



The GroundWire

The Way We Were by the Crusty OM.

ISSUE 2012-0

Article 3 – You’ve been ticketed, young man.

A few years ago, OK, OK many years ago, specifically? OK, August 20, 1971, I went to the mail box – back then the mail box was at the front door, not on the curb or down the street in front of the neighbors – and brought in the mail. There it was an envelope from Gettysburg, WN5FGB. At the ripe age of 14 years, I was a certified novice. If you were to come to Crusty’s shack, you’d see that license. With the exception of a period of 16 months between novices (not in this article), I have been part of Amateur Radio. That old key to the right is a picture of what I used for my first contact. Not that key, but the same “Navy flameproof” key.

Today we are talking about tickets. Why the word tickets, I don’t know, probably some soul like me that also took a zillion years to learn to spell LICENSE. It’s easy to get lost in that word on code. So license or ticket, matters not.

Trivia time:

OK, how many licenses does the average ham have? The answer is two.

What is my call sign? I don’t have one.

How many named amateur licenses are there? One. Amateur Extra, See §97.9

Crusty ain’t got a call sign? No and neither do you! Call signs are issued to stations. I am not a station, I am an operator. I am well aware of the fact that 99.99 percent of the time the call and the person are tightly associated, Shoot now days, most ham’s don’t even identify right when away from home. According to Part 97, you are to use the call sign of the station on which you are operating. Technically, that means if you were at my house, talking to me in the car, we BOTH should be using the same call sign. That’s right – it would be AB5COM this is AB5COM. Sound weird.

Why so station call signs, you ask? Cause the brutes in Fox Charlie Charlie’s Denton listening post (long shut down) care more about signal quality then signal content. If your transmitter was spewing trash on the air, they’d pink slip you and tell you to clean it up. Today, most of us (me too) are nothing but a bunch of appliance ops and the sig quality is always FB. FCC usually left the content monitoring to the Official Observers to send out warnings. Crusty got one (OO slip) of for yapping to long without a call sign.



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At one time there were more station license types. As opposed to the two we now have (primary, and club), there were also secondary station licenses and repeater licenses. If you had a second home, or a station besides at one the house, you could get a secondary license for that location. Repeaters also had separate licenses for a while. 146.880 in Houston (also known as the big stick) got the first of the WR5 calls, WR5AAA. Irving had WR5ABE. Back then, getting a repeater license required sending in engineering diagrams and control design to the FCC for approval before getting the license. The calls lasted a few years, but the FCC relaxed the repeater regulations and did away with the special calls for repeaters. I did notice that WR5AAA has been reissued as a vanity club call sign to the Houston Amateur Radio Club and is back on 146.880.

Who in SWDCARC has four licenses? That would be Johnny Roberson, one operator license, one station license, and two club station licenses.

Operator license

The US really blurs the line between operator licenses and station licenses. To my knowledge, they have never issued an operator license without having it tied to a station license. I have not kept up with Japanese licensing lately, but I had a buddy, one of us Texas boys, that had a Japanese operator's license only. He was a missionary over there and could operate at a club station, but could not operate his own station. I believe he now has a station license.

There was a time when the FCC issued an Amateur Extra Operator's license. These are unique licenses. I was dumb and never got around to getting the Extra Op's license. I knew a few that did.



I know it's hard to read, so I am going to point out a few things. First, no call sign. Op's don't have call signs, remember, secondly no expiration date. To quote the license "THIS LICENSE IS VALID FOR THE PERION OF TIME AND TO THE EXTENT PROVIDED BY ANY VALID AMATEUR RADIO



LICENSE CARD (FCC FORM 660) HELD BY THE SAME LICENSEE, INCLUDING ANY RENEWAL OR MODIFICATION THEREOF, AND ENDORSED TO SHOW AMATEUR EXTRA CLASS OPERATOR PRIVILEGES.” This was the consummate wall paper. Really gave you no privileges, but looked nice on the wall. It was also a lot bigger than the regular license.

This was also one of the easiest licenses to get (and why I kick my butt for not having one). All it took was a copy of your Amateur Extra ticket, a cover letter saying what you wanted, an envelope and a stamp. Notice the place of issuance. Yup, the Earl Campbell building down on Commerce in Dallas. The place we took our test to get that ticket in the first place. Unfortunately, when I got my Extra I never got around to sending off for mine.

History of Licenses

According to Wikipedia, the Radio Act of 1912 the Department of Commerce issued Amateur First Class and Amateur Second class. Amateur licensing officially began in December 1932. Wiki also says that the amateur radio operator licenses were ornate while the station license was plainer.

In 1934, the Communications Act of 1934 established the “Federal Communications Commission”. There were three classes of license, A B and C. A was the top license and required one year’s experience as a B or C licensee. Class B and C were the same, except C was mail order.

On July 1, 1951 FCC redid the Amateur Licensing structure again. This was the start of the modern era of licensing, with Novice, Technician, General, Conditional, and Amateur Extra. The Advanced class, the class the old Class A op’s were grandfathered to, was not issued from 1951 to 1957.

According to some (fools), there was a problem with the licensing structure above. Novice’s and Techs had limitations on their licenses, but General, Advanced, and Extra all had the same privileges. In 1964 some wise guy at the ARRL came up with “Incentive Licensing”. Under this plan, the Extra’s had use of the whole band, the Advanced and Generals got less of the band. My original Elmer, WA5JFO, would almost spit at the mention of the League. He was a General class licensee and got bit by this plan. Now there was a reason to upgrade licenses.

Couple of interesting points: There were three classes that all had the same written test. Those were the Tech, General and Conditional. The Tech license was 50 MHz and above only, and required 5 WPM code. General was 13 WPM. Conditional, Technician and Novice were tested by proctors, them being General or above. All novices and techs were proctored by an elmer, the Conditionals were for people who were 175 miles from the nearest FCC semiannual test site. More on testing later.

Over the years the FCC has dinked with licensing. Especially the novice. At one time the license was a one year, non-renewable, non-repeatable license. By the time I got my novices, you could it was a two year, repeatable license. There was a 12 month layoff period between licenses. I got a second novice merely to get my code speed back up to 13 and got my General.

From January 1, 1976 to December 31, 1976, the FCC allowed Bicentennial call signs. These were special call signs that could be used to celebrate the countries bicentennial. At the time, there were no calls in the AA-AL prefix. The FCC issued a crisscross matrix by prefix. WA became AA, WB became AB, etc. These were strictly voluntary, but cool.

Current structure

I remember the date as Jan 1, 1978, but don’t hold me to that. FCC came out with the new call sign structure. KA for Novice and Techs, N for Generals, KA by two for Advanced and 1 by 2 / 2 by 1 or AA by 2 for the extras.



There have been numerous changes since 78. Techs got novice privileges. Novice/techs got voice on 10 meters. In 1991, the roof started caving in and the first no-coders came on board. In 2000 the rules were radically changed, all license classes except Tech required only 5 wpm. The roof finally collapsed in on February 23, 2007 when all the code requirements were lifted. Of course, as I noted last column, code officially died in 1999 commercially.

Testing

Testing has been a vital part of Amateur Radio all along. Prior to 1984, Testing was exclusively the domain of the FCC at official test locations. My 1971 License Guide lists 77 cities where you could take a test at least twice a year. The FCC had 24 district offices, and they gave the tests regularly. Tuesday morning, 9-12 AM, Federal Building, Dallas was the closest office. Houston also had a district office. From those offices there were groups that went out to other cities either quarterly, semiannually, or annually. My first crack at the Extra was a 170 mile drive to San Antonio for 5 minutes of code and flunking the code test.

