Bacon Bits

Flying Pigs QRP Club International, W8PIG
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FPQRP membership is open to all licensed QRP operators who reside within 12,000 nautical miles of Cincinnati, Ohio.

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NETS:			
DAY	TIME	FREQ	NCI
Sun	0100Z	7.137	KC8NYW
Mon	0100Z	7.044	WB8ICN
Thurs	0100Z	7.044	KE1LA

(All days/times listed are UTC)

CLUB FREQS.	
1,814 kHz	3,564 kHz
7,044 kHz	10,110 kHz
14,062 kHz	18,100 kHz
21,064 kHz	24,910 kHz
28,064 kHz	

ALL FPqrp frequencies are UP 4 kHz from the standard qrp frequencies except for 20 meters.

Dave KD3EM shows us a neat trick for the SD20 Pole

In this issue:

Ramblings

Hey Gang! It's July and Field Day is behind us. I'm looking forward to a new Hamfest season in Indiana. Thanks to the many contributors this month. I think we have a great antenna issue going here.

As always, I need your articles, don't miss out on your chance at being famous!

73 de KB9BVN

Another use for the SD-20 – KD3EM

Hello my fellow QRPers. I would like to share with you another use for the SD-20.

I remember reading one of the old ARRL antenna HANDBOOKS "1960 era" about a Helical wound vertical antenna. I decided to make one using the SD-20. My first problem was what frequency should I make it for, well I like 40 and 15 meters so that was what I was going for.

My second problem was what was I going to use to wrap it with? I got to thinking about it and remembered the window alarm tape that was available from Radio Shack at one time and it seems that they don't carry anymore.

I decided to look else where and in the Mouser Electronics Catalog I found what I was look for:"Embossed Copper Foil Shielding Tape ½" x 18 yards" So I got two rolls since one roll is only 54 feet. Before I broke the SD-20 down, I ran each section up to where it was a snug fit, but not so tight that I would have trouble taking it down, I took a marker and marked it, this would be my starting point for the windings.

As you can see in the Photos that I tried to keep the spacing even all the way up and the twist going in the same direction.

When I got to the end of a section I used a little more tape and wrapped it inside so the next section would mate up to it and ensure a good contact. I was able to keep the spacing of the turns on each section except on the very last one. I just wrapped it solid and it acts like a stinger.

As you can see in the picture, on the bottom section I have the tape running under the top loop which happens to be copper, so I removed the paint off the tip and soldered it to the tape to ensure a good electrical contact.

I then had to super glue the end of the tape down due to the soldering. I got some angle iron about 18 inches long, and on one end using a band saw I put a point on it. I then went to the hard ware store and got some 10/32 screws and flat washers and wing nuts. I drilled two holes one on each side to mount the screws, these are the mounting points for the ground radios and the ground leg of the coax cable.

As you can see in the photo, I ran a jumper from the other loop on the SD-20 down to the angle iron. For ground radials, I went to radio shack and got a 100' spool of 22 gage stranded speaker zip cord. On one end I striped the insulation off and twisted the ends together and installed a eyelet terminal end and then measured out 34' and did this twice. I unzipped the zip cord and ended up with 4 radials. I use hose clamps to hold it in place. After it was put up and ready to try out, I first decided to check the SWR.

SWR's were 1.1:1 up to 1.7:1 throughout the ham bands.

All of my readings were taken while going through a match box, BUT, I tuned for the best match at the lowest frequency on each band. For example the settings that I used on 40 meters at 7.000 mhz were the same that I used at 7.300 mhz.

Over all the antenna worked very well, while I was getting the readings I also worked a station in Austin,

TX on 15 meters ssb, and a England station on 20 meters cw while I was running 5 watts.

73 de KD3EM

SMT – I See the Light! – WA5BDU

I've been thinking for a few years that I'm going to have to get going on this SMT thing, but putting it off out of fear of failure. I'd even been collecting the tiny parts, but seeing them just added to the intimidation level.

