

# SPARKS

P.O. Box 342768 \* Memphis, Tennessee 38134-2768 \* Volume 22 \* June 2016



## Welcome to the Delta Amateur Radio Club

Visit our home on the web at: <http://www.deltaclub.org>

EMAIL: [darc4you@gmail.com](mailto:darc4you@gmail.com)

Facebook: <https://www.facebook.com/darcmem>

Newsletters; <http://www.deltaclub.org/sparks.html>

## W4BS

### REPEATER SYSTEM

146.820<sup>-107.2</sup> 147.360<sup>+107.2</sup>

146.625<sup>-107.2</sup> 443.200<sup>+107.2</sup>

224.420<sup>-107.2</sup>

**This month's meeting** begins at 7pm on June 14, 2016, at Ellendale Church of Christ, 7365 Highway 70 Memphis, TN (1 ½ miles north of Highway 64 (Stage Road)).

**In this month's program** we welcome Ken Johnson, KBOZTX. Licensed in 1995, Ken holds an Extra class license. He currently serves as the NW MS ARES District Emergency Coordinator and Marshall County ARES Emergency Coordinator. An Emergency Management volunteer for nearly 25 years, he is also a member of Desoto County Search and Rescue. His fascination for weather started as a teenager and he has been a Chaser and Spotter since his 20s. He enjoys sailing and camping and works for a large local airline as the Manager of Powerplant Engineering. Ken's home town of Holly Springs received serious tornado damage on December 23rd, 2015. As a spotter he warned thousands of residents in the area using ham radio and continued for two days with rescue and recovery. The experience so close to home touched him greatly but reminded him of the vital role ham volunteers play in such circumstances. He looks forward to sharing those events with the Delta Club.

**Delta Club FCC testing sessions** are held every month except December. Registration begins at 5:30 PM and testing begins by 6:00 PM. Please remember to bring two forms of identification, one of which is a photo ID, and copies of any existing licenses or CSCEs. You need to know your FCC Registration Number (FRN) if one has been issued. Please be on time for registration to allow our Volunteer Examiner (VE) team to finish in time to attend the club meeting. The 2016 test fee is \$15 (cash or check). Individuals who successfully test for their initial FCC license grant at a Delta Club test session or through a Delta Club training class will receive a complimentary individual club membership for the remainder of the current calendar year when they also show proof of ARRL membership. For more information, please contact our VE Liaison, Jeff Krause, AJ4GY, 901-301-6776 or [AJ4GY@comcast.net](mailto:AJ4GY@comcast.net).

**Congratulations** to those who passed exams during Delta's May, 2016, test session: new Technician Robert Briggs, KM4TZJ, new General Curtis Payne, KM4TOW, and new Extra Pat Tobin, KI4SEI.

## President's Corner

Submitted by Ken Laseter, KI4AOH

WOW! June is already here, and the year is almost half over. Seems like we were just celebrating New Year's yesterday. With the arrival of June comes the heightened anticipation (and planning) for FIELD DAY. It will be here on the 25<sup>th</sup> and 26<sup>th</sup> of this month. That's right, the last full weekend in June. As I said last month, this year's FIELD DAY will be like no other you have ever seen. It will be bigger, better, and more diverse. We have four Amateur Radio Clubs and several different local, state, and federal agencies scheduled to participate. So save the dates and plan to be a part of history in the making by volunteering. We will be needing help during setup, starting at 0700 Saturday morning, operating for 24-hours, and teardown on Sunday morning.

As always, please don't forget to check into the Delta Club information net on the 146.820 repeater at 8:00 pm each evening, and when you check-in, make sure to thank the net control operator for taking time from family and busy schedule to call the net for us. They are some of our most valuable assets!

If you have not renewed your club membership now is the time. I think we still have some members that are procrastinating or have forgotten. Linda, KJ4CTX, will be glad to accept your renewal application and cash, check or money order, either at a club meeting or via snail mail.

See you at the meeting Tuesday night!

73,  
Kenneth Laseter  
KI4AOH

## Treasurer's Report

Submitted by Linda Laseter, KJ4CTX

### DELTA AMATEUR RADIO CLUB

#### Monthly Treasurer's Report

For month ended May 31, 2016

Submitted by: Linda Laseter, KJ4CTX Treasurer

### CHECKING ACCOUNT

#### BEGINNING BALANCE

|  |                    |
|--|--------------------|
| <b>BEGINNING BALANCE</b> as of May 1, 2016 | <b>\$ 9,651.45</b> |
|--|--------------------|

#### INCOME

| Date                | Description           | Amount             |                    |
|---------------------|-----------------------|--------------------|--------------------|
| 5/1/2016            | Huntsville bus trip   | \$ 55.00           |                    |
| 5/4/2016            | Huntsville bus trip   | \$ 55.00           |                    |
| 5/11/2016           | Huntsville bus trip   | \$ 385.00          |                    |
| 5/12/2016           | Huntsville bus trip   | \$ 220.00          |                    |
| 5/12/2016           | Membership dues       | \$ 105.00          |                    |
| 5/15/2016           | Huntsville bus trip   | \$ 55.00           |                    |
| 5/16/2016           | Beebe equipment sales | \$ 500.00          |                    |
| 5/18/2016           | Huntsville bus trip   | \$ 110.00          |                    |
| <b>TOTAL INCOME</b> |                       | <b>\$ 1,485.00</b> | <b>\$ 1,485.00</b> |

#### EXPENSES

| May-16                |         | To            | Description          | Amount            |                   |
|-----------------------|---------|---------------|----------------------|-------------------|-------------------|
| Date                  | Check # |               |                      |                   |                   |
| 5/10/2016             | 1373    | Steve Frazier | Meeting refreshments | \$ (98.99)        |                   |
| <b>TOTAL EXPENSES</b> |         |               |                      | <b>\$ (98.99)</b> | <b>\$ (98.99)</b> |

|  |                     |
|--|---------------------|
| <b>ENDING BALANCE</b> as of May 31, 2016 | <b>\$ 11,037.46</b> |
|--|---------------------|

#### CERTIFICATES OF DEPOSIT

|                           | Maturity Date | Balance as of |              |
|---------------------------|---------------|---------------|--------------|
| Certificate of Deposit #1 | 7/10/2016     | 1/9/2015      | \$ 10,280.23 |
| Certificate of Deposit #2 | 10/11/2016    | 10/9/2015     | \$ 5,050.12  |

|                               |                     |
|-------------------------------|---------------------|
| <b>TOTAL DARC CASH ASSETS</b> | <b>\$ 26,367.81</b> |
|-------------------------------|---------------------|

## **This Month's Board Meeting Minutes**

June 7, 2016 -- Submitted by Linda Laseter, KJ4CTX

Attendees: Bill Stevens, WC9S, Michael Knight, KK4IOH, Steve Frazier, KK4VPT, Dan Lasley, NE7JN, Kenneth Laseter, K14AOH, and Linda Laseter, KJ4CTX. Barri Munday, WB4SWP, Len Grice, KM4MRY, Joe Lowenthal, WA4OVO, and Jim Cissell, K14I, were absent.

The meeting was called to order at 7:03 p.m. by Ken.

Joe called in from Maine and gave his report on training and the Huntsville bus trip.

Linda presented the Treasurer's report and then advised the Board that Len Grice is now sending email letters to new members welcoming them to Delta Club. Approval was received to send letters to all club members for their support.

Dan reported on his project to publish articles each month in 2017 about YLs or items of interest to YLs. He has commitments from two or three YLs to write articles and would like to have other YLs write articles. He also brought up the possibility of restarting the YL net. This was tabled until Danny Banks, KJ4FXZ, could be consulted. Additional ideas regarding YLs were discussed.

