

SPARKS

P.O. Box 342768 * Memphis, Tennessee 38134-2768 * Volume 23 * April 2017



Welcome to the Delta Amateur Radio Club

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

EMAIL: darc4you@gmail.com

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W4BS

REPEATER SYSTEM

146.820^{-107.2} 147.360^{+107.2}

146.625^{-107.2} 443.200^{+107.2}

224.420^{-107.2}

144.390 Digipeater

This month's meeting begins at 7pm on April 11, 2017, 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 Glen Popiel, KW5GP. Join Glen as he discusses new Arduinos and Arduino variants along with projects from his upcoming ARRL book, "More Arduino for Ham Radio." Glen is the author of ARRL's "Arduino for Ham Radio," which contains 19 Arduino-based Ham Radio projects and ARRL's "High Speed Multimedia for Amateur Radio." Glen is a Volunteer Examiner, member of QRP-ARCI, and the Olive Branch Amateur Radio Club. By day, he is a Network Engineer and Technology Consultant for Ciber, Inc., and the Mississippi Department of Education, specializing in Open Source solutions, and has worked in the computer and electronics field for over 40 years. He has just completed his latest ARRL book, "More Arduino Projects for Amateur Radio," which should be available in May. This new book includes 15 all new Arduino projects that introduce the newer, more powerful, inexpensive and easy-to-use members of the Arduino family and tells how you can create your own feature-rich Arduino-based projects for your home and ham shack.

Delta Club FCC testing sessions are held monthly except December. Registration begins at 5:30 PM; testing begins by 6:00 PM. Please bring a photo ID and another form of identification, copies of existing licenses or CSCEs, and your FCC Registration Number (FRN) if one has been issued. Please be on time for registration to allow our Volunteer Examiner (VE) team to complete their work prior to the club meeting. The 2017 test fee is \$15 (cash or check). Individuals receiving 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 email our VE Liaison, [Jeff Krause, AJ4GY](mailto:Jeff.Krause@AJ4GY.com), or call at 901-301-6776.

Congratulations to those who passed exams during Delta's March, 2017, test session: new Technician James Hammerich, KN4BVI, new Extra Clifton Johnson, W1CLJ, and a special shout-out to Tech Class 2-17 student John Reiners, KN4BVH, for his early passing of both the Technician and General exams.

President's Corner

Submitted by Ken Laseter, KI4AOH

Once again, Spring is here! Don't know about you, but this is my favorite time of the year with everything budding out and turning green again. This year my sinus problems are not as bad as last year. Sure hope the pollen is not causing you any sinus allergy discomfort.

I don't have much for this month's article so I'll mention a couple of things below and simply say that I look forward to seeing everyone at the Delta Club meeting this coming Tuesday evening at 7:00 pm.

FreeFest is this Saturday from 9:00 am til 3:00 pm at the Bartlett Station Municipal Center, 5868 Stage Road, Bartlett, TN. I'm looking forward to seeing you there and looking forward to seeing the new toys the exhibitors have. I'm sure one of them will have something that I can't live without.

Don't forget to check into the DARC 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 their family and busy schedule to call the net for us. They are some our most valuable assets!

If you have not renewed your club membership now is the time. Linda will be glad to accept your renewal application and cash, check or money order.

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 March 31, 2017

Submitted by Linda Laseter Treasurer

CHECKING ACCOUNT

BEGINNING BALANCE

| | | |
|--------------------------|---------------------|-------------------|
| BEGINNING BALANCE | as of March 1, 2017 | \$5,601.37 |
|--------------------------|---------------------|-------------------|

INCOME

| Date | | Amount | |
|---------------------|----------------------|------------------|------------------|
| 03/31/17 | Membership dues 2017 | \$ 270.00 | |
| 03/31/17 | Membership dues 2017 | \$ 90.00 | |
| TOTAL INCOME | | \$ 360.00 | \$ 360.00 |

EXPENSES

| Date | Check # | To | Description | Amount | |
|-----------------------|---------|-----------------|--------------------|--------------------|--------------------|
| 03/01/17 | 1410 | TN Sec of State | Annual Report | \$ (40.00) | |
| 03/01/17 | 1411 | MARA | Free Fest Donation | \$ (200.00) | |
| 03/14/17 | 1412 | Yaesu USA | Repeater | \$ (600.00) | |
| 3/31/2017 | 1413 | Joe Lowenthal | 80 Meter Filter | \$ (154.50) | |
| TOTAL EXPENSES | | | | \$ (994.50) | \$ (994.50) |

| | | |
|-----------------------|----------------------|--------------------|
| ENDING BALANCE | as of March 31, 2017 | \$ 4,966.87 |
|-----------------------|----------------------|--------------------|

CERTIFICATES OF DEPOSIT

| | Maturity Date | Balance as of | |
|---------------------------|---------------|---------------|--------------|
| Certificate of Deposit #1 | 10/10/2018 | 1/31/2017 | \$ 10,437.72 |
| Certificate of Deposit #2 | 10/19/2022 | 3/31/2017 | \$ 10,039.27 |

| | |
|-------------------------------|---------------------|
| TOTAL DARC CASH ASSETS | \$ 25,443.86 |
|-------------------------------|---------------------|

This Month's Board Meeting Minutes

April 4, 2017 -- Submitted by Barri Munday, WB4SWP

Attendees: Steve Frazier, KK4VPT, Scott Adams, KM4PMU, Barri Munday, WB4SWP, Joe Lowenthal, WA4OVO, Bill Stevens, WC9S, Dan Lasley, NE7JN, Ken Laseter, KI4AOH, Linda Laseter, KJ4CTX, Kevin Zent, K4KLZ, and Len Grice, W4MKS.

Ken called the meeting to order at 7:00.

Linda gave the Treasurer's Report and covered the budget year to date.

Kevin confirmed Glen Popiel, KW5GP, would present April's program on Arduinos.

Len discussed a press release for Field Day and said Jelly Thompson, N4HLT, will be speaking with Germantown mayor Palazzolo regarding Field Day preparations.

Joe just completed a Tech class with testing on the prior Saturday; we have five new Techs, two new Generals and one new Extra. There will one more class to demo equipment; Pat Lane, W4OQG, will demonstrate the long wire antenna. There will be a Tech class offered in July, date and place to be announced.

Joe also mentioned requesting quotes from bus companies for the Huntsville Hamfest bus trip. Unlike previous years, the bus will pick up passengers only from Germantown Baptist Church around 6:00 am. See Joe's bus trip article in this issue for more details.

Bill said he sent Yaesu a check for a new repeater but has received no confirmation of the order as yet.