At Arkiecon, the Fort Smith group had some board sets for the Trevor DDS for sale and I grabbed a set, which consists of two boards and a programmed microcontroller. (I call it the Trevor DDS because I never can remember his call--KG6CYN.) This post gives some of my observations about SMT and some about the AD9850 DDS unit.

Seeing the light:

Getting enough light--or the right light--has been a big issue for me as my eyes age. I find myself hauling stuff to the kitchen table to examine. There are four, 4-tube fluorescent fixtures above the kitchen table. In my ham shack, I have a high intensity desk lamp for close work. But not long ago, someone posted about a fluorescent lamp for craft & sewing use that he found to be good for close circuit work. I couldn't find one of those, but it did get me to thinking that a more diffuse source, as opposed to a point source, might be the key. So I hung a four foot shop light over my bench (finally ignoring my wife's protests about its looks), and things did improve a great deal. I also dragged out every magnifier in my arsenal--headbands, jeweler's loupes, hand held magnifying glasses.

Soldering the easy ones:

I started with the two-terminal parts, which turned out to be surprisingly easy. Let me back up first and mention that I bought the smallest gauge solder RS has, at 0.015 inch diameter. My procedure included tinning the board contact area first, even though this is a tinned board. Holding down the part, holding the iron, and holding the solder is a three handed operation. So with some solder already there, I was able to get down to two hands. Be cautious with that tinning--it's easy to create an enormous Mt. Everest of solder (from the SMT part's perspective) without really trying. Then I like to put a bit of flux on both the board's and the part's contacts. Helps the solder flow and also its sticky nature makes the part less likely to take flight in the event a mosquito sneezes somewhere in the room.

So now I put the part in place, hold it down with a toothpick or component lead (how archaic!), and melt the solder on one pad to get the part fixed in position. If it decides to slip and slide, you can still move it while you have only one end to reheat. Then you can do the other end and re-do the first end with more solder in hand, if needed. I don't worry excessively about the part being slightly cockeyed, if the connections look OK. You have to balance aesthetics against the possibility of applying too much heat against your desire for geometric perfection.

The 1206 parts are huge. The 805's aren't too bad. I did notice that it seems easier to substitute an 805 part on a pad designed for 1206 than vice-versa. Something to think about if you're laying out your own boards. It didn't take too long before I was feeling pretty comfortable with the Rs and Cs. Even when I soldered one in the wrong place, lifting it out with two irons was simple. You do need a pretty firm rule about only one component out of its package at a time. Some are marked a bit cryptically, and some not at all. I like the transparent poly envelopes with a frosted white area to write values on, for storing my SMT parts.

Oh yeah, don't solder in any "tall" parts near SMT parts until the SMTs are in place. You need to be able to get at 'em from all directions.

Your worst nightmare--TSSOP:

OK, enough fun and games. I knew I had to tackle the dreaded SSOP packaged DDS chip sooner or later. Might as well see if I can actually get it installed before spending any more time or money on this project. The pin spacing on this chip is ungodly tiny. You can't see the individual pins with the naked eye. You can barely see 'em with a jeweler's loupe. Tin the pads beforehand, because adding

solder with the chip in place can be a nightmare. Use flux, again in part for its stickiness. Make one of those "doofus" hold down thingys (see the NORCAL page). Line it up. Inspect it. Take a break. Inspect it again. Check pin 1's orientation for the 99th time. Get ready to solder, but if your hands are shaking from nervousness, put it off until tomorrow. OK, now or never. Tack one corner and see if things are still lined up. Then the opposite corner. But you still aren't home free. It's really hard to control the amount of solder applied, with desired amounts down to near zero. But a small excess quickly becomes an ocean and you've got a bridge. I'm not that adept with solder wick, but I did manage to clean up one or two bridges with it. I finally decided to rely mainly on the solder applied during tinning and take the risk of having not enough, rather than too much. After completing the soldering job, I used two straight pins held with alligator clip leads as ohmmeter probes, to check all adjacent pins for shorts. Things looked OK, but I couldn't be sure until I bought the rest of the parts, installed 'em, and fired it up.