Steve advised we had plenty of snacks on hand and offered some of them for Field Day.

Michael discussed tents, radios, and helpers for Field Day. He has made announcements on the Net several times regarding Field Day and will continue to do so.

Bill asked Michael to purchase the "Visitors Welcome" sign previously approved by the Board. He also advised we needed additional computers and tents for Field Day as well as volunteers to operate the "GOTA Station." He is asking everyone to bring their own chairs for Field Day. All computers being used Field Day should be tested at the Field Day meeting Thursday, June 9<sup>th</sup>, to make sure they communicate with HamWan.

Delta Club's website was discussed briefly but further discussion was tabled until after Field Day. Ken passed out a copy of the by-laws for everyone to review and to be ready to discuss possible updates at the July Board meeting. Bill requested that an email copy of the original by-laws and a previous working copy be sent to all Board members for review.

In Jim's absence, Dan reported the program for June would be on the Holly Springs tornado and that Jack Parnell, K4BSI, was on the schedule for July.

The meeting adjourned at 8:05 p.m.

## Minutes of Last Month's Club Meeting

May 10, 2016 – Submitted by Dan Lasley, NE7JN

Club President Ken Laseter, KI4AOH, opened the meeting at 7:00 pm and reminded everyone to sign in and drop a ticket in the bucket. Ken announced that Barri Munday, WB4SWP, had resigned as club secretary due to limitations on her available time and asked for a club member to volunteer to replace Barri, whose absence will leave a huge hole in the organization by virtue of her diligence and attention to detail. Introductions were then made by name and call sign.

Ham Hilliard, W4GMM, moved to approve the meeting minutes as recorded in Sparks, seconded by Len Grice, KM4MRY; the minutes were approved by acclamation.

Ham moved to approve the Treasurer's report as recorded in Sparks, seconded by Mike Hodgetts, KV4QC; the report was approved by acclamation.

Linda Laseter, KJ4CTX, thanked volunteers for the March of Dimes March for Babies event on April 30th and noted a rained-out event. As part of Ham Questions 101 just prior to the meeting, Linda found the fox in the demonstration fox hunt.

Ham noted the N2S *Sultana* Special Event on April 30th was not only eventually rained out, but suffered from a tent that blew down and a later power outage. He also mentioned the very successful TN AuxComm event held May 6 and 7. Future AuxComm events will include classes on digital modes and on net control operations. Ham also talked about the following weekend's cross-band MARS activity.

Joe Lowenthal, WA4OVO, said three folks passed exams tonight. See page one for details. Joe reminded us about the upcoming bus trip to the Huntsville hamfest on August 20th. See his article elsewhere in this issue. A technician class will begin July 7, location TBD.

Bill Stevens, WC9S, spoke about Field Day preparations and asked for volunteers. Come on, folks, don't let Bill down during this fun event!

David Campbell, KD4NOQ, mentioned the upcoming fox hunt on May 15th. He will be the rabbit on 147.42 with call-ins prior to the event on Delta's 146.82 repeater.

Ken recognized the Net Control Operators for the nightly Delta Club Information Net and asked the operators present, Art Barnett, WA4PSS, and Keith Barton, KT4EP, to stand while he thanked them for their service and for the time away from their families while performing their duties.

Michael Knight, KK4IOH, presented tonight's program on the upcoming Field Day event.

After Michael's presentation, Ham moved to adjourn, seconded by David Gilbert, AJ4LV

## In Memoriam



Our club secretary, Barri Munday, WB4SWP, recently resigned her position in order to take care of her mother, Annabelle Munday. We were saddened to learn Mrs. Munday, 92 years young, passed away on May 12. Graveside services were held on Saturday, May 14, at Memorial Park Cemetery on Poplar Avenue.

Mrs. Munday was a member of Kirby Woods Baptist Church, a member of the Women's Exchange, a former member of King's Daughters and Sons, and other volunteer services. It is requested memorials be sent to the Salvation Army, Kirby Woods Baptist, or a charity of the donor's choice.

Barri is the poorer for having lost her beloved mom, WA4VVD, but she is the richer for both of her parents having been hams. How many of us can claim such a formative heritage? Her dad, Joe, was WB4SWP, which is now Barri's call sign.

Our thoughts and prayers go out to Barri and her family.

Submitted by Dan Lasley, NE7JN, with the grateful acknowledgement of contributions by Barri Munday, WB4SWP, Pat Lane, W4OQG, and Art Barnett, WA4PSS.

## DARC has a Facebook Group

Article Submitted by Amanda Nash, KM4MSC

As we all know, hams like to talk ... a lot. We chatter on repeaters, on single side band, vhf simplex, dits and dahs from a keyer, and even through our pc sound cards. Now we have an additional place to talk! DARC has a Facebook group! This group is a closed group for Delta Club members only. This will be utilized to help expand communications between old and new hams. With this resource, we can help guide new operators with questions, help maintain schedule of events, open our homes to operating parties and more. So come check us out! You can get there several ways.

1. Log onto your Facebook account and in the search bar, look up "Delta Amateur Radio Club (active members)".
2. Go to <https://www.facebook.com/groups/darcmem/>.
3. And for those who like QR codes, scan the code below for a direct link.



Please read over the rules and remember to be respectful in our wonderful hobby.

**Delta Ham License Training 2016**  
Submitted by Joe Lowenthal, WA4OVO

*There is no charge for classes, but the student is responsible for the purchase of the license manual and the \$15 ARRL FCC examination fee.*

Licenses Earned in 2016 from Delta Classes

7 Technician  
5 General  
5 Extra

If you are interested in attending a training class, send an email to Joe Lowenthal at [wa4ovo@gmail.com](mailto:wa4ovo@gmail.com) with the desired class name in the subject line, along with your name, email address and (cell) phone number in the text.

**Classes Scheduled**

**Technician Class 4-16: July 7 -- August 18, 2016.**

This class will be held on six Thursday nights beginning July 7th until August 18th from 6:15 pm to 9:30pm at the Germantown Police training room, 1930 South Germantown Road in Germantown. There will not be a class on July 21st.

Pre-registration is required. Email Joe Lowenthal WA4OVO at [wa4ovo@gmail.com](mailto:wa4ovo@gmail.com) with **Tech Class 4-16** in the subject line and name, email address and cellphone number in the message area. The manual is The ARRL Ham Radio License Manual, Third Edition.

We offer our continued thanks to EMHC ambulance company for generously providing their training room for the many ham radio classes given there.



## Huntsville Hamfest Bus Trip -- August 20, 2016

Submitted by Joe Lowenthal, WA4OVO

DARC is sponsoring a 50-passenger bus trip to go to the Huntsville Hamfest on August 20, 2016. There is a graduated scale fare for the bus trip. The fare is \$65 if paid by June 30, 2016, and \$75 if paid after June 30th. The fare includes the \$8 hamfest entry ticket. There will be two bacon, ham or plain biscuit sandwiches, water, sodas, chips, and fruit on the bus going to Huntsville and whatever is left for the trip back. There are no refunds, but you can sell your seat to someone else if you cannot go. Let me know.

Cash or checks will be accepted for payment. Make checks payable to Delta Amateur Radio Club. You can pay at a meeting. You can also send your check to Joe Lowenthal, WA4OVO, 6675 Ashbridge Cove, Memphis, TN 38120. Please include your name, call sign, cell phone number, and email address.

