

April 1994

72

The NEW ENGLAND QRP NEWSLETTER



NE-QRP
42 Cushing Avenue
Nashua, NH 03060-1816

TO:

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. Send your materials, hand written or typed, to 72. Floppy diskettes, MS-DOS Windows gladly accepted, and be sure to put your phone number in case a follow-up is necessary. Technical articles may be sent to John Collins, KN1H, 72 Technical Editor, at the address below. Membership news should be sent to NT1R, Bill Legge, also, at the address below.

Deadline for the next issue of 72 is June 4, 1994.

'72'

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QRP New England's Homebrew project #2: The "40-40"- a Single-board Superhet Rig for 40M/ 30M.

Every little rig project deserves a catchy title, so we'll bow to tradition on this one. This rig is named after the original concept for band coverage (40 Meters) and the club's kit pricetag (\$40). Any similarity between this nickname and that of any other QRP clubs' offerings is strictly a coincidence (*right!*).

This project's a low-complexity superhet transceiver for the low bands. When you get right down to it, a workable superhet transceiver needn't be more complex than a good DC transceiver! To get down to this level of simplicity, it's necessary to cut a couple of corners, but the result is still eminently usable. First, the sacrifices-

- Low speaker drive
- No RIT or AGC

And of course, the good news-

- 40M or 30M operation
- 40 Khz band coverage (40M)
- Varicap tuned VFO - low cost
- Full Break-in (QSK)

The result of this effort is a single PC-board design occupying a 2.8" x 4.0" layout. The discussion which follows covers the 40M version, but operation is substantially the same for 30 Meters as well. Let's take the 50-cent tour:

The receiver RF input is applied to U1 through T1, C1, and C2, which provide a bandpass filter tuned to 7.0 Mhz. T1's secondary winding provides roughly unity-gain into U1 to minimize overload (IMD). U1 provides about 13 dB of gain in this configuration, and converts the RF input to the IF frequency of 4.0 Mhz. The L-network (C12 and RFC1) following the mixer serve to

step the mixer output impedance down to the crystal filter's design value.

The crystal filter itself uses only 2 crystals instead of the usual four. This works well because of the choice of a low IF frequency. (The 8.2 Mhz IF used for the 30M version is slightly broader, but the result is still usable.) Loss through the filter is less than 2 dB, and with the component values shown, the -6dB bandwidth is about 500 Hz. Despite the filter's low parts count, performance is adequate when combined with the AF section's selectivity. The unwanted sideband image is down about 45 dB at the audio chain's 800 Hz peak response frequency.

The filter output is terminated in a 470 Ω resistor at the input to U3, the product detector stage. U3 converts the 4.0 Mhz IF signal to audio and contributes another 13 dB of gain. By matching the BFO crystal Y3 (more on this later) there's no BFO frequency trimming needed. The .033 uF capacitor across pins 4 and 5 of U3 provides the first measure of audio low-pass filtering.

The two sections of U4 each provide roughly 30 dB of amplification. The first section is configured as a differential amplifier to make use of U3's differential output and rolls off the audio response above 1.5 khz. Diodes D2 and D3 serve to limit the audio swing during transmitter key-down to reasonable values. Without these diodes, this stage saturates and upsets the operation of the following FET switch section.

The AF mute function is the familiar series FET switch popularized by W7EL. Despite its relative simplicity, it's hard to beat this circuit for click-free audio switching. The audio final stage is configured as a

bandpass filter centered at 800 Hz. The high gain of the two NE5532 stages (64 dB total) allows a design with no IF amp stage. The audio output level is adequate to drive headphones, but it won't cut the mustard for loudspeaker applications. The AF output stage internally overcurrent-limits on loud signals to provide a ready-made ear protection function. (In this respect, it accomplishes what you'd want an AGC for anyway.) If you're interested in saving a few milliamps on receive, either the TL072 or the MC1458 may be substituted, although at reduced maximum AF output levels. You'll save about 5 mA but at the expense of a limiting threshold about 10 dB lower.

QSK: The first prototype used a manual-changeover switch to perform T-R switching. Although this was adequate for casual QSOs, a couple of hours of contest operation with that version served to convince us otherwise! The initial version scrimped on parts by using U1's internal oscillator section, but the QSK application demands a stand-alone local oscillator. U1's internal oscillator suffered from pulling when a sample of the transmitted signal was applied to the mixer input, so instead, the LO function is now served by Q2. The T-R switch itself was borrowed (*OK- stolen!*) from W1CFI's 80-meter surface mount transceiver design.

The local oscillator (LO) uses the Colpitts configuration. Although it's not a minimum parts-count design, it's more "builder-friendly" than the tapped-coil Hartley. Polystyrene caps aren't the usual candidate of choice when used alone in a VFO design, but they're used here because they're compact and available in 5% tolerance values. The resulting temperature stability is more than adequate in this 3 Mhz application. C3 is part of a voltage divider providing proper injection to U1, and is grounded through the Vr supply. This "virtual ground" trick is used simply to ease

PC board layout, rather than for any Amazing Technical Reason.

The design also uses a varicap tuning diode for tuning coverage. While a smooth ball-bearing tuning cap and vernier reduction drive are the preferred approach, that choice drives the cost and mechanical complexity of a transceiver up considerably. The varicap approach supports quite a compact package! (See the article accompanying this one for details on a homebrew package measuring 4.1 x 4.1 x 1.5 inches.) If "ya' just gotta have" RIT, an outboard circuit which injects a tunable DC offset into the diode bias network on receive would do the trick. We're planning to cover this upgrade in the next issue of 72.

The transmitter chain is a pretty standard affair. The output power is about 1.5 watts and there's a drive control at the buffer stage (Q4) to adjust the output level. Any of a number of well-known TO-5 transistors, including the inexpensive 2N2219 or 2N3053 may be used as PAs in a pinch - expect about a watt of RF output if you use these. We checked the output spectrum for the more critical 30M case (due to the relative proximity of the IF and output frequencies), and this rig complies with the FCC requirements for spurious emissions. All harmonics were down at least 33 dB. The biggest spurious contributor (at 8.1 Mhz) was down 41 dB.

Building the rig is pretty straightforward. If you've gathered your own parts for this project, you'll need to match Y1-Y4 to within 50-100 Hz. To do this, use a "what-have-you" test oscillator to try out a batch of 4.0 Mhz crystals. You can listen on your main station receiver tuned to the high end of 75M - a frequency counter is not necessary. The 4 most closely-grouped crystals are the ones you want. (QRP New England's kit offering provides the crystals already-selected.)

One caution- the choice of 4.000 Mhz as an IF frequency yields a "birdy" at 7.000 Mhz. If your plans include operating this rig right down at the lower band-edge, you might consider other surplus crystal frequencies such as 4.032 or 4.096 Mhz for an IF.

Alignment is a piece of cake with this little rig. For test equipment, you'll need a main-station rig and multimeter. Here's how you "get there from here":

Receiver alignment:

- Adjust trimmer cap C8 to set the LO frequency to your favorite portion of 40 Meters. This corresponds to an LO frequency of roughly 3.05 Mhz at the full clockwise setting of R1 (8V on R1's wiper). You may need to remove a turn from L1 to get the tuning range up into the 40 Meter band. This is where the main station rig is used- as a signal source in its 'transmit' mode.

- Connect a matched antenna. Using a non-metallic tuning tool, peak C1 for maximum signal (or noise). If you don't have one of these tools, you can make one from a narrow strip of PC board material with the tip filed down to fit the slot in the tuning cap. *The use of an insulated tool is important because body capacity will make adjustment difficult otherwise.* Once this step is complete, background noise will be noticeably higher with an antenna connected than without.

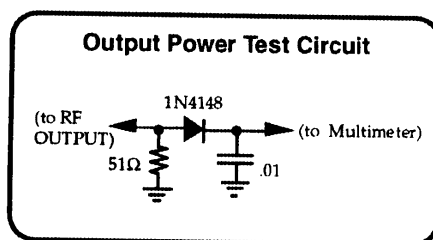
Transmitter alignment:

- Set trimmer R2 to approximately 3/4ths of its full-clockwise setting. Connect the RF output to a wattmeter (if you have one). If you lack this luxury, you can use your SWR meter with a dummy load connected and set in the "Forward" metering position. (See the test circuit

below for yet another way to get the job done.)

- Ground the "Key" input and adjust trimmer capacitors C23 and C26 for maximum indicated output power. The adjustment on the capacitors will be somewhat interactive, so alternate between the two for a maximum response.

- Adjust trimmer R2 as needed for 1.5 watts key-down power into a dummy load or test circuit. This adjustment will result in a test-circuit measurement of 12 VDC. Increase drive (R2 clockwise) only as needed to get to this level. More is not better- you'll coax a little more power out at the expense of efficiency!



That's it - you're on the air! On-the-air signal reports have been very favorable, and this little jewel might well become your favorite "little" rig. See you on the air!

And now a word from our sponsor... We don't want you to just read about this rig. We'd like you to fire up that soldering iron and get building! To that end, we've put together a kit to take the pain out of parts acquisition.

Here's the deal-

You send us:

- \$39.95 + 2.00 shipping

We send you:

- Drilled and tinned PC board
- Matched crystal set
- All on-board parts and wire
- Layout drawings and building instructions

You supply:

- Enclosure
- Connectors and controls (all avail. from Radio Shack)
- Labor

We discussed providing the enclosure and controls/connectors at a previous club

meeting, but concluded that we should leave these acquisitions to the builders' imaginations. (You can't please everyone, and many folks already have this stuff in their junk boxes. These items drive up the cost of a kit substantially, and we wanted to keep the price as modest as possible.)

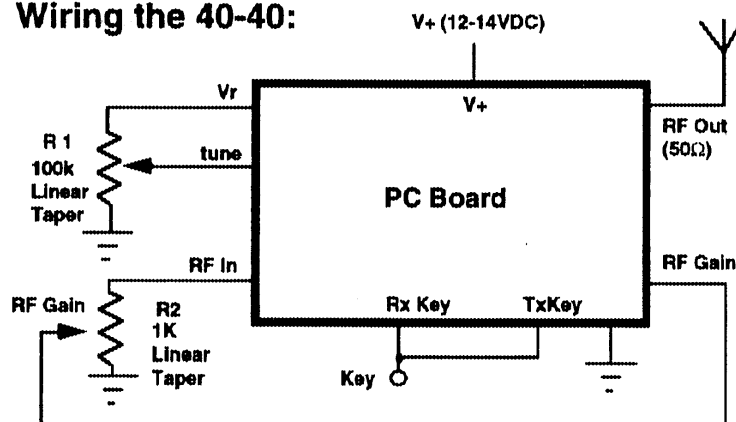
We'll also provide assistance to QRP New England members through one of our homebrew team folks if you get mired in deep technical chocolate pudding. Further information on technical support is provided with the kits.

