kranz, and W1FMR Jim Fitton, talked about QRP to the Wellesley, MA radio club. The club treated us to dinner and provided excellent hospitality. K1LGQ Dennis Marandos and W1FMR, Jim talked to the Derry, NH Repeater Society. The club members treated us to doughnuts and coffee. Someone should rate clubs based on hospitality. This could be a deciding factor on whether to talk, or not to talk, to club in the area. Sounds like a nice idea. Most clubs try hard, and occasionally one is downright rude to a speaker. I think politeness may be inversely related to distance traveled. At Derry, NH, Dennis, K1LGQ displayed some of his finely crafted rigs, test equipment, and wry wit as he was the hit of the evening.

The QRP-Afield event still echoes in my mind as one of the best QRP events ever. Requests have been made for us to run a spring event as well. Another club is welcome to run one in the spring or summer. The date for the next (fall) QRP-NE Afield is Saturday, September, 16, 1995. Times TBA elsewhere, but perhaps by the June issue you will know exactly. Start building a rig NOW! Excellent, simple, yet high performing rigs and kits are available (see this issue). These rigs fit your pocketbook and your backpack!

Congratulations to the W1FD Connecticut team for winning the first QRP-Afield trophy! AA1EX, Chet Bowles ran the event, and K5FO donated the trophy. Nice job guys, and thanks!

The next QRP-NE meeting will be held at the ARRL Headquarters on Saturday, February 18, 1995. A special thank you to Michael Tracy, KC1SX, who will host QRP-NE for the day at the ARRL. The official announcement is elsewhere in this issue.

The (flexible) itinerary is:

- 9:00 a.m.** Arrive ARRL - Show and Tell your HB gear.
- 80 meter VXO design contest - In this issue
- 40-40 rig troubleshooting session with NN1G
- 10:30 a.m.** - 12:30 p.m. QRP family get together
- 12:00 p.m.** Out to lunch.
- 1:00 p.m.** QRP-Afield trophy - Present to W1FD
- 1:30 - 4 p.m.** Operate W1AW/QRP
- 4:00 p.m.** Head home.

We may caravan to a nearby Newington motel if there are enough interested in holding a Friday night QRP "BASH".

All dues are due NOW! Read your label, and pay today

A few of the club Team-NE staff met in November to discuss club direction. We came up with a one word mission statement: "CODE". It stands for Construction, Operating, Design, and Education, the 4 pillars of QRP. That is what QRP-NE is all about and we will accomplish this goal with more home brew projects, a new Novice net, and other events designed to improve the QRP-NE CODE.

We also discussed limiting the club to 300 members. What about a club of only participating members? With a full participation club, members demonstrate interest by participating. At QRP-NE events, we get 10 or 15 participants at the most. Could we be barking up the wrong tree? Maybe our call sign should appear on club sign-up sheets, or event operating log sheets, or on the officers, or writers list for 72, in order to be considered qualified for membership. Something to think about. ARCI has a dire need at this time for a qualified new president. There is a nice travel allowance for the office holder. Yet, there are no takers. Could this happen at QRP-NE?

By popular, participant demand, the 79'er C.W. Sprint will be repeated. This February, (next month) each Thursday evening, Colorburst Crystals come alive. The 10 or so folks that entered last year loved it. Frankly, I don't know if we could manage more than 10 xtal controlled stations on 3.579 MHz all at one time unless they were pretty savvy operators.

Please respond to the NG1G survey in the Sept. issue of 72. Jack is interested in finding out what you are interested in. Future projects hinge on your reply.

Contact Greg, WA1JXR to offer encouragement for the new Novice net announced in this issue. You need not be a Novice to check in.

All officers: Please itemize expenses. Treat our beloved treasurer with due respect.

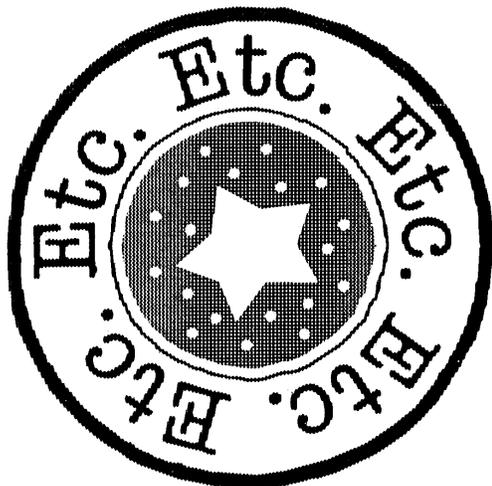
A hearty welcome to Al Bates, W1XH, the new distributor for 72. Al is the most experienced QRP'er in our midst. He started QRP Field Day gatherings back in 1985, and holds ARCI club number #79! Thanks Al.

On Mondays, Harry, W1LMU runs a 75 meter SSB net for QRP'ers. The 9:00 p.m. net gets a lot of competition from southern stations, but Harry is very persistent and does a great job. He cannot understand why so few members check in.

I would like to mention some advantages presented by the current wave of QRP and QRP clubs for enterprising individuals. There are opportunities for small businesses in this business. Alliances with QRP clubs provide clubs with needed HB projects and cash, while the business grows. In these days, customer service, teamwork and relationships, are extremely important. QRP (and amateur radio) presents a win-win situation for awake and aware team and relationship builders. One wonders if this opportunity exists with other types of clubs also? The Information Superhighway provides yet unknown opportunities to the imaginative person. I feel one thing for certain, team players car-pooling with QRP clubs along the Information Superhighway may run into more "good luck" than they ever expected.

Happy and Prosperous New Year.

**72 from Jim Fitton - W1FMR NE#01**



Building The New England QRP Club  
"Thirty-40" Transceiver  
Bob Gobrlick VO1DRB/WA6ERB

Do you want to put some fun back into your ham life? If so, then consider building the New England QRP Club "Thirty-40" Transceiver kit. The Thirty-40 is an unbelievable performance-to-price ratio value for a "first-time" kit builder or an experienced builder who wants to build a little rig with that something "special". The kit is even lots of fun to build. What's even more fun is operating the Thirty-40. I reveled in the thrill of having the Thirty-40 push 1 watt plus into a longwire and working up and down the East coast and a nice QSO with Yugoslavia.

You can read all about the design of this rig in the New England QRP Club newsletter *ZZ*, or just take a peak in the November 1994 issue of *QST* and read Dave Benson's NNIG article. Rather than talk about the design, I'd like to tell how much fun it is to build the Thirty-40. The New England QRP Club instruction manual for the Forty-40 and Thirty-40 units gives some great building tips. I'll supplement those tips with some of my own and also let you know what "tools" I used to build this fun kit.

The kit parts

At a price of \$40 plus postage, you may wonder what you get in the way of components for such little money. You actually get quite a bit—resistors, capacitors, transistors, integrated circuits (IC's), crystals, toroids, wire for the toroids and a printed circuit (PC) board. The PC board is a single-side board which is a good board for a simple transceiver. I have recently built some "bigger" kits using pc boards with double-sided and plated through holes and believe me, it is easier working with the Thirty-40 single-sided board. Double-sided pc boards offer a number of design advantages but soldering double-sided boards with plated through holes requires some additional soldering skills.

With a single-sided-board you 'sense' when you have enough solder on a joint by watching when the solder "blob" begins to "grow". As you gain soldering experience you intuitively know when to stop adding solder by visually seeing the solder joint form. On a double-sided board, with plated through holes, as you add solder to the joint the solder gets sucked up and disappears through the plated hole. It is not as easy to know when to stop soldering when plated through holes are involved. After your first couple of soldering connections, you proceed to check how much solder actually coated the opposite side of the board, since that is where some of the solder goes. With time you also learn how much solder is enough. That's why single-sided boards are easier to work with.

The component side of the board is blank, without a label mask to show where the parts go. Many would prefer a component mask, but I didn't find this a problem, since the Thirty-40 instructions have a nice 3-D like parts layout schematic. By holding the pc board up to the light, you can easily identify all the part locations against the schematic. Plus you would never get the Thirty-40 pc board down to the 2.8" X 4" size if you had to label all the part locations.

My standard procedure for stuffing boards is to assemble the "low profile" components first, like the resistors, disc capacitors and diodes and then start building "upward" with the crystals, coils, electrolytic caps and finally the transistors and IC's. Others do it differently—probably doesn't matter—but I always find it easier putting the low profile parts in first rather than trying to wedge those small capacitors in between coils and crystals later.

Some parts placement tips: 1. "Dress" resistors so the color code goes from left to right matching the parts layout schematic. When resistors are mounted vertically the color code should be on top. 2. Mount capacitors so the value can be read from the "front" or one "side" of the pc board. 3. Mount diodes so the value can be read from the top of the board. I think you get the idea—this always helps me when I troubleshoot a board (you notice that I said "I," since real builders always build the unit correctly the first time and never have to troubleshoot—hi). I may date myself here, but when I was in vocational high school, my instructor (a ham) taught us the old "mil spec" way of mounting components with the color coded end of the component toward the "higher" voltage potential leg of the circuit (you notice I didn't say words like tubes or E+ voltage etc.). Finally, admire (and inspect) your work when you're done soldering and before you start testing—it may never look this good again—hi.

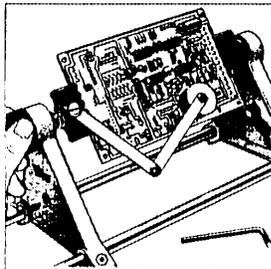
Some other PC board building tips: 1. Buff the board prior to working on it with a plastic scouring pad. Buffing helps to clean off any residue chemicals that may remain after the board etching process. 2. When winding toroids with a given length of wire, "kink" the wire in the middle and proceed to wind half of the coil. When complete with that portion, wind the other half. I find this an easy way to properly "space" the windings so I end up with the "magic" 30 percent of the coil free of windings. 3. Finally buy a spray can of rosin flux remover, or rubbing alcohol, and give the solder side of your board a shot of this when you are done. It makes for a "pro" finish and keeps crud from growing on your board when you operate on your next tropical QRP expedition.

### Soldering Room

My last couple of kit projects were done away from my home shop. A job assignment meant a relocation to an apartment. One of the bedrooms was designated a "soldering room" (as my wife calls it) and after furnishing the room with a sturdy folding table, I had to selectively determine what tools I would bring to my new ham shack- soldering room. My tools are not priced at the low end, but then again it is not the expensive lab quality stuff either. I made a decision to get some "decent" tools for my kit building experience. Here is my minimum list of soldering tools and aids.

**Light**—You need good light when soldering those tiny components (remember what your Mother preached). I purchased one of those swing-arm magnifying lamps that was side mounted on the work table. When I'm soldering or inspecting the pc board I am able to swing the magnifying glass right over my work. This is important to see "up close" any soldering bridges (I never get those) or components mounted incorrectly (never a problem). My lamp uses a 60 watt light bulb but one of these days I'm going to treat myself to one of those nice circular florescent units and really be cool. Printed Circuit Board Holder—For years I had a PanaVise circuit board holder stand that was purchased used at a ham flea market. It finally broke one day and I struggled for months without it. I could never figure out how a kit builder could live without a pc board holder. The PanaVise wasn't perfect and I wasn't interested in spending big bucks for a new unit. I finally came across a printed circuit board holder that answered my needs. Before I describe it though, I must say that you may have trouble finding this pc board holder. The unit is sold under the Weller name and is made by the parent company—Cooper Industries of Germany. I purchased my unit (part ESF-120) from Active Electronic Components in Montreal, and from what I can tell, even though Active has US offices, it is not available in the United States. If you can find it—buy it—it's a great unit.

WELLER CIRCUIT BOARD VISE



A picture would give a better description, but basically it looks like two triangular "bookends" that ride on two bottom rails. The board is placed in guides at the apex of each "bookend" and you adjust the "length" by moving the "bookends" closer or farther apart. There is a knob at the apex that lets you flip the board upside down to mount the components on one side and then flip over to solder. Finally it

has a little "space shuttle" like articulated arm on the component side that swings a foam pad over the component to hold the component in place. The parts now don't fall out when the board is upside down—ingenious!