Linda will man the GOTA station at Field Day, and Pat Lane is in charge of HF antenna placement. We will have sign up sheets for the operators as well as the public.

Len moved to adjourn at 8pm, Linda seconded.

Minutes of Last Month's Club Meeting

March 14, 2017 – Submitted by Barri Munday, WB4SWP

Ken Laseter, KI4AOH, opened the meeting with everyone introducing themselves by name and call sign.

Ham Hillard, W4GMM, moved to accept the Treasurer's report as well as the Board meeting minutes; neither second recorded.

Linda Laseter, KJ4CTX, announced that the YL net is doing well.

Jim Cissell, KI4I, is teaching a CW class in the HQ 101 class prior to the meeting.

Joe Lowenthal, WA4OVO, announced that a Tech class is on-going. There will be another Tech class offered after July 4th.

Jelly Thompson, N4HLT, told us he will offer a General class at Fire Station #4 on Forrest Hill Irene Road in Germantown.

David Webb, KV4QI, mentioned CERT plus training coming up at the Millington Fire Training Area, 5591 Dakar Street, Millington, TN, 29 Apr 2017, 11:00am - 4:00pm.

Bill Stevens, WC9S, talked about the Field Day organizational meeting on the following Monday night at Fire Station #4 in Germantown. He also reminded us of the estate sale and swap meet from 9-1 at the club meeting site on Saturday, March 18th. Coffee and donuts to be offered. FreeFest will be April 8th in Bartlett on Highway 64 from 9-3 with many good hourly prizes as well as the grand prize.

Don't forget the March of Dimes event on May 6th at Shelby Farms. Hams will be offered breakfast between 6-6:30. Check with Linda Laseter if you wish to volunteer.

David Campbell spoke about many different types of VHF/UHF antennas.

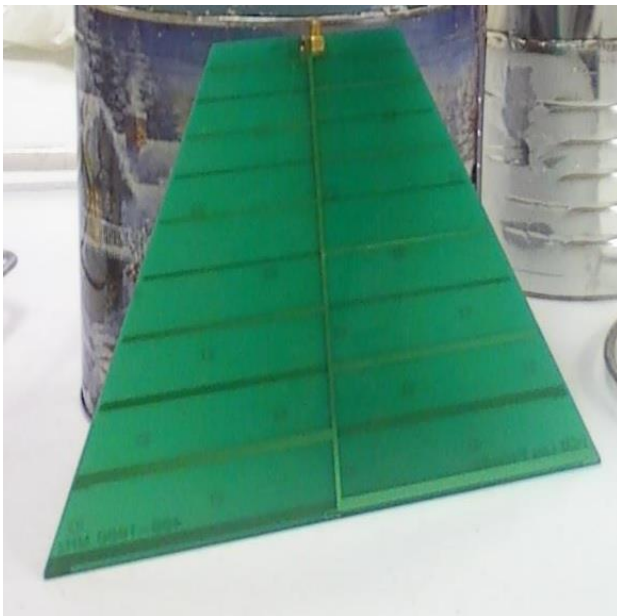
Last Month's Program

Submitted by Dan Lasley, NE7JN, contributions by

David Campbell, KD4NOQ, presented last month's program, "Antennas you may not have seen before."



David began by referring to the [web site](#) of Kent Britain, WA5VJB, who sells log periodic, Yagi, ultra wide band, and other types of VHF/UHF antennas.



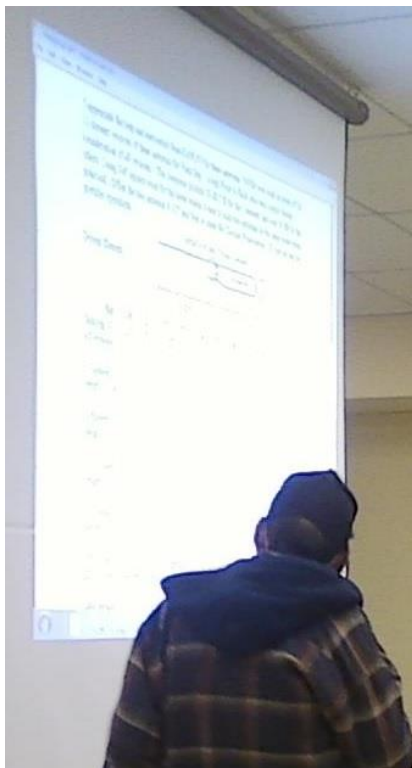
David says, "This is WA5VJB's 400MHz-1000MHz log periodic circuit board antenna. It was designed for the new OTA TV band (when all TV stations had to move to UHF). WA5VJB runs the antenna test range for 900MHz - 24GHz for Central States VHF Society."

With regard to "Antennas you may not have seen before," David was right: I'd never seen a printed circuit antenna of this type!



David showed us a home-brewed a two meter cubical quad antenna with reflector. He says, "It's a one wavelength loop antenna. I have used this antenna exclusively for transmitter hunting. You have to know your antenna pattern when using an antenna for this. How do you do this? Once I find the transmitter I have a field strength meter I hook up to the antenna and find its lobes and nulls."

The gain for this antenna is about four to six dB.



David presented a ton of technical information on VHF/UHF antennas, including several that he has built. He has spent considerable time on antenna ranges of the Central States and Southeastern VHF Societies where the performance of his antennas was measured by an impartial group of antenna experts. We were pleased to see that David's antennas perform well when compared to a wide range of other amateurs.



David described a number of "[cantennas](#)" he has built (several shown here with the printed circuit log periodic antenna). The interested reader can find a wealth of information on cantennas on the Internet.

We thank David for an interesting, detailed look at some of his experiences with VHF/UHF antennas.

Estate Sales

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

Bill Stevens, WC9S, will take the estate sale equipment to the April 8th FreeFest and, if anything is left, will take the remainder to the April Delta Club meeting. If you have questions about any of the equipment, please give Bill a call at 901-603-3448. Between price reductions and demand at FreeFest, Bill expects to sell much of this equipment. Don't wait too long and miss out on something you want!

Volunteers Needed for March of Dimes March for Babies!

Submitted by Linda Laseter, KJ4CTX

Saturday, May 6, 2017, is the date for this year's March of Dimes March for Babies. We will be back at Shelby Farms Park this year supporting the March of Dimes and enjoying all the new facilities in the park and hopefully some beautiful weather. I need a few more volunteers to help out from 7:30 a.m. until noon. If you can help, please send an email to [Linda Laseter](#) or call Linda Laseter at 901-268-1766. I appreciate everyone's support. Thank you and I look forward to working with you.

