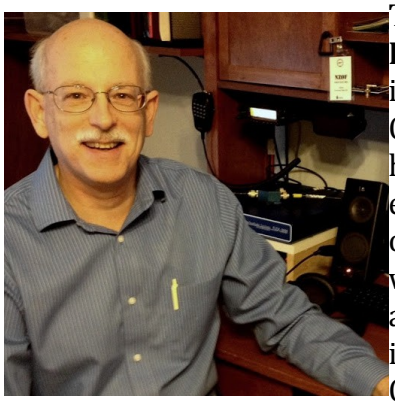
JOHNSON COUNTY RADIO AMATEURS CLUB, INC.
P.O. Box 93
Shawnee Mission, KS 66201

FEEDBACK

JUNE 2015

Spring Automotive Foxhunt Results

A Practical Guide to the Automotive Foxhunt -- Herb Fiddick, NZØF



The "fox" for May 8, 2015 hunt was **Bill Gery, KA2FNK**, who was located in Stoll Park, near 119th and Quivira in Overland Park. As with past JCRAC fox hunts, the signal we were hunting was emitting a short APRS packet about once a minute. Of course, the signal was not on the normal APRS frequency and while it included the necessary identification of KA2FNK, the GPS Coordinates had been entered manually and did not correspond to his actual location. There were about 7 teams participating in the May foxhunt. All but one of those teams started at the normal JCRAC meeting location at 75th and Conser in Overland Park. **John Morse, NØEI,** and I were the first team to find the fox this time.

Fox Hunting Techniques

As most hams know, there are several different methods and technologies that can be employed to find a hidden transmitter. The signal emission used for this particular fox hunt, however, creates some challenges for some of those methods. Directional antennas can be used, but because the signal emitted by the fox is short in duration, getting an accurate compass bearing on the signal is difficult. Switched antenna array, time-difference-of-arrival technologies can be used, but the short emission and the fact that it is fully modulated (not a dead carrier) make these technologies challenging also.

All of these technologies can and do work, but require practice and experience. Also, different technologies may work more or less well, depending on the type of "fox" one is hunting.

For the fox we were hunting in May, I have found the low-technology signal strength method taught to me a few years ago by **Don Warkentien, WØDEW** to be most reliable. I will admit that it's part art and part technology, but it can work really well once you understand the principals and get some experience with it.

The basic principal should be well understood by all hams - the closer you get to a transmitter, the stronger the received signal will

be. With that in mind, the basic technology is to arm yourself with something that tells you when you are getting closer. We all have the necessary technology--it's called a transceiver.

see FOXHUNT on page 10

JUNE MEETINGS

***June 12** – Do's and Don'ts of a New Repeater - Bill Brinker, WAØCBW*

***June 26** – Field Day*

The Johnson County Radio Amateurs Club normally meets on the 2nd and 4th Fridays of each month at 7:30 PM at the Overland Park Christian Church (north entrance), 7600 West 75th Street (75th and Conser), west of the Fire Station.

Much of the membership travels to the Pizza Shoppe at 8915 Santa Fe Drive for pizza buffet and an informal continuation/criticism/clarification of the topics raised at the meeting ... or anything else.

Leave the church, turn right (west) on 75th. Turn left (south) on Antioch. Turn right (west) on Santa Fe. Pizza Shoppe is just past the Sonic on your left.

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A publication of the
Johnson County Radio Amateur Club, Inc.

Bill Gery, KA2FNK, President

Aaron Boots, AAØRN, Vice President

Ted Knapp, NØTEK, Secretary

Cal Lewandowski, KCØCL,Treasurer

* * *

Chip ACØYF and Deb KDØRYE Buckner, Editors

All email addresses are available at w0erh.org

Terrific People Make a Great Club

Our cover story began with a brief email.

Herb, I hear you won the foxhunt. If you have a chance, would you tell me where the fox was, what equipment you used, who was in the car and whether there was a turning point or incident that led to your victory?

The result is **Herb Fiddick's, NZØF**, otherwise unsolicited front page primer on automotive foxhunts.

Tom Wheeler, NØGSG, takes us through another troubleshooting exercise that encourages those of us who sometimes struggle with Ohm's law the sense that maybe we do have the capacity to diagnose and remedy equipment failure.

And then **Jaimie Charlton, ADØAB,** takes Hambone on his own troubleshooting odyssey which, he explains, is a true story, except that the names have been changed "for the hell of it". Incidentally, Jaimie has already submitted an Hambone installment for the July FEEDBACK.

Terrific people willing to share their expertise makes for a great club. We have a great club.

