October 1995

72

THE NEW ENGLAND QRP NEWSLETTER

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

TO:

95NE001

Jim Fitton, W1FMR
P. O. Box 2226
Salem, NH 03079

72 ☺ THE OFFICIAL NEW ENGLAND QRP NEWSLETTER

Write For 'Your' NEWSLETTER

The goal of 72 is to make it easy for you to submit your ideas and suggestions for all to read. Send your materials, hand written or typed or MS-DOS to 72 . Use the Internet to send materials to your editor or floppy diskettes, MS-DOS Windows gladly accepted. Real technical articles may be sent to John Collins, KN1H, 72 Technical Editor, at the address below.

THE DEADLINE FOR THE NEXT ISSUE OF 72 WILL BE DECEMBER 30, 1995.

The Issue Is

October 1995

THE 72 TEAM

NEW MEMBERSHIP - William McNally - AE1D, 7 Blueberry Road, Windham, NH 03087, Tel.: 603/434-9695.

TREASURE - Paul Kranz - W1CFL, 26 Mettacornett Path, Harvard, MA 01451, Tel.: 508/687-1501, X-2604, FAX 508-687/7265.

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MEMBERSHIP NEWS - Bill Legge - NT1R, 232 Forceside Road, Cumberland, ME 04110. Tel.: 207/829-5248.

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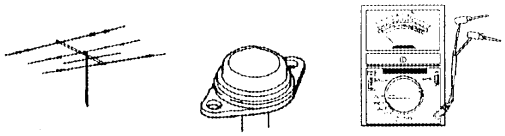
DISTINCT Club Matters, Adm., ETC., Jim Fitton - W1FMR, P.O. Box 2226, Salem, NH 03079. Tel.: (HP) 603/898-6188, (WP) 508/960-2577.



The Green Mountain-20 Transceiver

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

This article describes a single-board design transceiver intended for use on any one of the HF bands. This design is merged from both the "40-40" and the earlier NN1G Mark III ('95 ARRL Handbook) transceivers. This article describes the 20 meter version, but operation on other bands is largely identical.

First, though, a bit of background information seems fitting. After contending with inquiries about the XX-40s, 30-40s, 40/30s and so on, it seemed high time to vest the latest project with a more secure identity! In upholding the honor of our end of the country, I'll follow precedent by naming this effort after my own favorite corner of the world. (Those of you on the other side of the Connecticut river, fear not, there's a worthy successor in the works!)

The key design feature is a heterodyne local oscillator. Although the extra complexity isn't necessary for a low-band design, it really facilitates operation on the high bands. A Colpitts oscillator running in the 4-5 MHz region is mixed with a crystal-controlled conversion oscillator and then bandpass-filtered to yield the desired frequency. Once again, a varicap is used for tuning but this time to provide coverage of 100 KHz. This increased range necessitated some form of varicap temperature stabilization, which is provided by the 1N4148 diode in the bias tuning circuitry. The remainder of the LO components were chosen for good thermal stability. The 20 meter version, with its 22 MHz LO, exhibited a cold-start drift of only 8 Hz with the tuning pot at mid-range! In case you're curious, I considered using a 1/2-DIP CMOS oscillator IC for the conversion oscillator but cost, availability and relative spectral purity all weighed in against this scheme. This would have enabled 6 meter operation without requiring yet another adjustment for overtone operation. I'll leave an outboard 42 /58 MHz LO as an exercise for the reader, and you can bet *72* will want to publish your work!

This design also has a number of other upgrades, so let's take a look:

♦ Packaging - The printed-circuit board version of this transceiver is a double-sided affair measuring 3.5"x5". As such, there are no on-board jumpers needed to complete the wiring. This time around, all controls and other external connections, with the exception of coax, connect using 0.100" headers and sockets (provided pre-assembled in the kit version). Why? It looks much neater and OH-BY-THE-WAY- it's much easier to troubleshoot if the transceiver disassembles easily. I've resisted the urge to go with on-board controls and connectors because I feel you should have some choices and options when it comes to packaging a transceiver!

♦ Better Crystal filtering - A glance at the schematic reveals that the IF filter's been upgraded to the 4-crystal version. The IF frequency is 8.00 MHz, which will support operation even on 6 meter with adequate image rejection. Adjacent-sideband rejection was measured at -40 dB, a noticeable improvement over the 30-40 performance. Filter loss is 5dB, also an improvement over the lossy Thirty-40 performance, with an MDS of about -125 dBm. The choice of IF frequency is used for all bands except for 40 meters and possibly 30 meters. Due to the proximity of the IF frequency to the output frequency and the attendant difficulty in separating these two by filtering, the jury's still out until I have a chance to check these out.

♦ Improved front-end filtering. The receiver front end circuitry has additional filtering to improve image rejection. The "Thirty-40" in particular was marginal in this regard. [I can hear you saying- "I hate winding toroids! Why didn't you use IF transformers like in the NN1G design?"] I didn't want the filter design constrained by the IF transformer characteristics. By using toroids, there's more leeway in setting filter values to suit each band. As I came down to the wire for publication, my HF signal generator went on strike, so I'm currently unable to provide measured values for image rejection.

♦ RIT - You asked for it, you got it! Although I rarely use a RIT control, it's a must for many folks. The circuit is a derivative of the RIT upgrade which appeared in the pages of *72* a while back. The polarity on the On/Off control has been reversed with respect to that earlier version to allow the use of a control pot with an integral On/Off switch (isn't hindsight wonderful?) If you're using the printed-circuit board version of this design, the RIT pot/switch are connected through a 4-pin header. If you don't plan to use the RIT feature, this header may be left unused and RIT will be inactive.

♦ TX drive - The TX drive chain has been beefed up to provide more gain and improved stability. The transmit bandpass filter has a MMIC imbedded in it (see the July '95 issue of *72*). In addition to the improved gain, the placement of the gain block, in this location loads the filter, which aids stability by keeping the impedances reasonable. This pays off in a tuneup procedure free from unwanted anomalies (*i.e*, jumps in output level and other signs of instability). Although the use of a MMIC is overkill in this application, they're small. This is a nice way of saying the darned thing fit! In practice, I'm able to adjust the drive to provide output levels ranging from 0.5W to the full rated power.

♦ TX power - Thanks to the improved drive, there's more output power available. You should see 2.5-3 watts on any of the bands, and the output harmonic filter has been designed for this value. There's now space for a crown-type heat sink (provided with the kit version) since, I'll concede, it's needed for this power level. For the 20 meter version, at full power the second harmonic is down 32 dB. Spurious output were barely to be found–down at least 55 dB!

♦ The Joy of Big Audio. The various op-amp and LM-386 audio finals have been replaced with the 8-pin version of the LM380. Although this device draws a bit more idling current than its little brothers, it's worth it in terms of audio quality, and on a good signal will easily annoy other family members! Idling current on the transceiver as a whole is approximately 35 mA, still a battery-friendly value for the portable crowd. I did tinker with audio-derived AGC but was never happy with the result.

I've left this feature off and provided a tie-point (W1) at pin 5 of the IF Amp for those folks determined to experiment with this function.

Twenty meter parts values not shown on the schematic are as follows:

C31,33: omit- not used	Q1: MPF102
U1,4,6,7: NE602AN	Q2-Q5: 2N2222A metal
U2: MC1350P	Q6: 2N3906
U5: 78L08	Q7: 2SC799 or 2N3553
U8: MAR-3	D1: MV1662
U9: CD4066	D2-D8: 1N4148
T1: 10.7 MHz IF xfrmr	T2: FT37-43, 4 turns BiFilar
L1,L1: T37-6, 14T (0.59 µH)	L3: T37-6, 26T (2.0 µH)
L4, L5: T37-6, 17T (0.87 µH)	L6, L7: T37-6, 15T (0.68 µH)
L8: FT37-61, 11T (6.8 µH)	L9: T37-6, 11t (0.36 µH)
L10: T37-6, 13t (0.50 µH)	L11: T37-2, 27 turns (3.3 µH)

If you're interested in the kit version of this transceiver, it includes the high-quality board, all on-board parts and interconnect assemblies for the external controls. As with the Forty-40 series, there's an honest-to-goodness intruction manual. The price is $72 postpaid (a number somehow very familiar!) The GM-20 and its 15 meter brother will be available on October 15, with additional bands added shortly thereafter. See you on the high bands!

Dave Benson - NN1G

NEW ENGLAND QRP CLUB

79er SPRINT

When: Each Thursday evening during February and March, 1996

Mode: CW - Crystal and VFO Control

Frequency: ~3.579 MHz

Power Level: - 5 watts or less output power

Time: 9:00-10:00 PM EDT (0200-0300 UTC) To CALL CQ

Exchange: - RST QTH NE#X NAME, *ie*.579 MA NE46X Harry

Members use NEQRP number and add X if XTAL control; NE46X

Non-members use power level; 4W and add X if XTAL control; 4WX

QSOs are cumulative: Work the same station on subsequent Thursdays.

The 79ER transmitter was NE-QRP's first club project. It uses a 3579.545 KHz crystal to set the frequency. These crystals are used in the color-burst oscillator of all color TV sets in the United States and Canada, and in other devices as well.

The 79ER event is an ON-THE-AIR GET-TOGETHER, and not a contest. Last year, everyone used a mixture of homebrew transmitters with colorburst crystals and commercial QRP rigs. This year, we welcome all QRP stations to this event. Everyone works everyone this year. Crystal-controlled stations append the letter X to their calls, such as KF8EE/X. Yes, it's legal. We hope this event will stimulate everyone to build a crystal-controlled transmitter to use during the event!

Send Logs to:

Ted Albert, KF8EE
1924 Timberidge Drive
Loveland, OH 45140

(or) e-mail Logs to: **teda@lexis-nexis.com**

Logs need to be received by April 30, 1996 and results will be published in 72.

State output power level, type of rig, and antenna type on logs. Include comments on the event or how you built your crystal-controlled transmitter for inclusion in the report in 72.

Watch out: W1AW transmits bulletins at 10:00 PM. on 3.581 MHz.

Transmitter Reference articles: In case you were wondering, 79ER comes from 3.579 MHz. Articles abound on building a simple crystal controlled transmitter for 80 meters. Try the UNIVERSAL QRP TRANSMITTER, page 26 of ***Solid State Design.*** (ARRL), or ***The Oner*** (Sprat), or ***The Cubic Incher*** (ARRL), or ***The 79er/Colorburst Special*** (QRP-NE).