To order, send a check or money order to:

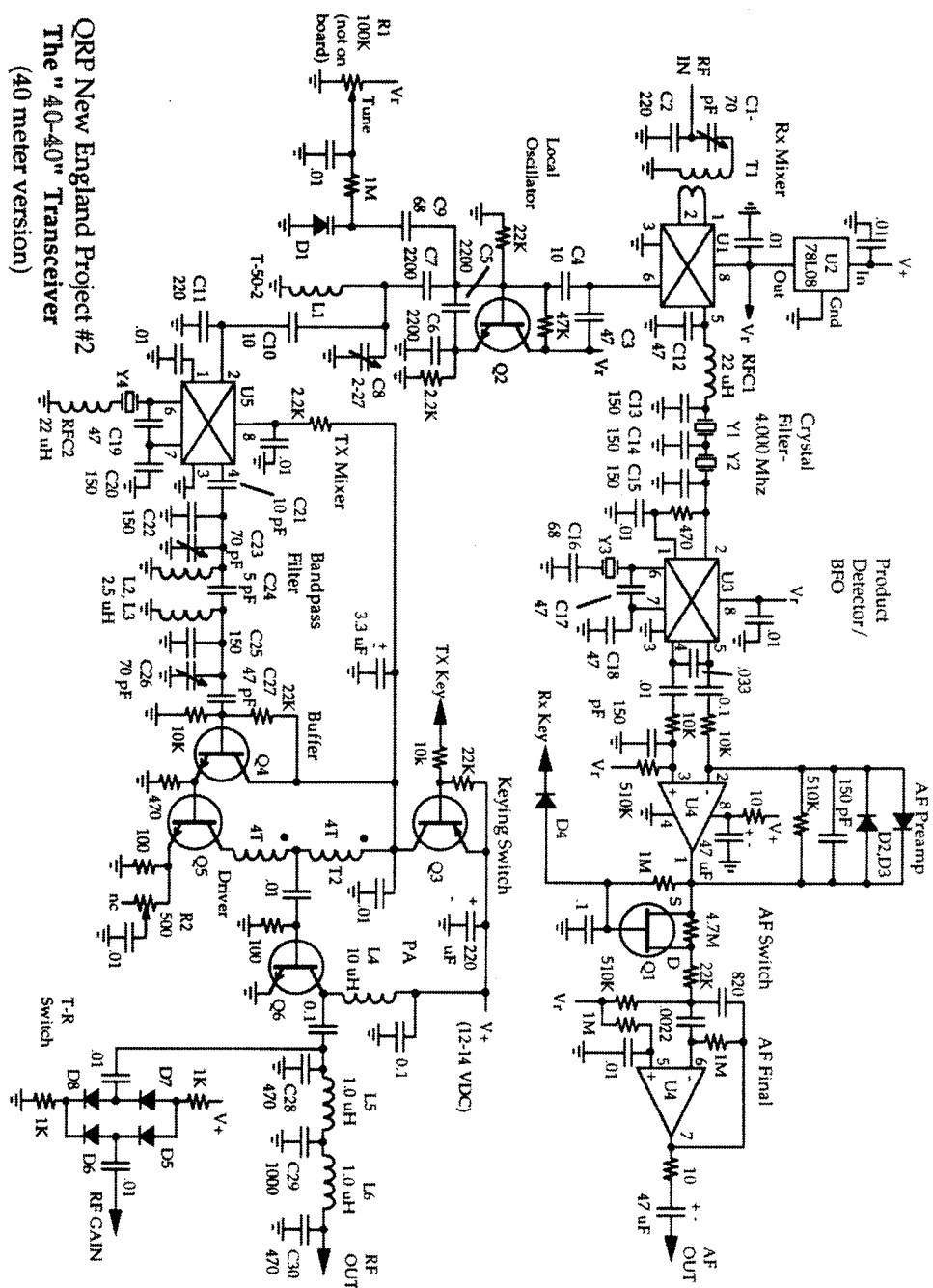
QRP New England
c/o Jack Frake, NG1G
P.O. Box 1153
Barnard, VT 05031

Be sure to specify which band (40M or 30M) you're interested in. We'll also plan on making these kits available at upcoming club meetings. Quantities are limited (we'd planned a run of only 50 kits) so "ACT NOW!" as they say in the advertising business. Let's hear from you!

Wiring the 40-40:

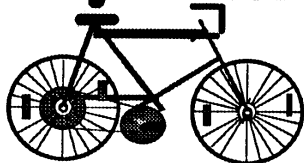


The "40-40"- a Single-board Superhet Rig for 40M/ 30M



NNIG © 1994 03/08

Second Annual QRP-Hamming Bicycle Tour



The second annual QRP-hamming bicycle tour along the Pacific Crest Bicycle Trail will take place again this year in August or September. The week-long trip will begin at Crescent Lake Oregon and end near Mt. Shasta, California. QRP hams who have bicycle touring experience are invited to join the group. There are no fees. The group will average 50-60 miles per day in hilly and mountainous terrain, and camp and cook in campgrounds. Most hamming will be done at the end of the riding day in campgrounds.

Last year, four hams John Talstad - KD8UKC, Dan Arbogast - NØDA, Guy Hamblen - AA7QZ, and Bil Paul - KD6JUI, along with one non-ham, made the trip along the Pacific Crest Bicycle Trail from southern Washington state to Crescent Lake, in Oregon. Oak Hills Research and MFJ QRP equipment was used on 40, 20 and 15 meters and several of the hams used solar panels to charge up batteries during each day's ride.

A monthly newsletter will go to those interested in going on the trip, and an exact date will be announced later. For more information write to Bil Paul - KD6JUI, P.O. Box 5183, San Jose, CA 95150-5183. Or, you may call him evenings at 415/345-7021.

Earth Friendly Technologies QRPP Low Power Award



THE PURPOSE of QRPP Low Power Award is to promote the enjoyment of low power operating while demonstrating its usefulness and practicality. Successful applicants will be issued an Award Certificate and a unique registration number assigned to them for life, regardless of call sign changes. By encourag-

ing low power operations, it is believed that the art, hobby and professions associated with RF communications will have a greater number of skilled and competent operators at their disposal. In addition, lower levels of QRM and RFI will be experienced while less pressure is being placed on the Earth's resources.

THE RULES are: any authorized amateur frequency and legal mode of communication may be utilized. The person/station applying for the award must demonstrate, to the satisfaction of the Certificate Manager, the following:

1. That the applicant's transmitter output power, during the period of qualifying communications, was accurately measured to be less than one watt (QRPP).
2. That the distance between the applicant's transmitting antenna and the receiving station was over 100 kilometers, 63 miles.
3. That no artificial means of active relay was used to complete the communications, i.e. repeaters, satellite transponders, digipeaters, land-lines, etc. However, reflections off the ionosphere, mountains, tropospheric ducts, auroral curtains, meteors, the moon, satellites, buildings, aircraft bodies and other passive reflectors are acceptable and encouraged.

APPLICATION:

- A. Send a signed statement to the certificate manager affirming that the transmitter power was less than one watt, the distance was greater than 100 kilometers, 63 miles, and that no artificial means of active relay was utilized.
- B. Provide the Certificate Manager with a photocopy of either the station log, or the confirmation QSL card, clearly showing the date, time, mode and frequency that the qualifying communication took place.
- C. If desired, provide the Certificate Manager with information concerning any endorsements, such as longer distances, even lower power levels, WAC, WAS, WAZ, solar powered, etc., that you may want listed on your certificate.
- D. Mail \$4.00 US (\$5.00 foreign) along with application materials A, B and C to:

'EFT'
Low Power Award
P.O. Box 460101
Aurora, Colorado
80046-0101

INTERNET Anyone ?

Chester (Chet) Bowles - AA1EX
NE-QRP #58

Can you send and receive mail via the INTERNET? If the answer is yes, there are some very interesting services available. Many corporations have access to the Internet for sending and receiving mail, and if you aren't sure about your company, talk to your system manager. It's pretty simple, easy and inexpensive to initiate the capability.

...one of the first things you will want to do is send a message to QRP-Request@think.com

Don't despair, however, if your company does not have mail access to the Internet and you can't convince them to provide it. *CompuServe, Prodigy and other similar services provide mail access to the Internet. Also, there are public servers which, for a monthly fee, provide Internet access to individuals (check the Yellow Pages under "Data Processing Service" or "Computers--Software and Services.")*

Once you have Internet mail capability, one of the first things you will want to do is send a message to QRP-Request@think.com and ask to be put on the distribution list. You'll start receiving as many as 20-25 messages per day from QRP enthusiasts, such as you, from around the world! Here's the way it works:

- Someone has a comment or question for the QRP "group."
- They address a memo to QRP@think.com.
- Messages addresses to QRP@think.com are automatically re-sent to everyone on the distribution list.

There are some "conventions" and "norms" for the way things are handled in this group. Nevertheless, just watch and read for a day or two and you'll get the idea.

When you register for the group, demographic information is requested for the records such as your name, call, EMAIL address, QRP rigs, QRP favorites and any other comments you care to share. You can either include that with your original request or send it as a separate mail message.

...Send and receive messages via Packet radio.

The other really interesting Internet service is the ability to send and receive messages from packet radio. Here's the way this service works:

⇒ From Internet to Packet

- Send mail to gate@wb7tpy.ampr.org
- The first line of text MUST be: `user@callsign.hierchial.address` (This MUST be left-justified.) For example:

packet: aa1ex@wb1wok.nh.usa.na

⇒ From Packet to Internet

- Send mail on packet to gate@wb7tpy.nh.usa.na
- The first line of text MUST be: `user@site.domain` (This MUST be left justified.) For example:

Internet: chester.bowles@mko.mts.dec.com (This is my Internet address.)

I've tried it and this service is great. However, some words of caution are in order. First, this gateway is run by WB7TPY out of the goodness of his heart. Don't over use it. Second, he doesn't like "test" messages. Finally, keep your messages short, to reduce the possibility of error, and if you must send a long message, break it up into several smaller messages.

There you have it! Simple stuff, but fun. Let me know how you did, and drop me a line. Enjoy!

Chet - AA1EX NE-QRP #58
Sharon, New Hampshire

RE: NN1G Building Notes

Bradley S. Mitchell WB8YGG

I saw that the NN1G design ran the NE602's at 8 volts (ouch). The 8 volts also supplied the VFO. While the NE602's are happy, they perform better at 6 volts. But since I'm also going to add the QRP15 RIT circuit and need higher voltage to keep the varactor voltage more than the RF tank voltage, I'll try go with the 8 volts (ouch). If your VFO doesn't oscillate with the 8 volt supply, replace the MPF102 and use a 2N5486, or better yet, a J310.

I ran the NE602's with an 8v regulator, and found that the regulator was actually 8.1 volts out. The problem showed up as a noise in the receiver that sounded like 'precip static' on an antenna, but apparently it was some sort of break down mechanism.. I'm using 6v regulators on one, and 5v on my other NN1G rig.
72' & 73'

Bradley S. Mitchell - WB8YGG
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Circuit Board Assembly Dept. 606 Test Engineering
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(716) 726-5775, FAX (716) 726-7109
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QST: Call for Articles

QST is always interested in considering articles on the topics of homebrewing equipment, or QRP operating. Before suggesting a topic, please review QST to see if it has been covered. Some areas to ponder upon:

QRP Antenna Tuners
Alternative Power Sources
Pictures/articles about people having fun with QRP
How your club set up a club project or kit

Please contact me with topics you'd like to write about. If I like the idea, I'll send you an Author's Guide and we can get started.

