

Flying Pigs QRP Club – BBQ

Bacon Bits Quarterly



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FPQRP [membership](#) is open to all licensed QRP operators who reside within 12,007 nautical miles of Cincinnati, Ohio.



Brian Murrey – KB9BVN (FP #57) Editor

Oh boy! It's Fall again, and time for the fox hunts to start up and the weather to cool off, and Flying Pigs will be hitting the trails, hill and dale for exciting expeditions to the outdoors. Just be sure to tell us all about them so we can join in on the fun in January.

In September I started a new job and a new career with the Knights of Columbus working as a Benefits Representative for 5 different councils in my QTH area. So my time on the air these last few months has been very sporadic and limited in duration. I haven't even touched a soldering iron since Field Day. For shame.

Anyway, this is the last issue for 2005. The next time you read the BBQ will be in 2006. If you are interested in becoming a regular BBQ contributor, I would love to discuss it with you. I think the writers we've had on staff this year did a fantastic job. I hear rumors that Nelson Winter even has a fan club. Thanks to all of you for making the BBQ a fun, interesting, and very enjoyable project for the Flying Pigs QRP Club International. Now, let's get on to the goodies!



Random Thoughts And Rambling – de WB0WAO Co-Editor FP -347

Well, this is the last issue of the BBQ for 2005 – I want to personally thank Bri (aka P.B.) for resurrecting the BB into the BBQ! Well done Brian, well done! Now it is time for Brian to take a well-deserved rest from the pressures of e-publishing so he can spend more time on the air!

Speaking of on the air time, I almost forgot how to turn the K2 on! I was working 60+ hours a week with only one day off from Memorial Day until mid September. I have been on vacation the past week and boy did I need it. I need to do a bunch of stuff with the antlers before winter sets in (and in Northern Michigan, that can be around Halloween).

One of the few ham highlights this summer was meeting Hank (Foxtrot Romeo Echo Delta), K8DD, at the local hamfest and parting with some hard-earned money to get a few goodies from QRP – ARCI. YOU MUST GET THE 25 YEARS OF THE QRP QUARTERLY CD / DVD! It was one of the best investments that I have made in a long time.

For many swine this was a very good year – Papa Diz was inducted into the QRP Hall of Fame, Rob found out he is gonna be a Daddy and Dan finally purchased a pair of pants! Let's hope that 2006 will be as good as 2005!

73

Dennis – WB0WAO



Designing and Building a 6-Meter Field Day Quad Bob WA1FXT and Judith KC8BOM (FP -533 and FP -534)

My XYL, Judith, KC8BOM, and I had the pleasure of participating in FIELD DAY 2005 with a great bunch of people, the Flying Pigs from Ohio, Michigan, and Indiana. Knowing that we wanted a VHF station, we kind of got the idea to build an efficient gain antenna that we could easily transport to the FIELD DAY site. We decided a Quad would be a good performer and not too difficult to construct at the FIELD DAY site.

Needless to say, the Quad worked very well at FIELD DAY 2005 and was great fun building. Some time after FIELD DAY, a number of Piggies asked for some of the construction details. So, here they are!!!! The construction details shown are not meant to be a "step by step" building process. What we hoped to share with you is the process of designing with available tools and materials. You may think of better ways to build this antenna and you may want to optimize different parameters.

The Electrical Design

Designing the electrical details for the Quad was nothing new to us and utilized the resources developed and made popular by our great antenna Elmer and friend, LB Cebik W4RNL. The first step was to read all of LB's Quad stuff at his website, www.cebik.com. I felt that I had to understand some of theory and characteristics of the Quad in case I wanted to Tinker with the parameters such F/B Ratio Gain etc.

Tinker? You know you just gots to tinker!!!! How else you going to learn and share your knowledge?

We decided on a four element Quad designed for a good compromise between F/B Ratio, GAIN, reasonable 50 Ohm matching and SWR Bandwidth. All these parameters interact. So, you must decide what is most important to your needs and optimize that characteristic using LB's Elmering and common software tools.

The first step after LB's Elmering was using HAMCALC. HAMCALC is a collection of programs written in GWBASIC to help you design just about anything. The collection was intended for people like me who want to design but don't want to do the math unless they really have to. Somewhere within HAMCALC is a GWBASIC program that will help you design Quads. Of course the program was written by LB and is designed to give you an optimized Quad design based on wire diameter. The program gives you the antenna element dimensions and spacing. In addition, LB gives you some handy diagonal and circumference figures for constructing the loops.

The second step for me was using EZNEC to model the Quad. There is no reason you could not use other antenna analysis programs. There are many of these programs available. If you don't have these

programs or you just don't want to take the time to Tinker on the PC, you can skip this step and go right to the mechanical construction.. However, I highly recommend that you DO Tinker on the PC. I found, the modeling programs give accurate and useful results within certain boundaries and if they are used correctly. The learning curves for good modeling are not too bad if you combine the PC Tinkering with some real life building in the back yard. The biggest reason why I don't skip this step is; the modeling tells me which direction to go in case the real life building/Tinkering doesn't match the expected performance.

For example:

You design a Quad using the HAMCALC tools. One of the characteristics you may want is a good 50-Ohm match at the feed point without the use of matching networks. So, take the HAMCALC dimensions and stuff them into the modeling program. The modeling program shows you the feed point impedance is not quite 50 Ohms resistive at your intended operating frequency. Tinker, Tinker and Tinker some more with spacing. Tinker with things such as the distance between the Driven Element and the Reflector. Viola!!!! You find that changing this distance changes the feed point impedance without upsetting your GAIN parameters too much!!!! So, now you know how to adjust the feed point impedance by varying the Driven element to Reflector element spacing. Now when your back yard Tinkering and SWR meter does not give you a good match to 50 Ohm coax you will know enough to vary your Driven element to reflector element spacing on the boom....just like on the PC!!

This example is a bit oversimplified. But, you do get the idea don't you? The combination of reading the theory, designing with available tools, modeling, and back yard construction is a wonderful learning experience and loads of fun. And, you'll look like an antenna God to your friends when you share your newfound knowledge !

The Mechanical Design

The objective for the mechanical design was to have an antenna we could easily transport for FIELD DAY. The design we used was not meant to be a permanent installation. Thus, it lacks the robust detail needed to live out of doors for an extended period of time. But, it will survive some wind and probably would last a year or two in our part of the country.

Like most Antenna Home brewers, I am attracted to the local home center plumbing departments. You can dream of all kinds of antenna designs staring at the plumbing fittings on the shelves. Besides, it gives you something to do while the XYL is at the craft store next door!!!!

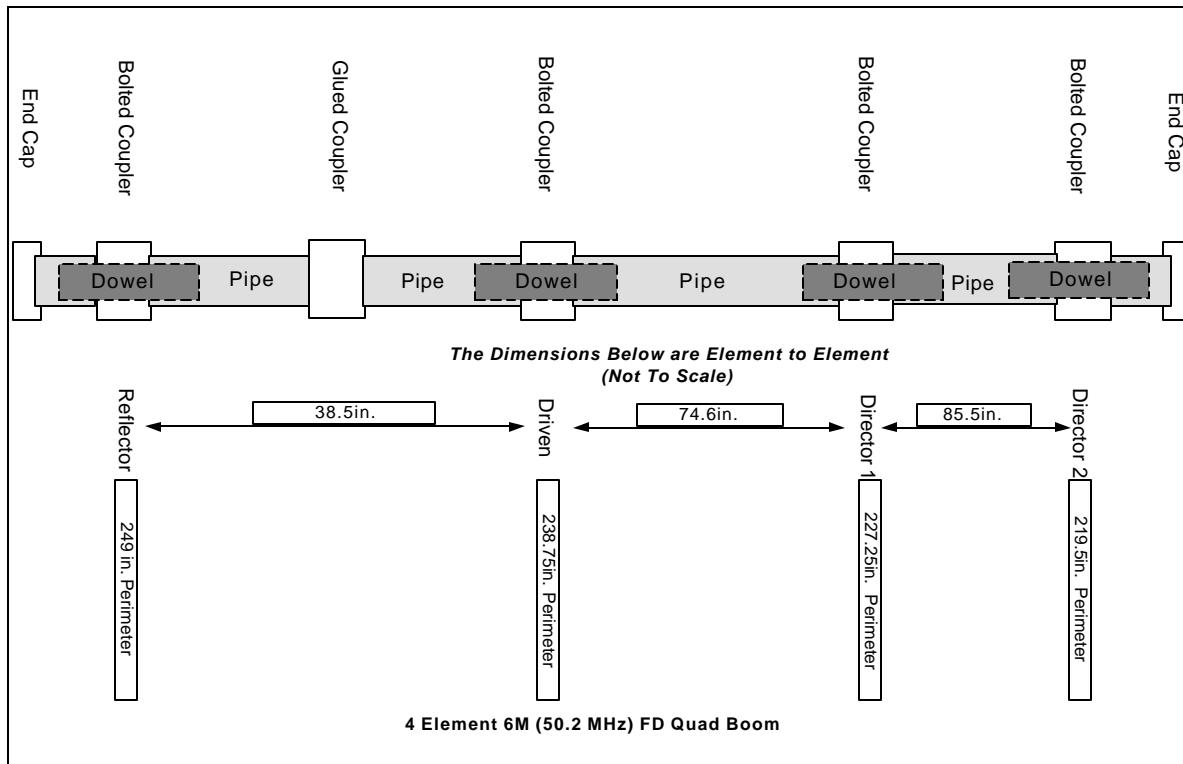
We chose to use 1½ inch schedule 40 PVC pipe and fittings for our Quad boom. We couldn't find suitable spreaders at the home center. So, Judith and I stopped at the local farm supply store on the way back to our antenna farm. We found 3/8 inch x 48 inches, fiberglass electric fence posts for \$.99!!!! Just right for Quad spreaders.... and cheap!!!!

We constructed the boom first. We cut the PVC pipe into lengths corresponding to the element spacing given in the electrical design stage. The pipes were then joined using PVC couplings. Since this Quad had to be disassembled and transported to the FIELD DAY site, we did not glue these joints. We thru bolted the joints together with ¼ inch bolts and reinforced the joint with an internal wooden dowel. Where the pipe lengths exceeded a few feet, we cut the pipe, rejoined and glued the pieces with couplings. Cutting the pipe into shorter sections and adding couplings helped stiffen the boom.

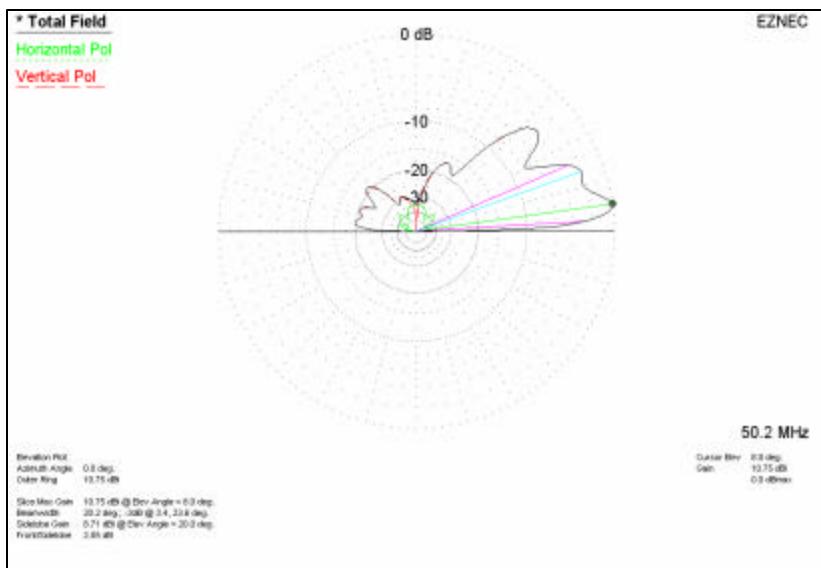
Next, we added the spreaders at the appropriate coupled joints. Spreaders were inserted into 3/8 inch holes drilled into the reinforced joints and were not glued into the joints. The spreaders were measured

and marked at the diagonal dimensions we got from the HAMCALC program. Then, the wire elements were cut using the perimeter numbers from HAMCALC. Don't forget to add a few inches for joining the wire ends. We attached the elements at the markings on the spreaders with wire ties and tape.

At this point, we had to have a way to attach the boom to a mast. So, I fabricated a boom plate from some 1/8 inch aluminum plate and used U-Bolts for the boom and mast fasteners. The boom plate was located near the balance point for the boom. We also added a vertical support for a lanyard that would bring up the ends of the boom and keep the boom from sagging too much.



The Testing



The coax feed line was attached to the driven element, the antenna was raised to the height we used for our modeling height in EZNEC, and we kept the antenna clear of other metal and grounded objects by a wavelength or two.

Now the moment of truth. We attached the AEA analyzer to the driven element and compared readings with SWR and impedance values predicted by EZNEC.

Note: The values read on the analyzer had to be corrected using a program

called TLD before they were compared to the EZNEC values. This correction accounts for the impedance transformation between the driven element and the analyzer. This transformation is caused

by the addition of the coax feedline. EZNEC values for SWR and impedance are at the antenna drive point and does not account for the feed line impedance transformation.

We were lucky. Our SWR and impedances were close to the predicted values. This is the time when your Tinkering at the PC and modeling pays off. We measured F/B ratio and a rough idea of the pattern with a field strength meter. They too were close to predicted values and met our specs for Field Day. You may want to Tinker with your antenna and modeling to further optimize specific parameters.