Jade Products

In response to your request for company data for QRP parts, etc., the following is available from Jade Products, Inc.:

COMPONENTS:

UC3906	Battery Charger Chips
LM388K	Voltage Regulator
8044ABM	Curtis Keyer Chips
NE602	Mixer/Modulator
NE604	Phase det/mixer
MC1496L	Mixer/Modulator
2N2222	2N3904
2N3906	Pico Fuses
300 Ohm "Window" twin-lead	UltraViolet Protected PVC Kits

1 Amp Battery Lead Acid Battery charger Kit
(See **WorldRadio**/QRP April 1994).

5 Amp Battery charger Kit

Curtis Keyer Kit (see August 1995 **WorldRadio**/QRP and July 1995 **QST** reviews)

J-Pole Antenna Kits and Assembled
(See **QST** article, August, 1995, page 62)

Marconi Antenna Kits
(Product review in **QST**, August, 1994)

Windom Antenna Kits G5RV Antenna Kits

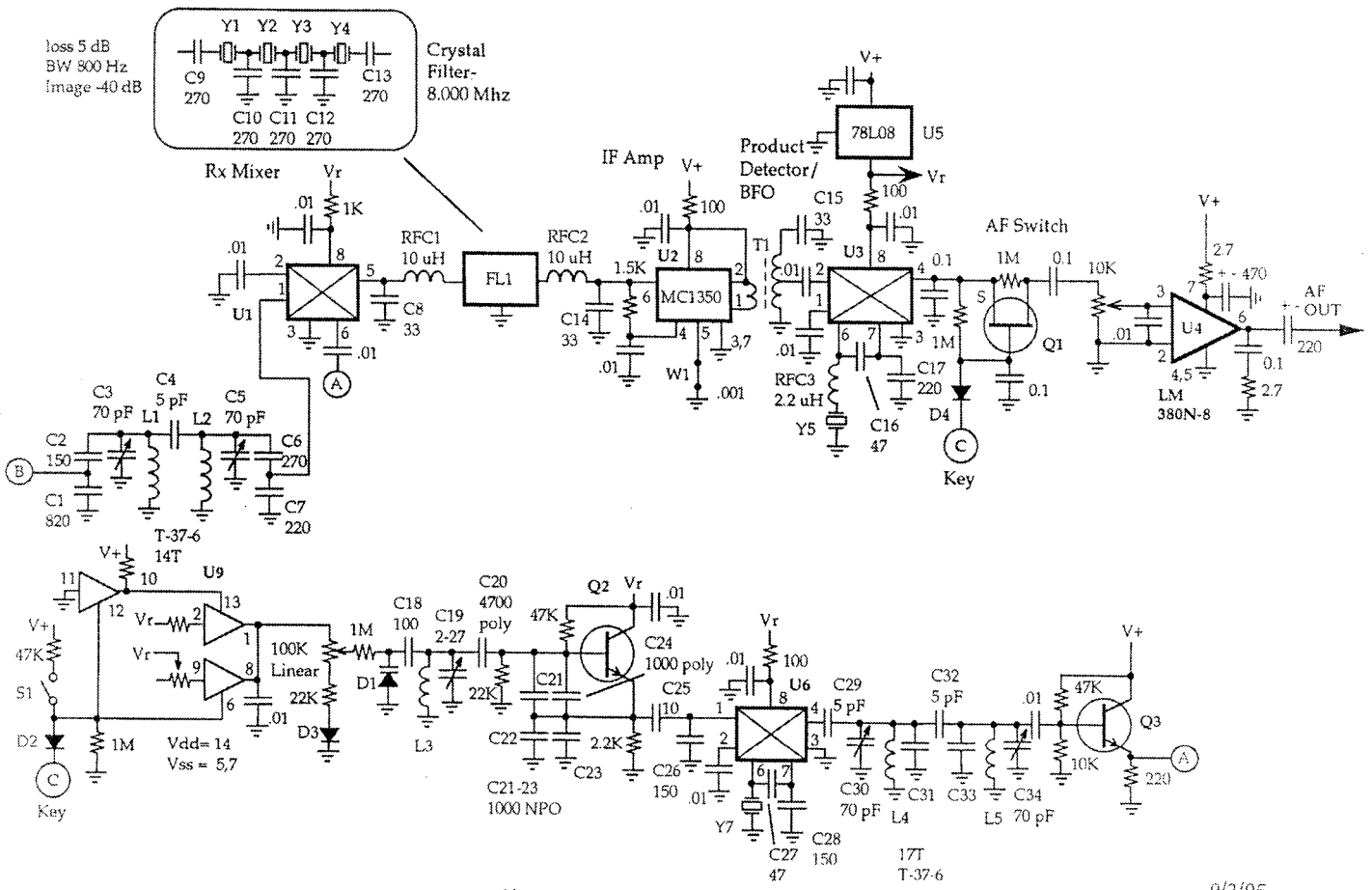
Telephone number: 1-603-3296995

For orders: 1-800-JADEPRO

(1-800-523-3776), (FAX) 603-329-6995

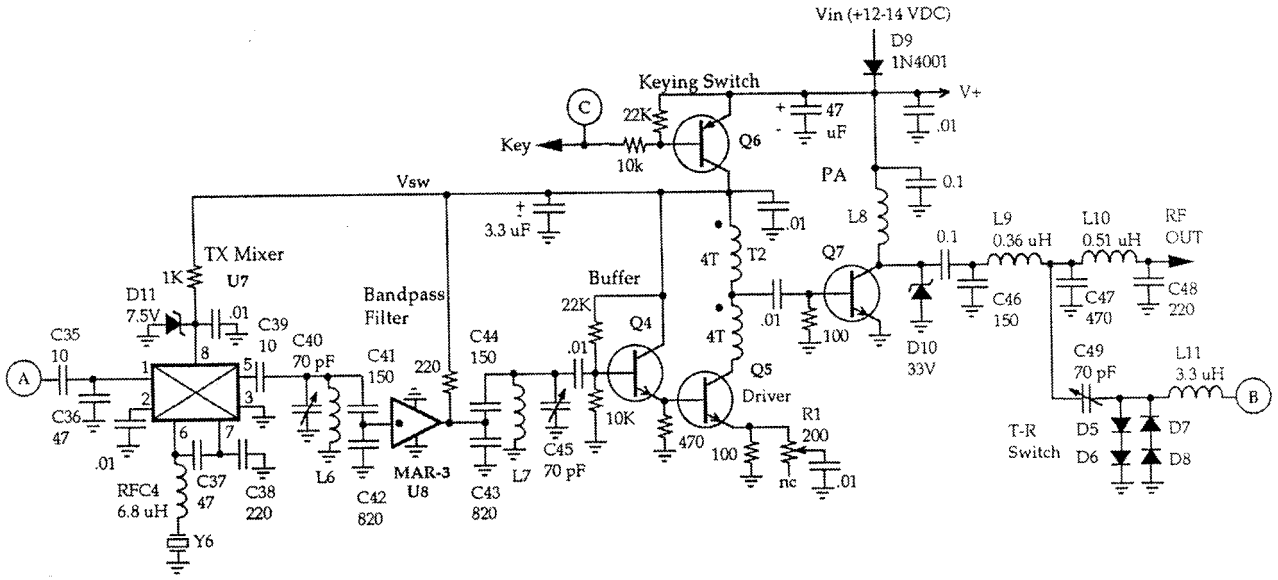
QRP AFIELD 1995

Did you have fun working the New England contest? Send your comments to the editor via e-mail/snail-mail. In the January issue, there will be a comprehensive report of everything everyone did with detailed anecdotes. Write now while it's fresh in your mind. A listing of who did what and how they got there will be included, so send your experiences now. QRP AFIELD was the *field day of all field days* and it's just getting started.



Notes: - all resistors 1/4W 5% carbon composition.

9/2/95


Vin (+12-14 VDC)
D9
1N4001
Keying Switch
V+
C
22K
Key
10k
Q6
47
uF
.01
PA
0.1
Vsw
3.3 uF
.01
L8
L9
0.36 uH
L10
0.51 uH
RF
OUT
TX Mixer
1K
U7
4T
T2
Q7
0.1
D11
7.5V
.01
C39
10
Bandpass
Filter
Buffer
22K
Q4
4T
.01
100
C46
150
C47
470
C48
220
C35
10
A
C40
70 pF
C41
150
220
C44
150
.01
Q5
Driver
D10
33V
C49
70 pF
L11
3.3 uH
B
1
8
5
2
3
6
7
C36
47
.01
C37
47
C38
220
RFC4
6.8 uH
Y6
L6
C42
820
MAR-3
U8
C43
820
L7
C45
70 pF
10K
470
100
R1
200
nc
.01
T-R
Switch
D5
D6
D7
D8

8/29/95

The Lunch-Eating Balun—Revisited

Walter B. Thomas, III - WA4KAC
7904 Chapel Cove Drive
Laurel, Maryland 20707

During one of the winter ARCI QRP contests, I had an unusual string of "not being able to be heard" using my QRP on 40 meters (NorCal 40 at 1.8 W). At the time I was using a commercial tuner to feed my non-resonant attic loop (approximately 98 feet around and mostly horizontal, 30 to 33 feet up and fed with about 145 feet of 450 ohm ladder line.) The tuner is a Tee-network using a large diameter air coil and a 1:4 balun (ferrite core) on the matching network's output to transform an unbalanced to a balanced output. I began thinking about the reputation output baluns being inefficient. The 100-watt folks may not be so concerned about a "little" loss, but with my "marginal" antenna and QRP I figure that any loss is stealing watts from the antenna.

John Collins had published an article in the *QRP QUARTERLY* about balun inefficiencies, so I got thinking how could I measure the loss through the tuner. I ended up using the NC40 as a signal source at 7.040 MHz and a dummy load/RF peak voltage detector (contained in a small Pomona box with an integral male BNC connector) and DMM to evaluate what I had. The NC 40 was set to about one and a half watts—it measured 1.54 W at the transceiver's output. When the dummy load/RF detector was transferred to the tuner's bypass jack, 1.45 watts was measured. Thus, 90 mW was being lost just through the two SO-239 jacks, two UHF9(m)-to-BNC(f) adapters, tuner SWR bridge and the tuner's switch (used to select "bypass," "coax 1," "coax 2" and "balanced/wire.") The dummy load then was connected to the "coax 1" output, the tuner tuned to an SWR of 1.0:1 (measured with it's built-in SWR bridge) and an output of 1.36 watts measured. Since this measurement was made using the same connectors and input power as the "bypass" measurement, it indicated that another 90 mW was being lost in the tuner itself, even when feeding a 50.0 ohm resistive load. The measurements were repeated using the balanced output of the tuner and only 0.98 W was seen at the antenna terminals of the tuner. Connecting a 40 meter counterpoise wire improved things a bit, to 1.02 W output. Still, the efficiency of this set up was only 66%. (Connecting the counterpoise wire did not improve the tuner's output when it fed the "coax 1" jack.) Note that I was measuring the tuner using a 50.0 ohm resistive load, so the efficiencies using my antenna are likely to be even less, since it presents about a 25-30 ohm reactive load on 40 meters. These numbers from modeling it using *Elnec*.

I then connected my breadboard "Super Tee" antenna tuner [2]. I used the SWR bridge in the commercial tuner, so the number of connectors was the same and, in fact, a measurement at the Super Tee's input showed the same 90 mW loss as measured above. The output of the Super Tee's (it adjusted to an SWR of 1.01) was 1.33 watts—a 350 mW improvement over the commercial tuner with it's output balun. The super Tee uses a balun as it's input makes the unbalanced-to-balanced transformation, where it is reported to be more efficient[3]. By disconnecting the SWR bridge and feeding the transceiver output directly to the Super Tee Tuner, the measured output was 1.42 watts, an efficiency of 92%. Thus, using the tuner with an input balun added 0.44 watts to the antenna terminals. I'm now using the Super Tee tuner (it's still on a pine board so it really is "breadboard") and "borrowing" the commercial tuner's SWR bridge until I build one up for the Super Tee. What's more significant is that my QSO rate improved significantly.