Sometime in the late 70's, the FCC got wise and started doing on site testing at hamfests. This was great as many hams would be in town for HamComm etc., and not have to take a day vacation to get tested.

In 1984 the FCC started the Volunteer Examiner Program. This really changed the way one could get a ticket. First, there were LOTS more opportunities to take the test. A look at <http://www.dfwlist.org/> shows 20+ places to take the ham test each month, rather than the 4 or 5 times on Tuesday in Dallas. Secondly, I personally think a published question pool is a major asset. I really don't think I would have taken the extra 5 times with a published question pool.

The Waiting Game

One thing this generation has easy is the waiting for the license. When I got my licenses it was a waiting game on Gettysburg to get the licenses out. No two or three day turn around. No online database to query. It was a month from the time I took my novice till I got my ticket. By the time I got my Extra in 80, FCC had come out with the instant upgrade suffix, but first timers still waited. Speaking of upgrades, Upgrading your ham license was a darn site easier than FCC's attempt at upgrading the licensing software. Wait times went to 10+ weeks. I bet the programmers in Gettysburg saw less of their family then.

License Pictures

Cain't really talk about licenses without seeing some. I googled some pics and pulled the ones off the wall. I read somewhere that the original licenses were ornate things. Unfortunately, the old codgers forgot to scan them before going SK. I did find a couple of pictures of old licenses. If you want to see a current license, go look at a ham's wall.



Form No. 8-B

File No. _____
 Official No. TT-26
 Call Letters W9YT

UNITED STATES OF AMERICA
FEDERAL RADIO COMMISSION

AMATEUR RADIO STATION LICENSE

Subject to the provisions of the Radio Act of 1927, as amended, subsequent acts and treaties, and all regulations heretofore or hereafter made by this Commission, and further subject to the conditions set forth in this license, the

LICENSEE University of Wisconsin, Department of Electrical Engineering
is hereby authorized to use and operate the radio transmitting apparatus hereinafter described for the following purposes

for the term beginning August 23, 1930 ~~192~~ *, and ending* August 22, 1931 ~~192~~ *, unless this license is sooner suspended or revoked.*

This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term hereof, nor in any other manner than authorized herein. Neither the license nor the right granted hereunder shall be assigned or otherwise transferred in violation of the Radio Act of 1927, as amended. This license is subject to the right of use or control by the Government of the United States conferred by Section 6 of the Radio Act of 1927.

The licensee is authorized to use and operate the apparatus located at Electrical Laboratory ~~Secet~~.

City or town of Madison, County of Dane, in the State of Wisconsin
 described as follows:
VT-CW-ICW-PHONE

This one is fairly old. 1930 – heck, that is older than I am. Wonder if that was the original license or not. FCC database has a different name now days. Badger Amateur Radio Society. Still in Engineering Hall. Bet the club trustee has changed once or twice.

By the time I got my first novice, the license had really shrunk. This form 660 dates from December, 1970. I saw one on line from the early 60's that looked pretty much the same. *Non Transferable* was on the left side, not on the right.

Sometime between 1973 and April 1976, ole form 660 got a severe case of the uglies. These were the days when the computer nerds had invented closed in forms. The forms were inside an envelope, and they typed though the envelope on to carbon paper then on to the license itself. My college used the same form for sending out grades. Good grades still looked ugly on that type of paper. The dang printer paper manglers, err platen rollers, that's them, would leave smudges on the forms. I had a few in my day. If you look carefully, the form date is July 1978. I have an advanced just like it with an earlier form date.

AMATEUR RADIO LICENSE		NOT TRANSFERABLE		
EFFECTIVE DATE <u>03/14/80</u>	EXPIRATION DATE <u>03/14/85</u>	CALL SIGN <u>Z</u>	OPERATOR PRIVILEGES <u>AMATEUR EXTRA</u>	STATION PRIVILEGES <u>FRI</u>
NAME AND ADDRESS		STATION OPERATION LOCATION		
<u>2800 W PIONEER DR 144 IRVING TEX: 75061</u>		<u>2800 W PIONEER DR 144 IRVING TEX 75061</u>		
THE LICENSE IS SUBJECT TO CONDITIONS OF GRANT ON REVERSE SIDE				
UNITED STATES OF AMERICA FEDERAL COMMUNICATIONS COMMISSION WASHINGTON, D.C. 20554				
LICENEE'S SIGNATURE		FCC FORM 660 JULY 1978		
		FEDERAL COMMUNICATIONS COMMISSION		

That wraps this column.

The Best Point of View ... continued



Mike Allred, N5MA is one gem of an Elmer, and a close personal friend. Without Mike's constant coaching I would have never passed that Extra test, a test I took 5 times. Remember folks this was pre VE, pre question pool. Mike has been a close friend and one heck of a mentor over the 38 years (this October) I have known him.

<http://www.ac6v.com/history.htm> Great site for radio history.

"Amateur radio licensing in the United States" on the web at http://en.wikipedia.org/wiki/Amateur_radio_licensing_in_the_United_States

"Novice History Background" on the web at http://novicehistory.org/index.php?option=com_k2&view=item&layout=item&id=219&Itemid=67

West Coast DX Bulletin, "Bicentennial Call signs" on the web at http://novicehistory.org/index.php?option=com_k2&view=item&layout=item&id=219&Itemid=67

<http://www.ac6v.com/history.htm>

What is it??



Send your guess to n5txn.be@gmail.com.
Winner will be revealed next month.



ANSWER: Icom IC-W21E

No guesses, so no winners!!

Here is September's mystery ... What Is It??



Dr. John's Technical Stuff



A 630-meter transmit down-converter utilizing transistor mixing plus a 10-watt Class D power amplifier for little \$\$\$

A few months ago I talked about a way of generating a CW signal on 630-meters using an 80-meter LC oscillator and a buffered CMOS-based divide by 8 device to develop enough signal to drive a much larger power amplifier with a high quality keying waveform. This class-D device is great for CW but what about other narrow band, low baud rate digital modes like OPERA, JT-65 and WSPR? Fortunately these are all FSK modes that don't have more than one carrier frequency on the air at a given time so this means that I don't have to deal with the linearity issues associated with modes like SSB even though these modes are often generated using USB modulation from a conventional HF rig. While SSB transmitters can be complicated by beat frequency oscillators, IF mixing and other scary (and conceivably costly) things, it's a very simple affair to construct a device that take a signal from any HF rig on 80-meters and mixes that signal with another fixed frequency signal which ultimately produces the sum and difference of these frequencies. A little filtering allows some selectivity of the signal you are looking for and that can be output to a higher power amplifier to generate a usable signal level. It's really shockingly simple.

