



The GroundWire

Tells From The Bayou

ISSUE 2012-06

Humble Ham Beginnings

It all started innocently enough. While visiting my cousin in Louisville one summer in the mid 90's, I had the chance to watch Raymond WB4ZDU in his upstairs radio room (a.k.a. shack) on a Saturday morning. I tagged along with my coffee, and sat behind and to the right of his operating position. He settled in his chair, then turned on all sorts of equipment, and eventually began to send Morse Code with an odd-looking contraption I would later learn to be a "bug". Raymond was the net control operator for a slow-speed CW net that was scheduled for every Saturday morning. I watched and began asking questions while he keyed the bug, and wrote notes (perhaps a log book). It finally dawned on me that he was communicating with me and operating CW at the same time. I thought – "How is that possible"? I was intrigued and asked more questions. Raymond answered them all, and then some I'm sure. I recall leaving his home with the famous book "Now You're Talking". Once home, I read that book cover to cover. At some point I knew that I would become a ham too.

I picked up a copy of Morse Code practice tapes (cassette of course), and the Novice Class book for Radio Shack. So, practice started on both elements 1A and 2 at the same time. I remember reading the element questions and answers over and over again. And those poor cassette tapes! Stop, Rewind, Play...Stop, Rewind, Play... I'm sure I wore out my cassette player.

Then in '97, we relocated to Midlothian from Mandeville, La. The book and tapes were packed away in the storage unit for about a year. At some point, my mind returned to ham radio once again. I dug out the tapes and book, and started reading and practicing in earnest. In April of '98, I figured I was ready to test, so I used the ARRL to find the nearest club to me – SWDCARC in Duncanville, Tx. After contacting them, a testing session was arranged, and on April 14, 1998 I went to the Duncanville Fire Station on S. Main Street for the test. There I met Danny W5WB, Johnny KJ5LB, and Mike N5NXN. There were four or five applicants there that night, not sure what happened to them or who they were. I was asked which elements I was taking, and which one I wanted to take first. Since I was more concerned about the 5 WPM Morse Code



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Humble Ham Beginnings



Element, a decision was made to take it first to get it out of the way. The tape player was placed on the table, a blank sheet of paper given to me, and tape inserted. “One minute of practice to get adjusted to the sound...”. As soon as the tape started and the volume adjusted, I felt a deep despair. The tapes they were using were recorded with the Farnsworth spacing method! Arrrrrrgh, all of my practice tapes were standard spacing. This was not a good omen. After months of preparation, I would fail at the finish line.

One of the three VEC’s asked if I was ready, and I nodded in the affirmative, not really believing it. When taking the code elements (I eventually took and passed the 13 WPM Element 1B at Ham-Com in 1999) you are to copy every character onto paper and are then given 10 questions to answer based on what you copied. The tape started and copy I did. That tape player surely must be was mis-adjusted, I’m sure it was running way too fast. Anyway, the tape ran for 5 minutes, and I did my best copying every character. The question sheet was handed out and I recall not knowing the answer to at least one question. I handed in the sheets and sat down thinking the worst. The VEC’s sat quietly going over the papers, seemed like an eternity, red pens moving back and forth over my papers. What happened next I will never forget. Johnny looked over his glasses at me and motioned me to their table with his hand. Standing in front of him, he quietly asked “You didn’t study for this at all, did you”? I knew it, I just knew it. I remember telling him that I studied and practiced for over a year and a half. He then proceeded to tell me that I passed the Code test with one minute of perfect copy. They handed me element 2 and that went smoothly. I left the fire station a new Novice, and was greatly relieved. I joined the SWDCARC at the first meeting I attended after the testing. My first FCC assigned call was KD5DZG. Then it was time for Ham-Com and Field Day. At Armstrong Park that Field Day 1999, I was amazed at the goings on. The people were great, the food was super. What’s not to like. I was hooked. I vividly recall watching John KB5NJD operating CW as was stunned at his speed.