-- Chip and Deb

PRESIDENT'S CORNER

Field Day 2015 is June 27 and 28. We will be returning to the observation tower at the Shawnee Mission Park, which has proven to be a great location. Jay and the station team leads have been working hard to pull everything together. Setup will begin Friday afternoon and should be finished by the start of the club's meeting. Yes, the Club's second meeting of he month will be at the field day site. A few of members are needed to stay overnight Friday. In past years Friday evening has been a lot of fun with all the equipment in place permitting test runs.

The site has given us very good public exposure. While lnot active at one of the stations, please act as tour guides to our visitors. You may spark someone interest in getting a license. Speaking of licenses, Norma will be present conducting testing Saturday until 3 pm.

Talk to your neighbor, coworker, friend or youth group and extend a invitation to visit the site. There will a "Get on the Air" Station set up if they would like to make some contacts.

– Bill Gery – WA2FNK

"Alien" Bests All Comers in JCRAC VHF Shootout

Bill McMillan, NØYUD, and his "Alien Reflector Quarter Wave Ground Plane Antenna" topped the JCRAC field at the club's first VHF shootout on April 17.

Organizer **Lon Martin, KØWJ**, credited **Tom Wheeler, NØGSG**, with the idea to normalize results to level the playing field. Wheeler compared each HT's output to a standard one-watt to establish a decibel handicap for each contestant. Contestants then affixed their antennas. The received signal, when adjusted by the handicap, demonstrated the antenna gain or loss.

Martin observed that everyone laughed while McMillan was testing, again when McMillan won, and then once again, as people started speculating as to what kind of crazy solution it would take to best McMillan next year.

Finishing behind McMillan were **John Hochscheid, WØBBQ** (a Bill Brinker Close Coupled Maple Antenna), **Doug Tombaugh, N3PDT** (standard duck with a 19" counterpoise, **Aaron Boots, AAØRN** (Smiley 5/8) and **Jaimie Charlton, ADØAB** (coat hangar ground plane), of which only Boots' was a commercially produced solution. The complete results are available on the club website, www.w0erh.org.

Several JCRAC members tested multiple antennas, typically the "standard duck" supplied with the radio and an aftermarket design. In many cases the improvement was small enough that Martin concluded that radio manufacturers were making an extra effort to equip their radios with an with an antenna that both performs well and fits in the retail box.

In several instances, however, a competitor discovered that his commercial aftermarket solution performed less well than the factory-issued duck, demonstrating that an antenna's price was not necessarily indicative of performance.

JCRAC FIELD DAY

JCRAC will hold its Field Day activities near the Observation Tower in Shawnee Mission Park. Set up begins Friday afternoon, June 26. The Friday night club meeting will be held on-site.

Club members and guests are welcome to stay after the meeting to observe or operate the club's well-equipped CW, phone and digital stations, assisted, as necessary, by experienced hams.

Field Day itself is an exercise in outdoor emergency operations. Field Day stations around the country, continent and world, will be contacting one another for 24 hours beginning at 18:00 UTC (which will be 13:00 local) Saturday.

The club gets extra "credit" for contacts made by new (licensed less than one year) and unlicensed operators. **New hams and ham wannabees are, therefore, needed and wanted.**

Club members will receive an electronic invitation (please RSVP) to join the Club for dinner Saturday evening.

87th Street Parkway west to Ridgeview Road north and left at the "Y". Look ahead to the left.

JCRAC Re-Elects Club Officers

President Bill Gery called for nominations from the floor. He entertained a motion and second to re-elect an officer. The discussion consisted of two questions from the floor. "Are there any officers who don't want to serve again?" and "Is there anyone else who wants to be elected?" With that the initial motion was forgotten and an unofficial substitute motion asking that the current slate of officers be elected by acclamation was seconded and boisterously approved.

Accordingly, the club has re-elected **Bill Gery, KA2FNK**, President; **Aaron Boots, AAØRN**, Vice President; **Ted Knapp, NØTEK,** Secretary; and **Cal Lewandowski, KCØCL,** Treasurer.

Johnson County Radio Amateurs Club - May 8, 2015 Meeting Minutes
Fox Hunt. No meeting.