So what Collins said is true—baluns can "eat your lunch," or—in the case of our QRP signals, consume precious watts, or milliwatts (or microwatts for WA8MCQ and AA4XX).

I'm planning on making some more measurements, using the methods suggested by C. Lofgren[4] to see how the Super Tee does over a range of impedance's. I need to round up the needed non-inductive resistors from about 10 to 2000 ohms. More to follow!

MEASUREMENT ON TWO ANTENNA TUNERS

Measure Condition	Vpeak	P, W	P_0, mW	L_0, dB
1. NC40 @ antenna jack	1.40	1.54	-	-
2. MFJ-941 @ bypass (SO-239) (2) SO-239 + (2) adapters [1]	1.04	1.45	90	-0.26
3. #2, @Coax 1 (unbalanced) SWR = 1.0:1	1.65	1.36	180	-0.54
4. #3, + counterpoise	1.65	1.36	180	-0.54
5. #4, + EC ground [2]	1.65	1.36	180	-0.54
6. #2 @ balanced terminals Include, 1:4 balun SWR = 1.10:1	0.93	0.98	350	-1.93
7. #6, + counterpoise SWR = 1.01:1	0.98	1.02	322	-1.80
8. #7, + EC ground [2] SWR = 1.0:1	0.99	1.04	305	-1.75

10. SuperTee, input through same #2, include, SWR bridge	1.00	1.45	90	-0.29
11. SuperTee output (bal.) SWR 1.01:1	1.51	1.33	313	-5.63
12. #11, + counterpoise SWR 1.5:1	1.51	1.33	313	-5.63
13. #12, + EC ground [2] SWR 1.5:1	1.51	1.33	304	-5.62
14. #13, direct to tuner SWR 1.01:1	1.09	1.42	125	-5.33

72'/73'

Walter B. Thomas, III - WA4KAC

Acknowledgment: I thank John Collins for reviewing and commenting on my measurements and encouraging their publication.

References:

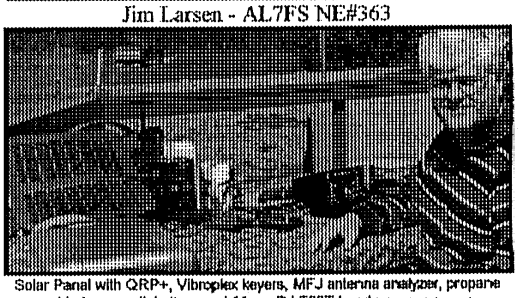
[1] Collins, John (KN1H), **A Balun May Be Eating Your Lunch**, *QRP Quarterly*, April 1987, pp. 10-11.

[2] Michael, D.A. (W3TS), Super Tee Antenna Tuner, QRP Quarterly, June 1992, p. 12.

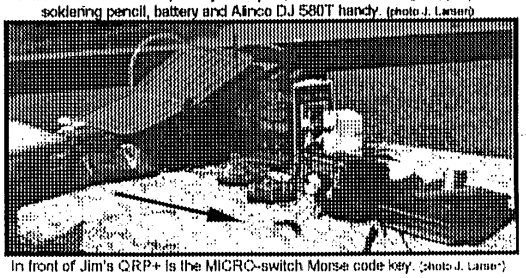
[3] Lau, Zach (KH6CP), A Balanced QRP Transmatch, The ARRL Handbook 71st ed., 1994, p. 21-34.

[4] Lofgren, Charles, Beyond the Z-Match, the IBZ Couple, Communications Quarterly, Winter 1995, pp. 27-32.

Jim Larsen - AL7FS NE#363



Solar Panal with QRP+, Vibroplex keyers, MFJ antenna analyzer, propane soldering pencil, battery and Alinco DJ 580T handy. (photo J. Larsen)



In front of Jim's QRP+ is the MICRO-switch Morse code key. (photo J. Larsen)

The Vermont QSO Party
The QRP Prospective

Steve Allen - KD1UP, NE#102
Moretown, VT

The planning had taken bits and pieces of the two preceding months, and the L S C A A R C (Lyndon State College Alumni Amateur Radio Club) would operate a club station during the 1995 Vermont QSO Party. The operations would be the first time in the history of this FINE BUSINESS operating event that there would be a category for QRP operation. Well, I can scarcely convey to you the excitement I FELT!

In keeping with the spirit of QRP operating, the station would be operating on portable GEL cells and an antenna would be put up at the operating site upon arrival.

Two days before the anticipated event, the national weather service began to predict a snow for Vermont on the very same weekend. Cool! And sure enough, the Saturday morning of the contest, the predicted precipitation was for ten to sixteen inches of snow! Excellent!

After the morning brew-up (coffee), and while looking out the window for the first flakes of infamy, the "landline" came to life and I heard the words of a familiar voice on the other end. "Hey OM. How's it going? KD1DP here!" Dave had been at the operations camp since the night before and the report from the contest site was the lack of sunlight had begun to handicap the photovoltaic charging system. An AC generator was needed in Starksboro, VT so my last stop in town was at the equipment rental shop. With the station and plenty of power in the back of the truck, I was on the road.

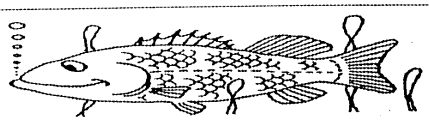
The snow had not begun to fall yet when I arrived at the camp site around 15:00 UTC. The first order of business was to get the dipole up and the station on the air. The snow was now falling in earnest by the KC1MP and I had the antenna in the air. After a quick lunch, we were QRP active.

The band conditions were outstanding! There was plenty of activity on 20 meters and the first CQ I answered was from a G3 station who gave us a 449 RST. I worked a couple of fellow QRPers and then went to 21.060 MHz to see what was going on in that part of the band. I found a PY1 calling CQ and received a 559 RST from him. Conditions seemed so good that I decided to crank up the power to 10 watts and see what we could do on SSB.

No sooner did I get on SSB but the GEL cell died. A quick assessment of the situation by our alternative energy expert (KC1MP) and we were back on the air running the Kenwood from a battery charger connected to an inverter. By now, the band conditions had reached a plateau which can only be described as phenomenal. My fourth contact on sideband was with V59T in Namibia, Africa who signaled us with a 5/9 report. That afternoon, the contacts were: 15 states and 4 countries on 10 watts or less and the antenna was a 105 foot, center-fed dipole (with 450 ohm ladder line), which was up about 25 feet.

What made this whole contest so memorable, in addition the great operating conditions, was the fact that it snowed heavily the whole time. When the crew got up Sunday morning, the countryside was absolutely buried in new snow. The new snow made for an interesting hike outside, especially with the 175 pound generator!

Steve Allen - KD1UP



"I do indeed have the original Tuna Tin II."

Ed Hare - KA1CV

I do indeed have the original Tuna Tin II. There is a tale that goes with it, too.

The Tuna Tin was in storage in the ARRL Lab at the time we were working on a Lab display area, which was to show the projects we have built over the years. When we through, I asked Mike Gruber to find the Tuna Tin II and put it on the shelf. He returned a bit later, crestfallen to say it was gone! As a QRPer, I was also disappointed—a piece of ARRL history had been lost forever.

Last year I attended the ARRL New England Convention in Boxboro and during the flea market session, I took a break and wandered through the area to see what was there. I walked past a booth of the "junquiest junque" when lying there in the middle of a pile was a version of the Tuna Tin II. It looked like the original I and thought it would be a suitable replacement for the one we had lost. The sign on the box said $1.00, so I coughed up the buck.

I brought it back to the Lab and showed Mike Gruber. We marveled how closely the builder had followed the original. The more I looked, however, the more it nagged me that the design was too close—the unit just looked too familiar. I had a hunchand checked out the May **QST** 1976 issue. Amazing—the unit looked exactly like the picture in the magazine. Even all of the resistors faced the same way, the ceramic caps were all the same size and color, the lead lengths were the same and the transistor looked identical. It wasn't until I noted that some of the labels were a bit crooked and offset exactly the way as I remembered, that it dawned on me—**this** was indeed the original Tuna Tin II that had wandered away from the ARRL Lab!

Now, this tale has special meaning to the New England QRPers because they all know that if they attended the convention that day, they probably walked right past it and could have bought it for a dollar.

There is only one thing to do at this point. I need to refurbish it a bit (it is missing a crystal holder). When I do, I will get it back on the air. If you hear W1AW in the October QRP test, you will probably be working a piece of ARRL history. I will QSL and write on the back of a photograph of the actual rig itself as it would be set up at W1AW. Ought to make for an interesting contest.

Ed Hare - KA1CV

Fall–My Favorite Hamfest Time

Joe Everhart - N2CX, NE#280

Fall means many things to many people: the aroma of burning leaves, cooler days with brisk mornings and end of vacation season, but to me it means **HAMFESTS!** Sure, there are spring HAMFESTS after the barren winter and there are summer HAMFESTS to be endured in the searing sun, however, fall is arguably the best season. Temperatures are moderate and we're all sick of tending our lawns and gardens plus we need a CHANGE. Fall hamfests gives us a chance to buy those needed parts and rigs that will carry us through our winter hibernation.

The highlight most hamfests is the tailgate area, and I'd like to share a few thoughts about flea markets. I'm going to just ramble about some buying and selling strategies and some other fun ideas of what to do at hamfests.

First of all buying strategies. Like certain anatomical features, everybody's got their own. One of the more intriguing notions is the "early bird catches the worm" gambit. Fests often open early for sellers to get ready before the general public arrives. No matter how early you start to set up, there's an early bird lurking like a vulture ready to pounce on the first bargain of the day. They wait with flashlight beams probing through the early morning gloom and mists pouncing as you pull into your tailgate spot prepared to peruse your goodies as soon as you turn off the ignition of the car. If you aren't wary, they start pawing through your wares before you have a chance to unload. Masters of the art wear miner's head lamps and walk around in Diogenesesque fashion searching for an honest deal.

Young hams being impecunious (?), have their own tricks. Some play "dumb" asking innocuous questions so that you think they are newbies and don't understand what they are looking at. They then make a ridiculously low just to see if you're paying attention, plus they keep coming back time after time wearing you down until you sell at a low price just to get rid of them! And an old reliable deceptive trick some use is the "sad eyes" technique when they sorrowfully look at something they really want, playing on your sympathy and hoping you'll throw it their way. They return periodically, not saying anything, letting you know that they can't afford whatever it is they're looking at. You think back to the times when you were just starting out in the hobby and couldn't afford all the neat stuff, and you figure you'll give them a break. You offer them that $75 microphone for thirty bucks and then they ask "Gee, do you have change for a hundred?"

