

JANUARY, 1994

72

THE "QRP - NE" NEWSLETTER



START THE NEW YEAR RIGHT -- JOIN QRP-NE FOR A DAY AT ARRL HEADQUARTERS, NEWINGTON, CT. SUNDAY, JANUARY 16, 10 AM. MORE INFORMATION WITHIN THIS ISSUE!

QRP-NE PROJECT # 2 INFORMATION IN THIS ISSUE, THANKS TO NN1G.

AS ALWAYS, MORE INFO FOR THE QRP ENTHUSIAST!

BEST WISHES IN 1994!

PLEASE WRITE FOR 'YOUR' NEWSLETTER

Our goal is to make it easy for you to submit your ideas. Send your material, hand written or typed. Please indicate whether or not you wish other newsletters and magazines to copy your article. Floppy diskettes, MS-DOS text files accepted gladly, any size any density. Be sure and send your phone number so that I may contact you. If you have a FAX # please let me have that too. My address is: **DENNIS MARANDOS, K1LGQ, 42 CUSHING AVENUE, NASHUA, NH, 03106-1816. 603-883-8655.**

Technical articles should be sent to John Collins, KN1H, QRP-NE Technical Editor. Please contact John with questions or concerns about articles of a technical nature.

Deadline for the next newsletter will be **APRIL 30, 1994**

DIRECTORY

Please Contact the following for information:

MEMBERSHIP-

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802-234-9792

CONTEST MANAGER-

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TECHNICAL ARTICLES --

John Collins, KN1H, RR2, Box 427, Cornish, NH, 03745. 603-542-2057.

NETS--

GREG ALGIERI, WA1JXR, 22 Chacehill Rd., Lancaster, MA 01523.
(508) 365-7128.

MEMBERSHIP NEWS--

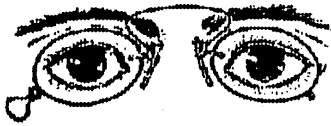
William Legge, NT1R, 232 Foreside Rd., Cumberland, ME 04110. (207) 829-5248.

NEWSLETTER --

**DENNIS MARANDOS, K1LGQ, 42 CUSHING AVE., NASHUA, NH 03060-1816.
(603) 883-8655.**

OTHER CLUB MATTERS, ADMINISTRATION, ETC.

Jim Fitton, W1FMR, POB 2226, Salem, NH 03079. 603-898-6188H
508-960-2577 W



President's Report

Jim Fittom — W1FMR

Merry Christmas and a Happy New Year from the staff of *ZZ'* and *NE-QRP*. There is a lot of activity by the New England Team this season, and one nice Christmas present for the club is the completion of Dave Benson's NE40/40 (40 meters for \$40) QRP club transceiver project #2. His previous rig, the NNIG-20, NE-QRP project is already very popular across the country. Remember—you saw it first in *ZZ*. The new Forty-40 project #2 will be a winner, judging by the circuit and from the early responses from all NE-QRP staffers that have seen it. Dave will display the Forty-40 at the January meeting of NE-QRP, at ARRL/W1AW, Newington, CT.

ARCI Amateur Radio Club International is looking for a few good leaders and if you are interested in helping get QRP-ARCI running on the fast track, let me know.

Dayton—The gang will be well represented again at Dayton in 94. If you have not tried this vacation with the QRP gang, plan to do it next year. The dates are April 28, 29, 30 and May 1. The rooms will probably be sold out by the middle of January. Write to Myron, N8DHT if you are interested.

NEXT QRP-NE MEETING AT ARRL,
JANUARY 16TH, 1994

QRP FD — I am excited about Dave Benson's proposal for a QRP Mini-Field Day. Six hours sounds about right from a 12 hour operating window. Maybe club members will have the NE-Forty-40 rigs field tested, tuned/tweaked, and running for the event in late August or September competition.

Forty Meters In the morning around 5 a.m., just before work, I hear VK stations on 40m, and starting around 2 pm Eastern time (on weekends) JA stations can be noticed. With a lot of luck, and much patience, I hope to work one with my little NorCal 40 rig. I have achieved 30 DXCC countries and about 40 DX stations in less than a month since completing the NorCal 40. Maybe raising the power from 2 to 3 watts will increase my chances even further. I use a modified 'half square,' or $\frac{1}{2}$ 'bobtail curtain' antenna, which is an extremely simple DX antenna. The antenna is far noisier than a horizontally polarized antenna but does very well on contacts beyond 1000 miles.

Elections There are some staff positions available on the QRP-NE team. Please let me know what job you would like and if it is available, we can see what can be done for you.

