

January 1996

72

THE NEW ENGLAND QRP NEWSLETTER



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

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 for all to read. Send your materials, hand written or typed or MS-DOS to **72**. Use the Internet to send materials to your editor or floppy diskettes, MS-DOS Windows gladly accepted.

THE DEADLINE FOR THE NEXT ISSUE OF **72** WILL BE MARCH 23, 1996.

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**MEMBERSHIP NEWS** -

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## More Output Power for the XX-40 Series

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Newington, CT 06111  
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Since I published the MMIC mod in the July '95 issue of 72, I've been asked if this modification to provide more transmitter drive will improve the picture for 30 and 40 meters. The answer is "yes".

Perhaps I could elaborate. I've had reports of marginal drive on the 30M version of this rig, leading to instability if the tuning procedure isn't followed closely. By adding the MMIC modification to the 30M version, substantially more drive reserve is available and instability is no longer a risk during the tuneup procedure. When I published this modification for 20M I was concerned about spectral purity for the 30M flavor. I'm happy to report that the results for this modification look good.

I also revised the PA output network for a nominal output power of 3 watts. All that new-found drive capability seemed like a case of "all dressed up and nowhere to go"! The values in the table at upper right reflect spectrum analyzer results taken both before (1.5W) and after (3W) the filter modifications. The drive settings were adjusted for each output level.

BAND	7.0 Mhz		10.1 Mhz	
(Power)	harm.	spurs	harm.	spurs
1.5 W	-35dB	-38 dB	-35 dB	-46 dB
3.0 W	-32 dB	-38 dB	-32 dB	-40 dB

The component values for these changes for 40 and 30 meters are shown below. I'd recommend adding the MMIC mod first if you plan to rework the output network for higher power. No PC-board cuts are needed to incorporate the added circuitry.

Several other notes apply for these modifications:

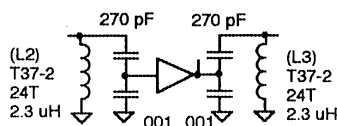
1) The RF choke shown earlier in the MMIC modification isn't strictly necessary. Stage gain with the choke was 14 dB and 12 dB without—more than enough in either case.

2) If you're boosting the output power, be sure to add a heat sink to the PA (Q6). The 0.5" diameter hat-style heat sink (see Mouser catalog) fits nicely on the PA and board layout.

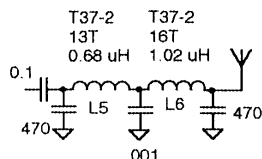
Send me a large SASE and I'll be happy to forward a set of modification notes and parts info. See you on the air!

### 7 Mhz

TX Bandpass Filter

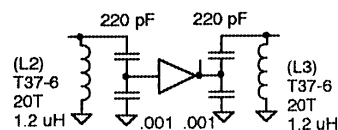


TX Output Filter - 3 Watts

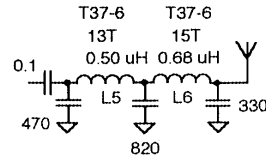


### 10.1 Mhz

TX Bandpass Filter



TX Output Filter - 3 Watts





The Small  
Wonder Labs  
SW24 Enclosure  
Kit and the  
Exorcism of Evil  
RF

Bob Gobrick VO1DRB/WA6ERB  
Transylvania, Newfoundland  
Canada

There they sit, on the work bench, in all their slender—two spanking new, just completed, New England QRP Club Forty-40 and Thirty-40 QRP transceiver boards. Both have been bench tested and even a few QSO's have been made with these marvelous creations of Dave Benson's - NN1G imagination. It's like these little radios have a life of their own—begging to be used and praised.

It's Dayton 1995 and as I'm about to catch my plane, I notice two Forty-40 and Thirty-40 boards still sitting on my work bench months later. OK, I'll admit it—I fear building enclosures for my rigs, even if it means something as simple as drilling a few holes and applying a little spray paint. The process terrorizes me and I feel something evil will happen if the PC boards don't like their new home. What if I make a mistake and the knob is off center—bad karma? What if I drill too big a hole for the connector and the lock nut pops through the other side—hypervarp? What if the spray paint runs down the side of the project making the cabinet look like a pop artist's rendition of the crying Madonna? And the barbs that I'll have to endure from my local radio club buddies when I tell them, "Oh I just threw this enclosure together temporarily". And finally the rejection from the Secret Society of the QRP Quality Craftsman Guild (SSQRPQCG) when I demonstrate a perfect soldering job with resistor color codes all lined up in a row, components properly placed so all letter marking can be easily read and then this, this sinfully ugly cabinet. Oh the horrors of it all...

I arrive at Dayton, Ohio. I feel secure leaving behind any evidence of my past attempts at ugly enclosures, for those evil sneers won't come my way. But I'm worried about those little rigs back home being neglected by their master and not having a proper home—what are they thinking, will they rebel and not "find" any DX for me? Oh my! At the evening QRP hospitality suite, I see Dave Benson - NN1G and thank him for the great design he made in the 40-XX series. I'd like to show him my versions of these neat little rigs, but you know, they're back home, in "temporary" cabinets, *but you know*. Dave sensing that some kind of evil spirit is beginning to overtake me, pulls out of his briefcase the QRP equivalent of the sacred cross and garlic wreath—a pre-punched, pre-painted and pre-labeled custom enclosure kit for his line of Small Wonder Lab rigs. Life returns to my body. I begin to see that there is hope for me and my little rigs. They will survive with a new home to protect them from that evil RF.

Dave has crafted a tidy, little enclosure kit for the old New England QRP club Forty-40 and Thirty-40 and the new line of SWL (Small Wonder Labs) rigs. The cabinet is a sturdy Ten Tec 2X4X4 box (thus the SW-24 name?), painted in gray and black with a nice silk-screen logo front panel. All chassis parts, connectors, pots are provided. Also included is a 6 page step-by-step manual (yes even for this simple enclosure) which is really nice for the first time cabinet assembler and fearful old codgers such as I. A first class cabinet kit to complement this nice radio kit.

Dave also makes a number of technical enhancements to the mounting design of the PC board for the enclosure. The PC board is isolated from the cabinet by four nylon standoffs and the only ground strap from the PC board to the cabinet is by the antenna mini-coax shield connection. Cabinet connectors have only the "hot" leads wired from the PC board to the cabinet—no separate ground wires. I talked to Dave about this design approach since I've experienced, in previous attempts at mounting PC boards into cabinets, a number of audio/RF feedback problems. Dave was aware of this situation and his feeling was that the SW-40 board was a small board with a limited ground plane and he wanted to isolate any ground loop problems in the rig. Let me just say his mounting design works and works well. After installing my Forty-40 into the cabinet, using the nylon standoffs and single ground return, the rig was "howl" free.

Happiness has returned to my hamshack. My Forty-40 and Thirty-40 have new homes, and my wife has taken the garlic wreath that used to hang around my neck and decorated our "Country Kitchen" with it. I am working all kinds of DX now that my little radios have been exorcised of that evil RF. **RF RF RF**



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March 1993 QEX 40 Meter QRP Rig  
(reprint, April 1995)

Presented here is the GREAT rig we have been talking about in north country. If you have a need or a desire for a first rate superhet transceiver, build this one. Perhaps a bit more complex than your average club project, but if you take your time, check/trouble shoot as you go along, you should have no problems. Except for the audio circuit, construction is straightforward. W1IS, N1FYT and I built one and ALL are working just great. The audio chip will oscillate, though, so it's best if shielded from the rest of the circuit. Keep all interconnections as short as possible. The March 1993 QEX article is lengthy, 14 pages, and a complete reprint can be obtained from our 22 editor, Dennis Marandos K1LGQ - NE#151 for \$5.00 Heck, it's worth receiving even if you don't build as there's a lot of great info in it. Dennis will send you the 14-page article so send a check made out to him. Also, if you want to build a 20 meter version of the above rig, check out the 1995 ARRL Handbook. Thanks Zack! Keep it coming

Jack Frake NG1G - NE#02



**NEW England QRP Club  
to meet at  
ARRL Headquarters  
Newington, CN  
March 10th  
Sunday**

The winter meeting for ALL club members, and guests, will be held March 10 at the ARRL headquarters in Newington, CN this year. Bring your QRP rigs, experiments, breadboards, antenna tuners and anything else you would like to show the other members. This meeting will be devoted to sharing, telling and seeing what others have and what they are doing. You will be able to meet your friends, operate the WIAW club station, QRP, and relish the company of the movers and shakers in the best QRP Club around.

The meeting time will be 9 AM with a break for lunch at a local "quick serve" and then it is operating time at 1 PM. This is the year QRP will be heard around the world so be there!

Mark your calendar now and think warm weather for a pleasant trip to the league's main offices. If you are not able to attend, listen on the air for club members who will be operating WIAW with their rigs.

**Rubber Bumpers for  
the NorCal 40 & 40A**



Home Building Tips #5  
Walt Thomas - WA4KAC

My NorCal-40 was built from a partial kit. I prefer using "bolt on" rubber bumpers (Zack Lau, "Birth of a 7 MHz Transceiver," *QEX*, March 1993, p. 12) I found Russell Industries #REC-207SR bumpers at a local electronics outlet (Mark Electronics, Belville, Maryland) which worked much better than others I have used. They have an internal metal washer in the mounting screw recess which prevents the edges from curling when it is tightened. The #REC-207SR bumpers are 1/2 inch diameter by 1/4 inch high and were attached to the bottom half case with 4-40 hardware. I later changed the two front bumpers to 5/8 inch high level (Russell #REC-2090SH), for these tilted the front upward and made tuning the rig easier and much more comfortable.

Walt Thomas - WA4KAC



**For Your  
Information**

**NorthWest QRP Club Third Annual Winter Sprint**

**DATE:** Sunday, February 11, 1996  
**TIME:** 18:00-22:59 UTC  
**FREQUENCIES:** CW: 3.560-3.580, 7.350-7.040, 14.060, 21.060 MHz  
SSB: 14.285, 21.385, 28.385 MHz  
**RULES:** For CW QSOs:

QSO with NWQ Member = 5 points  
QSO with non-member = 3 points  
Exchange: Give RST, state, and NWQ# (or power used if non-member)

**For SSB QSOs:**

QSO with NWQ member = 3 points  
QSO with non-member = 1 point  
Exchange: give RS, state, and NWQ# (or power used if non-member)

**MULTIPLIER:** multiply total score by 3 for using 1 watt or less.

**AWARDS:** Awards given to top score in each call area include top over-all score.

*Send complete logs by February 29, 1996 to:*

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

The NorthWest QRP Club hope you join them for their annual *WINTER SPRINT*. Stan - KF7ME asks that you include information on the equipment you used during the Sprint along with your log information.

**Colorado QRP Club Winter QSO Party**

The Colorado QRP Club wishes to encourage QRP operations and amateur radio fellowship on the HF bands and will hold a contest on the fourth Sunday of February from 22:00 to 03:59 UTC on the following Monday and the fourth Sunday in August from 18:00 to 23:59 UTC. The contest includes both CW and SSB divisions. Ratchewing encouraged! Send completed log, dupe (if over 200 QSOs) and name sheets within 30 days of the contest to:

**Jim Pope - KG0PP - CQC Contest Chair**  
P.O. Box 31575  
Aurora, CO 80041-0575

**DATE/TIME:** 2200 UTC February 25 to 03:59 UTC February 26, 1996. Sunday evening local time (United States)

**EXCHANGE:** RS(T), state, province, country, first name, and member # if CQC member. Power output if not member, *i.e.* 579 CO Jim NR 04

**SUGGESTED FREQUENCIES:** (No WARC bands)  
CW 1.825, 3.560, 3.710, 7.040, 7.110, 14.060, 21.060, 21.110, 28.060, 28.110 MHz  
SSB 1.910, 3.985, 7.285, 14.285, 21.385, 28.385 MHz

**CLASSES:** single band, multi-band, Novice/Tech

**QSO POINTS:** CW-CQC member 6 pts., non-member 4 pts.

SSB-CQC members 3 pts., non-members 2 pts.