**Reservations will be on a first come first paid basis.**

The bus will leave Ellendale Church of Christ, 7365 Highway 70, Bartlett, TN, at 6:00am on August 20th. A second pickup point will be at Germantown Baptist Church, 9450 Poplar Avenue at Johnson Road, Germantown, TN, at approximately 6:20am. The bus will leave Huntsville immediately after the 4pm door prize drawing and return to Germantown Baptist Church at approximately 7:30pm and to Ellendale Church of Christ at approximately 8:15pm.

Ellendale Church of Christ has asked us to park in the larger parking lot on the west side of the building to leave the east side open for church activity parking.

**Note new location for the pickup point at Germantown Baptist Church.** It will be on the northeast side of the church (toward Collierville) **in back** of the church and east of the tree-lined median so security cameras can oversee the cars.

## Last Month's Program

Submitted by Dan Lasley, NE7JN, contributions by Michael Knight, KK4IOH

May's club program was "Field Day, 2016," presented by Delta's Vice President, Michael Knight, KK4IOH. Because Michael's presentation was clear and succinct, I will borrow heavily from it in the description below.

2016's Field Day will be Saturday, June 25th, and Sunday, June 26th, at [7771 Poplar Pike, Germantown, TN](#), behind the Pickering Center. Set up operations begin at 8am (CDT) Saturday with on-the-air operations commencing at noon Saturday and ending at 3pm Sunday, followed by tear down operations.

This year the [Nashoba Club](#) is joining [Delta Club](#), [MARA](#), and the [Tri-State Repeater Association](#) in Field Day operations.

The Field Day objective: "To work as many stations as possible on any and all amateur bands (excluding the 60, 30, 17, and 12-meter bands) and to learn to operate in abnormal situations in less than optimal conditions."

Michael explained the rationale for Field Day:

- Emergency Preparedness
- Training and Practice Operating
- Social Gathering
- Recruit New Hams
- Demonstrating Our capabilities
- Experimentation with Antennas and Power Solutions

We will have a dedicated Get On The Air (GOTA) station again this year. Michael says, "The GOTA station may be operated by any person licensed since the previous year's Field Day, regardless of license class. It may also be operated by a generally inactive licensee. Non-licensed persons may participate under the direct supervision of an appropriate control operator."

Our capabilities will include voice, CW, digital, satellite, packet and APRS demos, and networking via HamWAN.

The Field Day operation accumulates points for on-air contacts: phone contacts count one point, and CW and digital contacts count two points. We accumulate additional points in a

number of other ways, such as youth participation, using 100% emergency power, media publicity, satellite QSOs, and more.



Photo by Dan Lasley, NE7JN.

How you can help:

- operate a voice or CW station
- log contacts
- help coach
- greet the public
- act as tour guides for the public
- loan batteries for the event duration
- help with set up or tear down (or both!)

Thanks to Michael for an interesting and informative program.

## AUXCOMM Exercise

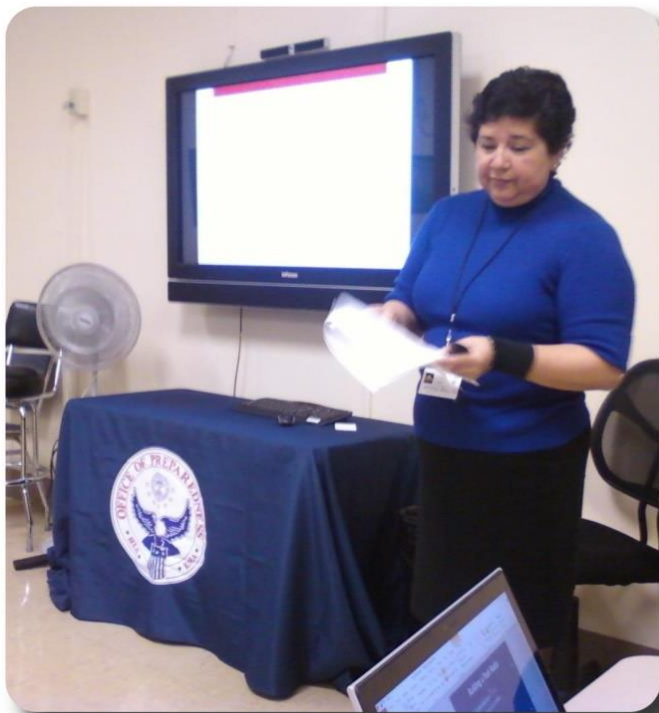
Submitted by Dan Lasley, NE7JN

Steve Smith, W5VAA, has been working with Gene Jones, KI4YUA, Shelby County Office of Preparedness, to prepare for a local AUXCOMM (Auxilliary Communications) exercise which was held on Friday, May 6, and Saturday, May 7. These dates coincided with the Tennessee Emergency Management Agency (TEMA) AUXCOMM exercise in Bell Buckle, Tennessee.

Classes for the local event were held Friday and Saturday mornings (details given below). All three classes were not only very interesting, but were very professionally prepared and delivered. As you read about the presentations, you'll find a clickable link to each presentation.

The classroom knowledge was put to work Saturday afternoon with Ham Hilliard, W4GMM, demonstrating the installation of an HF dipole, followed by testing voice communications with TEMA in Bell Buckle, then testing the ability to send and receive emails over HF. All tests were successful.

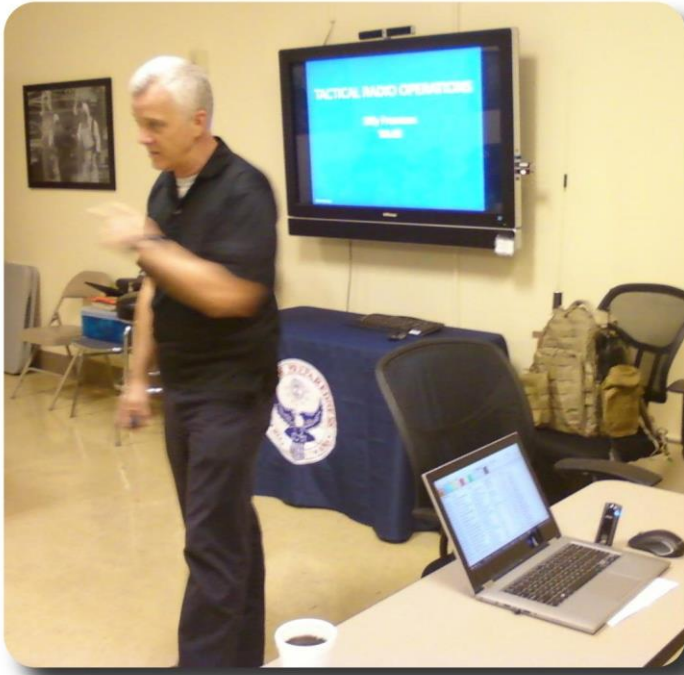
I counted 25 attendees Friday and 32 Saturday. If you missed this AUXCOMM exercise, I hope you can participate in future exercises.



Rosalinda Melena, WN2V, presented "[Clear Talk in an Emergency](#)". She stressed that "during an emergency, radio operators will become assets to our communities and local agencies IF we can effectively communicate." She told us "radio operators fulfill EMA's needs with three steps:" phonetics, speed, and information.

She also mentioned the type of net checkin procedure used with great success in April's AUXCOMM exercise.

Photo by Dan Lasley, NE7JN.



Billy Freeman, WL4B, discussed "[Emergency Radio Go Kit](#)." His presentation concerned building a back pack radio, with emphasis on topics such as radio type, antenna, battery size and type, ventilation, radio operating instructions, a channel chart, and others. He also told us about cross-band (VHF/UHF) setup and operations.