Northern California Club 40m transceiver kit

NorCal-40 kits are again available for \$94. Get in contact with Jim Cates who should get one for you post paid. The last cluster of 100 kits sold very quickly, and the demand is still high. If you would like to operate the NorCal-40, come to the next QRP-NE meeting at ARRL, January 16th.

72 & Happy Holidays
— Jim Fittom — W1FMR



DUES ARE DUE NOW!

QRP-NE TREASURER REPORT
Paul Kranz - W1CFI

QRP New England Club is two years old and still solvent! It's been a successful year for NE-QRP for many justifications, and one of which is we covered our expenses. This was accomplished chiefly from last year's dues increase, which is something we don't have to repeat this year.

NE-QRP's 80 meter Color Burst Transmitter Project #1 necessitated \$416 for parts in 1992 and brought in a total of \$618 last year plus \$303 this year for a net profit of \$505. *NE-QRP* is presently looking at another project, dubbed *FORTY-40*, under Dave Benson's capable direction for the coming year.

One of the major enigmas with club projects is financing the original parts purchase for the project before sales occur. This expense can really drain the treasury. For example, a \$10 per parts kit requires a capital outlay of \$500 for 50 kits. The capital outlay is about one third of *NE-QRP's* income for the year for a very inexpensive project kit.

**DUES ARE *NOW* PAYABLE
FOR THE WHOLE 1994 YEAR
FOR MOST MEMBERS.**

Overall, in 1993, income from

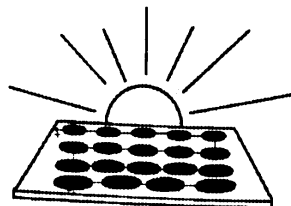
dues was \$1,273 and income from the 80 meter color burst transmitter was \$303. Expenses in 1993 were \$1,137 for newsletter printing and mailing and \$90 for postage and miscellaneous expenses. This leaves a balance of \$349 for 1993. It looks as if we are just covering our newsletter expenses from our dues.

Dues are *now* payable for the whole 1994 year for most members. Please check your mailing label which contains your NE-QRP number, the year for which dues have been paid, encoded in the upper right corner of the mailing label. Your money for renewing should be sent to:

Paul Kranz, W1CFI
26 Mettacomett Path
Harvard, MA 01451

Those members who joined NE-QRP before the July newsletter mailing will receive the July newsletter, all previous newsletters and be asked to renew their membership for 1994. For those members who joined NE-QRP after the July newsletter mailing, will receive the October newsletter plus the following four newsletters for the coming year.

72 — Paul - W1CFI



QRP New England's Project #2: The "40-40" - A Simple-Superhet Transceiver

It's on the way! Inspired by the success of the NorCal QRP club's recent homebrew offering, we've decided to provide a transceiver kit as our next homebrew project. We wanted to offer a usable transceiver design that wouldn't require a lab-full of test gear to build and align. We settled on a stripped-down superhet design, which surprisingly, is no more complex than a good DC transceiver. The result is a single PC-board whose outline dimensions measure only 2.8" x 4.0"! Key features are listed below:

- VFO-tuned Superhet
 - 40 Khz coverage
 - low-cost varicap
- 1.5 Watt output
- Full break-in (QSK)

(RIT will be an add-on)

The transceiver design was initially for 40 meters, but we also decided to offer a 30M option due to popular demand. The design emphasis is on ease of adjustment and also minimizes use of toroids to ease construction.

The builder with average experience in homebrewing should have no trouble getting this rig up and running. To ease assembly, we'll be providing a comprehensive set of assembly and alignment instructions with our kit offering. In the event you do run into a snag, we'll be arranging for troubleshooting support at upcoming club meetings.

Here's the deal:

We're currently planning to produce only 50 of the "40-40" Transceiver kits. The

price on these will be 39.95 (+\$2.00 shipping) and includes:

- Drilled & tinned PC board
- All on-board parts and wire
- Matched filter crystals
- Detailed layout drawings
- Assembly instructions

(You supply:)

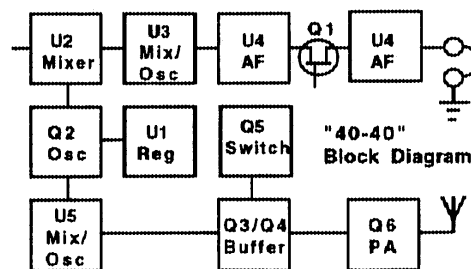
- Connectors & controls
- Enclosure

We don't believe these will last long at this price! If you're interested in one of these kits, a down-payment will secure you a place in line, and will also help finance the club's effort. To reserve a kit, send a check for \$20 to:

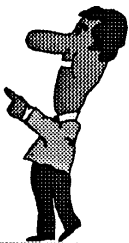
Paul Kranz, W1CFI
26 Mettacomett Path
Harvard, MA 01451

Be sure to specify which band (40 or 30M) you're interested in.