Of course adults play a variation on the same theme that the youngsters tried. You have an extra battery pack you bought a while ago but don't need any more. The battery pack cost you $30 and you want to get at least $25 for it. Invariably, some fellow will come along and say "I've only got this $20 bill left, will you take it?" Of course he pulls out at worn out, wadded up, soggy Jackson and you have this picture of a guy with kids to feed at home who went without lunch for a week to save up the money for this purchase. You say okay and give it to him for his low bid. Later, as you're leaving, he drives past your '83 Tempo in a brand new El Dorado.

Would I ever resort to those kind of tactics? Nah, I don't think so. Of course, if I only had a hundred bucks and somebody had a Sierra for sale....

Those are some of the ways people get a good deal, The most important circumstance, though, is to find what you want in the first place. Depending on time available and the size of the 'fest,' you can adopt a variety of strategies. For small fests (say a couple of hundred tail-gaters), I usually try to see everything. I wander up and down each aisle rubbernecking anything in sight. After an hour or so of reconnaissance, I realize that I'll never finish before the darned day is over, so I walk down the middle of each row and strain to check out the action on both sides. That way I'm equally likely to miss the goodies on both right and left.

You have to be much more organized to tackle a large flea market like the one at Dayton, Ohio. Unless you run daily marathons, there's no way you can even make it up and down each aisle in the several days allotted.

Unless you run daily marathons, there's no way you can even make it up and down each aisle in the several days allotted.

At this year's Dayton event, I watched the professionals in action. Individuals had to limit their efforts some way. They would walk between adjacent aisles and scanned from their vantage point looking for whatever it was they needed. If they saw antennas or computer stuff, for example, they'd venture toward it. Otherwise, they'd go down to the next set of aisles. I wish I were that disciplined!

More organized, experienced 'festers (sounds like my feet on Sunday evening) tackled the feat (ouch) in team fashion. They would arrive in groups, and fan out into the flea market area. Each carries a list of what the other fellows want and a hand hold radio. The individual members each take a section and scoured it carefully, and if they came across something on the list, they called the interested party on their hand hold radio to alert where to look. Efficient, but it kind of takes the "gee whiz" factor out of searching!

Getting the most for your buck often takes a quick mind and a lack of pride. It pays to dive into the "50 cents each" box. Recent bargains I've found are brand-new-in-the-box 365 pf variables for 50 cents each, banged up but serviceable MFJ audio filters for $1.00, an MFJ electronic keyer with a broken paddle, *but* a perfectly good circuit board with a Curtis keyer chip for $2.00. If I hadn't been willing to get my hands dirty I would have missed those bargains.

No matter what your *modus operandi*, it is very important that you do your homework before the big day arrives. I know it's nerdy and all that goes with it, but you really should plan ahead. Decide beforehand what you want and what you can afford to pay. Snoop around in the used equipment ads and on the Internet news groups to check prevailing prices. And consider flexibility, for if you can't find exactly what you want, is there an acceptable substitute?

For example, several years ago I wanted a Drake 2B to replace the one I sold years ago while attending college. I saw several at a local fest, but they were rather pricey at $125 to $150. I had budgeted only $100 for a receiver. Fortunately there was an older 2A with a Q-multiplier offered for $75. Since a 2A is the same receiver with only SSB selectivity, the 2A with Q-multiplier fit the bill for me very well!

Semiconductors are another area ripe for substitution. For example there are a number of adequate substitutions for the ubiquitous 2N2222. For example, did you know that the 2N2219 is the same device in a TO5 package? And it has a higher power rating to boot! In a similar vein, National Semiconductor devices are available in several different temperature grades. The common LM324 devices are "commercial" temperature range devices rated for 0 to 70 degrees centigrade. A higher grade "industrial" grade carries the nomenclature LM224 and is rated for -40 to +85 degrees Celsius. The top of the line is the Mil temp range LM124 specialized from -55 to +125 Celsius degrees. As a bonus, the military specification goodie comes in a ceramic package instead of the more common plastic. Likewise, commercial temperature TTL devices have a designation of 74XXX, while the mid-temp range version is 54XXX. Lists of commonly used components have appeared in several QRP newsletters over the last few years as well as the Internet QRP-L e-mail lister. I recommend you use these lists to decide what you should look for when you're buying home brewing supplies.

If he says "I don't know if it works or not," you can be pretty sure that it doesn't! Try and get the seller's name and address, or at least his call letters to follow up if you have problems later.

Speaking of components, hamfests are also an excellent place to pick up data books with technical specifications and applications information for electronic components. I highly recommend the Motorola semi-data books, particularly the RF Components book. There are a variety of others with data on linear IC's by National Semiconductor, Harris, Signetics/Phillips (maker of the ever valuable NE-602). Important digital semi manufacturers include Motorola, Texas Instruments, Intel and a whole bevy of newcomers.

For other reading material, hamfests are a SUPER place to pick up those back issues of ***QST, CQ, 73*** and the much lamented ***Ham Radio***. I always keep a list of back issues I need with me when I go to ham fests. You can often pick them up for 10 to 50 cents each. Most folks hate to throw them away and are glad to sell them reasonably to someone who can put them to good use.

When you buy gear at a Hamfest, it's best to take some simple precautions. First, don't just assume that the gear is in working order, ASK if it is. Ask, too, if there are any "funnies' about the equipment, such as odd quirks that don't quite work right but are too unimportant to matter. Look the stuff over carefully and search for: dirt cheap prices, cut-off DC power cords, missing accessories and defaced serial numbers might mean that the gear is stolen. Yes, it happens. I remember a few years ago seeing a real "deal" on computer printers. The seller was vague about their origin with good reason. The next week police showed up at buyers houses, to reclaim the printers, which had been stolen off the loading dock of a distributor!

On that subject, too, when you talk to the seller, be wary. If he says "I don't know if it works or not," you can be pretty sure that it doesn't! Try and get the seller's name and address, or at least his call letters to follow up if you have problems later. Most guys are honest, but it doesn't pay to get "bitten" by one of the few who isn't.

To assist with the "dead rig" problem, several of the local (southern Jersey) hamfests have started to offer a new service—the equipment checkout area. These services range from making AC power available to see if the filaments light to giving space to a local ham repair outfit who checks out your stuff with signal generators, frequency counters and a spectrum analyzer—all for free. He figures it's good advertising for his repair business. Next time you need something fixed, you'll remember him!

Whether you buy or sell gear, the instruction manual is an important part of the transaction. If you don't have it handy when you are selling the rig, it shows carelessness that may make a prospective purchaser wonder just how well you took care of the rig. And when you buy something, you really need the book if anything ever goes wrong with it. Of course hamfests are also a good place to pick up equipment manuals. Some ham dealers and even individuals show up with copies of popular manuals. Many dealers will also take orders for the many they have back at the shop and will mail them to you. Be sure to get a receipt so that you can prove that you paid for your manual. Record keeping at hamfests is often fragmentary so you may have to "remind" them later about their transaction. And having a receipt also helps you remember just who you order it from!

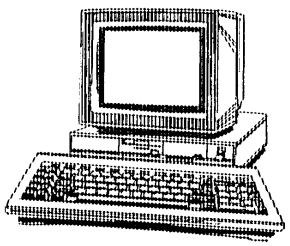
Since you are already going to a fest (aren't you?), consider distributing some QRP information. Check with your local (or national, or international) QRP group. Many have promotional literature available and encourage their members to solicit new blood. There are lots of closet QRPers out there who really need more information. When they come to look at our QRP goodies, mention NE QRP or QRP ARCI or NORCAL etc. And by all means tell them about the QRP-L e-mail reflector!

Finally, a fun way to get more out of your hamfest experience is to operate a portable QRP station right there on the flea market grounds! I did that during a QRP contest last year and got a whole bunch of people interested in QRP. Most of them were from HT-toting folks wondering what that funny noise was (CW). Next time, I'll have some QRP literature handy to tell them just what I'm doing. They'll think you're super!

One final thought—the single most important idea you have to do when walking the hamfests is to perfect that innocent, honest look you need on your face when you get home and tell the XYL "Gee, you'll never guess what I got for only ten bucks!"

Joe Everhart - N2CX, NE#280

Internet



The following have sent their Internet addresses to Z2 for all members to view. If you would like to contact any of the following people, copy their location and drop them a line. It would be nice if you mentioned that you saw their address first in Z2. If you're not listed, simply send your address to Dennis Marandos - K1LGQ, number one in the list below. For the subject heading, put INTERNET ADDRESS. If there is an error or an up-date to your address or call, send me a message and I'll correct it for the next issue.

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33. http://www.scn.org/scripts/mer.us/n/nwqrp/nwqrp.menu
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WILDERNESS RADIO

LOS ALTOS, CA: Wilderness Radio, P.O. Box 734, Los Altos, CA 94023-0734 has several QRP kits for sale with a budget for everyone's pocketbook. **THE SIERRA** is a multi-band CW transceiver that uses plug-in band modules for 80, 40, 30, 20, 17 and 15 meters. Like the NorCal 40A, there's virtually no chassis wiring----all controls and connectors mount on a single board. The price for three bands is $298 and for 6 bands is $369. For portable operation, the Sierra offers very low receive-mode current drain----only 35 mA. The superhet receiver has excellent AGC range and sensativity, RIT and a 400 Hz crystal filter. Transmit power is about 2 watts. QSK is fast and clean.

The **NORCAL 40A** CW transceiver sells for $129. It is rugged, high-performance 40 meter CW transceiver, ideal for back packing or home use; only 2.2"H x 4.6"W x 4.5"D. There are two watts output with clean QSK and a stable VFO. The superhet receiver with selectable AGC, RIT, 400 Hz filter and only 15 mA current drain on receive. One PCB, no jumpers and NO chassis wiring. Also, an excellent project for pro or beginner. Complete kit with skill-screened .060" thick custom case, and well written manual. Call Wilderness Radio 415/494-3806.

The NEST-40

New England Simple Titan Antenna

PART I

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Several moths ago, I began thinking about a suitable "portable" counterpart to a full-size two element 40 meter beam. I needed an antenna which would provide respectable forward gain and front-to-back (F/B) ratio. The antenna had to provide reliable, predictable performance in the field. The antenna also had to be low in cost.

The NEST-40, or *Nessie*, is designed especially for contesting, ragchewing and milliwatting. This is not a DX antenna; it's moderate take-off angle puts most of the gain within a single, unidirectional lobe out to about 500 miles of the station. *Nessie* is ideal for those 40 meter operators who enjoy QRP-to-the-Field, ARCI and June Field Day in contests.

WHY NEST-40?

For years, I gave no consideration to the possibility of being able to afford a beam antenna for 40 meters. I spent my time and energy running QRO, chasing DX on 40 and 80 meters with a pair of phased verticals. Upon switching over completely to QRP operations, my emphasis changed to domestic rag chewing, contesting and milliwatting. The big verticals were typically from two to three S-units down in signal strength from my 40 meter inverted vee for these domestic contacts. This was a revelation, and, clearly, something different was needed for that *extra* QRP punch.

TRIALS AND TRIBULATIONS

Several two element inverted vee parasitic arrays were computer modeled, using MiniNEC. The models looked great! The best model was subsequently built in my horse pasture. With great anticipation, I tested it against my reference (single) inverted vee antenna. After many adjustments, it showed mediocre performance—marginal gain and less than predicted F/B ratio.