I set up a modest station in our new home using a borrowed Ten Tec Century 21 and straight key from Raymond. Nervous first contacts were made, and QSL cards sent. First DX contact was made and the desire for DXCC was now set. I needed a rig of my own and after much research, I decided on the Elecraft K2. I have always enjoyed building things, and I’ve assembled a few kits, so assembling this one should not be a big deal. The box arrived and I jumped in and started putting together kit # 1270. I took my time, read each step several times, and when first powered up, the magic smoke remained intact. It was a great feeling making contacts on a radio I put together. I sold that first K2, and went QRT for a while. I missed making contacts, so I placed an order for another K2 and was pleased to receive #3010, the tenth unit sold with the updated RF board. I’ll not selling this one!!! After upgrading to General, I applied for and was granted the Vanity call K5MMH

In the years that have passed, I’ve met many people, shared experiences like Field Day and Ham-Com, and have had a blast doing it all. This hobby has many facets, and there’s something here for everyone. I’ve achieved DXCC basic and 20 meters, and am working toward other Band endorsements. Learning about packet and APRS has fueled interest in those modes, and applying APRS to our participation in the Head For The Hills Bike Rally has been very educational and fun. I am enjoying participation in our club and have held the offices of Vice-President and now Treasurer.

73, Mike/K5MMH

What is it??

Send your guess to info@swdcarc.org.
Winner will be revealed next month.



ANSWER: MTC UV X4

Several people submitted “Bill’s pink radio”, but that is not the correct answer!

Here is May’s mystery ... What Is It??



Dr. John's Technical Stuff



A loading coil and variometer combo for 620 meters (and maybe 1700 meters too!)

Last month I detailed a modification for the MFJ 259B antenna analyzer to extend the range to the 470kc region. The next step in my pursuit of 620 meter Shangri-la, also known as Nirvana, was to build a loading coil and variometer to match my existing low band antenna structure to the new band. Prior to designing this coil, I considered the option of erecting a new antenna to keep things simple. The simple fact was that I could not replicate the awesome radial system my current low band system employs (130 count, 100 foot radials – killer on 80 and 160m) anywhere on my property, nor would I want to as copper prices have made the purchase of bulk wire by the common man virtually impossible. I was fortunate to construct my radial system by way of a few “lucky” deals with wire suppliers, which no longer exist. A quick glance at the stations in the 600m-research group indicated that I had a better radial system than 99% of the participants. The answer was clear – use the existing antenna and switch in the new coil and variometer for 620 meters. Using the calculations that I detailed some months ago, I determined that I would need about 700 μH of inductance to resonate my existing structure on the band. After some research to see how others were “doing it”, I chose to wind my coil, which I was going to make about twice as big as I needed for “safety factor”, on a \$5 Ace hardware bucket. The variometer would be wound on PVC and a PVC pipe shaft would allow rotation for tuning. The wire used is #16 silver plated copper with Teflon insulation. Ring lugs and tie wraps from Harbor Freight round out the assembly to keep things nice and clean looking.



Components of the 620-meter variometer

Before I talk about construction, let's talk about the function of the variometer. A variometer is basically a moveable coil within a coil. This moving coil allows for modification of the inductance by way of capacitance and inductance and functions much like a tuner would. As indicated in previous articles, the narrow band between 472kc and 479kc still represents a 7-foot difference in quarter wave radiator length between the band edges. Even with the fact that feed line losses are generally low at these frequencies, that represents an appreciable mismatch if one were to use a tuner in the shack. The variometer is like a tuner at the feed point of the antenna. My intent is to make the variometer motorized so I can literally tune the antenna from the shack in real time. That's a simple task with limit switches and a gear-reduced motor. I should

point out that the variometer is a simple solution to apply to other bands if remote tuning is necessary but generally the losses are higher at higher frequencies so I would not recommend using this technique above 80 meters.

So lets build this beast. Since I know I have to drill some holes and work on the mechanical aspects of the variometer, let's start there. The first thing I do is pick the point where I think the variometer should go. I have no real concept of how many turns I should use (some references indicate 20% of your turns should go on the variometer) so since I was planning big on the coil with many taps, I simple choose a point about half way down the bucket and drill a hole large enough to accommodate the PVC shaft through both sides of the bucket.



Cutting holes for the variometer shaft

Next, we have to determine the rotational characteristics of a cylinder inside of a non-parallel bucket. Yes, the bucket, like pretty much all of them on the market today, has a slight pitch to it, sloping slightly from top to bottom. I can't really give you a good way to accomplish this except through cut and try. I had decided to use a 4-inch piece of PVC pipe for the variometer and about 50 total turns (25 per side of the shaft) and ended up with a variometer form of about 9.5 inches in length.