72' and 73',

Jim Kearman, KR1S
ARRL Asst Technical Editor

jkearman@arrl.org
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203-667-2568 (home)

**TAKE A
LOOK
AT THIS...**

AGENDA FOR ROCHESTER, NH QRP MEETING SATURDAY / MAY 7, 1994

In case you haven't noticed, there is a business meeting scheduled for Rochester, NH and ALL members and interested guests are to go to the Hexagonal meeting House at 10 AM for a report by all the officers. This building is near the front entrance. The AGENDA will be brief and direct and will focus on 1. reports from all officers (check the inside 72 'THE TEAM' roster to remind you who you are and to COME PREPARED to give a report!) 2. Dave Benson report on the Forty-40 Kit 3. 'Show and tell' QRP rigs by club members (bring your QRP project with you and have handouts if you feel club members would be inquiring about your piece 4. A discussion on club direction

and finally a deliberate sign-up sheet for field day. This means you're to come to the meeting with an idea of what part of Field Day you would like to help. This is not a five man club and field day deserves your support by being there, pitching in, operating the rigs and singing the old campfire songs we used to remember, but forgot the words to. Maybe even a chorus of PROUD MARY. If you really want to see some great guitar picking, Jim-W1FMR will play his 6 string to keep you humming...or was it bumming?

The agenda will emphasize the fun part of QRP and rely on the input from members. If there are club members who are NOT able to attend, but would like to have a say in club matters, send your ideas and comments to the president Jim Fitton-W1FMR whose address is in the beginning of this newsletter. Jim would very much like to hear from you and hear what other cross-country members are thinking.

Also, the Rochester, NH HamFest-Flea Market is the beginning to the great summer episodes of outdoor activities, including on the road, off the road QRPing, building, turning, tweaking and simply modifying that great transceiver you have. A lot of parts, pieces and fun projects are started at these flea markets and as the saying goes, THE EXCITEMENT IS BUILDING. Get to it and make a list of the moiety you need and the fun which goes with it.

Again, don't forget--May 7th at 10AM (Saturday) in Rochester, NH. The meeting will be announced by the FleaMarket ground intercom, however, don't rely solely on that one invitation, but to remember to be there at 10AM. You president Jim Fitton - W1FMR will begin promptly and would like to see you there and to be counted!

NEW ENGLAND Q R P Membership

If you're one of the few people reading 72 and have yet to become a member of this fine QRP club, you should now do the following! SUBSCRIBE. It's not too difficult, it's painless, and you'll have hours of fun, reading some of the best QRP articles by the 'movers and shakers' in our hobby. Annual dues are still \$10 for new members and only \$7.00 per year for renewals. ALL renewals are sent to the club treasurer Mr. Paul Kranz-W1CFI in Harvard, MA. Renewal is every January and make your check or money order payable to QRP Club of New England. Please put your call letters and/or NE-QRP number on your check and mail for a NEW membership to:

Mr. Jack Frake - NG1G
→NEW← Membership Manager
P.O. Box 1153
Barnard, VT 05031

Become a member of New England's best QRP club and join the fun. 'The excitement is building'. 72 & GREAT QRP DX!

You Can Pay Me Now
or
YOU CAN PAY ME LATER.

A Lesson in Kit Building Part I

James R. Johns - KAØIQT

(Editor's note: The following article by Jim, KAØIQT, is presented in two parts. With the explosion of new kit manufacturers and no one offering the "hand holding" which Heathkit used to offer, everyone can benefit from Jim's experience.)

Why do some kit builders seem to have little or no problem constructing a kit while others have a never ending string of problems? I've been constructing kits for the past 26 years. My first kit was an Ameco AC-1 transmitter kit which I still have in the shack today. I'm amazed that the thing worked at all based on the large globs of solder which appear to be thrown about the chassis. I went on to build hundreds of kits over the years and I've developed some techniques which I feel give me the best chance of having the kit work the first time. While most of these techniques are not new, they do work well for me.

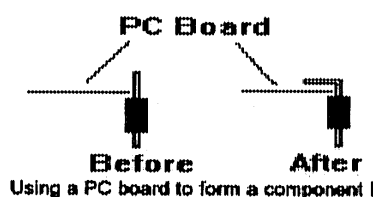
Clean the leads of each component to remove any oxidation before testing or mounting the component. I use an Exacto_ knife and gently scrape the leads on resistors, capacitors, inductors and transistors. Be careful not to nick the lead which could weaken the lead and cause an open or intermittent connection.

For components that don't want to stay in place on the circuit board, and which can not easily be held in place by setting the board component side down (such as IC sockets installed after the capacitors are installed on a board), I use drafting tape to hold the component in place. Drafting tape works better than masking tape because it is less adhesive so it doesn't leave a sticky residue on the board or component and is less likely to cause a static discharge when pulled from the roll or off the board. If you've never pulled masking tape from a roll while in a totally dark room (and after your eyes have had a chance to adapt to the dark) you should give it a try. It looks a lot like a Fourth of July fireworks celebration! When placing an IC socket on a board, check carefully to see that it is oriented correctly (look for the small notch at one end of the socket) and place the socket onto the board. Use drafting tape to secure the socket to the board and then solder one pin on each side of the socket on the opposing sides of the socket. (For example, on a 14 pin DIP IC socket, solder pins 1 and 8) Then remove

the masking tape and check that the socket is correctly placed and is level with the board over the entire socket. If it looks good, then solder the remaining pins. Otherwise it is a lot easier to reheat one or two pins and reseal the socket than to have to unsolder all the socket pins.

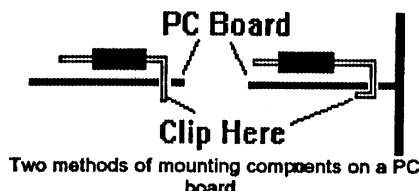
When mounting dipped ceramic capacitors, make sure that the waxy coating which covers the capacitor does not extend along the leads which are inserted into the component mounting holes. There are two ways to avoid this problem. The first is to mount the capacitor slightly above the printed circuit board so that the portion of the lead with the coating does not extend through the hole. I prefer to mount ceramic capacitors against the PC board with the shortest lead length possible, so I use a pair of needle nose pliers and carefully crush the coating where it extends down the leads. Be careful not to remove too much of the material or you will risk having moisture get into the component. I then finish cleaning the lead with my trusty Exacto_ knife to remove any of the remaining material.

Where possible, use a lead bending fixture to form the components. Not only does the finished product look better but you are less likely to have to unbend and rebend a component lead. An old trick from the HeathKit era is many (in fact most of Heath's) kits were designed with a resistor lead spacing such that the PC board can be used as the lead bending fixture. But the component edge against the PC board and bend the lead over the board edge forming a nice clean 90 degree bend. Repeat the process for the other lead. I used this technique for years before I bought a plastic tool to do the same job.

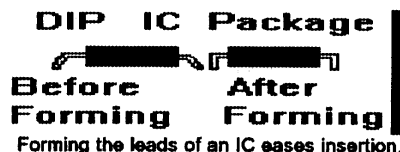


There are many ways to work with component leads before they are soldered to a printed circuit board. I like to install the component (resistors, capacitors, and inductors) onto the PC board then bend the lead over onto the board and clip the lead so that the lead doesn't extend beyond the solder pad. There are advantages and disadvantages to this technique. The biggest advantage is that the component is mechanically secure and there is little danger of the component working itself free from the board. The drawbacks are that the components are difficult or impossible to remove without destroying the component and you must be extremely careful to ensure that the lead is cut cor-

rectly. Using the pre-installation testing of components I very seldom have to remove (and destroy) a component from the board. When a component must be removed, I cut the component lead on the top of the board, discard the component, and then carefully heat the pad and allow the lead to drop off the board by itself, applying the minimum force necessary to allow this to happen. This avoids lifting a PC board foil.



Form the leads of integrated circuits before attempting to install them into a socket. This procedure removes the slight outward angle of the pins which is used to hold them in place during automatic device insertion at a factory. Before installing an integrated circuit into a socket, carefully lay the IC on its side with the pins on one side against a flat (preferably antistatic) surface. Carefully roll the IC until the leads are perpendicular to the IC body. Repeat the same procedure for the other side of the IC. Carefully place the IC on the socket and make sure none of the pins are bent outward or inward from the socket and press the IC into position. While it is easy to spot a pin which bends outward, one which folds up under the IC during insertion is real tough to spot.



Clean and tin your soldering iron frequently. I use some solder applied directly to the hot iron and wipe the tip clean on a damp sponge after the solder has flowed for a few seconds. I place the damp sponge in a small aluminum tray I made. The tray has about 1/4" sides and is slightly larger than a standard kitchen sponge. This allows the excess solder from the tinning operation to drop onto the aluminum tray when the soldering iron tip is wiped against the edge of the sponge. I use all four edges on one side of the sponge, then flip the sponge when the top of the sponge gets dirty. After using the opposite side of the sponge, I use my Exacto knife to cut off the sponge edges and start fresh again. Remember to moisten the sponge if you leave the kit building area for a day or so.

Soldering components that connect to a groundplane or large foil area requires a larger soldering iron than components soldered to small component pads. Make sure you have the correct size soldering tool for the job. This may mean having a soldering iron with removable heating elements or several soldering irons of different ratings. You should also consider owning a soldering gun for soldering coax connectors and those other large soldering jobs.

(Part II to be continued next issue.)

72



Brian - AE9K es
Bob - N1PWU

I hope I can put this 'thread' to rest. When I griped about QST, I made the comment that if anyone would be interested in a new magazine that would have micro processor based construction articles, programs and the like for ham radio, that would satisfy the completeness issue of the thread. The response from would-be authors and readers on my Email has encouraged me and Bob Berlyn, N1PWU, (who has experience in the publishing field,) to set the wheels in motion. We have a list of those people who offered comments and volunteered (or should I say offered) to write.

The premier issue will hopefully be out early this summer, as there are a lot of pieces to the puzzle still being pieced together. We will try to get copies of this issue into the hands of those who may be interested in such a magazine for comments. Since there are a large number of homebrewers on this, we figure you hams would be a good 'sounding board' and the toughest critics.

The premier issue will be a major part of our marketing research and you're now able to make or break the concept that we've all been griping about.

Now we can get back to having fun on the net and Jim's, KR1S's ears can stop burning. Let's hear only positive 'vibes'.

If you want more information, want to provide more comments, suggestions and encouragement, or to be assured a copy of our premier issue, let us know by Email: cieslak@cg9.eda.mke.ab.com (Brian Cieslak)

Brian - AE9K and
Bob - N1PWU



'FORTY-40' KIT INFORMATION

(SEND IN YOUR MONEY...NOW)

Paul Kranz - W1CFI
NE-QRP #09 Treasurer

The following is provided as a check of the orders received by the treasurer for the club's Forty-40 transceiver. Please check your order information for correctness in the table. In some cases, the amount submitted with the order exceeded the amount which was needed for dues and kit prepayment. The excess amount was added to the kit prepayment, in these cases.