A modified approach was then taken, again using a parasitic element. A specific length of ladder line, which was terminated with a variable capacitor, was attached to the parasitic element. This would, supposedly, enable the parasitic element to perform as either a director or reflector, depending on the setting of the variable capacitor. This "new and improved" array also gave disappointing results, probably die to the inverted vees' close proximity to the ground. The vees' apex height was 50 feet and the apex angle was about 100 degrees.

HOPE AT LAST

The term *phased array* conjures up thoughts of impossibility of complex LC networks for many of us. Myself included! I'd like to share with you the steps I took to successfully implement *Nessie*, a two element phased inverted vee array. Nessie meets all the criteria I originally specified, providing reliable performance in a portable environment. Predictability is ensured, because phasing is done from the operating position, at ground level.

BASIC INFORMATION

MiniNEC was used for the initial analysis of my antenna. Figure one shows the basic physical layout of the antenna with the two vees spaced 35 feet apart. This is a quarter wavelength for meters.

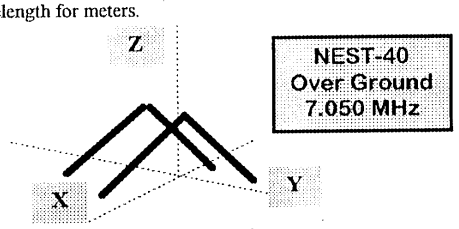


Figure -1

MiniNEC predicts that Nessie will provide a forward gain of 6.12 dBd and a F/B ratio of 26dB, with a take off angle of 42 degrees. Nessie was modeled assuming an apex height of 50 feet.

Figure two provides the original MiniNEC antenna file for those who would like to experiment further with the design.

MiniNEC Run File
NEST-40, 40-Meters 2 elements inverted vee beam
Over Ground
Frequency = 7.050 MHz

4 wires, feet

10	0.	-25.	25	0.	0.	50	#12
10	0.	25.	25	0.	0.	50	#12
10	35.	-25.	25	35.	0.	50	#12
10	35.	25	25	35.	0.	50	#12

2 sources, current
Wire 2, end 2 1.0
wire 4, end 2 1.,-110

Impedance	34.6 - j 22.5 ohms at pulse 19
Impedance	58.5 + j 57.0 ohms at pulse 38
VSWR	1.90
Forward Gain	8.11 dBd
F/B	28.39 dB
Azimuth Beam width	101 x
Angle of Radiation	42x with 8.12 dBd gain

CONSTRUCTION

The two vees are spaced 35 feet apart with an apex height from 35 to 50 feet. The minimum acceptable apex angle is 90 degrees, with 120 degrees being more desirable. The apex height will directly influence the take off angle.

Unlike a parasitic array, in a phased array, both elements are driven. Both inverted vees are constructed just as one would construct a conventional inverted vee. I my case, both vees were resonated at 7.040 MHz, using a VSWR meter. Each inverted vee leg will be around 33 feet four inches, plus or minus a couple of inches to accommodate differences in wire insulation, ground influence, antenna height, etc. I recommend

using RG-8X feed line for it's light weight and low loss at 7 MHz. It is a good practice to incorporate a "choke balun" at the feed point (apex) of each vee. It's easy to make a choke by winding 6 to eight turns of coax around a coffee can. The coil is then secured with electrical tape after removing from the can. The tape will keep it's shape, or if you want high-tech, you can use nylon wire wraps.

RADIATION CHARACTERISTICS

Figure three shows the broad lobe which this antenna produces and predicts a takeoff angle of 42 degrees. From New England, this places major energy in the mid-Atlantic ocean region, assuming the array is oriented on a north-south axis.

Notice that there is appreciable gain at takeoff angles from 30 to 60 degrees. The takeoff angle and lobe shapes are largely dependent on the inverted vees' apex height and the apex angle. Beaming south from New England, the relationship between takeoff angles and geographical target area is interesting to note (as determined from Miniprop Plus). After all the only reason we are interested in the takeoff angle is that it enables us to determine if a given antenna will provide gain over our intended target area.

PHASING

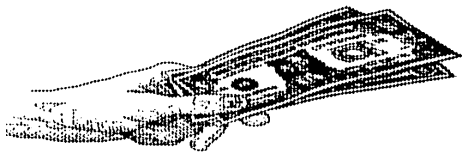
Nessie relies on a phasing box which is essentially a stripped down QRP version of Peter H. Anderson's intriguing design featured in the **ARRL Antenna Compendium**, volume 3, "Phased Verticals with Continuous Phase Control." My El Cheapo QRP" version will be presented in the next issue of 73.

The phasing box essentially provides the necessary phasing for both vees to establish forward gain and good F/B ratio. An added bonus also is the box can also be used with verticals. Unlike many phasing schemes, Nessie incorporates a variable phasing capability which enables "goof proof" performances. In addition, direction switching is accomplished by simply flipping a toggle switch. From my North Carolina QTH, I can instantly determine if a station is north or south of my location by reverse-phasing the array with the toggle switch. During Field Day 1995, I kept calling a station in Georgia, who should have heard me without any trouble, but a look at the phasing switch showed that I was phasing north instead of south. I flipped the switch and the station's signal increased three full S-units, and then he came right back to me.

I hope that this article might prompt some to consider exploring phased arrays. Please feel free to contact me via E-mail for additional information.

Paul Stroud - AA4XX
aa4xx@nando.net

CLUB TREASURER'S REPORT



Paul Kranz -W1CFI

Another year has passed and your club is still solvent to the tune of $2413.02 in its checking account. This total is $560.81 less than it began the year with, but only because the club invested $636.50 in the production of member patches and has yet to receive any income from patch sales. The sale of patches should provide a modest amount of income to the club in the coming year. Most of the surplus in the checking account was generated from Forty-40 kit sales last year.

Newsletter production is are our largest expense. It is currently costing us $496.57 to produce each printing of the newsletter and since there are 252 active members in the club, each of us pays $7.88 for our four newsletters. Since the newsletter publishing costs exceed our dues income, on a per member basis, we each are receiving a slight benefit from profit making projects the club participates in. This should provide some incentive to all club members to get involved in some of the club's activities in addition to meeting other members and having a lot of fun. A special thanks goes to members who do help with activities and club projects.

The following is a detailed tabulation on the income and expenses for September 1994 through September 1995.

BEGINNING CHECK BOOK BALANCE $2973.83

INCOME	
Dues	$2290.95
EXPENSES	
Newsletter	$1986.29
Membership	65.35
Flea Markets	33.00
QRP Afield	48.67
Kits	81.95
Patches	636.50
	$2851.76

ENDING CHECK BOOK BALANCE $2413.02

Great Lakes Net

Paul Kranz - W1CFI

This spring Greg Algeri WA1JXR and I began an attempt to reconvene the GLN net which meets on 3.560 MHz at 9 PM EST/EDT on Wednesday. Unfortunately, this summer has been one of the warmest we have had in some time which has made the QRN nearly unmanageable lately. However, with the coming of fall, things should improve and the net has the potential to become a great place for QRP-NE members to meet.

The following members have checked into the net over the past few months. WA3SRE has the unique distinction of having checked-in on nearly every net.

WA3SRE	**NT1V**
N6CXB	**AA1KC**
KI2L	**AA3GM**
NO1E	**KA1RZQ**
N1GIR	**K2LGJ**
VE3VA	**VE2XLT**
KA2QPG	**WB2QAP**
AA1HJ	**W1FMR**
WA1JXR - NetCtrl Sta	**W1CFI - Net Ctrl Sta**

Two Electret Microphone Ideas for QRP SSB

By Brian High, KV9X

I prefer CW over phone and have never given QRP SSB much thought until I received the **QRP Plus** from Index Laboratories. This rig calls for an electret microphone, and I came up with a homebrew "Floss Mic" using common household Radio Shack parts. I also modified my ICOM speaker-mic (made for the IC-2XX, IC-3XX and IC-4XX series) to work with the **QRP Plus**. Using the ICOM mic, I made many fine 10, 15, and 75 meter Field Day QSOs.

Other QRP rigs use electret mics for HF SSB as well. The KK7B T2 is a popular example. I have not built one, but glancing at the schematic it shows a 3-conductor (V+, audio, and GND) electret mic.

Generally, electret microphone elements come in either a two or a three-conductor style. Further, there are a number of ways to wire each one. For instance, if you go to Radio Shack, you will find one element of each style. On the backs of the packages, there are little schematics showing resistors and capacitors that must be purchased separately, however, the two microphones described here have not been wired according to these diagrams and both work well with the **QRP Plus**.

The "Floss Mic"

To make the Floss mic you will need "super glue" (RS# 64-2308), epoxy (RS# 64-2328), an electret mic element (RS# 270-090), a lever switch (RS# 275-016), microphone cable (RS# 278-356), a "12-yards" Johnson+Johnson™ floss container (internal parts removed), a 3/4 inch wire mesh faucet screen, a piece of shoe rubber, matching Velcro squares (fuzz and hooks, 1" X ¼"), a flat piece of white plastic (the pocket-clip from a mechanical pencil cap), and a 3-conductor 1/8" phone plug (RS# 274-284). As for tools, you will want a soldering iron, solder, and a hobby knife.

Cut a ½ inch hole in the back of the floss container with the hobby knife. Carefully put a drop of super glue on the inside of the floss container above and below the hole, close to the edge. (Please follow the manufacturer's super glue instructions.) Quickly place the screen inside the container, centered over the hole. Allow the glue to dry. Get the fuzzy piece of Velcro and epoxy it (fuzzy side out) to the front of the floss container. Allow this to dry overnight for strongest adhesion. I placed epoxy on the other piece to the shelf above the rig in our shack. (By the way, the Velcro came from the shoe. You can purchase Velcro in the hardware store with self stick tape already on it, if you like.)

Cut a ¼ X 5/8 inch vertical slit into one side of the floss container. This will be for the PTT lever (push-to-talk) switch. Place the hole where you would want the PTT switch to be. I put mine to the right of the wire mesh hole. My switch was actually the one with the roller on it (from the junk box) so I had to cut the roller off.

Poke one end of the mic cable through a small hole cut into the bottom of the floss container. Remove about an inch of insulation and trim back all but the shield conductor, the shielded conductor, and one other conductor. Undo the shield conductor and twist it to form two leads. Solder one to the ON terminal and the other to the mic's ground lead. Solder the shielded conductor to the mic's +/audio lead. Solder the remaining conductor to the center terminal of the switch. Before trying to stuff this circuit into the floss container, bend the mic leads so they will not be sticking straight out.

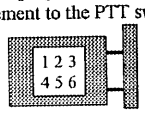
Take the shoe rubber, 1-½ X ½ inch, and cut a hole in it just smaller than the mic element itself. You want the hole to match up with the hole on the floss container. The rubber fits into the floss container vertically so that there is room on the side for the lever switch. Squeeze the mic element into the rubber and secure the switch and rubber into the container with super glue. Glue the white plastic strip (from the mechanical pencil) onto the lever to finish the PTT switch. Lastly, wire the mic cable to the phone plug according to the owner's manual for the rig.

