

April 1995

72

THE NEW ENGLAND QRP NEWSLETTER



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

TO:

72 ☺ THE OFFICIAL NEW ENGLAND QRP NEWSLETTER

## Write For Your NEWSLETTER

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

THE DEADLINE FOR THE NEXT ISSUE OF **72** WILL BE JUNE 3, 1995.

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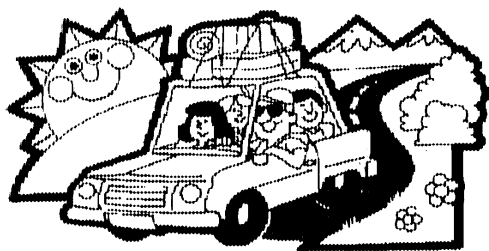
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## QRP Afield—Arizona Style

Mike J. Pulley - WB4ZKA

### Latent Thoughts on a Great Contest....

Here in the 'burbs of the Phoenix desert, "QRP-Afield" literally means "an excuse to take the family camping in the cool mountains for a weekend." After reading the other accounts, I'm almost embarrassed to report that temperatures peaked into the mid-70's, no rain fell until after the supper dishes were washed and the kids were snuggled in their bedrolls, and we had no irate landowners dictating where we could and couldn't park! (And they call AZ a harsh place to live!)

Rocky Evans - KG7VG, and I decided to 'tag team' for the contest. We ducked out of the office early Friday afternoon and scampered to Prescott, AZ at 6000 feet. My wife and daughters came along for a weekend in the woods as well. My wife is also a ham, and she is very supportive of such recreational getaways.

I really like the shorter 6 hour FD! It allows time to fit in some ham contesting without crowding out other fun activities with family and friends. It prevents a great contest from becoming grueling and overbearing.

Saturday morning at 7:00, Rocky and I started launching lines into the trees for the antenna. First, we had a debate over which direction was east. Suffice it to say, I can never show my orienteering merit badge in public again! We used a wrist rocket slingshot to hurl lead weights over the 60 foot pines and a fishing reel to pull the nylon antenna cords back over the top. As promised, we hauled up the 20 meter folded dipole on end for vertical polarization. When we finally stopped tugging and adjusting, the lowest point of the vertical was still a half wave above the ground. The antenna seemed to work fine all day.

Two high school age young men in the campground wandered over from curiosity. When we explained about ham radio in general and the contest in particular, they were all excited. They helped get the antenna up and later returned to see about our progress. One boy mentioned that his electronics teacher at school had offered to help the students get ham licenses. We may have some new hams spring up from this chance encouragement.

On the air at 9:00 MST. Occasionally, the 20 meter QRP window got squeezed out by the County Hunters on one

side and the encroaching packet racket on the other. When that happened, we found a nest of QRP activity sprang up around 14.047. "Good enough, sez I."

I did a dumb thing which shall go into the "Dumb Things I Have Done" column. First, let it be known that I am a NE-QRP member in good standing, but I haven't memorized my number yet. In programming the memory keyer, I mistakenly inserted my QRP ARCI membership number (#8492). Our first QSO with a NE-QRP member was WU7F, who repeatedly asked for my number. Then he finally asked, "NE NR?" Oops! I don't think NE-QRP is quite that large, yet. I couldn't find my NE-QRP number, so we quickly switched our report to "5W" and carried on. Duh! When I got home, I looked up my NE-QRP number (NE#248) and memorized it!

Slow going...average rate of 5 QSOs/hour. Far from blistering, but it left plenty of time to chat while the memory keyer pounded out CQ QRP, CQ QRP.... (What's the legal limit a station can call CQ unsuccessfully without having to append "B" after the callsign?)

We worked WU7F, W1FD, N6KR, K5FO, W5WO, AA4XX, KB2JE, VE2DRB, W4OEL, XE1/KG8DA, and JA7KE among others. I can hereby attest that Chuck Adams really *can* operate at 13 WPM, contrary to net rumor and lore. He pulled off one of the smoothest moves I've ever seen in a contest exchange, too. When Chuck called, another station was dead on zero beat with Chuck's note. (Don't you hate it when that happens?) I asked him to move up 500 Hz, a hazardous thing to ask most operators. The next thing I heard from him was "C" and 500 Hz away he was, when I could easily distinguish from the QRM. Nicely done, Chuck! Thanks!

I heard Jim, W1FMR, around 20:30Z, but could not raise him despite calling on all known 20 meter hailing frequencies. After reading his account, he was probably preoccupied with extracting his butt from the tar baby buoy.

We finished at 3:00 MST with 30 contacts, 20 multipliers, and a portable QRP kilowatt multiplier of X4 to total 2,400 points.

The equipment consisted of an MFJ-9020, a Palomar memory keyer, Bencher paddles, MFJ folded dipole suspended vertically, and a 12V battery.

Many thanks to the NE-QRP club for inventing and sponsoring this event. As mentioned by others, it comes at an excellent time of the year. QRP-Afield provides an excellent chance to escape to the hills/beach/park/school yard/driveway to ham in a change of scenery before winter forces us to stare at the same shack walls day after day. I can hardly wait to try again next time!

Regards, and 72

Mike, WB4ZKA

## CHANGE IN DUES...DUE

Beginning this September, the dues schedule will change. Renew your membership from September to December. After December, if your dues have not been received by the treasurer for the forth coming year, your name will be dropped from the 72 mailing list. This has been established to align the dues and newsletters together.

## NEW ENGLAND QRP CLUB Member Questionnaire

Jack Frake NG1G - NE#02  
March 17, 1995

### QUESTIONNAIRE RESULTS

In several past newsletters you saw our Construction/Club Kit Questionnaire. Here are tabulated results from those questions. Please keep in mind the intent of the questionnaire is only to obtain generalized information and surely not very scientific in nature. Heck, some questions are poorly written (if not all) as I had difficulty analyzing results in some areas...HI! With that said, I still found the information interesting-some as expected; some surprises. 38 members returned the questionnaire- a bit low but more than enough to establish solid results. Not all questions were answered... some more than once.

Q1. Are you interested in building homebrew equipment?  
YES=35, NO=0, OCCASIONALLY=3

Q2. If so, do you prefer:  
KITS=12, COMPONENTS FROM SCRATCH=2, BOTH=25

Q3. How many homebrew projects have you completed?  
0-1=3, 2-5=11, 6-10=10, 10+=14

Q4. Which method do you prefer?  
UGLY=12, PCB=32 OTHER=3(SM, PERF)

Q5. If surface mount transceiver kit were available, are you interested?  
YES=28, NO=8

This is an interesting response as there is surely interest in SMT (surface mounted). I will add though, that detailed notes were received from two knowledgeable members saying we should consider SMT kit only with extreme caution, as the equipment required to produce satisfactory results is not available to the average builder. This is an excellent point but interest is so high we could perhaps start with an easily managed kit. How about John, KN1H's TWO-FER? There are many circuits out there that would work well with SMT.

Q6. In what publication do you find the best circuits?

- |                            |                                   |
|----------------------------|-----------------------------------|
| 1) 72=22                   | 10) <i>Hambrew</i> =3             |
| 2) <i>QST</i> =21          | 11) <i>Radcom</i> =3              |
| 3) <i>QQ</i> (ARCI)=16     | 12) <i>NW QRP</i> =2              |
| 4) <i>SPRAT</i> (G-QRP)=12 | 13) <i>ELECTRONIC TODAY</i> =2    |
| 5) <i>CQ</i> =10           | 14) <i>COMM QUARTERLY</i> =1      |
| 6) <i>QRPp</i> (NORCAL)=10 | 15) <i>Low Down</i> (VK QRP)=1    |
| 7) <i>QEX</i> =6           | 16) <i>Popular Electronics</i> =1 |
| 8) ARRL Books=5            | 17) <i>World Radio</i> =1         |
| 9) <i>HAM RADIO</i> =4     | 18) <i>KIT CATALOGS</i> =1        |

Q7. Generally, in what price range do you feel is fair for a single band XCRV kit?

\$25-\$50=5      \$50-\$75=10  
\$75-\$100=9      \$100-\$125=1  
\$125-\$150=1

Additionally these responses were submitted.

Under \$100=8      Under \$110=1  
Under \$125=1      Under \$150=1  
Under \$200=1

It appears the market is in the range of \$75-\$100.

Q8. Have you built a QRP NE club kit? YES=21 NO=17

If so, which one?

79'er=6      40/40=15  
30/40=9      80/40=2

Q9. Did you complete the kit?  
YES=16      NO=6  
TROUBLE SHOOTING=6

Q10. Were you missing components from the kit?  
YES=8 NO=12

In fairness to the kit committee, the missing items were minor...one or two resistors, caps, etc. Several were missing difficult to obtain components. If you were one of those, I sent all that we had left over from the kit committee or from my personal parts bins. If you are still missing something, contact Dave Benson, (NN1G) as he will most likely have extra parts. The worst situation happened to be my own. The xtals from the 40 meter were accidentally placed in my 30/40 kit. It wasn't discovered until months later, after I had traded it for another piece of equipment with another club member.

Q11. What future kits would you like to see available, either commercially or from the club? Good response to this question. These are not in order.

Contest Keyer  
OSC/VFO/RF sources with digital readout  
High Efficiency Wire Ant  
Complete XCVR kit with PCB, case, etc.  
AM XCVR, lightweight, bulbs not LEDS  
Universal T/R switch, keyer, monitor  
Gel cell charger  
CW/SSB 5W DC 20,40,80 monobander  
NiCad charger  
Dual band XCVR 20/40, 80/40  
VHF gear  
Digital freq. display for analog TX, RX  
Portable Ant  
Test gear  
CW/SSB rig with 160-6m band modules  
Solar panel with charger circuit  
Cheaper version of the W7EL watt meter  
Artwork for club homebrew PCB's  
Step attenuation- low/high power  
Multiband SSB RX  
2M CW TX for Oscar

NN1G rig for 17M  
 Ant tuner/SWR to match 40/40  
 6M XCVR  
 2M CW/SSB XCVR  
 XCVR with drilled case/knobs  
 Micro XCVR  
 Keyer/paddle for travel  
 HF handheld  
 20M SSB XCVR, 5 watts, AGC, RIT,  
 excellent RX

If you search hard enough, 75% of the above is already available in publication, though not in kit form. If enough interest exist, a new kit committee can be formed. Contact Jim, W1FMR if you wish to donate your spare time.