JUNE CALENDAR

SUN	MON-TUE-WED-THU	FRIDAY	SATURDAY
7 Tour de Cure - Wheel to Weston Steve Rainey, WD0DPB - wd0dpb@gmail.com (913) 829-6438 Joel's Ride www.beth-torah.org/social_justice/joels_ride_wheels_for_meals.aspx Noah Dunker, KD0NRC	8 - 9 -10 - 11	12 @18:00 Community Emergency Response Team (CERT) Training -- Raytown PD Station-10000 E. 59 St. -- Melanie Lanigan 816-737-6022 laniganm@raytownpolice.org	13 @9:00 W5YI Testing Independence EOC 950 N Spring Street Norma Libby, WØKC – (816)353-8408 (816) 536-0469) normalibby@sbcglobal.net @08:00 - Independence Emergency Preparedness Festival 8am - Behind LDS Stake Center, 705 W. Walnut St. -- Thomas Wheeler, AC0SK <twheeler64@gmail.com> HamClass.org (Part 1) American Red Cross Midtown www.hamclass.org @08:00 Community Emergency Response Team (CERT) Training -- Raytown FD Station 1-6020 Raytown Trafficway -- Melanie Lanigan 816-737-6022 laniganm@raytownpolice.org
14 @06:00 Ride The Fountains Bike Ride - (Country Club Plaza, KCMO) -- Brian Short, KC0BS – 913-638-7373 kc0bs@arrl.net	15 - 16 - 17- 18 16 @ 19:00 VE Testing - Raytown ARC -- Community of Christ -- 63rd and Manning Steve Lufcy, K0OU - 816-353-6705 - k0ou@comcast.net	19	20 @ 09:00 VE Testing -- Johnson Co. Library, 151st & Antioch -- Jim Lee, N0KCB - 913-745-5121 - jimlee@kc.rr.com HamClass.org (Part 2) American Red Cross Midtown www.hamclass.org
21 Jun 21 - Kansas City Corporate Challenge, Du/triatholn Shawnee Mission Park - 5:30 a.m. Mike Bellinger, K0UAA - 816-363-1118 - <mbbelling@aol.com>	22 - 23 - 24 - 25	26	27 ARRL FIELD DAY
28 ARRL FIELD DAY	29 - 30 - July 1 - 2	3	4

Johnson County Radio Amateurs Club - May 22, 2015 Meeting Minutes

Meeting Date: Friday May 22, 2015. The meeting Started at 7:30PM.

Attendance: Self introduction with name and call sign. 30 signed the check in sheet. This was followed by the Pledge of Allegiance.

The Minutes from the April 24, 2015 meeting were accepted unanimously.

The Treasurer's report, as follows, was read and accepted unanimously.

Cash on Hand	$ 147.00
Checking Account	$ 387.95
Savings Account	$ 9,386.26
Total	$ 9,921.21
Repeater Operating Reserve	$ 810.87
Memorial Fund	$ 310.00
Active Members	136

Old Business:

- Repeater Update – All are working well.
- Field Day 2015 – In order to get an accurate count for Dinner on Saturday night, a Sign Up Genius form has been created. Please RSVP with your name and total number coming. A $2 donation will be collected at Dinner in order to help defray the cost.
- We are currently looking for volunteer Ensor Tour Guides. On Line Sign-up is available through Sign-Up-Genius. The link can be found on the Club's website.
- With Regards to Ensor, Rob Underwood, K0RU would like to see the Ensor Museum Promoted more in order to attract more visitors. A discussion followed which included contacting "The Best Times" magazine, setting up a display at Field Day and getting information onto the county's website and publications.

New Business:

- Annual Elections were held. A nomination was made to retain the current slate of elected officers. After a short discussion a motion was made to nominate the current slate of elected officers. This motion received a second. A vote was taken and all nominated positions received unanimous approval.
- JCRAC Elected Officers are: Bill Gery KA2FNK – President, Aaron Boots, AA0RN – Vice President, Cal Lewandowski – KC0CL, and Ted Knapp N0TEK – Secretary. Elected officers will take office on August 1.

Reports:

- 6 m – None.
- 10 m SSB Roundtable – 4 Participated on May 21.
- 440 Wheat Shocker net – 18 check-ins on May 20 and 120 check-ins on May 13.
- 2m Wheat Shocker net – 23 check-ins on May 21 and 22 check-ins on May 14.
- HF Activity – Finland on 15m CW, Moscow on 2m, Hungary and Northern Ireland on 17m, Italy on 20m Mobile.

Announcements:

- Hamclass June 13 and 20.
- Lonestar Bike Ride May 31.
- A big Thank You from Jay Burgherr, N0FB for all the help with Tour de Bier Bike Event.
- Watch Larry's List for upcoming events.

Business meeting adjourned at 7:53 PM

Program:

The Program for this meeting was a planning session for Field Day 2015.

Preventing Failure in the Baofeng UV5R Charger - *Tom Wheeler, NØGSG*

The Baofeng UV5R is the "little radio that can." It's certainly popular (being dirt-cheap doesn't hurt), but the charger base on this model tends to fail. How do I know? Well, I'm on charger base number three!