Coil form for the variometer

Selecting the center point of the variometer form PVC, I drilled a hole all the way through and ultimately expanded the hole to handle a 1/2-inch piece of PVC pipe for a shaft. I also found that I had to cut the ends down slightly for free rotation of the tube. This is a normal part of the cut and try process.



Completed variometer/ coil mechanical assembly. Note the two screws used on the shaft near the bucket to prevent motion of the shaft.

Next we will start winding the coil on the bucket. Calculations indicate that I need about 50 turns to achieve my required inductance. This is a big bucket and I have surplus wire so I am just going to find a

starting point at what is traditionally considered the bottom of the bucket and start winding. I used brass hardware since it is lower resistance at these frequencies than typical zinc nuts and bolts.



Starting point for the coil at the bottom of the bucket

From this point, put a ring lug on the wire, mount it firmly on the brass screw and start winding. I had decided that for the coil portion below the shaft, I install taps about every 15 turns. Duct tape made holding turns in place easy while working on the taps.



Winding the coil and adding a tap. The liberal use of duct tape makes holding turns in place easy when taking a break or making a tap point.

Taps are easy to construct if you use duct tape to hold turns in place while working on the tap. Simply tape the wire in place, select the tap point and strip off the insulation. Form a loop with the newly stripped wire and twist together, soldering them to form a stump to later attach to. Repeat every 10 or 15 turns. Above the shaft, I opted for taps every 5 turns. It's in this region that I expected to be the most likely location for a tap at 472 kc.



Tap construction. Pick the location, strip the insulation, twist and solder.

Arriving at the shaft, simply work your way around the shaft and keep winding. You want to leave a gap for the shaft to rotate freely. This is not a critical step so be creative in how you make the transition.

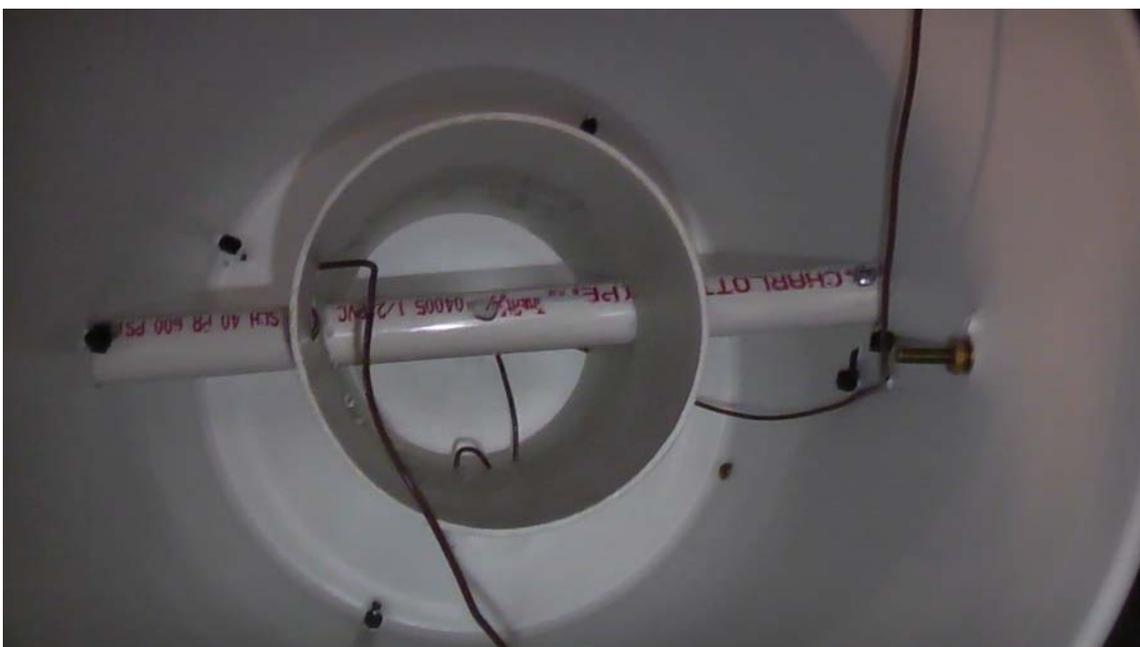
At the top of the coil, terminate like you started, with a lug and a brass nut and bolt. This will not only hold the wire in the place but will give a connection point for the coil on the variometer.