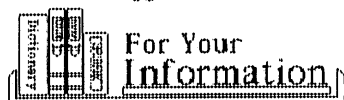
Jack Frake NG1G - NE#02

### 30/40 NN1G Rig...Orphan

**The Kit Committee has one remaining 30/40 KIT. The first phone call will reserve it. The price is \$38.00 plus postage. You supply the mods. Call Jack Frake NE#02 in Vermont 802/234-9792.**

#### Don't Be Caught Short!

Don't Forget, the dues schedule for NE-QRP Club is changing and will be September through December to RENEW your membership. This procedure is to align the ZZ newsletter with the membership dues from January to December. If you would like to subscribe several years ahead and avoid the yearly reminder, notify the club treasurer.



Some have trouble radiating with an End Fed Long Wire or Random Length antenna. If you are not getting out, or cannot match for low SWR. Here are a couple of things to try:

#### Match:

For a better match, cut a little wire off the antenna nearest the tuner.

#### Tuner:

Borrow a 2nd tuner, or build another type (simple L match) and ask a friend for a signal comparison between tuners.

#### Ground:

2, 3, 4 or 5 quarter wave radials spread around (counterpoise) are much better than 1 long one. Cut the long one in half. Connect them to tuner ground terminal.

#### Antenna:

The high current part of the antenna is where radiation takes place. The (away from you) open end of the antenna (most likely) has high impedance to ground, therefore, LOW current. Where you have the antenna connected to the tuner may be relatively low imp. and high current. Try to get enough wire up

in the air so that a high current node is located at a high point on the antenna.

#### Example

The current maxima occurs ~ 33 feet from the open end on 40m.

The current maxima occurs ~ 16 feet from the open end on 20m.

The current maxima occurs ~ 8 feet from the open end on 10m.

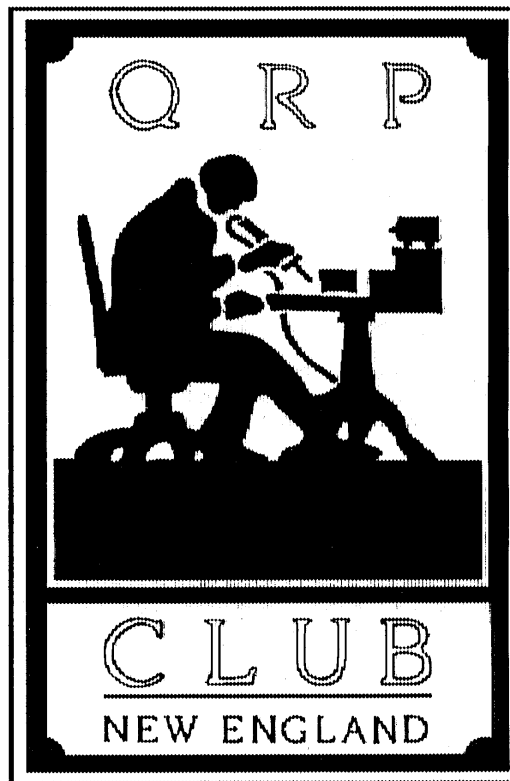
Or at 1/4 wave from the open end.

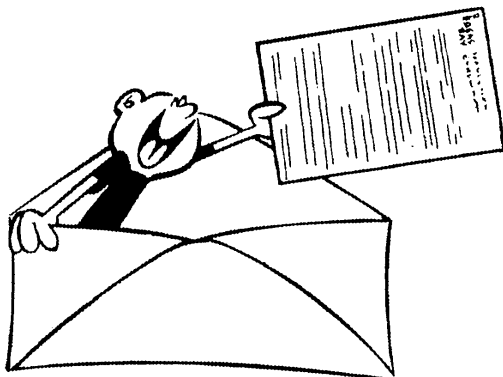
Many old timers do not know this but have stumbled onto a "magic" length. I use ~ 100 feet, for 7.0 MHz and higher, and cut a little off the end near the tuner, till it is able to be "Matched."

This stuff is magic. Read the Antenna Handbook, and Solid State Design, page 152 and 167 for measurement circuits, and experiment at home. Winter is rapidly coming to New England, and along with it some of the finest outside antenna experimenting weather to be found anywhere. Sorry for the folks in CA and AZ, with your (70 degree) poor antenna experimenting weather.

Good luck....72.

Jim, W1FMR





## No Limits To NE-QRP

Richard A. Stern - NW3N  
14 Minden Avenue  
Crisfield, Maryland 21817

I've recently become a member of NE-QRP. I was very pleased, when I received my first copy of *ZZ*. I read through and browsed most of the articles and reader comments. I couldn't help pause over the comments made about limiting the number of your members. I did ponder, for quite sometime, what this would mean to NE-QRP. Being a new member, not one from your region, I was a little taken back.

I've been active in 'ham radio' for about seven years. I managed to get my Extra ticket within about a year. Believe me...I was ready to plunge 'ALL MODE' into this great hobby. I bought a used TS-820, used 2 meter mobile, TNC and new handheld. I stepped on the 'HAM RADIO SUPERHIGHWAY' and revved up a borrowed PC to get into OVERDRRRIVE!!!!

(Just a little personal background.... I am a senior engineering electronics technician for a contractor at a NASA facility.)

Before I knew it, I was knee deep in hardware, software, firmware and wear-ware. I was packed up for this 'busman's holiday.' In the region I live in, packet enthusiasts abound and I became one of THEM!

To make a long story short, I was a little fuse in a BIG circuit (or was that circus!) I burned out! PUFF...SSSTT!!! My hard drive became floppy. I couldn't look a good piece of software in the CRT. I sold every piece of ham gear I had. (Well, I did keep my hand-held.) When I did this, I felt an unexplained relief coming from within; causing me to evaluate what I really wanted from this hobby. I found it summed up into one three letter word...FUN.

Plain and simple, that's when I turned to QRP. I can't describe the joy I had putting my first 5 watt, 30 meter on the air. After a one year hiatus, it was like going fishing. Sit back and cast a CQ into the RF pond. Call me easily pleased or too

laid back. I don't give a darn. I, finally, was getting FUN from a hobby I was fascinated with since I was a kid.

I started slooowwwly this time. I purchased an MFJ 9030. CQing in the mornings on weekends, re-learning the code and building basic antennas. I even kindled a desire to build my own equipment. The first kit was a Ramsey 30 meter, 1 watt (maybe) transmitter. I had read the ad in *QST* and now had one for myself. I looked in publications for information about QRP, which was pretty slim. I even made searches on the Internet. I got the ARRL sever and found a distributors list. This led me to send for some catalogues. My next kit was a HOWES 20 meter (5-10 watts). 'Really caught the building bug on this one.

LOW and BEHOLD. I found a club list on some server and dumped it to my printer. I can tell you...it wasn't easy finding sources for QRP stuff until one plugs into the right place. I looked over the list. It had a brief description of clubs all over the US. Picking NE-QRP, because I was partial to New England (my mother's from Portland) and it seemed to be the closest to my region. I happily sent my membership off in the mail.

I deeply feel that if you limited memberships, you'll dry up a great source for anyone that might be searching for knowledge about this mode of Ham Radio. I can understand about trying to administer a large group and cost that goes along with that.

I guess what I'm trying to say is, the newsletter, no matter how anyone tries to trivialize it, is a connection point for amateurs like myself. The membership is a good perk too. God knows, how many other hams are, or will be, in the same circumstance I found myself?

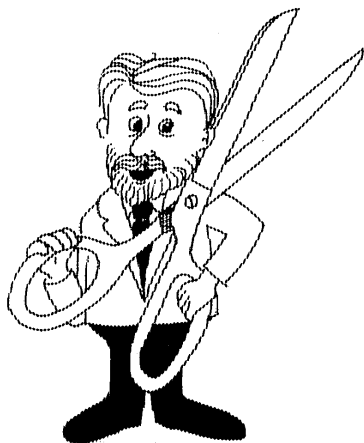
If you limit your membership, I feel, you might be putting out little sparks of curiosity that keep this great mode (QRP) going. I can't tell you how many times I've heard that this hobby in general, is dying. Well, don't help it along!

By the way, I didn't expect to contribute anything so soon, but you got my dandruff up when you said 'LIMIT'. Maybe, next time I'll write about the 5 foot diameter loop I've built from RG-8 and 1/2 inch PVC pipe. It sports a gamma match! You should see the field-strength meter (idea from your newsletter January 1995) jump. But, I might just have to limit myself and not write so much.

You should understand that this is only the opinion of me and my Labrador Retriever, Morgan....

**TNX de Rich Stern - NW3N  
Crisfield, Maryland**

Ed Note: Thanks for the interesting letter Rich and, I for one, whole heartedly agree with you concerning the limits for NE-QRP. I feel, as I had mentioned in January's newsletter, that the person who was 'cut off' from joining is going to, perhaps, be the greatest contributor, the deepest thinker and the most powerful designer the world of electronics has ever known...but we'll never know because he was denied access to 'the club.' Judging from your background and amateur experience, you have found a niche of amateur radio that suites you well. You're joined by many Hams across the country, as well as the entire world, who simply like to tinker, paste, pull and solder their hobby and then step back and admire what they have created. It goes without saying that we Hams enjoy radio, in every aspects of the hobby, and that you have chosen one portion of our minor obsession with enthusiasm of a kitten with a ball of thread. Keep the strong feelings and stay with your deep seated perceptions as to what radio should be like and you'll enjoy this hobby the rest of your life. I am curious who else had an opinion about limits for NE-QRP. Good luck and great DX to you and...of course, Morgan. (Are you ready to write that next article for *ZZ*?)



## End Fed Long Wire

Jim Fitton - W1FMR

For ease and speed of erection, and multiband versatility, at almost any location, it is hard to beat an End Fed Long Wire (EFLW).