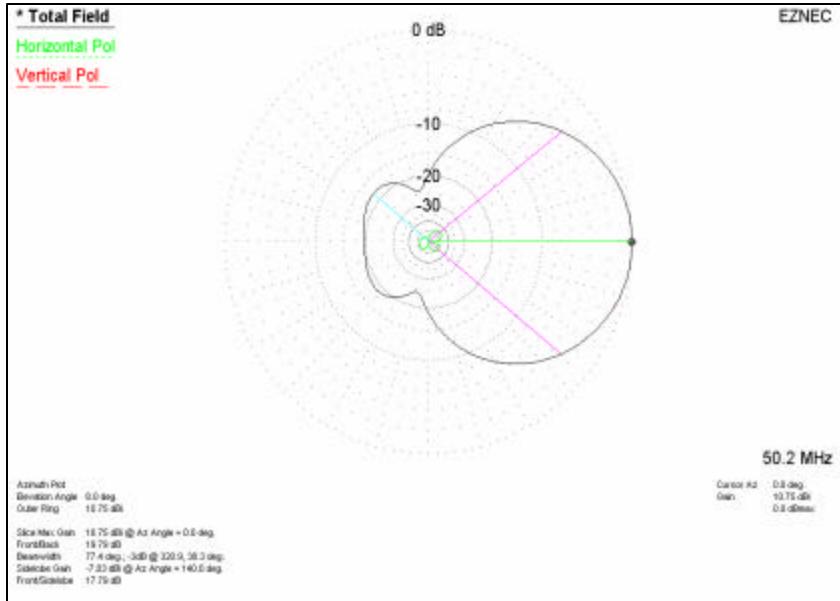
Lessons Learned and Retrospect

We have included sketches of our labor of love, HAMCALC results and the modeling results. Your design numbers may differ depending on how you built the antenna and what electrical parameters you want to optimize.

We learned a number of lessons from this exercise. The most important lesson was that you could easily design and build your own customized antennas using the tools available on HAMCALC and other software programs. The developers of these tools have done the difficult work. It is up to you to have the fun of using the tools and learning enough to share with others.

If you have any questions about this specific antenna, modeling, or, the design and construction process, please EMAIL us. We can supply you with photos of our antenna, EZNEC files and HAMCALC numbers. Also, we can give you the source(s) where you can find the software tools we used.

The most satisfying part of this hobby for us is Elmering and sharing with those who wish to learn what we have learned. Since we have made lots of mistakes, we have learned a lot!!!!



72/73,

Bob and Judith



Ham Shack Logging with XMLLog. By Dan, N8IE FP #-6

One of the biggest choices in the modern computerized Ham Shack is what logging program to use. This choice is made even more daunting by the seemingly endless supply of logging programs on the market. As with many choices and decisions in life, the simplest is often the best.

I, like many of you have spent countless hours sampling different offerings and untold hours importing hand written logs into every conceivable format known to man, only to be let down in the end. Many of these programs offer big “bells and whistles” at the cost of being too complex and user-unfriendly.



importing ADF files from contesting logs.

Now let's see just what XMLLog is. This is direct from the XMLLog web page:

Overview

XMLLog is an amateur radio logbook system for Windows 95, 98, ME, NT, 2000 and XP.

There is no charge for using XMLLog and no limitation on its distribution. Permission to distribute XMLLog for profit is prohibited.

There's now an XMLLog news group. For more information see the note near the end of this page.

XMLLog Features

Flexible log searching - Any log field can be used to select a subset of your log. For example you could select entries for a single country for which you have sent QSLs but haven't received responses. Or you could select all RTTY QSOs on 40 meters during October, 1995.

The search ended for me with a very simple, yet robust little program called XMLLog written by Michael McAmis, W1ECT. (<http://www.xmllog.com/>)

Before I go into detail about XMLLog, let me tell you why I choose it over the other programs sampled.

XMLLog is a very simple program LOADED with features, the program window is small, it's free, and the author keeps it up to date and works with the users to improve the program. Another great feature of XMLLog is the database is a native MS Access file. This means you can make major changes to the data outside of the program. This comes in handy when

Awards tracking - Tracks DXCC, WAZ and WAS. The QSL sent/received status is tracked as well as the submission status to the award sponsor.

Reporting - For each award XMLog can produce a report showing:

QSL sent/received status summary by band and mode.

QSL sent/received status details by band, mode and country/state/zone.

QSL award submission status summary or details.

Countries/states/zones needed by band and mode.

Critical QSO summary. This report lists QSOs that if confirmed would boost your totals.

There is also limited support for county hunting, IOTA, and grid square awards.

Callbook lookups - XMLog supports the Buckmaster, QRZ!, and Radio Amateur Callbook callbooks.

Label printing - QSL and mailing labels can be created based on info from log entries or from online callbooks. Labels can be created using standard layouts or from custom layouts you design.

Log importing/exporting - XMLog can import and export ADIF files or import .RES files from K1EA's CT contesting system. Log entries can also be exported as an Excel spreadsheet.

Packet Window

XMLog can display a separate window that interfaces to your packet TNC or to Internet Packet Cluster nodes. This packet window features:

*Scroll back - The packet window provides a large scroll back area which is saved between sessions.
Scripts - Scripts allow pre-programmed logins to Packet Clusters or bulletin boards.*

Packet Cluster Spots - XMLog can scan Packet Cluster spots and give vocal or CW alerts for needed QSOs based on the status from your log. Additional windows can be opened that display spots graphically as band maps or in 'spreadsheet' style.

CW and Rotor Memories - Memory buttons can be programmed to set your rig frequency/mode or control your rotor.

Callbook lookups - Callbook lookups can be made via a dialog or by double-clicking on calls displayed anywhere in the packet or spot windows.

CW keyboard - The packet window provides a CW keyboard that uses a CT-style interface to your transmitter.

CW messages - Pre-programmed CW messages can be sent using function keys.

Rig Support

When creating log entries XMLog can get the frequency and mode from your rig. You can also set the frequency and mode from Packet Cluster spots displayed in the packet and spot windows. Here's a list of currently supported rigs:

Alinco: DX-77

Elecraft: K2

Heath: SB-1400

Icom: IC-703, 706, 706MkII, 706MkIIG, 707, 718, 725, 726, 728, 729, 731, 735, 736, 737, 738, 746, 746Pro, 751A, 756, 756Pro, 756ProII, 761, 765, 775, 781, 821, 7400, 7800

JRC: JST-135, 145, 245

Kenwood: All models

TenTec: 516 Argonaut-V, 535 Argonaut-II, 536 Delta-II, 538 Jupiter, 563 Omni-VI, 565 Orion, 585 Paragon-I, 586 Paragon-II

Yaesu: FT-100, 747, 767, 817, 840, 847, 857, 890, 897, 900, 920, 980, 990, 1000, 1000D, 1000MP

As you can see, that's a lot of features in a small package!

So far I have imported all my Ham Radio logs into XMLLog, that's 13 years and over 20,000 QSOs worth of data. Working with this much data is no problem for XMLLog, in fact I've heard from other XMLLog users who have over twice the data I do, and they too report no problems handling large amounts of data.

I have created separate logs for other events, for instance I use a log file for QSOs made with the club call, W8PIG. I also keep separate logs for importing contest information so I can make "group" changes to the data before importing into my main log file. By using MS Access to create a separate database, I can use custom search options to track other awards such as the many offered by FISTS and other clubs.

Another nice feature is the ability to export data to an MS Excel file. With this you can sort and print a hard copy of your log in case of a hard drive crash and that backup I know you all keep fails. ☺

I have done this by sorting my logs by year and date, then printing a hard copy.

If need be, I have a hard copy to restore from, although with 20K plus entries I KEEP A GOOD BACKUP, that's way too much typing.....

Now XMLLog might not be "enough" for some of you die hard paper chasers out there, but for general logging, searching, and basic awards tracking it's a winner.

In my next article I'll explore the wonderful world of ADF files and how to convert your old hand written or text file logs into an ADF formatted file for importing into your favorite logging program.

72, oo
Dan, N8IE
FP #6

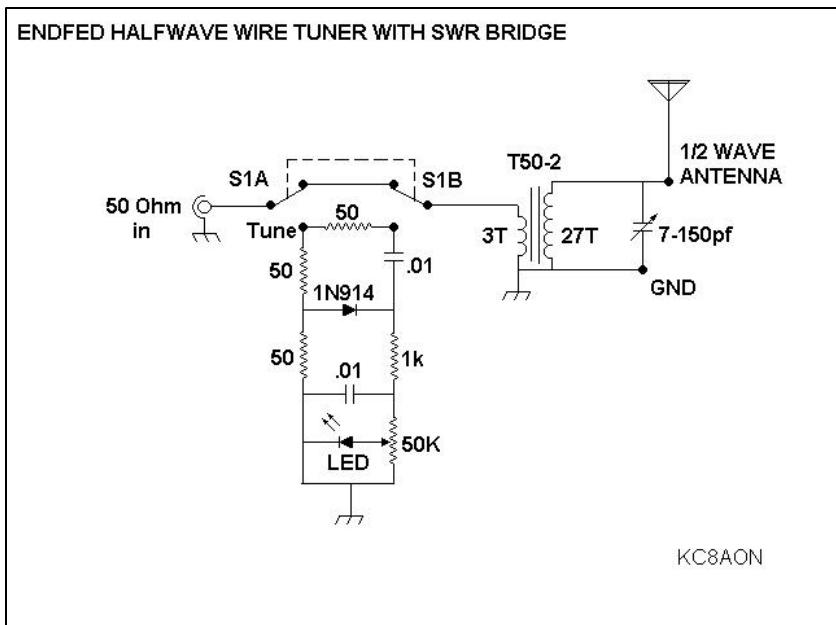


A Pocket Sized Tuner for End Fed Wires Rick McKee KC8AON (FP -33)

This is a very compact halfwave endfed wire antenna tuner that works 12 thru 40 meters with a halfwave wire for the band of interest attached. It is built into one of the small plastic Radio Shack project boxes that fits in the palm of your hand.

It is basically a parallel resonant circuit that transforms the hi Z of an endfed halfwave wire (around 5000 ohms) down to the 50 ohms that your transmitter likes.

To figure the length of the wire needed, use the formula: $468/\text{freq mhz} = \text{length in feet}$. It consists of a transformer of 27 turns of #22 wire wound on a T50-2 core, and a 3 turn link wound over the ground end of the main windings.



of interest to the antenna terminal and get it up as high as possible. I like to put mine up as an inverted L if possible with as much wire as possible in the vertical plane, and the balance of the wire running horizontal. This gives both vertical and horizontal radiation that works well both in close and far out. Next, attach the transceiver to the 50 ohm input on the tuner.



hope to work you on the air with your very own end fed half wave wire tuner!

72 & oink oink
Rick McKee, KC8AON

The 50 ohm side goes to the 3 turn link, and the hi Z antenna connects to the ungrounded end of the 27 turn winding. The variable capacitor connects across the antenna side from the ground to the antenna terminal. The variable capacitor in this tiny tuner was salvaged from an old AM broadcast band transistor radio that I picked up at a flea market for 50 cents ! If you see these old radios cheap at flea markets, grab them - the vari caps are valuable !

To use the tuner, first attach the endfed halfwave wire for the band

With the SWR bridge switch in the operate position, adjust the capacitor for maximum receiver signal or noise, then put the switch in the tune position, key the transmitter and watch the LED as you fine tune the antenna to get the LED to go out. Once the LED is off, put the switch back into the operate position, and you are ready to transmit. Refer to the schematic to help explain how to build the tuner. It is a very simple circuit to reproduce. Have fun building, and



MFB's Antenna Project (*Making do, with bad geography*) By Bill Todd – N7MFB FP# 419

I recently moved from Bay Center to Port Angeles, WA in early August of this year because of a job transfer. My wife joined me in our home on September 1st.

The two of us have always wanted to live in this part of the state, and in fact bought some property up this way in the late 80's, planning to build a house. That particular plan didn't work out, but we finally got here eventually.

When we first started looking for a place to live we discovered that the housing situation was really tight, with prices much higher than we expected, so we decided to rent a place until we got our bearings. We found an affordable duplex up on a hill above the city of Port Angeles, perhaps 500 feet above sea level.

The duplex is actually a pair of duplexes side by side with not much in the way of a front yard other than a concrete driveway where everyone parks their cars. The back yard is not that much better, consisting of no grass but crushed rock and pit run gravel that measures about 100 feet wide and 40 feet long – obviously, the landlord doesn't like to do yard work (lol). Directly in back of the back yard is a deep valley about 150 feet deep of perhaps 10 acres (nicknamed "the gully" by the local residents) that has many Alder, Maple and Fir trees. When I first saw these trees during our initial visit to the place, I thought I had some excellent antenna possibilities, but upon closer examination discovered that the really tall trees were out of reach on the far end of the gully, and that the majority of accessible trees were just above the ground level of our back yard, because of the steepness and depth of the gully.

The other complication I had to deal with in setting up an antenna system was the set up of my computer/ham room. SWMBO wanted our bedroom to be on the back yard side of the house because it was further away from the noise from the street, so that meant that the computer/ham room had to be placed on the front yard side of the house. The difficulty I faced was getting an antenna line to the back yard without putting a wire through the ham room window and up over the roof to the back yard.

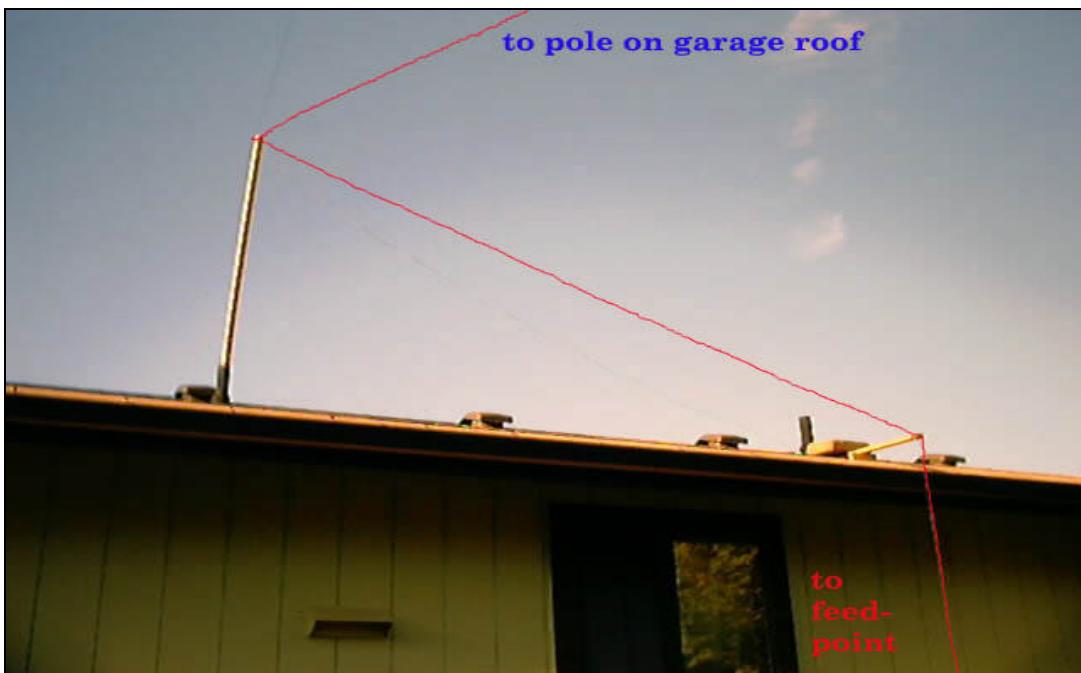
For a few weekends, I just set up my rig on the back porch of our duplex and operated out in the great Outdoors with a simple wire thrown up into a tree. It wasn't that great but at least I could communicate. I even managed to make three contacts during this month's ARS Sprint (Wow – stop the presses!).