The first-generation PC boards have already been received and checked out and minor changes have been cranked in. We'll be discussing project status at our January 16th meeting in Newington, and kits will be available by the next club meeting following (April-May '94). Stay tuned for the full-up article in the April issue of 72!



Meeting Minutes



The November 28 meeting of *NE-QRP* was held in Boxborough, MA. It was our second anniversary meeting and 14 members attended. Despite the heavy rainy weather, we had a terrific time. If you had been there, you would have enjoyed it!

Paul, *W1CFI* lugged his HB (homebrew) Mavti-40 meter and SM-30 meter (surface mount) rig; Jim, *KAØIQT* brought his ARC-40; *W1FMR* carried his NC-40 (project of the Northern Cal. QRP club), and *NN1G* displayed his new 40 meter prototype rig—QRP-NE project #2). (See Dave's HB proposal elsewhere in this issue.) Eric, *KA1EEC* hand carried his *NN1G* 20 meter kit rig and several members shared construction experiences.

Attending the November meeting were: Dave, *NN1G*; Jack, *NG1G*; Jim, *W1FMR*; Paul, *W1CFI*; Greg, *WA1JXR*; Jim, *KAØIQT*; Harry, *W1LMU*; Gerry, *NV1T*; Ron, *N1IUD*; Eric, *KA1EEC*; David, *KT1X*; Dennis, *K1LGQ*; Larry, *K1LO*, and guest Cheryl Pecor, waiting for license to arrive. Some members arrived about 12 noon, had lunch, and stayed until after 5 p.m. The official portion of the meeting ran nearly 2 hours and covered many club and QRP topics.

Thanks to Greg, *WA1JXR* for taking meeting notes:

Jack, *NG1G* noted that over 210 *NE-QRP* numbers have been issued.

A proposal to decide on a 30 meter frequency for QRP was passed along by Fred Bonavita, *W5QJM*. A subsequent discussion revealed that; 10.106 MHz seems very busy in New England,

and in Europe. 10.116 MHz is the European choice, and 10.123 MHz is the choice of the North West QRP society.

A comment was made that there seems to be a lot of RTTY QRM on 10.116 MHz and 10.123 MHz in New England. No consensus was reached at the meeting. Do you have any ideas, suggestions or comments? You can pass them along to Chris Page, *G4BUE*.

The next *NE-QRP* meeting is slated for January 16, 1994 (Sunday) at ARRL headquarters in Newington, CT. *NE-QRP* is the guest of Jim, *KR1S*. This pilgrimage is always fun as we have a short business meeting and then crank the famous *W1AW* rigs down to 5 watts, or connect our HB rigs to the monster antenna systems.

I brought newsletters from the NorCal QRP Club, G-QRP Club, QRP-ARCI, MI-QRP Club, CW Operators (VK) QRP Club, St. Louis QRP Club, and QRP-NE. I forgot to bring the OK QRP KLUBO information. There are more new clubs springing up every day.

Dave, *NN1G* proposed a QRP Field day lasting 6 hours sometime in August or September. Larry, *K1LO*, at the meeting, suggested that the period could be 12 hours long and QRP'ers could operate for any 6 hour stretch of time. This would provide good propagation opportunities across the US. time zones. The spirit of this contest would be a no 'contest-contest.' Just get out outside with your single bander or whatever you're using, a simple antenna, and see how many QSO's you can make. Points could be awarded for several categories such as HB, home operation, portable operation, for writing a good QRP story of your experience for ZZ, your most interesting location, etc. Would anyone like to be the manager of this contest? It could develop into an international event and we won't know until we try it.

A suggestion was mentioned at the meeting to raise money by offering a long term subscription at a reduced rate. The idea was tabled for the present time.

Affiliation with ARRL sounded like a good idea also, and *W1FMR* will

start work on a club constitution. Please send your comments to *W1FMR*.

Starting in February 1994, a directors SSB meeting will be held on the first Monday of the month. (9 PM on 3.855 MHz)

In February, Paul, *W1CFI* will publish a club roster which will appear in subsequent issues of *ZZ*.

Dave, *NV1G* designed a 40 meter QRP rig based on the *N6KR*, NC-40 (Northern Cal.) features, and it was quickly accepted as the new NE-QRP club project #2. Jack, *NG1G* volunteered to head-up an HB kit construction committee along with help from Eric, *KA1EEC*.

I have a copy of the attendees if anyone is interested in phone numbers or addresses.