A horizontal flat dipole is a better single band antenna if you can get good height, but it's bulky, time consuming and tricky to erect especially for 40 and 80 meters. Sloping and inverted-vee dipoles, though easier and quicker, are still not as easy as the E.F.L.W. Additional gear needed for an EFLW and other non-balanced antennas:

1. Some quarter wave length wires laying on the floor/ground to act as an RF ground or counterpoise. Connect them to the ground terminal of the tuner.
2. An antenna tuner
3. A sensitive SWR meter or bridge.

There is some loss through a tuner, but it's worth it to sacrifice an almost unmeasurable amount (0.2 db) of signal loss through a tuner in order to gain multiple bands, quickly and easily with an E.F.L.W.

See pages 152, Figure #26 and page 167 of *Solid State Design* for a tuner/bridge that can be made. A sensitive, tiny, edge mounted meter is desirable, and a 100 microampere meter will provide about 50 milliwatts full scale sensitivity. Scour the flea markets and snap up small, sensitive meters. Radio Shack sells some 100 ohm 1 watt film power resistors that can be connected in parallel to provide 50 ohms (figure 26). You can experiment with inductor and capacitor values that will make your test antenna and counterpoise behave, prior to taking them out into the field.

Jim Fitton W1FMR

## Colorburst Contest Comments

I was only able to operate the last 10 minutes of the event and was not able to get the newly homebrewed transmitter on the air in-time so I quickly fired up the Argonaut II and was pleasantly surprised to hear much more activity. I was running 5 watts to the end-fed 120' wire and worked WA1FMR/X, VE2KN, WB8E, and WA4EAT.

A very nice event. I will have the colorburst homebrew rig setup for next year.

73 ds Ted, KF8EE

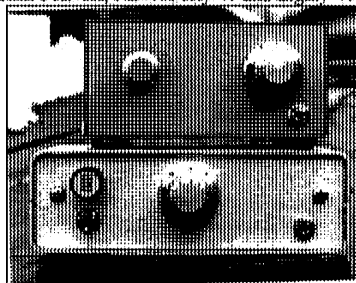
Last night I managed to work, with great difficulty: W1FMR/X Jim 579 NH 1 watt with S-5 QRN at 9:45 pm on 3.578.8 and W2FB/QRP Howard 559 NY 4 watts with S-5 QRN at 9:57 pm on 3.580.4 I heard W2FB talking to VO1DRB but couldn't hear Bob at all. Walt, WB8E, is about 3 miles from me, he had the only good signal on the band. Walt could hear better than me with his INVERTED VEE. Next time you guys have this contest, please consult the Sun for better sun spot activity and lower noise levels. okay Jim (W1FMR)?

Had good time, CU next week.

Rig: QRP Plus, 5 watts out, Oak Hills QRP watt meter, Gap Titan Vertical up 12 ft.

72, Byron WA8LCZ / VFO  
P.S. I used to run Xtals in my novice days, I'm never going back to that again. I don't care what you call it.

John Collin's KN1H, NE#01Forty-40 and Eighty-40 QRP Rig



John KN1H, Ernie AA1HK, Dan KA1ZYH, Mike N1JYP, Dave W11S

# LETTER TO A NEW QRP'ER ON ANTENNA SELECTION

Ed Manuel - N5EM  
Houston, Texas

First, realize that your question is so open that books literally have been written on the subject. Hence, I will "point" in certain directions.

1. There are numerous antenna tuner designs around. Consider one factor. If you decide on a coaxially fed antenna, choices are basically simple and in just about every antenna book, handbook and QRP book. If, on the other hand, you chose to feed your antenna with a balanced line (ladder line, twinlead, open wire line, to mention a few of the names), go find the design in recent handbooks by Zack Lau specifically intended for balanced feedlines. (ARRL Handbook, 1993 Edition, page 34-21, local library one would hope) Personally, I prefer not to use a toroidal balun for feeding a balanced line but Zack's use of it first is much better practice. The use of an unbalanced tuner first, followed by a toroidal balun is generally commonplace in the commercial tuner like MFJs and such.

2. You have a 3rd floor? God, that must put your roof up close to 40 feet. Try to use that height to your advantage. For 20 meters and up, you have the perfect platform for some kind of beam. Some homebrew beams that are not expensive or excessively large are the X-Beam and VK2ABQ Button Beam. How about a chimney mount? If you are interested in 30 meters and down, you can use that roof height to anchor a wire antenna. While you are in the 1993 ARRL Handbook, go to page 33-15 for a description of the X-Beam. At 20 meters, they become practical and can be mounted on an inexpensive TV rotator on a chimney mount.

3. For wire antennas, consider simple arrangements like the Up and Outer (I really hate that name). Feed a wire up to the highest point you can, then turn and head out to a tree for as far as you can. Point is to get as much wire as high and as long as you can. Then, tune it to your desired frequency with a tuner. I would encourage you to go find another experienced ham, preferably a QRPer, who can actually come to your house and look it over. I personally find that I have to stand in the backyard and think for a period of time until I can find the better ways to use the space. An antenna is a lot like a suit of clothes. No one solution is just right for every situation.

Reference material you should use  
**HF Antennas for All Locations**, Moxon, RSGB Probably the most interesting and useful antenna book I have.  
**W1FB's Antenna Notebook**, DeMaw, ARRL Good "how-to" book with emphasis on inexpensive wire antennas. ARRL

**Handbook**, 1993 Edition, ARRL. Just the last one I have. The 1994 and 1995 probably have the same information in them, but the locations may vary. One reference I do not think you would benefit from, at this point in your hobby is the **ARRL Antenna Book/Compendiums**. Long on theory and more advanced construction, short on simple, flexible wire antennas. Like they say in Cub Scouting, KISMIF (keep it simple, make it fun).

Above all, don't be afraid to experiment. Learn to measure what is going on in your antenna. Operating on the ham bands is a chance to compile statistical data. Put an antenna up. Use it for several weeks. How does it work? Where are you working stations? From which directions do they seem to be strongest? Did it perform as you expected when you put it up? How can you improve it? This is what makes the hobby fascinating. Just remember, just about anything will radiate and allow you to make contacts. With patience and a little attention to detail, you can make it work efficiently. Many a QRO station run their 100W ricebox to a crummy antenna never knowing the difference (Why, my tuner makes it a perfect match to the rig!). The QRPer delights in taking his/her watt or two and effectively radiating it so that the QRO station is "amazed" that QRP works so well. Let them think its magic, not physics!

Ed Manuel - N5EM n5em@aol.com  
Houston, Texas

QRP - Its a state of mind, not just a power level.  
QRP ARCI #4914, G-QRP #1243, NORCAL #498

## 1995 DAYTON QRP-CLUB FORUM SUNDAY 9:30-11:00 A.M. IN ROOM #7 FEATURED SPEAKERS WILL BE:

1. **Doug Hendricks**, KI6DS President of the Northern California QRP Club:

Doug Will explain how to hold "Successful Local QRP Gatherings" and how to attract local members and have fun meetings that people keep coming back to.

2. **Jim Fitton**, W1FMR Coordinator for the QRP Club of New England:

Jim will speak on QRP club leadership and introduce QRP club leaders from around the country.  
Local QRP Club leaders and representatives:

Be prepared to be formally introduced, explain the mission statement of your local club, and comment on upcoming projects and events.

**SAW YOU SAW IT  
FIRST IN 72**



## **Autek RF-1 Antenna Analyzer**

Product Review

**Joe Everhart, N2CX**

Last Christmas, which was only a half year ago, Santa Claus was very good to me. I got exactly what I wanted—an Auttek RF-1 Antenna Analyzer. Of course, I helped things along by attaching a copy of an ad from *QST* to my Christmas wish list...

The Analyzer is a small hand-held device intended primarily for measurements on hf amateur radio antennas. Condensed specifications are:

*Case:* 4.5x2.5x1.5 inches, black ABS plastic

*Weight:* 7 ounces

*Tuning range:* 1.2 to 35 MHz

*Display:* LCD with 1/2 inch digits

### **Readings:**

*VSWR:* up to 6:1

*Impedance:* 8 to 2000 ohms

*Inductance:* .04 to 300  $\mu$ H

*Capacitance:* 1 to 9999 pF

**Power:** 9 volt Alkaline battery (not included)

The appearance of the instrument is deceptively simple. It has an SO-239 coaxial connector and a ground lug for connections on one end and a LCD operating control display on its front. Operating controls are: pushbuttons for power on, selection of frequency band and mode, and two knobs for tuning. It tunes over the hf band in several ranges and is tuned by means of coarse and tune adjustments. The operating frequency is displayed on its multi-purpose LCD display. The display is also used to show measured values, depending on the mode chosen. Mine also included an accessory kit consisting of a couple of mini-alligator clips, a banana plug, and directions for the analyzer to measure rf components.

Use of a microcontroller chip allows the RF-1 to perform multiple functions and give detailed digital readings. Operating theory is not given in the instructions, but it appears to use a broadband bridge—probably resistive. Hints in the instructions also mention diode detectors and an A/D converter. It appears that the device performs analog rf measurements, rf detection and conversion to digital data, then calculation and display using the microcontroller. SWR and rf impedance are calculated and displayed directly. Inductance and capacitance readings are calculated as if the measured impedance were pure reactance. Methods are described for using displayed values to determine the type of reactance present and estimating the resistive component of the impedance. Its operation is similar to SWR analyzers made by MFJ, but it has the added advantage of calculating and displaying more than just frequency, SWR and "Resistance." In addition to that, the digital display is much easier to read than the analog MFJ meters. On the other hand, the high end MFJ units have a jack to allow use of the internal

frequency counter with external signals—a feature that the Auttek device lacks. The RF Analyzer's battery life is not given, but is probably longer than its competitors because of its liquid crystal display. At 1/4 the size and weight, the RF-1 is far more usable than the MFJ units in outdoor or tower-top applications.