On-the-air tests have shown this mic to work very well. Hank Aries - N7GGC was my first contact with this mic and he said it sounded "as good as the ICOM mic."

ICOM Speaker/Microphone Modification

I don't know the model number of my ICOM mic, but it was the one sold to go with the IC 2A and IC 2AT. It has a plug with both 3/32" and 1/8" mono phone plugs to go to "MIC" and "SP," respectively. To convert it for use with the **QRP Plus**, disconnect the cable and the speaker from the mic and PTT switch. Prepare a mic chord as mentioned above or use the original chord, replacing the plug with one as mentioned above. Wire the chord and mic element to the PTT switch as follows:

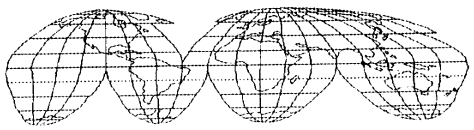
PIN OUT



The ground lead from the chord should go to pins 1, 2 and 5. Pin 4 should go to the chord's PTT conductor. Pin 1 attaches to a 39K ohm resistor and a 1 µf disk ceramic capacitor in parallel, and then to both the white mic lead and the +/audio conductor to the radio. The black mic lead goes to pin 1. The resistor comes with the mic, but the capacitor must be added. One tiny capacitor comes soldered to the mic element. Leave this one where it is. This is probably not the ideal wiring of the mic, but it sure works well and that's what matters.

I hope these ideas are of help. I can't wait for my first two-way QRP Floss Mic QSO!

—Brian High, KV9X
NorthWest QRP Club



HuMoR iN QRp

Michael A. Czuhajewski WA8MCQ
7945 Citadel Drive
Severn, MD 21144

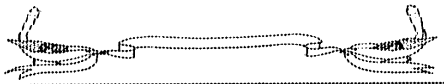
LOCAL QRPER BUSTED!

A local ham, well known for (what he said) his QRP activities and homebrew rigs was the subject of a pre-dawn raid by the enforcement arm of the FCC. Ric Campbell, of Carpenter Street, was charged for running a 5000 watt station. "I should have realized that something was wrong when the bamboo spreaders of my quad caught fire," said Campbell ruefully.

A Radio Shack milliammeter, mislabeled as being a microammeter, seems to have been the culprit. "I couldn't get proper power output," said the amateur," so I just kept on adding to the final amp. I had just achieved what I thought was five watts out when my SWR went haywire. I looked out to check my antenna just as the fire department rolled up."

All equipment was impounded. "I never seized an amplifier before that consisted of nine thousand 2N2222's running in parallel," said Rufus Bluthund, the special FCC investigator assigned to the case; "we're using it to heat our office at the Allegan (Michigan) monitoring station now." No information was available on Campbell's application for the first 10 meter HF CW QRP EME DXCC award.

WA8MCQ



QRP GROUP TRASHES HOSPITALITY SUIT AT DAYTON!

Fortunately, this headline never appeared in the Dayton Daily News, although it could have. The following true story was told to me in the late 80's by a well known QRPer who shall remain anonymous. I was told never to repeat this story publicly, but quite a few years have passed since the incident and the statute of limitations has probably expired by now.

It was the morning after the usual, big pizza party in the hospitality suite on the 11th floor, at the QRP Hotel in downtown Dayton (which seemed to change its name every two years whether it needed it or not). Our hero decided to look into the room to see how bad a mess was left for the cleaning crew, and was horrified with what he saw. There was trash everywhere, cigarette butts overflowing the ash trays, "billllyuns and billllyuns" of beer bottles and cans, dead pizza carcasses ground into the carpet, pizza toppings splattered on the walls, etc. He just knew that the management would bar the QRP ARCI from the hotel for all eternity, and perhaps even initiate legal action, if word of this devastation got out.

As he stood in the door wondering where he could find a couple QRPers to help him with an emergency clean-up, to his terror he saw a member of the cleaning crew walking toward him, with all her tools in tow. He ran to meet her, and whipped out a twenty dollar bill. "Look," he said, "before you go inside the hospitality suite I want to apologize for the mess in there. I'm in a position of some power in the organization that used it, and I really don't know what to say. They've never done anything like this before, and I'm deeply ashamed of what happened. We'd really like to keep coming here in the future, and maybe you'll accept this little gratuity in return for not telling the management about the awful mess."

She took the money, walked up to the room, stuck her head inside, and said, "Honey, this ain't nothin'----you shoulda seen this place after the Shriners convention got done with it!"

Mike Czuhajewski

QRP Hints and Tips

During NorCal's spring QRP to the Field event last April, I came across a method of launching antennas which worked well for me. I taped some 10 lbs. test monofilament line to a golf ball using some electrical tape. Then, using the "Armstrong Method," I gave it the 'ol heave-ho up into the tress. I found the golf ball to be just about right in terms of weight and I got some pretty good height with it. Also, it might help to paint the gold ball in some bright color to help spot it when it lands in the weeds.

72/73 Craig LaBarge - WB3GCK, NE#288

Are you sure...?

Several members have either misread their mailing labels or simply love to receive 72 for the next five year. A few readers have resubscribed to the quarterly magazine many years in advance. Thank you! A few simple observations will point out how easy it is to read your mailing label. Above your name on the mailing label is the year and NE#QRP number. Obviously, if your number was 95NE151, you're a full standing member to the end of 1995.

TO:

95NE151

Dennis P. Marandos
42 Cushing Avenue
Nashua , NH 03060-1816

CLUB PATCH ON SALE NOW

The NEW New England patches have arrived and they are a knock out! The club logo is red, white and blue and measures 2¼ X 3½ inches. The letters QRP CLUB and NEW ENGLAND are in red letter 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

My First (and Only) QRP DXpedition

Joe Everhart N2CX - NE#280

Way back in the Dark Ages, well, actually 1962, I had my first QRP "Dxpedition." At the time it didn't seem like much, however, looking back, I can see that it was in the true QRP spirit.

I had been licensed only a year or so, as WA2MES, and as a high school student, I was learning about the world as well as ham radio. At 16 years old, I wasn't afraid to try almost anything! My *big* rig was a homebrew 35 watt CW rig with a few crystals on 40 meters. The antenna was, believe it or not, a three element vertical phased array. Even with this modest setup, I managed 40 countries on 40 CW.

During the summer, I had an opportunity to travel to New Brunswick, Canada with my aunt and several cousins. Seeing an opportunity to try something new, I built a small transmitter that was truly QRP. It was a crystal-controlled vacuum tube 6L6 oscillator with an input power of about 6 watts.

Goodness knows what the output power was, in those days for few hams had RF power meters and all power measurements were power input. The output was link-coupled to the antenna and tuning consisted of "dipping" the plate current while adjusting the spacing of the output link for the highest current at the dip.

The receiver was a surplus ARC-5 modified to tune from 7 to 7.3 MHz. It was quite sensitive, although the selectivity was no better than the recently popular direct conversion receivers.

Since I had a month or so warning before my trip, I wrote to the Canadian equivalent of the FCC (something like the DOT) for an operating permit in Canada. Since I had a General class license, this was readily granted. However, knowing how my aunt felt about ham radio, I didn't tell her what I was doing—more about this later.

The family stayed with relatives near Saint George, NB. The house was an old farmhouse in the country with gravel roads the last ten miles of our destination. Electricity(!) and a community party-line telephone with one who lived on that dirt road, which probably meant a dozen or so families. Naturally they had a cesspool and running water provided by an electric pump. Though we arrived in August, the weather was a tad chilly at night, so my relatives lit the kitchen wood stove early in the morning to give the house some heat and to heat some water for our daily ablutions.

We *US* cousins got together with our Canadian cousins and did what teenagers usually do. We climbed the mountain behind the house, hiked the 5 miles to town, fished in the local streams and generally enjoyed rural Canada. We US types were raised in suburbia so this was all great fun.

After we had been there a few days, I revealed my ham radio to the cousins, and they though it was great fun to hide the radio in the attic and helped erect a 40 meter dipole. Darn, I wish I could still get some of that neat 72 ohms twinlead, because it was great for feeding dipoles. I think my cousins thought what I had brought was a 'spy' rig because I used a telegraph key and headphones and hid it after I was through with it!

During the day, I called CQ 'til my fingers were numb with no results. I found out what Bob Gobrick knows—when you're in the relative far north, QRP doesn't skip into any major population areas! But around dusk, when the ionosphere does its thing, I had a virtual pipeline into the New York/New Jersey area. Once I made one contact, others heard the portable VE1 suffix and waited in line to work me. Although I was very inexperienced, and suffered from poor receiver selectivity, I was in hog heaven working the big ones. Imagine the joy of a 16 year old running pileups with a QRP rig hidden in the attic!

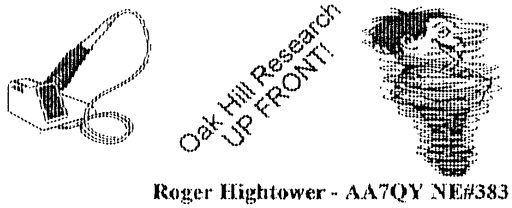
"Do you have anything to declare, ma'am?"

At the end of the week, I took the antenna down without the secrecy of its erection and my aunt took notice. Of course it was too late for her to do anything but express displeasure for my furtive hamming. She was afraid that it was illegal because of my reluctance to tell her about my radio gear. Even my official authorization letter from the authorities didn't calm her fears.

When the family returned the US at Calais, ME, the US Custom's agent asked "Do you have anything to declare, ma'am?" Knowing that I had my ham rig in a suitcase in the trunk and still not convinced of its legality, she hesitantly replied, "Well, I really don't know." Naturally, this was the trigger a suspicious boarder guard needed, and he asked her to pull over while he searched the trunk. She nearly expired with fear, while my US cousins chortled with glee! He checked all of the suitcases, the glove compartment and even looked into the wheel wells and under the car for contraband. He didn't even comment when he opened my suitcase and saw the radio gear. You can imagine the tongue lashing I got for her embarrassment when we pulled away!

Now you know the rest of the story.

Joe Everhart N2CX - NE#280



Roger Hightower - AA7QY NE#383

I just finished an OHR (Oak Hill Research) Explorer 20, after having constructed an OHR Explorer 30. It was fun, but a little frustrating, and I thought some of my observations might be of use to new builders/constructors.

I wanted to get in on the fun on 30 meters with the Internet QRP-Lister group, so I ordered an OHR Explorer 30 from Radio Devices. Easily done with the on-line order setup via Internet, and the kit arrived 3 days later. After it arrived, I enjoyed it so much I ordered the 20 meter version. I already have a NorCal 40-A, but wanted 20 meters just for fun. The following comments apply to both kits, unless specified otherwise.

Nicely packed, the kit arrived with no damage and was buried in foam peanuts in a nice box. All part bags were inside the case, which were wrapped in tissue for scratch protection. Inside this treasure box you'll find a hardware bag with all knobs, controls, nuts and bolts, plus an "electronics" bag with all the neat little glass and plastic pieces needed to build this kit, and a band kit, with parts specific to the band you have ordered. And, of course, a very nicely done plated through-hole PC board, which was solder masked and silk-screened.