When the first base failed, I figured it was a fluke; no worries, I had a spare and put it into service. A year later, the number two base failed. Spooky!

A quick Internet search revealed ... nothing, except for a ham or two describing a "very hot chip" inside the base, and wondering if the unit could double as a cigarette lighter.

Inside the base, there's a single IC chip that does most of the work. Figure 1 shows the "typical application circuit" of the proprietary Suncore SC6038 IC that's used in the base. This IC seems to be unavailable through normal electronic supply companies.

Why does the IC get so hot? Well, it's probably because the Baofeng engineers asked it to dissipate more than a watt with no heatsink. Yes, it's yet another Chinese circuit that's designed to fail!

In the UV5R charger, the value of R_{SET} is 0.5 ohms. This programs the battery charging current to:

$$I_{CHG} = \frac{200mV}{R_{SET}} = \frac{200mV}{0.5\Omega} = \underline{\underline{400mA}}$$

The value 200 mV is from the Suncore SC6038 datasheet and represents an internal reference voltage on the chip.

The IC's power dissipation is therefore:

$P_D = I \times [V_{OUT} - V_{IN}] = 0.4A \times [10V - 7V] = \underline{1.2W}$

We know the value of 0.4A from the value of R_{SET}, and we know the input and output voltages of the chip because the DC power "wall wart" supplies 10 volts, and the worst-case discharged lithium battery pack

Typical Application Circuit

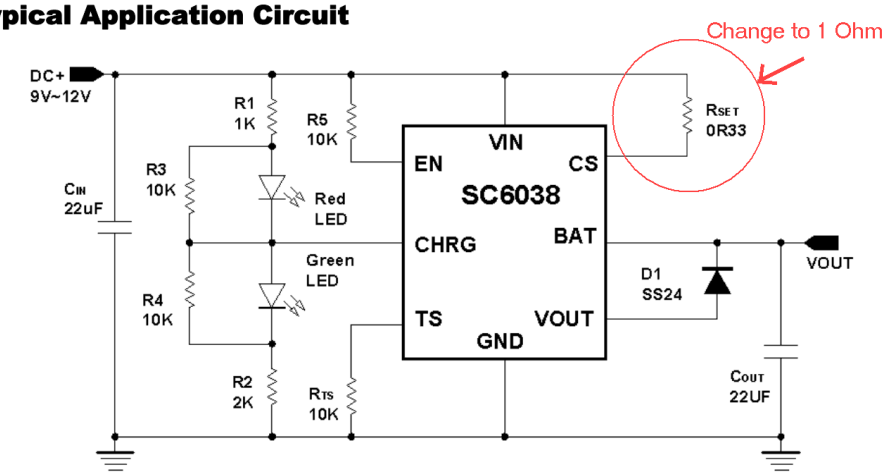

Figure 1: SC6038 Application Circuit

voltage will be in the neighborhood of 7 volts.

This is quite a bit of power for small chip on a board without a heatsink, as shown below. Eventually most of these chargers will die, especially if they're used to replenish batteries that have been deeply discharged. It's just a matter of time.