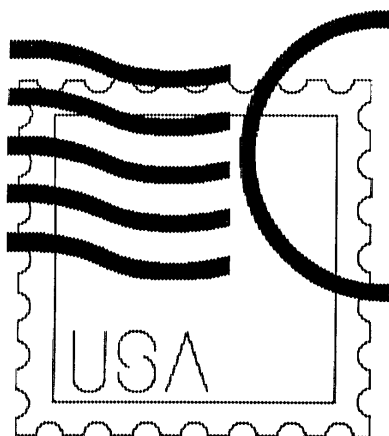
**MULTIPLIER:** States, provinces, countries worked. The same station may be worked on different brands for additional QSO points and multipliers. Contacts on the same band using a different mode counts for QSO points, but not as an additional multiplier.

**NAMES:** Total of first names from name sheet. One first name per letter of the alphabet. Name must be same as Callbook or QSL information.

**SCORES:** Total Score=QSO points X multiplier X names. Submit logs within 30 days of contest.

**POWER:** Stations must use 5 watts or less output on CW or SSB. There are no power multipliers.

**AWARDS:** To be determined. Highest score in each class.



## New International Rates

(Effective July 9, 1995)

Dennis Marandos - K1LGQ  
Nashua, NH  
k1lgq@dennis.mv.com

Let's face it, sending and receiving QSLs is a lot of fun, but unless you can keep up with the current stamp postage, you're going to get a few returned postcards and letters. Assuming you do send QSLs, the following table will give you a better idea of where your money is going. Simply put, if it's going to Canada or Mexico, you will need forty cents and thirty-five cents postage on that card, respectively. And, if it is a letter you're sending, try forty cents to begin with. If you send your QSLs through the ARRL QSL bureau, the cost has gone up (again) to \$3.00 per pound, plus your QST label.

### CANADA AND MEXICO

Weight (pounds)	Not Over (ounces)	Canada	Mexico
0	0.5	\$0.46	\$0.40
0	1.0	0.52	0.46
0	1.5	0.64	0.66
0	2	0.72	0.86
0	3	0.95	1.26
0	4	1.14	1.66
0	5	1.33	2.06
0	6	1.52	2.46
0	7	1.71	2.86
0	8	1.90	3.26
0	9	2.09	3.66
0	10	2.28	4.06
0	11	2.47	4.46
0	12	2.66	4.86
1	0	3.42	6.46

1	8	4.30	9.66
2	0	5.18	12.86
2	8	6.06	16.06
3	0	6.94	19.26
3	8	7.82	22.46
4	0	8.70	25.66
Weight Not Over (ounces)	All Countries (other than Canada & Mexico)	Weight Not Over (ounces)	All Countries (other than Canada & Mexico)
0.5	\$0.60	12.5	\$10.20
1.0	1.00	13.0	10.60
1.5	1.40	13.5	11.00
2.0	1.80	14.0	11.40
2.5	2.20	14.5	11.80
3.0	2.60	15.0	12.20
3.5	3.00	15.5	12.60
4.0	3.40	16.0	13.00
4.5	3.80	16.5	13.40
5.0	4.20	17.0	13.80
5.5	4.60	17.5	14.20
6.0	5.00	18.0	14.60
6.5	5.40	18.5	15.00
7.0	5.80	19.0	15.40
7.5	6.20	19.5	15.80
8.0	6.60	20.0	16.20
8.5	7.00	20.5	16.60
9.0	7.40	21.0	17.00
9.5	7.80	21.5	17.40
10.0	8.20	22.0	17.80
10.5	8.60	22.5	18.20
11.0	9.00	23.0	18.60
11.5	9.40	23.5	19.00
12.0	9.80	24.0	19.40

## POST/POSTAL CARDS



COUNTRY	RATES
Canada	\$0.40
Mexico	\$0.35
All others	\$0.50

## NEW ENGLAND CLUB MEETING Reminder

The New England QRP Club is to meet at the ARRL Headquarters March 10, 1996 - Sunday, in Newington, Connecticut. Bring your favorite rigs and "plug" into W1AW and try your hand at QRP from the "mother station." Meeting time is 9 AM sharp and will convene with a club meeting followed by a quick luncheon and operation of W1AW. Bring your rigs, cameras and friends and meet the best QRPers in the land!

## Loaded for Bear: QRP Afield or Bust!



Tom Doubek - AA1CA, NE#303  
Hampton, NH

What better way to stir up local interest in this regional/national field operating contest than to use my local club's site and a recently built "killer" field day antenna? We reprinted the rules in Port City (Portsmouth, NH) ARC's *Long-wire* newsletter, pitched it again at our September sixth meeting, got permission to use the Stratham Hill Park New Hampshire hill site (replete with 64 feet fire tower) and then moved on to other things. My preparation for the contest occurred the morning of the contest. Planning ahead is for nerds, right?

My HW-9, ATU (antenna tuner) and keyer-on-a-bread-board (I'll get it on perfboard and inside the rig one day...soon) went into a box easy enough. Antenna stuff was already in boxes I had hauled around my backyard to tend the current wires in the trees (catch that pun?). The actual killer antenna, a Vee Beam with 250 foot legs, was wound on a reel. With my June '95 copy of *ZZ* in hand, and drinks iced down, I loaded the '68 VW Beetle and moved out. My XYL tolerating the whole mess rather well. It was a beautiful NH fall day which was cool and windy but relatively clear. The 15 mile drive would even top off the battery a bit.

My plan was to run the HW-9 at 900 mW out, keeping the VW battery drain down to an amp or so an hour. There should still be enough volts left to crank the engine for the trip home. (I could always push-start it downhill.) The Vee Beam gain would offset the low power out, and I could taste those 8 points-per-QSO already. Main lobes would be northeast and southwest based on our June 95 ARRL Field Day experiences. Maybe even a little EU DX to shoot for. Band plan was 20, 40 and 80 meters, in that order. I was after QSOs!

I got up the hill (elevation 280 feet) an hour and a half before contest time. Vee Beam was up 2 hours later, thanks to help from Ron, N1LBG. Insulators were snagging in the tree branches and I failed to get the apex high enough on the fire tower. The Vee looked more like a sagging sloper low enough to do clothesline duty. The 450 ohm ladder

line flapping in the breeze did spice it up a bit. I unpacked the rig and placed it atop a picnic table, and nestled the VW up close. Already I'd forgotten a speaker; list of antenna tuner settings; thick cord for the tower/apex tie-down and a dowel rod for antenna/cord reel in/out. But hey, us hams are thrifty and maybe even crafty, right?

Just finished firing up the rig and working up new tuner settings when we were deluged with visitors. Lots of folks out enjoying the day. Stratham Hill includes a hiking trail and the fire tower stairs seem an obligatory climb for the hearty. Six young boys joined our table and Ron gave them an introduction while I tried to operate on 20 meters using earphones. 17:15 UTC and still no QSOs. Instead, I connected the keyer to a code practice oscillator and sent each of our guests names in code a few times so they could hear it on the speaker. "Here," motioning to the paddle, "now you guys try it." Much laughter. One boy knew about breadboards, and others wanted to know about the wires sticking out from behind the rig. Placing contesting on the back burner, I launched into a discussion on the international use of Morse code and how the keyer circuit regulates the dots and dashes. Then the boys gave the keyer a try. More laughter. Everyone moved on, with parting handshakes all around.

17:35 UTC, first QSO with WA8LCZ, Byron, in MI, the only QRP contester holding a place on 20 meters. Good for him! I found a spot and snagged one more 20 meter QSO. Called CQ another ten minutes with no luck. 900 mW or my antenna or conditions just wasn't cutting it. QSYed to 40 meters where I hoped there'd be more room and less QRM. Success! A string of QSOs (well...6 in all) that next hour, including Jim, W1FMR/1 NE #01 portable in Rye, NH. Hey, things were looking up!

More visitors, off came the headsets, more handshakes. Rick, WQ1T, and family were just out for a stroll and spent almost an hour with us. Then Paul, AA1MI, and his daughters (now making friends with Rick's daughters) also stopping by. Now 19:00 UTC and 8 QSOs in the log. No one answers my CQ so I go begging and start S & P (search and pounce) on others' CQs. They all want to ragchew, what else? After the first exchange I hit them with "AM IN QRP CONTEST BT PSE UR PWR? BK." Most take it gracefully and wish me "73 ES GL IN TEST." John, W2XS, in Long Island NY tells me my 589 signals are tempting him to get the dust off his QRP rig. By 20:00 UTC log is up to 14 QSOs. This 900 mW thing is a much different beast than my usual 3 watts. Expected to be a lot further along than this!

**I discovered, I couldn't talk and send CW at the same time. Just couldn't tell everyone else about Al and his bike and sending CW at 60 mph in the breeze.**

Somewhere in there I managed the all-time outstanding super colossal QSO of-the-day with Al, K3KMO/mobile on a motorbike. Imagine tooling west on I-90 on your chopper on a beautiful Saturday afternoon in Western NY sending CQ CQ CQ in CW no less! In that ten minute QSO I discovered, I couldn't talk and send CW at the same time. Just couldn't tell everyone else about Al and his bike and sending CW at 60 mph in the breeze. Wow! He gave me a 579 so my 900 mW was at least working somewhere. Don't know how he manages to QRV and motorbike at the same time.

Rick and Paul and families leave. Ron checks out but leaves some cookies(!) More hikers stop in, browse and chit-chat. Even the mothers are interested and ask how far away I've reached. MI and NC seem far enough away for them. Nick, AA1LN, arrives with cigar smoke burning, warding off the already dying insects. We sneak over to 20 meters once more. Europe stations are up and running in the Scandinavian Activity Day CW contest. Maybe I can eke out a few more QSOs/multipliers. Nick says his good-byes and I'm alone, madly chasing DX. 21:00 UTC, still no QSOs on 20 and wind is up, temperature falling. About 60 degrees F and wind chill rising. I don my trusty USAF field jacket and watch cap, wind at my back. Turning around I see the north antenna leg is laying on the ground. That explains the high SWR. By 22:00 UTC I sling the wire up a few feet on a tree branch and get back in the contest. None of the EU stations are answering me, most are S-3 to 4 so I throw in the towel and QSY back down to 40 meters.

22:35 UTC and only two more QSOs. Log is up to 17. Sun at the horizon, clouds moving in, night is near and I have an antenna to get down and rolled up. Now about 50 degrees F and wind holding at 10 knots from the SW. I close the log, shut off the rig and start packing up. 5 hours operating time and only 17 QSOs. We had more visitors than QSOs! Maybe I can get credit for eyeball QSOs? This 900 mW thing needs some serious rethinking...

Wind stops about a half hour after sunset. A few mosquitoes zoom in for dinner. The wire and cord reels in easily in the darkness. Have to use the flashlight for the knots. Get the Bug all loaded up, do a final sweep of the hill on foot and get ready to start the engine. Yes! Yes! Yes! She chugs and I drive ever-so-slowly down that hill, stopping at a pay phone to call my XYL. No HT for me. Get home by 00:30Z, about 8:30 p.m. local. Totally wiped out. Everything stays in the car till next day. Contesters' privilege.