Blurred photo by Dan Lasley, NE7JN. If you know Billy, you know he never stops moving! Billy, this is the *least* blurred photo I took during your talk!



Ham Hilliard, W4GMM, talked about "[How to Build and Erect an Antenna in an Emergency](#)." He covered dipoles, verticals, and random wire antennas, with a discussion of when the use of each type is appropriate. He suggested about a dozen different random wire lengths that will deliver a decent SWR when used with an antenna tuner. See his presentation for details.

Photo by Dan Lasley, NE7JN

If the reader will permit, I would like to mention a bit of personal philosophy. Although our hobby is known as *amateur* radio, we should strive for professionalism whenever we are in a position to lead, to teach, or to speak to others. Thanks to Steve, Gene, Rosalinda, Billy, and Ham for personifying the **professional** parts of *amateur* radio and for delivering a smoothly operating exercise.

## My First Fox Hunt

Submitted by Linda Laseter, KJ4CTX

Fresh from the Ham Questions 101 introduction to Fox Hunting I decided to try my luck on a true Fox Hunt (transmitter hunting). Wanting to test the various types of antennas before actually investing in one I decided I would take David Campbell, KD4NOQ, up on his offer of borrowing his favorite antenna for Fox Hunting. (Ah, the favorite antenna of an experienced hunter. This could really be great and give me an advantage in the hunt....right!) Little did I know!

Ken, KI4AOH, my driver for the event, and I drove to Marshall's on Covington Pike on a sunny Sunday afternoon to join the hunters. One by one they arrived. Each hunter had a different idea about the type of antenna to use. There was the measuring tape antenna (made the night before), an antenna that reached twelve feet or so into the air that was mounted on the back of a car, the quad I was using, and various other rigs. Some hunters were even using rather sophisticated electronic gadgets.

We raised our antennas in the air, turning this way and that way to home in on the transmitted signal. After listening and moving around a bit I determined I had a strong signal coming from somewhere in the direction of Bartlett Park. But what did I know.... this was my first hunt! So with a direction noted, we jumped in our cars and were off to a new location. The newbies (myself included) just followed the pack leader.

We headed north going up this street, down this one, around to the right, then left, and finally we turned right into a church parking lot. Out we jumped and connected our antennas to our HTs and once again raised the varied devices in the air searching for the signal. With a direction noted, we were off again! About this time the ole sly fox radioed to ask if we needed a hint. "No, we are good," we said as we continued on our journey. Turning to the right, then the left, right, left, right, and stopping this time in a school parking lot.

We were off again on the hunt when the fox radioed again. "Do you need a hint?" he asked. "Okay," we said this time. "We are near a railroad track," came the reply.

Still following the pack we neared Bartlett Park when Ken said, "There they are on the right." We follow the others into Bartlett Park. That's right...Bartlett Park! Remember my first signal and my thought of its origin! But what fun we had following along with the others in search of the Fox and gaining experience along the way.

We head out of the park and back to the fox, who was just outside the park, only to find DeWayne Love, N5XUL, waiting with the Fox. Seems he found the "old fox" within thirty minutes. DeWayne has been Fox Hunting for some time and has developed a system using various electronic gadgets to Fox Hunt without exiting his vehicle. He was kind enough to take a few of us for a drive and demonstrate his Fox Hunting equipment and skills.



Note to self: Research electronic gadgets for hunting. Until then bring a pencil, a map, a compass, an antenna (not sure what type although the quad worked well), and of course my woman's intuition!

Fun was had by all and we finished the day with a nice lunch together at a local restaurant.



The Fox (David Campbell, KD4NOQ) and the hunters (L-R, Linda Laseter, KJ4CTX, Amanda Nash, KM4MSC, and Ken Laseter, KI4AOH).

Photo by Bob Vawter, KW4RJ



More hunters (L-R, Jim Cissell, KI4I, Ann Cissell, WB4FAA, and Ken Laseter, KI4AOH).

This is Jim's vertically polarized fox hunting beam.

Photo by Bob Vawter, KW4RJ



L-R, Shannon Murphy and Amanda Nash, KM4MSC.

Amanda says, "That is my sister in law, Shannon. I built the antenna the night before and she decided she wanted to go with me since we frequently geocache together."

Photo by Bob Vawter, KW4RJ

### **Attention VEs Who Are General or Advanced class licensees!**

Submitted by Dan Lasley, NE7JN, contribution by Pat Tobin, KJ4SEI

At last month's meeting, Pat Tobin, KJ4SEI, mentioned something of interest to Volunteer Examiners who hold the General or Advanced class license and want to upgrade to Extra. [HamTestOnline](#) offers a [Free Extra Course for Active Volunteer Examiners](#) to help you upgrade to Extra for no charge. If you wish to take advantage of this free offer, you must be an active VE who has participated in at least three VE sessions in the past twelve months.

Thanks, Pat, for the information and congratulations on your upgrade to Extra last month!



## Odds and Ends

Submitted by Dan Lasley, NE7JN, contributions by Art Barnett, WA4PSS,  
Linda Laseter, KJ4CTX, and Elizabeth St. Vincent, K4KTG

Everyone has experienced looking for one thing, but finding a different, unrelated thing. That happened to me recently when I borrowed a copy of the May, 2016, CQ magazine from Art Barnett, WA4PSS (thanks, Art). I was looking for an article on fox hunts with the idea of including ideas from the article in Sparks, but I found some unrelated and very interesting goodies. Follow along and perhaps you'll agree.



From page 53: Did any reader know [Heathkit®](#) was building and selling kits again? Their [Frequently Asked Questions](#) list had some intriguing questions and answers!

“Q. What kind of products does Heathkit sell today?

A. We sell products that include hardware and software, publications, vintage kits, upgrade kits, new electronics kits, and lots more. See our [website](#) and [eBay](#) store.

Q. So who are you guys?

A. ... the entire board and about half of the team are licensed amateur radio operators. (Also happy with our team will be: car buffs, pilots, musicians & artists, sports/outdoors enthusiasts, parents, educators, and people who value community service.)

Q. I heard there is a group called Heathkit Insiders.

A. Yes, there is.

Q. How can I join the Heathkit Insiders group?

A. Take the [survey](#), and provide a valid email address.”

You won't find an [SB-220](#) kit yet, but they have to start somewhere!



From page 66: Have you ever wanted to make your own printed circuit (PC) boards? Now you can use your computer to create a PC board image and farm out the nasty chemical mess to one of several vendors, including [AP Circuits](#), [ExpressPCB](#), and [EAGLE PCB](#).

The article says, "... the boards themselves have essentially the same quality no matter where you order them from -- the differences here are price and delivery time."

If you have used one of these (or other) PC board fabricators, please [contact me](#) and let me know whether you were satisfied with the results.



A Delta Club YL recently said to me, "We need to get more women involved." Never at a loss for words, I replied, "Yes, we do," and stood there scratching my head for ideas until she walked away. Ok, Linda, CQ's page 80 finally gave me an idea, the [Young Ladies' Radio League](#) (YLRL).

The YLRL began with a letter in the July, 1939, issue of [OST](#) from Ethel Smith, then W7FWB, later K4LMB, now SK. The letter [said](#), in part, "Perhaps we should band ourselves together in a YLRL or something to that effect and make these woman-ignoring authors sit up and take notice." The twelve YLs answering the letter are known as the founding mothers of the YLRL. After Ethel's passing, the YLRL adopted K4LMB as their call sign.