Finally, I got an idea about an antenna system that could actually work. Fortunately, this house is elevated above ground by a perimeter foundation that's about 18 inches high, with an access door that just happened to be in the floor of the closet in the computer/ham room. So, I went under the house and ran a 35 foot piece of RG-58A/U under the house and out through a vent screen to the back yard. Once I was in the area I needed to be, I thought about erecting a standard dipole-type antenna but decided that the only antenna system that would be possible would be a long wire, because there was no nearby tree tall enough act as one side of a necessary two ended antenna support. An inverted vee wouldn't work either because the nearest tree was only 15 feet above ground level. So, I got out my Deluxe Antenna Launching Device (otherwise known as a fishing rod and Zebco reel) and began casting lines from the top of the garage out towards the gully in the hope of getting a line high enough into a tree to give my proposed antenna some elevation. I went through about half a dozen 1 ½ ounce

fishng weights until I finally snagged a top limb of a Maple tree that was perhaps 20 feet above the level of the back yard. I attached the antenna support seine line to the nylon fishing line from my antenna launcher, traveled into the gully, pulled the line down through the branches and then eventually attached 100 feet of 20 gauge insulated antenna wire to within a few feet from the Maple tree branch.



To keep the elevation as high as possible, I ran the antenna line from the maple tree to the top of a 8 foot wooden pole on the roof of the storage garage next to our house, and then continued the antenna line about 60 feet further to the top of our duplex. The wire was attached to another 8 foot pole, cleverly mounted in to one of those nifty PVC vent pipes on the roof of the house that I am sure were designed for ham radio Op's-lol, then down to the edge of the rain gutter (separated from the gutter about 1 foot), and ending up at the feed point about 6 inches off the ground. In total, I ended up with about 175 feet of wire in the air.



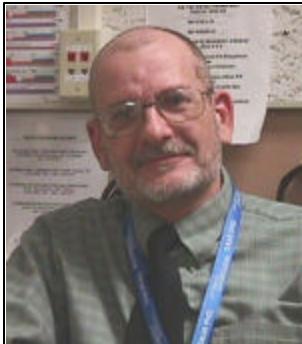


10 wire radials measuring between 40 to 80 feet in length were buried 1 inch under the gravel and then attached/soldered to a 3 inch x 2 inch piece of copper plated circuit board. The board was then connected to the braid side of the coax which was in turn connected to a ground rod, sunk 6 feet in to the earth next to the feed line.

All in all, this “make do” antenna system works pretty well. I discovered that the antenna resonates on 3.660 MHz, but with the use of a tuner inside the shack, I can load it up on all bands except for 160 meters, although I did load the antenna up the best I could the other night on 160 and had a QSO with a guy 133 miles away - so it does work to an extent on that band as well.

I do pick up more QRN here from nearby power lines than I did when I lived out in the “sticks” in Bay Center, but it’s not that bad. Basically, what I learned from this experience is Don’t Give Up – even if you have a less than perfect QTH.

73's & OO
Bill, N7MFB
(FPQRP #419)



An Introduction To: QRP on a Budget Dennis Doran WB8WTU FP#-138

The great thing about QRP operating are the many different angles of interest. If your interest is building equipment, backpack operating, minimalist stations or low power contesting, there seems to be something for everyone. Likewise there is a wide range of equipment to use and a new operator to QRP might find all the different choices somewhat confusing.

There are many threads and discussions on the Internet about what is the best radio to use for QRP operating. There is no one correct answer since much depends on each individual interest, station location, and funds available to spend on equipment.

In this article I would like to describe one approach for the new QRP operator to consider, and one that has worked for me. It is certainly debatable but hopefully will serve as a starting point for discussion and research.

Which radio is good for QRP ? The easy answer is the radio that you now own – whatever that may be. Just turn down the power to 5 watts for CW or 10 watts for SSB and have a ball.

If you are starting from scratch, the used radio market offers many different options. For the new QRP operator, I suggest the following criteria be considered:

1. General coverage receiver – This offers short-wave listening as an option for when band conditions are poor.
2. Both SSB and CW capability – Having SSB offers the option of QRP SSB as well as low power PSK-31 operation.
3. Radio capable of 100 watts output – When conditions are poor, tuning up the power to snag a QSO is not a crime.

As new radios are introduced with fancy new features, the used radio market offers many models that meet the above fun-factor criteria and make perfectly usable QRP rigs. All of that can be had for under \$500, many times WELL under that amount. There are truly some under-appreciate bargains in the used radio market, and I would like to mention a few to watch for. Again, this is purely subjective and just my personal opinion, but if you can find one of these in good shape and at a good price, it is a great way to get into QRP on a budget. I have suggested two models from each of the “big three”, however, I’m sure there are other models that operators would also recommend based on their experience. Your mileage may vary.

Icom: There is a LOT to be said about older Icom radios. They are generally easy to adjust the power from the front panel and in some cases, there is an internal switch to halve the output power to just 50 watts. Generally they are built very well and have long life spans.

First Pick: IC-735 – Try to find one with the CW filter and internal keyer already installed. These make great QRP radios. There is an internal switch to cut the maximum power to 50 watts and the QSK is very good. Much has been made of the “little plastic door” – not having one takes about \$50 off the price ! Very good AM reception and comes with FM for 10 meters. They offer a pre-amp and can be had for under \$400.

Second Pick: IC-725/726 – The IC-726 is an IC-725 with 6 meters. The receivers have a little hiss, but they are easy to operate and take the less expensive 9 Mhz CW filters. AM reception is decent but a little wide. FM was an option. No internal keyer. They offer a pre-amp and can be had for well under \$400.

Kenwood: Depending on the model, Kenwoods generally have very good receivers and transmitters. They are also built very well and have long life spans.

First Pick: TS-450S/AT – A very under appreciated model that was over-shadowed by its bigger brother, the TS-850S. The receiver is very good, has great AM reception and excellent QSK. It was sold with an internal antenna tuner as an option. There seems to be plenty of these for sale lately and can be had for under \$500. The CW and SSB filters are still available as new and easily available used. Power adjustment is by means of both a POWER control and CARRIER control, which takes some getting used to. This radio is a killer QRP rig.

Second Pick: TS-430S – Try to find one with the optional AM and CW filters installed. AM reception is very good, but requires the optional filter for optimal AM reception. These radios have an excellent reputation and can be had for under \$400.

Yaesu: Here I will suggest three models that make very good QRP rigs. All have very good receivers and are very easy on the ears.

First Pick: FT-840 – This is a no frills radio, that is greatly under appreciated, and is still sold new. It can, however, be found on the used market at a very attractive price. It has no internal keyer, nor any SWR indication or pre-amp, but is a great bargain used. The receiver is very good – even without a

pre-amp. AM reception requires an optional filter. With a CW filter, this radio sounds very good and is easy on the ears. I rate it first since they can be had very cheap, usually for under \$400. Filters are still available new, but not as common used.

Second Pick: FT-747GX – Another under appreciated radio that makes a very good QRP rig. This radio was housed in totally plastic case, but came with a CW filter and AM filter as standard. Tuning is a little fast but not too bad. Although considered to be a “cheap” radio, it was actually built very well, had very few problems and is easy to repair. These can be had for well under \$400.

Third Pick: FT-900 – This radio makes a very good QRP radio. Excellent receiver, built in keyer, although try to find one with the CW filter installed, as they are hard to find used. Very good AM reception. This model is not as common as the first two mentioned, but it is worth keeping an eye out for. The front panel is detachable for mobile operation. Most were sold with the built-in antenna tuner.

There are many other radios that can be mentioned, but these seem to show-up in the used market and at Hamfests most often and with very cheap asking prices. They make very good QRP radios and offer the advantage of SWL receivers when conditions are bad.

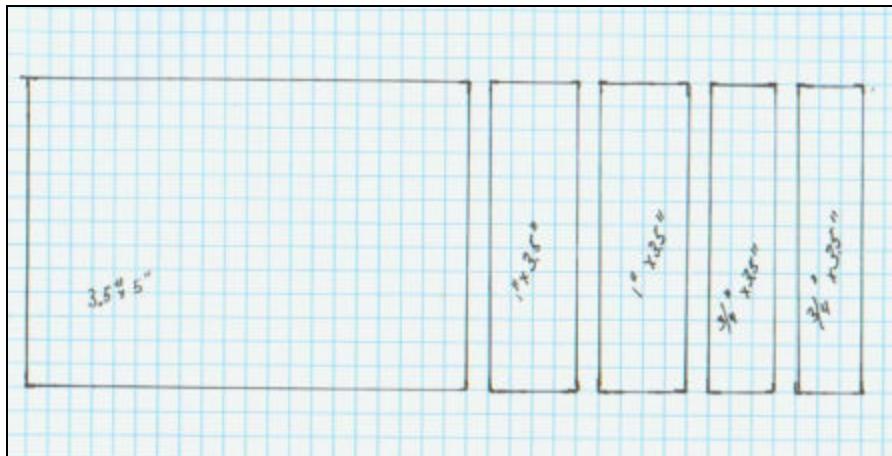
I hope my series of “Introduction” articles were of benefit to those just getting started in QRP. I appreciate the opportunity to have shared my thoughts with the Flying Pigs and would like to thank Brian for allowing me to do so.

Hope to work you all on the bands !



A FROSTY KOOL KEY “RC” Conley – FP#-567

After visiting Bill Chaikin's ([KA8VIT](#)) web site and seeing his home brewed single lever paddle key. I decided to try home brewing my own key. The first step was to see what was available for the project. I was unable to find what I thought would be suitable wood scrap then I saw the scrap 1/4" Plexiglass that I used for dipole insulators and my mind began to churn. "MAYBE"? After reviewing KA8VIT's work again and comparing his dimensions this is what I came up with.



Using only a common hack saw to cut the 1/4" plexiglass. I cut the base the same size as Bill's 3.5"X 5". Now where Bill used some 3/4" X 3/4" wood stock for the Back Plate I cut 2ea 1" X 3.5" strips these will be epoxied together to form the needed Back Plate. The 3/4" X 3.5" strips will also be epoxied together then cut in half to form "DOT" and "DASH" adjustment screws plates



After all the pieces were cut. I sanded all sides and edges to remove any burrs as well as rounding those sharp corners. It will also add a nice opaque look (I hope) to the finished key.



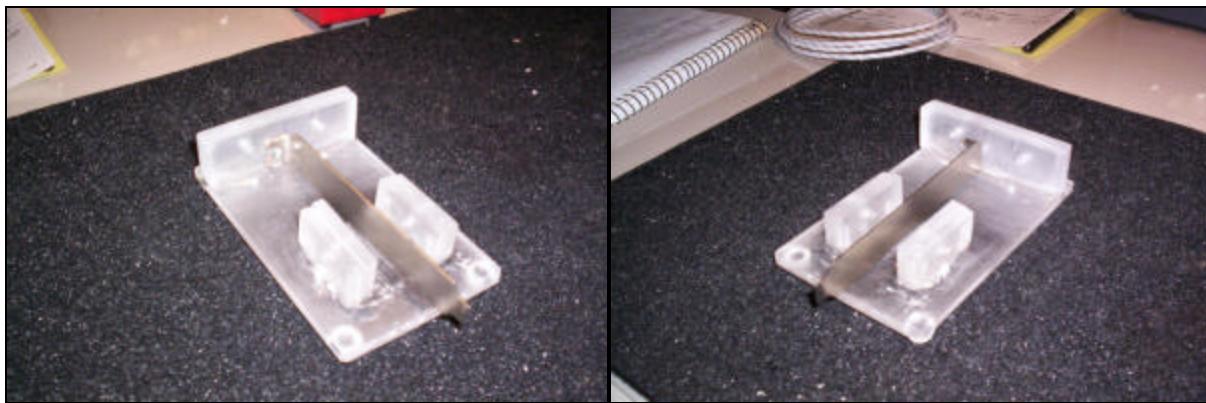
The two pieces for the Back Plate along with the two pieces for the Adjustment Screw Plates have been epoxied together making them 1" X 3.5" X 1/2 and 3/4" X3.5" X 1/2" respectively.



All components are cut. The holes for the screws having been centered and drilled. I sanded them to insure proper fit and epoxied them in place several times actually. I couldn't seem to get them aligned as I desired.



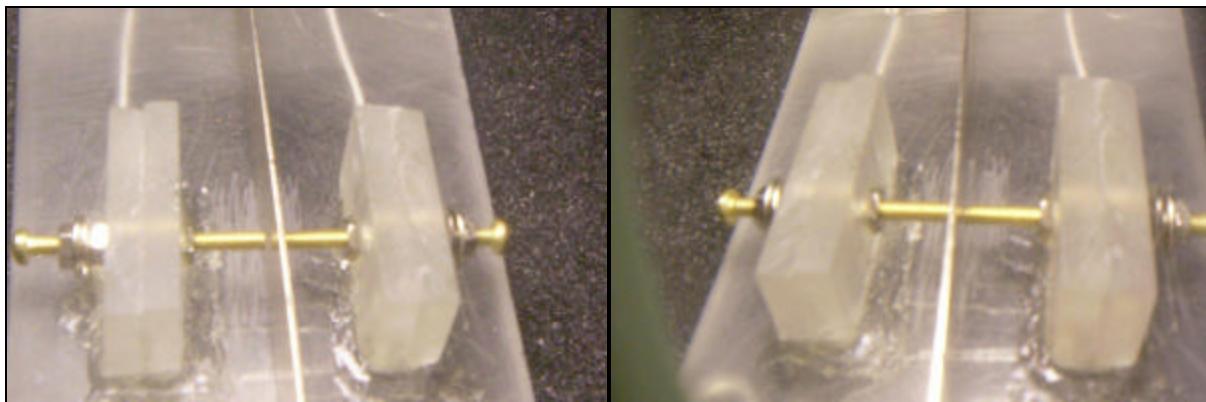
Here I've laid the arm in place to get an idea as to looks. After all of that I drilled from the bottom side some peggin' holes into which I epoxied in two 1/2" long 2-56 screws to reinforce the adjust screw plates. Most likely over kill but did it any way. You'll have to look close to see them.