The very thorough instruction book covers a wide variety of uses including:

Impedance measurement

SWR

L&C measurement

Converting between L and C and Z

Making 1/4 and 1/2 wavelength transmission lines

Measuring cable loss

Determining cable impedance

and several others. It also gives practical guidelines for usage and expected error values for its various operating modes along with methods to minimize measurement error. The book itself is a minicourse in rf and antenna measurement techniques.

Who should buy one? Well, the obvious answer is the serious hf antenna experimenter or builder. The unit is inexpensive enough that even a casual "appliance operator" might like to have one to check his antenna periodically. Unlike ordinary SWR meters, the RF-1 allows its users to determine the nature of antenna degradation if it occurs. Additionally, the serious ham builder can use the expanded measurement capabilities of the gadget for analysis and measurement on the bench. It isn't a lab-grade instrument, but then again, it doesn't cost \$30,000. With a few bright ideas, it can be very handy for checking rf components and resonant circuits as well as antennas, feedlines and antenna coupler adjustments.

### **Availability:**

The RF-1 is available only by mail order:

**Autek Research**

**P.O. Box 8772**

**Madeira Beach, FL 33738**

**813-888-9515**

Note that the company has recently moved and the above address is their NEW location and phone number as of about December 1994. The cost is \$129.95 plus \$6.00 shipping and handling and they do accept Mastercharge and VISA by phone. Shipping time may vary since Auttek is apparently a small company without a large inventory. I've heard 3 to 4 weeks delay, and mine was just under a month at Christmas, which is phenomenal.

I have no interest in the company other than being a very satisfied customer.

7/2/73,

**Joe Everhart, N2CX**

(Joe brought the analyzer to Newington, CT, and it is impressively tiny. An antenna analyzer to fit into your shirt pocket.)

## Small Wonder Lab 80 Review

Chuck Adams - K5FO

**MFR:** Small Wonder Laboratories  
**ADR:** 80 East Robbins Ave, Newington, CT 06111  
**Designer:** NN1G, Dave Benson  
**Model:** SWL 80 (80M version of NE40-40/NE30-40)  
**Size:** Single PC Board 4.0"(W)x2.8"(D)  
**Weight:** Not specified or weighed - a few oz at the most  
**PC:** Single Sided Solder Masked silk-screened and Solder Plated  
**Manual:** 17 pages, good quality single sided  
**Power:** 12-13.8 VDC  
**RX Drain:** 22mA@12.8V  
**TX Drain:** 422mA@12.8V for 1.5W output  
 130mA@12.8V for 15mW output  
**Modes:** CW Only  
**Kit?:** Yes. Only PC board and parts. Chassis parts and chassis not supplied.  
**Bands:** 80M, 40M, and 30M.  
**LO/VFO:** approx. 37 KHz range, 5.324-5.287 MHz on K5FO's Varactor tuned.  
**Drift:** 350 Hz for 30 minutes from cold start (K5FO)  
**Dial:** Builder dependent  
**RX:** Superhetrodyne  
**XMTR:** Yes. 0.0-1.5W output internally adjustable  
**Filter:** Two crystal Colp filter at 9,000 MHz  
**Selectivity:** about 900 Hz. SSB understandable on rcvr  
**RIT:** No - option from NN1G for \$5  
**Gain:** RF only  
**AGC:** No  
**Preamp:** No  
**Atten:** No  
**SPKR:** No  
**Meter:** No  
**S Tone:** No. Signal monitoring  
**Output:** 0.0-1.5W output, internally adjustable  
**Keyer:** No  
**QSK:** Yes, solid state  
**Price:** \$50 including S&H  
**Avail:** Yes. See above address.  
**Date:** January 29, 1995  
**Author:** Chuck Adams, K5FO

Two weeks ago, while on business in Mt View CA, a meeting of local QRPers was set up at Two Guys from Italy Restaurant in Mt View CA. At his meeting were Wayne Burdick and Dave Benson and a host of others.

I was sitting next to Dave and he was talking about his new boards and the SW80, the 80M version of his rig. Well, not being one to be pass up a new rig, (well almost). I placed the money in Dave's possession before the end of the meeting. He was out in CA from CT for the week. So he mails me kit on Monday the next week and I get it on Thursday.

Friday night, anxious to get at it, I do and about 2 am on Saturday morning it's a done deal.

First comments and impressions. A real nice clean board and much better than the previous ones from FAR Circuits, though the FAR boards were all right. The new board reminds me of the Heath green solder masked boards. Nice clean and some slight changes made over the other boards like I have on the NE40-40 and NE30-40. The silk screen is nice and clean.

There is an error on the board on the printing. Lower left hand side, first cap is labeled C2, sorry it really is C1 (150 pF) for the SW80.

The parts are first rate and all were there and the toroids -61 and -43's are in separate envelopes so that you won't mix 'em up.

I didn't feel like getting out the drill and make holes in a new case for this critter, so I yank out one of the NE40-40s out of its case and this puppy sits exactly right in the same place with no modifications whatsoever. OK, so 2 am, time for the smoke test.

I put on the earphones and plug in the Gel-Cell. Remember, I'm adventuresome and I don't use switches on the little rigs. WOW. Signals already. There's nothing to align on the receiver except C8 for the LO/VFO. Wow, loud signal and fast CW. Tune off a little and it's RTTY! Try to decode that? NOT.

OK, tune around and I'm listening to ship-to-shore stuff and CQs from marine monitoring stations. Oooops. Wrong frequency range here. OK, get back the assembly manual and look at L1 and count the turns. Ooops. Two too many, so remove two and low and behold we're in the low end of the band, where before we were too high. Now feeling better. There's a KH6 and a bunch of 6's on him, no chance for me. OK, so tune up a few KHz and hear KN6LX calling CQ. Call him and he just hears me above the noise level, so no QSO. He did try real hard though. OK, off to bed.

Sunday morning, up and its a little after 9 am CST, so let's see if the OK QRP group is on. They meet at 8:30 am on 80M now, since 40M was so long during the winter months and the low sunspot count. Sure enough I hear W15W, Randy, in OKC (Oklahoma City OK) and turn on the keyer and wait. He's talking to Dub, WA5YFY. Dub signs and Randy is by himself. Everyone has checked out. So I holler at him and he comes back. I get a 559. Talk for a while and sign off. The OK group meets around 3.687 MHz, since one of the guys is rock bound (crystal controlled) and can't meet elsewhere on 80M.

Good rig and good results with no problem other than I can't count and this probably due to the fact that I wound it last after just doing two 16 turn toroids and then doing 14 for L1.

OK, later in the day and I do the above review chart. I setup rig again into dummy load, etc. and start measuring things. WOAHHH! What is going on here? I get to the current/power out measurements and the reason I have the 15mW power results is that was the power level I was using in talking to OKC and CA! I had OHR in low power position and I guess last night I did not adjust the transmitter section. OK, tune and get the right output range. Now turn down to 0.95W to start on the battle for contacts on 80M just at the tail end of the winter season. Well, there is next year.

Dallas to OKC is 189 miles at 15mW yields 12,600 miles/watt for first contact. Not bad. The Ridgecrest, CA attempt was 1,205 miles at 15mW would have been 80,333 miles/watt. Almost but no quite, but that's what makes QRP so much fun. It isn't 100%, it's gotta be a challenge.

So another rig. I'm impressed with receiver sensitivity. It is a lot hotter than the 40M and 30M versions, a lot.

The above contacts with 90' long wire with MFJ tuner, so not the optimal antenna by a long shot. The only change to make, and I think this will take some experimentation is to reduce the selectivity or use the audio filter from OHR. Probably the latter until I get bored.

One of things that I'm impressed with is with Dave Benson and Wayne Burdick is the way that drift has really been

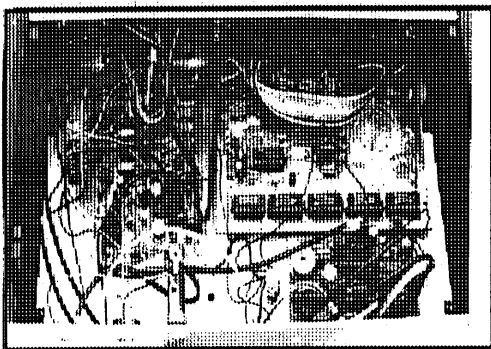
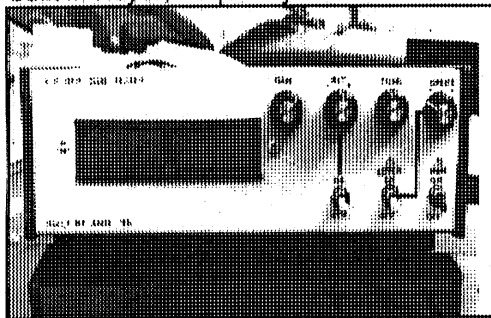
cut down with varactor diode tuning. People used to avoid it like the plague due to drift. A variable resistor is a lot lighter than a cap, but you do get finer resolution with a vernier tuning mechanism on a cap. Maybe someone can come up with a variable cap the same size and shape as what we are currently using with reduction mechanism or use one out of a damaged cap. Something for someone to come up with.

INMHO, another fine rig to play with during the nights when 80M is open and humming. Just the QRN is starting to pick up with spring and summer coming and it's already here in Texas this week.

Chuck Adams K5FO CP-60 ad-ams@sgi.com

## OUT TAKES OF QRP HOMEBREW

The following rig is Ernie's, AA1IK with built in Keyer, frequency counter and RIT



Ernie AA1IK - 40-40 RIG, inside view

## Coming Events

Dayton, Ohio the largest HamVention in America, if not in the world, on April 28, 29, 30. A lot of fun stuff, great crowds and easy lectures will be given in three days. Treasurer statement - DUES are due to change! We will move to September 1995 timeframe for renewals.

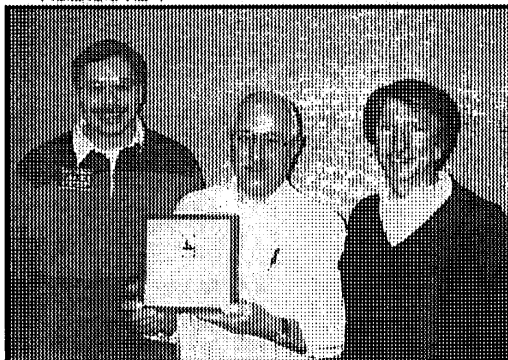
(Application---not needed for renewal. Call & NE# 1)



Dennis Marandos - K1LGQ pointing to call letters of W1AW in Newington, CT. NEW ENGLAND-QRP Club mid-winter meeting.