Name	Call	NE-QRP	Kit	Amount
(Robert Heck)	K1ZBB	NE106	30 m	\$20
Alan Hicks	KD1DJ	NO NE#	40 m	\$20
Ben Zarlos	W3GES	NO NE#	40 m	\$42
Brian Arsenault	N1FIY	NO NE#	30 m	\$20
Chas. Slackhouse	WA2IPZ	NE110	40 m	\$20
Chet Bowles	AA1EX	NE88	40 m	\$23
Dan Goodwin	KA1JML	NO NE#	30 m	\$20
Dana Michaels	W3TS	NE27	40 m	\$20
Danny Slevig	KA7QJY	NE195	40 m	\$20
David Besnea	W1RT	NE194	30 m	\$20
David Gauding	NF0R	NE84	30 m	\$20
David Weil	KB7ZZ	NE189	40 m	\$20
Dennis Marandos	K1LGQ	NE151	30 m	\$20
Derek Hook	WM1U	NE181	40 m	\$41.95
Doug Hendricks	K6DS	NE182	30 m	\$42
Eric Johansson	KA1EEC	NE186	40 m	\$41.95
Ernie Gregore	AA1IK	NE202	40 m	\$42
Gene McGahey	AL7GQ	NE171	30 m	\$41.95
George Gingell	K3TKS	NE28	40 m	\$20
George Gingell	K3TKS	NE28	30 m	\$63.90
Gerald Driscoll	NV1T	NE104	40 m	\$20
Gerald Driscoll	NV1T	NE104	40 m	\$20
Greg Algeri	WA1JKR	NE12	40 m	\$20
Greg Algeri	WA1JKR	NE12	30 m	\$20
Harry Ricker	KC3MX	NO NE#	40 m	\$20
James Carpenter	WD5BKO	NO NE#	30 m	\$20
James Congdon	W1NA	NE144	30 m	\$20
James Congdon	W1NA	NE144	40 m	\$20
James Fitton	W1FMR	NE01	30 m	\$20
James Francoeur	KC1FB	NE150	40 m	\$20
James Johns	KA0IQT	NE49	40 m	\$20
James Johns	KA0IQT	NE49	30 m	\$23
John Collins	KN1H	NE03	40 m	\$20
John Sakony	WA1SRE	NE181	30 m	\$24
John Sakony	WA1SRE	NE181	40 m	\$24
John Smith	no call	NE147	40 m	\$20
John Westphal	W8YNA	NO NE#	40 m	\$42
Kevin Purcell	N7WWM	NE167	30 m	\$20
Lloyd Roberts	AA1DL	NE78	30 m	\$41.95
Michael Ardat	N1JST	NO NE#	40 m	\$20
Mike Czuchajewski	WA8MCQ	NE33	40 m	\$20
Phil Walker	W1PW	NO NE#	30 m	\$20
Randy Jones	KA9HAC	NE22	30 m	\$41.95
Richard Ferrell	WA6NCX	NE137	40 m	\$20
Richard Fisher	K6BN	NE93	40 m	\$41.95
Robert Berlin	N1PWU	NO NE#	40 m	\$20
Robert Gobrick	VE2DRB	NE94	30 m	\$20
Robert Heck	W1JLA	NE106	30 m	\$20
Scott Cranston	KB1NW	NE180	30 m	\$20
Walter Windish	KB2JE	NE177	40 m	\$20

If there is a mistake with your order information, get in touch with Paul, at the address below, otherwise send in your money now to receive your kit

- drilled & tinned PC board
- all on-board parts and wire
- matched filter crystals
- detailed layout drawings
- assembly instruction

Mr. Paul Kranz -W1CFI
26 Mettacomett Path
Harvard, MA 01451

Charts & Graphs

Dennis Marandos - K1LGQ
NE-QRP #151

I don't know about you, but it seems to me that every time I read a new column, I always want to save it for future reference...but I never do. I always have the idea that I'll always know where to go when I need some information, but then I forget. And, I always tear my shack apart looking for that favorite article, written by...you know who, and can't even remember the name of the magazine it was in. Yes, thou I walk into the valley of numbers and facts, I will try and remember where I came from, but I sometimes get lost. In this issue, you will find a list of facts and charts which will jog your memory and make your life a lot easier. You will find this coverage is not just for the seasoned homebrewer, but also for the neophyte who never has sampled a list of beneficial information.

How often have we mused at the Greek language and saw Greek letters scattered around formulas and equations? You will find that many symbols have evolved from this very language. You might even remember your fraternity's name. By the way, our English word *alphabet* is derived from the first two Greek letters 'alpha' and 'beta,' giving way to *alphabet*.

While the exact sound of the Greek alphabet cannot be fully expressed through English phonetics, a close approximation is possible. The pronunciation key for the Greek letters and English phonetics is as follows:

Greek Letters	English Phonetics	Pronunciation
α	a	as in 'ah'
ε	e	as in 'met'
ι, η, ε	i	all 3 Greek letters: iota, eta and epsilon sound as 'ee' like in he
ο	o	as in 'dome' or 'form'
ου	u	sounds as 'oo' like in too
δ	d	as in 'then' or 'though'
γ	g	a 'heavy g' as in 'good', but NO as in George
χ	h	a 'throaty h' as in 'height' or 'holy'
σ	s	as in 'sing' or 'sat'
θ	th	as in 'think' or 'thought', but NO as in 'that' or 'there'
ζ	z	as in 'zebra' or 'zip'

GREEK ALPHABET

Name	Upper Case	Lower Case
ALPHA	A	α
BETA	B	β
GAMMA	Γ	γ
DELTA	Δ	δ
EPSILON	E	ε
ZETA	Z	ζ
ETA	H	η
THETA	Θ	θ
IOTA	I	ι
KAPPA	K	κ
LAMBDA	Λ	λ
MU	M	μ
NU	N	ν
XI	Ξ	ξ
OMICRON	O	ο
PI	Π	π
RHO	P	ρ
SIGMA	Σ	σ
TAU	T	τ
UPSILON	Υ	υ
PHI	Φ	φ
CHI	Χ	χ
PSI	Ψ	ψ
OMEGA	Ω	ω

To make the Greek alphabet come alive and mean something to you, it has to have a place in your daily routine. This is where amateur radio, as well as other sciences, come into focus. Let's survey a few of the symbols and see just how important they really can be. Match your wits with the following symbols:

Greek Letter	Reason and place of use
α	used to show angles, acceleration or area
β	used to show angles
γ	used to show conductivity, specific gravity
Δ	used to show small or large increments
ε	used to show dielectric constant
E	used to show energy
Z	used to show impedance
η	used to show Frequency Modulation index
θ	used to show angles, time constants, temp.
λ	used to show wavelength, conductivity
μ	used to show MICRO as a prefix, amplification
ν	used to show frequency
κ	used to show circumference / diameter (3.14159)
ρ	used to show resistivity, reflectance
Σ	used to show summation sign
τ	used to show time constant, transmittance
φ	used to show angles, radiant power, power phas
ω	used to show angles, angular frequency
Ω	used to show resistance (ohms), solid angles

Timer conversions have always been a nemesis for me and it is especially hardest when jumping from one day to the following day, such as Saturday night here, but Sunday morning there. Perhaps a refresher will take some of the strain off the minutes and hours and put us into the sun with azure brightness. Add one hour for 'daylight savings' time to your zone.

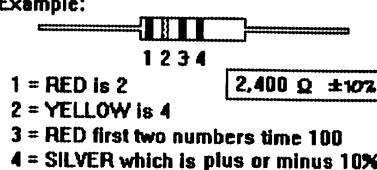
UTC	AST	EST	CST	MST	PST
00:00	8 PM	7 PM	6 PM	5 PM	4 PM
01:00	9 PM	8 PM	7 PM	6 PM	5 PM
02:00	10 PM	9 PM	8 PM	7 PM	6 PM
03:00	11 PM	10 PM	9 PM	8 PM	7 PM
04:00	MIDNIGHT NEXT DAY	11 PM	10 PM	9 PM	8 PM
05:00	1 AM	MIDNIGHT NEXT DAY	11 PM	10 PM	9 PM
06:00	2 AM	1 AM	MIDNIGHT NEXT DAY	11 PM	10 PM
07:00	3 AM	2 AM	1 AM	MIDNIGHT NEXT DAY	11 PM
08:00	4 AM	3 AM	2 AM	1 AM	MIDNIGHT NEXT DAY
09:00	5 AM	4 AM	3 AM	2 AM	1 AM
10:00	6 AM	5 AM	4 AM	3 AM	2 AM
11:00	7 AM	6 AM	5 AM	4 AM	3 AM
12:00	8 AM	7 AM	6 AM	5 AM	4 AM
13:00	9 AM	8 AM	7 AM	6 AM	5 AM
14:00	10 AM	9 AM	8 AM	7 AM	6 AM
15:00	11 AM	10 AM	9 AM	8 AM	7 AM
16:00	12 AM	11 AM	10 AM	9 AM	8 AM
17:00	1 PM	12 AM	11 AM	10 AM	9 AM
18:00	2 PM	1 PM	12 AM	11 AM	10 AM
19:00	3 PM	2 PM	1 PM	12 AM	11 AM
20:00	4 PM	3 PM	2 PM	1 PM	12 AM
21:00	5 PM	4 PM	3 PM	2 PM	1 PM
22:00	6 PM	5 PM	4 PM	3 PM	2 PM
23:00	7 PM	6 PM	5 PM	4 PM	3 PM
24:00	8 PM	7 PM	6 PM	5 PM	4 PM

UTC = Coord. Uni. Time *AST = Atlantic Std. Time.

Last of the charts for this issue is something you're all familiar with, which is the resistance color chart. Some newer hams have yet to fully grasp it's meaning, and this chart is intended for the proselyte.

COLOR	First & Second digit band	Multiplier Third color band	Tolerance of resistor 4th band
BLACK	0	1	n/a
BROWN	1	10	±1%
RED	2	100	n/a
ORANGE	3	1,000	n/a
YELLOW	4	10,000	(NO
GREEN	5	100,000	COLOR
BLUE	6	1,000,000	BAND:
VIOLET	7	10,000,000	±20%)
GRAY	8	100,000,000	n/a
WHITE	9	---	n/a
GOLD	---	---	±5%
SILVER	---	---	±10%

Example:



It's not hard and the experienced HAM has been doing it for years. Once you learn how to use the chart, it never leaves you. See you next issue with more CHARTS & GRAPHS.

Dennis Marandos - K1LGQ NE-QRP #151

News From ALL OVER

NE-QRP Club Mail Bag....



Membership News
Bill Legge - NT1R
NE-QRP #20

From the mailbag, there appears to be great discoveries that you're certainly **RADIO MATIVE**. If life is too short for QRP, then perhaps some of the big guns ought to read what others are doing, and join them in the fun.

Frank Roberts, VE3FAO, was active from Cable Beach, Nassau, Bahamas with his all homebrew QRP. He went to the island with an antenna tuner, designed by W3TS from July '92 QRP Quarterly, an SWR meter designed by W1FB QRP Classics-1st Edition, 100 KHz Frequency marker from ARRL Handbook, 4 stage audio filter, designed by N1AL from QRP Classics, Iambic CMOS keyer, AD7Z design, June '88 QST, 20 meter XCVR with 4.5 watts designed by K1BQT - Rick Littlefield, Jan. '89 HAM RADIO. Lastly, Frank had a 12 volt switch he used to switch batteries which he says is his own design. Not too bad Frank, keep it up and let us know where your next DX-pedition will be.

Rusty Smith, KD4GLC, NE-QRP #179, passes information along that he is dynamically involved in a lot of QRP clubs! He made an error and ordered his QSL's first and then joined six QRP clubs, which takes a bit of time writing all those numbers before putting a stamp on it. He has active membership in NE-QRP #179, MI-QRP #1144, G-QRP #7627, NW-QRP #207, QRP ARCI #8123 and NorCal #77. With a couple of hundred QSL's to send out, Rusty has a lot of writing.