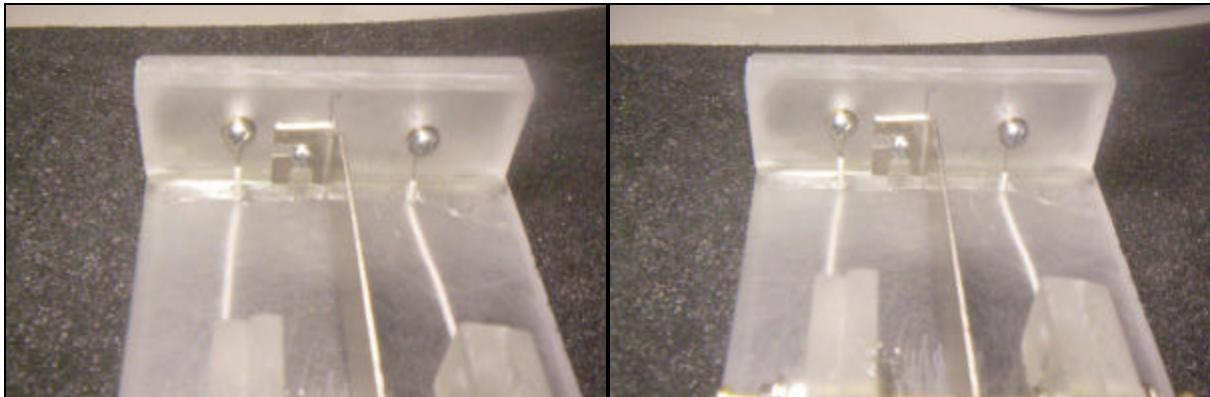
Here's the underside, see the peggin' screws?



Here is the set up I used on the Adjustment Plates. The inside nut is epoxied on the Adjusting Plate. There 2 nuts and flat washers (6-32) to clamp the wires going to the Back Plate.



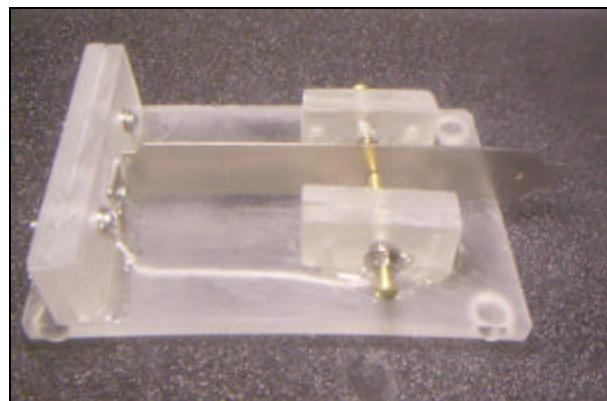
The Back Plate is shown here. Notice connecting wires from the Adjust Srews are run under the Base plate.



A close up view of the underside of the Base Plate. A close up view of the Back Plate from the underside



A view from the side.



The Adjustment Plate close up

After connecting it to my K1 (#1949) and testing it. I found like Bill Chaikin ([KA8VIT](#)) the lever action is surprisingly smooth and very sensitive. It's a joy to use and weighs in at whopping 4.85 oz. I did manage to get the DASH and DOT lines reversed but it only took a couple of minutes to fix that.

73 DE RC KC5WA



SOFTWARE TOOLS FOR THE HOMEBREWER

PART 2 – Let's BUILD Something

Jay Henson AJ4AY – FP#-115

This article is a follow up on my first article “Software Tools for the Homebrewer”. It is also about a really neat way for those of us that like to homebrew to quickly develop great looking PC boards for our projects. I like to call it “island” construction but I believe the official name of this method is the “Pittsburgh” style of homebrew construction.

In my first outing as a wannabe author, I discussed some of the software tools that I have found to be useful in building radio projects. In this article, I want to put those tools to use on a “from scratch” project. I see no sense in working on something if no useful final product comes out of the effort. To that end, we will construct a simple sidetone oscillator that can be used with almost any transceiver. The final product will be a twin T audio oscillator with an output frequency of 700 Hz, which can be adjusted. The components will be mounted on a 2 inch by 2 inch PC board and will utilize island construction. The Twin T oscillator was chosen because it produces a very clean sine wave output.

First, let's review my steps in developing a project. They are:

- Documenting the project.
- Preparing a working schematic.
- Developing a parts list.
- Developing a component layout and building a board(s).
- Developing a project layout.

DOCUMENTING THE PROJECT:

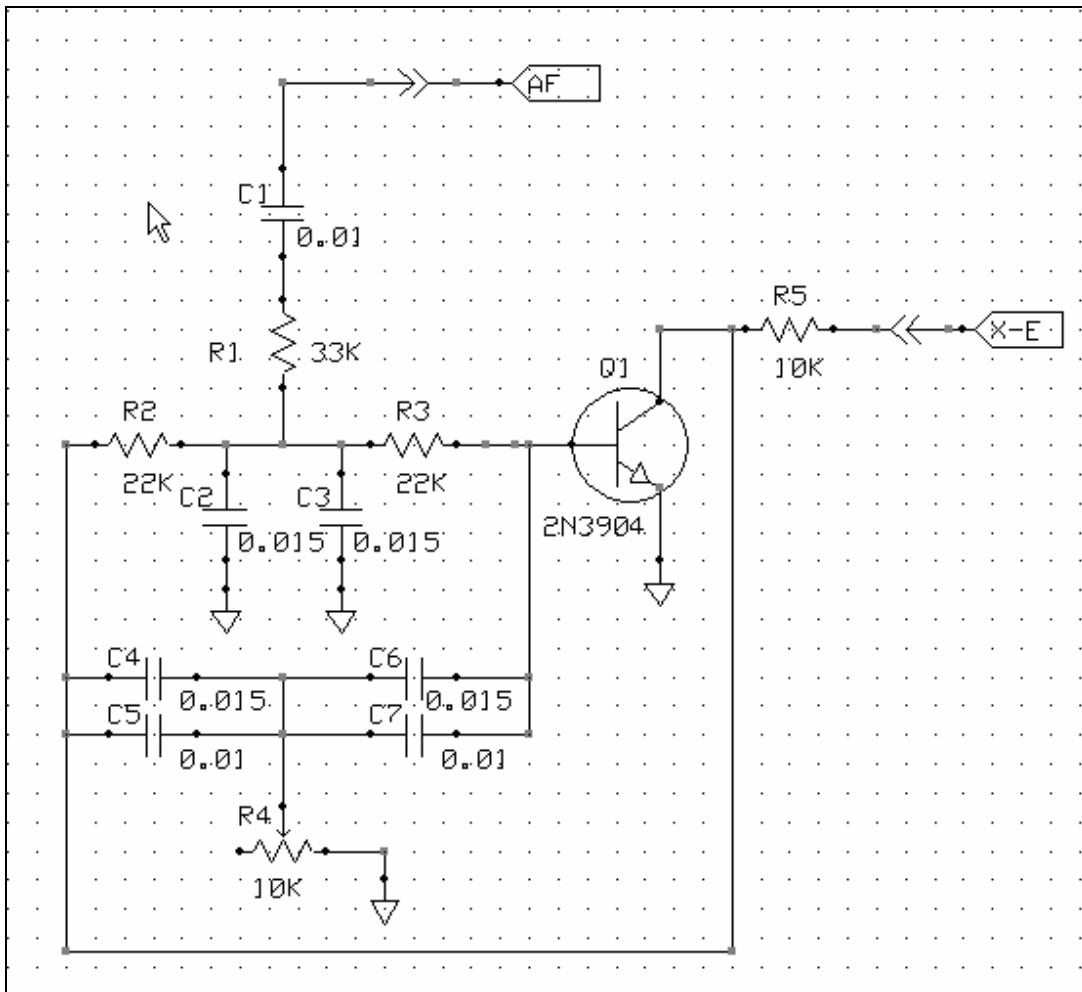
We are going to build a single board twin T sidetone oscillator using island construction. The oscillator can be easily integrated into a transceiver or used as a code practice oscillator with the addition of an audio amplifier. The output frequency will be 700 Hz, but is adjustable. My preliminary tests indicate a range from approximately 300 Hz to approximately 1600 Hz.

There is one input signal to the board, X-E. This is the transmit voltage. For a homebrew transceiver, this is typically around +8V and is applied only while transmitting (key down).

There is one output signal from the board, AF. This is the audio output signal that can be injected into the transceiver audio chain.

PREPARING A WORKING SCHEMATIC:

There is a lot of information available on the internet about the twin T audio oscillator. After reviewing several references and performing quite a bit of experimentation, I produced this schematic. If you have ExpressSCH on your computer, this schematic will take you about 30 minutes to duplicate.



I allowed ExpressSCH to automatically assign component ID's. Take note of the "double arrows". This is a custom component that I built and use to indicate external connections to a project board. The connections with arrows pointing inward (towards board components) are inputs. Likewise, those pointing away from board components are outputs.

If you will remember, one of my basic beliefs in all that I do is KISS (Keep It Simple Stupid). As you can tell in looking at the schematic, I have somewhat violated that principle by paralleling several capacitors. The values that worked well in this application were 0.03ufd (C2 & C3 combined) and 0.025ufd (C4 & C5 combined, C6 & C7 combined). These are not your run of the mill garden values for capacitors. Fellow piggies, use what you have!!!! Nothing says that you have to have a single 0.03ufd capacitor. Parallel three 0.01ufd capacitors and, viola, you have a 0.03ufd capacitor. I happen to have a junk box with a lot of 0.015ufd capacitors and 2N3904 transistors that I purchased from our own Brian (of small parts fame) KB9BVN. R4 was purchased from Diz W8DIZ, www.partsandkits.com. If you are a homebrewer, I urge you to take advantage of the component deals offered by others. Support your local QRP'er business person.

DEVELOPING A PARTS LIST:

ExpressSCH has a very nice built in function that generates a “bill of materials” from a schematic. In this example, there is only one sheet and the parts count is small so there is not a lot of mental work involved with this task. However, if you are working on a large schematic with multiple sheets, the number of various components and their values can easily become unmanageable. Let ExpressSCH handle all of this for you.

ExpressSCH will output the bill of materials to the clipboard. The information can then be pasted into your favorite data management/massaging tool, mine being Excel. This is the bill of materials for our sidetone oscillator.

C1	0.01
C2	0.015
C3	0.015
C4	0.015
C5	0.01
C6	0.015
C7	0.01
Q1	2N3904
R1	33K
R2	22K
R3	22K
R4	10K variable
R5	10K

With a little judicious manipulation of the parts list in my noggin, I find that we need:

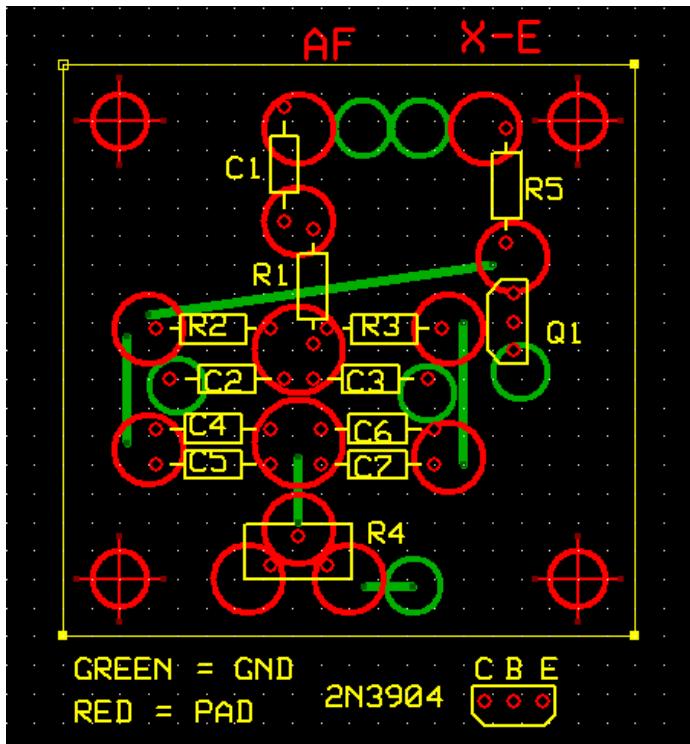
3 ea	0.01ufd
4 ea	0.015ufd
1 ea	2N3904
1 ea	10k
1 ea	10k variable
2 ea	22k
1 ea	33k

I can't stress how invaluable the generation of the bill of materials from ExpressSCH is. The larger the project, the more useful and beneficial it becomes.

DEVELOPING A COMPONENT LAYOUT:

Ok, we have a design document, a working schematic, and a parts list. The next step is to develop a PC board layout. The physical layout of the components on a PC board will be done using the “island” or “Pittsburgh” style of construction. To accomplish this task, we'll use ExpressPCB. It is easier to show the final layout as seen in ExpressPCB and then talk about it.

Before getting into the finer details of what you see, let's talk about what ExpressPCB sees. The default top layer of copper is red. The default bottom layer of copper is green. The silkscreen items are yellow. All of these colors are changeable by the user but I have never found a need to change them. You can choose to view everything, top layer only, bottom layer only, silkscreen only, or various combinations. I tend to view everything during development.



Dimensions are in real values. In other words, if I place a $\frac{1}{4}$ " diameter circle on the drawing surface, it will be $\frac{1}{4}$ " in diameter on the printed copy. A $\frac{1}{4}$ watt resistor is approximately 0.1" wide and approximately 0.4" long. On the printed copy, it will have those dimensions.