## THINGS TO PONDER

- NOVICE NET - W1JXR.... ANY INTEREST?
- QRP-TO THE FIELD SPONSORED BY THE NORCAL QRP CLUB
- QRP AFIELD SCHEDULED FOR SEPTEMBER - MAKE PLANS
- ARRL FIELD DAY JUNE 23, 24, 25 (FRI., SAT., SUN.)
- DUE SCHEDULE CHANGED SEPTEMBER THROUGH DECEMBER. NO LONGER WILL DUES BE SENT IN JANUARY. SEND YOUR RENEWAL TO PAUL KRANZ - W1CFI AND INCLUDE YOUR NAME AND NE#.



QRP-AFIELD - PLAQUE AWARDED TO W1FD AT ARRL HEADQUARTERS -NEWINGTON, CT  
CHET AA1EX, BILL W1KKF, JIM W1FMR

## Reflections on the Winter 1995 Colorburst Sprint

Ted Albert - KF8EE OHIO

During the past eight months, I have turned quite serious about HF QRP. I traded away my ICOM 735 for a new Ten-Tec Argonaut II as my main station rig. I ordered catalogs from various parts houses and began stocking my basement workshop with everything from toroids to varactor diodes. In January of this year, I was proudly surveying my workshop and wondering what I would build first from the new stockpile of parts. The decision came shortly after reading a note on the Internet QRP mailing list about the colorburst sprint. I couldn't believe that there were actually other amateurs who had found some value for those little colorburst crystals that can be found in many parts house catalogs. Radio Shack used to stock them on their shelves and one of them had found its way into my basement workshop years ago. The many times I had listened and called on 3.579 MHz yielded no contacts, yet here was evidence that folks actually used that frequency for QRP and had built rigs for it. I printed out the notice and posted it near my operating desk to remind me to listen for the up-coming event.

The first Thursday night in February yielded an hour of listening to static as I tuned around 3.579 MHz with my Argonaut II. I was reading the article in *Solid-State Design* about the 1 watt experimenter special. The article had been referenced in the notice about the colorburst sprint as a source for building a small crystal controlled transmitter for this event. At the end of the hour I made a mental note to check my parts stock to see if I had everything needed to build the little transmitter. I did not hear any colorburst sprint stations that first evening.

The second week I was monitoring again with the Argonaut II on 3.579 MHz, listening for stations signing /X to indicate that they were using their crystal controlled transmitters for the colorburst sprint. I started monitoring around 9:15 PM between 3.578 MHz and 3.580 MHz and heard nothing but static. I kept listening and at 9:45 PM was ready to call it quits when low and behold there was a weak signal calling CQ QRP on 3580.6 MHz. The signal grew in strength over the next few minutes and there he was, W1FMR/X. It took two attempts for us to connect, but at 9:50 PM I got him in the log with a 559 NH 1 watt. I sent him a 529 OH with 5 watts. I was hooked! I knew right then that my next construction project would be a 1 watt crystal controlled transmitter for the "colorburst sprint!"

The third week and I was busy in the workshop laying out the parts for my transmitter. The only dilemma I faced was how to construct the circuit. I didn't have the materials available to layout and etch a printed circuit board. That left me two choices, either use point-to-point wiring on a piece of perf-board or going with the dead-bug method of construction on a piece of copperclad board. As I was puzzling this over, I remembered reading about using a hacksaw blade to cut grids on a piece of copperclad board for building HF transmitters. I had a scrap piece of copperclad board that measured 2 x 4 inches. It was the

perfect candidate for the job. Cutting the grids took about 15 minutes of work and once I saw the result, I rolled up my sleeves, filled up the coffee mug, and settled in for an evening of serious work.

I started by simply placing all the parts on the board to check spacing and location. The plan was to build the stages from left to right, with the oscillator section built first. I used a metal-case 2N2222 for the oscillator and had it wired in about an hour. I took my time with the circuit, patiently winding the 43 turns of magnet wire for the primary of the tuned output transformer for the oscillator. Confident that I had the circuit wired correctly, I turned on the bench receiver, hooked up the RF probe and the VTVM to the secondary winding on the output transformer and keyed the oscillator. Success! There was a very nice signal and the VTVM was showing signs of life from the little oscillator. I spent the next 30 minutes working with the tuned output circuit, taking voltage measurements and just plain tinkering with the circuit. I was having so much fun that I had to force myself to stop testing and move to the final amplifier stage. After replenishing the coffee mug, I moved on to the final amplifier.

For the final amplifier stage, I choose a 2N2219 in a TO-39 case. I guessed that I might get close to a watt out of the circuit with that transistor. Another half-hour of work had the final amplifier completed on the board and it was time to smoke test the transmitter again. After coupling in the wattmeter and the dummy load, I keyed the transmitter and saw about a 1/2 watt of output. I was both pleased and disappointed with the result. Pleased that the final amplifier worked on the first try, but disappointed with the power output. Time to experiment again! I traded the 39 ohm base resistor for the 2N2219 amplifier with a 1000 ohm resistor. That brought up the output a bit. I managed to increase the power even more by reworking the toroid for the tuned output circuit in the oscillator section. I was showing about 750 milliwatts of output from the transmitter. I finished the rig by housing it in a small minibox. The total time at the bench was 4.5 hours of pure fun.

Working on the rig almost caused me to miss the third evening of the colorburst sprint. I wasn't quite ready to put the little transmitter on the air, and there was only 10 minutes left in the Sprint, so I used my Argonaut II again and was surprised to find many more stations turned out for the event. I worked stations in Canada, Michigan, New Hampshire and Alabama in those last minutes of the night's run.

Week four had me thinking about my newly constructed transmitter and how I could squeeze just a bit more output from it. I had purchased a 2N3053 from Radio Shack, after reading the parameters listed on the back of the blister pack that housed it. The transistor appeared to be the real thing instead of some lesser-rated unit. I put the transistor into the circuit and the output increased to about 900 milliwatts. Between the wattmeter and the RF probe to the VTVM, I knew I had approximately 1 watt of output and I was ready to Sprint!

On the fourth and final night I used the 1 watt transmitter with a portable short-wave receiver to work Michigan and New Hampshire. Antenna switching was accomplished by using a toggle switch on the front of the minibox and the sidetone was provided by the receiver monitoring the signal. I had that feeling of satisfaction that you read about in so many articles on QRP construction. I had built a transmitter, tweaked it, and worked



# QRP+ Observations REVISED

Dave Feldman

WBØGAZ - Denver, CO (DM79)

February 5, 1995

The QRP+ arrived last Thursday after being back-ordered for about 8 weeks. Not bad considering it was 6 MONTHS backorder on the 1280 kit from Ten-Tec!). The only rub here was getting "two-weeked" for two months, but then again Ten-Tec did exactly the same thing on the 1280. The QRP+ was ordered 15-Nov.-94, originally committed for delivery 05-DEC-94, and actually received 01-Feb.-95.

My unit is serial number Ø385. I took it out of the box, plugged it in, and started making these observations. I have not talked to Index Labs at all since I received my unit. In addition, these observations and opinions are solely my own and not based on coaching from any other user (except for one factual correction to number 9 below discovered when I posted a preliminary version of this write-up). As a point of reference, I am primarily a SSB operator, have a moderate home station (45 foot tower with tribander, 2 element 40M beam, etc.), with my main interests in VHF/UHF weak signal work, contesting, and tinkering with radio equipment, particularly tube gear—hollow-state. I've been licensed since 1971 and QRPing since 1972 (homebrew & Ten-Tec). I am not exclusively a QRP operator but do prefer that mode, so these comments are not made by a QRP purist by any stretch of the imagination. I will admit to being a strong fan of small, cute SSB & CW transceivers.

What follows was first posted 01-Feb.-95, and is reprinted here with a few corrections and additions.

Most people glow over the QRP+. I'll report the less-good news, too. None of these are show-stoppers, but they are worth mentioning.

1. My rig is somewhat microphonic. If I tap the case and am listening to CW, I definitely hear the artifacts. It's not terrible, but it's the only synthesized rig I've had that does this. I discovered the microphonics while trying to find the source of the cabinet resonance (next item below). Under normal service it has no strange behavior, but if I listen to a fixed carrier and tap moderately on the top of the cabinet, I hear strong dispersion for about 1/10 second.

2. The cabinet has a pretty severe resonance right around the peak frequency of the CW filter. That is, there is a secondary audio raspiness emitted from the cabinet itself right at some tone frequency when the audio gain is not kept very low. I suspect this can be fixed by properly padding the speaker mounts. The speaker is ample at max. volume (except for the resonance) and sounds OK but not great. At first I questioned the linearity (or non-linearity) of the volume control (volume grows mostly in the last 20% of rotation) but then decided for headphone AND speaker use I'd rather have the control as it is.

3. There is no support for "opposite" sideband. You get the "normal" sideband typical for the band in question. I looked

at the schematic and can't see why there isn't include an opposite sideband support. Sometimes I want to listen to this stuff! This one bugs me big time. The reason for this is my wish to use the QRP+ with transverters for satellite access.

4. The AGC recovery time is pretty slow, and can't be adjusted by front panel controls. I prefer faster, particularly in a contesting situation. This one bugs me, too.

5. There is a really strong "thump" when the AGC attacks on a strong received signal. Even my Argonaut is not as bad in this. It's livable, but I think the AGC capacitor charging circuitry probably has too-high impedance. The degree of "thump" is related to the strength of the received signal, and I suspect the powerful audio amplifier and efficient speaker contribute to the magnitude of the thump sometimes.