OK, if you are really stuck and you're tired of doing your pc board soldering on an old towel, there is one trick I just heard recently. If your pc board has corner holes for mounting like the Thirty-40, then temporarily mount 4 long screws with nuts and make long "feet" for the board. Now you can flip the board upside down and solder with the board elevated.

**Tools**—The tools used to construct with are important. For years I used those "only used once" wire cutters etc. that they always seem to sell at ham flea markets. They probably were only used once cutting prison chains and that is the reason they peddle them at flea markets. I was never satisfied with the quality of these type tools so I went out and bought some tools used by the professionals. Even though the price may be higher than the flea market specials you get what you pay for. Pick some good brands like Diamond/Xcelite and you will have tools that will last forever and are a joy to work with.

**Soldering Station**—When I first started building, I had a whole collection of different soldering irons (and a soldering gun). Most of these were used and then abandoned because they were too big, too small, too hot, not hot enough, etc. I've done it all with these irons—lifted pc lands right off the board with too much heat, had cold soldering joints, created soldering bridges because of too big a tip—on and on. Recently I was helping a ham solder leads to one of those tiny DIN connectors for his TNC. When he brought out his iron I almost went home—I think his kids most have used it for some wood burning craft project. It was miserable to work with. A soldering station is one of the most important purchases for kit builders. Even if you are not a kit builder you will never regret the purchase of a good soldering station the next time you need to solder some DIN and new mini-DIN connectors.

My first soldering station (and still my favorite) was a Weller WTCPR soldering station that I bought used at a hamfest. It consisted of a 24 volt power unit which held the spring soldering iron stand and cleaning sponge. The iron portion was a fixed temperature type and the temperature was determined by the tip that you used—600, 700 or 800 degrees F. My unit came with a 700 degree screwdriver tip. These stations can be purchased used for decent prices and even if the tip looks worn, replacement tips are readily available.

There is a lot of discussion about what wattage the iron should have. What is important is not the wattage, but the temperature at the tip and how fast the tip responds to maintaining that temperature when your heating a joint. Solder melts at less than 400 degrees F. You need about 500 degrees for the solder to form the inter-metallic bond with the leads and PC board land. And finally you have about 100 degree gradient between the iron and the Soldering Station—

And finally you have about 100 degree gradient between the iron and the soldered joint. Thus you need an iron with a working temperature of approximately 600 degrees and an iron that will maintain that temperature from start to finish. A good soldering station iron, such as the Weller, Ungar, OK Industries brands will give you that. If you are able to obtain an Ungar soldering equipment catalog it makes for some

interesting and informative reading. My second soldering station was one I picked up at Dayton this past year. It is an imported brand carried by C&S Sales of Illinois and it features a digital display and an adjustable temperature from 300 to 900 degrees. It's a nice unit but I have yet to find a "screwdriver" type tip for it. It comes with a conical type tip (like a pencil point) and although some people prefer that (Doug DeMaw W1FB article in Oct. 94 CQ) I like the small screwdriver or chisel type point. I like to "wedge" the tip between the component lead and pc land to get good heat to both parts. I always find the conical tip "skidding" around the joint. By the way the C&S Sales soldering station had a special Dayton price of \$75.

**Soldering tips:** Follow the advice of cleaning your tip with a wet sponge before you solder and always try to tin the tip, by applying solder, before you return the iron to the stand. The "enemy" of a tip is letting it's surface heat away without the protection of a "wetted" tinned surface.

I am also a big fan of desoldering braid. It is a little tricky to use at times and you have to minimize overheating the area that you want to remove solder from, but I find desoldering braid a lot more effective than those inexpensive desoldering hand pumps. I usually keep a couple rolls of different sizes available when I'm doing a project, but you know, I hardly ever use the stuff (right...). By the way, forget about trying to desolder IC's with desoldering braid. My advice is to cut off every leg at the IC and desolder and remove the left over leg stubs. I always seem to ruin the PC land when I try to "save" the chip by desoldering the whole thing. Unless you have one of those expensive desoldering vacuum pump stations, it's not worth it---it's a lot easier (and cheaper) buying a new chip. A damaged pc board is the pits ---you'll never trust it again.

So those are some of my "tricks of the trade" in building the QRP Club of New England Thirty-40. I take NO credit for any of these tips---these tips came from Elmers that I've read in 72 and elsewhere in the QRP Quarterly, SPRAT, QRPp, etc. My experiences come from reading about other's experiences and then trying it out myself. I just wish I started reading earlier in my kit building career, it probably would have made all my projects work better and it would have prevented me from burning my fingers every time I would hold a component lead in place while soldering---ouch! The main thing is to enjoy the Thirty-40 kit building experience and to take pride in showing off your MBM (Made By Me) Thirty-40 project at your next ham club meeting.

72 Bob VO1DRB/WAGERB

**Check you 72 mailing label and if it say 94 NE # # #, you better renew your subscription, or you'll be dropped from the halls of electrons. Send your renewals to Paul Kranz, W1CFI, Treasurer. You will find his address elsewhere in this issue.**

## Three'Fer Is the End Product

D.A. 'Mike' Michael - W3TS, NE#27  
Halifax, PA 17032-0593

After using the PHOENIX TX on a few portable outings, I decided I would like to try and build a VFO controlled transmitter. After much experimenting with different VFO schemes, the THREE'FER is the end product. The name was stolen from a long line of fun TX projects in *SPRAT* and *QRP QUARTERLY*.

I tried a VFO with multiplier setup but the band spread was poor on the higher frequency bands. Then, I tried a heterodyne VFO at 6 MHz crystal mixing for 80, 40, and 20 meters, such as the White Rose RX. The 6 MHz VFO "leaked" through to the 7 MHz bandpass filter too much and so it was back to step one and the work bench. I gave the old standby 5 MHz VFO with 9 MHz crystal a try and 80 and 20 meters looked good. I didn't have a 16 MHz crystal in the junk box, but I did have a 2 MHz crystal, and this one worked very well for 40 meters and the VFO didn't leak through the 40 meter bandpass filter, as much.

I tried a few mixer setups and a 'diode ring' worked well, but took a lot of extra transistors, etc. To complete the VFO/mixer portion, I wanted low parts count and low power consumption. I gave the popular NE-602 chip a try and the results were just what I was looking for. Low parts count and low power consumption and low spurious output. The NE-602 was as clean as the diode mixer with more output. (Note: if the 5 MHz VFO leaks through or big spurs appear below and above 14 MHz---replace the NE602 *it is blown!* All spurs on all bands were down at least -35Db or more.)

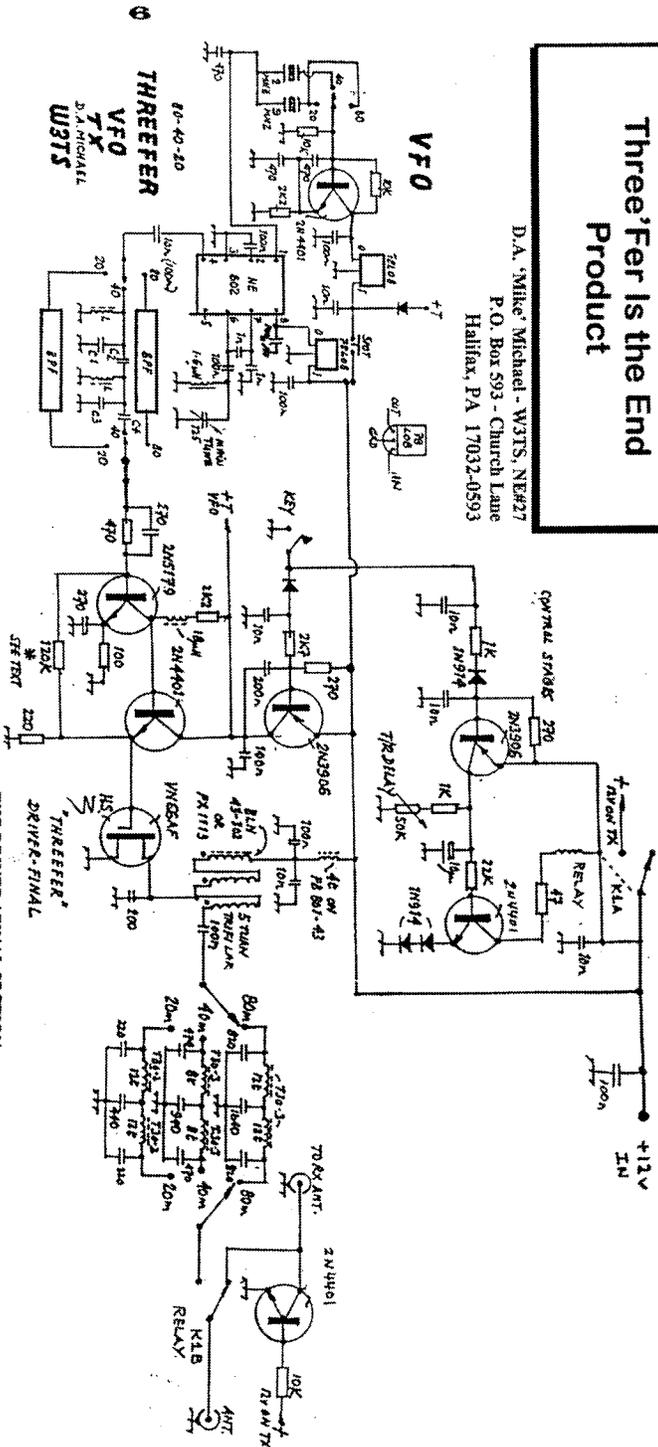
The driver/final was another area that took some empirical engineering. I again wanted low parts count and good power efficiency. I tried many circuits and was about to give up when I remembered the LCK TX section and gave it a try. Looking at the circuit for a while, I saw a few areas that could be improve. I put an "peaking" choke in the collector of the driver to improve the gain at 20 meters. I also changed the output transformer for a better match and efficiency at the power level I was looking for. With a little bias tweaking, I was able to get good output and efficiency.

The lowpass filter and TR circuit is standard. The three stages are built on three separate circuit boards using ground plane - 'ugly' construction. My unit is housed in a 4X4X2 inch box with a small "spy" type key mounted on the top. The unit is powered from a 12 VDC, 1 amp. wall cube transformer, or batteries. I use the SONY 2010 for the RX.

D.A. Michael - W3TS, NE#27  
P.O.B. 593 - Church Lane  
Halifax, PA 17032-0593

# Three'Fer Is the End Product

D.A. 'Mike' Michael - W3JTS, NE#27  
 P.O. Box 593 - Church Lane  
 Halifax, PA 17032-0593



**THE VFO SECTION**  
 This crystal mixer VFO board uses the internal oscillator of an NE602 on 3.1 to 3.5 MHz to mix with 2 crystals to produce a signal on 3 bands. A 9MHz crystal provides the 80 and 20m signal and a 2MHz the 40m signal. A Band Pass Filter is added to the output for each band. The inductors for these filters are wound on Toko 10K formers.

BW	BAND	L	C1	C2	C3	C4	10K Coil	OUTPUT
0.5MHz	80m	5uH	350p	40p	200p	180p	19 turns	-12dBm
0.5MHz	40m	1.3uH	390p	22p	300p	82p	10 turns	-13dBm
0.9MHz	20m	0.6uH	210p	10p	160p	47p	7 turns	-14dBm

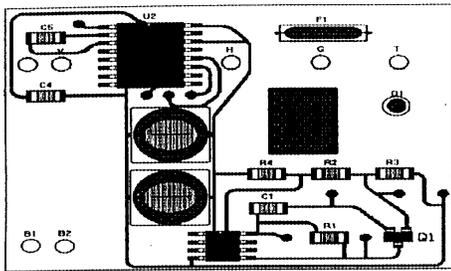
Note: If VFO is leaking through or there are big spurs below or above 14MHz, replace the NE602. It has been shown! (All spurs on all bands - 3.5dB or better)

**THE DRIVER / FINAL SECTION**  
 This circuit began life as a modification to the LCK Transceiver (SPRAT 60).  
 \*The 120K Feedback Resistor:  
 Put in a 200K trim pot (set to maximum resistance) then adjust toward zero ohms and measure output power. Set pot for maximum output. Take out and measure. Put in a fixed resistance of that value. In my unit it was 120K

AT 13.8 Watts:

BAND	POWER OUT	CURRENT	POWER IN	EFFICIENCY
80m	3.4 watts	380mA	5.2 watts	65%
40m	3.4 watts	380mA	5.2 watts	65%
20m	2.5 watts	310mA	4.2 watts	60%

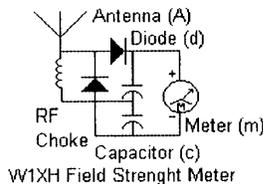
**LOW PASS FILTER and CHANGE-OVER SECTION**  
 There are switched Low Pass Filters for each band. The change-over circuit is semi-break-in operated from the key with a 50K variable potentiometer to control the "hang time" of the transmit receive change-over. This can be adjusted to suit keying speed. The transistor on the receiver antenna input is biased to protect the input circuit of the receiver.