Okay folks, watch out for next year 'cause I'm coming back. And next time I'm really gonna be loaded for bear!

Tom Doubek - AA1CA, NE#303  
Hampton, NH

## FOUR DAYS IN MAY ©

The QRP Event of 1996

QRP Amateur Radio Club, International (QRP-ARCI) proudly announces the first QRP Symposium to be held on Thursday, May 16 1996—the first day of four festive days of 1996 Dayton Hamvention QRP activities. Mark your calendars and get your hotel reservations in early for this not-to-be missed QRP event of the year.

Conference presentations, meetings and workshops on everything you wanted to know about amateur radio QRP will all be part of this full day Thursday event to be held at the Days Inn Dayton South (513-847-8422). QRP-ARCI Symposium attendees will start their day with a wake-up coffee social and then plunge into a morning of multimedia QRP presentations by renowned QRPers and QRP equipment manufacturers. A short break for a catered lunch and some special QRP door prizes and

then back to an afternoon of more exciting QRP technical presentations. And if that is not enough, then come join us for a Thursday evening of QRP break-out session tutorials. The 1996 QRP-ARCI Symposium will be the talk of the Dayton Hamvention.

**Get the Bug all loaded up, do a final sweep of the hill on foot and get ready to start the engine.**

QRP-ARCI continues the "Four Days in May" QRP extravaganza with nightly hospitality suite sessions, where QRP projects from around the world are displayed with a pride that only a QRPer could appreciate. "Four Days in May" QRP-ARCI week culminates with the annual QRP-ARCI Fri-

day Night Banquet honoring QRP dignitaries for their service to the amateur radio community.

Your 1996 QRP-ARCI "Four Days in May ©" Symposium Committee:

Bob Gobrick VOIDRB/WA6ERB, public relations chair

(rgobrick@public.compuconsult.nf.ca)

Bruce Muscolino W6TOY/3, technical paper chair

(BRUCE3900@delphi.com)

Paulette Quick, N9OUH, registration chair

(plquick@facstaff.wisc.edu); P.O. Box 145,

Madison, WI 53701-0145; (608) 263-9326 (wp)

Thanks and hope to see you all there

Bruce W6TOY

*New England Club Dues DUE!*



**\$7.00**

If you haven't remembered to send in your dues for 1996, now is the time to write that check and send it in now so you won't forget. It appears that a few people need a little prodding remember their subscription has lapsed and that they will no longer receive the fine stories, excellent reviews and great technical tips found in the 72 newsletter. Because this is Leap year, and because this is also an election year, 72 wants you to still be counted as one of the regulars. If you haven't anything else to do today, right now, write that check for \$7.00 for your renewal and send it to the Renewal Chairman:

**Bill Studley - AA1OC**  
**133 Baboosic Lake Road**  
**Merrimack, NH 03054**





## Announcing NEW ENGLAND QRP CLUB NEWEST MEMBERS!

The following new members have taken the pledge to operate QRP in the best interest of amateur radio. Won't you welcome them aboard and tell them you saw their name in 72.

NE083 Arnold Chick, WK7K (corrected call)  
NE257 James Pope, Jr, KG0PP (new call)  
NE267 Chester J. Blaszcak KF2Y (corrected call)  
NE292 Peter H. Meier, WK8S (corrected last name)  
NE302 Michael Ardai, N11ST (corrected last name)  
NE325 Larry F. Burkett, WA7SOU (corrected call)  
NE356 Arthur J. Aspers, N2LOI (corrected last name)  
NE400 Barry Shore, NR1P  
NE405 Robert D. Reif, W1XP  
NE406 Peter J. Harrison, N1UBN  
NE407 John R. McKee  
NE408 Roy H. Gregson, W6EMT  
NE409 J. Scott Johnson, AC4AJ  
NE410 David Rowe, KC1DI  
NE411 Richard M. Stern, AA6BS  
NE412 Craig Jay Sterling, AA3MD  
NE413 Gabe A. Sellers, KG0NR  
NE414 Richard Sherman, WZ2T  
NE415 George F. Reitz, AD4EP  
NE416 W. K. Penhallegon, W4STX  
NE417 Robert E. Helms, AF5Z  
NE418 Charles L. Kuhn, N9NVV  
NE419 Thomas F. Randolph, N100Q  
NE420 John E. Redwine, K5ERJ  
NE421 Kenneth A. Tata, K1KT  
NE422 Jay Freud, N2RIZ  
NE423 Calvin A. Hoerneman, W4OTS  
NE424 Russell W. White, AB7JX  
NE425 Gary R. Hanson, KJ5VW  
NE426 Russell Carpenter, AA7QU  
NE427 Stanley R. Nelson, KD0G  
NE428 Robert D. Haslach, N3FRT  
NE429 Bruce O. Bowes, KB2TRF  
NE430 Robert R. Scott, AC4QQ  
NE431 Barry Whittemore, WB1EDI  
NE432 Bruce Huyck  
NE433 Dennis H. Otley, KB9LGZ  
NE434 Larry Lai, BU2BJ  
NE435 Jim Cates, WA6GER  
NE436 Donald Lefrancois, WB1CDH  
NE437 Robert C. Kerns, K2VNM  
NE438 Daniel J. Maguire, AC6LA  
NE439 Wayne's Wood-N-Things  
NE440 William Stietenroth, K5ZTY  
NE441 Joseph Spencer, KK5NA  
NE442 Robert C. Walworth, AK5B  
NE443 Robert W. Kmak, KC5RAS

## LET US KEEP HEARING FROM YOU! ~~QRP~~ ~~CLUB~~ ~~NEW~~

The fellows on the GLN would like to remind you that they are meeting on 3.560 MHz at 9 PM eastern time on Wednesday. Join us and meet some of your fellow QRP New England Club members.

## APRIL 27, 1996 SATURDAY QRP TO THE FIELD

Get ready for a June-type field day by testing your equipment in the QRP TO THE FIELD, which is open to all radio amateurs using all bands and both modes - SSB/FM & CW. Sponsored by the *Northern California QRP Club (NorCal)*. SINGLE transmitter on the air at one time. Once started, use the same power output and location categories.

THE CONTEST PERIOD: Saturday-1300 UTC to Sunday 0100 UTC- (Saturday 6 AM to Saturday 6 PM PDT). Mark logs to indicate your best (8) continuous hours for scoring.

EXCHANGE: signal report & state, province, or country.

QSO POINTS: 1 watt out or less-10 points (either mode)

5 watts or less-5 points (either mode)

Over 5 watts-2 points (either mode)

Multiplier: Field location-4.0 X multiplier (field=battery power & temporary antennas)

Home Location-2.0 X multiplier

(home=commercial power & permanent antennas)

Home Brew equipment-3.0 X multiplier (if you built it, it is considered homebrew)

commercial equipment-2.0 X multiplier

### FINAL SCORE:

Band/mode QSO points X location multiplier X equipment multiplier = Band/mode total. Add the band/mode totals for the final score: Example:

(20) 20M/SSB QSO's X5(5W) X4(field) X2(comm. = 800 pts.

(35) 40M/CW QSO's X5(5W) X4(field) X3(HB) = 2100 pts.

Final score = 2900 points

SUGGESTED FREQUENCIES: 1.810, 1.910, 3.560, 3.710, 3.985, 7.040, 7.110, 7.110, 7.285, 10.120, 14.060, 14.285, 21.060, 21.110, 28.060, 28.385, 50.060, 50.128, 51.700, 144.050, 144.200, 146.520 MHz.

AWARDS: "Top Ten" scores certificate (The ten stations with the highest point totals.)

Participant Certificate for 20 or more contacts (including a 9"x12" manila envelope with 3 units of postage.)

Send Logs, with Station and Location Descriptions to:

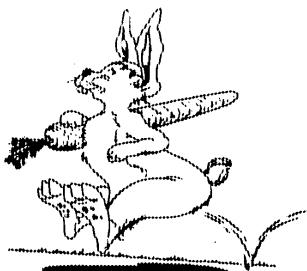
Bob Farnworth—WU7F

6822 131 Avenue SE

Bellevue, WA 98006

Have your logs in by May 31, 1996. All contest committee decisions are final. Include in a #10 SASE if you would the results.

## The Story of Digipeter Rabbit— A No Code Fable



Frank Terranella, N2IGO

Once upon a time, in the far away kingdom of Radio, there was a peaceful valley called Hamville, inhabited by a group of rabbits. Hamville was originally settled by the Whiskey family, and the patriarch of that family was an old hare called Charlie Whiskey.

Charlie Whiskey was a farmer by trade. He came to the beautiful valley of Hamville when it was all open meadows. He saw the potential for farming the vacant land and over time he developed a thriving carrot plantation. Charlie Whiskey's carrot plantation was the envy of all the inhabitants of the kingdom of Radio. He succeeded year after year in producing a bumper crop of carrots. All the other residents of the kingdom came to Charlie for advice on planting carrots. Charlie would always tell them, "The secret's in developing a good ear." No, Charlie didn't have superior hearing, but he had developed a very special skill. You see, Charlie picked his carrots with his ears.

In fact, Charlie had worked hard at perfecting this skill and was able to harvest at better than 20 carrots a minute. All of Charlie's family learned to pick carrots with their ears. Soon they were all picking at better than 20 carrots a minute. Charlie was so proud of his special skill that he insisted that everyone who came to work at Hamville first show that he could pick carrots with his ears. Charlie would not give new settlers any land unless they could demonstrate to his foreman, Victor Echo, that they could pick at least 5 carrots a minute with their ears. When they could pick 13 carrots a minute, Charlie gave them more land to work. When they were able to pick carrots by ear at the rate of 20 a minute, Charlie made them full citizens of Hamville.

This process of learning to pick carrots with your ears went on for some time. In other parts of the kingdom of Radio, other rabbits began to pick carrots by ear. However, there were some noisy ducks, known as the Quackers, who lived in the community of Good Buddy. They used their mouths to pick their crops instead of their ears. They had much larger mouths than the rabbits and saw no need to use their ears. The rabbits all looked down on the Quackers. "We must always require ear harvesting skills for entry into Hamville," they said. "That way we will keep out those noisy Quackers." So everyone who came to Hamville had to learn how to pick carrots by ear if they

wanted to stay. Charlie Whiskey was adamant about that. "If you don't want to learn the skill of ear harvesting then go work in Good Buddy with the Quackers," he would say.

And so the years passed, and new methods of farming were developed. These new methods were easier to learn than ear harvesting, especially for the animals who didn't have the big ears that the rabbits had. What's more, the new methods were just as efficient as ear harvesting. As time went by, fewer and fewer of the young animals were willing to learn the skill of ear harvesting. The population of Hamville began to dwindle. All the residents of Hamville were getting on in years. To make matters worse, there were new neighbors nearby who coveted the beautiful open farmland of Hamville. They wanted to come in and turn it into commercial uses like shopping centers. And worst of all, the pollution from the Quackers, the other Rabbits, and the Mice (known in Hamville as the QRM group) were having an adverse effect on farming in Hamville. The future looked bleak indeed.

Then, one day, a stranger called Digipeter Rabbit came to Hamville. He was an educated rabbit who had studied at the School for Scientific Bunnies (SSB). He had majored in Farm Mechanics and knew all of the latest scientific agricultural methods. But for all his education and know-how, there was one thing that Digipeter could not do. He could not master the skill of picking carrots with his ears. And since he already knew how to pick carrots more efficiently with new scientific methods, he was not interested in learning.

Charlie Whiskey was outraged. "What do you mean you won't learn to pick carrots with your ears? Why, we in Hamville have been picking carrots that way for 75 years. It's a tradition here. It shows that we're special and that we're better than the Quackers. If you don't have the desire to develop a good ear, then we don't want you here in Hamville."