They have interesting upcoming [conventions](#), they award yearly [scholarships](#) to YLs, they sponsor certificates for both YLs and OMs, and you can even contribute to a [quilt](#) that one of the YLs is piecing together for a quilt raffle.

Their [history](#) cleared up confusion on my part about YL vs. XYL: "In May 1940, the YLRL set forth the policy ... that the term "YL" was to be used of all licensed amateur operators of the feminine sex. This meant they were all young ladies no matter what their marital status was. A licensed woman is a YL while an XYL is a non-licensed wife."

Every ham knows what 73 and 88 mean. What about the meaning of 33? See [The Birth of 33](#). Don't miss [A Call to Action-A Time of War](#) or [Bletchley Park - Enigma - In Remembrance](#). This is a very interesting group for all the YLs out there!

Just in time for Field Day, CQ's pages 84-87 tell us Sporadic-E (or Es) propagation begins in early May and continues through the summer. "Occasionally, very thin regions of extremely dense ionization can form within the E layer. At times, these thin regions form into dense clouds which are capable of reflecting radio waves of frequencies which are much higher than those reflected by the regular E or F layers." The Maximum Usable Frequency of Es propagation can sometimes go as high as 220 MHz, although the higher the frequency, the less likely you are to find Es. Conversely, the lower the frequency (upper HF and VHF up to about two meters), the more likely you are to encounter Es.

Other propagation modes (trans-equatorial propagation, tropospheric ducting) can combine with single-hop Es or double-hop Es to make DX interesting during the summer.

This **brief** summary of Es can't possibly do justice to the four-page CQ article. Borrow a friend's CQ and read the whole thing!

[Elizabeth St. Vincent](#), K4KTG, AUXCOMM, TN-COML, writes about two items of general interest in a recent AuxComm email. The first concerns Google Earth Pro:

"[Google Earth Pro](#) is currently available at no cost. When registering your new account, use "GEPfree" as the key, and you should be good to go. From the discussion happening within the Facebook Group, I understand you can incorporate the APRS App, among other uses."

When I went to her link, I discovered that Google expects you to agree to a number of terms, including:

- Allow Google Earth to automatically install recommended updates.
- Help us improve Google Earth by allowing us to collect anonymous usage statistics.

It's not that I don't trust multi-billion dollar, multi-national corporations, but the phrase "caveat emptor" (*let the buyer beware*) jumped immediately to mind when I read the terms, and I would be remiss in my duties were I to fail to point out those terms. Elizabeth's second item concerns replacement batteries:

"I recently needed to replace a few of my batteries for my older Kenwood TH-77A handheld (1992 Model). When I wasn't able to find them on eBay or Amazon, I had to really dig to find a replacement set. I came across [Cut Rate Batteries](#) and they not only carried the batteries I needed, but they are also located in Powell, TN! If you're in the market for replacement batteries, give them a shout. They offer a price break after your 5th battery, and I received an email following my initial order for 10% discount off my next order."

## Welcome To New Club Members

Submitted by Len Grice, KM4MRY

The Delta Club would like to extend a very hardy welcome to the following hams who have recently joined the club. Please search them out and welcome them to the fold!

Jim Barnes, N4YOK  
David Church, AD4Q  
Raymond Cole, N5RLC  
Christopher Cooper, KM4PMW  
William Fullerton, AF5HA  
William Howard, KM4MSA  
Tina McElravey, KM4PMZ

David McElravey, KM4PNA  
Marlin Mogy, KM4DPP  
Ryan Turner, KORET  
William Varnadore, KG7QAR  
Todd Wright, KM4HRX  
Warren Zimmer, KC7ND

## Update on Ham Fests

Submitted by Dan Lasley, NE7JN, contributions by Rick Kanschat, NOKYN,  
and Paul Rosenblatt, KK4DMD

As I mentioned in last month's [Sparks](#), the [Mid-South Amateur Radio Association](#) (MARA) contributed \$3,922 to Le Bonheur Children's Hospital as a result of this year's FreeFest. With his permission, I'm quoting from a recent email from Rick Kanschat, NOKYN, on the contribution:

"On Monday I delivered the donation to Le Bonheur and it was greatly appreciated. I was asked what account I wanted it to go to. In the past I have selected the general fund which would be used in many different ways. This year I selected the endowment fund, which is new for this year, that doubled our donation. Any monies put in that fund Methodist Healthcare matches. So MARA will get credit for \$7844.00 donation.

Thank you on behalf of Le Bonheur Children's Hospital. Rick Kanschat, NOKYN, Senior Director of Support Services, Le Bonheur Children's Hospital."

After Rick's email arrived, Tony Brignole, WA4KHN, let us know that MARA's contributions to Le Bonheur over the years have amounted to \$25,756 and this figure doesn't include a recent, generous contribution from Delta Club members Ron Rubin, K3RON, and Janet Souza, W3JLS.

Thanks to Tony, FreeFest ramrod, and to everyone who contributed to a **great** hamfest.

I've found some very interesting gizmos at FreeFest and at other hamfests over the years and I'd like to share a couple of the more interesting with you.



At the Union City, TN, hamfest in March I found the most unconventional CW paddle I've ever seen! Built very sturdily from the innards of a hard drive, I think if you ran over it with an [M1 Abrams tank](#), the only resulting damage would likely be to the tank treads! The seller, Rich Range, WB9SFG, didn't know who built it. If you know, please [contact me](#).

Photos in this article by Dan Lasley, NE7JN.



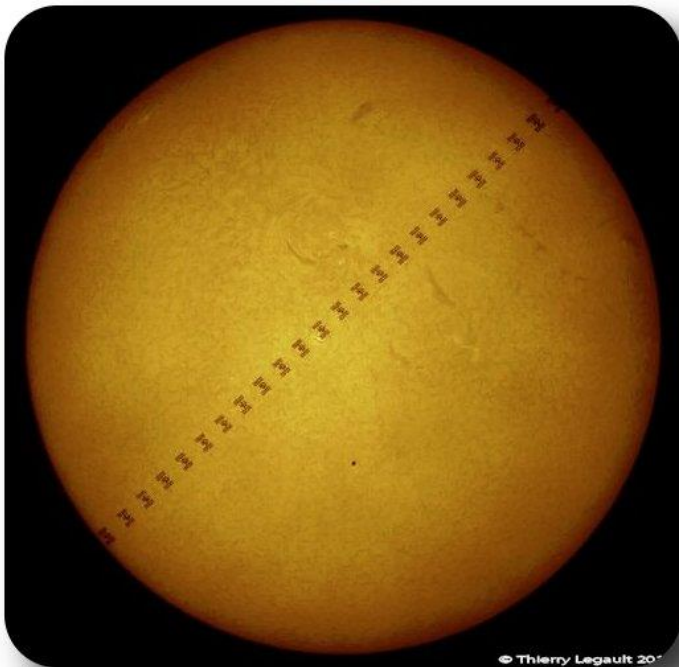


When I saw Paul Rosenblatt, KK4DMD, at this year's FreeFest, he showed me an interesting device he had purchased, a Charger Doctor. This device connects in-line between a USB device and a USB power source and automatically switches between showing voltage (left image) and current (right image). I bought one for five bucks. The black rectangle at the top of each image is my cell phone charger and the connector at the bottom goes to my cell phone. The charger is delivering 4.88 volts at 0.11 amps.



## ISS and Mercury Transit the Sun

Submitted by Dan Lasley, NE7JN



From [spaceweather.com](http://spaceweather.com), May 10, 2016: "Around the world yesterday, thousands of astronomers photographed a rare transit of Mercury across the face of the sun. Only a few, however, caught the [double transit](#). To capture such a near-perfect alignment of the sun, Mercury, and the ISS, the observers had to locate their optics precisely within narrow corridors no more than 5 km wide and have their cameras running during a 0.6-second interval when the ISS passed by at 17,000 mph."