**A DIFFERENT KIND OF  
FIELD STRENGTH METER**

W1XH - Al Bates - NE#15  
2 Coach Road  
Chelmsford, MA 01825

One disadvantage to in-line SWR meters and power meters is they don't indicate if you are radiating a signal. All the power in the world won't make any difference if it isn't radiating. A field strength meter measures the strength of your signal. It's as simple as that. My field strength meter is so simple, it can be built in less than an hour. All parts come from your junk box, or you can buy all the parts at the local Radio Shack store if you want.



This circuit is a little different from most field strength meters for it uses two diodes and two capacitors in a voltage-doubler circuit. This means the device is twice as sensitive as other field strength meters and the RF choke just gives 'something' for the voltage to develop across.

Part values are not critical. The RF choke is anything from 1 mH to 2.5 mH. The diodes (d) are 1N34, 1N914, 1N4148, or just about anything as long as both of the diodes are the same. The best choice might be germanium diodes, but you can even use some zeners if you have nothing else in your junk box. The capacitors (c) are 0.001  $\mu$ F to 0.1  $\mu$ F, as long as both are the same value. The voltage and dielectric are unimportant, but don't use silver mica or electrolytic capacitors. Mica capacitors are too good for this project and electrolytic capacitors are too big and will be too slow. Disc ceramic capacitors are nice. The meter is anything from 50  $\mu$ A to 100  $\mu$ A. The antenna is telescoping salvaged from an old portable radio. The antenna can be any length from one foot to a foot and a half.

Construction is simple. I built my meter on a scrap of vector board. I drilled holes in the board for the meter terminals and used them to mount the board to the meter. The part leads make good interconnections. I soldered the antenna to the vector board with a short piece of wire. I never used a box for this meter, and it just sits on the table near my rig.

Testing is easy. Put the field strength meter near your rig and key your signal. If the needle goes to full scale, you can either push the antenna one more section, move the meter away from the rig, or reduce power.

I don't remember exactly when I built this field meter but I think it was in the late 70's. The meter has been on several Field Day trips where it sat in a tree and indicated passing signals...if any. If you want to make the field meter more sensitive, you can increase the antenna length. You can also connect two antennas, one to each side of the RF choke. (I'm not sure why you would want to do this, but it's up to you.) You can also try grounding the end of the RF choke that is not connected to the antenna. Replacing the RF choke with a LC tuned circuit will make the field strength meter a WAVE meter. You can also replace the meter with a pair of high impedance, magnetic headphones and have a voltage doubling crystal radio.

My suggestion is to just use the meter as a Field Strength meter and have fun with it. You made it, now use it.

73' & 73'  
W1XH - Al Bates - NE#15  
2 Coach Road  
Chelmsford, MA 01825

## The North West QRP Club

A word from our brother fraternity

There are erratum which pass by every editor in every publication, no matter how hard we try to find them, so please note the following corrections from the NW QRP Club.

1. Cam Hartford, N6GA (of QRP ARCI) is NOT Cam "Coe".
2. The date of the NW QRP Sprint contest is on January 14, 1995, NOT January 16, 1995.
3. The ARCI SSB Contest is January 15, 1995. NOT December 1994. Obviously!

Regards from the West side of the country. N7MFB-President of NW QRP Club.

Bill Todd - N7MFB

**Here's a ditty for you to hear.  
Read it slowly and don't Pout.  
Your New England QRP Club is reminding you,  
Membership dues are due, without a doubt!**

Your editor - Dennis Marandos - K1LGQ

# MAKE YOUR MATCH

Dennis Marandos - K1LGQ NE#151  
42 Cushing Avenue  
Nashua, NH 03060-1816

Test your knowledge of LETTER SYMBOLS by matching the NUMBER definition on the left to a letter symbol on the right. Most, if not all, of the symbols have been used by hams in QSO's, magazine articles or general knowledge from high school by those who deal with science. Without using the name in the definition, see if you can match the symbol to its dictionary definition. For example, the letter symbol to number 1 is Y. Use the entire alphabet A-Z only once.

Qst #2	Definitions	1700 Aby
	Match the left column with the center column. Mark your answer in the right column.	
1	The symbol for <b>admittance</b> .	
2	The degree of hotness or coldness of a body or an environment.	
3	A unit in the International System specified as one International coulomb per second and equal to 0.999835 ampere.	
4	The symbol for <b>impedance</b> .	
5	The symbol for <b>reactance</b> .	
6	A unit of measurement equal to 1,000.	
7	The symbol for <b>internal energy</b> .	
8	In the meter-kilogram-second system, the unit of force required to accelerate a mass of one kilogram one meter per second per second, equal to 100,000 dynes.	
9	A stable, positively charged subatomic particle in the baryon family having a mass 1,836 times that of the electron.	
10	The symbol for <b>charge</b> .	
11	The unit of inductance in which an induced electromotive force of one volt is produced when the current is varied at the rate of one ampere per second.	

12	A metric unit of volume equal to approximately 1.056 liquid quarts, 0.908 dry quart, or 0.264 gallon.	
13	The symbol for <b>magnetic flux density</b> .	
14	A measure of a material's ability to conduct electric charge; the reciprocal of the resistance.	
15	A unit of electrical resistance equal to that of a conductor in which a current of one ampere is produced by a potential of one volt across its terminals.	
16	The unit of capacitance in the meter-kilogram-second system equal to the capacitance of a capacitor having an equal and opposite charge of 1 coulomb on each plate and a potential difference of 1 volt between the plates.	
17	A unit of electrical energy equal to the work done when a current of 1 ampere is passed through a resistance of 1 ohm for 1 second.	
18	The international standard unit of length, approximately equivalent to 39.37 inches. It was redefined in 1983 as the distance traveled by light in a vacuum in 1/299,792,458 of a second.	
19	The symbol for <b>potential</b> .	
20	The symbol for the <b>Roman numeral 500</b> .	
21	The symbol for <b>capacitance</b> .	
22	A unit of volume equal to one cubic meter.	
23	The base of the natural system of logarithms, having a numerical value of approximately 2.7183.	
24	An International System unit of power equal to one joule per second.	
25	The symbol for <b>resistance</b> .	
26	The symbol for <b>current</b> .	

## CHECK YOUR MAILING LABEL

Club dues are due in January for the following year for ALL club members. Some members have been paying their club dues when no dues were due! So please check your mailing label for correct information. Be certain that it contains the correct address and that your membership number and dues payment date are shown correctly. To decode the membership number and the dues payment date, locate the number in the upper right corner of your mailing label on this issue of "72". The first two digits are the year for which dues are paid and the digits following the "NE" are your membership number. For example: 95NE123 is interpreted as dues being paid through 1995 and the membership number is 123.

Any errors or changes should be noted and sent to the Treasurer:

Paul Kranz - W1CFI  
26 Mettacomett Path  
Harvard, MA 01451-1864

# More Power versus More Harmonics

Michael A. Czuhajewski - WA8MCQ  
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Severn, MD 21144

An article appeared recently in both the *New England QRP Club* and the *Northern California QRP Club* newsletters about getting more power output on 15 meters from the HeathKit HW-8 by taking turns off the output network coils. And, it suggested, that the Heath engineers, or someone else in the kit production process, 'blew' it somehow in their design.

The article was partially right in that Heath did not design the network for maximum power output and that you can modify it for more output. However, maximum power output is not the only consideration when designing a filter, and this modification substantially degrades the harmonic rejection. I contend that Heath Company did design the 15 meter network correctly when both power and spectral purity are taken into consideration. And, two other ham friends, who are engineers, have also arrived at the same conclusions after their own independent research.

I did simulations of the network using *Touchstone*, professional grade RF/microwave software from EESF. This software is expensive and costs in the vicinity of \$10,000, which I use at work...not at home! The program showed the optimum values for MAX. output are somewhere between the HeathKit values, that is— both 1.3  $\mu\text{H}$ , and his, both 0.6 $\mu\text{H}$ , around 0.7 and 0.9  $\mu\text{H}$  respectively for the two coils. I came up with slightly different values each time I ran the optimizer since I was using the random function and there were 4 variables involved. Nevertheless, the coil values were always in the same neighborhood.

After checking the match quality between the final amp and output network with a variety of inductor values, I did plots of frequency response and found it quite interesting. The stock Heath circuit gave less power but provided about 30 dB attenuation to the 2nd harmonic, while the higher power modification gave only 15 dB. The *Touchstone* optimization for maximum power was some place in the middle—20 dB. I tried a value of 1.5  $\mu\text{H}$  for both inductors and it gave 32 dB but with even less power. I later repeated the test with real-world values of Q for the coils and results were similar.

FCC rules do not require that we use filters with a certain amount of attenuation; the FCC only specifies that spurious output from our stations, including harmonics, be at

least 30 dB below the carrier at 5 watts or under, additionally, 40 dB for higher power output, as well as a maximum of 50 mW, in any case. How we do that is up to us; if you can still achieve at least 30 dB of harmonic attenuation at the output of the HW-8, which may require additional filtering beyond the modified networks, then FCC requirements will be satisfied, although, insertion loss would eat up some of the power increase.

Do we really need to keep the existing network? Remember, the HW-8 was designed differently then than it would be today. Although the HW-8 output provides for a certain amount of latitude, everything now is designed for a fixed 50 ohm load, followed by an external antenna tuner. A 5 or 7 element Chebyshev low-pass filter from the tables in the ARRL handbook might be a better replacement for the existing 15 meter output network. At least, with respect, to harmonic suppression.

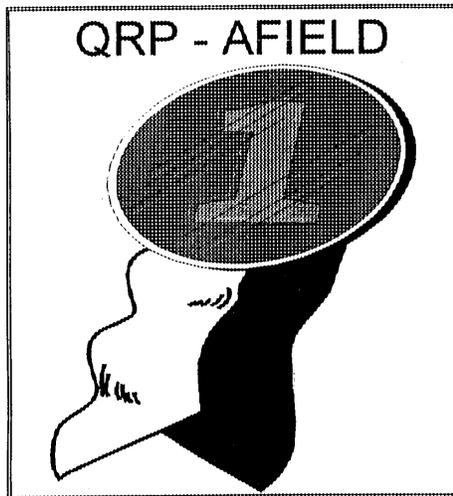
I selected a 5 element Chebyshev low-pass filter with 0.1 dB ripple, which gave a good tradeoff between input SWR and harmonic attenuation, scaled for a cut-off of 22 MHz. *Touchstone* told me it had 32 dB at the 2nd harmonic. Unfortunately, I picked a 7 element Chebyshev, using standard capacitor values, and it registered 48 dB, and it took a lot of parts. Both have quite low insertion loss at 21 MHz. By contrast, a simple 5 element half-wave *pi* low-pass filter, such as page 170 of the *W1FB QRP Notebook*, 2nd Edition, gave only 20 dB. Depending on the amount of harmonic energy present at the final amp, even 20 dB attenuation would have been sufficient to meet FCC specifications. I haven't done a spectrum analyzer tests on an HW-8, yet.

Incidentally, *Touchstone* showed that the existing HW-8 networks for the other bands gave a better match between the final amp and load than did the 15 meter network, *i.e.* more power and also provided good harmonic suppression—to boot. In the article, the author said he calculated the resonant frequency for the HW-8 network and found it was around 13 MHz. I scratched my head over how he did it, that is...the calculations with a variety of component combinations and managed to arrive with a ball park value of about 11 MHz. But, when I used the same approach to the other bands, they all showed a "resonant frequency" of very roughly half the operating frequency, as well. And, those bands work quite well...!