I finished my NC-40 40 meter QRP transceiver the week before the meeting, and worked 33 countries by the meeting date. The Caribbean and European stations who were preparing for the CQ WW CW contest made life easy in the Extra portion of the 40m band. The NC-40 transceiver is a delight to use, easy to construct, is inexpensive, and sounds and looks real good, too. Unfortunately, NorCal sold out the first 100 kits in a couple of weeks at \$80. Kit manufacturers may start offering their version of the kit soon and NorCal may do another run, as well. I hope to change the PA on mine to impart more output (~3 w.) for chasing DX. The rig has an adjustable PA feature, useful for lowering battery drain and power output while camping or with local contacts. Very nice feature, indeed.

I will see you at the January meeting in Newington, CT on 1/16/94 at 1500 UTC (10 a.m. EDT) or in QSO with *W1AW/QRP* from 1900 to 2100 UTC (2 to 4 p.m. EDT).

For car pool information, call me at home 603 898 6188 H.

73/72 Jim Fitton, *W1FMR*
QRP-NE mvjf@mvubr.att.com (Internet)

In A Word....

Dennis Marandos - K1LGQ ©

Everyday you talk 'radio jargon', or electronics, you're using eponyms. You didn't even know it, and to think that these eponyms were there all the time. What's an eponym you ask? Easy to answer and fun to know and even more fun to use. An eponym is a word that used to belong to a person's name, or place. For instance, when Ronald Reagan was president, his view on the economy was different than most of the US, hence the news media dubbed his slant as "Reaganomics." You see, his name was used as part of the word to explain a definition. Better still, have your ever doused your tooties in epsom salt to relieve all that strain off your feet? Did you know that epsom salts were originally from Epsom, England. I think you have the idea.

Let me introduce a few terms we're so familiar with, but didn't know where they originated. In the course of time, I'll give the frequent terms we have heard and used and before long, you'll know exactly what an eponym is and how it affects our hobby!

WATT - is named for James Watt who lived from 1736-1819 in Greenock, Scotland and was an inventor. His name is associated with steam engines and lights bulbs, but not power output. His partner's name was Matthew Boulton, whose claim to fame gave us the word 'horsepower.'

OHM - is named for Georg Simon Ohm who lived from 1787-1854 in Germany. His name is link with the law of electric current which states that current is directly proportional to volts and inversely proportional to resistance. We have not seen Georg Ohm's name on too many devices, considering we use the color-code scheme for most resistors.

AMPERE - is named for André Marie Ampère, a French scientist who lived from 1775-1836. His discovery in the field of magnetism and electricity

had literally opened the door to electronics as we know it today. His formulated formula for Ampère's law is equally up there with Georg Ohm's.

VOLT - is named for Count Alessandro Volta who lived from 1745-1827 in Italy. His discovery of the first battery was named after him—Voltaic Pile. His name, of course, is also associated with the force of electricity called volts. With the combination of volts, resistance and current, we have arrived at OHM's law, the basis of all circuit formulas .

MORSE CODE - of course was named after Samuel Finley Breese Morse who was born in Charlestown, Massachusetts. Morse lived from 1791-1872, moved to London, England and could have been remembered more for his work as a portrait artist. Morse gravitated toward electronics and successfully designed a code to transmit to a receiving station. His design was challenged through litigation, however, Morse won and to this day is still used world-wide.

I will give you more eponyms next issue and try to sensitize you to the words around us. 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.

Dennis Marandos • K1LGQ



SO METER CW QRP STILL AVAILABLE

For your information, you can **STILL** get NE-QRP project #1 for your shack. If you have a friend who thought building was beyond him, get the NE-QRP #1 project for his New Year project. It's compact, light and just the fun item for your QRP collection. If you don't have your very own NE-QRP project #1, order now so you won't forget and be the first in your area to operate low power. Send \$17.50 (ppd) to

Mr. James Fitton - W1FMR
P.O. Box 2226
Salem, NH 03079

HW8 + T50-6 + ECG 488 = 5 WATTS

Gary D. Borich, W5UDV
1009 Harwood Place
Austin, TX 78704

Not long ago I had a QSO with a chap who basted he was running 5 watts with his HW8. "What? QRS. Five watts?" I shot back. Sure enough, he repeated 5 watts. Impossible, I thought to myself, as I politely excused myself from the QSO.

Some months later I was trying, without luck, to work HL1CG in Seoul, Korea on 30 meters with my HW8. The HW8 had been converted according to the article by Howell Ching, KH6IJS, in the April, 1984, *QRP Quarterly*. After trying for more than an hour, the most I got for effort was "QRP?". Before returning to bed at 4:30 AM, the last thought I remembered as I drifted off to sleep was how nice it would have been to have a 'boot' on my HW8—a full QRP gallon. And what about all those QRP contests I've been in when the other guys were running 3 to 5 watts? I had never been able to peak my 30 meter signal beyond 1.3 watts after countless attempts at retuning the heterodyne frequency oscillator, mixer amplifier, and tank coils. I couldn't stop wondering if an HW8 really could be 'tweaked' to run 5 watts.