Parts buying digression:

This isn't really a junkbox project, since the boards are precision engineered for certain parts. I rate projects by the number of suppliers required, envisioning a punitive handling charge and minimum order from each one. And I've tended to avoid the big houses for that reason. But after much internalized grouching, I saw that both Digi-Key and Mouser have pretty good policies for the buyers of small quantities. IIRC, Digi-Key has a $25 minimum order and actual shipping costs only.

They did have a few cases where they don't sell singles, but what the heck. Would I really want one resistor at 9.7 cents instead of getting ten for $0.97 anyway? No. Mouser has no minimum order, but do have a minimum of $6 for S&H.

Same as Dan's, so no big deal. I did run into one glitch--Digi-Key's computer ordering system refused to admit that they have the mechanical encoder used in the project. So I had to get a different one from Mouser. Beyond that, the one red herring was the MMIC and figuring out how to get just one from Mini-Circuits, leading to ...

MMIC digression:

I couldn't figure out how to purchase the single ERA-1SM MMIC amplifier from Mini-Circuits, so I started looking at surplus places like Dan's and Brad Thompson (AA1IP). When building a pre-engineered project like this DDS thing, it's fun to get as many data sheets as you can and try to learn something in the process. I hadn't fooled with MMIC amplifiers before, but I have wanted to learn about them. It's pretty interesting and seems fairly simple. You've got a specified gain, 50 ohm input lead, 50 ohm output, and power supply and ground leads. You select a "biasing" resistor for the supply lead based on the specified DC current from the data sheet and your power supply voltage. And you need a choke in series with that resistor, just like you do on the collector lead of a common emitter amplifier, to keep the RF from leaking out that path. The maximum usable frequency is typically 1 to 8 GHz, so no strain for HF. I just needed to match the gain (12 dB) and the maximum output before distortion, of the part Trevor used. Trevor says his DDS puts out 1 V p-p into 50 ohms. That's 4 dBm. So I found one likely suspect from the offerings in Brad's list. Brad has an HP (Aligent) MSA-0786 that has 12 dB gain and a 1 dB compression point of 5.5 dBm--just enough headroom with a bit to spare, at 50 cents. And the pinout is the same. (Probably standard.) So I did get the pleasure of making one design decision, however small, for my own version of the project. And next time I need some gain with 50/50 impedance, I'll have another trick in the bag.

Finishing & firing it up:

This is a nicely engineered design, with three boards (counting the LCD display) that plug together in a stack. But it's no Heathkit and you've kinda got to study the photos on Trevor's site to figure our where to put pin headers, where sockets, and which way they point.

[Trevor's site:
http://www.qsl.net/kg6cyn/DDS_Project.htm]

I plugged the things together, less the switches and encoder, and fired it up. The display said 40.000 MHz and my counter said 46.102 MHz, which is

where I heard it in the receiver. Hmmm ... The sine wave looked good on the scope though, even at such a high frequency. Turns out it doesn't really initialize until you have some switch action, so I wired them in and dialed up a frequency. Now everything matches. The LCD display reads about 30 Hz below my FT-1000's reading, but I'm not going to say which (if either) is correct. I'd say that's pretty darn close. I am also getting some glitches and sometimes no control at all out of the rotary encoder. Maybe because I bought a different one than the one specified. That will require further investigation.

This is a nice frequency generator. It can be a useful for testing crystals and filters, and/or it can be the heart of a transceiver. But that's not all you get! Supposedly, Trevor has incorporated the ability to program the microcontroller (AT89S8252) in circuit, from the PC. And since you can unplug its board from the DDS, you could use it in other ways. I hope to investigate that. This particular chip might rival the one in the NJQRP package in some ways. It is available in a DIP package, which is a big plus. But it doesn't have built in ADC, which is a big advantage of the Motorola chip as I see it.