Amateur Hardware Update

Article and image submitted by James Butler, KB4LJV

Many times we need composite video monitors to use for Amateur television or as displays for older computers we still run with our favorite software. These older displays are harder to get now that VGA monitors are the norm. One good product is an adapter for your computer monitor that allows you to run composite video input on your VGA monitor screen. The unit has a pass through mode so it shows your normal computer screen, but at the push of a button a composite video signal can be displayed. Extra cables that are needed are included. I hooked mine up to my computer and hooked up an ATSC converter so I can switch between the computer and the news channel during storms to get weather updates. The unit works great and is available on Ebay for about \$12.00. Do a search for "composite video to VGA converter".

Editor's notes: See the next page for the full-size image that James contributed. James told me the ATSC (Advanced Television Systems Committee) standard is the digital equivalent of the NTSC (National Television System Committee) analog TV standard. Thanks, James, for the explanation.

Amateur Packet Update

Submitted by James Butler, KB4LJV

Many times we want to buy electronics parts and tools to use in the Amateur radio hobby. One company that has a lot of good stuff is Debco Electronics. They carry RF connectors, Powerpole tools and connectors, coax and coax tools, and electronics tools. They also carry resistors, toroids, rectifiers, ICs, semiconductors, and electronics assembly hardware. They even carry a line of antenna accessories. If you looking for electronics parts and tools check out what Debco has for you. The web address is <http://www.debcoelectronics.com/>



HQ 101

Submitted by Dan Lasley, NE7JN

In the March HQ 101 session, Jim Cissell, KI4I, introduced the Morse code sounds of the letters F through J. As Jim sent patterns of dits and dahs, he asked the attendees to speak the letter as soon as they recognized it. Jim stressed that we should listen to the sounds of a letter without counting individual dits or dahs.

In the April HQ-101, which begins in an upstairs meeting room on club meeting night at 6pm, Jim will continue with letters K through O. If you are interested in becoming a CW operator, please join us for this month's HQ 101, even if you missed any prior HQ 101 CW sessions!



Photo by Dan Lasley, NE7JN

Pictured are (L-R), James Hammerich, KN4BVI, Ray Miller, AA4UK, Janice Shaner, KX4BB (back to camera), Harold Crouch, KC9SZC, Glen Ellis, KK4LPG, and Jim Cissell, KI4I.

Thanks again, Jim, for Elmering us!

Delta Ham License Training, 2017

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 2017 from Delta Classes

5 Technician
2 General
6 Extra

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

The new [Technician question pool](#) is effective July 1, 2014, through June 30, 2018. You will need the [ARRL Ham Radio License Manual 3rd Edition](#) to study for the Technician exam.

The new [General question pool](#) is effective July 1, 2015, through June 30, 2019. You will need the [ARRL General Class License Manual 8th Edition](#) to study for the General exam.

The new [Extra question pool](#) is effective July 1, 2016, through June 30, 2020. You will need the [ARRL Extra Class License Manual 11th Edition](#) to study for the Extra exam.

Current Classes

Tech Class 2-17: February 25 -- April 15, 2017

Tech Class 2-17 is being held on six Saturdays from 9am to 1pm at EMHC ambulance company training room, 6872 Appling Farms Parkway, from February 25th to April 15th except for March 25th and April 8th.

There were 11 students in the beginning with six finishing the class that includes two YLs. The instructors were Joe Lowenthal, WA4OVO, Perry Hayes, N4PSH, Len Grice, W4MKS, Pat Lane, W4OQG, and David Webb, KV4QI, with assistance by Tom Dichiara, AC5MR.

The WCARS FCC VE team led by Gary Weatherford, W5EMA, provided the test session on April 1st. Congratulations to John Reiners, KN4BVH, who tested early at the Delta Club meeting test session on March 14th earning both Tech and General. He then earned his Extra Class license at the class test session on April 1st. Congratulations to Rob Stalcup, KN4CHR, for earning his Technician and General licenses. Congratulations to Teresa White, KN4CHS, Olivia Ritter, KN4CHT, and Jacob Haynes, KN4CHW, for earning their Technician licenses.

On April 15th the equipment demonstrators will be Rick Tillman, WA4NVM, on satellite; Pat Lane, W4OQG, on Winlink and Rick Pellicciotti, KJ4NWQ, on APRS.



Tom Diciara, AC5MR, demonstrating his Icom IC-7300. Photo by Joe Lowenthal, WA4OVO.



Michael Knight, KK4IOH, on digital modes. Photo by Joe Lowenthal, WA4OVO.

Planned Classes

Tech Class 3-17 is being planned to start in the second week of July on either Monday or Thursday nights for six weeks from 6:15pm to 9:15pm. The location will be determined closer to class time. If interested in the Technician class, send an email to [Joe](#) with Subject line: Tech Class and name, email address and cellphone in the text area.

Women in Radio

Submitted by Patricia Phillips

Editor's note: we are continuing a new column about women with significant accomplishments in the art and science of radio. Each article is written by a woman and most of the writers are hams. YLs, please contribute more articles!

The year was 1906 -- 14 years before women were given the right to vote, let alone allowed any thought of a career in technical or scientific matters -- but Gladys Kathleen Parkin, age five, was too busy running a wireless radio station with her brother to be affected by the sexist nonsense outside her family home. Relocated to San Rafael, CA after the great San Francisco earthquake, the family was thriving, including the precocious Kathleen, as she was called.

The development of the technology originally called "Hertzian waves", based on electromagnetic radio waves discovered by Heinrich Hertz in 1886, had taken a giant leap forward when the first practical wireless telegraphy transmitters and receivers were developed by Guglielmo Marconi beginning in 1895. Earlier terms referring to the transmissions had been displaced by the common use of "radio" or "radiotelegraphy", and Morse Code was the common language of the airwaves.

One of the first wireless stations in California was operated for six years by young Parkin and her brother John. Kathleen's fascination with and expertise in the technical field grew quickly, until she achieved a first in wireless communications and in female history. By the age of 15, she obtained a first-class commercial radio operator's license from the United States Government with the call sign 6SO. The license entitled her to operate any grade of wireless station and to secure employment on vessels. Miss Parkin was the youngest successful female applicant for a radio license ever to be examined by or pass government testing.

But before receiving the commercial license, the young woman Parkin had already made history. Prior to receiving her professional license, while still a child, she held an amateur radio license for six years, to the age of eleven. She applied for the government license on a whim, just to see whether she could pass or not, and passed the examination with a high score. She was the third woman to successfully pass the examination for a first-class radio license, and the first woman in California.