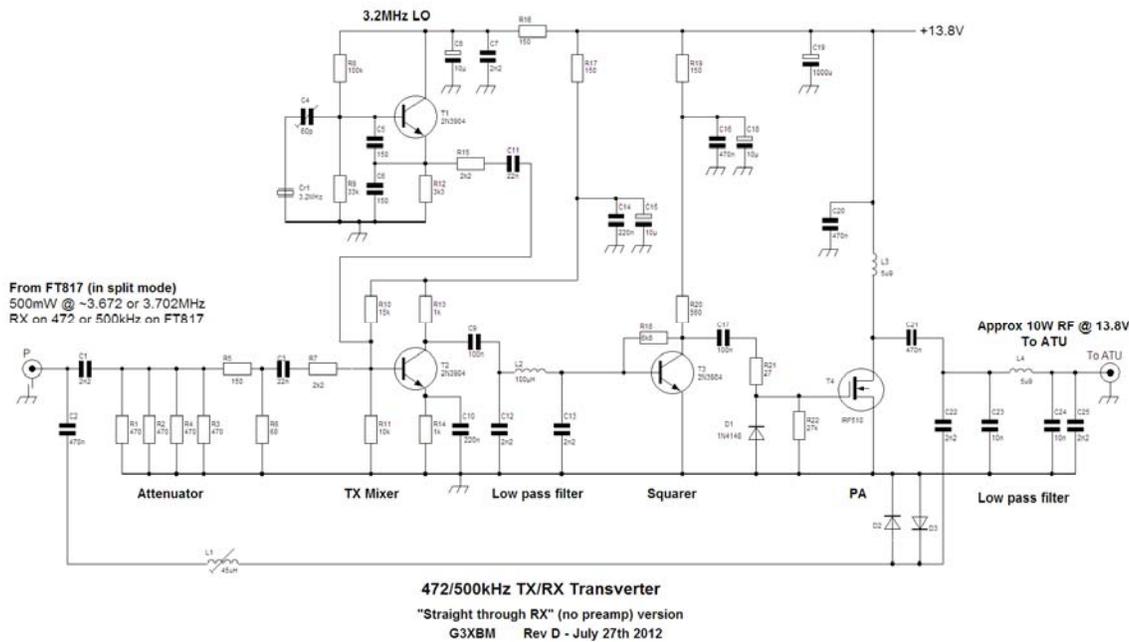
So why 80-meters for a starting frequency? There is a lot of data to suggest that the lower the frequency of the local oscillator (LO) and the RF source that provides the frequency variability, the higher the frequency stability of the output signal. There are a lot of other factors that go into this but it's a pretty good generalization. My original system was going to use a 28 MHz LO and the RF from the radio at 28.472-.479 MHz to generate a difference frequency between 472 and 479 KHz. Examining the stability of this system compared to the same arrangement using a 3.2 MHz LO with rig RF between 3.672 and 3.679 yielded many orders of magnitude more stability with the lower frequency system. It also helps that 3.2 MHz crystals are easy to come by today.

What makes this system unique is that mixing occurs not in a pricey and sometimes difficult to obtain and utilize doubly balanced mixer from someplace like minicircuits.com, but rather utilizing a \$.39 2N3904 bipolar junction transistor. What's really nice is that if you burn up the transistor mixer because you injected too much 80-meter power, they are simple and cheap to replace.

What do mixers do and how do they do it? Well, there is a lot of black magic there but in the simplest form, a mixer is a transformer on the input driving a diode bridge kinda like a rectifier and then an output transformer. Yes, I am oversimplifying this in big way (primarily because I can't really rationalize how it works entirely, it just does!) but the signals are introduced to that diode ring at different locations and the signals circulate through the mix and match the frequencies. At the end you get the sum and difference of the signals. There are all types of mixers out there. Some pass the original signals though (never understood where that would be handy) and some pass one of the signals through along with the sum and difference. It really depends on what you are looking for. With the 2N3904 transistor, the signals are just thrown onto the base of the transistor at similar power levels and the signals duke it out until they are amplified as sum and difference. I'm sure some of the LO and RF drive frequency is present as well but the low pass filter on the output takes everything out except for the lowest frequency, 472 KHz band. I imagine the purists are cringing to hear me say that but it works and it works well.



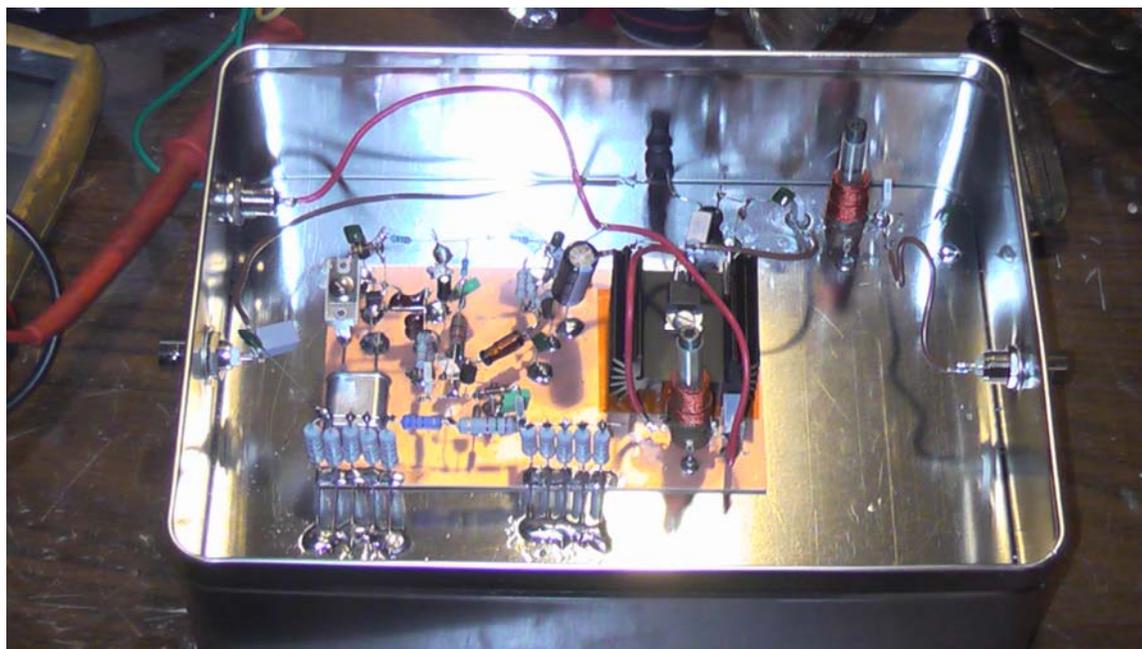
I was not the first person to come up with this idea in amateur electronics. Roger, G3XBM, was developing a similar system in July of this year so that he could operate OPERA and WSPR on 600-meters, right around 500 KHz, which is where many of the experimental licenses currently reside today. Roger is an accomplished electrical engineer and did a very good job developing his system and tweaking component values for optimum RF decoupling and maximum signal with inexpensive parts, many of which reside in the builder ham's parts box.



My device differs every so slightly. As the radio I am using for 630-meters has a minimum output of 5 watts and mixers of any flavor have a tendency to be finicky – they don't want too much power or too little power, they want “just enough” whatever that is – I opted for about 30 db of attenuation which resulted in about 5 mW of power to the mixer. If I needed more, I could always turn the power up just a bit because I scaled the attenuator for 10 watts of dissipation (multiple 2 watts resistors in parallel). As it turns out, 5 mW was plenty of power and judging the amplitude of the 3.2 MHz crystal oscillator waveform, the input was close to equal.