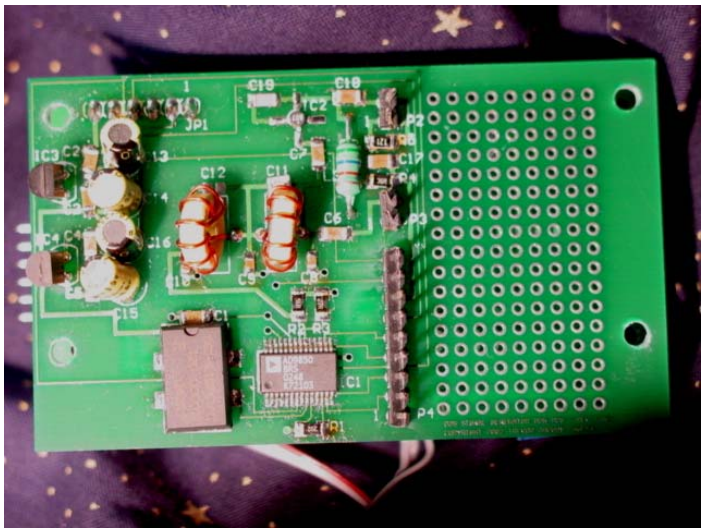
Homebrew SMT boards?

Now that I'm an instant expert on SMT, I'm thinking I should try doing my own board. The best thing, other than compactness and parts availability, is not having to drill holes. It's Manhattan without the pads. I'm trying out the Eagle limited freeware version recommended by Trevor. But the artwork isn't the hard part, it's how to transfer it to the board. Iron on transfer? Photo-resist process? That homemade mucilage & paper approach by WD8CIV looks interesting too. Stay tuned. Or tell me what to use.

Anyone still awake and reading? To quote Porky Pig uh budea, budea that's all folks,

72--Nick, WA5BDU
Russellville, Arkansas
http://www.tcainternet.com/wa5bdu/

Photo Descriptions:



This is the DDS board. You can see a mixture of SMT and leaded parts. I count 5 SMT resistors (black) and 12 SMT capacitors (ceramic), plus the crystal oscillator, DDS chip and MMIC amplifier are SMT. Conventional parts included toroids, voltage regulators and electrolytics. See how the miniature molded choke (green, upper right) dwarfs the SMT parts around it? The big black rectangle to the left of the DDS chip is the 125 MHz crystal oscillator. The black dot with four legs (upper right) is the MMIC amplifier. Pin headers on the right are pointing up, but the one at the upper left is pointing down, since the DDS and processor boards plug together back-to-back. There's a prototyping area at the right. More low-pass filtering? Another stage of amplification?

In this photo, you see the processor board. The AT89S8252 is in a DIP package, as is the separate memory EEPROM. It's hard to see 'em among the

tall trees, but there are 12 SMT devices on this board. The connector at the lower right is the interface to the DDS board. The pot is the contrast control for the LCD, which plugs in to the row of sockets between the pot and the two chips. This photo also shows some important tools, like the magnifying headband, jeweler's loupe, and 0.015-inch solder. And don't forget lots of light from everywhere. I should also mention that those binocular microscopes on eBay are starting to look pretty good to me.