Next wire the variometer in a similar manner. I put 25 turns on each side of the shaft and rather than using hardware to hold the wire in place, I used 3-holes in the PVC form at each point where the wire is sewed in and out with both wires terminating inside of the PVC form.



Winding the variometer. Note the method of holding the wires in place at the lower starting point.

Since the variometer represents a moving coil, I did not want any loose wires floating around inside of the bucket. In order to get the feeds back outside of the bucket to connect to the coil and antenna, I drilled a hole in the shaft at the center of the PVC form and simply pushed both leads to the outside.



Through-view of the variometer. Note the hole in the center of the shaft with one wire from one end of the variometer passing through. The second wire is floating around and has not yet been pushed through and outside.

Outside of the main coil, one wire from the variometer connects to the top of the main loading coil and the other side connects to the feed point of the antenna.



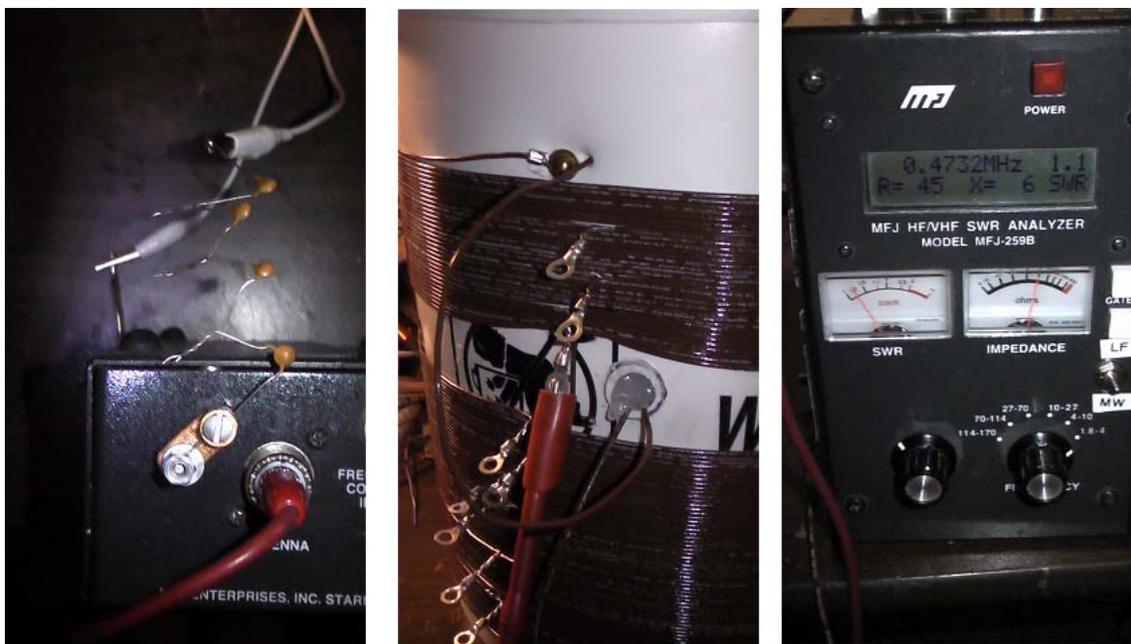
The completed variometer

A little hot glue was used to secure the PVC form of the variometer to the shaft as well as secure the wires exiting the shaft. I would have used PVC glue but didn't want anything that permanent at this point since no testing was completed. I also soldered ring lugs to each of the tap stumps on the main coil. While I have not figured out how I will interface to the tap at the antenna, this seemed like a logical means of connection at the time. One additional item that is very important: I pointed out early on that there is a pitch to these buckets, that is, they are larger at one end than the other. In order to hold the turns in place, I used a little spray varnish on the coils and buckets to act as a glue to hold things in place. There are other ways to accomplish this but if you notice your coil slipping and sliding on the bucket, pick a solution and go with it. I did not experience this problem with the variometer – the PVC pipe is a true cylinder with no pitch.

Testing

This is where things get interesting. At the time of construction, I was not prepared to test this coil with the antenna. In fact, at the time of writing this article, I have not acquired the vacuum relays to switch high voltage RF between my main station running 80 and 160m and the new home brew transmitter I have been working on. This is one of the complications of sharing antennas. My switching arrangement is vastly complicated and will be described in a later article. In the short term, I needed a way to test this coil to make sure it was going to play nice with my antenna. Referring back to my calculations, I had determined that the surge impedance of my antenna system was around 480 ohms at 472 kc's. This translated to almost 2200 ohms of capacitive reactance. From this information, I was able to work backwards and determine the equivalent capacitance that my vertical exhibits with respect to ground. Doing so would allow me to come up with capacitors of equivalent capacitance of the vertical and test the coil using my newly modified antenna analyzer.