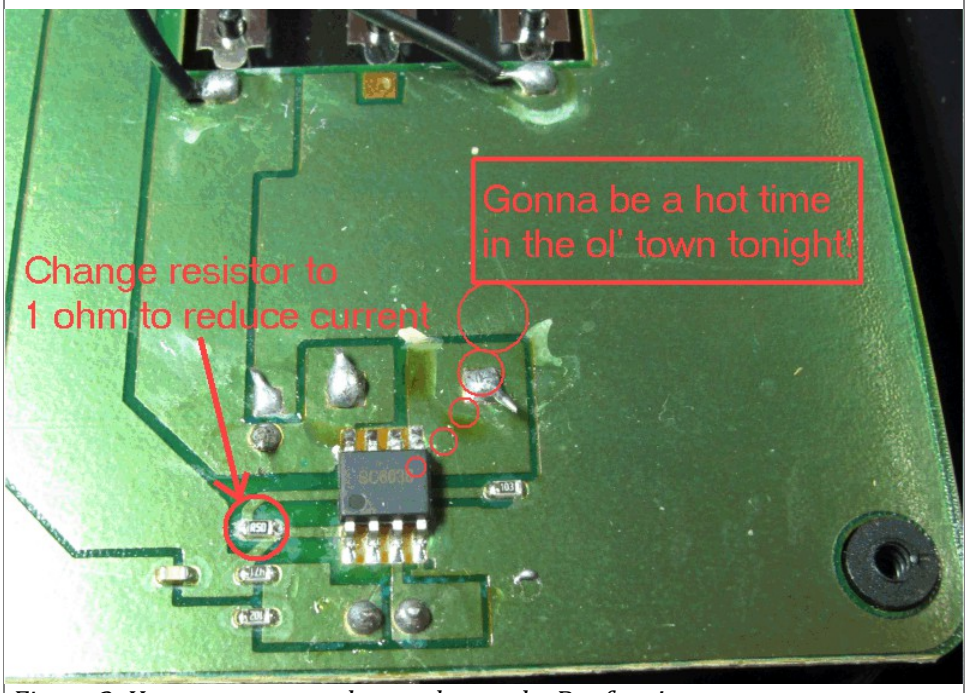

Figure 2: Your own personal space heater by Baofeng!

The fix to this problem is very simple. Simply replace the 0.5 ohm resistor, circled on the circuit board of Figure 2, with a 1 ohm unit. This will reduce the charge current to 200 mA, and drop the IC power dissipation in half (about 600 mW maximum).

After you've completed this modification, your radio will take twice as long to charge as before (probably around ten hours), but the charger should last a lot longer!

-- JCRAC FEEDBACK --

Hambone Fixes an Old Transmitter - Jaimie Charlton, ADØAB

Our story begins in the pre-dawn hours one morning with Hambone quietly knocking on the door of his Uncle Elmer's house. In his other hand, Hambone is carrying a large plastic bag with something bulky in it.

"Come on, Uncle. Open up before Dude sees me. Come on, come on."

A sleepy Uncle Elmer eventually opens the door.

"Hambone, What are you doing here so early? It's still dark out and the coffee pot hasn't even turned itself on."

"Shhhh," said Hambone as he stepped into his uncle's house and quickly closed the door. "I don't want Dude to see me."

"So, what's the big kerfuffle between you and your brother now?"

"It's like this," explained Hambone. "Dude and I were talking to this ham-friend of his who bought this old transmitter at the hamfest. It's a Drake T4xb and the schematic came with it. Anyway, Dude's friend applied power and turned it on, but it didn't work."

"That's not unusual for a hamfest find," added Elmer.

"Yeah. So, he asked Dude to take a look at it and find the problem. Dude said he didn't know much about old tube transmitters and didn't think he could help.

The guy said he's been 'working' on it for about five months. He said he's tried everything. But I think that amounted to his wringing his hands and dancing around it wearing nothing but an aluminum foil beanie."

"Please Hambone, don't underestimate the power of the aluminum beanie. I have one right over there."

Ignoring his uncle, Hambone continued, "Well, I got thinking that an old tube radio can't be very complicated. Just change the tubes, tighten any loose wires and it oughta work. The guy even threw in a complete set of tubes.

So, I said that I would fix it even if Dude can't. That was a mistake," confessed Hambone.

"I took it home and fired it up on a dummy load and tuned my receiver to its frequency. It transmitted, but made an awful buzzing noise. I turned all the knobs, but nothing got rid of the buzzing. Finally, I pulled the chassis out of the cabinet, tightened all the screws and replaced all the tubes. But it still didn't work. That's why I brought it to you, it's in this bag."

At this point Hambone dumped the contents of his black plastic bag onto Elmer's bench.

The chassis was still out of the case and there were plenty of extra tubes--some unrelated to the transmitter.

"I got thinking," Hambone continued.

"There you go, thinking again. That's always dangerous," Elmer interjected.

"I got thinking that maybe this radio never worked. Back then they didn't know much about radio. There might be flaws in the design or some really strange old parts. I thought you could hook up all your test gear to see what really is the problem. I thought we could use your digital oscilloscope along with an RF generator and an audio oscillator and a vector voltmeter to analyze this transmitter," added Hambone gaining confidence.

"We could do that," mused Elmer. "But why don't we take a look at it first."

With that, Elmer hooked the transmitter to a dummy load, tuned a receiver to its frequency and turned it on. After a few seconds, the tubes all began to glow. He keyed the transmitter and a loud buzz blasted through his receiver.

"Dude's friend is right, there is a problem," observed Hambone.

"The first thing to notice," Elmer commented as he looked over the radio, "is that all the tubes are glowing and the pilot lamps are lit. That's a good sign. Now let's make a voltage measurement or two. The schematic shows we should have about 250 volts on pin 11 and 650 volts on pin 10 of this power supply connector."

Setting his multimeter to DC volts, Elmer clipped one test lead to ground and poked the other onto the connector pins.

"Hmmm, the 250 volts looks okay, but there is only 450 volts where there should be 650. That's nowhere near enough."