My search for an answer to my question took me through two editions of the *Hot Water Handbook*, edited by Fred Bonavita, W5QJM, and some past issues of *QST* and *CQ* collected by my good friend, Bob Logan, N25A. To my surprise, my question had been asked many times before and partly answered by more than a few hams. Unfortunately, like the story of the three blind men describing an elephant, each before me had discovered only a part of the answer.

When I assembled all my sources, the puzzle came together. Here is what I found and how, in about an hour to put 'boots' on an HW8.

My first discovery was an insert by KH6IJS at the bottom of page 11 of

the 1985 *Hot Water Handbook*, describing how he switched the 2N4427 final for an ECG 488. He reported getting 3.0 to 3.7 watts out on 20, 30, and 40 meters, and as much as 2 watts out on 15 meters using a 12.5 volt power source and a dummy load. His rig, like mine, had already been converted to 30 meters, by removing the proper number of windings from the 80 meter toroids.

As it turned out, his choice of a new final couldn't have been better. The ECG 488 specifications are nearly identical to the 2N4427 (see table 1), except that the rated output power for the ECG 488 is 4 watts instead of 1 watt for the 2N4427. Unlike some other substitutions I've made, the input and output impedance of the two devices are nearly identical, thereby requiring no other modification. In addition, the required drive level for the ECG 488 is only slightly more than the 2N4427, but well within the limits supplied by even an aging HW8. The downside is the cost of the ECG 488, which is about \$ 11.00.

Table 1. Comparative Data for 2N4427 and ECG488

Although I had invested very little time in making the substitution, I was disappointed at the results. I obtained only a half-watt increase on 40 and 30 meters, and practically no increase on 15 meters. My power level now ran about 2 watts on 40, 1.7 watts on 30, and 1 watt on 15 meters. But, to my surprise, I was getting 5 watts out on 20 meters with a 13.8 volt power source. My scope confirmed that my signal remained clean on all bands.

Then came the second piece of the puzzle, thanks to an article by Michael Czuhajewski, WA8MCQ in March, 1993 *QST* on low output levels on 80 and 40 for the HW8. Like me, he also had unusually low output on 40 and 80 meters. He traced it to an increase in the permeability of the ferrite (FT) cores used by Heath for the 80 and meter bands. While Heath used powdered iron (T) cores for 20 and 15 meters, the larger inductance for the lower frequencies required the use of ferrite cores. Ferrite cores have higher permeabilities than

powdered iron which allow higher inductance to be achieved with fewer turns.

But, the permeability of ferrite cores tends to increase over time due to changes in the magnetic properties of the core itself. To confirm this, I checked the inductance of L26 and L27 (30 meters, originally 80) and L28 and L29 (40 meters) and found all 4 had inductance substantially in excess of the design specifications reported in the HW8 assembly manual (p. 14.). In fact, I was surprised how much they had drifted upward when my LCR meter showed inductance for L26 and L 27 of more than 6 μH , when they should have been 3 μH , and showed inductance for L28 and L 29 of more than 11 μH , when they should have been 7 μH . The power was being generated but not making it to the output! The 20 meter toroids were powdered iron and registered the correct inductance, right on the money. that is why I was getting 5 watts out on that band, but not on 30 or 40 meters.

Using T 50-6 toroids, I wound new coils for 30 and 40 meters according to the required inductance (see table 2, which also includes data for winding fresh coils for 80 meters) and returned the heterodyne oscillator, mixer amplifier and tank circuits. I keyed the rig, and Presto! 5 watts out into a dummy load on 30 and 40 meters.

Table2. HW8 Tank Circuit Modifications for Increased Output

BAND	Toroid*	Turns**	AL (μH)	Inductance
80m	FT37-63	29 (L26)	177	15 μH
	FT60-63	35 (L27)	220	27 μH
40m	T60-6	42 (L28)	40	7 μH
		42 (L29)		
30m	T60-6	27 (L #'s may vary)	40	3 μH
16m***	T37-6	14 (L33)	30	0.6 μH
		14 (L34)		

By the way, if you key down for 30 seconds and notice a decline in your output, it's possible your toroids are heating up due to improper inductance (high SWR).

While I was satisfied I had solved the riddle for 30 and 40 meters and had a

full 5 watts out on these bands as well as on 20, I wanted the same result on 15 meters. On 15, I had never been able to obtain more than 1 watt output. I know 15 meter circuit losses are greater than at the lower frequencies, and I could see from my scope that the drive level into the final for 15m was less than the other bands, as Heath acknowledges. But why so much less? And, why no improvement on 15 from my superfinal?