But Digipeter was adamant. He saw no reason to learn an obsolete skill just to stay in Hamville and he refused to even try. Charlie Whiskey took the matter to the Ancient Royal Rabbit League, which he had founded. The ARRL decreed that everyone in Hamville must learn to pick carrots with his ears or be banished. And so Digipeter Rabbit left Hamville and founded his own village called Techietown.

Soon, all the young animals in the land of Radio were flocking to Techietown. But Digipeter had his own entrance requirement. A good ear and a good memory were not enough for him. No one could stay in Techietown unless he could demonstrate technical knowledge, understanding and ability, and the desire to contribute to the advancement of Techietown.

Digipeter encouraged all the residents of Techietown to experiment in the cultivation of new unexplored lands, never before farmed. Digipeter showed them how to overcome pollution problems. He showed them how to use the land they had more efficiently. Digipeter even perfected a method of farming which allowed a number of rabbits to farm the same land at the same time. And while the residents of Hamville were picking 30 carrots a minute on a good day, in Techietown, harvests of 300 carrots a minute were possible. Using Digipeter's methods, and those developed by the other bright, young residents, Techietown soon became the most prosperous village in the kingdom of Radio. This did not escape the notice of the Field Carrot Council, which governed the kingdom of radio. To reward the residents of Techietown for their contributions to the kingdom,

the Field Carrot Council gave Techietown more and more land to work, until its borders touched those of Hamville.

Meanwhile, Hamville was still plodding along as it always had, oblivious to the revolution in farming occurring around it. The old hares still picked carrots by ear. The Ancient Royal Rabbit League complained bitterly to the Field Carrot Council about all the new land it was giving to Techietown, but the population of Hamville continued to drop. When the Field Carrot Council gave two acres of Hamville property to Techietown, the residents of Hamville began, for the first time, to be genuinely concerned about their plight. Some even dared to ask the Ancient Royal Rabbit League to change its mind about the need to learn to pick carrots by ear to live in Hamville. "We need new blood here to fight off the Field Carrot Council," they said. Charlie Whiskey, now in his nineties, was furious. "We have to maintain our standards. We don't need those smart young bunnies, we need rabbits skilled in our time-honored harvesting techniques. We need rabbits who are dedicated enough to the principles of Hamville to want to learn our methods. If a rabbit really wants to live here, he'll learn our ways. If he doesn't, we don't want him. You don't want those Quackers to move here, do you?"

But by now the residents of Hamville had seen the writing on the wall. Although they genuinely enjoyed picking carrots with their ears, they realized that there were now other ways which yielded just as many carrots. And though they would probably continue to pick carrots by ear as they always had, they could no longer shun those bright young rabbits who chose a more modern method. A group of rabbits, led by an elder statesman rabbit named Elmer, who had once served in the government of the kingdom of Radio, asked the Ancient Royal Rabbit League to change its policy. The League agreed and issued a decree that henceforth ear harvesting skills would not be required to become a resident of Hamville.

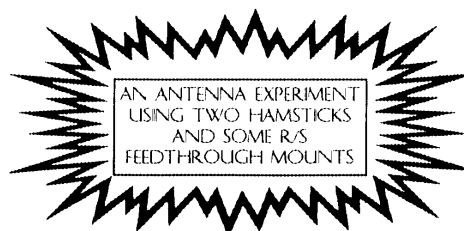
When Digipeter Rabbit heard of the decree, he sent envoys to Hamville with all the latest scientific discoveries, which he shared freely with the residents. The residents of Hamville seized upon the new knowledge and soon Hamville became revitalized. Its population began to increase as young rabbits were attracted to its bountiful open farmland. The Field Carrot Council, impressed by the renaissance in Hamville, did not take away any more of its land, but actually gave some new territory to Hamville. Everyone was amazed at the new vibrancy of Hamville.

Charlie Whiskey, though sad that his beloved harvesting method was no longer in vogue, saw that his people were prospering and was glad. And to show that there were no hard feelings, Charlie Whiskey sent Digipeter Rabbit a packet of 73 carrots which he had picked himself—with his ears.

The residents of Hamville rejoiced and declared a festival to celebrate their new prosperity. And over the front door of the Hamville Festival they put a banner, which read: "A bunny's worth is measured not by the skill of his ears, but by what lies between them." The residents of Hamville had learned an important lesson.

-THE END-

Frank Terranella, N2IGO



Roger Hightower  
aa7qy@primenet.com

I mounted two R/S 21-950 feed through mounts to a short piece of 2" square steel tubing from the junk box, then connect some RG-8, braid to one lug and center conductor to the other. I then screwed the 40 meter hamsticks to the mounts, raised the thing up on a 20 foot nonconductive mast, and worked to tune it. Best SWR I could get was 2.3:1, and it was very narrow-banded.

I decided to check it out anyway, so I tuned it for 7.040 MHz and compared it to (1) a 40 meter wire dipole at 16 feet and (2) a Cushcraft R-7 Vertical mounted at ground level. Both the wire and R-7 had better reception than the Hamstick dipole, with the R-7 best of the three. Conditions were not the best, and very few signals were heard here in AZ on any of the antennas. The two calls I heard were KB5RKF in Riverside, TX and WA4ZIQ, and some sixes.

I got the idea for the antenna from a recent article in *QST* where the author used Hustlers and a balun. I wanted to reduce the weight and mass by eliminating the resonators, so I went to the HamSticks. I'll keep playing with it. I have a feeling that there is some potential in the idea...just need to do it when I have better conditions. Very unscientific. I live in an area with severe antenna restrictions (the R-7 is hidden in a grove of trees, and the wire dipole is at the eaves of the house), so the HamStick dipole was up on a temporary mast after it got dark, and came down when I determined there wasn't much to be heard.

I would be interested to hear if anyone else has tried this antenna experiment and what their results were. I was hoping to be able to permanently mount the antenna in the attic, but for now will stick with the R-7.

72/73,

Roger Hightower - AA7QY



## NEW QRP OPERATING AWARDS



sponsored by

**Colin Neal - AA3LM**

These awards are designed to encourage QRP operators by recognizing their significant accomplishments in two-way low power communications.

### AWARDS AVAILABLE

Worked 25 States	Worked 50 Countries
Worked All 50 States	Worked 100 Countries
Worked All 6 Continents	Worked 200 Countries
Worked 25 Countries	Worked 300 Countries

### GENERAL REQUIREMENTS:

This is an "on-your-honor" awards program, because the sponsor believes that hams are honest and QSLing is becoming too expensive. If you made the contact, you can count it for these certificates. Cards or lists are NOT required.

QRP for these awards is not more than 5 watts CW or 10 watts PEP SSB.

To received a certificate, send a letter stating that you have made the QRP contacts required for the specific award. Include your name, call, mailing address, and \$1.00 for each certificate requested.

Please specify any requested mode or band endorsements (CW, SSB, QRPP, Wire Antennas, specific band, specific power level, etc.) in your letter. Multiple endorsements can be listed on your certificate. An example would be: CW with 2 watts on 20 Meters.

Mail to:

**QRP Operating Awards**  
**Colin Neal - AA3LM**  
 264 Miner Street  
 Malvern, PA 19355

The certificates are printed on 8.5 x 11 inch colored parchment paper, and are folded for mailing in a 4 x 9 inch envelope. The two folds can be easily smoothed out for display. I will try to mail your certificate within a few days of receiving your letter.

72

**Colin Neal - AA3LM**

### NorCal 40/40A Tuning Potentiometers



Home Building Tips #6

In tuning the NorCal 40 and 40A transceivers, which both use a potentiometer for tuning the VFO, I've noticed that

received signals sounded "chirpy" when I tuned slowly through a signal. The signals are "clean" (no chirp) when I stopped rotating the VFO knob. According to Wayne Burdick, N6KR, this is caused by non-linearity in the tuning potentiometer. This makes sense when you consider that the pot provides the control voltage to the tuning diode; if the voltage "jumps" as the pot is tuned, the pot is not providing a smooth voltage variation with control rotation so the oscillator frequency shifts and causes a "chirp" on the receive signals. When the knob is static (not being turned), the voltage is, of course, fixed and thus the oscillator frequency is stable.

Over the year, I've have thus far tried five different types of potentiometers in my NorCal 40 and 40A: the stock NorCal pot (composition), cermet (ceramic-metal), conductive plastic and two wirewound types, ten and single turn. The conductive plastic potentiometer showed the least "chirping" during tuning for the less expensive potentiometers. Sams *Reference Data for Engineers* (7th Ed., 1986) supports this: conductive plastic potentiometers "are most notable for their high rotational life. Another desirable feature is their low noise and output smoothness." They are constructed with a very fine-grained conductive ink embedded in a plastic "substrate," thus the wiper (center connection) contacts numerous individual particles as the control arm moves across the resistive element. Composition and cermet potentiometers, on the other hand, are constructed of "coarser" materials, so that the wiper is likely to run across, more discontinuous grains."

In my 40A, I have a Spectrol 5/8 inch square conductive plastic potentiometer installed with a 10:1 Jackson Brothers vernier. This is similar to the one in the HW-9.) This allows chirp-free tuning, a direct frequency read out and a tuning resolution of about 6-7 KHz per turn. Between 1/4 and 5/8 inch conductive plastic pots I have tried, the 5/8 one seems to be better. One 1/4 inch square pot was very smooth except for a discontinuity right at 7.040 MHz! The 5/8 inch pot can be used without the vernier by spreading the wire leads to fit the pads on the PWB. I had it in the 40A this way before I installed the vernier drive.

The ten-turn precision pot offered the best tuning resolution and absolutely NO tuning "chirps!" You also get all 10 turns over the entire range of varactor tuning—most of the single turn cermet and conductive plastic units gave only about 260-270 degrees of effective rotation as there are "dread zones" at the ends of pot rotation where the shaft turns but no resistance change occurs. However, the ten turn pots are more expensive and they need a counter-type readout for indicating the frequency, unless you use a KC-1 or other frequency counter. I've got a 100K, ten-turn on the NC40 with a 1.8 diameter counter dial; this gives me about 5-7 KHz per turn over the 60 KHz tuning range for which it was set. **DO NOT** use a single turn precision wire wound. I tried several different types from 5K to 100K, with the intention of getting a direct frequency read out, and they all tuned with a step function.

I'd would recommend either a conductive plastic or a 10 turn pot for best "chirp-free" tuning. The 10-turn is the easiest to install, whereas, the conductive plastic pot (with vernier) can give a direct frequency read out.

**Walt Thomas - WA4KAC**

## A LISTING OF QRP/HOMEBREW RESOURCES

Danny Gingell, K3TKS

QRP KITS - many of the popular QRP Projects. Most are Complete kits including all parts. 624 KITS, Pat Bunn - N4LTA, 171 SPRINGLAKE DRIVE, SPARTANBURG, SC 29302. Hi-Quality PCB, and Detailed instructions. (803)573-6677, Various options offered.