Not to mention that Parkin was a cover girl of sorts, applauded for her technical achievements by being featured on the cover of the industry magazine, The Electrical Experimenter, in October 1916, when she was 15. She was featured in several other publications throughout her life, including the 1916 San Francisco Chronicle.

The newspaper trumpeted: "Girl 15 Years Old Gets Radio License: Gladys Parkin Receives High Rating San Rafael Miss Says She May Go to Sea With Brother, Who Is an Operator." To the amazement of many, Parkin was perfectly qualified to be a professional telegrapher.

With the female vote still years away, the dedicated teenager had her own thoughts on the rapidly-growing highly technical field of wireless.

"With reference to my ideas about the wireless profession as a vocation or worthwhile hobby for women, I think wireless telegraphy is a most fascinating study, and one which could very easily be taken up by girls, as it is a great deal more interesting than the telephone and telegraph work, in which so many girls are now employed. I am only fifteen, and I learned the code several years ago, by practicing a few minutes each day on a buzzer," she told the Electrical Experimenter.

She continued: "I studied a good deal and I found it quite easy to obtain my first grade commercial government license, last April. It seems to me that everyone should at least know the code, as cases might easily arise of a ship in distress, where the operators might be incapacitated, and a knowledge of the code might be the means of saving the ship and the lives of the passengers."

"But the interest in wireless does not end in the knowledge of the code. You can gradually learn to make all your own instruments, as I have done with my 1/4 kilowatt set. There is always more ahead of you, as wireless telegraphy is still in its infancy," she declared. Pay careful attention to Parkin's reference to making your own equipment. That is exactly what she did, including the creation of a kilowatt spark-gap transmitter.

Throughout her life, Parkin made her own instruments so that they would meet her exacting specifications. No doubt had there been generic off-the-shelf models, she would have eschewed them in favor of her own hardware, known for its precision and accuracy.

Parkin's early childhood interest in what began as a challenging hobby for a superior mind grew into a full-time business. She and her brother both managed and worked in the family radio business, Parkin Manufacturing Company.

By 1925 the company was especially well-known for its Crystal Radio set, precisely created with Bakelite board, single tuning control, 4 screw terminals for antennas and other forward-looking procedures. Throughout her life, Parkin continued to fine-tune ever more reliable and popular wireless equipment.

Although a search of eBay did not turn up any Parkin Company models on sale, the growing interest in the field is revealed in a 1917 booklet: Audel's Easy Lessons in Wireless Telegraphy. In comparison to the developing beginner's market, of course, Parkin was already a licensed commercial operator.

An oral history of Parkin is held in the Anne T. Kent California History Room Oral History Program at the Marin County Free Library. Published in 1977, it contains thirty-seven pages of her reminiscences of her days in the wireless world.

A star in the early wireless world, Parkin was well-known not only to other amateur operators in her area by the age of 25, but, thanks to publications and her hardware development for the Parkin company, in far-flung worlds well beyond her home town. Parkin died at age 88,

having left her mark on women's history, and the crucial development of wireless hardware and techniques.

Patricia Phillips is an (ostensibly) retired Public Information Officer from Kennedy Space Center where she was a key member of the Space Shuttle launch team as well as an expert on technical spin-offs and biomedical research. An award-winning writer for 50 years, she's written for many international and national publications. Most recently, she's been a featured writer for an Oklahoma magazine. Also a poet, Ms. Phillips has received national acclaim for her first book, Freddie Came Home and Other Coyote Tales, and her work is taught at the university level. She's been a keynote speaker at the University of California at Berkeley for her poetry. She is at work on new poetry as well as a historical book. She's also a popular Native American storyteller and accomplished platform speaker. She says she deeply appreciates the emergency and support work that hams provide for us all in times of need.

Huntsville Hamfest Bus Trip

Submitted by Joe Lowenthal, WA4OVO, Director of Training

DARC is sponsoring a 50-passenger bus trip to go to the Huntsville Hamfest on August 19, 2017. There is a graduated scale fare for the bus trip. The fare is \$60 if paid by May 31, 2017. The fare is \$65 if paid by June 30, 2017, and \$70 if paid after June 30th. The fare includes the \$9 hamfest entry ticket. There will be 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 can not go. Let me know.

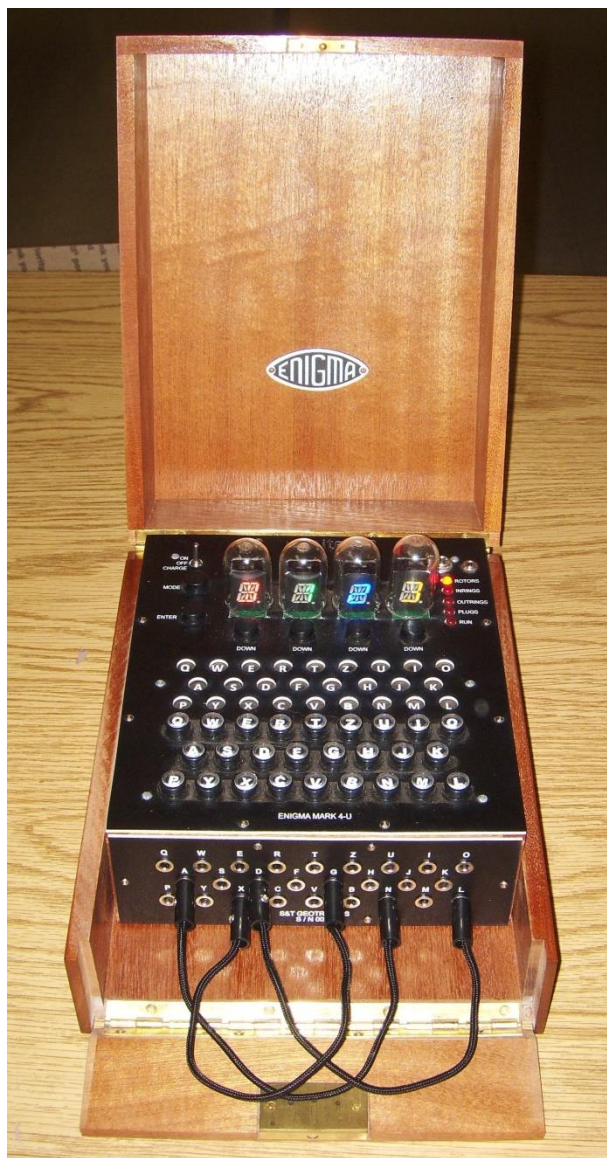
Cash or checks will be accepted for payment. Make checks payable to Delta Amateur Radio Club. You can pay at a meeting. You can also send your check to Joe Lowenthal, WA4OVO, 6675 Ashbridge Cove, Memphis, TN 38120. Please include your name, callsign, cell phone number, and email address. **Reservations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

The bus will leave Germantown Baptist Church, 9450 Poplar Avenue at Johnson Road, Germantown, TN at 6:00am. The bus will leave Huntsville immediately after the 4pm door prize drawing and return to Germantown Baptist Church at approximately 7:30pm.