The bottom line is that you should not modify the output network for 15 meters on the HW-8 unless you really know what you are doing with respect to filter design and frequency responses and are aware of all the consequences. Perhaps provide for some additional harmonic attenuation past the output of the modified network to stay within the FCC limitation.

My HW-8 has been 'dead' in the water for a couple of years since I cannibalized both of the cans used in the heterodyne oscillator to get someone else's running. I eventually replaced them with TOKO coils, another article to write, and some day I'll get around to doing some tests with the standard and modified 15 meter coils using a spectrum analyzer. I'll pass along the results when I do. Stand by...

Michael A. Czuhajewski - WA8MCQ



**Chet Bowles- NE#58 AA1EX  
Sharon, NH**

The first-ever QRP-Afield event was held on September 17, 1994. Rain and poor weather made it difficult for many New England folks to get on the air, nevertheless, the bands were pretty full of QRP signals for a good part of Saturday afternoon. Forty meters was particularly busy, but a number of stations also used 20 meters to good advantage.

For those of you who may have missed the rules, the intent of the contest was to encourage QRP operators to get out "in the field" to operate their rigs using non-commercial power and temporary antennas. The contest period was

short—only six hours—which left lots of time for other weekend activities.

We ended up with 34 official entries, but there were many additional stations on the air giving points and contacts. **The Meriden, CT ARC was the winning entry with 59 total contacts.** They received a plaque donated by Chuck Adams, K5FO. The top ten finishers each received a certificate signed by Jim, W1FMR and Chet, AA1EX.

From the comments, everyone had a good time and the contest appeared to be a rousing success. Look for QRP-Afield 1995 in September of next year. We had a few suggestions for rule changes and longer operating hours. We will try to accommodate some of those requests.

Look for an official announcement of QRP-Afield 1995 at Dayton. In the meantime, thanks to everyone who helped make QRP-Afield 1994 a most successful contest.

**'72 Chet Bowles AA1EX  
NE#58  
Sharon, NH**



**Check your mailing label for expiration date**

# QRP-Afield 1994 Results

## Final

<u>CALL</u>	<u>NAME (NE #)</u>	<u>OPERATED FROM</u>	<u>CLASS</u>	<u>TOTAL</u>	<u>Q's</u>	<u>MULT's</u>
1	W1FD Meriden (CT) ARC #18	Nr Wallingford, CT	H Field	6844	59	29
2	AA4XX Paul Stroud/Rob Capon	Raleigh, NC	L Field	5040	30	21
3	W3TS D.A. Michael #27	Halifax, PA	L Field	4896	34	18
4	W8LCZ Byron Johnson #283	Nr Orchard Lk, MI	H Field	2856	34	21
5	WB4ZKA Mike Pulley #241	Nr Prescott, AZ	H Field	2400	30	20
6	WU7F Robert Farnworth #211	Bellevue, WA	H Field	1976	26	19
7	AA1EX Chet Bowles #58	Oquossoc, ME	H Field	1920	32	15
8	W1FMR Jim Fitton #01	Salisbury, MA	H Field	1836	27	17
9	AA7QU Russ Carpenter	Cascade Mts, OR	H Field	1560	26	15
10	WK8S Pete Meier #292	Nr Waterford, MI	H Field	1536	24	16
11	KSFO Chuck Adams #222	Nr Richardson, TX	L Field	1520	19	10
12	K3SS Hugh Maddocks	Reston, VA	H Field	1512	27	14
13	KR4NR Carl Letter	Melbourne, FL	H Field	1500	25	15
14	VE2DRB Bob Gobrick #94	Montreal, Quebec	H Perm	1288	56	23
15	N1CJB Walt Yatzook #282	Northfield, CT	H Field	1232	22	14
16	NG1G Jack Frake #02	Barnard, VT	H Perm	1100	55	22
17	N1CUU Carl Heidenblad #04	Salisbury, MA	H Field	1008	21	12
18	AA1DL Lloyd Roberts #78	Mt Snow, VT	H Field	936	18	13
19	K3WWP John Shannon	Kittanning, PA	H Perm	924	44	21
20	N4AOX Clay Wynn	Nr Knoxville, TN	H Field	880	20	11
21	KT3A Cameron Bailey #291	Manchester, PA	L Field	576	9	8
22	W4OEL Shel Dunham #199	Mechanicsville, VA	H Perm	468	26	18
23	WA2BQI Bud Peterson #289	Jamestown, NY	H Perm	405	27	15
24	AB5OU Tim Pettibone	Las Cruces, NM	L Field	336	7	6
25	N6KR Wayne Burdick #37	Belmont, CA	H Field	320	10	8
26	KA9HAO Randy Jones #22	N. Kingston, RI	L Perm	300	15	10
27	WA1OFT Tom Barbish #31	Coventry, RI	H Perm	260	20	13
28	NØIZZ Lawrence Mergen	Kansas City, MO	H Perm	238	17	14
29	KX1E Bob Coakley #26	Portland, ME	H Perm	231	21	11
30	WB3GCK Craig LaBarge #288	Phoenixville, PA	H Perm	117	13	9
31	K7YHA Rich Arland #239	Wilkes-Barre, PA	H Field	100	5	5
32	W9CUN Ken Anderson	Mt. Sterling, IL	H Perm	90	10	9
33	KM3D Harry Bump/David Strasz	Richland, PA	L Field	72	3	334
34	KI6DS Doug Hendricks #182	Dos Palos, CA	H Perm	2	2	1

**QRP**  
**HOWLS WITH DELIGHT**



**Comments—Soapbox**

“Late start. Wrong 12V power cord. Returned to home QTH. Torrential rains. Stayed in driveway to make 5 QSO's. I love this hobby.” Rich, K7YHA

“Operated from Godek's farm, near Wallingford, CT—our usual FD QTH.” Meriden (CT) ARC, W1FD

“2 hours—had fun—that's what counts. I like the time of year, time of day, and duration of contest. Family-friendly.” Cameron, KT3A

“Real Field Day. In drippy clouds, sitting in wet grass on ski trail (40M wide) with umbrella over rig & op. Too windy for dupe sheets. Quit early to catch last chair lift down. Rained all the way home.” Lloyd, AA1DL

“I was surprised by the number of stations participating—especially on 40 meters. There was sufficient activity to keep us going through most of the afternoon.” Paul, AA4XX

“(1:30 p.m.) —This is certainly a beautiful area and not a cloud in the sky. (4:30 p.m.) — Did you ever see it rain so hard?” Carl, N1CUU

“WOW—what a great gathering. Let's do it more often with maybe a winter challenge (QRP A-Snow?)” Bob, VE2DRB

“Great weather due to cool front, thus it wasn't a typical Texas summer day. Good OP's all over. AA4XX wins fastest code of the day.” Chuck, K5FO

“Good thing 'field site' was close to home—forgot keyer cable, power cable and my NE

QRP #! Packed up, came home and worked a few." Randy, KA9HAO

"Antenna: Rain spout (really!) This event was a great idea. A lot more interesting (and friendlier) than a regular contest. How about running one in the spring too?" Craig, WB3GCK

"It was a great little contest. I was very pleased by the amount of activity generated." John, K3WWP

"I am enthusiastic about the concept of a mini Field Day, but wish I had heard more QRP stations. Was it poor propagation to the West Coast? Or a limited number of participants?" Russ, AA7QU

"Good contest, good scoring scheme. The 6 hour duration seemed OK to me." Bob, KX1E

"Operated between thunderstorms from picnic table in the clouds at 3000 feet (Look Rock State Park, Chilhowee Mountain, TN). Finally worked NE#2. Looking forward to next time. Had a great time." Clay, N4AOX

"I went to a local State Park but due to threatening weather, I didn't start setting up until 1600Z. Shortly after, I had to move as it started to rain." Pete, WK8S

"I enjoyed the test, worked all New England states, and am looking forward to next fall." Hugh, K3SS

"Glad it didn't rain. Wish I had a rig for another band, 40M didn't come alive 'til the last hour." Walt, N1CJB

"Rain? The sun was shining in Oquossoc, ME!" Chet, AA1EX

"I was floored by the activity. We had two stations set up—both worked many stations. First 20M QSO was with KP4DDB/QRP" Jim, W1FMR

"I had planned for this contest for weeks and when Saturday arrived, I went to an electronic surplus store for hams and forgot all about operations. Dah, what contest?" Dennis K1LGQ- Nashua, NH.

"Do I win the last place prize for club members?" Doug, KI6DS



**Did you check your mailing label? No dues sent in...no newsletter sent out!**

**BATTERY TECHNOLOGY IN THE 90'S**

**RANDOM THOUGHTS ABOUT  
BATTERY EVOLUTION**

**Dennis Blanchard - K1YPP NE#187  
143 East Road  
Hampstead, NH 03841-2229**

Batteries are a blessing and a curse, all in the same package. The choices are many, as are the sizes and packages. Unfortunately, this causes a dilemma such as which one to use, when to use it, and how to maintain it.

The traditional choices for batteries are the NiCad, Dry-Cell, Wet-Cell and Gelled electrolyte Lead Acid and Alkaline. Some of the newer devices that are available now include the NiMH (Nickel-Metal-Hydride, a NiCad look-alike), Lithium, Zinc-Air (don't ask me about that one, I don't have a clue) and "Smart Batteries."

QRP operators use batteries more often than most amateurs simply because we tend to be more portable in our operations. Low power and small size is conducive to battery power. The batteries of choice appear to be NiCad and Gelled-electrolyte. Unfortunately, when those NiCads are no longer serviceable, they end up in the landfill, which is more and more becoming illegal. They're toxic!



Pound for pound, a NiCad battery can give more current than most other portable batteries. The NiMH battery also has high current capacity and is less toxic, although not entirely. Their popularity stems from the fact that there has been a trend in Walkie-talkie devices for higher and higher power.

We as Amateur Radio operators must ask ourselves if this is really the right direction to be going. It has not yet been proven, but there appears to be some evidence that high power, particularly at high frequencies (144, 220, 1296 MHz, etc.) may be harmful. Microwave ovens operate near 1296 MHz, and