Rusty says that with college applications taking a bit of his time, he wasn't too active, however, that has changed and worked the "Winter Sports." He casually worked the G-QRP Club (#7627) and about 20 other QRP'ers on 80 meters, as well as the NW-QRP winter sprint making a half dozen QSO's, and

wishing he could have stayed on for three more hours. Rusty runs about 4 watts.

Al Bates, W1XH, NE-QRP #15, writes to say that he thoroughly enjoys reading and hearing what other QRP'ers are doing and encourages more to write to ZZ and 'brag' a bit about their hobby. Al, for those who still remember, used to be the editor for the old Chelmsford radio club (Massachusetts) and the now active Acton-Boxboro club, Massachusetts.

Al mentions two anecdotes he recently experienced which are pretty interesting. One day he worked W9BRD on 30 meters, who was the author in July '93 QST "Honey, I Shrunk The Antenna," QRP. The article was about little loop antennas, typically 3 feet by 4 feet, benevolently pouring a strong signal. Al says the QSO was strong and attributes it to the antenna. This may give an insight about this antenna and something to think about.

Al also mentions that it was more than several months ago, however, a special QSL "turtled" its way to his house. During the October '92 QRP QSO party, Al worked HA92ITU, which was a special events station in Hungary. The contact was on forty meters with 4 watts output into a 40 meter dipole up 20 feet. He was extremely happy about that one for Europeans are very rare for him. Keep up the DX Al and let us know how you're doing.

Mike Bryce, WB8VGE, writes to say that his book on the HW-8 is now into it's second printing. If you were caught off guard and couldn't locate this book...Mike says he's got his act together and is now ready for the second coming. The HW-8 Handbook is a collection of modifications for the Heathkit QRP series with up-grades for the HW-7, HW-8 or the HW-9 QRP rigs. Over fifty pages of modifications and tips to get the best out of each. The cost is \$11 postage paid to your door. His address is SunLight Energy Systems, 2225 Mayflower NW, Massillon, Ohio 44647.

Mike also asks if the North East is frozen from all the cold or has the RF stopped flowing. He doesn't hear much from the upper corner of the map, however, he will be listening more in the future when things wind down for him. Keep us informed Mike and let us know what you're doing.

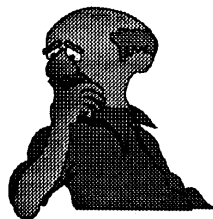
Bill Todd - N7MFB, NE-QRP #63, president of the NW-QRP Club, writes to say that neither of our clubs has taken the stand that we are the "best" QRP Club attitude, but rather both clubs support the growth of QRP in all its forms and directions. Perhaps the only difference in 'direction' is that the NE-QRP club is primarily known for kit building ideas, while the NW-QRP club tends to support operating, i.e. contesting and kit building. Bill also says that he has a natural affinity between the NE-QRP club and the NW-QRP club for both were forged about the

same time and have about the same number of club members, hovering around 280. Bill says that the first issue of the NW newsletter hit the mail bags on June 1, 1993.

Another bit of trivia, which shouldn't go unnoticed, is that Jack Frake - NG1G, NE-QRP #02, was an early member of Bill's club and also drew the logos for both NE-QRP and NW-QRP. Great work Bill, and Jack, and we can only see bigger and better ideas coming!

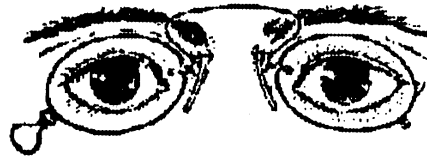
Membership News
Bill Legge - NT1R
NE-QRP # 20

Are You About To Lose Your License?



If you haven't already heard, it was five years ago that the FCC switched to the 10 year renewal format, which means that this is the last wave of hams writing to the FCC to keep their license current. If you're reading this column and haven't renewed and received you ten year license ever, then you're the person about to lose his license. Check, today, to make sure you haven't forgotten to make out a form 610 and get it to the FCC. While we're thinking about renewing, it's always easier to have a buddy system, group, to all pitch in and remind each other that it's time to get moving. There were too many W- and K-call signs dropped from the grand roster because the grace period went by, and new N- and AA- calls assigned. Let's keep the hobby moving in the right direction...check your expiration date.

A brief NE-QRP meeting was held during the IRS Flea market in Hudson, NH March 19 where Jim Fittom - W1FMR, John Collins - KN1H, Jack Frake - NG1G, Bill Legge - NT1R and Dennis Marandos - K1LGQ met to discuss club direction and membership contribution.



President's Report

Jim Fittom — W1FMR
NE-01

Here it is March already, and the DX on 40 meters has been spectacular for the low-power buff. Using the NorCal-40, 2 watt, kit transceiver, 55 countries have been contacted. The NE-QRP 40/40, and 30/40 transceiver kits will be ready by mid-April. You will be amazed at the performance for the size and cost.

Thanks to the Forty-40 team for a job well done; Dave-NN1G for circuit design, Paul-W1CFI, Eric-KA1EEC, Steve-N1NPI and Jack-NG1G on the team. This project takes an enormous amount of work, phone calls, and coordination to get a design such as this up and running. It benefits the membership and the club.

The first 50 kits sold out in 2 weeks and the demand persists, so Jack-NG1G will manage the new "Kit-Squad". Team members will include Dave-W1IS and Mike-N1JYT, and both they are going to shoulder the club Forty-40 project to produce an additional 50 kits available by June 15. All upgrades, if any, will be included on the second run. Send a \$20 deposit to the squad contact to hold one. I am ordering a second kit to modify for 160 meters.

Meetings: Thanks to Jim-KR1S for hosting the January ARRL meeting for it was excellent! The next QRP-NE meeting will take place in Dayton, OH on April 29 and 30 with members NN1G, W1FMR, K5FO, K16DS, VE2DRB, KA9HAO, KA0IQT, N8ET, W1HH, WA3SRE, N8CQA, AA2U, KR1S and scores of others (hopefully) attending. We have never tried an out of New England meeting before.

The following weekend a meeting will be held at Rochester NH on Sunday, May 8 (my 55th birthday) at 10:00 am. What a neat way to spend a birthday! After the Rochester meeting there will be a Field Day meeting in June, and we may be able to sneak a brief meeting into August. The QRP-Mini FD event in

September or October and perhaps a fall meeting in NH, for October. Mark your calendars.

How about testing your QRP-Mini Portable FD station during the next QRP-ARCI QSO party (April 9 or 10)? Heck, you could operate mobile and still make contacts during that contest. Head for that picnic table or site that you always wanted to operate, for any 6 hour period, and send your log to me or Chet, AA1EX with a description of your equipment and what it was like to operate portable. We would love to hear how you did it, and you may even get published in *Z2* with your results. If you would like to have company, let us know and Chet and I can help coordinate your portable trip.

You would not believe how much fun it is to communicate with other QRP'ers using your PC on Internet. N8DHT told me that CompuServe now has a QRP message area which costs nothing but the basic service rate of \$9/month to connect still exists, and it has even more options and coverage. If you have a computer and a modem. Give it a try for a month.

See you in Dayton OH, Rochester NH, Princeton MA, or on the nets....

72'

Jim Fitton-W1FMR NE-01

Field Day 1994 is Just Around the Corner! REFLECTIONS ON FIELD DAY 1993

By now most of you have seen the Field Day 1993 results as printed in the November issue of QST Magazine. As a reminder, we finished with 901 QSO's for third place in the 3A Battery class. This is an impressive effort for only ten operators. And we would have had a bigger score, and even more fun, if we had more operators from QRP New England.

The first place winners in our class was W2SEX in West New York who claimed only twice as many QSOs with 65 Operators! Of course, I'm sure their call also played some factor in attracting contacts.

The first place overall club winner was AD6T in California, and averaged only 50 contacts per operator, compared to our 90. And the Zuni Lupers, who are always top contenders, averaged 61 contacts.

You can clearly see that QRP-NE has the potential to be a top contender, plus we have an excellent field-day site on the side of Mt Wachusett in Princeton, MA. In addition, the operators that we have are excellent, but we clearly could use more operators.

There were many times last year when rigs were idle, or when one person operated alone for too long a stretch, due to a lack of operators. We could have easily been much closer to the top of the standings with the participation of more club members. Furthermore, we would

have had even more fun if others had joined us. I believe the hint has been made.

LOOKING AHEAD TO 1994

Field Day for QRP-NE is a low budget, no pressure event, with as much emphasis on fellowship, sharing and learning as on racking up the points. But, with limited participation, perhaps too little time is devoted to the social aspects. With more members, we can have even more fun and sharing. Join in on the good times and come on board!

We will meet at the Princeton site on Saturday morning to set up antennas and stations. Everyone will bring their own food and kitchen gear. There is plenty of room to set up sleeping tents away from the stations and nothing is elaborate, but we have a good time.

You don't need to be a super contester or be a technical wizard to contribute, however, we need able bodies who can set up antennas, secure guy wires, keep logs and follow dupe sheets, cook, play the guitar or make hot chocolate late at night, AND help take the stations down when the contest is over. Everyone has something to contribute, and I, for one, have learned a lot by participating in the last two years.

BAND CAPTAINS and PARTICIPANTS NEEDED

To get operations going for 1994, I need two types of volunteers. The first is Band Captains to be in charge of an operating band. In Field Day terminology, a band is a frequency and a mode, so 40 meter CW is a separate band than 40 meter SSB. The Band Captains coordinate the gatherings of necessary equipment, setting up and operation of the stations.

If there are specific items the Band Captains need, I will talk to the other participants and line up what is needed. This year I would like to expand the definition of "Band Captain" to include items such as 10/15/20 meter SSB as one person's area.

The other type of volunteer is a Participant. Obviously, you would be have a list of participants so we can plan operating and other schedules.

THE BOTTOM LINE

We will scale our effort based on the response that we get by the middle of May. If you would like to be a Band Captain, please tell me what Band(s) you are interested in, and give me a run down on the equipment and shelter you can provide. If you don't want to be a Band Captain, but would like to help out, also let me know your operating interests, and what equipment you can bring.

Even if you can't make Field Day all weekend and even if you have a family or local club commitment, I hope you will seriously consider joining QRP-NE for Field Day 1994, June 25-26, in Princeton. See me at one of the club meetings or drop a line.

Mark Swartwout, NX1K
QRP-NE Field Day Chair
26 Harriet Ave
Shrewsbury MA 01545
Evenings: (508)842-3174
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Meeting Minutes



Jim Fitton - W1FMR President NE-QRP #01

Minutes from the New England QRP (QRP-NE) Club meeting held on January 16, 1994 at ARRL Headquarters, Newington, CT. Sixteen members attended, many driving for 3 hours in bitter cold temperatures hovering around 0 degrees F. Despite the frigid atmospheric conditions, friendly spirits, conviviality, and the extreme southern location of the state of Connecticut provided welcome relief from the really treacherous weather further north. Thanks to Jim Kearman, KR1S, QRP-NE contest manager and ARRL worker, for hosting the visit, and Norm Bliss, WA1CCQ, W1AW radio engineer for coming in on Sunday and making us feel very comfortable and welcomed at the radio station of W1AW.