Calculations indicated that I needed about 250 pf of capacitance to mimic my vertical. My inventory of capacitors in the pF range had been decimated while building loops for 80m-direction finding but I did find some value to connect in series and get "close enough"



Experimental setup for testing the coil

Using the analyzer, RF is fed to a tap (middle picture). The antenna wire from the variometer is attached to the capacitor at one end and the other end of the capacitor is connected to the ground of the analyzer (first picture). By adjusting the variometer position (90 degree rotation of the shaft), and testing several taps, it is possible to find the resonance point (last picture), or at least near zero reactance. This test gives me some generalized data and assurances that I should be able to get the antenna to resonate between 472 kc and 479 kc. In fact, I have full band coverage by adjusting the variometer using this test setup. That is

encouraging considering that there is a huge difference in impedance from one end of the band to the other. That's also the reason I will implement a motor to tune the antenna remotely.

A word of caution: I would NOT consider doing this type of testing in the shack with a transmitter. Even five watts at these frequencies with a coil this large can result in a Tesla coil effect, generating dangerous voltage and current. The analyzer operates at the microwatt level and loses are huge but resist the temptation to setup the coil in the shack and drive RF to it. Save that for the antenna feed point where you hopefully implement safety barriers and solid grounding.

Next time I will either discuss my home brew VFO/transmitter/amplifier for 472 kc or I will actually implement this loading coil at the antenna. It all depends on what goodies I find at Hamcom to facilitate the remote switching of extremely high voltage. Vacuum relays can be expensive!

If you are interested in undertaking this project, I am available to answer questions. There is a lot of engineering type stuff that goes into this and sometimes you just have to figure it out while doing it.

73 and see you in the pile up!

John, KB5NJD..

Announcements

All members that have paid their dues for 2012 have had a name badge made up for them. If you have not picked yours up, please come to the general meeting and pick it up. Name badges will not be available after June meeting.

Ben/K5NEB, V/P

Help Wanted!

Richard Bird of the Ellis County ARC is looking for Bike Rally help. If you have not had enough of two excitement, here is another opportunity for Public Service:

Tour d'Italia Bike Ride

June 16, 2012

Italy, Texas

contact Richard Bird KD5NFW@sbcglobal.net

DON'T FORGET!

The next 80-meter fox hunt will happen on June 2, 2012 at 9 am. This will be a driving hunt and all teams and hunters are asked to meet in the parking lot of Acapulco's Mexican Restaurant (the normal Saturday morning breakfast meeting place for the club) in Desoto on the north side of Beltline and just east of Hampton. Join a team – Jerry, KB6OJE, Jimmy, KB5WIO, and Rick, KJ5UY, are all looking for individuals to ride with them so come join the fun and see what this is about! Or form your own team and give the veterans a run for their money! Hunt boundaries will be defined just prior to starting time. We hope to see you there as the drama unfolds...

MS150 Bike Ride, May 5 & 6, 2012



Jerry, KB6OJE, SWDCARC Secretary, was one of approximately 48 amateur radio operators providing communications support for this very vital fund raiser for Multiple Sclerosis. This year there were 116 teams with the number of team members ranging from 4 to 164. The top fundraiser was the Feisty Devils team which raised \$147,956.25. This was a two day ride beginning at Dr Pepper Park in Frisco going North up by Ray Roberts Lake to Sanger for Lunch stop, where Dan, KE5LHC and I were assigned at mile 41.7.



Then in a Southern direction to Texas Motor Speedway where they spent the night. Total distance for Day 1 was 86 miles. Sunday began with breakfast at TMS and a ride around the race track to start the Day 2 ride. The route took them in a North Westerly direction to Decatur, where the Lunch stop was located with the same two radio operators assigned, KE5LHC and KB6OJE. The distance to Lunch stop was 31 miles and the Day 2 total was 65 miles. Communications took place on two nets (1) Tactical and (2) Resource/SAG. Each Rest Stop had 2 radio operators with one monitoring Tactical Net and other monitoring the Resource/SAG net. All the vehicles used in the MS150 Bike Ride were provided by Toyota with SUVs for supervisory personnel and GM 12 passenger vans for SAGs with back two rows of seats removed for bicycles.