Germantown Baptist Church has asked us to park in the back on the northeast side of the church so there will be security cameras on the cars like last year.

The Enigma is Alive and Well!

Text and photos by Dan Lasley, NE7JN, contributions by Marc Tessier, KM4YWV,
and James Sanderson, KM4YWT



As I was exploring the March 4th ham fest at Birmingham, I walked around the end of a table and came to a screeching halt! There sat an Enigma, the famous German encryption device from World War II! It couldn't have been an authentic Enigma, however, as four color LED displays were scrolling text where the rotors should be and the device was somewhat smaller than an authentic Enigma. I met [James Sanderson](#), KM4YWT, one of the designers, and he told me how the electronic version of the Enigma came to be. Later I met his partner, [Marc Tessier](#), KM4YWV, who filled in more details of their amazing story.

In the [full-sized version](#) of the image of the Enigma replica at the left, you can more clearly see the LEDs are indicating B, 1, 2, and 3. This is part of the rotor setup for the four-rotor navy Enigma. The Enigma replica can also function as a three-rotor army or Luftwaffe Enigma.

The plugboard is shown here with three wires. Each wire exchanges one pair of letters (here, A-N, G-X, and D-L). [Wikipedia](#) says an Enigma without a plugboard "... could be broken relatively easily using hand methods, while attacking versions with a plugboard was much more difficult."

Their project began as an [instructables.com](#) page, then turned into an Open Source Enigma Replica [Kickstarter](#) project which raised more than \$62,000! (All you entrepreneurs out there should take note of this figure!) Marc quit his job and turned to the replica on a full time basis.

Marc told me he maintained a [blog](#) while he and James were designing and building their proof of concept replica.



James Sanderson, KM4YWT (left), and Marc Tessier, KM4YWV, with their [ScrollaText](#) and [Enigma replica](#) products.

Stephen Cass, senior editor at IEEE Spectrum, acquired an Enigma replica kit from James and Marc. He built the kit and wrote "[Build Your Own Enigma Cipher Machine, Alan Turing not included.](#)"

Don Rotolo, N2IRZ, wrote "[DIGITAL CONNECTION: Encryption and Enigma Machines](#)" in the May, 2015, issue of CQ Magazine and mentioned the Enigma replica featured here. Note: the on-line article is available only to CQ Magazine subscribers.

In writing about the Enigma in the October, 1988, issue of Scientific American, A.K. Dewdney repeats a phrase from one of the Sherlock Holmes stories: "What one man can invent another can discover." So it was with German military cryptography in the 1920s and later decades. As described by Stephen Budiansky's "Battle of Wits" (perhaps the most interesting book I've read on the Enigma), the Polish Cipher Bureau was, in the early 1920s, "producing a steady stream of decrypts of German traffic collected by its listening stations." By mid-1928 that steady stream dried up. Analysis of the unbreakable German messages led the Poles to suspect a machine was encrypting the traffic.

Budiansky says soon thereafter the Poles got a lucky break: they received a misdirected package that contained a German commercial (not military) Enigma. Upon ordering and receiving their own commercial Enigma, the Cipher Bureau found they could not decipher German military traffic and suspected that the wiring of commercial Enigma rotors (one of the components of message encryption) differed from the wiring of military Enigma rotors.

After the Polish Cipher Bureau spent four fruitless years trying to decrypt German military Enigma traffic, they brought in Polish mathematician Marian Rejewski in late 1932. By early 1933, thanks to Rejewski's insights and hard work, they were reading German messages.

In July, 1939, British and French government crypto experts met with representatives from the Polish Cipher Bureau in Warsaw. During this meeting, the Poles provided copies of the German military Enigma to the British and French, along with documentation on what they had accomplished over the years. The British Enigma copy arrived in England on August 16th. Sixteen days later Germany invaded Poland, thus starting World War II.

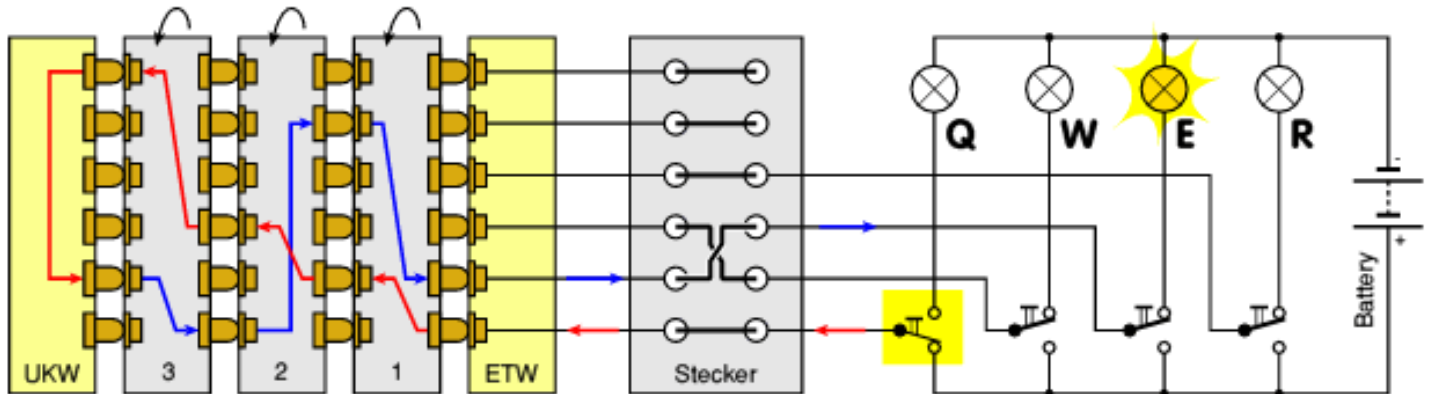
The story of the use of Enigma against Germany becomes more and more intriguing from this point in history through the end of the war and beyond. See Budiansky's or other books on the Enigma or search the Internet for the complete story.