Given my previous success, I looked immediately looked to the toroids in the tank circuit for 15 meters. I measured their inductance and to my dismay, they were exactly as Heath specified: 1.25 μH . The problem couldn't be due to changes in permeability. Then, the third and *last* piece of the puzzle came into place.

Could Heath have made a mistake?

Could Heath have made a mistake? Could the inductance needed at 21 MHz be different than delivered by Heath? Given the values of the capacitors and inductance in my 15 meter tank circuit, I calculated the resonant frequency of the circuit and to my surprise, found the tank circuit was resonant at 13 MHz, not 21 MHz. How could this happen, since everything was according to the design specification given by Heath?

To determine if a design flaw had occurred, I recalculated the inductance that would be needed for 21 MHz and found them to be about .6 μH , not 1.25 μH , which Heath had supplied with the unit. I took four turns of L 33 and L 34 to lower the inductance to 0.6 μH and keyed the rig. I now had 2.5 watts out, which is about the maximum obtainable on 15 meters with the existing drive level. Coincidentally, afterward, I heard that others had discovered the same flaw in the 15 meter tank circuit, however, in all fairness to the engineers at Heath, last minute changes, part substitutions, or communication foul ups could also have been the culprit.

So what do I do now with my spare time and 5 watts on 30 meters? I keep looking for HL1CG at 4:30 AM. This

time he won't get away!

Gary D. Borich, W5UDV

Table 1. Comparative Data for 2N4427 and ECG488

Descrip.	Collector to Base Volts	Collector to Emitter Volts	Base to Emitter Volts	Max. Collector Current	Max. Dissipation Watts	Current Gain Min.	CASE	Approx. Price
2N4427 ECG346 NPN, RF Driver, 1 W	40	20	2.0	0.4	3.5	10	Y0-39	\$8.00
ECG488 NPN, RF Po. Driver 2W	36	18	4.0	0.8	6.0	5.0	Y0-39	\$11.00

Depending on substitution band, L #'s for 30 meters may vary. No Change was made for 20 meters.

* Toroids available from Oak Hills Research 20879 Madison, Big Rapids, MI 20879

** No. 26 wire with 30 degree gap between ends.

*** Dr. alternatively, remove 4 turns from existing toroids, L33 and L34.

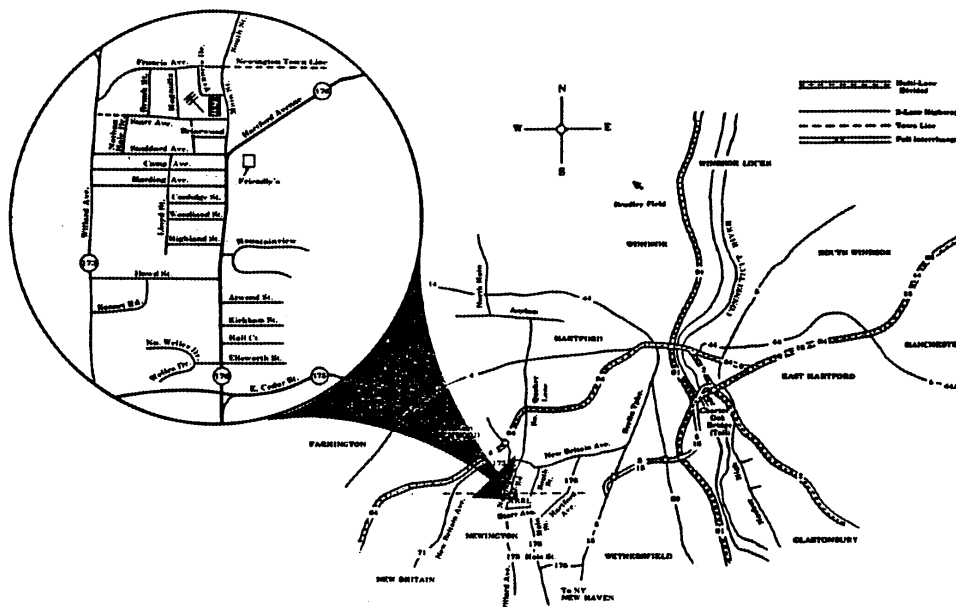
MEETING ANNOUNCEMENT QRP-NE AT ARRL HEADQUARTERS

Sunday, January 16Th, 1994 --10 A.M.

These meetings at ARRL have been great fun in the past! Bring your homebrew projects, ideas, plans and your amateur radio license to ARRL for this QRP-NE meeting.