6. I really wish there was a means of lighting the front panel meter and frequency readout. It would not have cost much, and would make the rig usable in poor-light or poor-eyesight situations. Lighting would obviously have a power-consumption impact, but it would be trivial to make it switchable. Even my little Standard C108A has a backlit LCD and it's been running for a long time on a pair of AA cells. The C108A even has a time-out option on the lighting, which I really like.

7. The arrangement of the front-panel button for "fast" tuning is not optimal. For a right-handed operator, you pretty well need two hands to tune in the "fast" mode. Either there should have been a button "latching" (hold it down for a few seconds and it stays in the fast mode hands-off) or repositioned it on the lower-right corner of the button array (preferably making this option switchable for left- and right-handed operators). Either would be an easy firmware fix.

8. There is no Noise Blanker. I realized this up-front, and perhaps due to the 50 MHz single-conversion IF it can't be done easily, but I really do miss the NB. The electric fence across the street is plainly audible. It was over the NB issue that I delayed ordering the QRP+ for about four months. I regret having waited so long, and didn't initially realize that there might be a good reason for not offering one.

9. I had complained before about losing the VFO frequency when I inadvertently hit the "memory" button. A second hit of the button sets things back to VFO, just as I had originally wanted. I was in error on the first posting. Call it sensory overload.

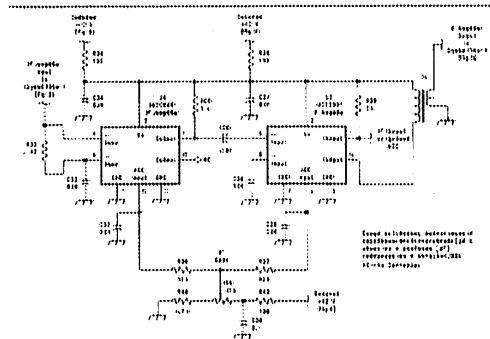
10. I think some people have complained of poor transmit audio. As far as I can tell, the rig does fine with full 5W PEP output, but the mic gain has to be run up pretty far with my run-of-the-mill dynamic hand mic. I do wish the mic gain and CW sidetone controls weren't recessed; there is no decent reason why to let them protrude from the back panel slightly just like the CW speed control. PS, I'm using a really cute little hand-mic that came with an old TRIO 2200 2M FM rig of 1972 vintage.

After some additional use, I continued to investigate and I feel that it is a struggle to get a robust (fully modulated) SSB signal out of the rig. I measured PEP versus average power on a Bird 43P with a 50H slug, and after further testing think the rig is somehow fighting me when I try to get consistent full PEP output. I do notice that the rig has some pretty extensive ALC circuitry, where the original Ten-Tec Argonaut (a point of comparison) does not seem to have. I haven't looked at the rig's

16. The rig doesn't let the operator change frequencies while transmitting. This is probably a good precaution, but if I use it as an IF for a satellite up-link, I need that capability for Doppler compensation. You might say "this rig wasn't intended for satellite," but remember that there is a satellite mode with 28 and 21 MHz operation, so I do have aspirations of setting up a satellite ground station while camping out (with a small secondary receiver).

Again, sorry for the bandwidth, but I had a number of people that felt my first posting was a decent review, so I wanted to clean it up and post it "for real" this time.

**dgf@netcom.com**



### 40 Meter schematic QEX IF amplifiers



## Primary Viewing Was Gone!

Research by KILGQ - Dennis Marandos

It happened a long time ago and has been reported in piecemeal fashion, but it did happen and it happened in Boston, Massachusetts. Of course, only the old timers will recall the elements that lead up to the sabotage, but if you dig deep enough in some of the older magazines, you will get all the facts, bit by bit.

The strongest and broadest television station in New England was WBZ-TV, channel 4 and had been the leader in all broadcasting as well as total revenue in the primary markets. Ordinarily, you wouldn't have noticed anything happening in New England when "it" started to appear, because television was still in its infancy, and a lot of DX antennas were just hitting the market for the home owner to install. Cable was not even heard of and the most scientific event was Kennedy's speech of going to the moon...someday. The hula-hoop was now old fashion and Big Brother Bob Emery was the hit at noon time viewing. Big Brother Bob Emery was WBZ's ace up their sleeve for mid-day television. Every kid in New England drank a glass of milk and saluted the flag, all within thirty minutes.

The six o'clock news was brought to you by Shawmut Banks where an Indian, with feathers in his hair, would encompass the entire picture on my television screen. The phrase at sign off time was, "It's always good weather when good friends get together." It seemed that the moms and dads in New England had everything going for them for television was the home entertainment center for millions.

In our neighborhood, many of my friends and I used to compare what happened on "the tube" from the preceding evening's broadcasting and we used to howl the next day at what we thought was crazy television. Milton Burl was the funniest thing you could have imagined on the big screen, but my dad occasionally wanted to see the other channel...Bishop Fulton J. Sheen. Anyway, the kids would identify with anything they thought was funny. A few of my friends in the southern section

of the city said they had lousy television reception and could not see a thing. They blamed everything on their old television antennas and couldn't wait for dear old dad to get the DX antennas the rest of the neighborhood already had. The problem was rampant with most of the "guys" who lived in the southern part of the city, but specially toward and into Massachusetts was it the worse. Of course, living in New Hampshire and receiving Boston television was like working DX. Every time the reception was fuzzy, everyone blamed it on the mountains in between us and the transmitting station, which, of course, was not the problem.

Eventually, the local newspapers carried the account of poor reception shared by everyone in southern New Hampshire and attributed the uncertainty of good viewing to the terrain and atmospheric conditions. They reported that they had good sources who knew that the sun spot cycle was the real evildoer and in time everyone's television viewing would return to normal. You just had to give it time, and it would return.

Our family used to receive the Boston newspapers, even though it was the evening edition or the following day, but we had a "major" newspaper delivered to our door. The *Boston Harold* was a tabloid many northern folks read to get the inside scoop of Boston and Washington politics, as well as the sports wrap-up on the Boston Red Sox and Celtics. I used to get the paper after dad had read it. (He used to say I messed the pages up too much and no one could read it after I was through with it.) After I read the sports sections, I was always interested in the science section, for most of the gang in the area was affected by MIT and anything which occurred there.

There was one article I remember seeing that seemed very strange for it was as if I had phoned the details to the city desk myself. It was about the television reception in northern Boston and surrounding areas, and the commentary went on to say that interference was not constant but erratic, as if a machine had interfered with WBZ's television transmissions. It was interesting for two reasons, one—it was everything I had said it was, that is, interference with lousy reception and two—it dealt with radio and radio waves, which always interested me...no matter what. As the articles came through, one at a time, you had the feeling that the interference was caused by student's who were experimenting at MIT and were not telling any one of their escapades. It was truly absorbing to follow the same saga week after week, month after month.

My neighborhood of friends always talked about what we saw the night before on television, but it was strange the same results were on all our sets for channel four...WBZ. We thought for sure that the station was breaking down completely and the station managers could not find their problems, so everyone in the north section of New England switched to other viewing channels, where there was not a bit of viewing trouble. It was too bad for the guys in the area because that meant Bishop Fulton J. Sheen had prime-time viewing with no questions asked by others in the room. There never was a moment's hesitation about what channel we were going to watch for dad always knew the reception was pretty much spotty to even consider sitting through Uncle Milton's dumb escapades. Simply, we watched all the 'other' stations, such as WNAC and WHDH, but definitely not WBZ channel four.

Again and again in the local newspaper, there would be a letter to the editor saying how much better the reception was



for two of the Boston television stations but not for WBZ and that we ought to write to the FCC and get a new broadcasting station in the area, if WBZ couldn't fix their machinery. The letters to the editor blamed everything on the television station, but on other pages of the same newspaper, WBZ said the problem was definitely not with the station but with something beyond their boundaries. The engineers at WBZ had checked and rechecked their television studios but were unable to track down any problems whatsoever. They called upon some of the greatest minds to help them fix their riddle.

The money revenue for WBZ shrank, a little at a time, and it dwindled to a point anyone could see there were not many paid ads on their station. The *Boston Herald* said that there were other factors that had to be checked out before anything drastic could be done. The FCC in Washington, with their heavy hitters, was called in to help and to conclusively find the problem why WBZ television had horrible reception north of Boston, and surrounding areas. The newspapers reported that the FCC would release the final word whatever the real problem was, but nothing appeared in the papers to say what they had found, nor did they 'fix' what was wrong. All New England waited to see just what next would happen to align the television viewing north of Boston.

Little by little, snippets were released about how the poor reception and interference were caused during certain times of the day, and that it did not occur at others. The FCC, the engineers at MIT radiological department and the WBZ engineers pondered why only certain times of the day the predicament reared its ugly head. In another small paragraph well within the *Boston Herald* evening news was a short mentioning that the problem was being investigated by the FBI and CIA for they felt something was coming at us from "over there." The United States had many enemies, especially those in the communist countries, and at this moment, nothing could be ruled out for what the problem might be. Herb Philbrook, the spy who lead three lives, lived in Nashua, NH for years and no one ever suspected Herb as being a secret agent for the government. Who knew what it was, but it certainly had everyone's attention.

Again, reading the letters to the editor, I saw an unearthly letter that said something to the effect that the WBZ's problem would be stopped for one week and for everyone to watch what would happen. The letter went on to say that the writer could make the interference and poor reception vanish and that it would only be one week in continuance. I thought it a little strange someone writing to the newspapers to say the problem would be eliminated. Why didn't the police or FBI know what was happening, but most of all, who was the writer who would turn off and on the poor reception at will? It all seemed bizarre.

For one week, from Monday morning to the following Sunday night, not one flicker or one fuzz line was detected on anyone's television anywhere in New England. It was as though all the problems vanished and the engineers had cleared up whatever it was that bothered WBZ television. Even Milton Burl seemed a little bit funnier, not having seen him in a long time. Indeed, the revenue for WBZ shot up and new ads were placed quickly on the screen. A huge sigh of relief blew over New England and all was back to normal. At least we thought it was till the following week, the poor reception/interference returned. God, couldn't the engineers find the problem and cure it? The

president was talking about men on the moon, but couldn't they keep Uncle Milt on for another week? It seemed as if one of their vacuum tubes blew out and they didn't know where to look. Everything was as it was just weeks before, poor reception and the gang talking about what they missed on television the preceding night.