The dot in the lower center of the image is Mercury.

## Ham Questions 101 – Off and Running!

Submitted by Linda Laseter, KJ4CTX

Ham Questions 101 is off to a great start! May's forum was an introduction to Fox Hunting (transmitter hunt/radio direction finding). After a brief discussion in the classroom we headed to the Ellendale Church parking lot in search of the Fox. A few of us participated in the hunt using various types of antennas. Michael Knight worked with the hunters giving them advice on how to hold their antenna for the best result and reading their radio signal strength to determine the direction of the Fox. Michael did a good job because all participants found the old Fox. It was an interesting experience for all who participated (observers as well as Fox hunters).

Each month we will be offering a new topic for discussion and will also be available for questions. Come join the fun! **This month our topic for discussion will be "Now that I have my license, what do I do?"**

We hope you will join us. This is a very informal small group. We are here to help you answer your questions. Maybe you are a new member and just want some information about the opportunities that are available through the club. Then join us, we can help with that as well.

We meet upstairs in the Ellendale Church at 6:00 p.m. just prior to the regularly scheduled monthly Delta Club meeting. If you are not able to attend the forum, then please send us your questions via email.

For more information, please email Linda Laseter, KJ4CTX, at [LindaLaseter@gmail.com](mailto:LindaLaseter@gmail.com) or Dan Lasley, NE7JN, at [sparks@carbheat.net](mailto:sparks@carbheat.net).

## Equipment for Sale

Submitted by Dan Lasley, NE7JN, contributions by Bill Stevens, WC9S

Most of the equipment listed below is from the estate of Jimmy Rye, Jr., KG4TKY. All equipment will be available for sale at June's Delta Club meeting.

Thanks to Bill, WC9S, for being the equipment wrangler. I hope everyone appreciates what a time consuming and laborious task this is!

| <b>Jimmy Rye Jr KG4TKY Estate</b>                   |            |
|---|------------|
| Tentec Orion II HF transceiver #566                 | \$2,000.00 |
| Tentec Antenna Tuner #238b                          | \$350.00   |
| Tentec External Speaker #307                        | \$75.00    |
| Tentec Power Supply #963                            | \$80.00    |
| TenTec Encoder/Keypad #302                          | \$75.00    |
| TenTec Desk Mic. By Heil                            | \$100.00   |
| Kenwood TR-2500 HT 2 meter with desk charger        | \$25.00    |
| Drake UV-3 KM Transceiver & Drake PS-3 Power Supply | \$450.00   |
| Miscellaneous Antennas                              |            |
| Tentec receiver kit #1254                           | \$100.00   |
| Tentec QRP 40 meter CW transceiver kit              | \$60.00    |
| Tentec 2 meter FM transceiver kit                   | \$100.00   |
| <b>Left over from last sale</b>                     |            |
| MFJ-267 Dummy Load / Watt meter                     | \$75.00    |

## The Lancaster/Marston Corner

Submitted by Dan Lasley, NE7JN

The Lancaster/Marston Corner refers to the works of Don Lancaster and Ray Marston, both of whom published extensively in various electronics magazines and in other publications. This column will cover wide-ranging topics in electronics but won't be limited to Lancaster and Marston; we'll cover other authors as well.

In last month's Sparks, I discussed "Mastering Oscillator Circuits Through Projects & Experiments" by Joseph J. "Joe" Carr, K4IPV (SK). I made the observation that **any** amateur radio operator in this country could not only have noticed errors in two equations, but could have corrected them as well!

In Figure 1 below, Node A is a "virtual ground," meaning that the op amp - input is grounded just as the + input is grounded. Below the diagram you'll find the equations in error, 5-2 and 5-3.

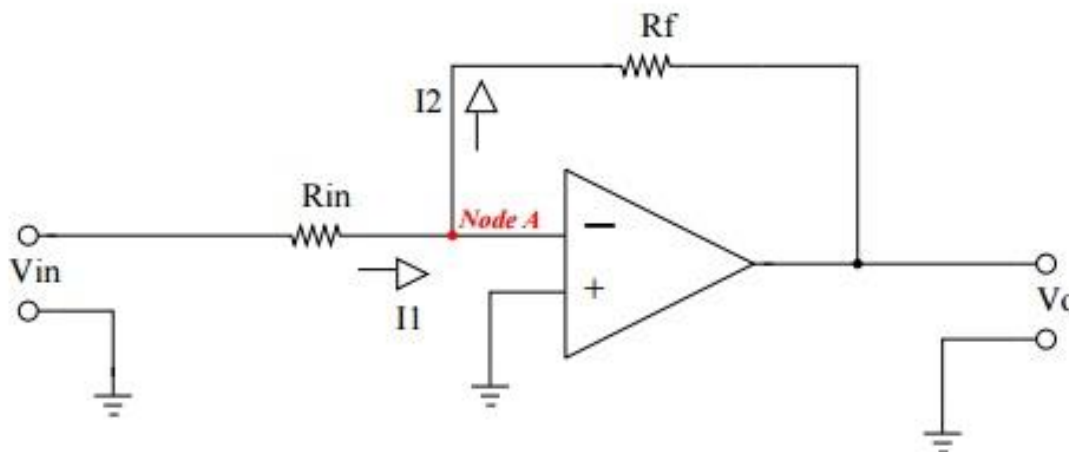


Figure 1: Joe Carr's Figure 5-7 on page 83

$$I_1 = \frac{V_{in}}{V_o} \quad (5-2)$$

$$I_2 = \frac{V_o}{R_{in}} \quad (5-3)$$

Every ham learned Ohm's Law, so Carr's figure 5-2 is clearly in error;  $I_1$  **cannot** be a dimensionless number!



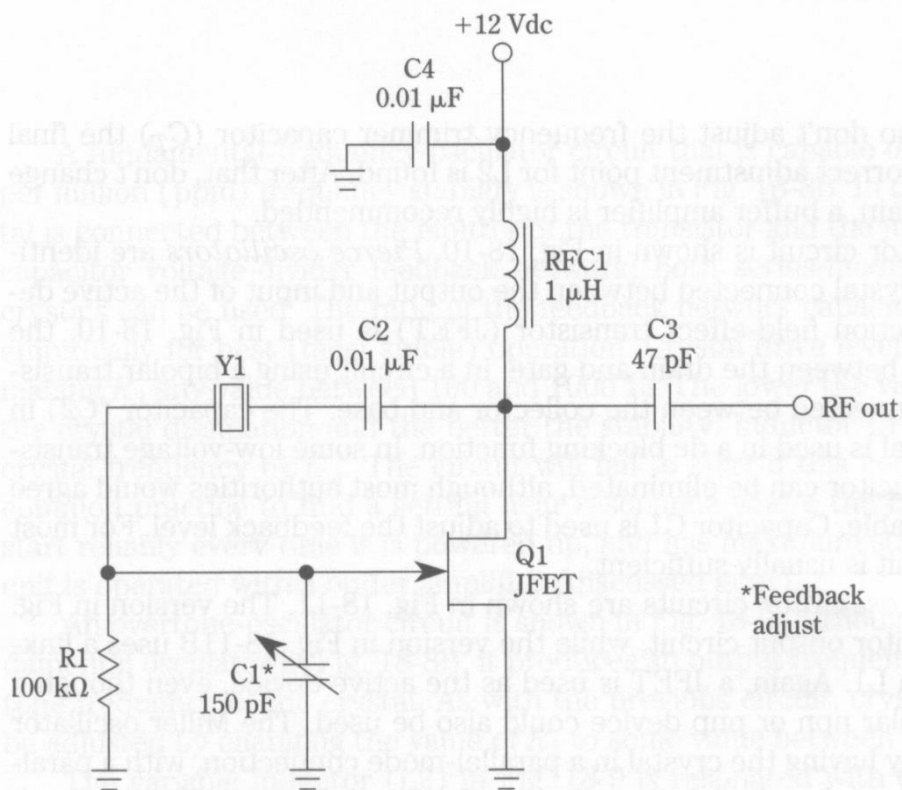
If you look at the schematic, you'll see that  $I_2$  depends on  $V_o$  and  $R_f$ , so equation 5-3 is also in error. You know Ohm's Law, so you can fix both equations! Let's look at the correct equations:

$$I_1 = \frac{V_{in}}{R_{in}} \quad (\text{revised 5 - 2})$$

$$I_2 = \frac{V_o}{R_f} \quad (\text{revised 5 - 3})$$

The point of this exercise is to make you realize you have more knowledge than you think you do, even to the point of correcting an otherwise excellent book!

Next month I plan to build Carr's Figure 18-10 circuit shown below and report the results.



18-10 JFET Pierce oscillator.

## DX News

Submitted by Dan Lasley, NE7JN

The ARRL Letter is a weekly email with useful information such as the following week's QSO parties, which are great avenues to snag states missing from your WAS conquest. For example, the first ARRL Letter in May gave no fewer than four QSO parties (7th Call Area, Delaware, Indiana, and New England). Because Sparks is monthly, I can't generally publish QSO party information; it would be hopelessly out of date. All is not lost, however; I found a [2016 State QSO Parties Calendar](#) that covers the remainder of 2016. Good hunting!

HONDURAS, HR. Gerard, F2JD is QRV as HR5/F2JD from Copan until July 13. Activity is on the HF bands using CW, SSB and RTTY. QSL direct to F6AJA.

TURKEY, TA. A number of operators will be QRV as TC2016EXPO and TX2016ANT from April 23 to October 30 during EXPO 2016 hosted in Antalya. QSL both calls via TA4ED.

BELIZE, V3. Henk, PAOC is QRV as V31HV and V31HV/P until October. Activity is on 80, 40, 20 and 15 meters using CW, SSB and JT65. He uses his portable call sign during weekends from beaches south of the city. QSL direct to home call.

NICARAGUA, YN. Ilias, TG9IIN is QRV as YN3/TG9IIN from Leon until the end of July. Activity is on the HF bands using SSB, RTTY, PSK and JT65. QSL direct to home call.

BELGIUM, ON. Special event station OS101AB will be QRV from May 21 to June 21 to commemorate the 101st Airborne Division during the Battle of the Bulge. QSL via bureau.

BRITISH VIRGIN ISLANDS, VP2V. Kevin, K6TOP, is QRV as VP2V/K6TOP from Tortola until June 15 while on vacation. Activity is on 40, 20, 15 and 10 meters using mostly CW. QSL via NR6M. *(Note: This is an inexpensive way to add to your DXCC total; your QSL card and an SASE go to a U.S. address. No green stamps needed!)*

Don't miss the [13 Colonies Special Event](#) on July 1-6. It's an easy way to acquire QSL cards from the 13 original states on multiple bands.

I should have notified everyone about the [Museum Ships Weekend Event](#), Saturday, June 4<sup>th</sup>, and Sunday, June 5<sup>th</sup>. This year 111 ships or ship monuments in 28 states and 11 countries planned to participate. Mark your 2017 calendar for this event. As with the 13 Colonies Special Event, participants in the Museum Ships Weekend special event are very good about returning your QSL card. You'll greatly increase your odds of receiving the other stations's QSL card if you *a/ways* enclose an SASE!

## USS Thresher, [Museum Ships Weekend Event](#) Submitted by Joe Lowenthal, WA4OVO

Museum Ships on the Air coordinated by hams with the Battleship New Jersey Amateur Radio Station NJ2BB was June 4-5. I had the pleasure to be one of the six hams who operated W1WQM from the USS Thresher (SSN 593) Memorial in Kittery, Maine, on June 4th. The station was set up on one of the three picnic tables under four shady trees. We put up a 5/8ths wave 20 meter vertical, a 40 meter dipole and a long wire. The ideal temperature was in the upper 60s to lower 70s with a nice breeze.



This location memorializes the 129 crew, officers, shipyard workers and civilian contractors who perished on the Thresher on a post-overhaul test dive from the Portsmouth Navy Yard on April 10, 1963. In the center of the traffic circle across US 1 is also a 129-foot flagpole to commemorate the 129 souls. For more information, see the [USS Thresher Memorials](#).

Photo by Joe Lowenthal,  
WA4OVO



During my operation, I had the pleasure to work a gentleman who had at that time recently trained five of the crew. Another contact said he had been in a Navy squadron on its return from the Middle East. While over the Atlantic they were diverted until their fuel ran out to search for the sub.



Joe, WA4OVO, operating W1WQM on an Icom 7300 with Bill McAllister, KC1AXC, logging. In the background (L-R): Rick Messeder, NE1EE, and Peter Perkins, WA1OWH. Photo by Kriss Kliegle, KA1GJU

## Dayton Photos

Submitted by Dan Lasley, NE7JN, contributions by Jim Cissell, KI4I,  
and Len Grice, KM4MRY



Here is Joe Lowenthal, WA4OVO, with the new ARRL President, Rick Roderick, K5UR.

Photo by Len Grice, KM4MRY



Several Delta Club members have talked to or met George Donovan, WB5WUX (Mississippi), Kay Thompson, W9KAY, Bruce Thompson, K9LOF (both from Illinois), and "Elvin" Yuji Miura, JA3CZY (near Osaka, Japan).

Elvin was my first DX contact!

Photo by Jim Cissell, KI4I





The ARRL Contest Update email for June 1, 2016, says, "Kristen, KB3OQV, aka @antennahairgirl, at the Dayton Hamvention! The functional antenna lights up, and connects to her HT."

Not only is this YL appropriately coiffed for Dayton, but she seems to have a cool scrolling call sign!

Photo by Jim Cissell, K14I

## SPARKS Newsletter & Delta Club Information

SPARKS is published monthly by the Delta Amateur Radio Club and emailed to club members. All information published in this newsletter is provided as a service. While every reasonable effort has been made to ensure accuracy, neither the Delta Amateur Radio Club nor its officers assume any liability resulting from errors or omissions. All correspondence may be mailed to:

Delta Amateur Radio Club \* P.O. Box 342768 \* Memphis, Tennessee 38184-2768

An alternative email address to offer the Board your suggestions, ask questions, and voice complaints is [darc4you@gmail.com](mailto:darc4you@gmail.com).

Please note that you must provide your name and call sign if you're requesting specific actions or personal follow-ups, and also be aware that any profane or mean-spirited comments will be unceremoniously discarded without consideration.

Delta Club Members Can Like Us/Follow Posts On Facebook! Go to <https://www.facebook.com/darcmem>.

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*Welcome back, Barri!!!*

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[km4mry@arrl.net](mailto:km4mry@arrl.net)

**Immediate Past President:**

Joe Wray, WD4GXI

Board members beginning their positions in 2016 are listed in red.

