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### **The President's Corner: David KR4OE**

Happy 2018! Does anyone know what happened to 2017? It sure went by much too fast but what a year it was. CFARS again took first place in the NC QSO Party, eleventh in the 2A category nationally in Field Day and first in North Carolina, and we had the best Swapfest to date. It is hard to believe that in 2018 the CFARS Swapfest will celebrate twenty years. We closed out the year with a great Christmas dinner with a big crowd of members and some great door prizes. Speaking of door prizes, to all of you who won those radios we want to hear you on our nets and any time in between. Also another great year for the Possum Trot Chapter of Ten Ten International as this chapter continues to dominate.

It has been eighteen years since I wrote a Presidents Message for the newsletter. A lot has changed in eighteen years but one thing has remained constant is this club and the strength in its members. This club continues to be one of the premier amateur radio clubs in North Carolina. One of the reasons this club remains strong and vibrant is due to the people who lead this club and for the last three years that person has been Van N4ERM. Join me in thanking Van for his strong leadership and all the hard work. Also thanks to George KM4ODS who served as vice president over the last year who provided us with some great programs over the year and also for all his hard work during the NC QSO Party and Field Day. I would like to welcome our new vice president, Ben KM4ODT. If you have any ideas for programs this coming year let Ben know what you are interested in learning more about. The other club officers and cast of characters remain the same for 2018 but they deserve a round of applause for all they do for the club. Thanks to Chuck KJ4RV and Bill KJ4OFD for taking care of the club treasury and recording the minutes of the meeting respectively. Also thanks to Mike KN4XP who takes the time every month put together the newsletter, Bill KU4W for taking care of the repeaters, and Marty W4MLW who has agreed to take on the role of Public Information Officer. A big thank you to our outgoing PIO Irv K3IRV for always being there to get the word out. Now I referred to the cast of characters and maybe you are wondering who they are. Well besides the members who carry a title in the club there are many, many others who are always there to lend a hand at a CFARS event, call a net, manage a net (thanks Kelly and Chuck), check the antennas at the shelter sites, take care of the food at the Swapfest with hardly any notice, play qrp in the park, etc. But most important of all thanks to all of you who choose to be members of the Cape Fear Amateur Radio Society. There is strength in our numbers as CFARS continues to be one of the largest groups in the state.

The next club meeting is January 15 at 7:30pm. Our program will be "What Santa Claus brought me for Christmas." So bring in what Santa brought you or anything else ham related you may have acquired in the recent past. Some dates to remember for January are VE Testing on the 13th, North American QSO Party-cw January 13-14 and ssb January 20-21, ARRL VHF contest January 20-22, and Winter Field Day January 27-28. Don't forget CFARS dues are due so see Chuck KJ4RV at the meeting or at breakfast or you can send them in to the club PO Box.

**73 to all and 72 to my qrp friends**  
**David KR4OE**

### CFARS Officers

President .....David KR4OE kr4oe@nc.rr.com  
Vice Pres..... Ben KM4ODT bassettbw@aol.com  
Sec./Treas..... Chuck KJ4RV kj4rv@arrl.net  
Recorder.....Bill KJ4OFD kj4ofd@arrl.net  
Newsletter Editor...Mike KN4XP kn4xp@yahoo.com



### Coordinators

Membership.....David KR4OE kr4oe@nc.rr.com  
Net Manager.....Chuck KJ4RV kj4rv@arrl.net  
Emergency .....Mike K4JWX k4jwx@outlook.com  
Information.....Kelly N4EWG n4ewg@nc.rr.com  
Repeaters.....Bill KU4W kc4swy@embarqmail.com  
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Field Day.....Vacant  
Health & Welfare...Mya mya@embarqmail.com  
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Swapfest .....David KR4OE kr4oe@nc.rr.com  
Public Information...VACANT  
Webmaster.....Steve KI4EZL webbie@nc.rr.com

### Club Repeaters

(PL 100 Hz)

**K4MN**  
2 m 146.910/146.310  
70 cm 444.400/449.400

**K4MN**  
6 m 53.810/52.810

**WA4FLR**  
2 m 147.330/147.930

### **Club Membership**

#### **Dues**

CFARS club membership dues are due and payable in January each year. CFARS does offer you the option to pay your dues no later than March. Yearly dues are \$15.00. CFARS offers a lifetime membership option for \$150.00. If your dues are not paid by March you will not be a voting member of the club. The right to vote on issues for the club comes with club membership.



The Cape Fear Amateur Radio Society News is the official newsletter of the Cape Fear Amateur Radio Society. It is published monthly as a PDF. The newsletter is emailed monthly when the latest version is available. Please provide your email address to the Newsletter Editor. The CFARS News welcomes articles and other contributions. Please email submissions to the newsletter to cfars\_newsletter@yahoo.com. The Editor reserves the right to edit any and all pieces. The submission deadline for each month's News is the last Friday of the preceding month. The views expressed in the CFARS News are those of the individual authors and do not necessarily reflect the views of the Editor or CFARS.

CFARS Club Patches are available for purchase. Contact **Chuck KJ4RV** for your patch today!