Once more, there were weird letters sent to the *Boston Herald's* editor saying they were the ones who could lift the curse of poor reception, but you acquire this sort of thing every time an area goes into panic. It's as if the snake oil salesmen, who promised a life-long cure for arthritis, showed up, but these people were trying to gain a quick buck by selling 'cures' to help better reception and eliminate interference from every one's television on channel four. I am sure the 'powers to be' followed up on all the hocus-pocus, nut-cake letters that were circulating throughout New England, but there was one letter that had a return address in the Bahamas which always stood out, for who could watch New England television in the Caribbean ocean?

I did not have my radio license at the time, but I used to listen a lot of AM (amplitude modulation) on seventy-five phone and used to hear all the restorative solutions the old timers had and what they would do if they were in charge. There was even, for a short moment of time, a crusade to band all ham transmitters who lived within one hundred air-miles of Boston. This was the one and only time amateurs were banned in Boston. Quite a trick if you can get away with it. This idea was squelched when it was discovered that the operating frequencies were so distant from any television frequency that it was impractical to think amateurs could have a hand in the interference. Also considered were the taxi cabs whose frequencies were VHF and most of the local police who had not moved from the high end of the AM spectrum...1.7 MHz. These ideas were all dismissed when the engineers who worked on the problem knew from the very beginning that whatever caused the poor reception/interference was done by something other than amateurs, local cab drivers or low band police transmitters. Their attention shifted elsewhere to find the answers.

Several weeks had gone by since the last reprieve when another letter was sent to the editor of the *Boston Herald* newspaper saying that the WBZ problem would again vanish for one week, but no other explanation was given. It did say, however, when the interference would stop and the exact time the poor reception would begin again. It appeared very strange to have someone write, again, to the Boston newspaper saying what would occur before it did occur. It was signed by the same person who had sent a letter previously from the Bahamas.

It became stranger ever for the person who wrote the letter was accurate to the second, as if WWV were his timing device. WBZ now demanded that the FCC, CIA and FBI all investigate to determine what, who and where the interference/poor reception was emanating. Notwithstanding all those who wished for a person to be caught, nothing was found. The newspapers reported nothing when the reception was at its best and said nothing when it returned to its worse. All one could imagine was that the defense department of the United States had been brought to its knees. Nothing could be found, even though some of the most sophisticated oscilloscopes and panadapters had been used. Could anyone find a trace of what was wrong? This was an engineer's nightmare to have one of the strongest, brightest schools in America, M.I.T.'s school of

Radiological Warfare, stumped, at its knees and unable to find an antidote. Could it be America was being invaded and we were at a loss for help with no one to turn to for answers? It appeared that we were stumped and nothing could be done, except to wait and see when the next letter would reveal in the newspaper.

In the newspaper, indeed, another letter was sent by the Bahamas connection who asked for a lot of money to stop any interference, and to have all the moneys sent to a Swiss bank account with several types of box holders and box numbers. All the accounts were untraceable and were deeply regarded as being safe from ever being revealed. Every account was hidden within a labyrinth of levels to off-set a complete investigation. It appeared there was no other alternative.

A plan was devised and money was sent to the Swiss accounts to satisfy the anonymous "bandito." There was nothing else WBZ-TV could do for their advertising revenue had fallen way below an operating television budget would allow and paying the ransom was the only course left to do. After all the money transfers had been made, and letter carriers had flown gold deposits to the Swiss accounts, did the interference go away permanently. To this day no one had ever found out exactly what had happened or why the interference came or went away as it did, but the WBZ-TV enigma still lingers on the minds of those old timers who live here.

Oddly, one day, an inconspicuous article in the *Boston Globe* newspaper, a decade after the WBZ-TV problem, later did print a story about a new wave of front-line warfare used to divert radio signals with the help of a device designed by Sinned Sodnaram of Egypt. Sinned was an exchange student at MIT who had stumbled across one of the most significant inventions know to mankind, but because of the secrecy involved, it was extremely difficult to reveal this intelligence to the science world. An empty folder with scribbled notes on the outside jacket said that the project was canceled for lack of experimentation. Under the jotted words was another message printed, "Project canceled for lack of true pragmatic authenticity." It was signed by Sinned Sodnaram and dated June 1960.

## Meeting at W1AW ARRL Headquarters, Newington CT



**Jim Fitton - W1FMR  
Salem, NH**

The following members were present at the February 18th meeting: Report of February 18, 1995 New England QRP Club meeting at W1AW - ARRL Headquarters, Newington CT. Among the many innovative people and interesting HB rigs presented were:

LARRY OLSEN	K1LO
DAVE BENSON	NN1G
CHET BOWLES	AA1EX
TOM CASSIDY	KAITQM
BILL NORTHUP	N1QPR
BILL KEANE	N1NIK
MARK SWARTWOUT	NX1K
SCOTT THOMAS	NM1J
BILL ACITO	KC1GS
KEVIN WEBSTER	N1EPU
GEOFF FOX	WA1U
HAROLD KRAMER	WJ1B
BOB MOELLER	KA1PXF
WALT YAFZOOK	N1CJB
AL ABRAMS	N1NFJ
JIM JOHNS	KA0IQT
HOWIE CAHN	WB2CPU
DAN BROWN	KA5DNH/1
HARRY McDADE	W1LMU
JOE EVERHART	N2CX
JACK FRAKE	NG1G
DAN KEANE	NU1M
ZACK LAU	KH6CP/1
BILL WAWRZENIAU	W1KKF
BOB GRAVEL	K1BUB
JIM FITTON	W1FMR
DENNIS MARANDOS	K1LGQ

NorCal Sierra, by Wayne Burdick, N6KR is now a famous all-band QRP kit transceiver and it was chosen by ARRL for publication. We will be watching the Handbook for it.

40/40 transceiver, built by Bryan Bergeron, NU1N, uses DDS frequency control and is featured in Communications Quarterly, Spring 95. An excellent idea showing where we are headed uses the 40/40 QRP-NE club project as a base.

A VXO circuit providing 15 KHz swing at 3.587 MHz by Joe, N2CX the 1st place winner in the QRP-NE VXO contest, The rig was used during the Feb. 1995, 79er Colorburst Sprint.

The 80m VXO design contest was won by Joe-N2CX with this rig the circuit was his version of the popular G-QRP club "Oner".

A Six meter CW & SSB transceiver built by Zack, KH6CP/1 was very impressive, designed in Zack's very solid craftsman style.

A large number of excellent and unusual crafted 80/40/40 transceivers appeared this year, along with many different HB species. Perhaps this was the biggest HB showing by QRP-NE so far.

A 40-40 rig troubleshooting session was held by Dave, NN1G. Dave set up a fully equipped lab upstairs over the W1AW station, and fixed and analyzed various types of member's rigs.

A beautiful QRP-Afield trophy, sponsored by Chuck-K5FO, and designed by contest manager, Chet-AA1EX was awarded to contest winner, W1FD. I hope some of the photos that taken will make it into the club newsletter.

Most of us lunched at the local Friendly's restaurant and overwhelmed them with our (purchasing) power.

The bands were very noisy that day, and not too many contacts were made at W1AW/QRP.

It was an excellent meeting and we cannot thank Michael Tracy and the ARRL staff enough for hosting our rowdy gang.

#### Mid-Winter - A smashing success

The agenda at W1AW was:

Report from officers

NN1G Forty-40 Tech. trouble shoot session

Operating the W1AW station

VXO Contest

Potential for NE QRP Club Convention-need planning manager

New members. requirements.

QRP-Afield - Plaque Awarded to W1FD, September 1994 Winner

## More gain for the "30-40"

**Dave Benson - NN1G**  
80 E. Robbins Avenue  
Newington, CT 06111

"So, how come my 30-40 doesn't seem as loud as the "40-40?" you ask. I'd like to be able to say that the reduced legal power limit in effect on 30 meters is responsible, but that's not the whole story.

The 30-40 IF crystal filter design proved to be somewhat of a compromise between selectivity and loss. After all, a low-loss configuration with good skirt characteristics is a tall order for only two crystals at 8 MHz! I had opted for selectivity, as a consequence, the 30 meter version simply doesn't have as much gain as its 40 meter sibling.

Here's a "quick-n-easy" mod for the popular 30 meter version of the XX-40 transceiver to boost the receiver gain, with no cuts or jumpers required:

The IF filter capacitors (C13-C15), currently 270 pF, may be replaced with 220 pF capacitors. For the truly-adventurous, these capacitors may instead be 150 pF each, although the alternate-sideband rejection at 800 Hz will be down only 20 dB or so. I had tested this latter configuration and found that it restored about 10 dB of gain, putting its sensitivity on par with that of the 40 meter version. No other changes to component values are needed.

Give it a try---this modification is proof of the old adage, "There's no such thing as a free lunch", but you may find it a useful enhancement.

**Dave Benson - NN1G**

## Field Day is Just Around the Corner

Now that you have gotten all the bugs out of your portable station in the QRP to the Field activity, it is time to think about QRP-NE field Day 1995.

Once again we will be at our excellent site on the side of Mt Wachusett in Princeton, MA. We have had lots of fun the

last few years, and we have had good results. But we could have easily done better in the standings, and had even more fun, with the anticipation of more club members.

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

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

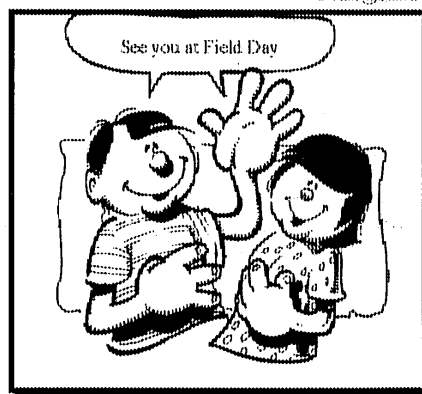
You don't need to be a super contester, or be a technical wizard to contribute. We need folk that can set up antennas, secure guy wires, keep logs and dupe sheets, cook, play the guitar or make hot chocolate late at night, and help take the stations down when the weekend is over. Everyone has something to contribute. And I, for one, have learned a lot by participating these last few years.