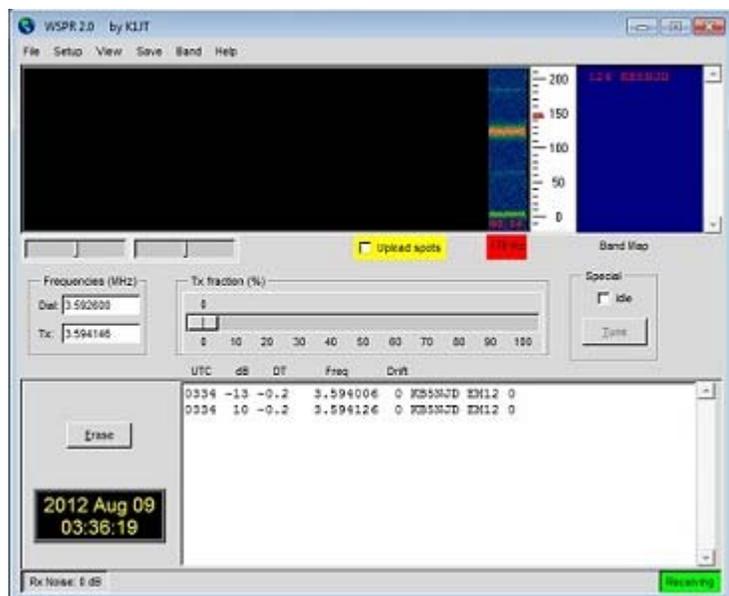
Additional differences in the system include the lack of receive loop back. It should be noted that in my system, I do not listen on the transmit antennas, instead utilizing separate directional receive systems. As a result the loop back is not necessary. It bears being said that this is NOT a true transverter. It is only a transmit downconverter and to receive on the target band, you must operate in split VFO mode, transmitting on 80m and receiving in the 472 KHz band on the other VFO. Modern radios accommodate this switching very easily. It may be necessary to utilize a receive preamp since most amateur transceivers do not offer very good sensitivity at these frequencies out of the box. A system that I am currently designing for Russ, KX5G, will have to address this problem.

Since I am utilizing an outboard 100-watt power amplifier, I do not need the 10 watt PA on board the down converter that utilizes an IRF510. In its place, I use a few stages of what Roger, G3XBM, refers to as a “squarer”. This is nothing more than intermediate stages of amplifier. Since I did not really know how much boost I would need to achieve the 12v peak-to-peak signal I needed to drive my big PA, I simply started adding stages until I saw useful power. That works well as long as you are prepared to do good quality filtering on the output. In future versions I am considering utilizing the IRF510 at a lower supply voltage and then utilize an output attenuator to achieve the necessary drive power for the larger PA. This will make the efficiency purist cringe but I like to think that the heat generated in attenuators within the box ultimately contributes to frequency stability of the crystal oscillator after a few transmit cycles. It’s like an unintended crystal oven.



Transmit down-converter including receive loop back and 10 watt PA utilizing an IRF510 MOSFET

So far I have built and tested a number of these units over the past two weeks and they seem to have great frequency stability, drifting only a few hertz after initial warm up. Testing was accomplished using separate radios to transmit and receive within the ham shack and transmitting into a dummy load utilizing WSPR at 50% transmit cycle and 10 watts. Below is the WSPR interface showing the received signal on 475 KHz while the adjacent radio is transmitting on 3675 KHz into the down-converter:



There are a couple of things to note from this image. First, disregard the reported RF frequency. The WSPR system had to be “dummied up” for the test. Reception is, in fact, occurring on 475 KHz utilizing the Yaesu FT1000 Mark V Field. Secondly, note that the receiving waterfall shows a number of signals that are 60 Hz apart and that in the receive window there are two simultaneous received signals from the same transmit cycle. This is the result of power harmonics and is easily resolved by placing 1000 uF electrolytic capacitors in parallel with the existing decoupling capacitors on the mixer, LO, and the squarer. Note that I have notified Roger of this change but the above schematic does not incorporate these additions. That means you would add a capacitor in parallel to C7 and 8, C14 and 15, and C16 and 18 for a total of 3 additional capacitors. Additional testing has resulted in almost total attenuation of the harmonics. Depending on the quality of your power, you might need more or less.

Much of the work that Roger and I have incorporated into our respective systems utilizes RF PA design concepts that were developed by Rog, GW3UEP, who has been referenced in past articles regarding PA design. So many of these concepts are open source ideas and the level of development gets better and better through experimentation.

My long term goal is to build up a number of systems for use by select club members that I feel like would use the system either by setting up beacons or operating when the band officially opens. This includes setting up a beacon on the behalf of the club at someone’s house utilizing a minimalist system with a short vertical and loading coil design. If you have an HF system that you are not utilizing on a regular basis or have multiple radios, consider setting up a receive-only system to provide reports to other WSPR or OPERA systems on the air. I will talk about how to do this in subsequent articles because I think it is a very valuable thing to have a large number of receivers to listen for band openings. It may likely only require that you setup the free software as if you were going to run a digital mode and set the frequency on your radio.

Odds and Ends

I had intended on talking about the math associated with EIRP calculations and the measurements associated with it. Since the ARRL executive committee and counsel are still drafting the proposal for the FCC we don't yet know what the max EIRP will be. It is presumed to be 1 watt but it might end up being 5 or even 20 watts. Until we know for sure, I will hold off on that.

A few other items that I have forgotten in previous months that I thought were important:

Filtering and the ATU: One of the features of a high Q antenna system and subsequent narrow SWR bandwidth is the filtering capability offered by the ATU. While the ATU's primary purpose is to match the antenna to the feed line and for maximum power transfer with a minimum of conductor losses, because the match is narrow, signals that are out of band will generally be rejected because the resistance, at least in my system is a dead short, that is 0 ohms resistance. For example, when I am tune up for operation at 475 KHz, if I sweep upward in frequency, the resistance drops to 0 ohms close to 490 KHz and remains this way well into the AM broadcast band with an ever increasing value of reactance. In short, even if the filtering in the transmitter were missing, it's my belief that there would be absolutely nothing left in terms of harmonics at the second harmonic since the SWR bandwidth is so narrow. This is a nice, additional layer or spectrum protection.

Beware of SWR meters for HF at low frequency: When I was developing my first signal source and PA's I was utilizing an MFJ 949 tuner that I had as a spare around the shack. It has a dummy load and a cross needle meter and was great for the purpose of seeing the RF I was generating as well as terminating that RF during development. The problem was with how power is sampled. Almost every through line power meter on the market uses a ferrite core transformer of type-43 material to sample RF on its way to the load and utilizes a diode rectifier and voltage divider to ultimately display a voltage output on the meter that corresponds to an SWR value and power. The problem here is that type-43 material is VERY lossy at lower MW frequencies. In fact, it is so lossy, that Pat, W5THT, who operates in the ARRL 600-meter research experiment as WD2XSH/6 in Gulf Port, MS, had a core get so hot that it virtually exploded. Pat tried to modify the core material to utilize type-77 core material, which is more compatible with these frequencies but was unsuccessful. In short, it was just easier to start from scratch. The take home message here is that you should not believe the SWR readings on your meter at these frequencies. In fact, SWR values will always read high. In my case, into a 50 ohm load, my meter still reads over 2:1 SWR. It took me a long time to figure out what was going on. Those meters are only spec'd to 1.8 MHz! Even Bird ThruLine Wattmeters read erroneously at these frequencies without the properly matched slug. What's more and less obvious is that using the wrong core material sinks a tremendous amount of power and for some time I left this meter in line with my high power system which resulted in a significant amount of power burned up as heat in this core. Fortunately mine did not blow up but it looks like it's been hot. That meter is now out of line and I am seeing an appropriate level of system current into a dummy load. When selecting a ferrite for use as a current transformer to indicate the antenna system health, be sure you use Type-77 at these frequencies lest you have lots of loss. Power line ferrites also seem to work well.

Check your HF rigs for the MARS/CAP mod: You might be surprised! Many radios that have the capability to be modified for extended transmit will make power at 630-meters. What these systems often lack is filtering. A simple low pass filter will clean up the waveform and result in a very good quality signal. Russ, KX5G, determined that his radio would make 25 watts at 475 KHz and an examination of the waveform indicates that a little filtering will make it suitable for air. That will simplify his installation tremendously. In my case, the Yaesu's FT1000 and 920 are difficult mods that are compromises at best and a transmit down-converter is a more logical solution.