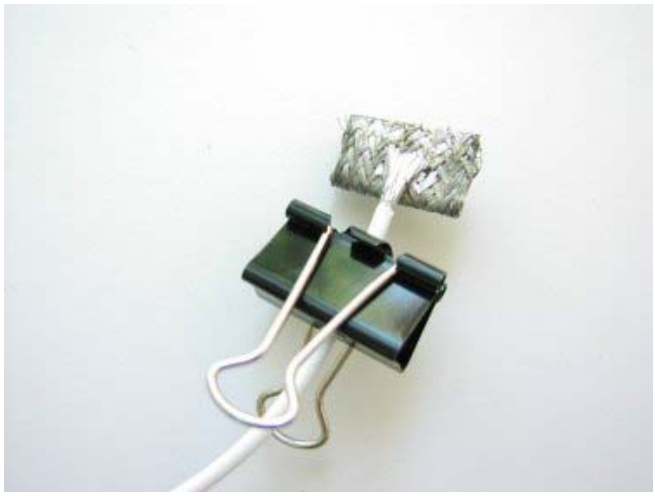
Re-inventing the Tape Dipole – DJ8GO

About 20 years ago I traveled with a Heathkit HW-8 and a Hy-Gain TD-1 tape dipole in my bag, and both saw quite a few exotic locales. The QRP transceiver by now is an Elecraft K1, and like the HW-8 the tape dipole was sold somewhere along the way. I normally use a MP-1 vertical for my portable operations, but often, when I have space for a full-size dipole, I wished that I still had the TD-1. (which also was available in a military version from Rockwell-Collins called, I believe, the HD-4000) I've tried a few modern light-weight incarnations of the reel dipole, and although they work fine none of them had the sturdy reassuring feel of the old TD-1.

When I spotted these chrome clad 50' measuring tapes on eBay, the pair for $13, somehow they just cried out to be made into a tape dipole. The cases are made of metal coated with plastic and quite rugged. It turns out, although the tape looks like shiny bare metal, it is coated with some stuff that is an excellent insulator - so you have to use steel wool to remove it in some spots - but more about that later.

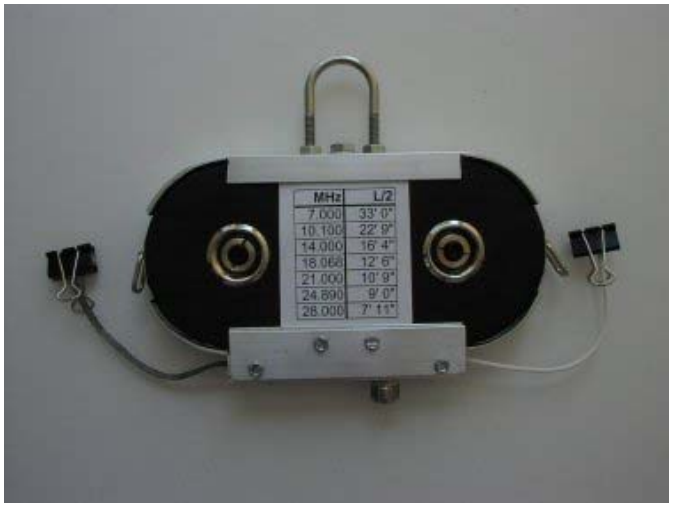
An aluminum U-profile, 3/4" wide and 1/2" high, normally used to protect the edge of plywood, looked like a good choice for a frame to hold the reels. With a bit of handiwork with a metal saw I fashioned the two brackets that hold the tapes. They are bolted together with a 4 1/2" bolt with nylon spacers in between. (all the materials I used are readily available in hardware stores).

The old TD-1 had a screw-down clamp to stop the tape, which also served as the electrical connection to the tape, and the dust and dirt that gathered in that spot rubbed off the markings on the tapes pretty quickly. So it's probably not a disadvantage that these reels have nothing of the sort. I chose to make the actual electrical connection using binder clips that squeeze a short length of grounding strap firmly onto the tape. Since the tape is coated you have to use steel wool to remove the coating over some length around the desired point of contact, and it turns out that this works quite well.



The finished product is definitely not designed for the backpacker, but it conveys the heft and sturdiness

that I remember from the TD-1. With its aluminum frame it is probably even more solid than the original. Taking a clue from the original I have attached a laminated frequency-to-length conversion chart to the back. Unlike the TD-1 with its 66' reels the two 50' reels will not permit operation on 80m. However, since I'm rarely ever on 80m and my K1 is not configured for it, that's not something I miss. I believe that similar tapes are available in 100' length, so you could construct this antenna to cover 80m, too. The whole thing looks and feels professional and solid, which was my most important objective.



My construction has a SO-239 connector that directly connects to the antenna without a balun. I felt that an electrically balanced situation is probably not going to occur in the odd locations that this antenna will be used in, and therefore the added complexity of a balun didn't seem justified - the TD-1 didn't have one either. (Although a small balun can easily be added to the construction.)