We will have "show and tell", do some business, tour ARRL HQ, and operate W1AW/QRP from 2 to 4 pm EDT (1900 to 2100 UTC). For car pool information call Jim Fitton, W1FMR at 603-898-6188.

Visiting *Your* Headquarters



The general public (but especially League members) are always welcome during regular office hours (8:00 A.M. - 4:30 P.M. Monday through Friday, local time). Tours of the administrative headquarters and the Maxim Memorial Station, W1AW, are given on the hours of 9, 10, 11, 1, 2, 3 and 4, but special times can be arranged. Large groups should make advance arrangements, one week ahead, either by writing to our address c/o the Membership Services Department or by calling 203-666-1541. Please give the date and time of arrival and the number of people who will be coming.

W1AW operates from 7:30 A.M. until 1:00 A.M. M-F and from 3:30 P.M. to 1:00 A.M. on Saturdays and Sundays. An FCC-licensed amateur may operate the station between the hours of 1:00 P.M. and 4:00 P.M. Monday through Friday local time upon presentation of a current FCC amateur license or photocopy thereof. Special times must be made for weekend operation.

The full office tour includes a description of the services and operations of the various departments: Communications, Club and Training, Technical, Membership Services, Advertising, Production, Circulation, and Controller's. Highlights of Headquarters include the museum, Hiram Percy Maxim's "Old Betsy" spark-gap transmitter (still in working order!) and the Ralph P. Thetreau Memorial Antenna System.

All facilities will be closed on New Year's Day, Washington's Birthday, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day.

PUBLIC TRANSPORTATION

Most continental airlines serve Hartford Connecticut through Bradley International Airport. Amtrak provides rail service along a north-south line. Bus service is available from Greyhound and Continental Trailways. Public bus transportation from Central Row in Hartford via the "New Britain P-line" brings you through the intersection of Hartford Avenue and Main Street (Newington) leaving at 5 minutes of the hour and 25 minutes after the hour. Exact change (60¢ as this is being written) is required. For more information call Connecticut Transit: 203-525-9181.

AUTO ROUTES

From NORTH

SOUTH 91 to
EXIT 28 Wethersfield/Newington, U.S. 5, CT 15
(Berlin Turnpike)
EXIT at ROUTE 175 WEST (Newington)
RIGHT at end of ramp
2nd light - RIGHT - ROUTE 176, Main Street
Hq. on left after two traffic lights

From SOUTH

NORTH 91 to
EXIT 17, ROUTE 5/15, Meriden (Berlin Turnpike)
EXIT at ROUTE 176
Straight through junctions of 174, 287 and 175
(5 stoplights)
At 7th stoplight GO STRAIGHT - do not follow
Route 176
Hq. 2 blocks on left.

From EAST

WEST 86/84 to
EXIT 57 East Hartford
Charter Oak Bridge (toll) to Connecticut 15 WEST
EXIT at ROUTE 175 WEST (Newington)
Right at end of ramp
2nd light - RIGHT - ROUTE 176, Main Street
Hq. on left after two traffic lights

From WEST

EAST 84 to
EXIT 41, South Main Street, Elmwood
RIGHT at light at end of ramp
At next light - LEFT - New Britain Avenue
RIGHT at SOUTH STREET (light after underpass)
South Street becomes MAIN STREET in Newington
ARRL Hq. on RIGHT (about 1½ miles down road)

IF and MICROPROCESSOR CRYSTAL FREQUENCIES for MULTIBAND RIGS

IF	43	39	32	25	18	17	11	10	9	11D	2D
BAND											
160									7.2		
80					14.5	13.5			5.5	14.5	5.5
40	36	32	25	18	11	10	4	3	2	18	
30	33			15	8						12
20		25	18	11	4	3	3	4		25	16
17	25										20
15		18	11	4	3	4	10	11	12	32	
12											
10	15	11	4	3	10	11		18			
6		11	18			33		32			

IF FREQUENCIES IN MHZ.

ASSUME IF FREQUENCY IS "BOTTOM" AND TUNE "UP".

"D" INDICATES TUNING "DOWN".

KN1H 12-93

IF & MICROPROCESSOR CRYSTAL FREQUENCIES FOR MULTI-BAND RIGS, by John Collins, KN1H.

Much has been written about the potential for using inexpensive microprocessor crystals in crystal filter projects but I haven't seen much about using them in heterodyne oscillators of double-direct conversion receivers, double-conversion superhets, or single-conversion transmitters. The accompanying chart shows the range of first IF frequencies useable with crystals shown in the current Digi-Key catalog. None of these crystals costs more than \$1.50, making multi band rigs quite affordable.