Now, let's look at the layout. The grid is on 0.1 inch centers with the overall PC board measuring 2 inches by 2 inches. In each corner of the board is a red circle with crosshairs. These are to be used as drilling guides for mounting holes. I have found that 4-40 hardware works very well for this purpose.

Along the bottom edge of my layouts, I generally include a legend. It is primarily to document transistor leads or other reference information. Doing this means that I have the information close at hand and I don't have to dig out a reference book during the construction process.

I mentioned earlier that ExpressPCB sees green as the back copper layer. For my single sided PC boards, I use green for a different purpose. Notice the GREEN = GND and the RED = PAD comments in the legend. On the drawing surface, I interpret a green circle as a ground connection where one component lead is soldered to the top copper layer, or ground plane. A red circle (other than those designating the mounting holes) will become an "island", or an insulated connection point for component leads. For our project, there are two sizes of red circles, or islands. The common connection point for R2, R3, R1, C2 and C3 and for C4, C5, C6, and C7 is a $\frac{5}{16}$ " diameter island. The rest of the islands are $\frac{1}{4}$ " in diameter. I have found that $\frac{1}{4}$ " islands can easily handle four connections, maybe five if you force the issue. Anything, more than four will usually require a $\frac{5}{16}$ " island.

The green lines are jumper wires that connect islands.

In keeping with KISS, the general layout of the components on most of my boards physically follows the schematic layout very closely. I also tend to include component ID's on the layout. This makes locating specific components and troubleshooting problems much easier.

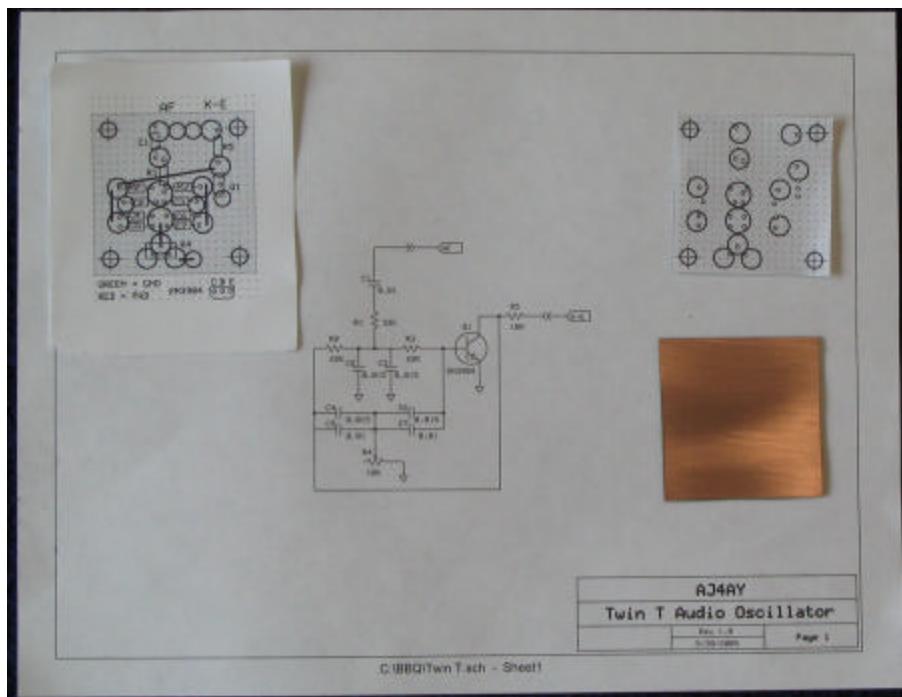
BUILDING A BOARD:

Now comes the fun part. We are going to transfer our layout to a PC board, cut the islands, and add the components. This is a fairly regimented process in that a sequence of events takes place in a specific order, regardless of the board being made. So let's do this as a Step 1, Step 2, etc. and I'll insert comments where needed.

Step 1 From ExpressSCH, Print the schematic.

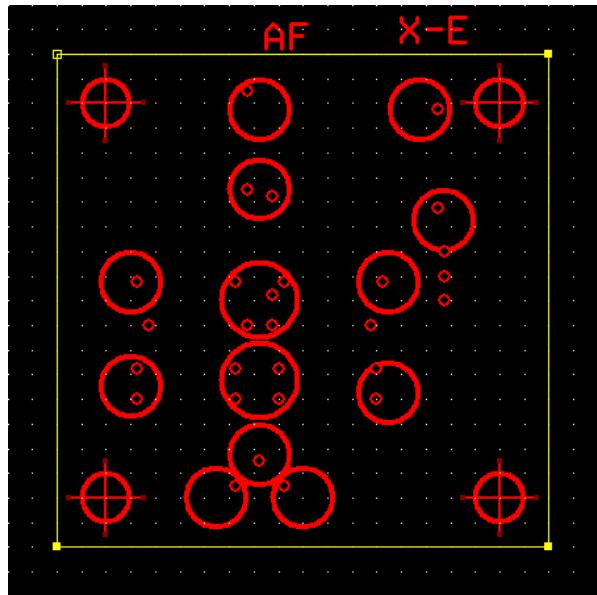
Step 2 From ExpressPCB, print the complete PC board layout. There are selection boxes to print the various layers. Select top, bottom and silkscreen layers to print. It is not necessary to print in color unless you just like to see it that way.

Step 3 From ExpressPCB, select the printing of the TOP layer ONLY and print it. Again, it is not necessary to print in color.



In this picture, I have the schematic of the project, the printed output from step 2 in the upper left corner of the schematic, the cropped printed output from step 3 in the upper right corner of the schematic and a 2" X 2" piece of PC board (Step 4) in the lower right corner of the schematic.

The output from step 3 is the key to the whole process. The printed output for our project will look like this except be black on white (no color printing).



You will notice, right away, that all of the component outlines, ID's, and ground connections have disappeared. The very small circles are component connections for lead # 1 of the various components. For our purposes, ignore these. All that remains are the islands and the mounting hole circles. Cut the pattern along the board edges in the printout to produce the 2" X 2" cutting template.

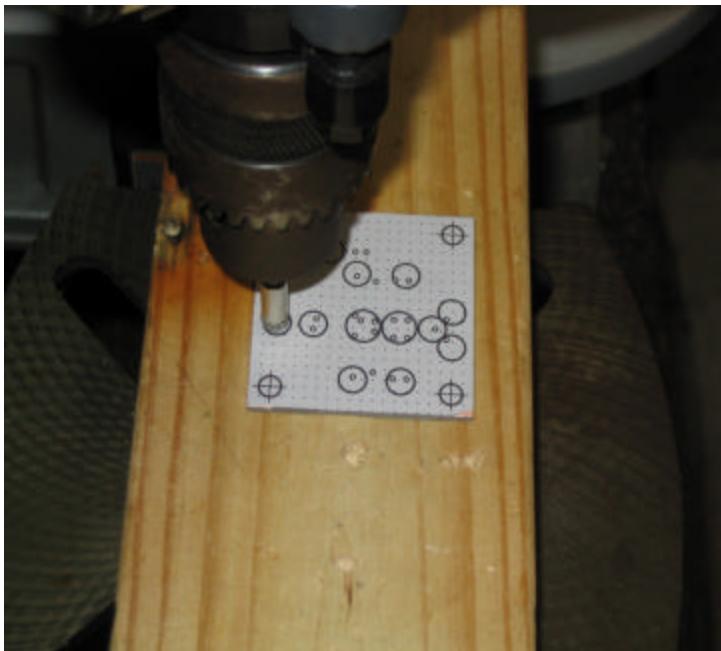
Step 4 Cut out a 2" X 2" piece of PC board. Clean one side of the copper with a green scotch brite pad or very fine sand paper. Do not use steel wool. Wipe the PC board clean and avoid placing your fingers on the cleaned side.

Step 5 Place the PC board, clean side up, on an open piece of newspaper. Spray the PC board with a thin layer of Elmer's Spray Adhesive and allow it to dry for 5 minutes. Align the paper template from step 3 with the PC board and secure the template to the board. Make sure that the paper template is smooth and secure and has no air bubbles behind it

Elmer's Spray Adhesive or Artist adhesive can be found at office supply stores.

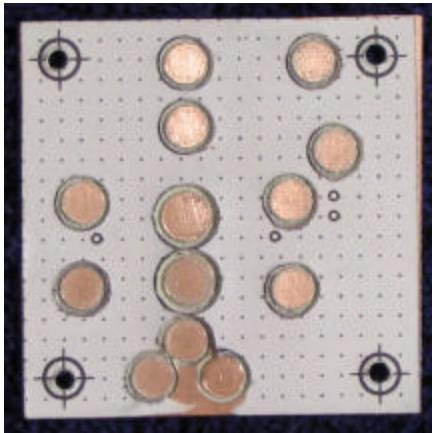
Step 6 If mounting holes are to be drilled, center punch the cross hairs on the template. I usually use a small nail and a light tap from a hammer to put a ding on the PC board. A 1/8" drill bit in a drill press works well for 4-40 screws.

Step 7 It's time to cut the islands in the PC board. We will be using diamond hole saws that are available from Harbor Freight. Go to <http://www.harborfreight.com/> and search for item 32398. This is a \$4.99 set of 3 hole saws that includes 1/4", 5/16", and 3/8" cutting tools. All have 1/8" shanks.



A drill press is necessary to do this cutting. You can try this with a hand held drill motor but the job will be much easier with the drill press. Mount the 1/4" hole saw in the drill press chuck, keeping as much of the shank as possible in the chuck. This will keep wobble at the cutting edge to a minimum. Move the table up to within 1/8" or so of the cutting tool. This will leave enough room to slide the PC board under the cutting tool. Using the paper template as a guide, begin cutting the 1/4" islands. Very little down pressure is required. The intent is to cut through the top copper layer ONLY, not through the PC board. Remember, don't use the 1/4" saw to cut the 5/16" islands. Been there and done that before.

Step 8 Mount the 5/16" hole saw in the chuck and cut the two larger islands.

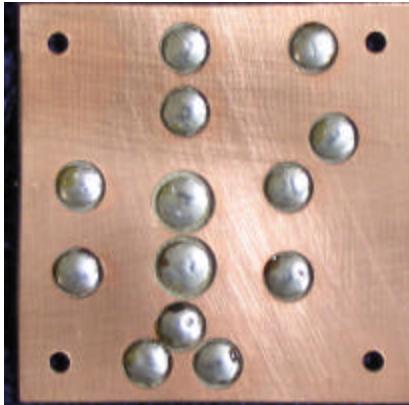


This is a picture of the PC board after all of the islands have been cut and the holes drilled for the mounting hardware. You will notice that the paper template is destroyed during the cutting process. The removed pieces of paper are caught in the bore of the cutting tools and should be removed.

Step 9 Remove the remaining paper and adhesive from the PC board. The paper should be easy to peel off. The green scotch brite pad will remove the spray adhesive with a little effort. I have used alcohol on large surfaces to speed things a little. The downside of using alcohol is that the gummy mess tends to collect in the grooves around the islands.

Use a small pointed tool (see Summary for locating a set of tools) to clean out the grooves that have been cut in the copper and fiberglass. This removes trapped small copper particles that can produce a short between the islands and the ground plane. Use an ohmmeter to verify that every island is insulated from the ground plane. If you decide to skip this task, you could regret it later. It doesn't happen very often, but there is the possibility that the copper is not truly cut through or small copper particles are wedged in a cut and causing an island to ground plane short. Now is the time to find these problems and not after components have been soldered in place.

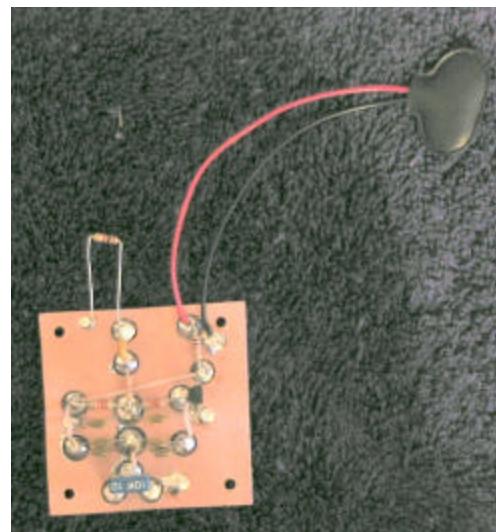
Step 10 Tin all of the islands. I find that a 700 degree tip in my Weller iron works best for this. Completely cover the copper on the islands. Again, use an ohmmeter to verify that every island is insulated from the ground plane. I speak with a voice of experience on this. It is very easy to develop a small, hard to see solder bridge between an island and the ground plane.

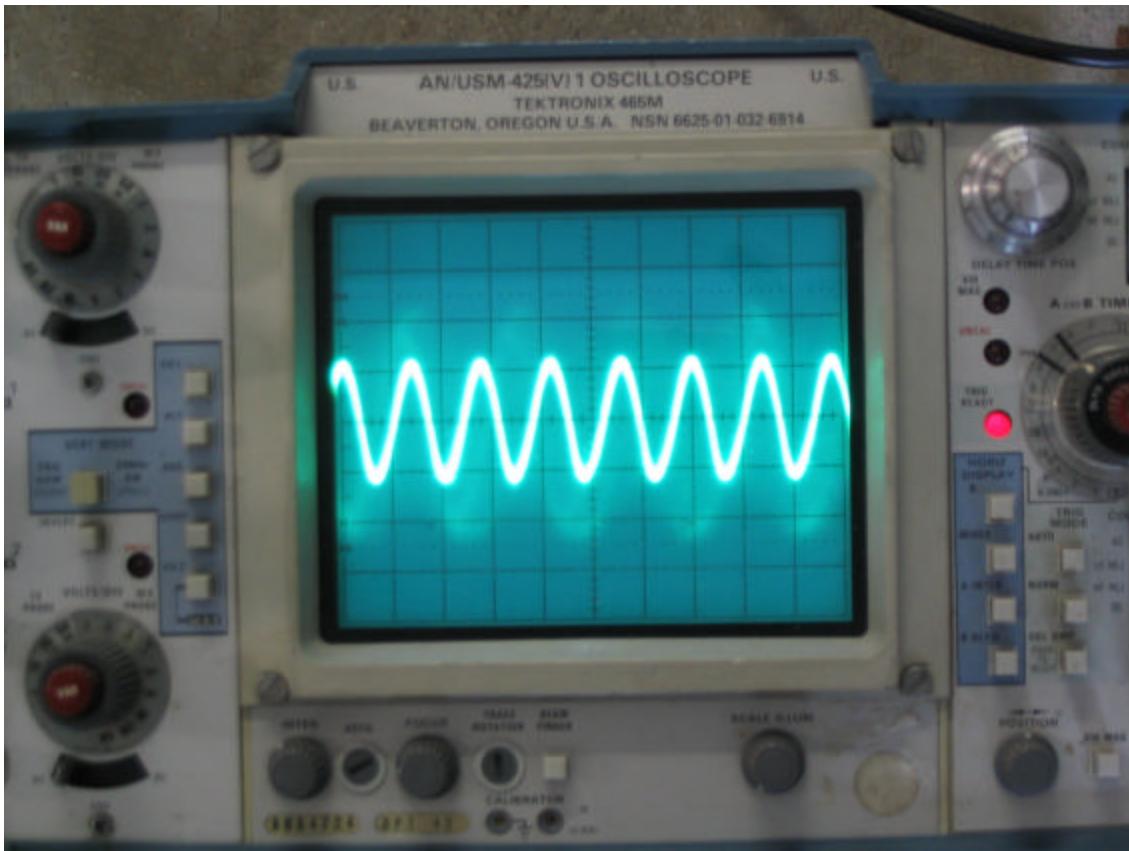


In this picture, the PC board has been cleaned and the islands tinned. An ohmmeter has been used to verify that the islands are isolated from the copper ground plane.