A & A ENGINEERING: Another Leader in the Competition for providing "Quality Amateur Radio Products." If you see a Radio Construction Project in an article, you can look forward to the appearance of an A & A ENGINEERING KIT. Large. S.A.S.E. for Catalog: A&A ENGINEERING, 2521 La Palma UNIT K., Anaheim, CA 92801: (714)952-2114, FAX (714)952-3280:

FAR CIRCUITS (Fred KF9GX): PRINTED CIRCUIT BOARDS for most popular Articles. appearing in QST, QEX, 73, CQ, HR, 1988 & 1990 ARRL HANDBOOKS, W1FB DESIGN NOTEBOOK & Several Other CUSTOM BOARDS are also Available. (Ex-N9ATW) 18N640 FIELD COURT, DUNDEE, IL 60118:

KANGA PRODUCTS: Dick Pascoe, GØBPS 011-44-0303-891106, 9 am-7 PM only please. Closed Wed. Many Hi-Q Kits Featured in "SPRAT" now available from KANGA US: C/O Bill Kelsey, N8ET ENGLAND. 3521 Springlake Dr., Findlay, OH 45840. 419/423-5643 7-11 PM EST. Seaview House Crete Road East, Folkstone, Kent, CT18 7EG e-mail Kanga@bright.net: USA ORDERS Contact N8ET.

Bruce Williams, WA6IVC [Superhet RX & XTAL TX] Simple TX 80, 40, 30 or 20m. [73-Dec. 91] Simple SuperX 80, 40, or 30m. [73-Apr. 91] Now offering The MXM Simple Transceiver, a single band Superhet design for 20,30,40 or 80m. M X M Industries: Rt. 1 Box 156C, Smithville, TX 78957, (512)237-3906:

Dick Witzke, KE8KL brings an exciting line of quality radio products at reasonable prices. QRP Explorer Single Band QRP CW transceiver kit. Four Band CW transceiver kit. SCF-1A switched capacitor audio filter kit. Model WM-1 QRP Wattmeter Kit. OAK HILLS RESEARCH 20879 MADISON STREET, BIG RAPIDS, MI 49307, 616/796-0920. FAX 616/796-6633.

Dick Szakonyi, KA3ZOW has created a formidable product line of QRP transceivers and accessories. The latest being the 80 Meter TAC-1 transceiver and his programmable counter/display. S & S ENGINEERING, 14102 Brown Road, Smithburg, MD 21783, 301/416-0661.

Dave Benson, NN1G QRP Transceiver Kits. Now offering new transceivers with higher power than before. SMALL WONDER LABS, 80 East Robbins Avenue, Newington, CT 06111. 203/6673536. e-mail bensondj@aol.com.

Bill Hickox, K5BDZ Presents an Exciting New offering of kits for the traveling QRPer. BACKPACKER II CW transceiver Model TRFT-550. SWR/POWER meter - tunable BANDPASS AUDIO filter, gel cell battery charger and other new kits. TEJAS KITS, 9215 Rowan Lane, Houston, Texas 77036

Bob Dyer, KD6VIO (415)494-3806 Will bring the latest offerings of NorCal Kits. Currently offering NorCal 40-A and the Cascade. The Sierra is expected to be offered in the fall of 1995. Wilderness Radio, P.O. BOX 734, Los Altos, CA 94023-0734.

## HAVING TROUBLE MEETING YOUR QRP FRIENDS?

The following frequencies are suggested for meeting QRP friends and then moving to another location or simply keeping the QSO brief. Good luck and keep the RF burning...!

BAND	CW	SSB	NOVICE
160 METERS	1.810 MHz	1.910 MHz	---
80/75 meters	3.560 MHz	3.985 MHz	3.710 MHz
40 meters	7.040 MHz	7.285 MHz	7.110 MHz
30 meters	10.106 MHz *	no phone permitted	---
20 meters	14.060 MHz	14.285 MHz	---
17 meters	18.080 MHz	18.130 MHz	---
15 meters	21.060 MHz	21.385 MHz	21.110 MHz
12 meters	24.910 MHz	24.950 MHz	---
10 meters	28.060 MHz	28.385 MHz	28.110 MHz
6 meters	50.060 MHz	50.885 MHz	---

\*Subject to possible change. Suggest 10.116 MHz.

## Erratum Erratum Erratum

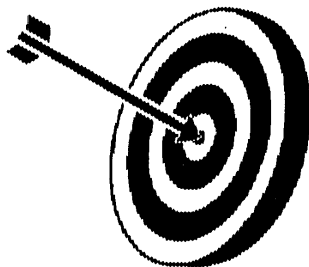
In a previous article, the *LUNCH-EATING BALUM*, *REVISITED*, by Walter Thomas - WA4KAC, there was an error regarding the length of the 450  $\Omega$  feedline. It should have been 14 to 15 feet, not the 145 feet published. The error does not affect the measurements nor the conclusions of the article.

## CLUB PATCH STILL ON SALE

The NEW New England patches are still on sale and they're a knock out! The club logo is red, white and blue and measures 2 1/4 X 3 1/2 inches. The letters QRP CLUB and NEW ENGLAND are in red letters with the remainder portion in azure blue. The price for one is \$4.00 and for two is \$6.00-postpaid! You can put one on your back-pack and another on your QRP jacket. Send your request to:

BOB MOELLER KA1PXF  
PROJECT MANAGER  
9 COREY LANE  
BENNINGTON, VT 05201-2116

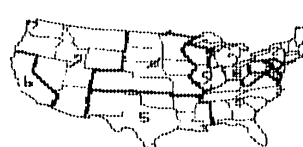




# QRP AFIELD 1995

## New England QRP Club Results

Call	Name	Location	(field, farm, school, etc.)	Q's	Mults	Score
W1NRG	Meriden, CT ARC	Wallingford, CT	Godek's FmHi Field	44	25	4400
WB3GCK	Craig LaBarge	Elverson, PA	French Ck SP Lo Field	26	13	2704
WB4ZKA	Mike Pulley	nr Flagstaff, AZ	campgrnd Hi Field	31	13	1612
AA7QU	Russ Carpenter	Cent. OR	7k' mountain Hi Field	31	20	2480
KB2JE	Walt Windish	High Point, NJ	High Point (1800')	29	19	2204
W0MNS/7	Dave Fischer	Huntsville, UT	at home Hi Perm	22	12	264
WK8S	Pete Meier	Waterford, MI	Dodge SP Lo Field	25	11	2200
K5FO	NorTex-CAd Cam	Richardson, TX	park Hi Field	19	12	912
	Hartford ams					
N2CX	Joe Everhart	Camden, NJ	Hi Field	19	11	836
AA1CA	Tom Doubek	Stratham Hill, NH	Lo Field	17	8	1088
K3NLT	Russell Mumaw	nr Souderton, PA	farm Lo Field	15	8	1024
NN1G	Dave Benson	Union, CT	state forest Hi Field	15	10	600
N6GA	Cam Hartford	Table Mt., CA	Lo Field	14	9	1008
NF0R	David Gauding	Creve Coeure, MO	park Hi Field	13	11	572
K1LGQ	Dennis Marandos	Nashua, NH	Greely City Park Lo Field	12	8	384
KC1GS	Bill Acito	Millbury, MA	back yard Hi Field	12	7	336
KC1FB	Jim Francoeur	Norwalk, CT	on deck Lo Field	10	7	560
W1FMR	Jim Fitton	Mobile in NH	various locastions Hi Field	15	9	540
N2MNN	Steven Pituch	Livingston, NJ	in field Hi Field	16	8	512
AA1IK	Ernest Gregoire	Canaan, NH	backyard Hi Field	11	11	484
WA2BQI	Bud Peterson	Jamestown, NY	at home Hi Perm	36	13	468
WU7F	Bob Farnsworth	Cougar Mt. Park, WA	Hi Field	15	6	360
W1XH	Al Bates	S. Chelmsford, MA	yard Hi Field	9	6	216
K3TKS	Danny Gingell	Silver Spgs., MD	at homeHi Perm	23	13	299
N1MVC	Wallace Kimura	Lebanon, NH	at home Hi Perm	10	9	90
KT3A	Cameron Bailey	Manchester, PA	elem. school Hi Field	3	2	24
KD6PRD/7	Joe Gervais	Peoria, AZ	new home! Hi Perm	5	4	20
WA1JGK	Mill Moore	Hartland, VT	Hi Field	4	3	48
KB2VBI	VARA-J Everhart	Camden, NJ	Hi Field	2	2	16
W6ZH	Pete Hoover	Honolulu, HI	in hotel Hi Field	1	1	4



#### QRP Afield COMMENTS:

TUFF GOING OUT WEST! GLAD TO ENTER CONTEST, KEEP UP GOOD WORK! DAVE FISCHER, W0MNS/7

HAD A GREAT TIME OPERATING QRP-AFIELD. I CAN HARDLY WAIT FOR SOME SUNSPOTS! WALT WINDISH, KB2JE

OUR GENERAL CONCLUSIONS WERE THAT, FIRST AND FOREMOST, WE HAD FUN! WILL WE DO IT AGAIN? IN A HEARTBEAT—YES! RUSSELL MUMAW, K3NLT

WE REALLY LIKED THE SLIDING CONTEST PERIOD THIS YEAR. SIX HOURS IS THE PERFECT CONTEST DURATION TO ENJOY WITH NON-HAM FAMILY AND FRIENDS. MIKE PULLEY, WB4ZKA

SO, DID THE COLORADO CREW SIT THIS ONE OUT OR WHAT? (GRIN) JOE GERVAIS, KD6PRD/7

PART OF THE TIME POOR PROPOGATION, BUT WE HAD BEAUTIFUL WEATHER AGAIN, SAME AS LAST YEAR. CHUCK ADAMS, K5FO

WISH THERE WERE MORE PEOPLE ON 30 METERS. AL BATES, W1XH

I HAD TO WORK THIS YEAR, BUT MANAGED TO GET IN AN HOUR AT THE END. CAMERON BAILEY, KT3A

FUN EVENT. TRIED OUT OWN DESIGN FOR PORTABLE MAST. JOE EVERHART, N2CX AND BILL FARREY, NC2X (IMAGINE THE CONFUSION IF THEY HAD EACH USED THEIR OWN CALLS! ED.)

GEORGEOUS DAY - 15 METERS WAS OPEN - W1AW CAME BLASTING THROUGH, BUT QRPERS WERE FEW AND FAR BETWEEN. CAM HARTFORD, N6GA

BIGGEST SURPRISE WAS GETTING N6GA ON 15 METERS. STEVEN PITUCH, N2MNN

THIS IS A GREAT CONTEST. RUSS CARPENTER, AA7QU

LOUDEST SIGS HEARD WERE AA1CA RUNNING 900MW ON A VEE BEAM AND K3KMO/M OPERATING WITH 100 WATTS AT 70 MPH ON A MOTORCYCLE! JIM FITTON, W1FMR

I WAS IN HONOLULU. ONLY ONE "TEST" QSO, BUT HAD 15 OTHER QSOs ON 40, 30, AND 20. PETE HOOVER, W6ZH.

A LOT OF JUN THIS YEAR. GLAD I GOT AN EARLY START AS 40 METERS WENT TO THE DOGS AROUND 7 P.M. BUD PETERSON, WA2BQI

PERFECT WEATHER. PERFECT LOCATION. LOUSY CONDITIONS. TWO OUT OF THREE NOT TOO BAD! DAVID GAUDING, NF0R.

GREAT TIME, EVEN GOT JIM FITTON - W1FMR, #1 AND THE GUY AFTER ME AT #151 DENNIS MARANDOS K1LGQ. JIM FRANCOEUR, KC1FB.

MAYBE MOBILE NEXT TIME. DANNY GINGELL, K3TKS

GREAT DAY--LOUSY CONDITIONS. IT WAS WARM AND SUNNY, SO VERY ENJOYABLE! PETE MEIER, WK8S

MY SOLAR PANEL STILL HASN'T ARRIVED SO MAYBE NEXT YEAR WE'LL TRY IT FROM "AFIELD." HAD A LOT OF FUN ANYWAY! WALLACE KIMURA, N1MVU.