That's a good stopping point for this month.

73 and see you in the pile up!

John KB5NJD..

Uno Momento, Por Favor de KX5G

I have been hearing talk about the Arduino Uno microcontroller board. I call these Single Board Computers (SBCs) as they are quite powerful. I have been talking to John and others about projects that seemed to fit the capabilities of this board. The more I investigated, the more I was intrigued, On the 18, I went to Fry's and found this board. Could not resist the temptation to play with this little thing. To help understand the size of the board, I set the board on top of my debit card. As you can clearly see, it's tiny.



First, the history. The Uno design is open electronics. Everything about the board, the pin out, trace routes, etc is open for public use. This means anybody and his brother can reproduce the board and sell it without paying royalties to Arduino. I had planned on ordering one from Arduino, but at Fry's, saw this clone, and could not resist.

The OSEPP Uno is almost a carbon copy of the Arduino Uno. There are a couple of differences. The first obvious difference is the Osepp uses an SMT processor, instead of a socket mounted DIP. The only problem with that is if you let the smoke out of the processor, you toss the board, instead of replacing just the processor. OK, don't crispy critter the processor.

The other difference is the way the board talks to a PC and the Arduino development system. IF you read the back of the packaging it clearly says in large letters that this board looks like a Nano board (another one of the Arduino line) to the pc/development software. Well, I am a real programmer and I don't need no stinking manuals. After two hours or so and two computers attempting to talk to the SBC, I got off the Arduino official web site looked at the Osepp web site and followed their installation instructions. 5 minutes later, we were conversing. Then I so looked at the packaging and saw the label saying the same thing – as they say on the Linux boards “RTFM”, read the “fine” manual.

Next, do something with it. Well, what else, Morse code sending! Sending morse code has been on ham computers since the day of the 8008 I would guess. One of my mentors, N5MA, had written a CW sender for the KIM-1 a wopping 1K SBC from the late 70's that was about 8.5 x 11 inches. The design for the code was his as I remembered it. Second generation code is much easier to write. A couple hours later, I have a complete program sending strings. All that is left is being able to use it real time.

More about the card. In the upper left hand corner, you see a silver box. That is a type B USB connector for communicating with a PC / MAC (whatever that is). On the bottom left is a power plug for 6-12V. It appears the board itself pulls 50 ma. Of course you start driving speakers, and other stuff your mileage

will vary. Across the top and bottom are the various digital and analog ports. The board conveniently has software controlled pull-up resistors to keep the inputs at 5 volts, allowing for negative logic.

The development software is freely available on the web and is basically C++. You install the appropriate drivers to make the USB look like a serial port, tell the development system what type of board you have (after checking with the manufacturer of the board) and you are ready to go to town.

The card has 13 digital ports, 2 are dedicated to serial communications, one is hooked to a LED, and so it can only be used for output. The others are free for you to use either as input or output. Some of the digital ports are set up for Pulse Width Modulation. PWM allows you to fake an analog voltage by varying the width of a square wave. That is something akin to how a switching power supply works. There are five analog input ports that will return a value of 0 to 1023 across 0 to 5 volts. That works out to 4 millivolt resolution.

Memory inside comes in three flavors. There is 2K ram for data. This ram is volatile and will not retain anything on power cycle. This memory is used for variable storage. The main program is stored in 32K of flash memory. This memory can be used to store data also, but there are special functions to read/write the flash memory. There is also 1K of EEPROM that is static and only needs to be loaded once. This is where I stored my Morse code lookup table. 90 characters is small, and right now I have no other need for the EEPROM.

Programming is a hoot. Once you learn the language, you write the code and press the send button. The development package compiles the program, ships it to the Uno, and resets the Uno. The program then runs. Sidebar here, there are many things that can reset the Uno, beside the software and the button on the board. USB port resets also reset the board. Booting the mother ship causes the little Uno to reset more than once. When the board has Morse code running, it gets old restarting every time.

There are a few language constructs that are different in the Uno world. “Sketches” are programs, and “Shields” are daughter boards. The design spec calls for all shields to be built to stack on top of one another to make a package. I have found shields for everything from accelerometers to LCD panels to GPS nodes to wireless Ethernet.

Pictured right is my prototyping box. With my coordination I needed to build something that would be easy to move about as I worked with the Uno. The prototype board comes with double sided tape on the back. I stuck that down of a piece of foam in a old shipping box. The Uno came in a little plastic container that I have cut slots in the one end for the power cord and USB cord. That plastic box is double sided taped to the foam also. On the bread board I hot glued one of the pots that I will use all the time as I kept knocking it loose (OK, I grabbed the wrong pot at Fry’s I was reaching for a single turn pot and grabbed a 20 turn. I have a bad habit of not grabbing the item I think I am grabbing when in a rush.) This looks like I have something that even I can prototype on, and my daughter is always willing to help with the real coordination parts.

On top of the box is a speaker and a solar battery (200x SWDCARC Christmas party door prize). The Uno can be powered off the USB port so I plugged in the USB into the solar battery. I can now run the Uno completely off grid. Of course if I am running CW on a 100 W radio, there will be power around, but it makes for a cool picture, and an application for the solar battery.

At \$24.90 at Fry's, this is a neat play toy. I have plans for it (both professionally and in the hobby) so I'll end up getting some shields and electronic gismos.

**AMATEUR RADIO
TECHNICIAN CLASSES
SEPTEMBER 13, 22, & 27
THURSDAY SEPTEMBER 13 & 27**

7:00PM – 9:00PM

Prairie Paws Adoption center

2222W Warrior Trail

Grand Prairie, TX. 75052

***SATURDAY SEPTEMBER 22, 2012**

9:00AM – 1200 NOON

*** Charles England Public Safety Training Complex,**

310 W. College

GRAND PRAIRIE, TX.

RESERVE YOUR PLACE

CLASS SIZE LIMITED TO 20

RSVP

BY SEPTEMBER 7, 2012

CALL BEN BARBER 972-262-3114

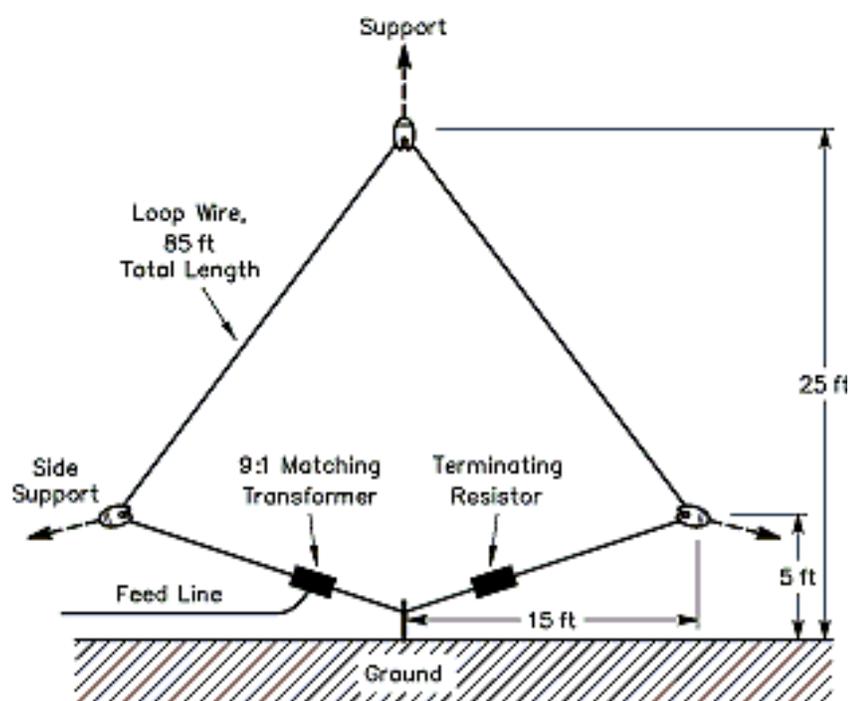
OR email

K5neb@sbcglobal.net

CLASSES are FREE

Now that 80-meter foxhunting has caught on with our group, I wanted to introduce a new antenna that Larry, KY5S, and I used in the last foxhunt with great success.