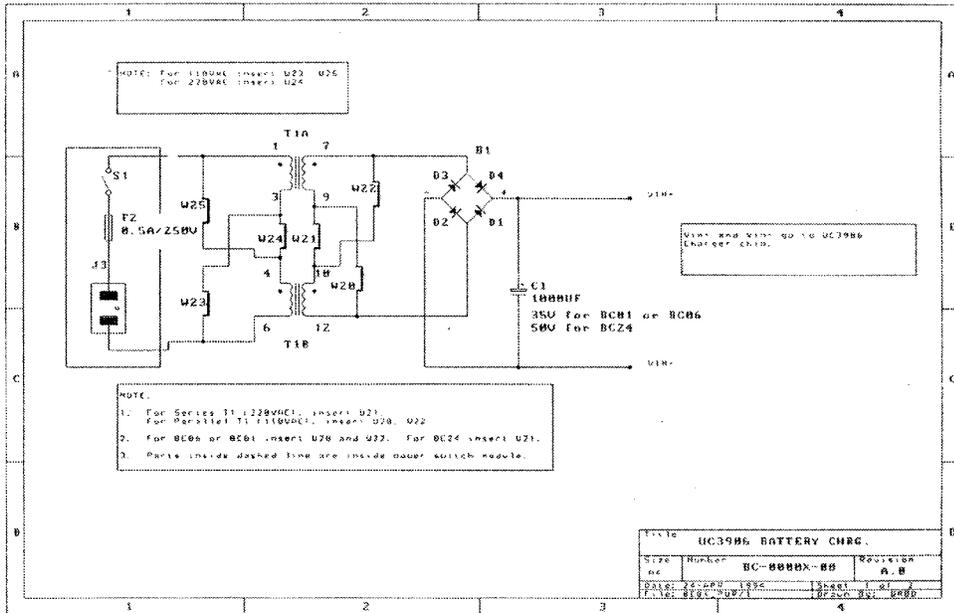
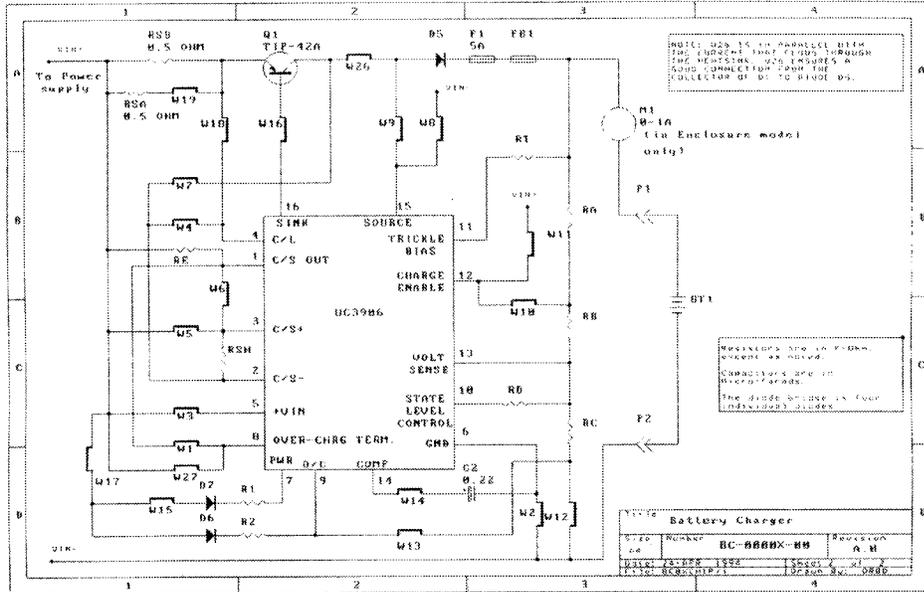
even the 500 watt ovens cook very well. Do we really want 5 watts next to the brain cells (20 dB less than the oven, of course the oven is shielded, isn't it)? One need only look around at a ham convention to realize that the effects are already there; look at all the gray and balding heads. Is this the result of too much RF, too close? Just kidding. Seriously, we QRP operators should start pushing for lower power portable VHF/UHF hand-helds, the higher power really is unnecessary.

A question is commonly asked: "Can I charge my NiCad battery with a lead-acid (often motorcycle or small automobile battery) charger? The answer is **no**. The charging curve for these batteries is in no way related. There are devices on the market, however, that can be programmed to do both. I refer you to the piece by Warren Dion, N1BBH for the specific devices.

The charger must accomplish several different things: bulk charging, final charging and maintenance. Bulk charging is easy—force a high current into the battery until it nears complete charge. Now, things get more difficult, for we want to complete the final charging stage. This is where the "smart chips" make life easier for us. 'Smart chips' watch the charging curve of the battery and as the slope of the curve changes, they compensate the current going to the battery to level things off without overheating the battery or doing other damage. Once the final charging is completed, the charger must now be smart enough to "hold" the battery at some state, ready for use.

The holding state is usually at some preset voltage point. By referencing a voltage, the charger doesn't care how big the battery is. If it were current referenced, then the size of the battery would have to be known ahead of time. A 12 volt battery will always use the same charging points on the curve, but different size batteries could have vastly different currents to maintain them.

The chip must be smart enough to monitor things once the charge is completed, and, without exception, they do this now.



A typical charger has a power line rectifier (or solar panel) which goes through some kind of filter to create DC that may not be well filtered. Unlike a power supply, a hefty filter is neither necessary nor desirable. The ripple in the DC gives a lower average value and as long as that value stays above some minimum point, the charger will supply the needed current. If the DC is at some high average, (which would mean a more complicated, expensive filter) then the heat sink will have to dissipate more heat to make up for the  $\Delta$ Voltage drop.

The battery makes a pretty good filter-capacitor, so equipment in use while the charger is running will not experience too much trouble with hum. Some filtering between the load and the battery can be used if this is a problem.

The charger will use the DC from the rectifier to go through a 'pass' device, such as a pass transistor. In a situation where the battery

is severely discharged, the pass transistor may have to dissipate rather substantial amounts of heat. For example, a 12 V battery has been discharged to 3 volts. The charger bulk power supply voltage is up around 20 volts.  $20V - 3V = 17$  Volt drop. If the charger is to supply 1 amp charge rate, this will mean the heat sink and pass transistor will have to absorb  $17 \text{ volts} \times 1 \text{ amp} = 17 \text{ Watts}$ . Some chargers (such as the **Jade Products, Inc. Fun Kits**—how's that for a product plug?) have a feature that looks at the battery and if it is below a pre-set level, it will only trickle charge the battery until it reaches a higher voltage—for example, 10 volts before charging at the bulk rate. This now reduces the heat wasted to  $(20V - 10V) \times 1 \text{ amp} = 10 \text{ watts}$ , a substantial decrease.

**The battery makes a pretty good filter-capacitor....**

The following drawing shows the **JADE PRODUCTS INC. Gelled electrolyte and Lead Acid battery charger series**. See if you can find the pass transistor and the control chip?

These circuits are easy to build but can be deceptively tricky to get running if something is not right. It is a circuit where the output affects what the input is doing and the input can affect what the output is doing. It is the traditional loop-feedback circuit. One thing that has caught more than one builder is that the charger doesn't produce any real power until a battery is connected. If one puts a dummy load to test it, there won't be any output because the charger is looking for the condition of the battery and it is not going to charge a dead battery at full rate. It will charge at a trickle speed. This is very different from the typical brute-force charger found in a department store.

**One thing that has caught more than one builder is that the charger doesn't produce any real power until a battery is connected.**

Another feature that some charger chips employ is the "burping" technology. In essence, what this means is, the charger produces a high current charge into the battery for some pre-determined time, for example 980 millisecond. The charger then takes a coffee break for about 10 Milliseconds and does nothing.

Then it reverses the charging voltage. That's right, it hooks things up backwards for about 15 milliseconds and then takes a voltage reading on the battery to see where the charge state of the battery is. Why the reverse current you ask, simple—

this reverses some of the chemical process that heats the battery during heavy charging and stabilizes the

chemical reaction. It "burps" the battery. I believe ICS Corporation has the patent on that idea.

Earlier, a smart battery was mentioned. There is a battery standard starting to evolve around energy cells to initiate batteries into generic forms so that every device that seems to hit the market doesn't have a unique battery that cannot be found anywhere except by one producer. This standard will define the battery package, ratings and monitoring function. The battery will have a liquid crystal display showing its state of charge, current rate of use, and how much longer it can be used, internal temperature, etc. It will also have an external bus connection to show the user load-information, such as a computer or walkie-talkie, that the user is told when to give things a rest and do a recharge. This will be a vast improvement over the present few seconds between when the battery light on the walkie goes out and the time that the battery goes dead.

One exciting development in battery technology presently available, but hasn't as yet received much attention, is from the Amateur Radio community. Ray-O-Vac Corporation has developed a rechargeable Alkaline battery called the RENEWAL® Battery. It can be recharged 25 times. I can see the reader's response now...Ho-Hum. But wait, there's more! Most NiCad manufacturers promise that the NiCad battery can be recharged hundreds to thousands of times. Sure they can, but that is under ideal conditions. What is the real world like? Most amateurs are erratic when it

**I have tested some inexpensive NiCads available from a major local electronics supplier and they died at 4% per day. They were dead in a month.**

comes to battery use. The walkie will sit for days, even months before it gets used. Good NiCads commit suicide at the rate of 1.5% per day and that's the good ones. In other words, they self-discharge at that rate. In 90 days, the battery is dead. I have tested some inexpensive NiCads available from a major local electronics supplier and they died at 4% per day. They were dead in a month. This is why upon purchase, one must charge the NiCad before use, for it is usually technically dead because it has been sitting on the shelf since it was originally manufactured and charged.

As mentioned earlier, NiCads are toxic—don't throw them into the local landfill. Many states now have recycle centers for them, or contact the manufacturer if you don't know what to do with the dead cells.

NiCads are particularly fussy about charging, and to some lesser degree, so are NiMH batteries. They don't like to be charged mid-cycle. They really must be discharged all the way to properly re-charged. Some of the newer chips consider this and force a discharge if the battery is not fully discharged. The Maxim 712/713 series support this function. If this condition is not done, the battery will develop the "memory" problem that is so often spoken of with NiCads. In reality, more NiCads die from abuse than memory failures. Hobbies, such as R/C cars, are much nicer to the batteries, for they tend to play with the car until it slows down. The battery needs charging, PLUNK—into the charger with the batteries for a full recharge.

Amateurs, on the other hand, operate in more of a "stand-by" mode where we want that walkie to be ready when needed. Unfortunately, trickle charges are not really that good for the NiCad, but then neither is sitting idle unused good either, so it is a lose-lose situation.

The RENEWAL® battery, on the other hand, is a really long life battery. After a shelf life of FIVE years, it has only discharged by 5%. It is almost like new! If that isn't enough, the cell stores about three times as much power per charge as does the NiCad so it is still truly useful. It has one limitation that the high powered walkie talkies don't like, which is, the cell should only be used on loads of about 400 MA maximum and peak loads of about 1.5 Amps. NiCads can offer many times that power. Still, in low power mode and for QRP operation, this battery is a real winner.

The RENEWAL® battery charger is made by Ray-O-VAC and is available almost everywhere. I purchased one in a drug store and the other in a major retail store. Keep the booklet that comes with the charger, for it is loaded with coupons for real price cuts on future purchases of both batteries and chargers.

JADE PRODUCTS INC. is in no way involved with Ray-O-Vac Corporation and the above comments are my personal observations about this wonderful battery. Give them a call or write for the Applications notes & Data Sheet on the RENEWAL® battery line, and I bet that will convince you. Their address and some other

pertinent addresses follow at the end of this article.

### **Now to dispel a few myths**

The first myth concerns placing a Lead-Acid automobile battery on concrete for an extended period of time. Common knowledge says this will kill the battery. My experience with this myth has uncovered the following scenario: a battery becomes spare because an automobile, on its last legs, decides to die on the first really cold day of winter. After cranking the daylights out of the engine that refuses to start, it has been decided to junk the car. Another reason it

may become spare is because the automobile was in an accident. Since the battery appeared to be in good health when the accident occurred, it is now decided that the battery should be saved before the car is sent to the bone-yard.

Unknown to the owner, the electrical system of the automobile experienced a short circuit and the battery was discharged severely. Since this "spare" battery has no immediate use, it is placed on the concrete floor of the garage, or, in some cases, the cellar. There it sits, lost, forgotten and probably near dead from having the daylights

cranked out of it before being sentenced to the concrete floor. Ohmic resistance of the plastic between the connection posts is in the billions of ohms. At twelve volts, to discharge the battery through this plastic would take longer than most of us have to live. The real reason the battery

goes dead is because it was left in terrible condition and allowed to freeze a few times during the winter. Truly the knell of any battery under these

**After a shelf life of FIVE years, it has only discharged by 5%.**

**Another reason it may become spare is because the automobile was in an accident.**

conditions. The myth about putting a block of wood under the battery will not help—proper charging and maintenance will.

Gelled Electrolyte batteries are finicky devils. One must carefully charge them. I can't begin to relate how many times I have people tell me they charge these expensive devices with very primitive chargers, such as those sold in the department stores. These charger are often used for this task and for a while they will work, however, the battery will not last long. As little as a 5% deviation from proper charging rates can severely shorten the life of this type of battery. Regular lead acid batteries are far more forgiving.

It is fortunate that there isn't a branch of government to look after abused batteries, I suspect they would have a substantial workload. (The battery police.)

The previous scenario reminds me of a story about the fellow that decided he was going to experiment with feeding his horse saw dust instead of oats. He figured he would increase the proportion of saw dust a little each day and decrease the oats. At first he bragged about the experiment far and near and about how well it was going. After a while, he didn't say anything more about the experiment. A curious friend finally asked:

"Hey Hank, whatever happened with your horse saw-dust experiment, how did it go?"

"Well," replied Hank, "It went darned well for some time, but then all of a sudden that fool horse just up and died before I could finish the experiment!"