We need to have Band Captains who will be responsible for making sure everything is in place for a given band. If you would like to take on this challenge, now is the time to step forward and be counted. The number of stations we run is determined by the number of band captains.

Even if you don't want to be a Band Captain, even if you can't make it all weekend, even if you have a family or local club commitment, we hope you will seriously consider joining New England QRP Club for Field Day, June 24-25, 1995 in Princeton, Massachusetts. Get in touch with me, now, at one of the club gatherings, or better, drop me a line saying you can help in any way. If you need directions to the site let me know.

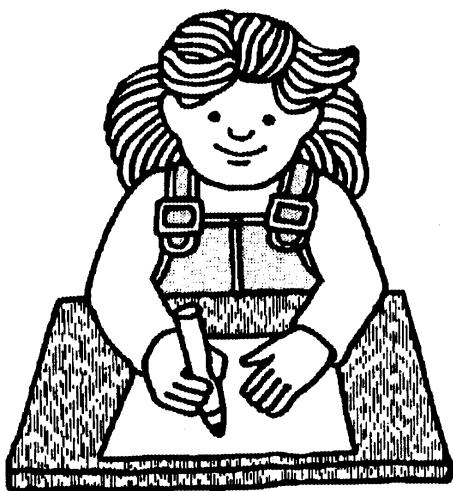
QRP-NE Field Day Chair

**Mark Swartwout - NX1K**  
26 Harriet Avenue  
Shrewsbury MA 01545  
508 842 3174  
swartm@shr.dec.com



## Note From WB6FZH/KH6

Greg Greenwood NE#287 can be found on 10.123 MHz at 01:30---02:30Z on Tuesday and Thursday using a Thirty-40. If anyone needs an Hawaii skid... here is your chance! Good Luck.



**YOU'RE NEVER TOO OLD TO COLOR**

**Ernie Gregoire - AA1IK  
RR #1 - Box 227  
Canaan, NH 03741**

I have been using the 40/40 QRP rig for about a month now. The bugs seem to have all been ironed out, and I am having a great time using it. I receive comments such as, "FB ON UR 1 WATT". Actually, using the rig and building it are two separate experiences.

This is the first radio that I have ever built. I did build (assemble) a keyer kit to get used to soldering in small places, plus I was encouraged by some local hams who are also QRP fans to continue. They thought that this little radio would be fun to build and to operate. It looked a little bit more involved than the keyer did, however. Upon finishing the radio, I thought that it certainly would have been nice to have known some of the things that I learned ahead of time. This would have saved me time and money.

I call this rig the 40/40+. The plus was about \$200. I added for a few additional goodies. There is a built in keyer, a frequency counter for a digital display, and a stout TenTec enclosure. More on these later.

A few of my buddies were building an ugly construction QRP radio and I listened to their nightly soap opera exchanges on the local repeater. Their interesting conversations went on for months. After much hair pulling and thrashing around, they managed to get their rigs on the air. I hoped to avoid this "Fun," and opted for a kit. The 40/40 really does qualify as a homebrew rig due to planning, and providing your own enclosure and other "stuff" that you would want in a QRP rig to have. No two homebrews are alike.

#### **IN BUILDING THIS RADIO, I LEARNED:**

- A knob may just LOOK like a vernier in the catalog. (It turned out to be just a knob).
- RG-174 coax is great for curing stray RF troubles. (My keyer went 'kerblooie,' speeding up and was uncontrollable).
- Check knob clearance before cutting potentiometer shafts. (You can always cut more off later).
- I learned that projects like this take at least five times longer than I thought it would.
- I learned that some things must be done in order. Time spent on layout is time well spent.

#### **NEXT TIME I'D DO IT THIS WAY.**

1. Assemble ALL of the sub-assemblies, RIT kit, frequency counter etc.
2. Gather ALL of the connectors, jacks, pot's and knobs, and then go to #3.
3. Make a template of cardboard and mount all of those parts that go on the panels front and rear, including screws before doing any drilling and cutting. (As it turned out, I was lucky, not smart).
4. When drilling holes, don't bother with masking tape to protect the finish, the tape won't protect it anyway. Paint the box with a nice color of spray Rustoleum. I used 5 coats of almond, and it came out much better than the paint job that TenTec did. I sprayed the screw heads by putting them into the end of a piece of card board to protect the threads. (Painted screw heads make the project look great).
5. Protect all subassemblies with diodes for voltage reversals.
6. The 9 volt input for the keyer and frequency counter is not 9 volts only and they will run fine on 12 or 13.8 volts. (This information was NOT supplied with frequency counter)
7. You can't do too much planning. I wanted to include a built-in power supply, (D-cells). I put all of the separate kits (on three separate printed circuit boards) into the box. It did look like they would fit, but they didn't. So, I eliminated the battery supply.
8. I used water based poly-urethane to protect the stenciling. It doesn't stink, and makes clean up a snap. It also doesn't melt the stencil transfers like the clear nail polish did.
9. A frequency counter and a dummy load are priceless for tuning the rig and getting it to play.

My grandson watched me use brightly colored highlighters to color in the components on the work manual as I soldered them into the circuit board and declared, "Grampa, your never too old to color, are you"?

**Ernie Gregoire - AA1IK  
Canaan, NH**

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**Rochester, NH**  
**Home Traders/Radio Flea Market**  
**largest in New England**  
**May 12th (Friday night), and May 13th (Saturday)**  
**See you there!**

## Do You Know What Length It Is?

Dennis Marandos - K1LGQ NE#151  
Nashua, NH

A lot of times we're in the field and we instantly want to create a dipole! Why? Because we're thinking how much better it would be if only we had a 'better-cut' antenna for the DX stations at the other end of the band. Or, simply the old dipole stretched so much from the last field day you attempted when the center-feed was fifty feet over the coal furnace smoke stacks, it lengthened off frequency. Okay, maybe I am stretching the dipole a little to suit my purpose, but the following chart will give you a right-on figure to get on frequency! Have fun and don't stretch the truth on those DX contacts!

Operating Frequency MHz	Total Length Overall feet/inches
<b>160 meters</b>	
1.810	258.5635359116
1.910	245.0261780105
<b>80 meters</b>	
3.560	131.4606741573
3.710	126.1455525606
3.985	117.4404015056
<b>40 meters</b>	
7.040	66.47727272727
7.110	65.82278481013
7.285	64.24159231297
<b>30 meters</b>	
10.105	46.31370608610
10.125	46.22222222222
10.145	46.13109906358
<b>20 meters</b>	
14.040	33.33333333333
14.200	32.95774647887
14.300	32.72727272727
<b>17 meters</b>	
18.080	25.88495575221
18.130	25.81356867071
18.160	25.77092511013
<b>15 meters</b>	
21.040	22.24334600760
21.125	22.15384615385
21.250	22.02352941176
21.350	21.92037470726
<b>12 meters</b>	
24.910	18.78763548776
24.950	18.75751503006
<b>10 meters</b>	
28.040	16.69044222539
28.125	16.64000000000
28.350	16.50793650794
28.500	16.42105263158
28.750	16.27826086957
28.900	16.19377162630
<b>6 meters</b>	
50.060	9.249011857708
50.885	9.197209393731

## Check It Off

Dennis Marandos - K1LGQ  
Nashua, NH

A little optimism is very contagious when you're working the DX stations, but how about just keeping track of your WAS contacts? The following chart will be helpful to remember who you have already contacted and what states you're looking for. Make several copies of this chart and track of each band you're operating QRP. Have fun!

AL	Alabama	MT	Montana
AK	Alaska	NE	Nebraska
AZ	Arizona	NH	New Hampshire
AR	Arkansas	NJ	New Jersey
CA	California	NM	New Mexico
CO	Colorado	NY	New York
CT	Connecticut	NC	North Carolina
DE	Delaware	MA	Massachusetts
FL	Florida	ND	North Dakota
GA	Georgia	OH	Ohio
HI	Hawaii	OK	Oklahoma
ID	Idaho	OR	Oregon
IL	Illinois	PA	Pennsylvania
IN	Indiana	RI	Rhode Island
IA	Iowa	SC	South Carolina
KS	Kansas	SD	South Dakota
KY	Kentucky	TN	Tennessee
LA	Louisiana	TX	Texas
ME	Maine	UT	Utah
MD	Maryland/DC	VT	Vermont
MA	Massachusetts	VA	Virginia
MI	Michigan	WA	Washington
MN	Minnesota	WV	West Virginia
MS	Mississippi	WI	Wisconsin
MO	Missouri	WY	Wyoming



### NEW MEMBERS

From the January issue, a few corrections have been made:

Fred Turpin - K6MDS is NE#290	Cameron Bailey - KX3A is NE#291
Mike Rioux - NW1J is NE#301	Mike Arhai - N11ST is NE#302
K02LRI is NE#295	W0KSD is NE#312
NE#326 N1PWH - August McCann	NE#339 W0MXY Hal Bergeson
NE#327 NZ4I Ranson Felt	NE#340 AA4XX Paul Stroud
NE#328 K1DX George Woods	NE#341 N9OUH Paulette Quack
NE#329 N2KPY Peter Calcandy	NE#342 N1TYK Richard Spada
NE#330 WA5THJ Bryon Tatum	NE#343 K0IPH Dave Holosovny
NE#331 W3MY Russ Sutton	NE#344 AA4GC Rack Wagner
NE#332 N2IPY Bob Easton	NE#345 N1EPU Kevin Webster
NE#333 NW3N Richard Stern	NE#346 W1JB Harold Kramer
NE#334 AA7AR/6 Bruce Florip	NE#347 W4RNL L.B. Cebik
NE#335 AB6SO Victor Black	NE#348 K03NV Scott Bauer
NE#336 K1CLN William Welch	NE#349 KP2PH Nick Franco
NE#337 (no call) James Stanley	NE#350 W02VUF Robert Wempner
NE#338 W1SH Charles Molzen	NE#351 W01HHW John Clark