The location we were assigned to set up our communications station at Sanger High School placed the two story brick building between us and the repeaters we were using. When tried to check in with the handi-talkie, Net Control said someone was not making the repeater. I attached a 2m roll up J-Pole antenna to a push up pole about 20' high and tried again to make contact with Net Control and was successful this time. Dan, KE5LHC, had his IC-7000 operating on battery and also had a J-Pole antenna on a 24' push up pole and made good contact. He, too, could not make contact with his handi-talkie. The next day at Decatur High School we were both able to make contact with Net Control with our handi-talkies with no problem.

On The Road With N5PKZ



Power for the FT-897 come from the battery box in the back of truck. The battery charges while the truck is running. Antenna is rigged from Buddipole parts in inverted V configuration with 16 foot mast. (I haven't played with the fiberglass mast yet. I need to work on materials to guy it.) My antenna was tuned to 40 meters; accomplished by adjusting wire length to electric fence posts. Worked CT, WV, and AL.

73,

Gene / N5PKZ

Financial Report ... May 2012



May-12	Income	Expense	Balance	Petty Cash
General Fund				
Beginning Balance 5/1/12			\$2,050.96	
INCOME/EXPENSE				
Dues Income-2012				
Shirt & Cap Order # 3	\$66.00			
Transfer From Matl. Property				
Tranfer Petty Cash income				
TOTAL INCOME				
	\$66.00			
EXPENSES				
Proforma Shirt Order Chk. 2011		\$66.00		
TOTAL EXPENSES				
		\$66.00		
TOTAL INCOME/EXPENSE	\$66.00	\$66.00		
Ending Balance 5/31/2012			\$2,050.96	
Special Events Fund				
Beginning Balance 5/1/12			\$125.14	
INCOME/EXPENSE				
Trans from General Fund				
TOTAL INCOME				
	\$0.00			
EXPENSES				
TOTAL EXPENSES				
		\$0.00		
TOTAL INCOME/EXPENSE	\$0.00	\$0.00		
Ending Balance 5/31/2012			\$125.14	
Material Property Fund				
Beginning Balance 5/1/11			\$2,085.78	
INCOME/EXPENSE				
Dues Income-2012				
Transfer from General Fund				
TOTAL INCOME				
	\$0.00			
EXPENSES				
Telephone Pymt. 01May		\$39.67		
GPS Antennas + connectors Ck. 2010		\$223.56		
Transfer to General Fund				
TOTAL EXPENSES				
		\$263.23		
TOTAL INCOME/EXPENSE	\$0.00	\$263.23		
Ending Balance 5/31/2012			\$1,822.55	
May Balance	\$66.00	\$329.23	\$3,998.65	

2012 Board Members

President

Scott Crappa (KE5NLK)

Vice-President

Ben Barber (K5NEB)

Treasurer

Mike Harang (K5MMH)

Secretary

Jerry Keltner (KB6OJE)

Directors

Paul Dryer (KD5IVP)

Lester Wong (K5ITO)

Rick Ellis (KJ5UY)

Committee Positions

Repeater Trustee

Johnny Roberson (KJ5LB)

Newsletter Editor

Bill Ellis (N5TXN)

Web Master

Bruce Holt (KG1BAH)

MN²

Monday Night Net

Net Time 8:00PM

147.060(+) Primary
444.500(+) Alternate

Minutes of Board Meeting ... May 1, 2012



The meeting was called to order by Scott, KE5NLK at 6:35 pm.

Invocation was given by Johnny, KJ5LB.

Executive Board members present: Scott, KE5NLK, Ben, K5NEB, Mike, K5MMH, Lester, K5ITO, and Jerry, KB6OJE.

Club members present: Johnny, KJ5LB, Jimmy, KB5WIO and Bruce, KG1BAH .

Guests: None

Minutes: Motion to approve by Ben, K5NEB; Motion 2nd by Lester, K5ITO . Motion passed.

Treasure Report Motion to approve by Jerry, Kb6OJE; Motion 2nd by Lester, K5ITO. Motion passed.

COMMITTEE REPORTS

Repeater: Both were working on 1 May 2012.