Another myth concerns the short life of automobile batteries when used as backup batteries for repeaters or home stations. It is true that they will not last as long as deep cycle batteries if certain measures are not followed. One of the reasons the deep cycle batteries last longer is because they allow space under the plates in the cells for flakes of material to accumulate. This material accumulates as a function of aging of the battery and if it piles high enough, it can start to internally short the cells. There are chemicals in the deep cycle battery to reduce this flaking action. One can prolong the life of the automobile battery by simply giving it a good "shake" once in a while to level out the flake accumulation. My personal station is a Drake TR-7 (Ah-ha, so K1YPP doesn't always run QRP! Honest, I do most of the time.) It uses an automobile battery and a JADE PRODUCTS INC.

1 amp charger and has been running this way for so long now I have forgotten when it was first installed. The battery is as good as new and it does get a shake every now and then.

Hopefully this rather long winded piece has been informative and didactic. (If you think this was long winded, hook up with me on 7.120

MHz on Sunday morning some time!) Batteries have been around for a long time and with electric transportation in the near future, interest in them can only increase. Take good care of those devices and they will serve you well. Start letting the major walkie manufacturers know that you are more interested in longer operating sessions than higher power operation and force

**Batteries have been around for a long time and with electric transportation in the near future, interest in them can only increase.**

them to start using the rechargeable alkaline batteries. They really are nice.

**72' Dennis Blanchard - K1YPP**

**SOME USEFUL CONTACTS:**

**Ray-O-Vac Corp.**  
OEM Sales and Marketing  
P.O. Box 44960  
Madison, WI, 53744-4960  
TEL: (608) 275-4694  
FAX: (608) 275-4973

**JADE PRODUCT INC.**  
PO BOX 368  
E. HAMPSTEAD, NH 03826-0368  
TEL: (603) 329-6995  
FAX: (603) 329-4499

RENEWAL® Batteries

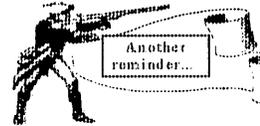
Gel/Lead Acid Chargers  
Solar Chargers



"Look what I cooked up last night!"

"I finished my 80-40 kit last night and put it on the air! Very good performer. The keying is quiet and clean, the keyed signal is clean in my receiver and didn't have any chirp or key-clicks. I could hear the antenna noise in the receiver so that the noise figure should be O.K. and didn't hear any intermod. I got one watt output and the rig tuned from 3.700 to 3.738 MHz as built. The instructions were very complete and I only found two minor errors in them. Tune up was a breeze and the whole project took about 8 hours to finish: 2 to wind toroids, 4 to load and solder parts and 2 to wire the panel controls, check it out and align it. Now I am going to get a nice box for it from Active Electronics. That's about it for a brief product review. I did have it on the air for a few minutes but it was 10:30 and I was ready for bed by then! I'll let you know how the first few contacts go."

72 - Paul Kanz - W1CFI



Did you remember to renew your subscription to the New England QRP Club? Now is your chance to continue receiving your newsletter and to not miss a single issue of some of the greatest articles coming from the deepest parts of New England. The home of the QRP's, movers and shakers, the trend setters of low power communications begins with your subscription and membership to the New England QRP Club. If you don't send in your dues for 1995, the newsletter won't be sent out and it'll be even harder for us to remember your name. Send your dues to the treasure, whose name is listed on the front pages of this wonderful newsletter, and you'll survive next year's installment of QRP in space! You won't have the chance to do this again, so while this idea is fresh on your mind, reach for your checkbook and send your 1995 dues now. Tell us what you've been doing in 1994 and we'll print your comments in the up-coming issues of 72.

## To all current and expectant Sierra owners

Wayne, N6KR

As expected, this field test is yielding some early data. Over half of the rigs are coming up right away, but there are a couple of common problems emerging:

1. The VFO may not cover exactly 150 KHz as specified in the alignment section. If you get LESS than 150 KHz, even when you've squeezed the turns of L7 as much as possible, add three turns to L7 and start over. Don't panic--you don't have to re-wind L7! Just splice some wire onto one of the leads if you prefer, using a small length of heat shrink tubing or thin "spaghetti" (wire insulation) to cover the joint. If you get MORE than 150 KHz, even with the turns spread as far as possible, remove three turns and start over.

2. The TX monitor (sidetone) pitch adjustment (C38) may not allow you to set the tone where you want it. Things to try: (a) make C39 larger--e.g. 330 $\mu$ F; (b) make L2 larger, e.g. 22 $\mu$ F (using an RF choke or toroid--doesn't matter which); (c) as a last resort, you can parallel a 27 to 33pF cap across C38.

3. Power output on some of the 20 meter modules is lower than expected--around 1.25 to 1.5 watts with a 13V supply. All of the prototype units were higher than that, at around 2 watts. Things to try: (a) re-peak the pre-mix oscillator and TX trimmers (slowly! they're touchy); (b) squeeze the turns on L6 in the output low-pass filter a bit; (c) if you're really motivated, substitute some different capacitors, preferably 5% silver mica or polystyrene units, for C47, C48, and C49.

4. Sidetone level (actually transmit monitor level) may be too high. After some head-scratching, Eric Swartz and I have concluded that this is due to the TX 4.915 MHz oscillator signal over-coupling into X5, the post-IF-amp crystal filter. Things to try: (a) adjust C38--the TX monitor pitch trimmer--so that the TX monitor tone is just a bit out of the center of the receive crystal filter's pass-band; (b) if this doesn't do it, use a 2N4416 or other JFET as a transmit-mode voltage limiter, as follows (on the bottom of the main PC board, using just the leads on the JFET if long enough):

i. connect the gate of the JFET to the anode of D2 (+8V TX)

ii. connect the source of the JFET to pin 8 of U5

iii. connect the drain of the JFET to pin 1 of U5 (c) if this still doesn't cut the TX monitor tone amplitude enough, try this circuit (on the bottom of the board, with very short leads):

DON'T CUT ANY TRACES OR REMOVE EXISTING PARTS--just add these three parts (R, C, D) to the existing circuit. You should be able to find a value of R that results in a comfortable TX monitor amplitude. This circuit may be added to the next revision of the Sierra board, complete with a trimmer to set the TX monitor level. That's it for now. Please let me know how your Sierra kits are coming together! Thanks and 72,

Wayne, N6KR



### NNIG 40-40 Success Story

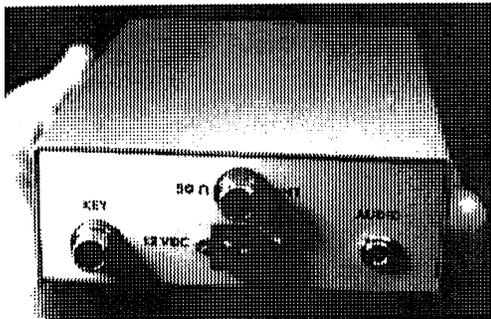
Well, I guess it's my turn to tell a story of fun and success. Saturday morning, I was getting ready for the NAQP and had to clean the NNIG off the desk, so I figured I'd better just finish it! Tune up and alignment went just as the manual said it should. I called Geoff (W1U) on the other side of town to see if I was getting out at all, and everything seemed to be just fine! Sunday morning I got on and heard a KP4 from Puerto Rico and worked him on the first call (he even gave me a 579!).

I think I'm going to like this little rig! I built it nice and small so I can take it with me where ever I go! Thanks to Dave and all those that put the kit together. Well done, and it works GREAT!

72' & 73 - Kevin N1EPU

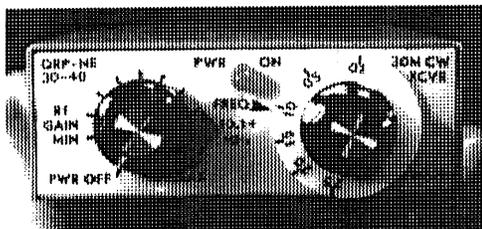


Pete Hoover - W6ZH  
Proves LIFE for Thirty-40



The hands of Peter Hoover - W6ZH and his homebrew Thirty-40

Dave Benson's Thirty-40 and Forty-40 QRP kits have been a huge success for the QRP community, and Pete Hoover - W6ZH proves there is life for 30 meters. Dave's great design and easy to assemble kits have been sent to all corners of the country and Europe. *QST* did an exceptional article for NN1G's transceiver which won the places of all experimenters who read the article. We in New England had no doubt that Dave's circuit and design would keep us active throughout the winter, and summer, months. Dave comments that he has run the small suppliers out of their stock, however, he now has a more uniform inventory to make his job easier.



Front view of Peter's Thirty-40 transceiver.

As those who have already made one of the XX-40 kits, it's up to the builder to supply his own mechanical design, pots, for tuning and cabinet for building. As you can, Pete has done an excellent job, with his compact construction.

The New England QRP newsletter would like to print your creation and design of your QRP rig. Send a clear, well-focused picture of your project and for subsequent issues and you'll see it here for other to awe. If you have the opportunity to have your pictures scanned and digitized into a .PCX file, this certainly would a tremendous help to your editor.

Again, thanks Pete - W6ZH for your contribution and let's hear from other members in the QRP brotherhood to show what we're doing.

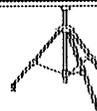
**SMALL WONDER™ Labs**

Dave Benson, NN1G  
80 East Robbins Ave.  
Newington CT 06111

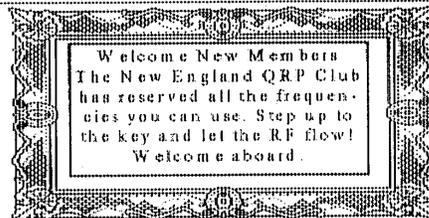


Dave Benson - NN1G is still engineering his XX-40 superhetrodyne, transceiver series and if you still have not ordered yours yet, the kits are still available for \$50. Write to Dave at the above SMALL WONDER LABS address and be sure to indicate the band you're ordering. (160m, 90m, 40, 30m, 20m)

"CORRECTION"  
Michael Lewis  
ALIVE AND WELL  
operating from  
Greenbrae, TN



In the last newsletter of 72 (October 1994), Michael Lewis' call was listed as (NO CALL). Well, it's pretty evident that Mike does have a call and it's **WB4O**. Happy New Year!



Welcome the following new members who have joined New England's hottest QRP club and wish to share the wonderful excitement we have to offer. Tell them you saw their name and call in 72. Let's give them a rousing big cheer...!

- |                                 |                                 |
|---------------------------------|---------------------------------|
| 291 Fred N. Turpin - K6MDJ      | 292 Peter H. Meizer - WK8S      |
| 293 Richard Wilson - N3KRS      | 294 William McNeely - N1RZD     |
| 295 (No name sent to treasurer) | 296 G.M. P. Tolliver - KQ4AL    |
| 297 Dan Keane - NU1M            | 298 Sam Barrett - WA5RPP        |
| 299 Thomas Cassidy - KA1TQM     | 300 Meriden A R C - WINRG       |
| 301 Mike Rioux - (no call)      | 302 Michael Ardda - (no call)   |
| 303 Lt.Col Tom Doubek AA1CA     | 304 Tom Samulenas - WO1X        |
| 305 Ronald Wilson - N1GOZ       | 306 Hamid Khan N7OLJ / AF2CW    |
| 307 William C Northup - N1QPR   | 308 Arthur S. Dersault - KD1EHT |
| 309 Edward R. Cox, Jr. K8JC     | 310 Gary Sehne - N2KTY          |
| 311 David R. Le Duc - AA1HU     | 312 James P. Rybak - N2KSD      |
| 313 Gwen Kuklewicz - N1JEX      | 314 Floyd Glick - WD8CUJ        |
| 315 Steven Bailey - KA1RXX      | 316 Frederick Bragdon - KA1LDC  |
| 317 David A. Kreider - N1PZO    | 318 William B. Keame - N1NIK    |
| 319 Preston J. Douglas - WJ2V   | 320 William A. Hassan WA1ML     |
| 321 Soett A. Thomas - N1MU      | 322 Gregory P. Fox - N1TGC      |
| 323 Henry Van Der Heide VE3TV   | 324 Andrew T Chandler - N6JTX   |
| 325 Larry F. Burkett - WA7SOU   | ---                             |

# QRP New England NETS

**Greg Algieri - WA1JXR NE12**  
22 Chace Hill Road  
Lancaster, MA 01523

Here it is, the last week of December, and I promised I would provide some input on the QRP NE NET activity, and, seeing the deadline is January 7, 1995, I thought I better get my act together and deliver some comments to our editor.