FIRST - Read through the assembly manual at least twice, so you have a good idea of what's going to happen. It's non-technical, so you won't have a problem understanding anything.

SECOND - Sort all the parts by type and value. I used a block of non-conductive foam, and stuck the part leads into it, in the order of the installation. This allowed me to conduct inventory and saved time when I started stuffing the board. No problem with the 30, but the 20 was missing a 100 pF ceramic disc cap, which I found in my junk box.

From this point, the assembly went fairly straightforward, and any time there might have been possible confusion about a part, clear explanations were given in the manual.

Double check all parts before installing, because desoldering a plated through-hole PC board is not fun. I did make one dumb mistake on the 30 and put a DIP socket in the wrong direction, but rather than unsolder it, I marked the board so I would be sure to install the chip correctly.

THE MANUALS - Clearly written, with illustrations and construction tips, which made the effort fairly easy. There

were a couple of errors, though, which I attributed to trying to have a "master" manual for all kits, with different pages for different band models. Also, there had apparently been some recent hardware changes, because a couple of instructions just couldn't be performed.

On the 30 meter kit, the manual called for a three-lug terminal strip to be bolted to hole "G" in the rear case panel...no such hole could be found. I circled that instruction to return later, but it turned out that TB1 wasn't even used in this version of the kit, so no problem. For the 20 meter kit, the mysterious hole was there, so the terminal block was installed.

Later, when it was time to install the power connector, the instructions discussed wire connections to J4 which weren't included. The power connector with the kit was a Molex-type, loosely fitting in a rectangular hole. J4 would have been a coaxial power jack, as in the 30 meter kit. Be careful here. If you don't know how to wire the Molex connector and associated diode, get help. The manual doesn't give you a clue.

I have had an exchange with Dick, KE8KL of OHR about the kits, and he told me that they have now standardized the coaxial power connector for the radios. Apparently there were still some of the older kits on the shelves, and all manuals have been updated.

Aside from that little problem, the construction went well. Alignment was simple and straightforward, and since I had a DMM with a built-in frequency counter, it only took a few minutes to have the rigs up and running. My first QSO on 30 meters was with Chuck Adams - K5FO in Dallas, so the reason for building the kit was met. I haven't tried 20 yet---too many other things to do right now.

If you are new to kit-bashing and QRP, you would do well to give the Oak Hills Research kits some thought. They are

reasonably priced, simple to construct, and the units work well. I now have the Explorer 20, 30, and the WM-1 wattmeter, which make a nice little QRP station on the bench. The NorCal 40A sits comfortably on top of the 20 and 30 meter transceivers. All these radios will fit in my large tackle box, with a couple of GEL-cells, to take to the field. I am ready!

72, de Roger, AA7Q NE#383
aa7qy@primenet.com
NorCal #1099

QRP FREQUENCIES WORLD WIDE

The following frequencies are recommended for QRPers. You can work QRP anywhere in the ham bands, but you'll find a large number of active QRPers around these frequencies in order to easily locate others running low power.

Band	CW	OSSB	DX Countries
160	1.810	1.910	1.843 (Europe)
80	3.560	3.985	
	3.710 (Novice)	3.690 (SSB EU)	
40	7.040	7.285	
	7.030 (Europe)		7.090 (SSB EU)
	7.060 (Europe)	7.110 (Novice)	
30	10.106		
20	14.060	14.285	
17	18.096		
15	21.060	21.385	
	21.110 (Novice)	21.285 (SSB EU)	
12	24.906		
10	28.060	28.885	
	28.110 (Novice)	28.385 (Novice)	28.360 (SSB EU)
6	50.060	50.885	50.285 (SSB EU)
2	144.060	144.285	144.585 (FM)

NN1G Rig Mods— Homebrewing 90's Style

Joe Everhart N2CX - NE#280

The advent of some excellent kits sponsored by QRP clubs on both coasts and several small businesses has led to a resurgence of interest in homebrewing. To the purists this is not "true homebrewing," but at least it's a major step above strict appliance operation. And in line with the do-it-yourself philosophy, those who build the kits are tempted by their simplicity to modify them and add additional functions of their choice. Here are a few of my own additions.

NEQRP whetted my appetite and appealed to my Scottish heritage by offering the XX-40 line of rigs, designed by Dave Benson, NN1G. They represent a branch in the evolutionary tree planted by Rick Littlefield, K1BQT, who popularized some very simple QRP CW rigs with pretty high performance considering their simplicity. The advance was combining simple, inexpensive crystal ladder filters (in turn popularized by Wes Hayward, W7ZOI) with a versatile oscillator/mixer integrated circuit developed for the Cellular Telephone industry. These two elements formed the heart of superheterodyne transceivers that overcome many limitations of earlier simple QRP CW rigs based on direct conversion techniques.

Oh yeah, Dave's unique contribution was simplifying the basic design to the point that NEQRP could sell the pc board and board mounted parts for only $40.00. The constructor provided the front panel controls and cabinet. That's surely enough to warm a frugal Scotcham's heart on a cold winter evening. By the way, the XX in XX-40 is for the band for which the rig is purchased and they were sold for 80, 40 and 30 meters.

Seeing a good thing, Dave Benson started a small business, Small Wonder Labs, to market his design, since the business volume outgrew the volunteer effort started by NEQRP. Business being what it is, the rigs are now slightly more expensive, although still VERY reasonable. And as an added feature, SWL also sells an add-on kit consisting of an attractive small case and the panel-mounted components. The SWL rigs are designated the SW-80, SW-40 and SW-30.

A popular form of homebrewing today is taking one of the excellent kits and adding your own enhancements. Here are several "enhancements" I've made on my Thirty-40. They are applicable to any of the series, and, of course the SW, series as well.

1. Audio Enhancement

The simplicity of the XX-40 means some compromise in audio output. My aging ears need help, particularly when I'm using a physically small antenna like the 30 meter Hamstick. The unmodified rig uses an operational amplifier to drive headphones directly. To get added gain and to better drive low impedance 'phones, I added a $9.95 Radio Shack 28-4031 audio amplifier inside the case.

This amplifier is 'spec'ed' to operate from any supply voltage from 6 to 15 volts or so, with a gain of 26 to 46 dB (you determine the gain when you assemble the amp.) Maximum output level is on the order of a watt! Needless to say, that's plenty of volume for headphone use. The amplifier uses an NJM386 integrated circuit, apparently a beefier relative of the popular LM-386. All components mount on a small printed circuit board. Assembly of the amplifer takes less than 1/2 hour.

Figure 1 shows where I mounted the amplifier - inside the top of the Thirty-40 case. I used another Radio Shack product, catalog number 64- 2343 double-sided foam tape. You'd be surprised how many consumer products use a similar type of tape to mount odd circuit board add-ons. In fact the phone company even uses a heavy duty type to mount cable clamps, phone jacks and switch boxes in customer installations.

Two precautions are in order when using what I call double-sticky tape. First, use only foam type tape. You need something that can conform to non-flat surfaces such as PC boards to get best holding power. And secondly, because the tape can absorb and hold moisture, be careful not to stick it onto any high impedance circuits. The moisture can cause erratic operation.

Adding the amplifier to the rig's circuit is very simple. I simply disconnected the wires to the headphone jack and connected them to the input terminals of the amplifier. The amp's output leads were then wired to the headphone jack. Figure 2 shows the electrical connections. Note that in the Radio Shack amplifier circuit, the input ground connection goes through a 100 ohm resistor. I have no idea why, so I ignored it and grounded the input directly to the amplifier's ground foil.

A POPULAR FORM OF HOMEBREWING TODAY IS TAKING ONE OF THE EXCELLENT KITS AND ADDING YOUR OWN ENHANCEMENTS.

I like to use ribbon cable for wiring in mini-rigs. It lies flat against side walls and minimizes rats nest wiring by virtue of the fact that the leads in it are held together by the common insulation. At the wire ends, the individual leads are pulled apart just enough to make connections. After wiring the amp to your rig, make sure that the volume pot on the board is turned all the way counterclockwise before you power it up. With the added gain, you may get a loud surprise if you don't! I experienced no difficulty in operation, although the -386 type audio chips need a pretty low impedance power source or they will oscillate, causing a loud howl or motorboating. Adjust XX-40 the board-mounted volume control and the amplifier's volume control for best results.

Some users of the NORCAL and Oak Hills Research rigs have mentioned low audio also. This amplifier is equally usable on almost any rig with inadequate ouptput volume.

2. Headphones for QRP rigs

Many of the simple QRP rigs these days, be they homebrew, kits or commercial, have less audio than we may desire. There are many reasons for this, simple circuitry, low power drain and use of the ubiquitous LM-386 audio amplifier chip. Many use 1/8 inch phone plugs, but there is no standardization on whether the jacks are set up for stereo or monaural head-

phones. I find it annoying to have to resort to using different adaptor plugs for different radios.

A handy solution is something I picked up from the Internet QRP-l e-mail reflector. Someone mentioned that Radio Shack sold a set of sensitive headphones that could be used either for stereo or mono applications. A trip to the local Shack told me the rest of the story.

They sell the model NOVA-42 headphones for about $12.99 (more or less depending on the store and whether or not they are on special sale.) The catalog number is 33-1115. Outstanding features are good sensitivity for rigs with weak audio, a 9 foot cord, and an in-line volume control and stereo/mono switch. The in-line volume control is particularly handy with the NN1G XX-40, Small Wonder Labs SW-XX and NORCAL NC-40 rigs which have no external audio volume controls.

I've been very pleased with the headphones' performance with the above rigs as well as an OHR 20 meter rig I used to have. The phones are also adequate for casual stereo music listening although they can't compete with high end Sony "digital" phones.

3. Standarized connectors for QRP rigs

I've built a number of small QRP rigs over the years and used a variety of commercial rigs as well. And they all have a different set of audio power, antenna and key connectors. Usually I have a ZIP-LOC ™ bag for each rig with adaptors to some common set of connections. When I wired up my Thirty-40, I decided to set a new standard for my rigs. It really wasn't unique, I just used the same connectors as my NORCAL-40A, because the connectors in it are pc-board amounted and thus difficult to change!

ANOTHER TRICK I USE WAS ALREADY DESCRIBED IN JUNE 95 NEWSLETTER OF *72* AS PART OF AN ARTICLE ON CONSTRUCTING A CABINET FOR THE XX-40, BUT IT BEARS REPEATING.

Figure 3 shows the control layout on the front and rear of my Thirty-40, It actually is only a small departure from the one recommended by NN1G in his xx-40 assembly instructions. The major changes are use of a three circuit 1/8 inch phone plug for the head and a two-circuit jack for the key lead. By standardizing the connectors this way, I can use the same plugs for either rig, an important consideration for portable or mobile operation. Remember the first Field Day when you discovered at the site at 2 pm Saturday that you had the wrong adapters!

Another practice that I have standardized is the use of a dummy diode. I wrote it up in QRP Quarterly a couple of years ago, but here's a short (no pun intended) summary. I put a diode from the input power connector of the rig to ground as shown in Figure 4.

Any of several types of diodes can be used. The simplest is an ordinary rectifier diode, with its anode connected to ground and the cathode connected to the positive power connector terminal. This prevents rig damge if you accidentally hook up the power with the wrong polarity (Of course I've never done this....)