Step 11 Populate the components on the board. You will quickly learn how to bend component leads to make this job go faster.

This is a picture of the completed board with all components mounted. For testing, I have also added a 9V battery connector and a 1K ohm load resistor.





This is a picture of the sine wave output from our project board. The vertical scale is 5mv/division and the horizontal scale is 1 ms/division. As displayed, the output is 12.5mv PP at approximately 714 Hz (5 complete cycles in 7 ms).

SUMMARY:

The island method of PC board construction is quick and easy. This project board took 3 hours to complete, from step 1 to viewing the sine wave on the scope. That includes the time used to take the pictures.

A word of caution is in order at this time. Make sure that the dimensions of the components you are using in your project are the same as those used in the laying out process. For example, in our project, R4 is a 10K variable resistor. There are several variations on this type of pot. I used a single turn pot. The miniature 10 turn PC board mounted pot that you have in the junk box would not fit the islands that I have used. Use what you have and adapt the layout as needed.

If, heaven forbid, you find an error in your schematic (never happens, right!) and you need to revise your board, it is not a world disaster. Make yourself a new board. I have actually turned a board over and made the revised layout on the back side of the original board. Most, if not all of the components, can be taken off of the original board and placed on the revised board, as is. None of the components should be destroyed in this process.

For this simple project, it was not necessary to produce a detailed CAD drawing of how the PC board would be implemented or placed in the transceiver. However, this step is a vital one for larger efforts. Again, my software of choice for simple CAD efforts is CadStd Lite.

This is a list of software and tools that I have mentioned in this article:

For a free download of ExpressSCH and ExpressPCB, go to:

<http://www.expresspcb.com/ExpressPCB.htm/Download.htm>

Elmer's Spray Adhesive or artist adhesive is available at office supply stores

Diamond Hole Saws are available from Harbor Freight, item number 32398

<http://www.harborfreight.com/>

4 piece pick and hook set from Harbor Freight, item number 34328

<http://www.harborfreight.com/>

A similar product is made by Stanley and is available at Wal Mart.

For a free download of CadStd Lite, go to:

<http://www.cadstd.com/lite.php>



QRP TTF 2005 – A success story from the Florida Keys By Nelson Winter NE4LS FP#-909

Tom (K4THL) and I had done well in the QRP TTF (To The Field) contest in 2004 (we actually got first place in our category) so we thought that we should give it another shot in 2005. Since we had operated under my callsign and operated at a location of my choosing the previous year, we decided that we should operate under Tom's callsign and operate from a location of Tom's choosing this year.

The theme for QRP TTF 2005 was "Ridin' The Rails". An extra bonus was to be awarded for operating from a location that embodied rail travel either current or past. I set upon a research project to learn more about the railroad structure in Florida and the history behind it. It didn't take me long to stumble upon Henry Flagler's Florida east Coast Railway.

Henry Flagler was a self-made multi-millionaire and visionary. His savvy entrepreneurial spirit catapulted him into partnership with the likes of the Rockefeller family and standard oil in the 1870s.

By 1878, Flagler's wife, who had always struggled with health problems, was very ill. On advice from her physician, she and Flagler visited Jacksonville, Florida for the winter. Mary's illness grew worse, however, and she died on May 18, 1881 at age 47. Two years after Mary's death, Flagler married Ida Alice Shourds. Soon after their wedding, the couple traveled to St. Augustine Florida where they found the city charming, but the hotel facilities and transportation systems inadequate. Flagler recognized Florida's potential to attract out-of-state visitors. Though Flagler remained on the Board of Directors of Standard Oil, he gave up his day-to-day involvement in the corporation in order to pursue his interests in Florida. He returned to St. Augustine in 1885 and began construction on the 540-room Hotel Ponce de Leon. Realizing the need for a sound transportation system to support his hotel ventures, Flagler purchased the Jacksonville, St. Augustine & Halifax Railroad, the first railroad in what would eventually become the Florida East Coast Railway.

Flagler's initial vision of the railway included overseas trestles that would connect Florida to the Bahamas and Cuba. The railroad would allow passengers to travel to any one of a network of upscale resorts that Henry had planned throughout the region. It would also open up a more economically viable trade route to Cuba.



Every few years Henry would extend the terminus of the rail line farther and farther south; first Daytona, then Palm Beach, then Miami and Biscayne Bay.

Henry was called a madman and a lunatic. Perhaps he was – but he was able to undertake the most challenging rail project in the history of mankind. Although the project was never completely finished, the mark he made on Florida's history is indelible.

By 1905, Flagler decided that his Florida East Coast Railway should be extended from Biscayne Bay to Key West, a point 128 miles past the end of the Florida peninsula. This segment of the rail line would eventually become known as "Flagler's Folly". At the time, Key West was Florida's most populated city and it was also the United States' closest deep-water port to the canal that the U.S. government proposed to build in Panama. Flagler wanted to take advantage of additional trade with Cuba and Latin America as well as the increased trade with the west that the Panama Canal would bring. In 1912, the Florida Overseas Railroad was completed to Key West.

In 1935 on Labor Day a hurricane struck the middle keys and destroyed the railroad and killed over a hundred WWI veterans that were returning from a well-deserved rest. This tragedy was later known as the Labor Day disaster. The hurricane ended the railroad's reign over transportation in the keys. The right of way was sold to the state of Florida for \$600,000. A highway was built right on top of the existing rails and trestles and remained in use until the last section was replaced with a modern highway in 1995.

Now that I have given you a synopsis of the history of the railroad I will continue on our journey that surrounded the QRP TTF 2005 event.

After obtaining an Internet education on Henry Flagler and his legacy I needed to find a location where Tom and I could operate from that would embody the railroad that Mr. Flagler left behind. While it is true anywhere along the existing highway 1 originally was part of the railroad, we wanted to have a location that shouted its authenticity. I happened upon a state park called Bahia Honda. This place was just what we were looking for.

This bridge was 5,055 feet in length and consisted of 27 through-truss spans and 9 deck plate girder spans. Thirteen spans were 128 feet, 13 spans were 186 feet and one was 247 feet. The deepest water at any point along the Key West Extension was encountered here -24 feet and even deeper- and had to be penetrated to anchor the piers. It is the only camelback-type bridge used in the project.

The bridge and the adjoining island are now part of Bahia Honda State Park.



I emailed Tom several links with info about the park and he agreed that this place had all of the earmarks of a perfect place from which to operate.

Tom was able to make the initial contact with the rangers and then the park's manager



Tom and I decided to schedule our scout trip to Bahia Honda three weeks in advance of the contest. It was good that we went. The first thing we found is that getting there can take a lot longer than anticipated. We showed up at the park's entrance around 11:30 in the morning. The staff was cheerful and helpful. We obtained a map and set out about searching for that "perfect" spot. We marked on the map all of the places that we thought would be suitable. We spent the better part of the day exploring the park, taking notes, bearing headings and taking snapshots. We were glad that we had come.

I then followed up with another conversation with the park's manager to make sure that we would be allowed to set up our gear and operate. The manager proved to be VERY accommodating. He knew about Amateur Radio and was willing to help us in any way possible. This was encouraging to say the least.

Tom and I had a few discussions about equipment and antennas leading up the date of the contest. We already had settled on his K1 as the primary rig but the antenna situation was an issue that was debated back and forth. On one hand we wanted to take advantage of the low takeoff angle of a vertical + salt water and on the other hand we wanted some directionality. About 1 week before the contest Tom decided that we were going to use a doublet fed with balanced line and supported with fiberglass poles. I was fine with his decision.

We obtained two Black Widow crappie poles from the local fishing supply store; one for each of the ends, and my 30' MFJ 1910 which was deployed as the center support. The elements were cut to 1 1/4 wavelength on the highest freq we wanted to operate (21.060) to give the antenna a maximum radiation lobe at 90 degrees from the wire.

We set the whole antenna up in a test run at Tom's house and it tuned up to less than 1.5:1 with Tom's K1 on all bands. We even were able to make a few good Qs so we knew that the antenna was working FB!

The next weekend was the contest and we felt ready. Everything had been considered and all preparations were made, batteries charged, sun screen packed, ample water obtained.... Everything was double-checked.

On the morning of the contest we left for Bahia Honda around 8:30 in the morning. While driving down I was trying some of the local repeaters to see if I could raise anyone. It was very quiet – no activity until we got into Marathon. I was able to hook up with ND7K – Chuck. I told him what we were doing and he remarked that he was a cw operator too. Plus, he wanted to go simplex so I could claim him for IOTA. What a great guy! Do we QSYed and sure enough we hooked up again and had a fun chat. He said he would try to work us for the contest and then signed clear.

We arrived at the state park a little later than we had hoped but we felt we still had plenty of time for setup. We talked to the rangers at the booth and told them what we were doing and who we needed to speak to. A few minutes later the park's manager arrived. We discussed with him our preferences for an operating position. He explained that all of the camping sites were unavailable. We had also chosen a spot on the south side of the island during our scout trip. We all agreed that this site would be very suitable. We got back in our vehicles and then Tom followed the manager to our special spot.

We unloaded quickly. I brought a large canopy for shade. Tom hadn't actually seen my canopy before and I think he was under the impression that it was of the EZ-Up kind. He gave me a stern look when I opened up the box with all the poles and a small sheet of paper for instructions. It actually turned out to be not that bad and he forgave me later for having brought such a cheap canopy (grin).

Once the canopy was erected, we brought the picnic table under it and then set about erecting the antenna. In the middle of putting the thing up a man stopped by and asked us what we were doing. As

it turned out he was a ham too and so was his son who was with him. He asked if he could help but we turned him down his offer since we already knew how everything was to be configured.



Once the antenna was up and all the essentials were unpacked, Tom moved the truck into our designated parking spot. He came back and we tuned around the bands to see how everything was working. The antenna loaded up FB again on all bands and we were feeling pretty happy with our setup.

Here's how the station looked to a passer byer. You cannot really make out the distant end of the antenna but you can fully see the closest crappie pole and the center support with the twin-lead blowing in the wind and the canopy that we assembled from a million parts.

We decided to operate in one-hour shifts throughout the six out period. I make a couple test contacts just before the start of the action. Everything was working great. Tom wanted me to operate the first shift. I acquiesced. started out on 20 meters since 15 was dead, dead, dead.

I was using my Brown brothers straight key. The band was short at first. Then as time progressed I



could start to make contacts farther and farther away with openings up the eastern seaboard. When my hour was up I could hardly believe how well it was going.

I stepped away from the key and I handed over the station to Tom. He plugged in his brand new Vibroplex bug. It's a very nice piece of mechanical genius, but I could never get the hang of it. While Tom pounded way I set about taking some pictures of the area.

The biggest feature of the park is of course the Bahia Honda Bridge. Here is what it looked like from out operating position.



At the base of the path to the bridge there is an informational placard, which gives you a brief history of the bridge and Henry Flagler.



Once on the bridge, the view was spectacular. I walked all the way to the end and took this shot.



What is really amazing about this picture is that the Atlantic is on the left and the Gulf of Mexico (Florida straits) is on the right. You can just make out the water pipe near the base of the bridge which brought water to Key West – some 27 miles away. This is the picture we used for the QSL card.

I looked at my watch and I knew it was my time to operate again so I hurried back to the station. Tom looked happy so I knew that things were going well. I unplugged the Vibroplex and went back to my Brown Brothers.

All of a sudden I hear s a really strong signal WN1GIV. I know that as Bob Patten's (N4BP) original novice callsign. I have him a call and I said "Hi BOB. It's Nelson" since I was using Tom's callsign. Bob and I agreed to try on 15 and 40 meters for some extra points. I knew Bob was close by so making this work wasn't going to be a problem. We made the exchanges no problem. Bob's a great competitor so I knew he was going to be tough to beat – but I was glad to work him during the contest and get the points. Thanks Bob!

Tom and I continued trading shifts and watching the beach goers as they watched us too with great curiosity. I worked ND7K (Chuck) who I had worked on the repeater earlier that morning. Throughout the duration of the contest there were a lot of callsigns I recognized. It was nice to hear some familiar beeps.

Here is a summary of the contacts we made:

Count	Band	SPC
1	15	1
50	20	26
3	40	2

We're also claiming the "Train Station" multiplier as well as the "straight key" multiplier.



As the afternoon sun went down on the bridge we packed up and headed home. It was a long tiring day but we accomplished what we had set out to do. Have a great time! We might even have won in our category – but we won't know for sure until the results are made available in a few more months. Dit dit nw



Fun with Radio Antennas from Military Field Antenna Handbooks – Jim Glover WB5UDE FP#-1036

Quite often, we're pleased if our portable operations involve antennas that turn out to be adequate. But, what if we could use a portable operation as a chance to put up something remarkably effective as an antenna? If that idea sounds appealing to you, you might want to consider looking into how the military accomplishes effective radio communications.