**ABOUT NETS** - With propagation down, due to the low sun spot cycle, it sure has been a challenge keeping the NEW ENGLAND QRP net on going. The NE QRP SSB net meets on Monday at 2100 Eastern Time on 3855 KHz., I have not been able to make the net on a regular basis due to family commitments, but I still check-in as time allows. Harry - WILMU is usually on frequency and calls the net together. I was able to operate my station right after the fall ARRL convention in Boxboro and there were quite a few stations. A lot of the check-ins on the net were informed of the NE QRP Club meeting via Boxboro convention.

Some of the check-ins include WA1JXR-Greg, WILMU-Harry, KB2JE-Walt, KA1TQM-Tom, KI2L-Larry, WA1GXY-Phil, WA5RPP-Sam, just to name a few that were on the net while I was there. With membership over the two-hundred mark, I would think we could get a better turn out than the 4 to 6 QNI's we get each net, but since the start of the net in 1993, this has been the typical numbers. Partly I think this is due to the fact that many QRP'ers are primarily CW operators. I'm not sure some even own a microphone (Hi-hi J). The fact is, QRP SSB is more difficult due to the larger bandwidth signal which makes receiving a reasonable signal/noise ratio much harder. This is certainly true on 75 meters in the evening.

I encourage all NEW ENGLAND QRP club members to dust off that microphone and get on the club net QRP or QRO. I often run 50 watts, or so. It's a great place to talk about that new HB project, test it on the air, or get hints on solving problems you may be encountering.

On another topic, it has been suggested that the club should start a QRP Novice net. I think this is a great and a QRP CW net in the novice bands on 80 or 40 meters could work. Experienced QRP operators would help Novice QRP operators, plus it is also a way for Technician class QRP operators to get into an HF QRP net. Start building up your code speed and let us help you. The QRP calling frequencies in the Novice seg-

ment on 80 and 40 meters is 3.710 MHz and 7.110 MHz. I would imagine an evening net 80 or a morning net on 40 meters would work well. This would be a good place to try out that colorburst 80 meter crystal (NE QRP Project #1) with a different crystal or the 80/40 — 40 receiver (NE QRP Project #2). We could even do a QSO sprint of sorts with the net frequency and time as the meeting place similar to what we did with the color burst sprint.

If there are members who are interested in running the novice net or have any ideas or suggestions, I would certainly like to hear from you. Drop me a line.

I would like to remind all QRP members that there are a couple of ARCI QRP nets which are good places for New England QRP Club members to meet and QSO other QRP operators. These are listed below:

Net Name	Date Time	Freq.	Net Control	Asst. Net Control
NEN	Sat. 08:00	7040 KHz	WA1JXR Greg	K3TKS Danny
GLN	Wed. 21:00	3560 KHz.	NN1G Dave	-

Also, remember the QRP NE SSB Net Monday, 21:00 3855 KHz. WA1JXR Greg / WILMU Harry.

I look forward to hearing your comments/suggestions on the NE QRP Novice NET, and would like to see someone come forward and run a novice net. I will help, however, with my commitments to other nets, my plate is full.

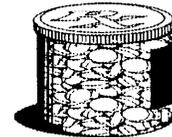
Look forward to hearing you all on the air in 1995.

72 Greg - WA1JXR NE#12

“With membership over the two-hundred mark, I would think we could get a better turn out than the 4 to 6 QNI's we get each net, but since the start of the net in 1993, this has been the typical numbers.”



**You know what the doctor told you.... Did you remember to send in your dues? If you would like to continue receiving Z2, renew your membership before you're on the dead-letter list. Now, you wouldn't want that...would you? The New England QRP Club is just what the doctor ordered—low stress, easy reading and a lot of friends to make you smile. Keep us along with you in your Expeditions and mention us in your QSO's. Truly, the QRP Club of New England is just you need to complete your station Now, take out your checkbook and renew your membership with one of the leading QRP clubs in America. Swallow those pills and keep on reading Z2.**



# BIG SOUND Ten Bucks!

**Dennis Marandos - K1LGQ NE#151  
Nashua, NH**

I can't get it in my head that the signals are there, but I can't hear them. I know they can hear me, but—geeese, I am having trouble hearing them. Okay, I narrowed down part of my problem... the audio portion of my Thirty-40 and Forty-40. What did I do about it? I offered an audio amplifier in the last issue of 72 which used an LM-386 chip and gave about 1/2 to 3/4 of a watt of audio power. Not bad, but wait, I had fun building it, gathering the parts, looking for audio jacks, low wattage speakers, electrolytic caps, a few resistors, etc. I mean, in the real spirit of amateur radio I MADE IT FROM SCRATCH and it was mine. Now I am ready to bring you an up-date as to where you can buy one.

I saw two audio amplifiers in Radio Shack which you have to see for yourself to appreciate. One is ready-made for immediate use and the other is in a bag of parts, waiting for you to put the soldering iron to it.

Radio Shack has a series of kits called Science Fair® and the audio amplifier is new for their line. It's advertised as "Crunk IT! 1-Watt amplifier kit," RS 28-4031 for \$9.99. Larry Olsen - K1LO and I went to our local store to see just what was inside, that is—to see if it was worth the ten bucks. At the counter, we opened the box, took out the parts and saw that it had an LM-386 chip plus all the parts to make it work! It certainly was worth the money and it had it's own circuit board to slide into your already made project. Best of all, I didn't have to swamp a resistor network to bring it to 12 volts DC. The project can handle from 4 to 28 VDC making this a pretty versatile little audio amplifier. A wiring option lets you select 26 dB or 46 dB total gain. I thought it looked pretty interesting and was about to hand over ten buck when I saw another audio amplifier for two bucks more.

The second amplifier had much more to offer and was 'worth' the investigation. It is Radio Shack's **Audio amp with speaker**, part number 277-1008, \$11.99. I took it apart and sure enough it had everything already put together in one little plastic box, just waiting to be hooked up to my QRP audio. The amp was by far better than the first one I saw because I didn't have to assemble it and it was ready for use. I only needed a 9 volt battery and I was listening on the air. Needless to say, I got the second one and went home to see if it would do all that I wanted it to do.

I did need one jump cord with 1/8 inch jack on both ends to connect to my rig. It was laid out on the operating table, volume was GREAT and I heard AA2AV calling CQ on 40 meters without a bit of ear squinting. I gave Paul a call and sure enough he heard me without a bit of trouble and I heard him loud and clear...without an earphone. He gave me an RST 579 and he was 599. Of course, his 40 meter beam did help quite a bit. He lowered his power from 80 watts to 5 watts and he was STILL a 599 into New Hampshire. Good going Paul, nice antenna!

The second audio amp, with it's own speaker, is pretty sensitive, that is, it has *my* sensitivity pre-amp blasting into an LM-386 chip. It operate on 9 volts with a dc adapter socket, but the center plug is negative and the outer casing is positive. I wish Radio Shack would catch on that it's the other way around. Inside, there is an 'idiot diode' 1N4001 to prevent you from destroying your circuit, if you should be a 'bimbo' and not follow the voltage polarity, which I have done often. It also has a 1/8 inch jack for headphones, if you want to still put the ear-warmer headphones on. Overall, this amplifier is pretty slick.

My final conclusion is audio plays a big part in QRP, that is, you have to hear them to work them. I don't want to be distracted by a truck going by with loud mufflers or a huge jet flying over head soaring into a flight plan. I just want the comforts of a big-rig sound in a little portable operation. Either of the two kits will be ideal for you and it will show marked improvement in your operating station. I chose the latter because all my QRP rigs have an audio jack for headphones and it was easier for me to patch a cord between the two. I also have the LM-386 audio amp SCHEMATIC I presented last issue hanging on my wall when all else fails. I am not giving up on making what I need...not yet, at least.

**Dennis Marandos - K1LGQ NE#151  
Nashua, NH**

## A hint:

Crystal operating technique is very different! You had better think twice before touching that key. Many stations will be sharing a single frequency and an uninformed or inconsiderate operator could easily be mistaken for a dope. Or worse...

*Simple rules for the VFO operator.*

Do not call crystal stations on frequency.

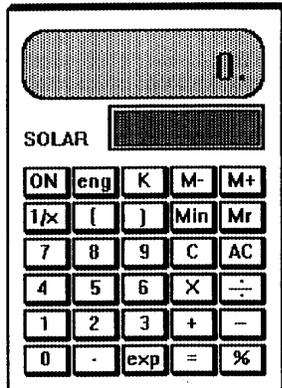
Crystal stations listen way up and down the band.

Give a crystal station a long call, breaking in between, for a reply.

Crystal stations may have a slow T-R switch.

CREDIT for June 94 PREMIER PHOTOS  
pages. 20, 21, 22.

Apologies, credit and explanation long overdue! Steve Hideg, N8HSC was the cameraman behind the lens and it's due time Steve received his DUE. Thank you Steve and keep the pictures coming. Good New Year and lots of DX to you from the gang at...22.



## DUES DUE - DON'TS WON'T

Treasurer's Report

**Paul Kranz - W1CFI  
Harvard, MA**

It probably doesn't need to be said that the treasurer's report is not the first thing any avid QRP'er would turn to upon opening his newsletter, but this one's different!

This past year was nothing short of spectacular for our club. The club made \$1,692 on sales of Forty-40 kits, thanks to the efforts of Dave Benson - NN1G, Jack Frake NG1G, his two 'kitters' and your treasurer. Perhaps the best part of this news is the non-financial aspect of the kit project. Here, the club contributed to a lot of QRP fun for members with these superb transceivers. I have really enjoyed using my 80 meter version and can't say enough good things about it. My log is filled with 80 meter contacts made with this little rig and I find that I'm on this band more than I have been in many years. One of my first contacts was EA8CN in the Canary Islands. I encourage those of you that haven't yet finished the transceiver kit assembly to do so as soon as possible. You'll have the time of your life on the air with it!

Now for the real treasurer's report. Looking at the figures below, you can see that the club brought in \$6,307 this year from kit sales and dues. Of this, the club spent \$4059.55 for the newsletter, membership costs, miscellaneous activities like field day and flea markets, and for kit parts. Our balance for the new year is \$2940.36.

The newsletter is our largest expense. If an average of 200 members are assumed over the whole

year, you can see that the newsletter costs \$6.98 to publish and mail. This means that the club spends all of its dues income on publishing the newsletter.

The present membership breakdown is 243 paid members of which 149 have paid through 1994. The remainder have dues paid through 1995, 1996 or 1997. Please note that:

**DUES ARE DUE FOR 1995  
FOR ALL MEMBERS NOW!**

Check your mailing label to see what year your dues are paid through. For example, if the right hand, upper corner looks like this 94NE<your number>, you owe dues for 1995. If you forget, your newsletter will simply stop showing up!

For current members, renew by sending a check for \$7 to:

Paul Kranz, - W1CFI, Treasurer  
26 Mettacomett Path  
Harvard, MA 01451

A new application form *is not needed* to renew, but write your call sign and NE-QRP number on each check!

For new members only, send an application form with \$10 to:

Jack Frake, - NG1G, Club Membership  
P.O. Box 93  
Barnard, VT 05031

Write your call sign on the application and check!

### Treasury Report

1993 BALANCE \$ 692.91

#### INCOME

Dues	\$2112.00
<u>Kit Sales</u>	<u>\$4195.00</u>
Total	\$6307.00

#### EXPENSES

Newsletter	\$1395.65
Membership	\$ 160.91
<u>Kit Parts</u>	<u>\$2502.99</u>
Total	\$4059.55

1994 BALANCE \$2940.36

**NEW ENGLAND QRP  
CLUB CONTEST**

**LOOK!**

**QRP-NE - COLORBURST SPRINT**

When: Thursday evenings during February, 1995  
 Mode: CW - Crystal control  
 Freq: 3.579 MHz (TV Colorburst Frequency)  
 Site: QRP - RQRP EX  
 Exchange: RST QTH NE#/PWR X-NAME (SOMANBARI Harry)  
 (599 NH 5WX Bob)  
 QTH = State  
 NE# = QRP-NE number (non-members send PWR)  
 PWR = Output Power (for non-members)  
 X = Use if Colorburst Crystal Controlled  
 Any transmitter using a 3.579 MHz crystal is acceptable.  
 State your power level on logs. QSO's are cumulative.  
 QSO's are cumulative.