How does it perform? That's, of course, hard to say since I can't switch to another antenna easily. Stainless steels tapes are not a particularly good material for antennas if you're looking for low resistance material - but then, real wire antennas out there gather a coat of oxidation pretty quickly which introduces some resistive loss, too. Over all the antenna seems to perform quite well - I get into Europe and South America on 20m with 5W quite regularly from the East Coast despite the lackluster conditions. Setup is very simple using the length chart, and my Elecraft K1 has no problems giving me a 1:1 SWR every time. For a total cost of about $25 and a few bruises on my fingers from the metal work I have an antenna that is at least as rugged as the TD-1 and should travel with me for a long time to come. (and this time I'm not going to sell it unless you make me an offer that I can't refuse ...)

73 de DJ8GO (N2DE) Ulrich Steinberg

Stealthy HF Coat Hanger Antenna – KR1ST

No, this is not about some cute antenna that's about the size of an oatmeal box and runs at 100% efficiency from 160 all the way up to 10 meters (and 6 meters if you leave the oats). In fact, there's nothing new on this page. It's just about a very common HF antenna that I recently built.

The antenna is made from a $15, 500 ft roll of black #14 insulated stranded wire, about 120 small black wire ties, and maybe 30 or so large black wire ties. You need black wire ties because they are UV resistant, and they will cost you just a few dollars at a hamfest, flea market or hardware store. If you can't find black ones, just go with the white ones. Too much worrying about the best possible materials will not get you on the air any quicker. :)

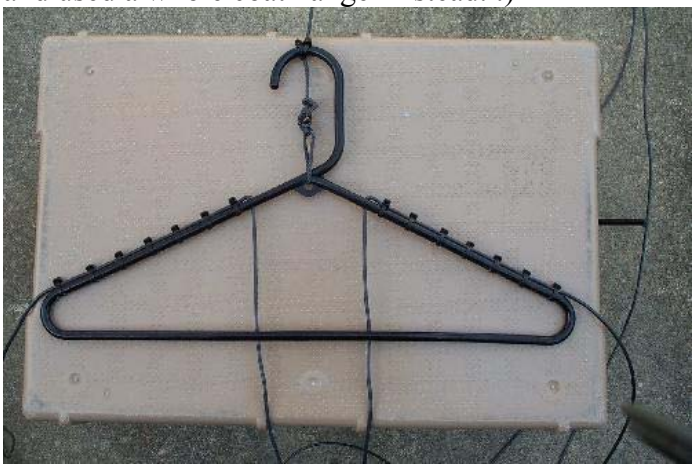
12 black plastic coat hangers were used to make the spreaders and center insulator from. The coat hangers will set you back another 2 bucks. So if you have to buy all the materials new, the antenna would cost you about $25, tops.

I started out by making a whole bunch of spreaders from the coat hangers. I cut the coat hangers in straight pieces of 3.5 inches long. Each coat hanger is good for about 7 or 8 spreaders. I drilled a hole on each side of the spreader that would be large enough

for small wire tie. I also put a little groove perpendicular to the holes in the spreader on each end of the spreader. This helps to keep the wire on the ends of the spreader.

The antenna and feed line contain no splices. So one leg of the antenna and one side of the open wire (ladder line) is made from one piece of wire. I cut two 125 foot long wires from the roll. Then I measured 65 feet on each wire for one leg of the inverted V and marked it with tape. The remaining 60 feet were used to build the open wire line.

Next I prepared the center insulator. Rather than cutting some nifty center insulator from some piece of plastic, I decided it was too hot for so much work, and used a whole coat hanger instead. :)



Each leg of the inverted V is tied down with the large wire ties on the top of the coat hanger. I made a small groove with the edge of a flat file in the coat hanger that helps keeping the wire in place. Then the wire drops down through holes in the coat hanger where the wire starts its life as open wire feedline.