Where military field operations are concerned, radio communications need to be both rapidly deployable, and highly reliable. Those are qualities we amateur radio operators would like to enjoy when we deploy antennas for portable operations. Although military operations have some resources that exceed what we amateurs are likely to bring along when portable, we may choose to bring along one of the important tools that help make military field communications successful: **military field antenna manuals**.

About ten years ago, I got my hands on a photocopy of the US Department of Defense Field Antenna Handbook. I've enjoyed having this resource to reference for antenna ideas, and to share with other hams, but it's necessary to photocopy it to get a copy in another ham's hands. So, I was glad to find a copy of the US Marine Corps Field Antenna Handbook in PDF form on the web a few months ago.

The two publications are remarkably similar, and I suppose the Marine Corps version (dated 1999) must have been based on the Department of Defense version (dated 1984). In any event, they cover pretty much the same material, with mostly the same diagrams and charts. Curiously, I find the older (Defense Department) version more complete, so I guess they must have worked to streamline the later version. Both publications cover the fundamentals of propagation, antennas, feedlines, and "field expedient" techniques ("improvising" is what some people would call it--business as usual, pretty much, for many hams!), as well as specific HF and VHF antennas, including some discussion of NVIS antennas and techniques.

Not surprisingly, many of the HF antennas would be familiar to hams. The vertical, dipole, inverted vee, long wire (not random wire), and inverted L are described, as well as others. However, some of the antennas are a bit out of the mainstream for hams. The sloping vee, sloping wire, and vertical half rhombic are examples of the slightly more exotic antennas these handbooks describe. The general theme here is that these are quite long antennas, and exceed what most of us could put up in our back yard.

However, there are events like Field Day and other portable operations which may involve setting up where more open space is available. When there's room, these longer offerings from the military field handbooks may be worth considering. So, a Field Antenna Handbook for Field Day antenna ideas? Well, why not!

Let's take a look at three of the longer, higher performance antennas you might want to think about trying for your next portable operation- the sloping vee, sloping wire, and vertical half rhombic antennas.

All three are simple, broadbanded, and capable of supporting long distance contacts. They are directional, so will need to be erected so as to favor a particular direction. The sloping vee has the advantage that it does not require a ground plane, while the other two do require ground radials, a counterpoise laid on the ground, or ground rods to function properly. You'll need an antenna tuner for all three.

SLOPING VEE

The sloping vee antenna involves two long conductors fed from a high feedpoint, and sloping gently toward low ground supports, with an angle between the two conductors that should be selected depending on your operating frequency and the distance over which you hope to operate. Here's a picture:

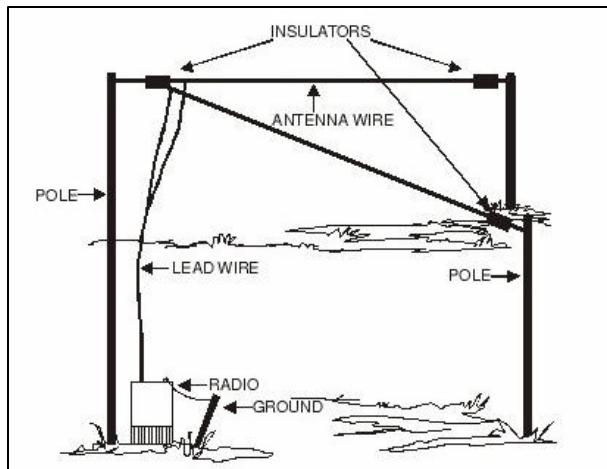


Fig. 1 Sloping vee antenna. The feedpoint should be about 40-50 feet high, and the end supports just a few feet high.

The picture doesn't make it clear, but the two sides of the sloping vee are fed with opposite sides of the feedline. (The "ground" connection shown in the picture is not a ground plane for the antenna.) The apex, feedpoint, "center" support, or whatever you want to think of it as, should be about 40 feet (~12 meters) high.

The two legs should be about 500 feet long, and the supports at the far ends of the legs should be about 5 feet (~1.5 meters) high. The angle between the legs depends on the distance over which you'd like to communicate:

Path Length (Miles)	700 to 1000	1000 to 1500	over 1500
Apex Angle (Degrees)	60	45	30

the apex, outward along an imaginary line midway between the two legs. (In other words, it's directly opposite to the direction the angle of the V "points" to.) The take-off angle depends on the apex angle, and the frequency. The following three patterns will help you get the idea:

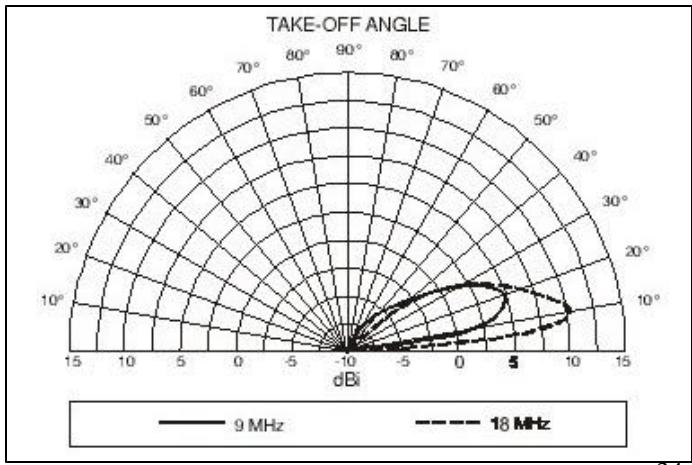


Fig. 2 Path length vs apex angle for sloping vee.

This sloping vee configuration is useful from 2 to 30 MHz. The favored direction will be from

the apex, outward along an imaginary line midway between the two legs. (In other words, it's directly opposite to the direction the angle of the V "points" to.) The take-off angle depends on the apex angle, and the frequency. The following three patterns will help you get the idea:

Fig. 3 Vertical pattern for sloping vee with 30 degree apex angle.

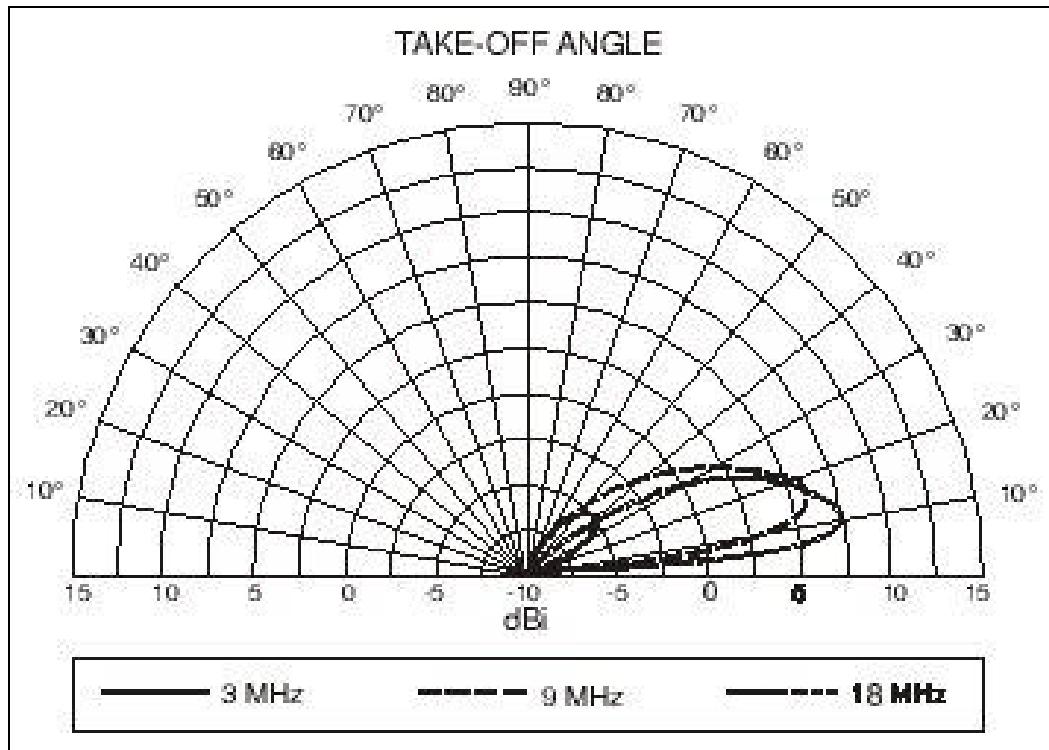


Fig. 4 Vertical pattern for sloping vee with 45 degree apex angle

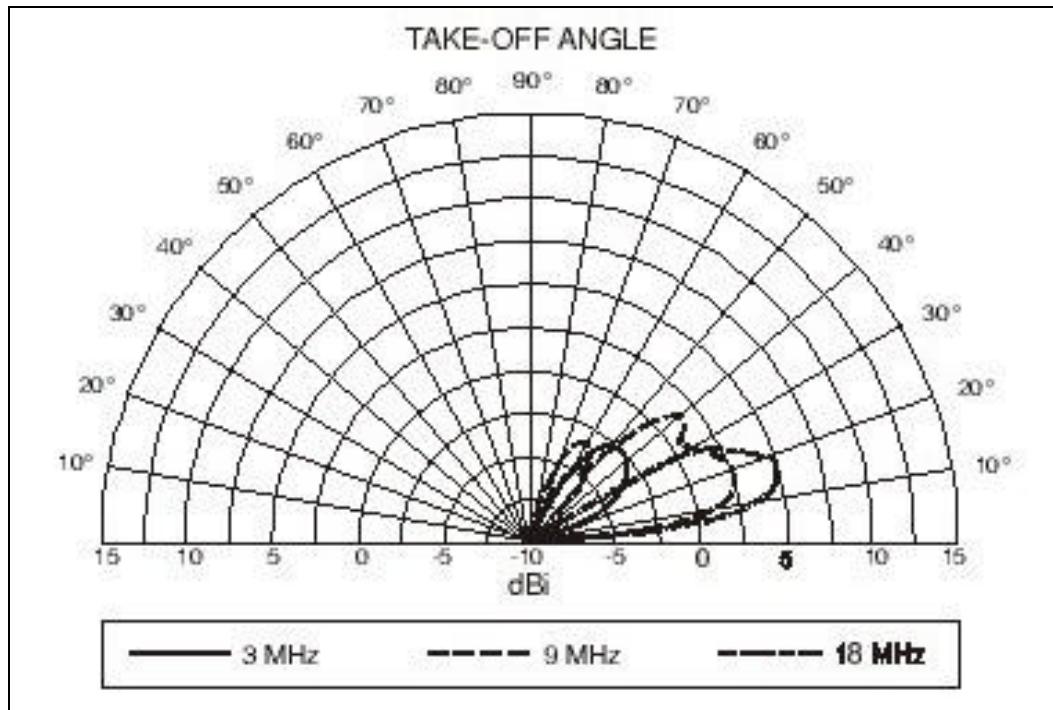


Fig. 5 Vertical pattern for sloping vee with 60 degree apex angle

SLOPING WIRE

Even simpler than the sloping vee, is the sloping wire antenna. The sloping wire is a variation on a basic long wire antenna, but requires only one high support. As with its non-sloping counterpart, a sloping wire may be relatively short (less than at least two wavelengths long) and still "work" but it won't have the gain and directional properties described here. To get some gain and directivity at HF frequencies, make your sloping wire 250-500 feet (~78-156 meters) long, with an apex at about 45 feet (~14 meters). The low end can be up about 5 feet (~1.5 meters) or so.

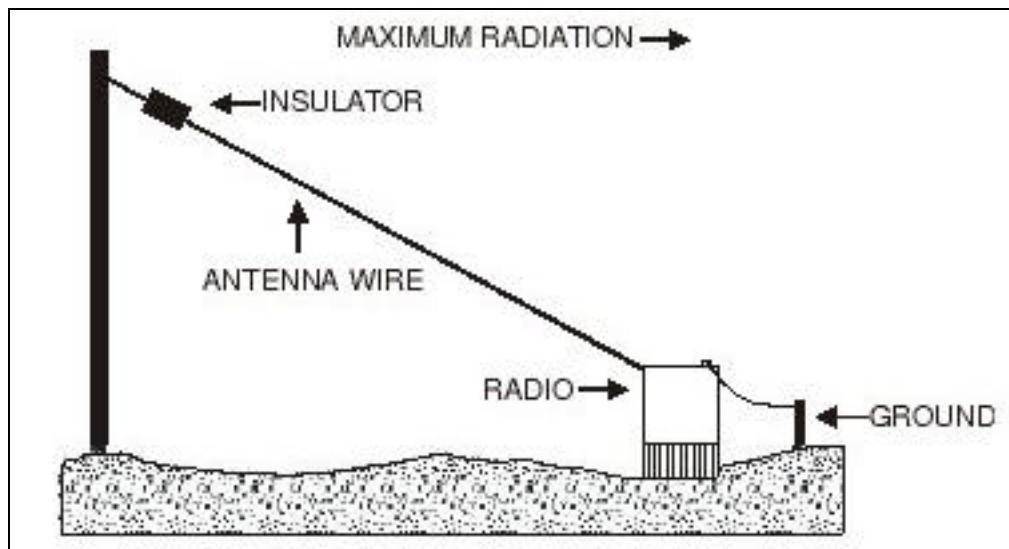


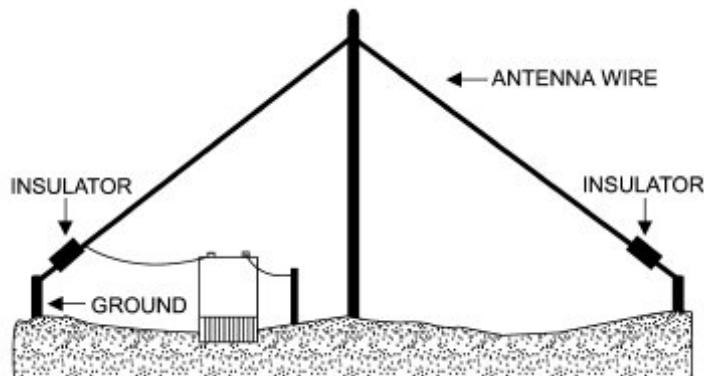
Fig. 6 Sloping wire antenna.