**QRP-NE - COLORBURST SPRINT**

**When:** Thursday evenings during February 1995.  
**Mode:** CW Crystal control  
**Freq:** 3.579 MHz (TV Colorburst Frequency)  
**Time:** 9:00 - 10:00 p.m. EST  
**Exchange:** RST, QTH NE#/(PWR), X-NAME (579 MA NE44X Harry) (599 NH 5WX Bob)

**QTH** = State  
**NE #** = QRP-NE number (non-members send PWR)  
**PWR** = Output Power (for non-members)  
**X** = Use if Colorburst Crystal Controlled  
 Any transmitter using a 3.579 MHz crystal is acceptable. State your power level on logs. QSO's are cumulative: you can work the same station on subsequent Thursdays. Don't watch TV much? Remove the crystal and put it to better use. Watch out: WIAW transmits bulletins at 10:00 p.m. on 3581 KHz.

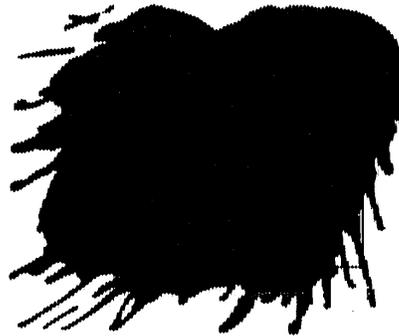
**Send Logs to:**  
 snail mail

**J. Kearman**  
 83 Main Street Apt 13C  
 Newington, CT 06111

Logs need to be received by March 10, in order to be included in the April issue of 72.



Some of the boys are getting together to renew their membership in the New England QRP Club. Don't you want to be included? Subscribe now so you won't forget.



Mark your calendars now and don't miss out at the opportunity to operate your own QRP rig from the WIAW station. February 18, 1995 (Saturday) at 10 AM, at the ARRL Headquarters in Newington, CT.

Meeting with our president W1FMT - Jim Fitton, 72 newsletter editor K1LQ - Dennis Marandos, Forty-40 presentation by designer NN1G - Dave Benson, and more. After lunch, we will operate WIAW - QRP for the duration of the afternoon. Call W1FMR for car pooling and directions.



**CHECK YOUR MAILING LABEL**

Club dues are due in January for the following year for ALL club members. Some members have been paying their club dues when no dues were due! So please check your mailing label for correct information. Be certain that it contains the correct address and that your membership number and dues payment date are shown correctly. To decode the membership number and the dues payment date, locate the number in the upper right corner of your mailing label on this issue of "72". The first two digits are the year for which dues are paid and the digits following the "NE" are your membership number. For example: 95NE123 is interpreted as dues being paid through 1995 and the membership number is 123.

Any errors or changes should be noted and sent to the Treasurer:

Paul Kranz - W1CFI  
 26 Mettacomett Path  
 Harvard, MA 01451-1864

**LARRY'S QRP HOME BREW  
BEER**



**low in alcohol but not in taste**

**Larry Olsen - K1LO NE#207  
Hudson, NH**

Since there has been an insurgence of electronic home brewing, it might be nice to explore some other avenues of the old

1	5 or more gallon clean food grade plastic container, (or glass carboy) with air-tight, removable lid (or stopper), drilled to accept a fermentation airlock.
1	Fermentation airlock with stopper to fit above container
5	Feet of plastic hose, 1/4 inch to 3/8 inch diameter is ok, This will be used to transfer beer from large container to bottles.
17 - 53	Sufficient clean empty re-sealable beer bottles, 12 to 22 oz. I suggest the FISHER d'ALSACE, GROCSH as these do not require the use of bottle capper and expendable caps. But, make sure you have enough bottle volume to accept your batch size before you start.

fashion art of home brewing, or make your own beer. I like a low power BEER, QRP BEER, that doesn't take the edge off your fist but still communicates five by nine flavor.

The process is simple and only requires 3 hours your time, plus time waiting for complete fermentation. All this for about 3 to 5 gallons of your own home-brew. A good starting point is to follow the 3 gallons recipe that will give you a quality "LITE" beer.

You begin by accumulating the following equipment:

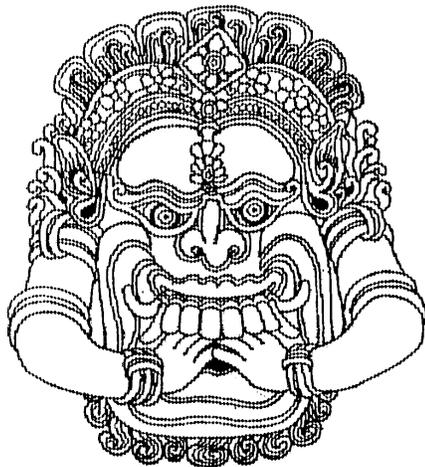
1 Kg	Brewer's malt. Obtainable from wine making shops or grocery stores, like SHOP'N SAVE SUPERSTORE. Cost is about \$5.35 for 1 Kg, which includes beer yeast.
1 packet	Dried ale yeast, supplied with brewer's malt.
1/2 cup	SUGAR
8 oz.	HONEY
1/4 teaspoon	Irish moss, also called carrigeen, used to help clarify beer, optional.
2 oz	CLOROX for cleaning container, tubing and containers.

PROCESS

- CLEANING
- WORT BOILING
- PITCHING
- FERMENTATION
- PRIMING AND RACKING TO BOTTLES
- AGING
- PORING and DRINKING

Have fun and don't forget to make your own QRP labels. Drop me a line if you don't have success and...drop me a line if you do! 72' and 73' from New Hampshire.

**K1LO - Larry Olsen, Hudson, NH**



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Any errors or changes should be noted and sent to the Treasurer:

Paul Kranz, W1CFI  
26 Mettacomett Path  
Harvard, MA 01451-1864

## BOXBORO, MA ARRL

The Boxboro, MA ARRL convention was a success. Three featured speakers:

Dave Benson - NN1G  
Chet Bowles - AA1EX  
Randy Rand - AA2U

were an immense hit. The QRP forum ran for 2 hours and the crowd varied from 72 to over 100 at various times during the session.

About 1/3 of those attending were NE-QRP club members and about 5 attendees participated in the QRP-AFIELD contest 2 weeks prior. Dennis Marandos, K1LGQ, the editor of the club newsletter, did an excellent job moderating the forums. Dave Benson, NN1G, discussed design of the Forty-40 series of transceivers and mentioned some of the modifications appearing in the (fall) issue of the club newsletter, 72. Dave also hinted that a construction article for the 80-40 and other bands will appear shortly in either *QST* or *QEX*.

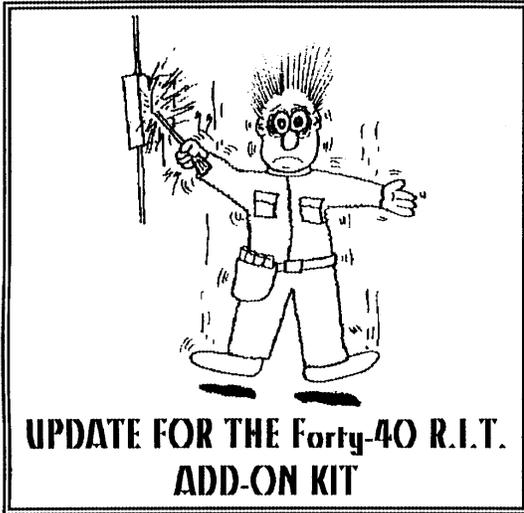
Chet Bowles, AA1EX, showed the first 21 scores received, from the first ever QRP-AFIELD contest. The high score was attained from a New England club effort using 1 transmitter. The second high score (so far), was a team from 4-land and they sent in a terrific video. Unfortunately, we could not get a VCR in the forum room to show the video to the crowd. Featured in the video was a walking stick antenna which will appear in the December issue of *QST*.

Randy Jones wowed the gang with a very informative talk on antennas for the QRPer. He talked about the relative merits and performance of various wire, vertical, low-triband, high-triband and stacked tri-band beams. What made this talk interesting was his data was based on experience, not just theory. Bill McNally took videos of the 3 QRP talks and it is an excellent productive production! I can't wait to work with Bill to see how he gets the video into final edited form.

Dick KA3ZOW was present from S&S Engineering and displayed the ARK 40 series of transceivers. He had a short trap dipole set upon a short mast. I watched a visitor make a contact using the smaller version of the ARK series, with a CW station in the deep south, with an excellent RST report. For a 40 meter contact in the middle of the afternoon, I was very impressed! Oh, I won a dual band MAG mount antenna. To go with the dual band handy I won the year before.

See you all at the Rochester, NH (May 18, 1995) swap-fest. The club meeting will be on Saturday at 10:00 a.m. Listen for announcements.

Jim Fitton - W1FMR NE#01  
Salem, NH



**Ernie Gregoire - AA1IK**  
 P.O. Box 221  
 Cannon, NH 03741

I hope you all had a Merry Christmas. I spent a week after the holiday attempting to put the 40/40, into a box.

**Everybody needs a Guru.**

The radio was complete including toroids, (those festive little red things) as my wife calls them. All I had to do was add the R.I.T. kit, put it into a box, add some knobs and BING-BAM-BOOM, I'd be on the air. I did a lot of BING and BAM, but I got no BOOM. I called John Collins-KN1H, and he quickly pointed out the error on the schematic that came with the R.I.T.

**Item 1.**

There is a 100K potentiometer used to tune the rig and this is the source of the trouble. The center tap of this POT must be wired to the TUNE point connection on the 40/40. (You must provide this Pot. It does not come with the kit.)

**Item 2.**

Looking at the diagram, there is a line that says (Existing R1), and it has an arrow pointing to the XX-40 board. Eliminate the line from the dot where it is connected to the 100K Pot., to the XX-40 board.

**Item 3.**

Eliminate the little bent arrow that is part of the 100K Pot. This is the center tap of the 100K pot, and was corrected in Item 1.

Many thanks to John Collins, KN1H, for this fix.

SO...HOW DID IT WORK? It all works just fine.

After helpful hints given by Dave Benson, NN1G (Guru no.2), on the updated tuning procedure, it played.

**72 Ernie Gregoire - AA1IK**  
**Cannon, NH 03741**



**A BRIEF STORY**

There used to be a guy by the name of Smart who used to read and love articles to make the fun gizmo's he found in all the mail that went to his house. His first name was Knotso and his aim in life was to live it to the fullest. There was one problem with Knotso and that was he never had much of a memory. Try as he would, facts and important dates simply fell out one side of his head and evaporated into the air. However, Knotso cherished building his equipment and tuning his QRP station till it hummed like a top. All the neighbors were proud of Knotso and admired him for his interlectual prowess of electronics, but they never did understand his memory loss for meaningful events and dates.

One day, as life continued, Knotso didn't receive any of the fun projects he used to receive in the mail. He sat by the front door of his house and waited for Mr. Mailman to deliver his eargerly awaited writings by some of the greatest people in the world, but nothing arrived. Finally, his wife asked Knotso if he ever renewed his membership to the New England QRP Club. Knotso looked down with embrassment and said, "No." It's easy to see why he's called Mr. Knotso Smart. Renew today and don't let this happen to you.

**72 - Dennis Marandos K1LGQ NE#151**  
**42 Cushing Avenue**  
**Nashua, NH 03060-1816**



**Answers for Make Your Match.**

1=Y	2=T	3=A	4=Z	5=X	6=K
7=U	8=N	9=P	10=Q	11=H	12=L
13=B	14=G	15=O	16=F	17=J	18=M
19=V	20=D	21=C	22=S	23=E	24=W
25=R	26=I				