A real all-band rig would require special-ordering a few crystals - there is a sad lack of correlation on 160 and the WARC bands, and most are already familiar with the ".5" problem on 80. However, new frequencies are being offered all the time, and hopefully some of them will produce a match. The recent addition of 14.5 and 13.5 Mhz is very useful.

Building a multiband receiver or transmitter using these crystals is only slightly more complex than building a mon-band rig. I have had good results with a 5 band superhet using a 39 mhz first IF, a 7 band receiver using a 10 Mhz, and a 6 band transmitter using 17 Mhz. Sometimes extraordinary care must be taken for image rejection, e.g. 1 Mhz AM breakthrough on 21 Mhz with a 10 Mhz IF, but upconverting to a high first IF offers a lot of possibilities for birdie free receivers.

SEE CHART

Passing the baton, by Carl Heidenblad, N1CUU

With this issue, the general editor hat for 72 passes over to Dennis Marandos, K1LGQ. I would like to take a minute to thank him for taking on the position of editor, and to thank the club members for all the help and encouragement these past 2 years. It's been fun seeing the club and the newsletter grow! I'm sure the best is yet to come. As we made the changeover, and worked to get this issue out there were a few rough spots, caused by problems at this end. These will all be worked out next time. Again, thank you to all & 72!

ANNOUNCING THE NORTHWEST QRP CLUB WINTER NW QRP SPRINT QRP CONTEST

DATE: SATURDAY, JANUARY 15, 1993
TIME: 0100-0400 UTC (5-8 PM PST)
FREQS: 3560-3580; 7035-7040; 14060 Khz.

RULES: The object of the Sprint is to contact as many other QRP stations a possible within a 3 hour period. Contacts with NW QRP Club members count as 5 points each. Non-members count as 3 points each.

EXCHANGE: Give RST, your state, and your NW QRP member number. Non-members must give the power used in watts. (Must be under 5 watts).

MULTIPLIERS: Multiply total score by 3 for using 1 watt or less. No multiplier for power over 1 watt.

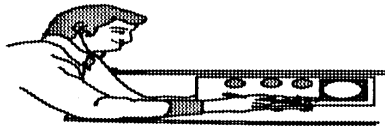
AWARDS: An award will be given to the highest score for the top QRP entry in each call area and a special award will go to the top "Winter NW QRP SPRINT WINNER." You don't have to be a member to win.

Send completed logs by Jan. 29, 1994
to KG7CR Stan Yarema, Contest
Editor, 3457 12th West, Seattle, WA
98119.

Your material wanted...NOW!

You're sitting in your easy chair and you're working the "big" contacts. You're smiling from ear-to-ear, having a pretty fun time of it. Before you know it, the QSO is over, the DX worked, and your log book has all the information to add one more notch to your QSL collection. Aahhh, the joy of ham radio, but...wait, who else knows about your good fortune? NO ONE! Now is the time to get your thoughts together and write down just what happened and send it along to your QRP-NE newsletter. There are a lot of others who just love hearing about what you just did. Excitement is contagious. TELL SOMEONE!

You're sitting at your workbench and you have just successfully wired your newest QRP rig to your collection. However, you didn't follow the author's techniques because you just knew there would be a better way of constructing your masterpiece. Your ideas worked and your short-cuts did also. TELL SOMEONE! Now's the time to get your thoughts in hand and write to the QRP-NE newsletter to spread the word. There are a lot of people who would like to know just what you did differently that made your "project" work, where others have failed. This is the time to pass these ideas along. TELL SOMEONE!



The day your special delivery arrived by mail, you couldn't wait to open it and examine all the parts. You're not like the others, who don't even read the instructions, or look at the schematics, etc.... You're too methodical and have decided to see this project through...to the end, perfectly, flawlessly, with pure

delight. You finished your project and it's nothing as it was advertised. The parts were shoddy, mislabeled, and worse...missing. Boy, do you have a lot on your mind! TELL SOMEONE! Get your ideas on paper and radiate your feelings. Explain the *angst* that went through your mind, not to mention the money that went through your wallet, and let others know what happened to your project. Tell how you found out your solution and the way you went about it. Write to the QRP-NE newsletter and TELL ALL!

Our goal is to make it easy for you to enjoy our hobby. Send materials, hand written, typed or floppy diskettes (MS-DOS) with all the information to give you credit. Technical articles should be sent to John Collins KN1H, QRP-NE Technical Editor, RR-2, Box 427, Cornish, NH 03745 (603-542-2057). All other materials, of any kind, should be sent to: NEWSLETTER Editor, DENNIS MARANDOS K1LGQ, 42 CUSHING AVENUE, NASHUA, NH 03060-1816, 603-883-8655. Let's hear from you...now!