Here's a detail shot of the center insulator which shows how the wire is fastened to the insulator:

The next detail picture shows how the rope is attached to the center insulator:

After the center insulator was done I started building the open wire line from the two 60 foot wires that come out of the bottom of the center insulator. Every 18 inches I put one spreader. The 18 inches between the spreaders is rather arbitrary. The wire is tied to the spreader with a small wire tie, and then I put a drop of Krazy glue between the wire and the spreader to make sure the spreader doesn't slide on the wire. The glue is not really necessary, but is an extra insurance. Once the spreader is put on the wires it will look like this:

To get the antenna in the tree, I used a slingshot to shoot a fishing line over the tree. Don't worry too much getting it over the "right" branch. I've tried that for a while with very little luck. Once I had the fishing line over the tree I pulled the support rope over the tree with the fishing line. Then I attached

the center insulator to the support rope and pulled it up in the tree.

Instead of just tying the rope off on the trunk of the tree, I use a pulley and weight system to give the antenna and rope some freedom to move around in the wind:

As a weight I use 3 peanut butter jars filled with rocks. The jars are tied together with some #14 solid insulated house wire and duct tape. The reason that I used 3 jars instead of one larger is, that I used to have a just a simple wire in the tree that required only one jar. Then I added more wire to it and a second jar was necessary. To keep the inverted V up in the air I needed a third jar. Since I go faster through this brand of peanut butter than anything else that comes in a large jar, it may take a while before I can replace the three jars with one large one. :)

Each end of the inverted V is tied off on a small insulator made from a short piece of PVC pipe. On the other side of the insulator I tied a rope that goes to a support structure. One side of the antenna sneaks through an opening between the branches of other trees to a weight a pulley system.

This weight system has saved me a lot of grief. At first I just had the rope tied off on the trunk of the tree. However, every time we got a good bit of wind the wire got caught in the branches from the trees it goes through. This happens because when the center of the antenna moves towards this end, the wire would drop onto the branches where it can easily get tangled. The weight system keeps the wire nicely under a small amount of tension that keeps the wire away from the branches. Ever since I put this weight system in place I never had the wires caught again in the branches.

This picture gives you a better view of the insulator. On this end I used a marine type pulley just to see how well it would work. I've noticed that the clothesline pulleys work better for this small diameter rope, than the marine type pulley. Even though the marine type pulley runs freely, the rope just slides through it rather than that it causes the wheel to rotate. I guess there's not enough friction. I don't have this problem with the other pulleys.

The weight is not shown in this picture. The weight actually travels freely up and down in a bush. I've tried making pictures of it, but you simply can't see it.

I've tied the open wire off onto the eve of the roof using an electric fence insulator.

From there it goes to the window below where it enters the shack.

I cut a wooden board a while ago to fit in the window so that I can drill as many holes for cables as I want without doing too much damage. :) I use a wooden stick as a standoff that allowed me to also create a drip loop in the open wire feed line before it enters the shack. And yep, it works:

I can tune this antenna from 160 to 10 meters. On 160 I can also short the feedline and tune the antenna system as a T wire antenna against ground, but it seems to make very little, if any, difference.

Because I don't cut the support ropes to length once the antenna is up, I can take it down and put it back up within minutes. If a bad storm approaches or if I want to inspect the antenna, I can take it down within 5 minutes by simply taking the weights off. It may take about another 5 minutes or so to get it back up. I mark the rope with a piece of duct tape so I know where the weights go.

The best thing I like about this antenna is that I can be QRV on all HF bands with only one antenna and one feedline. The fact that it is rather inconspicuous is a nice bonus. This antenna system has been through several storms and stayed up nicely. The only thing I may have to do is pull the center support back up a bit after strong winds have had their fun with the antenna.