As shown in the image of a simplified military Enigma I below, pressing the Q key allows current to flow from the battery through the *Stecker* (plug board), ETW (*Eintrittswalze*, entry wheel), rotors 1, 2, 3, UKW (*Umkehrwalze*, reflector), back through rotors 3, 2, 1, and return trips through the entry wheel and *Stecker* to light the indicator lamp E as the encrypted output. Now let's see how encryption occurs.

The Q signal moves right to left, unchanged, from the depressed key through the *Stecker* and the entry wheel, but as the signal makes its first traversal (in red) of rotor 1, Q becomes a different letter, an action repeated in rotors 2, 3, and the reflector. As the signal now moves left to right (in blue) through rotors 3, 2, and 1, it makes transitions to three different letters.

Upon arriving again at the *Stecker*, one final letter exchange occurs with the result that E lights up on the letter display.

Pressing Q again causes a different output, which could be any letter except Q itself. The change is due to the rotation of one position of rotor 1. After rotor 1 moves 26 times, rotor 2 moves one position. After rotor 2 moves 26 times, rotor 3 moves one position. As you can see, because of rotor movement, every input takes a different path through the Enigma to the output. Exchanging letter pairs via the *Stecker* makes encryption even more devilishly difficult to decrypt.



From <http://www.cryptomuseum.com/crypto/enigma/i/index.htm>, used with permission from Paul Reuvers, PE1BXL.

Using an on-line Enigma emulator with default settings, I pressed Q 48 times; here is the encrypted result:

CNVI WFWO XFPW CIKY XHWH XRAN PPHS YDHB GNHD KEJB BJKS FLCX

As is evident in this message, an input of Q never produces an output of Q. This was one of the shortcomings of the Enigma.

If you would like to see an authentic Enigma, visit the following museums:

[Military Communications and Electronics Museum](#), Kingston, Ontario, Canada; [Museum of Science and Industry](#), Chicago, IL; [Canadian War Museum](#), Ottawa, Ontario, Canada; [Bletchley Park Museum](#), Milton Keynes, U.K.; Smithsonian Museum, Washington, D.C.; [Naval Academy Museum](#), Annapolis, MD; [Computer History Museum](#), Mountain View, CA; [National Cryptologic Museum](#), Fort Meade, MD; [Discovery Park of America](#), Union City, TN.

If you aren't afraid of a little math, see [The Cryptographic Mathematics of Enigma](#) by Dr. A. Ray Miner, and [Solving the Enigma: History of the Cryptanalytic Bombe](#) by Jennifer Wilcox. Both authors were employees of the National Security Agency at the time of writing.

Thanks to James and Marc for a very interesting look into history. Guys, as your next project, how about a SIGABA/ECM Mark II replica?

March Swap Meet

Submitted by Dan Lasley, NE7JN, most photos by Len Grice, W4MKS

I hope you were able to attend the March swap meet. We had coffee and donuts, lots of conversations, and more goodies than you could haul away in a Mac truck! Check out some of the attendees:



Photos by Len Grice, W4MKS



Photos by Len Grice, W4MKS



Bill Stevens, WC9S, and estate sale items.

Photo by Len Grice, W4MKS



Photo by Len Grice, W4MKS



Photo by Dan Lasley, NE7JN

The tools, equipment, and parts shown here, seemingly stretching halfway to the Mississippi state line, are from the estate of Bob Gruner, W4UFT. We miss you, Bob.

Art Barnett, WA4PSS (shown here), and Jim Cissell, KI4I, are Bob's estate wranglers.

Help Still Needed

Submitted by David W. Webb, kv4qi

Community needs your help! Please EMAIL to volunteer: dwebb@certplustraining.org

Show Time: 1100 hrs. - Saturday, April 29th, 2017, Millington Fire Department sponsored "Rain or Shine" Preparedness Drill at 5591 Dakar St. Fire Training facility

What Help Is Needed?

- Incident Command Staff position (must be a CERT/equivalent program graduate)
- CERT Activity (Team) Observer/Evaluator
- Safety Officer
- Ham Radio Operator (bring your Handi-Talkie)
- CERT Team Mentor/Participant (Bring your own CERT gear)
- Injury Role-play Participant (old clothes that you don't mind getting "bloody")

Thanks for your support!



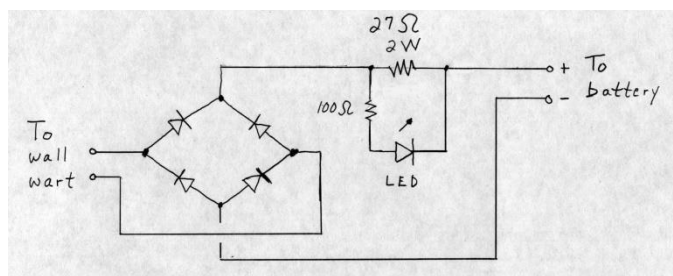
Wall Wart Warnings

Submitted by Dan Lasley, NE7JN

Incident #1. A few months ago I plugged in the cordless drill to charge its NiCad (nickel cadmium) battery, a process that usually takes about four hours. About ten minutes later the LED went out, not a good sign. When I opened the charger, the smell of burned components greeted me. I found a quarter-watt resistor burned black, the printed circuit board underneath was scorched but otherwise looked ok, but no other signs of problems.



I replaced the burned resistor with a two-watt version but the charger was still dead. I poked around with a voltmeter and discovered the wall wart was providing no voltage, so I unsoldered and replaced the wall wart. Here's something odd: if you look closely (left), you'll see the wall wart's output claims to be 14.5 volts DC, yet the charger circuit has a diode bridge (below)!



Why would a manufacturer add an unnecessary diode bridge if the wall wart is putting out DC?

Since the wall wart is toast, we'll never know whether its output was AC or DC.

Incident #2. Robert Spann, K4RAS, was looking for a 12VDC wall wart. I offered to scrounge one for him. I found one in my junk box, but when I measured the output, it was over 18 volts with no load. Allen White, WB4MIO, noted that transformer-type wall warts have poor regulation and are notorious for delivering more than the rated output voltage with no load.

The moral: if you want to use a scrounged wall wart, be very careful about AC vs. DC, voltage ratings, and polarities. You don't want that expensive battery-powered gizmo to let its magic smoke escape!

FreeFest Coming in April
Submitted by Dan Lasley, NE7JN

What is FreeFest? It's a hamfest sponsored by [Mid-South Amateur Radio Association](#) (MARA). It will be in operation from 9:00 AM to 3:00 PM on Saturday, April 8, 2017.

What's free about FreeFest? Admission, parking, tables, and just about everything else except for food and additional raffle tickets. Even the first raffle ticket is free!