The terminated loop is not a new design but was re-introduced to the ham community by Gary Breed, K9AY, in the early 1990's. These have become a standard for hams in limited space situations that wanted to be successful on the low bands. I use 3 loops, each on separate poles and each with relays to switch directions for a total of 6 directions of coverage. These antennas are quite good and have a high degree of reliability and simplicity but they have a fairly large footprint, standing some 25 feet tall and 30 feet horizontal near ground level.



Here is Gary Breed's original K9AY loop from his description

These antennas provide a cardioid pattern in the direction of the transformer with a deep null in the direction of the terminating resistor. Front to back is on the order of 30-40db depending on elevation angle while front to side is less impressive at 2-3 S-units (about 12-18 db). Since I have done entire programs on this antenna before I will dispense with a detailed discussion of the theory of operation but will say that these are nothing more than imperfectly phased, short, close spaced phased vertical arrays. That means that they are ground dependent. They are very broad banded, low Q and low impedance antennas. The full-sized version uses a 450 ohm – 50 ohm impedance transformer and these can be purchased or easily built. The termination resistance for 80-meters is typically around 300 ohms.

Addressing the issue of size for a mobile foxhunt, it all comes down to scaling. Because these are receive-only antennas, the size can be adjusted with the understanding that feed point impedance and termination

Construction details for the "Secret Weapon" 80-meter Foxhunt Antenna



resistance may change. My portable loop was built on an old PVC frame that once supported a 160-meter shielded loop of the same design that most teams are using for the 80-meter foxhunts. I simply scaled the full size antenna down to the size of the PVC frame I had, maintaining the upside down diamond shape. The longer wires (vertical elements) are 5 feet, 6 inches long while the horizontal "phasing" elements are 4 feet long, terminating at the feed point. The antenna elements are nothing more than strong hook up wire. These can be scaled down further as well, just maintain the shape and adjust the termination resistance for the best null. This can be accomplished using a potentiometer rather than a rock-bound resistor. I found that the best match is with a 200 ohm transformer (4:1) but that might decrease as size decreases.

Original testing showed good strong signals 30 miles away transmitting from my home station and receiving with this antenna and my Sangean SW receiver. At that distance, I could also develop a strong null (signal minima) off of the backside of the antenna. Subsequent tests closer to home made it more difficult to resolve a signal. There was a good reason for this: the original test was performed after a rainstorm and ground conductivity was quite good at that point. The subsequent tests were done on very dry days, where rain had not been seen for a week or more. In order to solve this problem, I used two stainless steel antenna whips, each a little over 4 feet long mounted under the phasing elements. These whips connect to the groundside of the transformer. Making this change made the antenna quite sensitive and directive.

While I have referred to this antenna as a secret weapon, it is nothing more than a tool and one to be used in conjunction with the conventional shielded loops we have been using. It allows one to resolve the ambiguity with reasonable ease but should be confirmed using your shielded loop. We found this most helpful in starting out and then when we got close. Within a mile of the transmitter, we were not certain whether we had passed the fox location or not and this antenna allowed us to make decisions about where to go next. I think we would have been simply hunting and checking if we had only used a shielded loop.

There are other, smaller options out there as well, like loops with sense antennas. Do a google search and see what you can come up with. I would like to see some variety in what people are using in our hunts and there are plenty of options. Its always fun during the pre-hunt period for people to haul out their junk so everyone can see what they are using.

If you would like clarifications or further information, just let me know and I can talk you through it.

THE NEXT FOXHUNT WILL BE SATURDAY, SEPTEMBER 8, 2012 STARTING IN THE PARKING LOT OF ACAPULCO'S IN DESOTO AFTER BREAKFAST AROUND 8:30AM. LARRY AND I WILL BE HIDING THE FOX AND WE HAVE A REALLY GOOD LOCATION PICKED OUT FOR IT SO GET YOUR MAPS READY, LEARN TO READ A COMPASS AND DON'T FORGET THE PROTRACTOR, PENCILS AND ERASERS!

73 and see you in the pileup!

John, KB5NJD...

So I have to admit that I have been really looking forward to the day that I would get to be a participant in the 80-meter foxhunt – from that first day Rick mentioned that he wanted to hide it! The perspective is a little different as a hunter than being the hunted and I admit it is difficult to not be in the position of knowing exactly what was going on, a luxury that the fox gets to experience.

As I was trying to figure out with whom I might want to hunt, I had a few requirements: One, the individual needed to have an HF rig in their vehicle. Receiver sensitivity and selectivity can be very important in these competitive operations. Second, I wanted to incorporate someone who was not part of existing teams – why break up a team or why not work towards introducing new hunters to the sport? Finally, the person had to be logical and not impulsive. All too often I allow too much emotion to enter my play so I needed someone to balance that. The best person for the job was Larry, KY5S. Larry and I have worked well together over the years and he is very disciplined in his actions so it was going to be a perfect match. It also helped that Larry was a steely-eyed VHF foxhunter from the 70's back in East Texas! I was also convinced that taking careful measurements and following the data would yield good results. Larry as an engineer and me as a scientist, looked like a pretty good combination to test my theory.

I had decided months ago that I wanted to build an antenna to resolve the ambiguity associated with the coax loops. There are a number of ways to accomplish this task but the one I was most familiar with was the terminated loop, more commonly referred to as the “K9AY loop”. I've used these antennas for years at my home for low band receive-only antennas and while the original version is 25 feet tall with a 30 foot horizontal footprint, I decided that it would be possible to scale this down to a portable version on a PVC frame about 8 feet tall and 6 feet wide (If you are interested in details of this antenna, I may do a future article – or just ask me about it!) I built the system and tested it and after a bit of optimization I felt like I had a workable system.

Hunt day arrived and Larry and I were readying the system at his truck in the parking lot of Acapulco's in Desoto. That really is a dreadful parking lot and with all the power lines, it makes for some confusion with the signal. That's ok, because Rick and Scott kicked off the beacon after finding a blown fuse on the transmitter and there it was - plenty of signal sitting on or about 3579.5 KHz! Larry was driving the antenna adjacent to the truck and we found the null began to present itself from east to southeast. We spent a few minutes taking measurements and adding attenuation and turning off the preamp and settle on what we believe is the proper heading from the location, about 120 degrees (sorta southeast). We verified this using the coaxial loop and the null agreed with our data.

Our goal was to get perpendicular to this 120-degree line but we did not want to box ourselves in and not have a good route back to I-35, which was likely going to be the main artery we would need to get to the final destination. I should point out that the other two teams left 5-10 minutes earlier...That had a psychological impact for sure!