"Dude's friend said he measured those voltages and saw that the 650 voltage was way down," added Hambone. "But since the

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from HAMBONE on page 7

buzz seems like an audio problem and the audio part runs off the 250 volt supply, he said he would look there first. Also, since the rig actually transmitted, that 650 was probably a misprint on the schematic and 450 was really the right voltage."

"Well, that was a big mistake. The first rule of troubleshooting is to fix the obvious problems first. The very low 650 volt supply is an obvious problem."

"Now we need to hook up some cool test equipment to find the lost voltage," suggested Hambone.

"Cool your jets, Hambone. Let's have a look at the power supply schematic, first."

"Oh man, that sure is complicated," moaned Hambone.

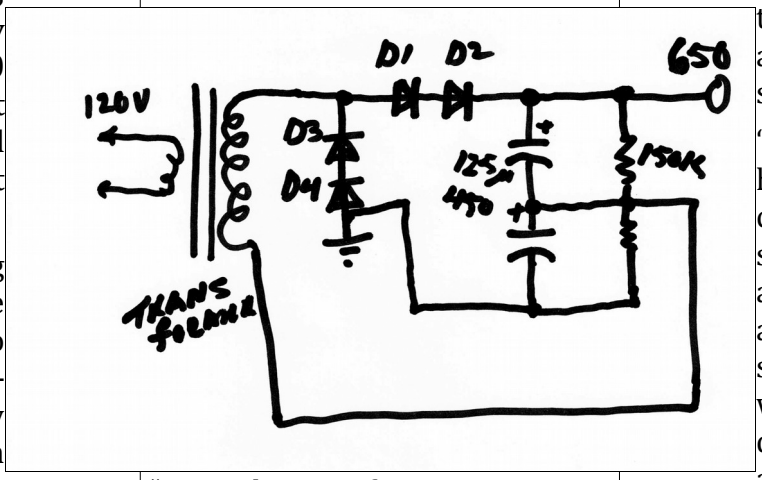
"It only looks complicated because there are really three power supplies all running off the same transformer. We are only interested in the 650 volt supply."

"But Elmer, that doesn't look like any rectifier I've ever seen."

"It isn't, Hambone. It's called a voltage doubler and was very popular back in the old days, although I don't know why. It may have been cheaper to use this circuit than to put a higher voltage winding on the transformer. But the circuit is notorious for poor regulation. It's not used much in new equipment these days."

"Sorry, Elmer, I just don't see how that circuit doubles a voltage."

"Well, take a look here. This is just the 650 volt part of the power supply." Elmer quickly sketched a circuit on his ever-present scratch pad.



"Since the transformer is running on 60 Hz AC, we know that the voltage on the secondary changes polarity 60 times per second. That's the secret to the voltage doubler action.

When the top wire of the transformer secondary is positive with respect to the bottom wire, diodes D1 and D2 conduct and charge the upper 125 microfarad electrolytic capacitor to the peak voltage of the transformer's secondary winding. While that is happening, diodes D3 and D4 are backward biased and don't do anything.

But, we don't have to wait but a tiny fraction of a second (one-half of a sixtieth of a second to be exact) and the polarity of the secondary voltage reverses making the bottom wire positive with respect to the top wire. When that happens, diodes D1 and D2 are reversed biased and block any current flow. This leaves the upper capacitor charged to the peak secondary voltage.

In the meantime, diodes D3 and D4 start conducting and charge the lower electrolytic capacitor to the peak of the secondary voltage. It seems weird, but the result is that the lower capacitor also charges to the peak secondary voltage."

"Okay, Elmer, I see we have the upper capacitor charged to the secondary peak voltage and the lower capacitor also charged to the same peak voltage. So, where does the voltage doubling come in?" asked Hambone.

"Take a look, it's already there. Our 650 volts is taken with respect to ground, not the transformer winding. That means we see the total voltage of the two capacitors in series, or double the voltage of either one by itself. Hence the name voltage doubler."

"That is very cool!" exclaimed Hambone. "But what do the resistors do?"

"They are there to equalize the voltage across the two capacitors and act as bleeders to discharge the capacitors when the transmitter turned off." They don't have anything to do with voltage doubling. Before you ask, D1 and D2 are in series as are D3 and D4 simply to increase the reverse blocking voltage of the pair. The fact that there are two diodes in each leg has nothing to do with the "doubling" function. In some higher voltage power supplies you will find three or four diodes in series in each leg."

see Hambone on page 9

from Hambone on page 8

"I knew that!"

"Good! Let's get on with the troubleshooting," added Elmer.

"We can see there are three possible trouble areas: the diodes, which may be open or shorted; the capacitors, which may be shorted or open or dried out, or the transformer, which may have shorted turns. Also, there may be something wrong with the transmitter that's causing it to draw too much current and loading down the power supply.