VE Session: Ben, K5NEB, had a class in Rockwall with 12 tested and 1 re-tested and 7 passed.

EOC: Status Quo. There was a banquet and awards were passed out.

Membership: No new ones this month.

Net: There were 13 check-ins last night. Ben, K5NEB, states that they need more Net Control Operators. If you are able to volunteer for this, contact Russ, KX5G by e-mail at russthom@tx.rr.com.

Web: Bruce, KG1BAH, reports it is up and running.

Groundwire: Had a great one with 15 pages. Keep those articles coming.

OLD BUSINESS

1. Ham Com – 8 & 9 June, 2012. SWDCARC has one table for you to bring the items you want to sell. Be sure to have the price you want and be prepared to spend some time at the table so others can “walk the floor”.
2. Head for the Hills – It is scheduled for Saturday, 12 May. Mike, K5MMH, and Jerry, KB6OJE are the co-chairpersons for this event. They report we still have some positions to fill and if you are able to volunteer, please contact one of them soon.
3. Field Day Chairperson - 23 & 24 June, Mike, K5MMH, has agreed to be the Field Day Chairperson, but says that he is going to need a lot people to help by being in charge of a particular portion of the event. Test of FD Antenna – Tested it and found that 2 coax connections were bad. They are being repaired.

NEW BUSINESS

1. HT & Mobile Radio for Club – Consider buying them at HamCom.
2. Thank you – Need to get a Thank You note to the Balloon launch group who presented the program last month.

PROGRAM: Richard Baker presentation on programming PIC for remote control.

Motion to Adjourn was made by Ben, K5NEB at 7:25 pm.

The meeting was called to order by Scott, KE5NLK at 6:30 pm.

Invocation was given by Richard, N5KXA.

Minutes: Motion: Rick, KJ5UY; 2nd by Jimmy, KB5WIO. Approved? Yes

Treasure Report: Motion: Jimmy, KB5WIO; 2nd by Jerry, KB6OJE. Approved? Yes

Guests: Johnny Grant, KB5YYK

COMMITTEE REPORTS

Repeater: Both repeaters are working. 2m repeater worked very well Saturday for the HFH Bike Ride.

VE Session: Ben, K5NEB, had 12 take the test in Rockwall and 7 passed.

EOC: There is to be a Table Top Drill at DeSoto regarding emergency communications.

Membership: No new members.

Net: Ben, K5NEB had a good net with quite a few check-ins. Also, need more members to volunteer to be in the rotation for Net Control. Rick, KJ5UY, is back in the rotation after another work schedule change.

Web: It is up and running..

Groundwire: Is on the web for all to read and enjoy and this months is going to be better.

OLD BUSINESS

Head For The Hills –Had a great turn-out and weather cooperated with a cool rainy day. Rotary Club had numerous favorable comments on the ride. Need those that participated in the HFH Bike Ride as volunteers to send an e-mail to Mike, K5MMH or Jerry, KB6OJE with your comments about the ride.

Break it into two parts (1) what should be reported to the Rotary Club and (2) what should be acted upon by SWDCARC. We want both positive and negative comments...how we can improve.

80m Fox Hunt – John, KB5NJD, reports there there will be another 80m Fox Hunt on Saturday 2 June.

This one will be from motor vehicles and there should be 2 – 4 people in each vehicle to make it a safe hunt. Starting point will be Acapulco Restaurant at 225 E Beltline (Hwy 1382) in DeSoto. Starting time and boundaries for the hunt to be announced later.

Ham Com – SWDCARC has one table reserved so bring your stuff to sell and plan to spend some time working the table so others can “walk the floor”.

Field Day – This year we will be going as 3F. Larry, KY5S is making a 40m loop for the SSB station. We will have two CW stations, 1 SSB station and 1 Get on the Air (GOTA) station. Make plans now to come out and participate in the set up and in the operation of the stations. If you know of any Boy Scout or Girl Scout groups, invite them to come out and we will get them on the air on the GOTA station either on voice or PSK31.

NEW BUSINESS

Tour d’Italia Bike Ride – Johnny, KB5YYK, provide information on this bike ride and requested our support with radio communications. Those interested should e-mail Richard Bird at KD5NFW@sbcglobal.net. The ride is on 16 June and starts and ends in Italy, TX.

PROGRAM: Richard Baker, N5KXA, gave a presentation on PICs.

ADJOURN: Motion by John, KB5NJD