Upcoming NE-QRP meetings in 1994 will be at Dayton, Ohio in April for the hamfest; Rochester, NH in May (the old Deerfield flea.) Sun. 10 - 11 a.m.); Field Day at Princeton, MA in June; and Boxboro, MA in October. In addition, Harry, W1LMU is going to reserve tables at local flea markets scheduled for late winter and early spring gatherings. Check into local CW/SSB nets for additional information.

NE Net, Saturday 8 a.m., 7.040 MHz; NE, Monday 9 p.m., 3.855 MHz (SSB has been-NIL lately); GLN, Wednesday 9 p.m. 3.060 MHz; NEN, Tuesday 8:30 p.m. 3.035 MHz. A list of some HB (Homebrew) rigs which were brought to the meeting: 2 NN1G-20, a 40/40 prototype and a printed board version, a NorCal-40, OHR Spirit and more.

Thanks to Randy Jones - KA9HAO, who provided a quantity of new relays, surplus from his parts business, for the free give away at the meeting. NE-QRP thanks you very much for the offering. If more members had been there to receive their relays, it would have been worth their trip.

Mark, NX1K reported an outstanding 1993 Field Day performance. Some members have signed up to participate in 1994-FD, however, additional loggers, antenna experts, SSB/CW operators, and guitar players will be needed this year. The potential for many more contacts would have been there last year if we had more SSB operators.

I am eagerly looking forward to the QRP-NE club pioneering a QRP Mini-Field Day event in September or October, and I am in the process of constructing mini-rigs, tuners, SWR meters, etc. in anxious anticipation.

Dave, NN1G brought the prototype of the Forty-40 meter HB club project transceiver and also the new printed wiring board version. Although the printed board didn't arrive until the day before, Saturday, Dave worked through the night and completed the rig in time for the meeting on Sunday. Great work Dave! Kudos! The members present were suitably impressed with the appearance of the board, HB enclosure, and Dave's tenacity to get a job done. The little 'Superhet' transceiver was enclosed in a box-frame, easily duplicated with simple hardware and tools which will be detailed in a future issue of 72. Eric, KA1EEC, volunteered to help prepare the kits and instructions. Jack, NG1G, who was on holiday in the Virgin Islands, offered to distribute and help 'kit' parts. The success of this venture will pave the way for more of these terrific HB projects in the future.

Luke Dodds, W5HKA, passed away recently from a heart attack. Luke was Secretary-Treasurer for the QRP Amateur Radio Club International (ARCI) for many years and will be sadly missed by all who knew him.

Carl, N1CUU handed the 72 editorial baton to Dennis, K1LGQ. Thanks Carl for two years of excellent craft and leadership providing your mates with a superior journal. Carl will maintain close ties with the newsletter, and we are fortunate for his efforts. A special hearty welcome to Dennis-K1LGQ, and it was Dennis' work on the January issue which turned out very nicely with graphics and creativity. Congratulations...!

Attending the January meeting were: Mark-NX1K, Jim-KR1S, Eric-KA1EEC, Zack-KH6CP/1, Mark-KE1L, Dave-NN1G, Jim-W1FMR, Dennis-K1LGQ, Mike-KC1SX, Derek-WM1U, Larry-K1LO, Randy-KA9HAO, Bill-AE1D, Mike-KD1BF, Bill-N1OSA, and Bob-KA6NOC. Thank you all for coming.

Be on notice that QRP New England will hold its "QRP A-field..." contest on a Saturday in September. The contest will be from 16:00-22:00 UTC. More details from contest chairman Chet Bowles-AA1EX, in the next issue. Get your portables ready!

More than half the members present communicate via INTERNET or electronic mail. (E-Mail). Is this a sign of the future? Carl, N1CUU, is being financed by the club in order to tap into the wealth of QRP information available on INTERNET. Club members in turn will receive this excellent information via 72.

The Excitement Is Building!

72 / 73 Jim Fitton, W1FMR QRP-NE #01
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RadioKit Review

Edward Pacyna - W1AAZ

I have built nearly a dozen transceivers so here are my two cents worth of information.

First of all, I can not comment on the quality of parts, as I furnish my own parts, except for the air variable capacitors, which I do buy from RadioKit.

I buy the boards directly from FAR Circuits in Illinois, the same source that RadioKit gets theirs. There are two versions, one from HR January '89 called 'NE602 QRP CW 20M transceiver' and sells for \$8, and the other from CQ September '90 called 'QRP 15 transceiver' and sells for \$12. The earlier version had two COHN XTAL filters, one on each side of the IF amp. to develop 8 poles of selectivity and reduce broad band noise, plus a doubly tuned band pass filter in front of the RX mixer. The later has only a single tuned circuit in front of the mixer, a 4 pole Chebyshev XTAL filter and adds RIT. Both versions include 2 stages of active AF filtering after the product detector, AGC and can easily be put on any band by changing the VFO and crystal filter frequencies.

Regarding the PC Boards

As mentioned, the boards are not silk screened with the component shape and design, but actually, I prefer the board being blank, as it makes for a nicer looking finished product. Most builders should have no problem following the parts placement diagram. However, a paint by the numbers approach might make it easier for some. The boards are very well laid out with a lot of nice ground planes. Pads are lined up and logical, however, the later version does come with a couple of pads missing drilled holes. None of the 50 or so boards I've gotten from FAR were solder masked, including the NN1G board set. The usually good solder plate by FAR takes solder very nicely. It is always good practice to lightly clean any PC board with scouring powder, such as Comet, Ajax, etc., before beginning your project. The board is compact 4" x 3" (25% smaller than the NN1G board set and contains more circuitry, e.g. RIT, active filter, AGC). With a higher part density, soldering does take a little more skill. Also, use only a low wattage iron with a point tip and a good quality thin solder. Those hams over 40, such as I, might be more comfortable with the magnifying eye glasses as sold in drug stores. I have been able to unsolder and remove parts over and over with a little care. I make lots of modifications along the way.

Regarding the schematic

I recall that both the schematic and parts placement diagrams are correct. The problem is that they are slightly different. The difference is minor and as long as you didn't get your license by memorizing the answers, the problem should not be too difficult to resolve. I recall having to install one component on the solder surface of the board. Pin 4 on the NE602 product detector needed to have a bypass capacitor, since it is unused and has RF floating. This point is shown on both diagrams.

Regarding the tuning capacitor

This is a very nice capacitor and I sometimes buy them from RadioKit. It has a silky smooth feel built into the 7:1 reduction drive and is 5 - 55pF. The frequency versus shaft tuning is exceptionally linear. The plate spacing is perhaps a bit wider than the broadcast band variables of yesterday. The stability is excellent. If it got shipped with the plates unmeshed or dropped on the floor, a rotor plate could bend.

Possible modifications

The circuit works well as is. The RIT version is nice because the station you're working may be using the opposite sideband or, worse, drift away from your frequency. The T/R switching is semi break-in and as MFJ states in their ads "silky smooth." By the way, this circuit is the same used in the MFJ 90XX. Full QSK is nice if its used but I find few that do.

I usually run my radios from a 13.8V regulated power source and believe most others do the same. The on-board 12V regulator is unnecessary and reduces overall RX gain. It would also be a good idea to install some reverse polarity protection to protect your labor of love. A power diode in series with the power supply feed is simple and it reduces voltage by about 0.7 volts, or install a series fuse in the line with a shunt power diode on the radio side of the fuse--cathode to fuse.

The AGC is a mixed blessing, and it is audio derived and pops on strong signals. I don't like any AGC on CW. First of all, if a strong signal is nearby, it reduces the RX gain making it more difficult to receive the weak signal and the usually pumping action is unpleasant. In a similar fashion, the AGC reduces the opposite sideband suppression that your crystal filter provides. On the other hand, it reduces the signals dumped into the product detector. This is a weakness in the NN1G design.

The NE602A is a wonderful device provided it's used correctly. Due to it's gain, the input intercept is -15dBm or so. If you give it more signal than it's meant to handle, you get a lot of IMD product. By the way, one nice feature of this design is that the VFO is buffered and has an adjustable pot allowing you to

control the TX mixer drive and thereby reduce IMD products. On the receive side, I control the IF gain with a front panel pot on RX (use AGC for TX monitoring only). I do not install the volume control for it's kind of hockey installed on the AF power amp. anyway. You will have a much better receiver with this approach.

I always use IC sockets when I build. Use only low profile machined sockets, the kind that have round holes for the IC pins. There has recently been some discussion of NE602's oscillating, e.g. NN1G Marc II, when sockets are used. Although NE602's do have a lot of gain into VHF, oscillations are usually due to poor circuit layout or improper decoupling. As shown in the data sheet, the NE602 supply voltage should be decoupled with a 5 μ H choke and bypassed at all frequencies with multiple bypass capacitors, e.g. 0.1 μ F, .001 μ F, etc. I usually use a 100 ohm resistor with a ferrite bead for the choke. Also, since maximum supply voltage is 8 volts and the best noise figure is at 6 volts, I use 6 volts (78L06 regulators). The advantage of sockets is that it makes the radio very easy to debug and or repair. If you do have a problem, remove the IC so it doesn't load the circuit, and using a multimeter makes measurement taking easy, and also to find solder bridges, components installed incorrectly, etc. I always build my radios backwards for example in a RX I start at the output and build toward the input (reverse in a TX). Just build the audio output stage and test it before you proceed. You'll never have to deal with more than a few parts or 1 error at a span. Its easy to test stage by stage without a lot of fancy equipment, too. After you build the audio amp., put your finger on the input. You should hear an AC buzz. Next, build the product detector and you'll hear a hiss, if all is well. You actually now have a DC (Direct Conversion) receiver so connect an antenna and your might hear some signals as you tune the BFO capacitor). Next, build the IF amp. and the signals you heard before should be louder.

The other two changes I usually make to the radio are to change the VFO circuit to a series tuned configuration, (for lower noise) and stagger tune the AF active filter. With a little thought, the series circuit will fit on the same PC board pads provided. Most active filters simply repeat the same stages *N* times, e.g. same Q, frequency, etc. What you get is a very sharp needle-nose response that rings and is not very useful. With stagger tuning, the Q, center frequency and gain is changed to get a bandpass response instead. Different bandpass shapes can be synthesized, e.g. Butterworth, Chebyshev, etc.) with superior skirts. The circuit is exactly the same, only the R C values change. I also build the filters with a little more gain so the signal into the product detector will be kept low. Sometimes, instead of the in-out switch, I use a simple audio fader circuit such as the one in the TenTec Century to simulate variable bandwidth.

My main point is that these are very nice transceivers, and should not present difficulty to

many homebrewers. However, they are not suitable for novice level. After reviewing my narration, RE: Radiokit, I had a 'NN1G Mark II' board set that I began piecing together.

Now, I see why the instructions suggest not to use sockets on the NE602's. From an RF design, the layout is not very good. The NE602's are decoupled very poorly, if at all. As I mentioned, put the V+ supply (pin 8) somewhere near a ground plane and install several bypass capacitors, a 100 ohm resistor and ferrite beads near pin 8. In the Mark II, a feeble attempt was made to decouple the product detector. From pin 8, there is over 1/2" of trace before a single MF bypass, then almost 3/4" more trace before a 47 ohm decoupling resistor. On the product RX mixer, pin 8 isn't decoupled. (Yes, there is about 3/4" of trace and a bypass capacitor at the 78L08 regulator.)

The BFO circuit has trace running all over the place. Not only could this cause VHF oscillations, but could couple BFO signals back into the IF amp. input, something you don't want in a RX. The input and output trace for the XTAL filter is also much to long--1 1/2" to 2". This could really set you up for performance problems, i.e. filtering and RX noise.