## Upcoming Public Service Events

If you are a coordinator for any of these events, please review the listed information. Email corrections to [sparks@carbheat.net](mailto:sparks@carbheat.net).

| <u>Event Date</u> | <u>Event</u>  | <u>Contact Information</u>  |
|-------------------|---|---|
| June 18, 2016     | <b><u>Tour de Peddler for the Diabetes Association</u></b><br>Starts at one of 3 Peddler locations; 13 hams needed  | Pat Lane, W4OQG<br><a href="mailto:w4oqg@bellsouth.net">w4oqg@bellsouth.net</a><br>901-301-9738                                   |
| Sept. 10, 2016    | <b><u>Bike MS: Rock-N-Roll 2016</u></b><br>Landers Center in Southaven to Gold Strike Casino in Tunica and back on 2 <sup>nd</sup> day;<br>Multiple Sclerosis fundraising event | Darrell Sheffield, KK4D<br><a href="mailto:darrell.sheffield@memphistn.gov">darrell.sheffield@memphistn.gov</a><br>(901) 277-8122 |
| October 1, 2016   | <b><u>Bluff City Blues 100 Ride</u></b><br>Start from downtown Memphis  | Danny Banks, KJ4FXZ<br><a href="mailto:dbanksd@bellsouth.net">dbanksd@bellsouth.net</a><br>901-517-7661                           |
| Dec. 3, 2016      | <b><u>St. Jude Marathon</u></b><br>26.2 mile fund raiser in downtown Memphis  | Roger Schlichter, WR4R<br><a href="mailto:wr4r@bellsouth.net">wr4r@bellsouth.net</a>  |

## Tennessee Ham Radio License Plate

Submitted by Joe Lowenthal, WA4OVO

The link below is for information and instructions about Tennessee ham radio call sign Emergency/Safety automobile license plates:

<http://www.tn.gov/revenue/article/emergency-safety>

The application can be found at this link:

<http://www.tn.gov/assets/entities/revenue/attachments/f1312601Fill-in.pdf>



## Other Notes of Possible Interest

Submitted by David Webb, KV4QI

It's Time to Renew Your 2016 Annual Memberships! Download the latest Delta Club [Membership Application Form](#). Thanks for Your Active Support of Delta Amateur Radio Club!

## Memphis Area VHF/UHF Nets

Updated Nov, 2015

| Name of Net                       | Freq. MHz      | Tone             | Local Time   | Day of Week  |
|-----------------------------------|----------------|------------------|--------------|--------------|
| <b>Delta Club Information Net</b> | <b>146.820</b> | <b>- (107.2)</b> | <b>8:00p</b> | <b>Daily</b> |
| Mid-South Barefooted Bullfrog Net | 146.535        |                  | 7:30p        | Daily        |
| Secret Service Net                | 224.780        |                  | 8:30p        | Mon          |
| Elmer Net                         | 145.210        | - (107.2)        | 9:00p        | Mon          |
| The Short Winded Net              | 146.850        | - (107.2)        | 8:30p        | Tue          |
| MedMERS Net                       | 146.820        | - (107.2)        | 12:00p       | Wed          |
| CERTPlus Net                      | 443.200        | + (107.2)        | 8:30p        | Wed          |
| ARES Training Net                 | 146.880        | - (107.2)        | 9:00p        | Thu          |
| Super Sunday Niner Net            | 927.6125       | - (146.2)        | 8:30p        | Sun          |

**Delta Club sponsored Nets are shown in red.**

## TENNESSEE HF NETS

As of December, 2015

All times are Central Time

| Net Name   | Freq. MHz | Local Time | Day of Week |
|--|-----------|------------|-------------|
| Tennessee CW Net                                       | 3.563     | 7:00p      | Daily       |
| Tennessee Slow CW Net                                  | 3.682     | 7:30p      | Tue-Sun     |
| Tennessee Alternate Phone Net                          | 7.238     |            | As needed   |
| CUSEC (Center for United States Earthquake Consortium) | 3.810     |            | As needed   |
| CUSEC (Center for United States Earthquake Consortium) | 7.180     |            | As needed   |

### 3980 kHz – TN Phone Net

Mon-Fri - 5:40 AM, 6:45 AM & 6:30 PM

Saturday - 8:00 AM & 6:30 PM

Sunday - 8:00 AM only

Holidays - 8:00 AM only

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See Advertisement Order Form for Instructions.



### MID-SOUTH AMATEUR RADIO SUPPLY (MSARS)

6631 Vallendar Cv., Bartlett, Tennessee 38135

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|-------------------------------|----------------|------------------|---------------------|
| Antennas                      | Antenna Mounts | Connectors       | Coax & Cable        |
| HT                            | Magnet         | UHF              | RG-213              |
| Mobile                        | Trunk Lip      | "N"              | RG-8/U Mini         |
| Base Station                  | Roof Mount     | SMA              | RG-58               |
| HF                            | Window Mount   | BNC              | 450 & 300 Ohm       |
| Wire                          | Swivel Ball    | RCA              | Rotor Cable         |
| LDG Electronics               |                | Accessories      | Miscellaneous       |
| Automatic Antenna Tuners      |                | RF Chokes        | Gordon West Books   |
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| Brand Specific Antenna Tuners |                | Antenna Switches | Fuse Holders        |
| Baluns                        |                | SWR/Power Meters | Remote Tuner Boxes  |
| Ununs                         |                | Mic Holders      | Dog Bone Insulators |

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**Mid-South Amateur Radio Supply**, (MSARS.COM) is owned and operated by local hams who are dedicated to promoting the hobby and providing help to anyone interested in ham radio. We actively support the local amateur radio clubs and are ARRL members.

**MSARS** offers free antenna building classes each year and help many new hams with guidance on their first radio, setting up a ham shack, programming a radio and much more. We are proud to be a part of the ham radio community and are *here to help you*.

*Please thank our sponsors by using their services and mentioning that you saw their ad in the Delta Club SPARKS Newsletter!*

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### DELTA AMATEUR RADIO CLUB

P.O. Box 342768  
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**DARC** Meeting: Second  
Tuesday of every month  
at Ellendale Church of Christ  
7365 Hwy 70, Bartlett TN



W4BS REPEATER SYSTEM  
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*We offer our continued thanks to EMHC ambulance company for generously providing their training room for the many ham radio classes given there.*

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Make check payable to Delta Amateur Radio Club (DARC) at monthly Delta Club meeting, or send US Mail to club mailing address at P.O. Box 432768, Memphis, TN 38134-2768. Camera ready means that ad copy is exactly as you wish it to appear, scaled to fit within the dimensions specified below. Ads may be submitted in .gif or .jpg format, or submitted as a hard copy (we will scan and place your ad for you).
3. Your ad order and payment must be received on or before the first Tuesday of the **month before** you want it to appear in Sparks.

**SPARKS ADVERTISING**

| FULL PAGE      |             |             | HALF PAGE      |             |             | ¼ PAGE         |             |              | BUSINESS CARD  |             |             |
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| <b>\$50.00</b> |             |             | <b>\$25.00</b> |             |             | <b>\$15.00</b> |             |              | <b>\$10.00</b> |             |             |
| for 3 Months   |             |             | for 3 Months   |             |             | for 3 Months   |             |              | for 3 Months   |             |             |
| 7" w X 8 ½" h  |             |             | 7" w X 4" h    |             |             | 3 ½" w X 4" h  |             |              | 3 ½" w X 2" h  |             |             |
| Jan<br>2016    | Feb<br>2016 | Mar<br>2016 | Apr<br>2016    | May<br>2016 | Jun<br>2016 | July<br>2016   | Aug<br>2016 | Sept<br>2016 | Oct<br>2016    | Nov<br>2016 | Dec<br>2016 |