Where is it? 5868 Stage Road in Bartlett, just east of the railroad tracks. Additional parking is in the large parking lot west of Walgreens, then walk across the small bridge and look for crowds entering the building. The MARA web site has [directions](#) in case you haven't been there before. The talk-in frequency is 147.03 MHz with a PL tone of 107.2 and a +600 KHz offset.

What will I see at FreeFest? The better question is what won't you see! You'll find ham equipment vendors large and small, individuals selling nearly anything you can imagine that's ham related and some things that aren't ham related. Most of the action takes place inside, but with the cooperation of the good-weather gods, some vendors will be outside as well.

What else is going on at FreeFest? If all of the above still leaves you wanting, you can pass your first ham exam or upgrade an existing license in the morning and attend a seminar in the afternoon. DON'T MISS the concession stand! If that's still not enough, check out the list of [prizes](#) you can win.

What else should I know? 100% of raffle ticket proceeds go to [Le Bonheur Children's Hospital](#), a leader in pediatric medicine.

Volunteer Needed!
Submitted by Dan Lasley, NE7JN

Richard Martin, K4DXF, recently suggested that folks bring books and magazines to club meetings with the idea of delivering these items to the local Veterans Administration Hospital. We are looking for a volunteer to collect items brought to the club meetings and deliver these donations to the V.A. Hospital.

If you are interested in volunteering for this project, please contact [me](#).

YL News

Text and photos by Linda Laseter, KJ4CTX

YL LUNCHEON – This month (March) we met at the Olive Garden for some Italian cuisine. As usual, we ordered a variety of menu items (spaghetti, ravioli, and broccoli chicken fettuccine) just to name a few of the items ordered. Needless to say we had way more on our plates than we could eat, especially after eating salad and breadsticks. And guess what! They had buy one and take one home. We all thought that was a great idea even though the waitress did get a little confused about whether salad or soup came with the take home items. I don't think anyone had to cook that night; I know I did not!

Jackie, KG5DMW, won the March door prize that was a cute little owl wind chime. I was hoping to win....I love wind chimes!

Our April luncheon is as follows:

11:30 a.m.

Saturday, April 29, 2017

Colton's Steakhouse & Grill

8030 Hwy 64 (just west of the Wolfchase Mall)

Memphis, TN 38133

901 383-8445



(L-R) Janice, KX4BB, Jan, KK4VQA, Jackie, KG5DMW, Betsy, KD4KOM, Gale, KI4VDI, Linda, KJ4CTX. Not pictured: Ann, WB4FAA.

YL NET – Please welcome Janice, KX4BB, as a new YL Net Control Operator. Janice is doing an excellent job calling the Net. She has added a few of her own touches to the YL Preamble that sound very professional. She would love to hear more YLs on the air, as would I. Please join us and check-in this Saturday night.

If you would be interested in becoming one of our YL Net Control Operators, please send an email to [Linda Laseter](mailto:Linda.Laseter@deltaamateurradioclub.com) or call 901 268-1766. It is easy and fun. Just follow the Preamble and jot down the call signs (suffix only) of the hams who check in. You gain experience on the radio and it builds your confidence as well. We never know who will check-in and it is always exciting to hear from someone new.

Please join us each Saturday night at 8:45 p.m. on the 146.820 repeater.

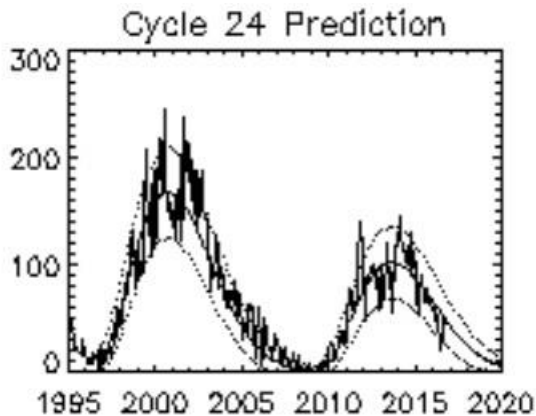
33,
[Linda Laseter](mailto:Linda.Laseter@deltaamateurradioclub.com), KJ4CTX



Another photo of the YLs. This one adds Ann, WB4FAA (far left), and drops Linda, KJ4CTX.

HF Propagation: Sunspots? We Don't Need No Stinkin' Sunspots!

Submitted by Dan Lasley, NE7JN



I was chasing DX during a contest on Saturday, February 25th. We are in the downward-trending part of the current eleven year [solar cycle](#) (cycle 24), so you wouldn't think HF bands above 20 meters would be very active; [spaceweather.com](#) said the [sunspot number](#) for the day was 27. As the diagram indicates, this number is pretty weak compared to the top of the last two solar cycles.

<https://solarscience.msfc.nasa.gov/SunspotCycle.shtml>

I found a little activity on 10 meters, more on 20 meters, but 15 meters was jumping! Over the course of several hours on the 25th, I heard about 25 countries (mostly on 15M) and logged two All Time New Ones (Switzerland and Corsica).

I also worked the CQ WW WPX contest on March 25th. I heard two countries on 10M, 16 countries on 15M, and 11 countries on 20M. Once again, 15M was hot and the sunspot number was only 12, even lower than February 25th. I snagged one All Time New One (Cape Verde) on both 15 and 20M.

I am, of course, being facetious about not needing sunspots. In general, the higher the sunspot number, the better DX conditions are, especially on the upper HF bands.

As you can see in the diagram, the predicted bottom of the current solar cycle is still about three years away. That doesn't mean we will have no DX until then. It does mean if you want to work DX, plan ahead and look for the major contests when many folks will be active on the HF bands.

Even though we have at least three years until we see an uptick in HF propagation, I was amazed to learn that the first sunspot of the next cycle, cycle 25, has already appeared! How do we know this sunspot is part of cycle 25 and not cycle 24?

See "How's DX?" by Bernie McClenny, W3UR, on pages 99-100 of the April, 2017, QST. Bernie provides some interesting information, including several links, on sunspots and solar cycles.

DX News

Submitted by Dan Lasley, NE7JN

This information is courtesy of the ARRL's DX news emails.

ANTARCTICA. Francois, F4HLT is QRV as FT3YL from the Dumont d'Urville Station Terre Adelie on Petrels Island, IOTA AN-017, until February 1, 2018. Activity is on 20, 15 and 10 meters using SSB and various digital modes in his spare time from 0900 to 1100z and after his work duties. QSL via F6KPO.

ANTARCTICA. Alex, UA1OJL will be QRV as RI1ANO from Bellingshausen Base, King George Island, IOTA AN-010, from April 2017 to March 2018. He will be active in his spare time on the HF bands using CW, SSB and various digital modes. QSL via RN1ON.