If you make your wire at least several wavelengths long at the operating frequency, it will be directive at about 10 degrees off either side of the wire, both up and down the wire, for a total of four directions. The directions toward the low end of the wire will be favored over the opposite directions. And again if the wire is at least several wavelengths long, it will have a low angle of radiation.

VERTICAL HALF RHOMBIC

The vertical half rhombic antenna is so named because it resembles (both physically, and functionally) a rhombic antenna cut in half lengthwise, and then stood up on its side. It has a single high support, about 50 feet (~15 meters) high, in the middle of from 500 feet to 1000 feet (~150 to 300 meters) of wire supported at its ends with supports up about 5 feet (~1.5 meters). You will need a 600 ohm terminating resistor at the far end, and ground rods at both ends, making this a slightly exotic antenna. For some reason, they left the terminating and grounding of the far end out of this picture:

Fig. 7 Vertical half rhombic antenna.



The center support is about 50 feet high. Terminate the end away from the transmitter with a 600 ohm resistor between the antenna wire and a ground rod. For frequencies below 12 MHz, point the terminated end in the direction to be favored. For frequencies above 12 MHz, the favored directions will be about 10 degrees off either side of the wire, toward the terminated end. This one makes a great field antenna for medium to long range contacts.

GET YOUR OWN!

If you'd like to see more details about the antennas I've described here, or if you'd like a practical guide to antenna and propagation fundamentals, you may want to download a copy of the USMC Field Antenna Handbook of your own. It's available at a number of web sites, so I'd encourage you to Google for it and pick a site at random to download it from (so we won't assault someone's bandwidth capacity). Or, you can get it here:

<https://wwwdoctrine.usmc.mil/signpubs/r3403c.pdf>

The handbook includes not only an introduction to radio waves, propagation, polarization, gain, directivity, feedlines, and several different antennas (including some military models), but also information on topics like repairing antennas in the field, setting up an antenna farm, satellite antenna systems, NVIS, and more!

Whatever your portable communication goals, you're likely to find something in this handbook that you can use. Download a copy today, and have some fun with radio antennas the military way!

This is ONE HAPPY PIG!



The semi-official Flying Pig QRP Club International Dictionary

Thanks to Ken Louks WA8REI FP #-766

PIG-TIONARY - the laytest and graytest o-fish-ul sorcer of woids and daffy-nishuns fer Flah'n Peegs. Manure from the pigpen, piled, re-piled then com-piled by "Pigpen Ken," WA8REI, Flah'n Peeg # 766.

The woids ain't in alfalfa-betical order. Why? If you're a Flyin' Pig, does that really matter or make no nevermind? Of course it WOULD matter if you were a SSB QRO operator! It would give him somethin' to whine about over the air.

Now hang onto yer curly pigtail, cuz here go the daffy-nishuns:

Pignacious (pig-NAY-shus) - of, or acting like, a flying pig; a right jolly good time. *"They had a pignacious good time at the FDIM buildathon."* ; a big pigsig: *"he had the most pignacious signal I ever heard!"*

Pig-nic table - the thing you put your ittybittypiggyriggy on when operating "portable." *"Michael operated his K1 from a pig-nic table at The Pig Farm."* a table from which to pig out. *"The pig-nic table was overflowing with good slop."*

Pigtish - the official language of the Flyin' Pigs, usually sent in Morse Code; Pig Latin is also acceptable.

Pig Latin - Owhay igaipays omcommunicatecay enwhay eythay alktay.

Dispigure - Deface; change the appearance of. *"Some ninny spray painted the Painted Desert and dispigured it."*

Pig-destrian mobile - operatin' the radio piggy power whilst walking. (The Brit pigs like that word whilst, by the way. I learned that in Shetland).

Pigro-nautical mobile - operatin' the radio when flying (as in piggy flying). Applicable to piggy power of 5 watts or less. Not to be confused with aero-nauticalmobile from flying in aero-planes.

Piglet - a kid pig. Not a goat! Synonymous with "Harmonic" in ham radio. *"Who let the piglets out? Oink-oink, oink-oink?"*

ProPIGation - to what extent a pig sig floats thru da ether. When the proPIGation be good, you can work the world on a wet noodle runnin' piggy power.

Discomfigurated - discombobulated, discombooberated, etc. *"He got discomfigurated while operating pig-destrian mobile in the blizzard during FYBO, and froze his buns off. They found him about the 4th week in May after the snow melted."*

Pigtificate - a piece of paper that you staple to the side of the pigpen, showin' all the other pigs that you "flew high" in a pigtest. *"He received a FB Pigtificate for winning the Run For The Bacon pigtest."*

Pigtest - an on-the-air event for QRP stations ONLY. No scoring is allowed for any QRO stations. This is opposed to a contest which is for con artists running 3 KW of power who cheat to try to beat out other con artists. Now you know why it's called a CONtest. Pigtesters are as honest as their snouts are long.

Piggyback - the kind of rides a Flyin Pig gives his piglets or grandpiglets; it's extra fun for the piglet, because you're both flyin'!

Pignal Corps - the branch of the military that taught many Flah'n Peegs about radio and Morse Code.

Piggles - them green sour things you eat with a Ruben sandwich in the food court at Dayton, thet'll put another curl in your pigtail. Jowl-lickin' good!

Oinkment - what old piggies rub on their peeg-weengs after flying all day.

Pigsample - how a Flyin' Peeg leads others. "*He lead other piggies to the slop troff by pigsample.*"

Pig-pocket - what ya gotta watch out fer at a place like Dayton; someone who tries to steal the money you saved all year fer to buy a new pigrig with.

Peegin (PeeGIN) - the time the pigtest starts. "*The Spartan Sprint peegins at 0200Z.*"

Flah - what people in 4 and 5 Land call fly (as in Flah'n Peegs)

Peeg - what people in 4 and 5 Land call a pig.

Weeng - what people in 4 and 5 Land call a wing.

Pigheaded - what some QRO and SSB operators are; what all Flyin' Pigs and CW operators ain't.

Pigtail - that thang ya clip onto da end of yer dipole if'n ya dun cut the dipole too short to begins wit; that useless curly thang on da back of a non-flyin peeg thet don't even taste good in bean zoop.

PHz - Pigahertz. 20 meters is 14 Pigahertz; QRO operators call it Megahertz, to go along with their mega watts of power.

Pigrig - a rig that puts out no more than 5 watts of pure pig power.

QRP - short for Q.R. Pig - or any pig station running 5 watts or less. Who gives a diddly about the "Q.R.???"

QRO - short for Q.R. Ostrich - any big-gun station running 6 watts to 10 KW or more. They need to go bury their head (and their signal) in the sand, or go lay a giant egg somewhere, so the QR Pig stations can radiate their ittybittypiggysiggies out o'er the ether with the greatest of ease. QROs tend to use SSB, and in the microphone you hear a windstorm created by their amplifier cooling fans. When they key their mikes, you hear a "broooosh-CLUNK" when the relays of the 10 KW amp kick in, then they splatter plus or minus 10 KHz.

Pigsig- what a pigrig send out o'er da ether. Also called an ittybittypiggysiggy. They dun ain't gots no clicks or chirps or TVI like the QRO signals have.

Ittybittypiggyriggy - a small, compact, light-weight pigrig, used for portable operation, the Run for the Bacon contest or the ARS Spartan Sprint, sometimes placed in an Altoids tin to keep the ittybittypiggyriggy in "mint" condition.

Pignoramus - a QRO operator akin to Pooh Bear: of very little brain, as can easily be seen by listening to him ramble on about a bunch of nuttin on the air; a QRO operator who can't send Code worth a hill of beans.

Slop - good food fer etin.' "Lobstercon certainly had some good slop." "They were happy as Flyin' Pigs in slop operating QRP on Field Day."

Slop trough (or slop troff) - that thang that the piggies all pig out from. "There's nothin' like gatherin' at the slop troff on a hot summer day when Farmer John fills it with ice cold watermelon rinds."

DisGRUNTled - What happens when a piggy gets laryngitis: he can't grunt or oink-oink. Also a common term for QRO ops. They are disgruntled and spend hours on the air (on SSB or 2m.

FM) whining and complaining about everything under the sun. They're jealous because they can't oink-oink like Flyin' Piggies can!

Pig-spedition - any portable QRP operation, often from a pig-nic table at a park or campground; it need not be a trip to one of the four corners of the flat earth (where you risk falling off the edge). "He went on a pig-spedition from whence he operated the Run For The Bacon contest."

Bacon, pork chops, ham, ribs, pork steak, pork roast - things Flyin Pigs eat that's made strictly from NON-flyin' pig meat.

Pig-ment - What a pig meant, as in "eh? wha-did-ya-say?"; The color of a Flah'n Peeg, usually "pot-belly-pink." See the Flyin' Pig logo for a egg-zample.

Pig-ture - what you dun take with a dig-it-ull camera at FDIM, then download it on the internet so all da piggies git a good pot-bellied-pig laugh.

Pigronomy - the study of the behavior of Flying Pigs; attempting to find out what possesses them to call CQ 30 times without getting a reply when the bands are dead and full of QSB and QRN.

Boaring - what ham seminars for QRO operators are.

Oink-oink - what a Flyin' Pig sez when he breaks a big pileup and works a rare DX station; The official greetin' of the Flah'n Peegs. Note it is always Oink-oink, not just one oink. Flyin' Pigs are twice as good as a single oink.

PIG STYle - how piggies "do it," especially if they are in a pig sty. Synonomous with "makin' bacon."

Pot-bellied - what all Flyin' Pigs look like after a big pig-out, and after which they are not able to fly for several hours because their pigbellies create drag during take-off AND they exceed the maximum gross weight.

Rind chew - what QRO operators call a rag chew. Flah'n Peegs enjoy a "good ol' chaw on the ol' pork rind" when band condx hold up.

St. Pignatius - the patron saint of all Flying Pigs, who brings rare DX, long rind chews, 599 RSTs, high contest scores, and comes down the chimley at Christmas time with pigrigs, pigtenna tuners, pigtennas, etc.

Pig Newton - a bar cookie that goes good with coffee when operating a pigtest or while chewin' the rind with a fellow piggie.

Aspigmatism(uh-SPIG-mah-tizzum) - what a Flyin Pig gits from lookin at his computer monitor after e-logging for 48 solid hours in a weekend contest.

Pig leaf - What Adam and Eve wore after they disobeyed God and ran QRO power instead of QRP power that God (in keeping with FCC rules to use the minimum power necessary for a QSO) ordered them to use.

Pigtitious - the kind of story that ain't true. *"It was pigtitious that all the ESE suffix pigs worked all the EE suffix pigs."*

Pig Gig - an event where there's lots of NON-Flyin' pork barbecue sandwiches; music made when several Flyin' Pigs get together with musical instruments.

Piggot - that thing ya turn on the faucet to fetch some water in a pail fer a thirsty pig in the middle a Ju-ly. *"Make sure you turn the piggot off afterwards, so it don't drip!"*

Pignore - pay no attention to. *"all Flyin' Pigs pignore the KIMAN broadcasts."*

Pigiron - what pigs use to solder parts together to make a homebrew pigrig; what you make "buns of steel" out of.

SupercalifragilisticexpIGalidocious - da longest woid that a Noo Yawkuh can find in da Pig-tionary. Quite atrocious, fer shur, fer shur.

Pig-Ben - a big ol' clock tower in London that the Brit pigs like to fly 'round; serves as a good timepiece for loggin' piggy QSOs.

Pigtenna - the thing that radiates the ittybittypiggysiggy out into da ether.

Pig-out - a restaurant, barbecue, etc., where there's lots of good slop. *"The Michigan QRP Club has a good pig-out the first Saturday of every month."* to eat so much slop that you can no longer fly, and become pot-bellied. *"They really pigged out at the FDIM banquet."*

Oink-pen - what ya use to sign in at FDIM with. Blue or black oink works best. Use red oink if you have to sell yer pigrig at Dayton in order to pay for the FDIM banquet.

Pigmy - A small, skinny or short Flyin' Pig, so named because it was bullied out of the slop troff by big pigs; a small breed of pigs from the African interior, with no meat on their hocks; the runt of the pig litter.

Pigonometry (pig-o-NOM-a-tree) - a form of math that Flyin' Pigs use to calculate angles of radiation and lengths of elements for various pigtennas.

Pignature - what you write on your HAM license, using an oink pen, to make it o-fish-ul.
For peegs thet cain't speel, jest put a big "X" in the spot for the pignature and gits another peeg fer ta witness it.

Pig Sky Country - the State of Montana from which fine pigsigs float out oe'r da ether.

Pigwig - a very important or influential Flyin' Pig, notably, any member of the Flyin' Pigs.

Pignified - having shown pignity or stateliness. "*The President of QRP-ARCI was a very pignified gentleman.*"

Pigure - calculate or figger. "*Be sure to pigure your multipliers correctly in the pigtest.*"
a female with the right stuff in the right places. "*Dolly Parton has a pignacious pigure.*"

Higgledy piggledy - in disorder; in jumbled confusion. "*The QRO SSB crowd usually are a bunch of higgledy piggledy hams.*"

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OUR MISSION:

- 1: Have Fun.
- 2: No rules.
- 3: Have a group of Friendly Hams who enjoy Amateur Radio, and sharing their skills with their fellow Hams.

CLUB EMAIL POLICY:

These are not rules, just common sense.

Club email is not moderated, as we are not a stuffy group. You can send off topic messages about most subjects, but please keep it clean and in good taste. We do like good-natured ribbing and joking with each other, but we will not tolerate flaming other members or spamming the group. We will remove offenders who abuse our open policy. The word eBay is allowed.

CLUB WEB PAGE:

The club web page is our forum for sharing projects, and information about us. You are encouraged to submit your ideas and projects to be added to the web page.

<http://www.fpqrp.com>

OUR MONTHLY CONTEST – RUN FOR THE BACON SPRINT:

This event is held on the 3rd Sunday Night (EST) of the month. For full details on how to participate, see the website address of: <http://www.fpqrp.com/fpqrprun.html>

PROBLEM REPORTING:

If you are having problems with email, the web pages, or a fellow club member, please report this to either:

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