73 de KR1ST – Alex

WAP Contest Update

Currently we have 42 Flying Pigs that have posted their ongoing results to the website. (http://www.fpqrp.com)

As of 06/30/2003
Rank, QSO #, Callsign
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1 79 K3ESE	2 56 K4FB
3 51 AF4PS	4 48 KG4FSN
5 46 W8DIZ	6 41 N0JRN
7 34 AC5JH	8 32 KB9BVN
9 27 AJ4AY	10 26 WB8ABE
11 25 KC8AON	12 20 K9DI
13 19 NN1F	14 19 WN4M
15 16 K8FP	16 16 W9FCC
17 14 N8IE	18 13 KI8JM
19 13 N7MFB	20 13 WB0WAO
21 12 KC4URI	22 9 KB5ELV
23 9 VE3VG	24 8 W0CH
25 8 W0JRM	26 6 VE3CRM
27 6 VE3FAL	28 6 WU9F
29 5 K8PZ	30 5 KJ0C
31 5 W7ILW	32 4 K6MMC
33 4 KG4LDY	34 4 WR5O
35 3 AG4NY	36 3 W9HL
37 3 WB6JBM	38 2 KC5GXL
39 2 WB8YYY	40 1 K8ZT
41 1 W0EB	42 1 WV9N

Looks like Lloyd and JERRY are going to be tough competition!! Remember piggies, we have fabulous prizes on the line!

JULY QRP Contests – TNX to Ken N2CQ

RAC Canada Day Contest (CW/SSB)
Jul 1 - 0000z to 2359z
Rules: www.rac.ca/CANDAY.htm

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MI QRP Fourth of July Sprint (CW)
Jul 4 - 2300z to Jul 5 - 0300z
Rules: www.qsl.net/miqrpclub/

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Original QRP Contest (CW)
Jul 5 - 1500z to Jul 6 - 1500z
Rules: www.sk3bg.se/contest/origqrpc.htm

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Adventure Radio Spartan Sprint (CW)
Jul 8 - 0100z to 0300z (US/Canada Monday evening)
Rules:
www.natworld.com/ars/pages/spartan_sprints/ss_rules.html

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FISTS Summer Sprint (CW)
Jul 12 - 1700z to 2100z
Rules: www.fists.org/sprints.html

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QRP ARCI Summer Homebrew Sprint (CW)
Jul 13 - 2000z to 2400z
Rules: http://personal.palouse.net/rfoltz/arci/sumhom.htm
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AGCW-DL QRP Summer Contest (CW)
Jul 19 - 1500z to Jul 20 - 1500z
Rules: www.sk3bg.se/contest/agcwqrps.htm

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CQ WW VHF Contest (All, 6 & 2 Meters) ... QRP (10W) Category
Jul 19 - 1800z to Jul 20 - 2100z
Rules: www.cq-amateur-radio.com/

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RSGB Low Power Field Day (CW)
Jul 20 - 0900z to 1200z (80 M)
Jul 20 - 1300z to 1600z (40 M)
Rules: www.g4tsh.demon.co.uk/HFCC/

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CQC Great Colorado Gold Rush (20 Meters CW)
Jul 20 - 2000z to 2200z
Rules: www.cqc.org/contests/index.htm

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Islands On The Air Contest (CW/SSB)
Jul 26 - 1200z to Jul 27 1200z
Rules: www.g4tsh.demon.co.uk/HFCC

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Flight of the Bumblebees (CW)
Jul 27 - 1700z to 2100z
Rules: www.natworld.com/ars/pages/bumblebees/bb_rules.html

Thanks to SM3CER, WA7BNM, N0AX(ARRL), WB3AAL and others for assistance in compiling this calendar.

Please forward the contest info you sponsor to N2CQ@ARRL.NET and we will post it and give it more publicity. Anyone may use this "N2CQ QRP Contest Calendar" for your website, newsletter, e-mail list or other media as you choose.

(Include a credit to the source of this material of course.)
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Ken Newman - N2CQ
Woodbury, NJ
N2CQ

About the Flying Pigs QRP Club International

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.

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.

PROBLEM REPORTING:
If you are having problems with email, the web page, or a fellow club member, please report this to either:
Diz, W8DIZ at w8diz@cinci.rr.com
Rick, WB6JBM at ripowell@mpna.com
Dan, N8IE at n8ie@who.rr.com
We welcome all to join the Flying Pigs QRP Club, and we hope you have fun! Ω