WEATHER WAS OVERCAST AND WINDY. TOWARD THE END, MY FINGERS WERE GETTING STIFF FROM THE COLD, BUT I SURE HAD A LOT OF FUN. CAN'T WAIT UNTIL NEXT YEAR! CRAIG LA BARGE, WB3GCK.

HAD A HARD TIME KEEPING WARM AFTER IT CLOUDED OVER AND THE WIND CAME UP. MAYBE I'LL BRING A JACKET NEXT TIME! DAVE BENSON, NN1G.

WORKED A GUY IN FRANCE ON THE 20 METER VERTICALLY MOUNTED DIPOLE. ERNEST GREGOIRE, AA1IK.

LESS ACTIVITY THAN LAST YEAR—NEEDS BETTER PR. BEAUTIFUL DAY. WE HAD FUN. MERIDEN, CT. ARC, WINRG.

BOTTOM LINE: AFTER DOING DXCC AND WAS ON A FULL 3 WATTS AT HOME QTH, WORKING 900MW IN THE FIELD IS A MOST HUMBLING EXPERIENCE. TOM DOUBEK, AA1CA.

THE WEATHER WAS IDEAL, THE SUN SHOWN BRIGHTLY, AND I POPPED ONE FINAL AND DIDN'T KNOW IT! IT'S ALL IN THE ANTENNAS AND THAT'S A FACT. NEXT YEAR. DENNIS MARANDOS - K1LGQ.

WHERE WERE ALL THE QRPERS? PROPOGATION ON 30 METERS WAS GREAT! MILL MOORE, WA1JGK.

CHESTER S. BOWLES - AA1EX, Vice president, Crotched Mountain Foundation  
One Verney Drive, Greenfield, NH 03047. 603/547-3311 Ext. 404, bowles@cmf.org

**NEW ENGLAND  
CORLORBURST (79ER)  
SPRINT CONTEST  
WILL OCCUR IN FEBRUARY  
AND MARCH**

#### Announcing 1996 ARCI QRP

1996 ARCI QRP Banquet: This annual Dayton HamVention event will be held on Friday May 17, 1996, at 7:00 PM at

the Days Inn of Miamburg, Ohio. An appetizing, sit-down dinner will be followed by a special guest speaker with awarding of lots of exciting door prizes. Advanced tickets required at a 'true QRP' cost of \$13.00. Tickets will be available starting February 1, 1996 from Peter Meier - WK8S. Money order, including an SASE should be made out to Pete Meier, 4181 Rural, Waterford, Michigan 48329.



# New England Simple Titan

Part II  
Paul Stroud - AA4XX  
1318 Alderman Circle  
Raleigh, NC 27603  
aa4xx@nando.net

The October issue of *ZZ* carried Part I of the NEST-40 antenna article. Nessie is actually an inverted vee phased array, designed to provide respectable forward gain and good F/B (front to back) performance. Although the array was designed for 40 meters, it can be readily scaled to any HF band. Part II deals with pertinent phasing theory and the construction of the phasing controller.

## NESSIE'S PHASING THEORY

In order to understand how Nessie works, let's take a moment to consider some basic theory concerning phasing. It takes a finite amount of time for a radio wave to travel through any medium, whether it be free space, a wire, or a cable. Phased antenna systems use this concept in order to establish precise timing differences between the currents in the various antenna elements. It is common to see phased arrays with two, three, and four elements. In the case of Nessie, two inverted vee elements are used. MiniNEC (a computerized, antenna calculating program) indicates that for optimum front-to-back ratio and back ratio and good forward gain, we need to generate a difference in timing of 110 degrees between the currents in vee #1 and vee #2.

Figure A provides some important information as to what phasing is all about. Nessie is a 40 meter antenna. This means that it takes 40 meters, or slightly over 120 feet, for one cycle of a 40 meter signal to propagate through space. Figure A shows one such cycle, which is readily observable on an oscilloscope. Notice that the RF energy is in the form of a sine wave, with peaks at 90 degrees and 270 degrees. The cycle begins at 0 degrees and ends at 360 degrees, with one complete cycle being 360 degrees "long", in duration.

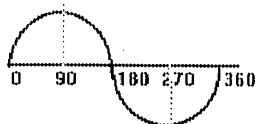


Figure A

Figure B shows Nessie's two antenna feedline currents. It can be seen that vee #1 current leads vee #2 current by 110 degrees. It can be also noted that vee #2 current lags vee #1 current by 110 degrees. It is also important to note that the amplitude of both feedline current is the same. In other words, both antennas are fed the same amount of power. Therefore, if we were to supply 2 watts

into the antenna system, vee #1 would radiate 1 watt and vee #2 would radiate 1 watt (disregarding losses, of course). This calculation could be confirmed by inserting a wattmeter into each feedline and observing similar power readings; however, the wattmeter tell us absolutely nothing about the phase angle. An oscilloscope is used for this purpose.

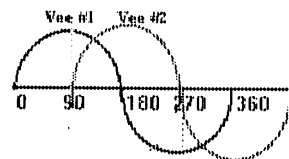


Figure B

Nessie can be built and tuned without an oscilloscope. Every effort has been made to make the design as simple and reliable as possible, without sacrificing forward gain and good F/B ratio.

Nessie makes use of the fact that specific lengths of coax can be used to establish precise phase lags. For example, a  $\frac{1}{4}$  wavelength piece of coax will produce a phase lag of 90 degrees, and a  $\frac{1}{2}$  wavelength piece of coax will produce a phase lag of 180 degrees if certain conditions are met.<sup>1</sup> This design also uses an L/C network to produce a variable phase shift from 35-90 degrees.

## NESSIE—AN ANTENNA SYSTEM

Nessie must be seen as an antenna system. The components that comprise the system include two inverted vees, two  $\frac{1}{4}$  wavelength RG-8X feedlines, one  $\frac{1}{4}$  wavelength RG-8X phasing line, one variable capacitor and one coil. The L/C phasing network enables the operator to provide a phase shift between the two antennas.

An overview of the system is presented in figure C. The antenna design does make use of specific lengths of RG-8X cable to provide proper phasing and feeding of the antennas. MiniNEC shows that for maximum front-to-back (F/B) ratio, a phase difference of 110 degrees is needed between the two inverted vees.

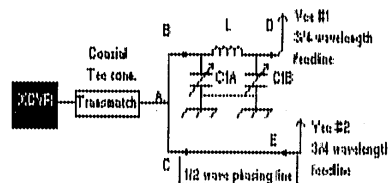


Figure C - System Overview

Let's step through figure C to see specifically how Nessie operates. At point A, a coaxial tee connector splits the incoming antenna current into two equal antenna currents. It is important to recognize that points B and C have equal antenna currents with the same phase. Also, note that the vees connect to the phasing controller through  $\frac{1}{4}$  wavelength feedlines at points E and D.

If we required a maximum 90 degree phase shift between our two antennas, we could feed one antenna at point D and the other antenna at point C; however, MiniNEC tells us that we need a 110 degree phase shift. We accomplish this goal by inserting a  $\frac{1}{2}$  wavelength phasing line between points C and E. This phasing line provides a 180 degree phase "lag" between C and E. Since point C



and point B have the same phase, there is the same 180 degree phase lag between points B and E.

The question which needs to answer is, "What is the phase difference between points E and D?" We already know that our goal is to be able to provide a 110 degree phase shift between these two points. The L/C phasing network between points B and D provides the answer to our quest. This simple network gives us a variable phase lag from 35-90 degrees between points B and D, depending on the setting of the variable capacitor. With **minimum** C, the phase shift across BD=35 degrees. With **maximum** C, the phase shift across BD=90 degrees. By varying the C, the phase difference between points E and D can be precisely adjusted from 90-145 degrees. Moreover, by setting the capacitor so the L/C phase lag is 70 degrees, the resulting phase difference between E and D equals 110 degrees (180-70 = 110).

Nessie's phasing range was intentionally established by the choice of inductance and capacitance in the L/C circuit. The coil is inexpensive and easy to construct. The use of  $\frac{1}{4}$  wavelength feedlines ensures that the antennas are "force-fed" the same currents and phase angles that are presented at points E and D<sup>3</sup>. Nessie requires that odd multiples of  $\frac{1}{4}$  wavelength feedlines be used. Since  $\frac{1}{4}$  wavelength feedlines will not reach to ground level,  $\frac{1}{4}$  wavelength feedlines were used. There is no reason that longer  $\frac{5}{4}$  or  $\frac{7}{4}$  wavelength feedlines could not be used, if one were willing to accept the corresponding signal attenuation that accompanies longer lines.

The two inverted vees are spaced 35 feet apart, with an apex height from 35-50 feet. The minimum acceptable apex angle is 90 degrees, with 120 degrees being more desirable. Both vees are resonated at the desired 40 meter operating frequency, which in my case was 7040 KHz. I used an SWR bridge for to accomplish this detail. One of the newer antenna analyzers would have made the job a lot less of a hassle!

MiniNEC predicts a rather complex impedance at the coaxial tee system feedpoint. I simply connected the Tee connector (point A on figure C) directly to my MFJ Versa Tuner II "load" connector. The other two ports on the Tee connector correspond to points B and C on the diagram. A quarter wavelength 75 ohm matching section, or a simple L/C network or "tee" tuner, could also be used in lieu of a commercial tuner, especially if a permanent antenna installation was desired. At any rate, the matching needs to be done as close to point A as possible. Any convenient length of feedline may be used between the transmatch and the station.

Some users may opt not to do any matching at all. The resulting SWR will be around 2:1 if the rig is connected directly to the Tee connector at point A with no additional matching.

#### NEST-40 Parts List

QUANTITY	DESCRIPTION
2 -	40 meter inverted vees
2 -	$\frac{1}{4}$ wavelength RG-8X feedlines for above
1 -	$\frac{1}{2}$ wavelength RG-8X phasing line
1 -	coaxial "T" connector
1 -	500 pF, dual (or more) ganged variable capacitor. I used Fair Radio # ASP-074-048
1 -	Homemade phasing coil
1 -	(Optional) Transmatch

#### Constructing the Phasing Coil

The phasing coil, in conjunction with the dual 500 pF variable capacitor, provides approximately 35-90 degrees of phase shift between points B and D.

To make the coil, cut a 20 and  $\frac{1}{2}$  inch length of #14 solid insulated wire. (I used ordinary house wire.) Wind 6 turns of onto a  $\frac{1}{4}$  inch OD (outside diameter) pipe. (PVC water pipe is fine.) Wind the coil as "closewound" as possible. Slide the coil off the pipe, and secure it with tie wraps or tape. The completed coil is approximately 7/8 inch ID (inside diameter), 1 and  $\frac{1}{16}$  inch OD, and  $\frac{1}{4}$  inches long, with 1 inch leads, which connect between the two gangs of the capacitor.

The coil is self-supporting, with one lead connected to one 500 pF section of the multiganged capacitor. (See Figure C). The other coil lead connects to a separate 500 pF section of the multiganged capacitor. Both 500 pF sections of the variable capacitor share a common frame, enabling the builder to mount the frame directly to a chassis or other suitable enclosure. Thus, capacitors C1A and C1B are separate capacitors sharing a common frame.

This symmetrical *pi* network provides an adjustable phase shift, while maintaining a 50 ohm input impedance over much of its tuning range. This ensures that both antennas receive equal currents<sup>4</sup>.

#### CUTTING THE $\frac{1}{2}$ WAVELENGTH PHASING LINES

At this point, I have to admit that until tackling this project, I had never attempted to construct any type of phasing line. Take heart! If I can do it, you can, too! One of the first things I discovered (You old hands probably learned this a long time ago) is that different brands of RG-8X are subject to having considerably different velocity factors from those specified by the vendors. I found deviations of 9-10 percent between two fresh batches that I had been saving for this project. Please don't assume that your velocity factor is 78 percent. Your  $\frac{1}{2}$  wavelength RG-8X cable will be between 50 and 56 feet long, depending on the velocity factor of your coax.