We decided to head to a school at Ovilla Road and Hampton. Actually we didn't know there was a school there until we got there but it looked like a good place to take a reading. I made the mistake of putting the coax loop into the bed of the truck with the K9AY loop so we were flying on autopilot up until getting to the school to take a measurement. The coax loop was kinda pointing south-southeast. Plotting the value actually put a crossing point near Mountain Creek Lake, north of I-20. I was starting to doubt our data and antenna. Larry said that we should setup the K9AY loop and have a look. Sure enough, the beacon was just south of east meaning that the original heading we took in the parking lot of Acapulco's was sorta right – it was at least the right general direction – but the heading was off pretty significantly. I guess this is why we make the first one the free-bee. Anyway, had we not had the K9AY loop, we would have taking a much longer path and wasted a lot of time checking out the original data crossing point which, at this point, was clearly an outlier in our dataset. We headed a little further south and at 287 we took a coaxial loop measurement in the truck and found a good crossing point with the previous measurement. The crossing point was on Becky Lane in a residential area just east of 77 and west of Rocket. We were in business! Psychologically you are

wondering how everyone else was doing and its tough to put the others out of your mind.

The signal continued to get louder although not much stronger on the S-meter – it was obvious we were close. We got off into farm country and found a private lake adjacent to the Charter Cable facility just west of Rocket. We took our third and final reading from this location and the data suggested that Rick and Scott were somewhere on the other side of the lake. The hardest part was finding roads into and out of the various areas. This is fairly rural country and roads have a tendency to snake around rather than traveling on the compass rose. We committed further, pulling off to allow traffic to get by and take the right fork at the Rocket water tower. Just past that, we see a white truck sitting on a paved surface in a cornfield. Yes, Rick and Scott had been banished to the cornfield. Larry makes a B-line for them truck and we are informed that we are the first to the fox in about 24 miles, 3 measurements and around 1 hour (I forget exactly how long). Rick makes sure that Larry takes the tag since I have a history of making mistakes with that – OOPS!

One funny exchange was when Texan Bill calls me on .06 to see if we had found it. I played it off like we were still hunting, even passing the mic off to Rick who was standing there at Larry's truck and acting as if he and Scott were still waiting to be found. Someone commented on some social engineering I had done earlier in the hunt when I signed my call on the .06 saying something like "Hi Rick!" Apparently everyone thought we had found it from that, even Rick who was searching for us with his binoculars. It was fun and we shortly thereafter headed back to the restaurant to drop me off.

So what did we learn? Generally speaking, our theory about taking careful data and following it is valid. When we took crossing points, our data put us about 1-2 miles east of the actual location. The final heading was right in line with their location. I think the most difficult part is trying to resolve minute differences in audio and signal level. Another interesting fact was that the actual location was exactly in the middle of the first measurement at the restaurant parking lot and the second heading that we were calling the first real heading. We split the difference. Larry and I were pretty careful with our measurements and I can wholeheartedly say that the Acapulco's parking lot is a really bad place to make measurements. Take the free measurement but don't read too much into it. Go take another one a few miles away in a better location.

This was a great time and I appreciate Rick and Scott for picking a great location in area we have not hunted before and their willingness to be out in sun - the weather was great and it was only 92 when I got home around noon! Also thanks to Larry for keeping me grounded and being patient, taking measurements at true logical points that were perpendicular to the previous headings. This is such an important thing in fox hunting!

I can't wait until next time! If I were stranded in the woods, I would not be at all concerned about whether or not someone would find me with the hunters we have developed from our group.

73,

John KB5NJD...

The Way we were by the Crusty OM.



Article 2 – Where to buy, Part 1.



First off, if you think this will be an advice column, wrong! “Were” is past tense. I was talking to a buddy about ham stores in the Metromess. I decided to compile a list of stores and even a few pictures. Pictures are from Google Maps, street view. I didn’t run around taking snapshots.

The DFW Metromess is the 4th largest Metropolitan Statistical Area in the US with an 6.3 million people in the area in the 12 county area. In the same 12 counties there are 15,240 licensed hams in that same area. You would think we could support more than one store in this area. However, with out of state purchases being tax free, some out of state stores giving free shipping, and the price of gas. I don’t need that radio this week, I can wait till the next shipment.

There have been many ham stores come and go in the 41 years I have hammed in the Metromess. Two were here before me. Now there is just one solid store here. What has happened in those 41 years. I’m about to tell you.

Before I get started, I need to talk about the classification of ham stores. They basically fall into one of three categories. I’ll use the following codes in this article for the different types.

Stand Alone: (SA) – Just what is sounds like. Complete ham stores that exist on their own.

Owned and Operated: (OO) – These are store fronts that are owned and operated by another organization. They all have their own store fronts and staff.

Electronics Outlet: (EO) This is a place that sells Amateur Radio equipment as well as other electronic stuff.

This single article got to be too long for one month. This month I am going to talk about stores that made an impact on the Metromess. Next month I’ll talk about the also rans.



Electronic Center Inc. Dallas (SA, OO)

This is the granddad of all the stores in the Metroplex. I believe it started in the mid 50’s but do not hold me to that. It was a well established SA store on Haskell just west of Central Expressway in 71 when I got into hamming. Very nice store. ECI started the first Saturday swap meet long before I knew of Ham Radio.

I came back from college in 1979 and decided to sell my HW-101 at the first Saturday. 7 The store was still on Haskell that summer. Sometime later it became an OO underneath Wholesale Electronic Supply at the corner of Central and Ross. It started out the width of the basement, was cut to 1/3 that width and finally went under. In their heyday on Ross, it was one stop shopping on the first Saturday. New stuff at ECI in the basement; parts at Wholesale Electronics on the first floor, and a large flea market out front. If you wanted a kit to build, you could walk next door to Heath (see below) Now days the building is a church. If you look carefully between the golf cart and the truck you’ll see the handrails going down to ECI’s basement.

Ed Juge, Fort Worth (SA)

Ed Juge was the ham store for Fort Worth. Located on S. Freeway south of Ramey, It was a rather large place. Saw SSTV there, had a nice wall of used equipment. I bought a couple of rocks (crystals) there for my novice transmitter. Really nice store. Not sure when it closed up. After '74 as I used their repair shop then. A few years later Ed became a VP at Tandy / Radio shack. I think he went on to be the CEO. Last time I went by the building it's still a missionary organization that it has been for years. Ed has been SK for a couple of years now.

Heathkit, Dallas (EO)



Next door to Wholesale Electronics and eventually ECI sat Heathkit. What can I say about Heathkit stores? They were the paradise for electronic hobbyists. I think neighborhood blight brought them down. No picture as it's now concrete. I believe they moved to North Dallas for a while and, like Heath, now a distant memory.

AGL electronics (SA) Richardson

AGL was a startup of some local hams. Their original location was in Keystone Park near Central and LBJ. They moved to a better location, I thought on Forest lane, Nice people, nice store. I wrote one of the workers I new had worked at AGL. I remembered Mike's name, but not the store name. It appears that AGL is still in business. Another owner, K5XG (and that is the correct call, he isn't one of the SWDCARC members) has started the store back up. Mike tells me he is mainly doing tower work. The web site is www.aglhamstore.com

Hardin's (OO) - East Fort Worth

The Jefferson Street store was the second worse location to put a ham store. Hardin's takes that honor of being the worse. If Hardin's was a SA, they would not have lasted a month. The store was located just west of east I-820 on Rosedale, NOT an ideal place to have a ham store. The outlet was rather small and cramped, but they were able to stick around for many years. Hardin's main line of business was sound systems, the ham store was a labor of love. They tried to duplicate a flea market on the third Saturday of the month, but I doubt they ever got more than about 20 sellers.