"We can tentatively rule out the transformer because, although it has been running for quite a while, it is not hot and the 250 volt power is correct. Shorted turns would make the transformer run very hot and cause all voltages to be low.

"We can also rule out a shorted diode pair."

"Why is that?" asked Hambone.

"Well, if either diode leg were shorted it would put AC on the capacitors and that would cause them to heat up, burst and discharge goop. I don't see any goop under the chassis.

"Of course, a diode could be open. That is, it doesn't conduct in either direction. But that is far less likely so we'll leave that test for later."

"Let's test the capacitors," said Hambone, reaching for the multimeter.

"Not so fast," said Elmer. "An ohmmeter is good for finding shorted capacitors, but it is not good for finding electrolytic capacitors that are open or have a high ESR or Equivalent Series Resistance. That occurs when capacitors, especially these old aluminum electrolytics, dry out. It makes them appear to have a large resistor in series with them. The large ESR effectively reduces the function of the capacitor.

There are capacitor testers that measure ESR, but an easier way to see if an electrolytic is good is simply to jumper a good capacitor in parallel with the doubtful component," added Elmer as he grabbed a big electrolytic capacitor and a couple of clip leads.

"Careful, Elmer," cautioned Hambone. "That capacitor is 250 microfarads at 450 volts. The schematic show the only 125 microfarads at 400 volts. Your unit is too big."

"Not to worry, Hambone. You can generally substitute one electrolytic for another as long as the voltage of the substitute is the same or higher than the original unit. It's also okay if the capacitance is higher, too," said Elmer as he connected the extra capacitor across the upper capacitor on the schematic.

"I don't believe it!" exclaimed Hambone. "The buzzing is completely gone!"

"We got lucky there," Elmer confessed. "The first one we tried was the bad one. Since I have several of these 250 microfarad capacitors, let's just disconnect the old part and wire this one in. While we are at it, we might as well replace the lower capacitor, too, because both capacitors have been under the same electrical stress and are the same age."

"Are you leaving the old capacitor in there?" Inquired Hambone.

"Why not? Taking that old can out would leave a hole in the chassis. Besides, these new caps are so much smaller that they easily fit underneath it. I'm going to completely disconnect the old part, though. It's old and might decide to short out."

Elmer quickly clipped out the connections to the original capacitor and re-wired them to the two new units. Elmer let Hambone put the transmitter back in its cabinet and check it out one more time.

"You see, Hambone, the key to good troubleshooting is to fully understand what exactly is going wrong. Then fix the obvious problems first. In this case, we were lucky that nothing else was wrong. Hooking up a lot of test instruments, randomly changing tubes and messing around seldom leads to a solution. We call that "shot-gunning the problem."

"Oh, I agree, Uncle. But it's still fun to play with all your test instruments."

--JCRAC FEEDBACK --

from FOXHUNT on page 1

The challenge is to detune the receiver in some manner so that you can discriminate between weaker and stronger signals using the built-in signal strength meter or by ear. If you receive signals from two different locations that are both full scale, how do you know which is closer?

Detuning a Receiver

There are at least three ways to effectively detune the receiver - modify the antenna to make it less efficient, add some attenuation to the connection between the antenna and receiver or just tune slightly off frequency from where the fox is located. I have had a lot of luck with a combination of the above.

Once I can hear the fox on its frequency, I start changing the receive frequency on my mobile radio until I can just barely copy the fox. Usually you can start by tuning 5KHz off frequency, either up or down, and then tune a little more off frequency once you start to get closer. This employs the bandpass filter in your radio as a signal attenuator. I also have a HT in my car with a short (around 1/2 to 3/4") piece of wire as an antenna.

Driving Around

Once you've got your radios set up, the only thing left to do is drive around until you start hearing stronger signals. Ideally, you should start in one direction and if the signal starts getting weaker, you know you're going the wrong way. Turn around and keep track of the signal strength as you drive. Ideally, it will rise and then start falling again. Keep track of where it was best. Your next step will be to start driving in a new direction, ideally 90-degrees either direction from your previous direction. The signal will either get stronger or

weaker and you will start to get a mental picture of a general area for the fox based on those observations.

Terrain Effects

Keep in mind that terrain and buildings can cause changes in signal strength, so don't rely solely on one reading to know whether your're getting closer or farther away - note the trends in the signal rather than an individual reading.