A further refinement is to use either a power zener diode, or, better yet, a transient suppresion diode. In addition to reverse polarity protection, you gain overvoltage and transient voltage portection by using this type of diode. Just be sure that the diode voltage rating is high enough not to conduct with normal supply voltages.

A VERY IMPORTANT thing to do when you use a shunt protective diode is to use a fuse in the power line between the rig and the power source. If the diode conducts, the fuse blows protecting the rig. If you have no fuse, the diode conducts and overheats, then opens up allowing the rig to be damaged. I solder the dummy diode right from the power connector to ground, so you have protection even without the power switch turned on. I usually use a Radio Shack "cigarette lighter" plug for power connections. The rig end mates with the chosen power connector. And it has a built in fuse!

4. Case construction

Another trick I use was already described in June 95 newsletter of *72* as part of an article on constructing a cabinet for the xx-40, but it bears repeating.

I built my case as a wrap-around, with the board suspended in it (Figure 5). Mounting the rig this way makes the whole PC board accessible for adjustment, alignment and repair.

Rather than try to check it out while the board was flopping around on my bench (actually the dining room table), I mounted the board and panel controls in the cabinet first. Then, I applied power for the debug and alignment effort.

No shorts, no tacked-on-and-ready-to-fall-off-at-any-time leads and I could get to everything!

By the way, the homebrew case was constructed of glass-epoxy printed circuit material. This type of construction has several advantages. The material is very easy to machine with simple hand tools although its abrasive nature wears out drill bits quickly. Also, having a big copper ground plane makes grounding VERY easy anywhere you want it with by just soldering to it. You can even use the inside of the top and bottom covers for circuit additions, using "ugly" style construction as popularized in QST by Wes Hayward, W7ZOI. Just think, you can build a three-dimensional rats nest!

5. PC board terminals

When I build a PC board project, I HATE to wire to it. The darned leads keep falling out of the holes while I'm soldering, it's always tough to get the darned wires in the holes in the first place, and it's very messy to replace the wires when (not if) they break off.

My solution is very simple----I never wire directly to the PC traces. I use a terminal type that can be soldered into the connecting holes and solder the wires to the terminals. This also lets you do all the wiring connections and soldering on the top of the PC board.

At one time I had access to some neat gold plated knurled terminals that pressed into PC boards for a good mechanical joint even prior to soldering. I no longer have any so I use the Vector™ T-42 pins instead. They are available from most commercial suppliers as well as some who cater to hobbyists (like Mouser.) They only cost about 4 cents apiece (smallest package is 100 pins) and makes your projects neater and much easier to work on.

72/73,

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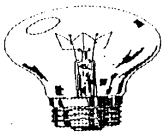

FIRST VACUUM TUBE

A Few Notes on Vacuum Tube Nostalgia

LB - W4RNL

Many of us built our first transmitters with a single vacuum tube as a keyed crystal oscillator. Nostalgia has brought back some of those rigs, rebuilt from scratch, to appear fresh and new. However, most of those one tube rigs of the late forties and fifties used practices known at the time to be bad. But, cheap was cheap—and forgivable in a first rig.

If you decide to give tubes a whirl, assuming you can afford the parts in this day and age, please update your design to the best practices of the tube era. Here is a short list (not complete by any means) of good tube, "hollow-state", practices.

1. Use a power transformer to isolate the AC from the chassis and circuit. Avoid direct AC rectification and the shock risks it presents. This is very important.

2. Do not key the cathode(s) but instead use some form of blocked-grid keying. Compare the plate voltage to the grid-blocking voltage, and the cathode-plate current to the grid current, and you will see the difference in danger at the key terminals. And do not directly connect your keyer output to a tube circuit without first being sure that polarity, current ratings, and voltage ratings are all safe for the keyed circuit.

3. Shape your keying to avoid clicks. This is simple to do in a blocked-grid keying circuit.

4. Use multiple stages to avoid keying the oscillator, if at all possible. A crystal oscillator might have to be keyed, but a VFO can be frequency shifted just out of the receiver passband without incurring chirp. A chirp is more likely when the oscillator goes from cutoff to full on then when it is frequency shifted. A mixing system that is keyed and allows the oscillator to run all the time is best.

5. Use a good output circuit that suppresses harmonics and other spurious signals. A PI network is not hard to design or implement. HAMCALC and other programs have PI design utilities. With a PI design, for safety, place an RF choke (1-2 mH) across the output terminals: if the coupling capacitor to the plate shorts, the choke will put the DC to ground and blow the fuse.

6. Oh, yes, use proper fusing figured for the right current level to blow reliably on dangerous overloads, but not on momentary overloads during initial tune-up.

7. Use plenty of power supply filtering with a full-wave rectifier. If you can find a small filter choke (5-15 H), use a two stage power supply filter with a good output capacitor for reliable regulation under the changing key-up/down load.

8. Avoid selenium rectifiers. Silicons is fine in place of the older rectifier tubes.

9. Use a bleeder resistor on the power supply as both a bleeder to discharge the filter capacitors and to act as a minimum load for good power supply regulation.

10. Try to find NEW high voltage electrolytic capacitors. Also test each transformer and choke to ensure that the insulation of the wires from the frame is still good.

11. Old tube sockets with ceramic bases are more likely to be in good condition than old ones with bakelite and plastic bases. Check and clean them thoroughly before using them.

12. Get a copy of a tube manual so that you use proper voltages for the plate and grid circuits. For blocked grid keying, the tube cut-off voltage is needed. For QRP, the recommended minimum operating plate voltage, and its corresponding screen grid voltage, if applicable, are necessary specifications.

13. Use proper means of interstage coupling to set both signal levels to drive the next stage and suppress, if applicable, anything but the desired signal. High impedance circuits are not immune to the same problems found in solid state, but may require slightly different means of correction.

14. Consider well whether your output stage, even at QRP levels, might benefit from final neutralization. Even five watt vacuum tube amplifiers can self-oscillate under the right (wrong?) conditions.

15. Get a handbook from the 50s to early 60s and study the more advanced circuits. There are many good ideas that requires only a few passive components to implement.

As you get into QRP designs with vacuum tubes, you will discover many other entries for the list, but these are enough to get you started. QRP deserves the best quality signal possible, and you and your family deserve the safest, most reliable equipment possible.

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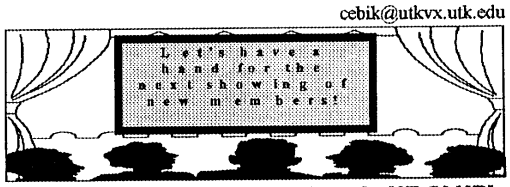

NEW MEMBER have their place in NE CLUB!

366 Michael T. Weaver, KG8H
367 Howard F. Newton, W2FB
368 Timothy Pettibone, AB5OU
369 Carroll J Shelton, KS4TL
370 Robert B. Sparks, AB5ZD
371 Ken Hanks, KD1XS
372 Charles Ketterman, K6EN
373 Clayton Schmitt, N7DKZ/HP3
374 Dan Goodwin, KD1XN
375 Lloyd Wood, KA2FDA
376 Mark Adams, N2VPK
377 James Pirkle, KR4QN
378 Millyn Moore, WA1JGK
379 William Studley, AA1OC
380 Michael Martell, N1HFX
381 William Morse, KB2URF
382 Wallace M. Kimura
384 Warren E. Lewis, AD4ZE
385 Christopher Gearhart, N1HWQ
386 Rob Caruso, VA3ROB
387 Robert Cutter, KIØG
388 William Breare, WA2YMW
389 Russell A. Mumaw, K3NLT
390 Charles P. Sammut, K8MI
391 Marvin Mitsuo Tanaka, KH6MM
392 David Maliniak, N2SMH
393 Jay D. Hall, WA6MOK
394 Kathryn Hall, WA6KFJ
395 Edward Manuel, Jr
396 Herbert Hoover III, W6ZH
397 Harvey Winters, VE1HDW
398 Michael D.Allen, KB5RBW
399 Ralph L. Irons, AA6UL
400 Barry Shore - no call
401 Lee Stanford, KM6LA
402 Richard K. Mulvey, N2VDS
403 Donald Stein, W2PTF
404 Edwin "Ted" E. Albert, KF8EE

THE QUESTION CAME UP ABOUT RADIO BEACONS, RECENTLY.

From the **"FCC Rule Book - Guide to the FCC Regulations,"** as published by the ARRL, from page 12-4, Chapter 12, titled "Specialized Operating"

"A beacon station is simply a transmitter that alerts listeners to its presence. In the radionavigation service, beacons are used to provide navigational guidance. In the amateur service, beacons are used primarily for the study of radio-wave propagation—to allow amateurs to tell when a band is open to different parts of the country or world. Accordingly, the FCC defines a beacon as "an amateur station transmitting communications for the purposes of observation of propagation and reception or other relatedactivities" [97.3(a)[9]].

The rules address beacon operation [97.203]. A few key points:

Automatically controlled beacon stations are limited to the frequencies shown in the table below.

Beacons that are manually controlled are not subject to the same restrictions as automatically controlled beacons [97.203(d)].

The transmitter power of a beacon must not exceed 100W [97.203(c)].

Any license class, except Novice, can operate a beacon station [97.203(a)].

Frequencies Authorized for Automatically Controlled Beacons

28.20—28.30 MHz
50.06—50.08 MHz
144.275—144.300 MHz
222.050—222.060 MHz
432.300—432.400 MHz
all amateur bands above 450 MHz

Thus, it looks like beacons below 28 MHz are not allowed by rules within the USA. Care is required here.

It will be interesting to see what happens to beacons below 2M after the W5YI application, since one way transmissions are pending by W5YI's application.

With the appropriate license, manually operating a beacon station below 28 Megahertz, the output power may not exceed 100 watts.

Operating automatic beacon stations below 28 Megahertz in the amateur bands is forbidden.

Chuck Adams -K5FO

ENY QRP

Paul Taylor - WB2GIN, reports that a new net has started up on 160 Meters. The ENY QRP net meets every Tuesday night at 9 PM local time on 1810 KHz. QRO stations are welcome to join in, but the net is intended primarily for the QRP level of operator. 160 Meters was chosen because the band is nearly empty except for contests. Five watts or even less can cover surprisingly great distances and it's anticipated that this net will afford more opportunities on this under used band. The net started during the summer, and activity should pick up as seasonal conditions improve. If you're equipped for Top Band, why not give it a try?

Reward:
Lost dog, 3 legged, one eye, mange, broken tail, recently castrated.
Answers to the name
"**LUCKY**."

DO YOU HAVE YOUR EARS ON?
OR
HOW TO CHANGE STEREO TO MONAURAL

Dennis Marandos - K1LGQ

There are some radio kits which require you to use one type of earphone while others dictate another. If you're using the Small Wonder Labs transceiver, you can cut the center shield to produce a monaural headset. I have used this conversion with great success! Also, if you measure your earphones and find the resistance to be near or very close to 8 ohms, the audio level will be strong. The further away from 8 ohms, the bigger the mismatch and hence less audio into the old cranium.