Hardin's also sold computers http://www.hardincomputer.com/Hardin_Computer/Home.html, They are doing well it seems. They are now in Arlington Highlands, much better than Rosedale.

Tuckers (OO) Garland, 1990's --



Many reading this will talk of Tucker's on Reserve Street. The company is still in business selling test equipment. Their forte, according to NJD, and the internet. This was probably my second favorite store I ever visited. They had a great museum of old ham radio equipment including most of the Heathkit gear. Real shame when the store went under.

Honorable mention - Madison's (SA) – Houston

In Spring, 79 I went to a computer convention in Houston. After the convention my buddy and I went to Madison's. This is got to be the best store I was ever in. Two floors of ham stuff, the second floor had a station set up where you could actually operate. Not sure what happened as I had little contact with the store. In the 70's Madison was as good as it got. I fondly remember the visit to that store.

That was a list of the top six ham stores in the Metromess. Some are asking, "Isn't Texas Towers a major player?" Of course they ARE! But this column is "*The Way We Were....*", not "*Are*" TT is alive and well, therefore doesn't qualify for this article.

Now I need some emery paper to depict the contacts on the J-38 key.

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http://en.wikipedia.org/wiki/Table_of_United_States_Metropolitan_Statistical_Areas consisting of the counties of Collin , Dallas , Delta , Denton , Ellis , Hunt , Johnson , Kaufman , Palo Pinto , Parker , Rockwall , Tarrant , Wise Co

FCC database download from 20 July, 2012.

Mike Roden, K5JR

Financial Report ... August 2012



August-12	Income	Expense	Balance	Petty Cash
General Fund				
Beginning Balance 8/1/12			\$2,063.46	
INCOME/EXPENSE				
Dues Income-2012	\$37.50			
ARRL Renewal Income-2012	\$39.00			
Micro Keyer payments	\$176.00			
Transfer From Matl. Property				
Transfer Petty Cash income				
TOTAL INCOME	\$252.50			
EXPENSES				
Chk. 2012 Ham-Gadgets		\$204.65		
Liability Insurance Ck 2014		\$320.00		
TOTAL EXPENSES		\$524.65		
TOTAL INCOME/EXPENSE	\$252.50	\$524.65		
Ending Balance 8/31/2012			\$1,791.31	
Special Events Fund				
Beginning Balance 8/1/12			\$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 8/31/2012			\$125.14	
Material Property Fund				
Beginning Balance 8/1/12			\$1,755.69	
INCOME/EXPENSE				
Dues Income-2012	\$37.50			
Transfer from General Fund				
TOTAL INCOME	\$37.50			
EXPENSES				
Telephone Pymt. 16August		\$39.55		
Transfer to General Fund				
TOTAL EXPENSES		\$39.55		
TOTAL INCOME/EXPENSE	\$37.50	\$39.55		
Ending Balance 8/31/2012			\$1,753.64	
August Balance	\$290.00	\$564.20	\$3,670.09	

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 ... August 7, 2012



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

Invocation was given by Bill, N5TXN.

Executive Board members present: Scott, KE5NLK, Rick, KJ5UY, Paul, KD5IVP, Lester, K5ITO and Jerry, KB6OJE.

Club members present: Johnny, KJ5LB, Bill, N5TXN, & John, KB5NJD.

Minutes: Motion to approve by Rick, KJ5UY; Motion 2nd by Paul, KD5IVP. Motion passed.

Treasure Report Motion to approve by Rick, KJ5UY; Motion 2nd by Lester, K5ITO. Motion passed.

COMMITTEE REPORTS

Repeater: Getting hot and the repeater is up and down – repair people have been notified.

VE Session: One took the Tech test and passed.

EOC: DeSoto Fire Chief retired.

Membership: No new ones this month.

Net: There were 3 check-ins last night before the repeater went down.

Web: Up and running. Let Bruce know if want anything on it.

Groundwire: On the web...Had some very good articles.

OLD BUSINESS

1. 80m Fox Hunt: The next one is scheduled for August 11th. Rick, KJ5UY and Scott, KE5NLK will hide the Fox. Time for the hunt will be 8:30 to 11:30 am. Start will be at the Acapulco Restaurant in DeSoto. Frequency is 3.580 with same boundaries as in July.

Keyer Kits: Building as a program at a future meeting if there is enough interest. Mike, K5MMH, is ready to order, so contact him if want one and haven't let him know yet.

NEW BUSINESS

1. ARRL: Club can received a commission if each new member who joins the club joins ARRL through the SWDCARC, also, when current members renew their membership in ARRL. All they need to do is pay the club and the club consolidates the orders and sends to ARRL. SWDCARC gets to keep \$15 of the new persons dues and \$2 on a renewing persons dues to ARRL.

2. Beacons on 472-479k are being built by John, KB5NND, and he would like to put one on the air using the Club radio box.

PROGRAM: WinLink presented by Larry, KY5S.

Motion to Adjourn was made by Paul, KD5IVP at 7:20 pm.

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

Invocation was given by Bill, N5TXN.

Minutes: Motion: Rick, KJ5UY; 2nd by Paul, KD5IVP. Approved? Yes

Treasure Report: Motion: Rick, KJ5UY; 2nd by Paul, KD5IVP. Approved? Yes

Guests: David, N6WII, Herbert K, William, KB8AZD and K5RBT.

COMMITTEE REPORTS

Repeater: 2m repeated operational. 440 repeated id disconnected at present. Parts on hand to repair and Floyd, KC5QBC, to reprogram it.

VE Session: 1 took test last month and passed the Tech exam, also one to take test tonight and passed.

EOC: Nothing new to report. DeSoto Fire Chief retired and new candidates for Fire Chief being interviewed.

Membership: One application received in mail today with out a check from KD8AZD.

Net: Had a good net last night with Rick, KJ5UY as net control, who asked for a change in the way an operator checked in to the net. Needed to listen to the way to insure you checked in in the proper order.

Web: It is up and running..

Groundwire: It is another good one this month, with excellent articles.

OLD BUSINESS

80m Fox Hunt – Rick, KJ5UY, assisted by Scott, KE5NLK, hid the fox and John, KB5NJD and Larry, KY5S, were the first to find it, followed by Lester, K5ITO, Harold, KF5LDG and Jerry, KB6OJE, were second, followed by Bill, N5TXN, Whitney, Barry, K1BSM, and Colt Thomas.

Keyer Kits: Mike, K5MMH, bought 8 of the keyer kits based on 7 members requesting them. If you want the other one, see Mike or send him an e-mail. He plans to assemble them after a meeting, probably next month.

NEW BUSINESS

1. JOTA: The 3rd Saturday in October is the date of this years Jamboree On The Air. The club has received a request from a Cub Scout Pack to set up at their location and give the Cub Scouts an opportunity to talk on the radio during this event.

2. Tech Class: Ben, K5NEB, will be presenting another Technician Class license class on 13, 22 & 27 September at the Grand Prairie Dog Pound Adoption Center. If interested, contact Ben ASAP as class is almost full.

3. General Class: Ben, K5NEB, is trying to get a General Class license class ready for 4, 18 & 25 October. If you are interested, contact Ben, K5NEB.

4. ARRL: John, KB5NJD, requested that new hams who want to join ARRL do so through SWDCARC as the club gets to keep \$15 of the ARRL dues, and for renewing your ARRL membership, if done though SWDCARC, the club gets to keep \$2. It is just another way of helping SWDCARC raise some money for our Treasury and it doesn't cost you any more money.

Presentation: Larry, KY5S, presented Winlink 2000, Amateur radio messaging system.

ADJOURN: Motion by Rick, KJ5UY