The May Fox Hunt

For the May fox hunt, John and I started out going West on 75th street. We weren't seeing much change in the signal (it was very weak), so we decided to go South on I-35. The signal got stronger as we proceeded South (or actually Southwest), so we knew we were generally headed in the right direction. We exited at 95th street due to traffic conditions and then had a choice to make - East or West? We chose West and the signal started to drop again, so we turned South on Lackman and started to get better readings. Lackman kind of ends at College Blvd, so we had another choice to make and proceeded East on College.

Local Knowledge

We started getting much stronger readings at that point and by the time we got to JCCC, we were starting to pick up the fox on the HT with the little wire antenna. This is the point at which the "art" kicks in and we started thinking about logical locations where Bill might be sitting. There were two obvious locations that came to mind--either somewhere on the campus of JCCC or in Stoll Park, immediately south of JCCC. We played a hunch and went to the park first and found Bill sitting out in the open in a parking lot.

Fox hunting can be good fun for hams and provides a good opportunity to get to know your equipment better. There are lots of ways to participate and, as with most activities, practice helps. Look for another fox hunting opportunity later this year.

-- JCRAC FEEDBACK --

Graphic courtesy of the Broken Arrow (OK) Amateur Radio Club, w5drz.org.

LOCAL MEETINGS AND FM NETS

	SUN	MON	TUE	WED	THU	FRI	SAT
AM	**0:00 Paul Revere 146.94- (88.5)**				11:00 Quarter Century Wireless Assn - RC's Restaurant, 135th & Wornall		07:00 - Santa Fe Trail ARC @ Perkins, Santa Fe E. of I-35, Olathe 09:00 - Ray/Clay ARC - Bargain Town (Hwy 10&13), Richmond, MO
18:00	**18:45 Miami County D4 ARES/Paola 147.360- (151.4)**	18:30 4th: KCDX Club @ Better Homes & Gardens Realty, 8101 College Blvd, #100 OPKS	**JoCo ARES Simplex 146.450**				
19:00	**Wheat State Net/Paola 147.360- (151.4)**	**145.47- (151.4) JoCo ECS** 1st: Clay Co ARC @ Liberty Hospital (Dialysis Ctr - Lower Level)	**JoCo ARES 145.29+ (151.4)** 2nd: Indep. FM ARC, St. Matt's UMC, 2415 R D Mize Rd., Indep, MO 3rd: Heart of Amer RC - Red Cross HQ, 211 W Armor, KCMO 3rd: Testing @ Community Christ, 63rd & Manning, Raytown	2nd: Douglas Co ARC @ Douglas Co Fairgrounds Bldg#1 2nd: Wheat State Wireless Assn @ Paola Fire Station	Jayhawk ARS 147.150+ (151.4) 1st: Pilot Knob ARC @ Leavenworth Co Courthouse - Emer. Op. Ctr.	3rd: Santa Fe Trail ARC Meeting and Fun Night @ Faith Technologies, 11086 Strang Line Rd, Lenexa	
19:30	**Swap and Shop 145.17- (151.4)** **Pilot Knob ARC 147.00- (151.4)**		**JoCo SATERN 145.13- ()**	**Clay Co ARC 146.79- (107.2)** **Pilot Knob ARC 147.00- (151.4)**	4th: Raytown ARC @ basement of Comm of Christ, 63rd & Manning, Raytown	2nd/4th: JCRAC "Regular Meeting" @ OP Christian Church, 7600 W 75th St. OPKS	
20:00	**Douglas Co ARES 146.76- (88.5)** **Raytown ARC 145.17- (151.4)** Clay Co ARC 147.33+ ()	**145.13- () KC Assoc of the Blind ARC** **147.375+ (156.7) Ray/Clay ARC**	**Southside ARC 147.12+ ()** **Santa Fe Trail ARC 147.24+ ()**	**Johnson Co RAC 443.725+ (151.4)**	**Johnson Co RAC 145.29+ (151.4)**	**VA Casual/Ham Roundtable 443.500+ (151.4)**	
20:30				**Jackson Co ARES Digital Training 146.97- ()**	Independence RACES 145.31- ()		
21:00	**Right Wing Wacko Net 146.97- ()**			**Swap and Shop 147.09+ ()**		2nd/4th: JCRAC "Annex Meeting" @ Pizza Shoppe, 8915 Santa Fe Dr., OPKS	

Local nets, meetings and testing sessions are posted as the FEEDBACK editor becomes aware of them.

A net is "local" if it can be heard on an attic VHF/UHF J-pole near I-435 and US69. Boldfaced type indicates that FEEDBACK heard the net. Plain type indicates that someone reported it to the FEEDBACK or referred to it on Larry's List, but the FEEDBACK has not confirmed its presence.

A meeting is local if the person who prepares the calendar thinks that it is local.