There are several methods that may be used to determine the proper length of your  $\frac{1}{2}$  wavelength cable. Take as much care as you can to cut the cable to the correct length. Improper lengths will yield disappointing results due to incorrect phasing. I would advise you to start with a long cable, around 58 feet long, and work from there. It's a whole lot easier to whack a couple of feet off than it is to splice a few inches back onto the cable. Be sure to install a PL-259 connector on the near end of the cable. I used the following four methods, and all gave acceptable results:

- 1) Autek Antenna Analyzer—extremely easy to use and very accurate. Thanks to WA3ULH for the loan of this little jewel!
- 2) Noise Bridge—My inexpensive MFJ unit gave very close results to the Autek. Remember to short the far end of the  $\frac{1}{2}$  wavelength phasing line when using the noise bridge. The noise bridge is a little more difficult to set up and use than the Autek.
- 3) Oscilloscope (dual channel)—Connect the  $\frac{1}{2}$  wavelength section of coax to your QRP rig. Terminate the far end of the coax with a 50 ohm resistor or dummy load. Trim the far end until an exact 180 degree phase shift is observed between the near end and the far end. This method gives extremely accurate results.
- 4) ON4UN Method—This method is very simple and yields good results. Solder a 50 or 52 ohm resistor into a PL-259 plug to serve as a dummy load. (You may also use a conventional dummy load, but keep the interconnecting coaxial cable less than six inches long.) Connect your dummy load to one end of a coaxial Tee connector. Connect the phasing line to the other end of the Tee connector. The far end of the phasing line remains open for this procedure, unlike the noise bridge method. The Tee connector is now connected to the "antenna" or "load" connector on a sensitive wattmeter. My OHR WM-1 did just fine for this test. Connect the QRP transmitter to the "transmitter" connector on the wattmeter through a convenient length of coaxial cable. Set you wattmeter on its most sensitive scale.

Observe the reflected power on the wattmeter with the  $1/2$  wavelength cable connected and disconnected from the Tee connector. By varying the frequency of your QRP rig, you can tell if your cable is too long or too short. Trim the cable until you observe minimum reflected power at your selected wavelength. It took a while to get the feel of this method, but the results were fine!

#### CUTTING THE $1/4$ WAVELENGTH FEEDLINES

Two  $1/4$  wavelength lines are needed, one for each antenna. If you are using the same batch of coax from which your  $1/2$  wavelength section was cut, you are home free. Simply measure your  $1/4$  wavelength section and multiply the length by 1.5. Your  $1/4$  wavelength feedlines of RG-8X coax will probably be from 75.5 to 83.5 feet long—again, depending on the specific velocity factor of your coax.

If you are using several different pieces of coax from different batches, it is necessary to check each piece for proper electrical length. Any of the preceding methods may be used to determine the proper length of the  $1/4$  wavelength cable. Just remember that with  $1/4$  wavelength cables, (unlike the previously prepared  $1/2$  wavelength cable), the far ends of the cables are left open when doing the noise bridge method and shorted when using the ON4UN method.

#### USING THE PHASE CONTROLLER

Nessie will provide about 6 dBd forward gain and a F/B ratio of 26 dB in its intended direction. Refer to figure D to see how the forward gain and F/B ratio are related to the phase angle.

Obviously, this antenna is too large to be rotated. The user must predetermine which main direction he wishes to work. Nessie will provide a unidirectional lobe with good gain out to about 500 miles. The lobe may be readily switched 180 degrees by either flipping a toggle switch or by transposing the two feedlines. In my prototype design, I decided to use the latter method. It takes a little longer to switch directions, but I deem it an acceptable tradeoff, as 90 percent of my 40 meter contacts are north of me. That's one advantage of living in the South! If instant (toggle switch) direction switching is desired, simply insert a DPDT switch between points D and E and the antenna feedlines. Nessie's unidirectional lobe will always be in the direction of the antenna connected to point E (figure C). It follows, then, that the arrays' null will always be in the direction of the antenna connected to point D.

Phase adjustment is made by first establishing a null in the desired direction; it's much easier to peak on a null than on a strong signal. For purposes of discussion, let's say we are located in Nashua, NH and wish to work as many major population centers as possible. One good bet is to phase southwest toward NYC, Philadelphia, Baltimore, and Washington, DC. To accomplish this, the support rope for the two inverted vees needs to be oriented on a southwest—northeast axis. The inverted vee elements will be oriented perpendicular to this southwest-northeast line. Remember, we first must establish a null toward our intended direction. To do this, we connect the antenna closest to the southwest to point D. The antenna closest to the northeast is connected to point E. Now listen for signals from 2-land and 3-land. Slowly tune the variable capacitor for the most pronounced null. You have now established the required 110 degree phase shift! Now transpose the antenna feedline connections. If your system is working properly, you will notice significant gain toward the southwest, with deep nulls toward the Northeast.

#### NESSIE ON THE AIR

On the air tests with Nessie have been a lot of fun. My first experience with phased inverted vees was this past Field Day, operating with the Orange County Radio Amateurs (North Carolina).

At times, I forgot I was only running 5 watts. Stations from all call areas out to 700 miles were usually worked on the first call.

My friend, Fran Slavinski - KA3WTF, and I put Nessie through the ringer during the second annual QRP-to-the-Field Contest, which also coincided with Fran's visit. Fran was gleaning from ear to ear as we worked stations in all call areas east of the Mississippi River with very good signal reports. Front-to-back ratios on most signals could be readily observed. Strong signals from northern stations could be nulled several S units when we were phasing south; also, we could null strong signals from the deep south when we were phasing north. The ability to discriminate against offending QRM, coupled with the ability to produce a few more dB in gain, makes all the effort worthwhile.

Bob Cutter - K10G, in Glenwood Springs, Colorado built his version of Nessie and reported similar performance to the prototype. Bob stated that he was able to substantially reduce the W6/land QRM while trying to dig out the Europeans during the October CQWW Contest. Bob suggested that I reiterate the point about preparing  $1/2$  wave and  $1/4$  wavelength cables. Be sure to leave the far end of the  $1/2$  wave cables open, while shorting the far end of the  $3/4$  wave cables when using the noise bridge.

My phasing controller was built open-framed style, with no enclosure. An SO-239 connector was bolted onto the frame of the variable capacitor, serving as feedpoint connection D. Be sure to leave the far end of the  $1/4$  wavelength cable open, while shorting the far end of the  $1/2$  wavelength cables when using the ON4UN method; However, when using the noise bridge method, the opposite is true, i.e. the far end of the  $1/2$  wavelength cable is shorted and the far end of the  $1/4$  wavelength cable is open. Feedpoint connection E is simply a barrel connector attached to the far end of the  $1/4$  wavelength phasing line. Bob, on the other hand, took a much more extravagant approach. He built his controller into a plastic cat food box!

I'd like to thank Bob for his helpful comments and suggestions. I would also like to thank Charlie White - KE4JKD, who enthusiastically shared much of the antenna wire for this project. Please feel free to contact me for additional information. My e-mail address is: AA4XX@mando.net.

There are many articles and books on phasing. The following is a list of references that were especially helpful to me:

DeVoldere, John. *Low Band DXing*. ARRL.

\*(MS-DOS software is now available from the author and may be obtained by writing to him:)

John DeVoldere, ON4UN  
215 Poelstraat  
B9220 Merelbeke  
Belgium

Christman, Al. "Phased Arrays for the Low Bands," ARRL Antenna Compendium, Vol. 3, pp. 28-32.

Anderson, Peter H. "Phased Verticals with Continuous Phase Control," ARRL Antenna Compendium, Vol. 3, pp. 37-41.

#### NEST-40 FORWARD GAIN VS. F/B RATIO

Phase angle	Forward Gain (dBd)	F/B (dB)
90	5.4	<17.0
95	5.6	<17.0
100	5.8	17.5
105	5.9	19.0
*110	6.1	26.4
115	6.2	26.0
120	6.4	24.8
125	6.5	22.0
130	6.8	<16.0

Note that the greatest F/B ratio occurs when the phasing is 110 degrees. The chart demonstrates that there is a trade off between maximum gain and maximum F/B ratio.

#### FOOTNOTES

1. Devoldere, John. *Low Band Dxing*. ARRL, 1987. Chapter two, p. 56.
2. Anderson, Peter H. "Phased Verticals with Continuous Phase Control." *The ARRL Antenna Compendium*, Vol. 3, p.38.
3. Devoldere, John. *Low Band Dxing*. ARRL, 1987. Chapter two, p. 64, 96.
4. Devoldere, John. *Low Band Dxing*. ARRL, 1987. Chapter two, p. 63.



## THE LADDER GRABBER™

### Product Review

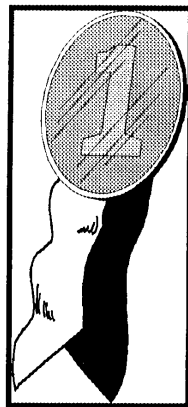
Dennis Marandos - K1LGQ  
42 Cushing Avenue  
Nashua, NH 03060  
k1lgq@dennis.mv.com

The EMTECH "Ladder Line Connector" is a convenient and simple method for connecting your 450 ohm ladder line at the antenna and keeping it connected. It has many advantages that solve past problems when using ladder line, such as broken and corroded connections being the most common. Assembly is straight forward, quick and easy and will give many years of reliable service. It's made of very tough plastic which resists UV rays, which causes plastic to disintegrate and break down after years in the sun. You can use this connector with any open wire fed antennas, dipoles, loops, inverted Vees, etc. The connections may be silicon sealed for further integrity of your antennas.

When the LADDER GRABBER™ crossed my desk, I thought it looked like all the others I had seen in the past, but there was something appealing about this one in particular. The plastic was 'space-age' and the durability was tough. I could sense that the LADDER GRABBER™ was made to last a very long time. It's the type of plastic that when you twist it to bits, it still hangs together and doesn't snap apart. It's the type of plastic that when you screw the stainless steel screws into their holes, they stay tight, snug and in place. It's not one of those tight screw holes that secure your antenna in place and then separates on the first hot/cold opportunity it gets. I must say, that the LADDER GRABBER™ is an item you should have in your shack because you'll kick yourself for not having it when you need it the most.

The way it works is to trim your ladder line to fit as indicated by the directions. The directions are included with easy to read and distinct pictures to show you how to get it together. The inside of the LADDER GRABBER™ has a contour fit made to hold the 450 ohm ladder line in place securely. Along with a front and back molded plate, stainless steel hardware is included. I don't know about your antennas, but every time a company sells an antenna, they always seems to leave out the most important part... stainless steel, no corrode hardware. You won't find this happening with the LADDER GRABBER™, which will contribute to it's long lasting life span. You can also fill the inside of the LADDER GRABBER™ with

"silicon sealer" to keep out moisture and keep antenna connections fresh.



In addition to the special plastic ladder line holder, included were two insulators for the antenna you're installing. This has to be the *pièce de résistance* for now you have everything you need to put your antenna up without having to buy anything further. The color of the LADDER GRABBER™ is the same as what you see on 450 ohm twin-lead, so everything blends nicely together.