I'm building my project for 40M and using different mixing in the RX as this will reduce the potential for spurs (10MHz IF, 3MHz VFO). I built the filter on the bench using 390pF, 510pF and 640pF capacitors, versus 330/470/560) and measured a 500Hz 6 dB BW with a filter impedance of 400 ohms.

There is also a difference between what is shown on the schematic for L2, low end to ground, and the actual board (tied to +12V). Its part of the rubbering circuit for the BFO and a strange one at that. The B-plus eventually gets AC coupled to ground, but it would have been better to put the inductor in series between Y5 and C2.

With my band plan in order, to receive LSB mode, I wanted the BFO to be on the high side of the filter so I won't install L2 anyway.

To improve filter performance, I grounded all the crystals in the filter to eliminate coupling between the units. I also saw that the design runs the NE602's at 8 volts (ouch). The 8 volts also supplies the VFO. The NE602's are happier and perform better at 6 volts. But since I'm also going to add the QRP15 RIT circuit and need higher voltage to keep the varactor voltage more than the RF tank voltage, I'll try and go with the 8 volts (ouch). If your VFO doesn't oscillate with the 8 volt supply, get rid of the MPF102 (it's Vp specification is to broad) and use a 2N5486 or better yet a J310.

72' and 73'

Edward Pacyna - W1AAZ
epacyna@auratek.com

In A Word . . .

Dennis Marandos - K1LGQ

As you will recall, an eponym is a word which developed from a person's name or place. As promised from last issue, I want to sensitize you to the words we use in our hobby every day and for you to know where they came from. Have fun and add these to your collection of radio trivia.

HERTZ — Heinrich Rudolf Hertz (1857-1894) was the German source for this unit of frequency. It was with James Clerk Maxwell's theory which gave Hertz the inclination to reveal what radio waves were and how peculiar their properties interchanged with electronics. Earlier licensed hams in the US often substituted the word *cycle* in place of *hertz*, however, with the swing toward metric, the word *hertz* has become fully rooted in our radio vocabulary.

BEL — It was Alexander Graham Bell's (1847-1922) name which makes it easy for us to measure loudness. Because it was such a huge measurement, the prefix *deci* (1/10) was inserted to bring BEL into focus and hence...*decibel* is more commonly used. *Bell was born in Scotland and became a naturalized US citizen and was a teacher for the deaf. It was his now famous utterance we so often say which is associated with our modern invention, the telephone, "Mr. Watson, come here, I want you."*

BOOLEAN — Of all the mathematic languages used for computers, this is the only one named after a person. George Boole (1815-1864) was an English mathematician who formulated his technique for a new math process he called Boolean algebra. His ideas using **AND**, **BUT**, **NOR** and **OR** have opened our digitized electronics to where it is today. It is from this means we are able to construct and use some of our most basic and simple IC chips.

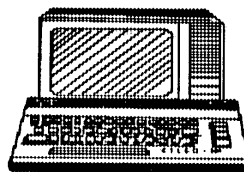
WHEATSTONE'S BRIDGE - It was Sir Charles Wheatstone (1802-1875) who created many inventions and one in particular was the Wheatstone Bridge. The device was used to measure electric resistance. The wheatstone bridge is rarely used by amateurs for resistance measurement, for the ohm-meter is still the favorite for this purpose.

BAKELITE — Lao Hendrik Baekland (1863-1944) was a Belgian chemist who worked in the US and became famous for his many inventions with photography of which a synthetic resin to produce photo paper was called *Bakelite*. Bake was used extensively throughout radio for it's non conducting characteristics and electrical insulation. Today, we

might equate his idea with the introduction of modern plastics.

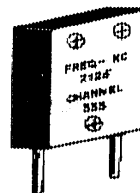
Again, I will give you more eponyms next issue and try to sensitize you to the words in our hobby. If you know of any unusual eponyms you would like to pass on to me, write them down and send it along. I would very much like to hear from you. 72' and 73'.

Dennis Marandos • K1LGQ



Recycle Your Megacycle

Recycle your older rigs, extra parts, handie's, HF gear or overflow you feel you would like to sell. This column is now featuring a place for you to turn your old ham gear or computer related materials into cash! If you have one, two or three items for sale, send your information, with call, address/phone etc. to Dennis Marandos - K1LGQ, 42 Cushing Avenue, Nashua, NH 03060-1816. If you're a person who is **LOOKING** for a rare item, place your request in "Recycle Your Megacycle" for others to help you. This superb offer is **FREE** for active subscribers to **72**. Please include your New England QRP number on all your correspondence. **72**



If you can get your hands on an older CB radio that uses crystal-mixing for the frequency synthesis, you'll find one of the crystals is 10.140 MHz—the top of the 30 meter band!

Maybe a list should be started as to what electronic gear contains crystals that fall within the ham bands. The most famous item on this list is the TV colorburst, the 3.579 KHz crystal. You'll find this crystal in some 'touch-tone' telephones.

Now what might have a 7.040 MHz crystal...?

Jeff NH6IL

Know Your Neighbor...!

Part i

As an added incentive to become more radio active, 72 would like you to meet your neighbor. Too often we hear, "I didn't know you were a member of the New England QRP Club," and so it goes a great conversation is started, a new rig

is tested, or simply an astounding QSO has begun.

The following hams are current members and their NE-QRP number and call registered. The list will be divided into two sections, with the conclusion of the entire list in the summer issue of 72. Also, from this issue forward, all new members will be listed. See if you can find yours. If you're on the inactive side, get your dues into New England-QRP now and become part of the gang and join the fun!

72

225 David Slade K2SJB
224 Albert Abrams N1NFJ
222 James T. Ide KA1VAA
222 ***non-issue member***
221 Frank Roberts VE3FAO
220 Geoffrey J. Fox WA1U
219 Rand L. Gray W1GXN
218 Terry L. Pridgen KC4YTF
217 John C. Smith WB2CWA
216 Joseph J. De Sousa, Jr. W1OFK
215 Michael Wyman WB1CWD
214 Richard Neindorff WB2RAR
213 ***non-issued number***
212 Michael Tracy KC1SX
211 Robert L. Farnsworth WU7F
210 Thomas Daffley WA1UMA
209 Donald Welsh
208 Jim Hydzik K3QIO
207 Lawrence H. Olsen K1LO
206 William Hickox K5BDZ
205 Richard S. Glines WQ1T
204 Neil Serafin KE0XL
203 John Schweiger N8YAU
202 Ernest J. Gregoire KA1YVM
201 Ronald Bosslet N1IUD
200 David Schaller W1IS
199 R. S. Dunham, Jr. W4OEL
198 Barrie L. Reynolds NX1A
197 William A. White N1OSA
196 John R. Kirby N3AAZ
195 Danny Stevig KA7QJY
194 David C. Basnia WR1T
193 Roger Blaisdell AA1DG
192 Michael Schmitt N1JYT
191 Geoffrey A. Burns N1GQV
190 Russell D. Knapp
189 David P. Weik KB7ZZ (r)
188 Mark Ciravolo N1NSS (r)
187 Dennis Blanchard K1YPP (r)
186 Alan Molin N1JXS
185 Richard Force WB1ASL (r)
184 Paul Carr N4PC
183 William Longworth KM1N
182 Douglas Hendricks K16DS

181 John Salony WA3SRE
180 Bruce J. Walker WT1M
179 S. Russell Smith, III
178 ***non-issue number***
177 Walter Windish KB2JE
176 Andrew C. Palm N1KSN
175 Charles W. Hennessy W4AT
174 ***non-issue number***
173 John Ferguson N1IPT (r)
172 Gary Utz KE2YK (r)
171 A.E. (Gene) McGahey Jr., AL7GQ
170 William S. Kelsey N8ET
169 John F. Woods WB7EEL
168 Erick S. Johansson
167 Kevin G. Purcell
166 Leon T. Switzer N8CQA
165 Robert P. Chartier N1JZO
164 Dave Karpiej (r)
163 Rod Bowes N1JDP
162 Robert Gravel K1BUB
161 Derek Hook WM1U
160 Scott Cranston KB1NW
159 John P. Allen KA1EU (r)
158 Clifford Wheeler N1DWA
157 Michael Dawson N1MQM (r)
156 Steve Taylor N1MXN (r)
155 Charlie Mackinnon WQ1Q
154 Faith Senie N1JIT (r)
153 John Nuhbian KB1NO (r)
152 David Potter K1MBO (r)
151 Dennis Marandos K1LGQ
150 James R. Francoeur KC1FB
149 Alan Amos JR. KN1O
148 Robert Gorman WA1SCH (r)
147 John C. Smith K1VNT
146 Frank J. Lauri KD2IX
145 Robert Corey WB1FRH (r)
144 James Congdon WN1A (r)
143 Skip Flem NT1G (r)
142 Ronald Smith WA4BID (r)
141 John Finn WA1VUU (r)
140 Robert N. Evans KC1WC
139 Howard A. Cahn WB2CPU
138 Frank Pellicano WB1GTK (r)

137 Richard L. Ferranti WA6NCX
136 Daniel Kinsella KA1OW (r)
135 Paul S. Adler KW1L (r)
134 Robert Raymond NE1I (r)
133 James Allred N1EXQ (r)
132 Mark Johnsen NB1U (r)
131 Christopher W. Kirk NV1E
130 Daniel Bisinger KA9HNR (r)
129 Dennis M. Johnson KA1BQZ
128 Bert Flower N1MXO (r)
127 Robert F. Bessette W1DKY
126 Thomas Cooper WA1GUV
125 Robert Moeller KA1PXF
124 George Caswell K1MON (r)
123 John Fellows WB1GMH
122 Joanne Fredette WB1GMG
121 Robert Frost W1FP
120 Alan Kinnon KD1EA
119 Robert Lee K8RL
118 Stephen Baranowski AA1BK
117 William Marchant WA1VAV (r)
116 Neal Lipson K1NDF
115 Perry Lipson K1OQX
114 William Clapp KB1YJ (r)
113 Daniel Brown KA5DNH (r)
112 Don Kirchoff W1QUP
111 Howard L. Mintz WA1CFX
110 Charles Stackhouse WA2IPZ
109 Roland Vidito N1FDP
108 Howard Soule K1CZ
107 Kenneth Wickwire KB1JY
106 Robert Heck W1JLA
105 William Burden WB1BRE (r)
104 Gerald Driscoll NV1T
103 Anthony Emanuele WA8RJF (r)
102 Stephen Allen KA1ZVZ
101 Craig Kolk KC1WV (r)

The **QRP Plus** HF Amateur Radio Transceiver Index Laboratories Gig Harbor, WA 98332

A review by ANDREW KF2JH

Six months after ordering it, my 'QRP Plus' arrived. A small box and a lot heavier than I thought, maybe four pounds. The 'QRP Plus' covers CW & SSB, 160 meters through 10 meters. Five watts out on SSB and 0-5 watts on CW. The rig has a SCAF digital audio filter, covering 100Hz to 2400Hz in 100Hz steps. Twenty memories, a SPLIT and RIT operation, and full break-in QSK. It also has a 20dB attenuator, a separate receiver antenna input and power/S meter. 'QRP Plus' claims 0.14 amps (140 ma) power draw on receive and 1 Amp on transmit at 12 V, plus an automatic turn-off at 11V and below. I measured 0.13 Amp (130ma) on receive with 50% volume, 147ma on 100% volume. Transmit drew 1.15 amps normal and 1.51 amps on >3.0 SWR. I haven't tried the 11V auto-off feature, but this would be great for not killing off gel-cells.