BARBADOS, 8P. Dean, 8P6SH is QRV with special call sign 8P50B until December 31 to celebrate the 50th anniversary of independence from Great Britain. QSL via KU9C. *Editor's note: here is a chance to snag a DX entity for only about a buck (total) for postage.*

ST. MARTIN, FS. Serge, VE1KG is QRV as FS/VE1KG until the end of April. Activity is on the HF bands. QSL direct to home call.

NORWAY, LA. Special event station LA1742K is QRV until the end of 2017 to commemorate the 275th anniversary of the city of Kristiansund. QSL via LA6K.

MALI, TZ. Laurent, F5IXR is QRV as TZ5XR until 2019. Activity is on 40, 20, 17, 12 and 10 meters using mostly CW. QSL direct to home call.

CHAGOS ISLANDS, VQ9. Jim, ND9M is QRV as VQ917JC from Diego Garcia Island, IOTA AF-006. His length of stay is unknown. He is generally active from 1200 to 1600z, with a focus on 30, 20 and 17 meters. He may be active on the satellites as well. QSL to home call.

GUAM, KH2. Santos, EA4AK and Tony, EA5BY are QRV as AH2P and KH2BY, respectively, until April 10. Activity is on 160 to 6 meters, including 60 meters, using CW, SSB and various digital modes. They may focus on the low bands. QSL to home call. *Editor's note: try to snag this one, not many hams on Guam!*

WAKE ISLAND, KH9. Randy, WW6RG plans to be QRV as WW6RG/KH9 beginning March 31 while on work assignment. Activity may be on 40 and 20 meters using SSB and QRP power. QSL to home call. *Editor's note: another chance to snag a DX entity for only about a buck (total) for postage. This one will be tough – QRP from Wake Island!*

CZECH REPUBLIC, OK. Special event station OL75SILVERA is QRV until April 14 to commemorate Operation Silver A, a British/Czechoslovak military operation that took place in 1942. QSL via OK1MOW.

Odds-n-Ends

Submitted by Dan Lasley, NE7JN

[How to tin](#) Litz-Wire. I tried the second method and it works very well. This method can, however, be dangerous, so observe the precautions!

After 66 years, International Crystal is [going out of business](#).

From the ARRL Contest Update for February 22, 2017:

- [Understanding SWR by Example: Take the mystery and mystique out of standing wave ratio](#), by Darrin Walraven, K5DVW.
- "Dennis, N6KI, suggests this website to help identify signals you might hear on the air. It features [audio snippets and waterfall displays](#) of the digital signals you're most likely to encounter."

WA7BNM offers his amazing [Contest Calendar](#).

For all you homebrew QRPers out there, see the [Tuna Tin 2 40th Anniversary Issue](#). The [grpme.com](#) folks have lots more kits available.

The [GQRP Component Data Book](#) has parts information on transistors, op amps, regulators, mixers, PIC pinouts, capacitor, and more.

The ARRL Letter for March 30, 2017, tells us "New Bands! [FCC](#) Issues Amateur Radio Service Rules for 630 Meters and 2,200 Meters."

I found a document formerly classified as Confidential on "[Sigint Technical Primer-I. Antennas: How they work; what the different types of antennas can do](#)." On the fourth and fifth pages, you'll see a black-bordered box with no content inside. That is called redacting and is a method of protecting sensitive information in an otherwise declassified document. If you think you know the contents of the redacted boxes, let me know!

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.

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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Board members beginning their positions in 2017 are listed in *italics*.

Public Service Events

If you are a coordinator for any of these events, please review the listed information. Please [email](#) corrections or additions.

| 2017 Date | Event | Contact Information |
|------------------|---|---|
| Jan. 15 | Swamp Stompers 50K/25K Run | Keith Barton, KT4EP |
| May 6 | March of Dimes March for Babies | Linda Laseter, KJ4CTX |
| TBD | Diabetes Tour de Cure | Pat Lane, W4OQG |
| Sep. 9-10 | 2017 Bike MS: FedEx Rock-N-Roll | Darrell Sheffield, KK4D |
| Oct. 7 | Bluff City Blues 100 Ride | Danny Banks, KJ4FXZ |
| Dec. 2 | St. Jude Marathon | Roger Schlichter, WR4R |

Note: Dates in **red** are tentative.

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 2017 Annual Memberships! Download the latest Delta Club [Membership Application Form](#). The 2017 membership renewal fee remains a very modest \$20 for an individual, with an additional \$5 fee for family membership. Thanks for Your Active Support of Delta Amateur Radio Club!

Memphis Area VHF/UHF Nets

Updated September, 2016

| Name of Net | Freq. MHz | Tone | Local Time | Day of Week |
|-----------------------------------|----------------|------------------|--------------|--------------|
| Delta Club Information Net | 146.820 | - (107.2) | 8:00p | Daily |
| YL Net | 146.820 | - (107.2) | 8:45p | Sat |
| Mid-South Barefooted Bullfrog Net | 146.535 | [simplex] | 7:30p | Daily |
| Secret Service Net | 224.780 | [no tone] | 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

DELTA CLUB ADVERTISEMENTS

See Advertisement Order Form for Instructions.



MID-SOUTH AMATEUR RADIO SUPPLY (MSARS)

6631 Vallendar Cv., Bartlett, Tennessee 38135

tel: 901-371-9700 • fax: 901-266-3374 • web: www.msars.com

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|--------------------|----------------|------------|---------------|
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| 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 |
| Remote Tuners | Power Poles | Coax Seal |
| 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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Operators**

Steve
W5VAA

Rosalinda
WN2V

Ham
W4GMM

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
Memphis, TN 38134-2768

DARC Meeting: Second
Tuesday of every month
at Ellendale Church of Christ
7365 Hwy 70, Bartlett TN



W4BS REPEATER SYSTEM
146.82- 147.36+ (107.2Hz tone)
224.42- 443.20+ (107.2Hz tone)



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

This space is available!

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

**Delta Amateur Radio Club
Sparks Advertising Order Form**

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Name: _____

Call Sign: _____ Phone: _____ Email: _____

TO PLACE AN ORDER

1. Mark the box below indicating the ad size you are purchasing and the months you want your ad to appear in Sparks.
2. Submit this completed order form and your camera ready ad, via email at sparks@carbheat.net
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.

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| 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 2017 | Feb 2017 | Mar 2017 | Apr 2017 | May 2017 | Jun 2017 | July 2017 | Aug 2017 | Sept 2017 | Oct 2017 | Nov 2017 | Dec 2017 |