The company's name is EMTECH, and their address is 13848 SE 10th, Bellevue, WA 98005. If you would like to call EMTECH, the phone number is 206/747-6810. The suggested price is \$9.95 and this is a good buy for what you're receiving. My suggestion would be to buy two, or more, for you home and portable use. After you see how the LADDER GRABBER™ takes the hassle out of putting up ladder line antennas, or any antenna for that matter, you'll understand why I think this is the buy of the year.

Dennis Marandos - K1LGQ  
Nashua, NH  
k1lgq@dennis.mv.com

## 1996 PROMISES TO BE A GREAT YEAR FOR THE NEW ENGLAND QRP CLUB

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gregoire@valley.net

### HERE IS A LIST OF EVENTS FOR THE COMING 1996 YEAR

- February through March**, the ColorBurst (79er) Sprint Contest. Every Thursday in February and March beginning February 1. The time is 21:00 to 22:00 EST (02:00-03:00 UTC). This is a friendly contest to see how many stations can be contacted using a color burst frequency of 3.579 MHz. Join the fun, contact the color burst folks and give them a contact point, if you don't have one yourself.
- March 10, 1996** Winter NE QRP Club meeting and operations at W1AW/QRP. Arrive at 9:00 to do some show and tell. The meeting is scheduled for 10 a.m. EST. A break for lunch at 12:00 and set-up for QRP operation is 13:00. Operate W1AW/QRP for 2 hours, for those who can't attend...listen to W1AW on ALL QRP frequencies.
- May 16, 17, 18, 19** Dayton Convention. hobnob with the QRP greats.
- June 22, 23** Field Day. The NE-QRP Club usually is held at the Wind Mill farm in Princeton, MA. More on this later.
- September 21** QRP-AFIELD. This event was pioneered by the New England QRP Club and is the favorite of all contests! This is an abbreviated version of field day QRP style. Even with band conditions low, we always have a fantastic time. (Read elsewhere in this issue the comments from QRP-AFIELD 1995.) It doesn't take much to score on this contest and it's very friendly...to boot!
- October 5, 6** ARRL convention at Boxborough, MA. More information on this event will be available later.

Ernie Gregoire - AA1IK

## Are You Up To Date?

Dennis Marandos - K1LGQ

In the past decade, or more, newer technology has zoomed up the road of progress and has caught A LOT of older hams by surprise. I'm referring to the newest coding systems and their values. It used to be that anyone could pick up a resistor and read the three color bands, possibly a fourth and understand what the significance of that resistor was. But, not anymore. The whole industry has switched to letters and numbers as their designators and if you don't have a copy of what they mean...no flea market in the world will save you. Read closely to what you can find on the benches of today's technology.

### RESISTANCE

The following marking on a resistor refers to the following values.

OHMS	CODE	Resistor Tolerance, last band on component
10	100	Brown = $\pm 1\%$
20	200	Red = $\pm 2\%$
50	500	Gold = $\pm 5\%$
100	101	Silver = $\pm 10\%$
10%	201	No band = $\pm 20\%$
500	501	
1,000	102	
2,000	202	
5,000	502	
10,000	103	
20,000	203	
25,000	253	
50,000	503	
100,000	104	
200,000	204	
250,000	254	
500,000	504	
1,000,000	105	
2,000,000	205	
5,000,000	505	

### Capacitance

$\mu F$	CODE	$\mu F$	CODE
0.10	104	10.0	106
0.15	154	12.0	126
0.18	184	15.0	156
0.22	224	18.0	186
0.27	274	22.0	226
0.33	334	27.0	276
0.39	394	33.0	336
0.47	474	39.0	396
0.56	564	47.0	476
0.68	684	56.0	566
0.82	824	68.0	686
1.0	105	82.0	826
1.2	125	100.0	107
1.5	155	120.0	127
1.8	185	150.0	157

$\mu F$	CODE
2.2	225
2.7	275
3.3	335
3.9	395
4.7	475
5.6	565
6.8	685
8.2	825

### Capacitance Voltage

Symbol	VOLTS - DC
A	100
B	250
F	300
D	500
E	600
F	1,000
G	1,200
H	1,500
J	2,500
K	3,000
L	4,000
M	5,000
N	6,000
O	8,000
P	10,000
Q	8,000
R	10,000
S	12,000
T	15,000
U	20,000
V	25,000
W	30,000
X	35,000

$\mu F$	CODE
180.0	187
220.0	227
270.0	277
330.0	337
390.0	397
470.0	477
560.0	567
680.0	687

### Capacitance Tolerance

D	$\pm 5\%$
F	$\pm 1\%$
G	$\pm 2\%$
J	$\pm 5\%$
K	$\pm 10\%$

### Capacitance Value

First two digits are significant, third digit is a multiplier.

$\emptyset \times 1$
1 X 10
2 X 100
3 X 1000
4 X 10000
5 X 1000000

### Positive Voltage Regulators

2.6 v	78L02
5.0 v	78L03
6.2 v	78L06
8.0 v	78L08
9.0 v	78L09
10.0 v	78L10
12.0 v	78L12
15.0 v	78L15

### The effect of VSWR on transmitted power

VSWR	VSWR (dB)	Return Loss (dB)	Trans Loss (dB)	Vol. Ref. Coeff.	Power Trans. (%)	Power Ref. (%)
1.00	0	$\infty$	0.00	0	100.0	100.0
1.02	2	40.5	0.00	.01	100.0	100.0
1.04	5	34.2	0.01	.02	100.0	100.0
1.05	6	32.3	0.03	.02	99.9	100.0
1.08	8	29.4	0.05	.03	99.9	100.0
1.09	9	27.2	0.06	.04	99.8	100.0
1.10	10	26.4	0.09	.05	99.8	100.0
1.12	12	24.9	0.14	.06	99.7	100.0
1.14	14	23.7	0.19	.07	99.6	100.0
1.15	15	23.1	0.21	.07	99.5	100.0
1.17	16	22.1	0.27	.08	99.4	100.0
1.19	18	21.2	0.33	.09	99.2	100.0
1.20	19	20.8	0.36	.09	99.2	100.0
1.22	20	20.1	0.43	.10	99.0	100.0
1.24	22	19.4	0.50	.11	98.8	100.0
1.25	23	19.1	0.54	.11	98.6	100.0
1.27	24	18.8	0.58	.12	98.4	100.0
1.29	26	18.2	0.67	.13	98.0	100.0
1.30	27	18.0	0.70	.13	97.9	100.0
1.32	28	17.7	0.75	.13	97.8	100.0
1.34	30	17.3	0.83	.14	97.5	100.0
1.36	32	16.9	0.90	.14	97.2	100.0
1.40	36	16.1	1.12	.15	96.7	100.0
1.44	40	15.5	1.44	.16	96.2	100.0
1.48	44	14.8	1.80	.17	95.5	100.0
1.50	46	14.6	1.97	.17	95.2	100.0
1.6	54	13.7	2.98	.19	94.7	100.0

## A TRIP TO CANADA WITH A LOT OF QRP!

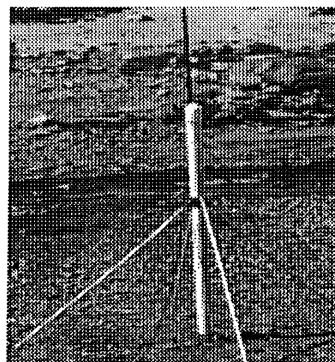
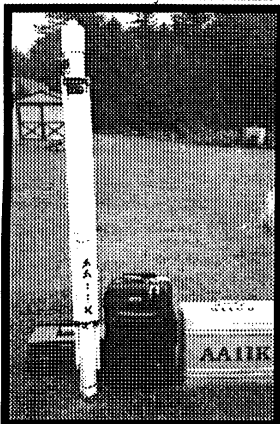
**Erin Gregoire - AA1IK**, of Canaan, NH, spent a little time in Canada this past fall with his XYL and his QRP. Ernie had prepared everything weeks before leaving, and, as we all do, made sure his portable station was ready for the excursion. The Outback antenna was tuned and mounted onto a tripod Ernie had fabricated himself so that it would be light weight, portable and accessible. The tripod is made from PVC tubing and is able to sit, positioned upward, as a vertical antenna. Also, along with Ernie's "fun kit" were 8 counterpoises to help *push* his signal where he wanted it to go. In Ernie's fun kit, were all the 'things' to make any contact necessary: key, earphones, log, pencils/pens, wire, tape, solder and the list goes on.

Also, along with Ernie's super portable tripod was his QRP PLUS, MFJ antenna tuner, plus Wattmeter. What Ernie did was to cut enough contour portions in his form padded attaché case to carry the complete station in one hand, including batteries. Truly a versatile operation and smooth way to go away from the home shack in style. Check out the pictures he took before and during his stay in Canada and note that everything is all laid out for ease of simplicity. This is absolutely the way to go and we can all learn from Ernie's meticulous, meditative approach to portable QRP operation.

If you could picture it, there is Ernie is sitting next to a breezy shoreline where the DX is sure to be. He's going after the BIG one and trying to haul in the DX. I am sure when the propagation improves, there will be a lot of us going to the shore line, trying to snag the elusive DX QSO with less than 5 watts. If this doesn't give you ideas of what the months ahead will bring, then remember, the winter snow will only last till the end of March. It won't be long before all of us will head out to try all the winter projects on our tables presently. We can try our skill with the winter sprints (contests) that are detonating over the country to see if we're ready for the warm weather test of veracity, or better still, we can dream the winter away and think what it **WOULD** be like if we were sitting on a warm shore line, hauling in the catch of the day with thirty QSOs per hour for our log books. It's competitive to dream and the price is right. While the snow is upon us, let's not think too far away for the warmer weather is just around the corner.



ERNE - AA1IK QRP STATION



TRIPOD WITH COUNTERPOISE.

The New England QRP Club is always looking for your input as to what you would like to read and what you would like to submit for information. Every newsletter is carefully scratched together whenever there is a free moment and every page is carefully aligned for the printer to do his job. **ZZ** would like to open its pages to everyone and is calling for manuscripts. Manuscripts on general issues should be submitted to the editor: Dennis Marandos, 42 Cushing Avenue, Nashua, NH 03060-1816. For detailed information regarding manuscript submission, please write to the address above and request the **ZZ** style sheet. Manuscripts for specific columns and features, can be submitted directly to the names at the beginning of this newsletter. For all manuscripts, the following regulations apply: one copy of each manuscript should be submitted, typed and double-spaced through-out (including direct quotations, if any, end notes, and works cited) with margins wide enough to accommodate editor's marks. The name, address, your call, and any affiliation should be on the front page. Materials may be submitted on diskette formatted for IBM-PC or compatible, or in Microsoft Word.

**ORIGINAL CARTOONS:** Some of us are talented drawers and scribblers, and our sketches are fairly accomplished. Some of us also have great sense of humor. Cartoons, original line drawings in black ink which depict scenes or ideas QRPers would find amusing are invited. Acerbic and gentle humor are equally encouraged. Drawings should be on 8½" X 11" unlined paper and signed with the ham/artist's name and call.

**ORIGINAL PUZZLES AND GAMES:** Many of us have created original ham-type games and puzzles which we use with our friends, clubs or other publications. Here is an opportunity for you to share your creations with readers of **ZZ**, The New England QRP Newsletter. All puzzles and games should be accompanied with clear directions for playing or completion. If appropriate, credit should be given to sources which inspired the puzzle or game, but heavily adapted puzzles and games are discouraged.

**ORIGINAL PHOTOGRAPHY:** QRP related scenes, other hams and friends and field scenes are welcomed. All photographs should be clear with acute detail. Photographs should be accompanied with complete identifications, including all names of hams and calls, friends and location of photo, plus date. If faces are clearly visible, names of those depicted are requested as well. *Donna* - K1LGQ