Attached to the top cover is a large 3.5" speaker

The unit is well made, with heavy 1/8" aluminum holding 5 PC boards, 4 boards stacked on top of each other, separated by plastic-covered aluminum shields. The other board holds the LCD and switches. Attached to the top cover is a large 3.5" speaker, and the wiring is well laid out. The PC boards are connected with a detachable ribbon cable. I believe Bruce Franklin of Index Laboratories makes medical equipment and he applied those high standards to this little rig.

Large switches, buttons and knobs make it a pleasure to operate. The display is easy to read, nice and large 0.5" numbers on a .75" display. The fuse is mounted on the back in a standard fuse holder.

The heart of this rig is an Intel 80C39 micro-computer chip. The chip controls the synthesizer (frequency control), display, filters, RIT, split frequency operation, iambic keyer, sidetone, and memories. I spent some time talking with Bruce about his selection of this chip. I asked him why he used the 8039 instead of the 8051 (a slightly newer and more functional chip). Bruce said that the 8051 was more RF sensitive. I have seen RF reset 8051's many times myself and spent plenty a night trying to prevent just that. He has put plenty of research into this rig. Another example is the easy-to-access, standard lithium battery (for memory backup), as well as recessed pots to set CW, power, sidetone and mic-gain. 'QRP Plus' also includes a nice large tuning dial with a finger point for easy tuning.

Having a nice tuning dial is very important, especially since all your selections are done by that one item. Press FAST, MEMORY, or BANDWIDTH buttons (or combination to store into memory or set keyer speed) and then turn the main tuning dial to select. In frequency mode, one full turn is 4KHz, in fast frequency mode one full turn is about 60KHz. You cover all the BANDWIDTH filters in a half turn, all 20 memories in 3 1/2 turns.

The head phone jack is set for walkman type stereo headphones (don't try mono headphones; they won't work unless you plug them in half-way). The volume output for the headphones is more than adequate. I never get beyond 3/4.

The receiver really shines. I could hear a lot more than I could ever hope to work and the SCAF filter is remarkable. Press the BANDWIDTH button and the display shows the SCAF filter frequency in KHz. At 2.0 KHz, SSB is really clear, and at 0.1 KHz, it's a CW pile-up solver (or so says Bruce). The filters work very smoothly, too.

Other nice features are: There are three recessed pots on the back which set:

Mic Gain

CW output power 0-5 watts continuous

Sidetone volume (not frequency) The MEMORY button toggles between the frequency in memory and the working frequency. A nice way to monitor q net or sked.

As with everything, I have my complaints

The iambic keyer is not ready yet, but will be a free update when it is. The box is pre-drilled and labeled for the plug. All that's needed is to upgrade the EPROM (the key is simulated in software like the CMOS Super Keyer II is) and the jack. The keyer speed is set via the main tuning knob and a button press.

As with everything, I have my complaints. The antenna connect is via a standard BNC instead of an SO-259 connector. The FAST tuning button moved at 60KHz per tuning dial turn. There needs to be a 1MHz rate for quickly tuning bands. Of course, this is only a pain until you set memories and use them to set bands. (The rig has some preset band frequencies which you can re-load into memory). I would have added a light for the LCD, but Bruce decided to save the 20-30ma and not add one. I built my own mic from the Radio Shack speaker mic, but I couldn't get the mic gain to give more than 1 Watt out on SSB. Bruce said people were having mixed results with building their own. Index Labs will be selling one as an option.

Overall, this is a fabulous rig for the money

Other observations: as we see more and more things controlled by computers, functionality won't be our complaints, software bugs will be. And I hit one. When in RIT mode, pressing REVERSE is suppose to give you the transmit frequency. It doesn't. It sets the receive and transmit frequencies to the RIT frequency. Nothing major and Bruce promises to fix it with the iambic keyer upgrade. Also the display frequency on my rig has a tendency to drift down 100Hz after the first transmit. This is solved by switching into SPLIT mode. The SPLIT mode locks the frequency in and disables the tuning knob (and yes this means the BANDWIDTH control is locked out too, another software bug to be fixed). But on the upside, a software controlled rig allows for more functionality. Bruce is talking about letting the user set the QSK break-in time, paddle reverse all of which can be accomplished via software. The rig does not reduce power on high SWR since the transmit components are rated at much higher power levels than 5W, but may produce spurious signals.

Overall, this is a fabulous rig for the money (\$595). It was built by a man who loves QRP for the QRP lover and it shows.

The usual disclaimers: I do not work for Index Laboratories nor am in any way compensated. Just a happy customer. Opinions expressed by the author are not necessarily those of Digital Equipment Corp.

The QRP Plus HF Amateur Radio Transceiver (it's not a kit) is:

Index Laboratories
9318 Randall Dr. NW
Gig Harbor, WA 98332
206 851 5255

ANDREW KF2JH



Announcing the Second Annual NorthWest QRP Club Spring Sprint. On May 21, 1994 (Saturday), at 17:00 to 21:00 UTC (Noon to 5:00 PM EST) on 40 meters 7.035-7.040 MHz, 20 meters 14.055-14.060 MHz and 15 meters 21.060 MHz the sprint kicks off for another great competition!

The object of the Sprint is to contact as many QRP stations as possible with a 4 hour period. Contacts with NW-QRP Club members count as 5 points and non-members count as 3 points each. You may work the same station on a different band and earn points. The output, of course, is 5 watts or less to be considered QRP.

The exchange is RST, your state and your NW-QRP #. Non-members who do not have a NW-QRP number will give the number of watts used. Scores can be multiplied by 2 for using 1 watt or less. Multiply total QSO score by the number of states worked during the contest.

An award will be given to the highest score for the top QRP entry in each call area, and a special award will go to the top Spring NW-QRP Sprint Winner. You don't have to be a member to win! When sending in your log sheet, please include your NW-QRP # and the watts used. All logs must be received by June 15, 1994 (Wednesday) and all logs sent to:

Stan Yarema - KG7ME
Contest Editor
3457 12th West
Seattle, WA 98119

CW Operators' QRP Club

1994 Contest Rules

Another contest worth your time is sponsored by the CW Operators' Club, Inc. in Australia. The date is Saturday/Sunday, the 11th and 12th of June 1994. This would be Friday night through Sunday morning in the 'States. The official time is 00:00 UTC Saturday to 08:00 UTC Sunday. The operating call area is VK, ZL and P29, with all normally recognized CW frequencies on 80, 40, 20, 15 and 10 meters.

In order to spread the interest and to reduce possible congestion on the frequencies, stations are asked to distribute their calling across bands using this guide:

On Hour =	All bands
Hour + 15 minutes	40 meters
Hour + 30 minutes	20 meters
Hour + 45 minutes	15/10 meters

Stations should preferably call on recognized QRP calling frequencies (1.815, 3.530, 7.030, 14.060, 21.060 and 28.060 MHz) then QSX to a working frequency.

The contact information is to be logged with RST plus a 3 digit number commencing with 001 and incrementing by one digit for each contact.

In order to make greater use of available band space and time, repeat contacts with the same station will be allowed with a minimum of three (3) hours between subsequent contacts. The scoring is as follows:

Contact with NON-DX stations:

- score 1 point for QRO station.
- score 5 points for QRP station.

Contact with DX stations:

- score 10 points for QRO station.
- score 20 points for QRP station.

Note: For this contest, the definition of DX is any station outside VK, ZL and P29 call areas.

Certificates will be awarded to the first three placegetters overall and to the highest scores in each of New Zealand, the Australian States and Papua/New Guinea. Any station claiming to operate QRP MUST NOT exceed a maximum of 5 watts carrier power to the antenna and should sign with the /QRP suffix. Logs showing contacts and points claimed should be sent, no later than July 14th, 1994, to:

Mr. Ronald Everingham VK4EV
30 Hunter Street
Everton Park, Queensland
4053 Australia

QRP NETS - January 1994

DAY	NET	G M T	E S T	FREQ MHz	NCS	Net Control State
Monday	New England QRP Club North West QRP Club	02:00 Tues	21:00 Mon	3.855	SSB	Connecticut
		03:00 Tues	22:00 Mon	10.123	CW	Washington
Tuesday	SEN (QRP-ARCI)	00:01 Wed	20:00 Tues	7.030	CW	K3TKS Maryland
	MI-QRP Club Net	02:00 Wed	21:00 Tues	3.535	CW	KBJRO Michigan
	N.E. Illinois QRP Net	02:00 Wed	21:00 Tues	3.560	CW	Illinois
Wednesday	MI-QRP Chapter #3	01:00 Thur	20:00 Wed	145.170	FM	WK8S Michigan
	GSN QRP-ARCI	02:00 Thur	21:00 Wed	3.560	CW	W5LXS Texas
	GLN QRP-ARCI	01:00 Thur	21:00 Wed	3.560	CW	NN1G Connecticut
	N.E. Illinois QRP Net	02:00 Thur	21:00 Wed	3.560	CW	Illinois
	WSN QRP-ARCI	03:00 Thur	22:00 Wed	3.560	CW	W6RCP California
Saturday	NEN QRP-ARCI	12:00 Sat	08:00 Sat	7.040	CW	K3TKS Maryland
	North West QRP	15:30 Sat	10:30 Sat	3.561	CW	WA Rag Chew
	WSN QRP-ARCI	17:00 Sat	12:00 Sat	7.040	CW	W6RCP California
Sunday	OK QRP NET	13:00 Sun	08:30 Sun	7.060	CW	Oklahoma
	MI-QRP Chapter #3	14:00 Sun	10:00 Sun	7.140	CW	WK8S Michigan
	VE QRP Group	18:00 Sun	13:00 Sun	14.060	CW	VE3
	TCSN QRP-ARCI	19:00 Sun	14:00 Sun	28.332	SSB	Texas
	TCN QRP-ARCI	23:00 Sun	18:00 Sun	14.060	CW	W5LXS Texas

Be aware that this list is neither complete nor accurate after the above date. Please inform us of any correction, additions or deletions.

Byron Johnson - WABLCZ
L.T. 'Buck' Switzer - N8CQA
Michigan QRP Club

(Editor's note: ZZ would like to know of any changes, too.)

Coming Attractions....

Roy - W7EL, along with some rather tangible goodies, has a project called "Brickette." This involves a 10 watt input with 5 watt output amplifier for the Optimized QRP transceiver. This is especially helpful with big expensive rigs whose output only reduces to 10 watts. Roy designed this project in 1979 to accompany his little rig and it was later updated in 1988, and to the best of any one's knowledge, this story has never been published. Roy gives credit to Wes Hayward with the name Brickette.

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QRP PLUS

Bill Todd - N7MFB, NE-QRP #83, North West QRP Club, says the QRP PLUS is for real, despite the unusual delay getting the projects out. The designer/manufacture is, indeed, personally aligning and testing each unit prior to shipping, which obviously takes quite a bit of time. There is reportedly a very favorable QRP PLUS review in the Amateur Radio Box, on *Internet*. Bill has yet to read all that has been said about the project, but as soon as he gets use to *Internet* he'll report back.

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