### December 2017 Club Meeting Minutes

On December 12th the Annual Eatin' Meetin' of the Cape Fear Amateur Radio Society meeting was held at Chason's Grandsons Carolina's Famous Buffet Restaurant at 3901 Ramsey Street, Fayetteville, North Carolina at 7pm. **Van N4ERM** opened the meeting and welcomed all for coming. **Van N4ERM** led the *Pledge of Allegiance to our Flag*. **Elton W4VGW** led the invocation. The introductions were made in the normal CFARS manner. **Van N4ERM** thanked **Jim KI4YRH** for obtaining the location for us. All commenced to eatin'.



A motion was made by **Bill N4WTL**, seconded by **Ed KD4ESA**, to approve the minutes of the August meeting. By vote the motion carried.

#### COMMITTEE REPORTS:

**Treasurer:** **Chuck KJ4RV** gave the treasurer's report. We are still solvent.

**Repeater:** No report.

**Net Manager:** **Chuck KJ4RV** reported check-ins and times per net from last month.

**Membership:** No report.

**Newsletter:** No report..

**Health & Welfare:** No report.

**Swapfest:** No report.

**VE Testing:** **Pat N4UGH** has set VE Testing for 2018 for the following dates: 13 Jan, 17 Mar, 9 Jun, 11 Aug, 13 Oct.

**Field Day:** No report.

**Public Relations:** No report.

**Old Business:** None.

**New Business:** None.

**Van N4ERM** thanked the club for allowing him to lead them for the last year, and listed some of the things the club had accomplished during the year, including 1<sup>st</sup> place in the 10-10 Spring CW contest, 1<sup>st</sup> in the NC State QSO party, 1<sup>st</sup> in the 10-10 Spring Digital contest, 2<sup>nd</sup> in the 10-10 Summer Phone contest, 11<sup>th</sup> in North America, 1<sup>st</sup> in Roanoke Division and 1<sup>st</sup> in North Carolina in the 2A category for ARRL Field Day and 1<sup>st</sup> in the 10-10 Fall CW and Fall Digital contests.

#### Door Prize Drawing: **David KR4OE**

Yaesu FT-2980V 2m Mobile Radio donated by Ham Radio Outlet won by **Larry N4USB**, Yaesu FT-2980V 2m Mobile Radio donated by Ham Radio Outlet won by **Jim KJ4EMX**, Yaesu FT-25R 2m HT donated by Ham Radio Outlet won by **Perry N4LBB**, TYT MD-380 DMR HT donated by R & L Electronics won by **William WD4DCR**, Baofeng UV82 Dual Band HT donated by R & L Electronics won by **Irv K3IRV**. Baofeng UV82 Dual Band HT donated by R & L Electronics won by **Bob WA4WHV**, Software Defined Radio Dongle donated by R & L Electronics won by **Bobbi N4KAY**, Software Defined Radio Dongle donated by R & L Electronics won by **David KF4FXC**, 10 pack of Amphenol PL-259 connectors donated by R & L Electronics won by **Bobbi N4KAY**, MFJ External Speaker donated by R & L Electronics won by **Greg KC4IOE**, MFJ External Speaker

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donated by R & L Electronics won by **Jim KJ4EMX**, Quartz Wristwatch donated by **N4EWG** won by **Lee KM4GQ**, Quartz Wristwatch donated by **N4EWG** won by **Greg KC4IOE**, Drill Doctor Drill Bit Sharpener donated by **W4VGW** won by **Mike KN4XP**, multi-meter donated by **N4ERM** won by **John W4RDU**, multi-meter donated by **N4ERM** won by **Bill W4WTL** and a multi-meter donated by **N4ERM** won by **Char KI4EZK**.

All the eating being done and the presents handed out, a motion was made by **Jim KI4YRH**, seconded by **Dan KW4BG**, to adjourn the meeting. By vote the motion carried. The meeting was adjourned at 8:25 pm. We had forty-five (45) members and eight (8) guests at the club meeting. The next club meeting will be January 15, 2017.

Submitted by **Bill KJ4OFD**  
**CFARS Recorder**

### *Items For Sale*

- Icom 706MK2G  
Includes CW filter  
Icom PS-85 power supply  
\$500  
Gene N4ANV 910-425-8003

Do you have equipment you want to sell or trade? If so put it in the CFARS Newsletter. Someone may just be looking for what you have to sell. Items are listed at no cost to you. Submit your items to [cfars\\_newsletter@yahoo.com](mailto:cfars_newsletter@yahoo.com)

### *Upcoming Hamfests*

**January 6, 2018**  
Winston-Salem FirstFest  
Winston-Salem, North Carolina  
[w4nc.com](http://w4nc.com)

**February 3, 2018**  
Charleston Hamfest  
Charleston, South Carolina  
[wa4usn.org](http://wa4usn.org)

**February 3, 2018**  
Virginia Frostfest  
Richmond, Virginia  
[frostfest.com](http://frostfest.com)

**March 9, 2018**  
Charlotte Hamfest  
Concord, North Carolina  
[charloteehamfest.org](http://charloteehamfest.org)

**March 18, 2018**  
Winterfest 2018  
Annandale, Virginia  
[Viennawireless.net/wp/events/winterfest](http://Viennawireless.net/wp/events/winterfest)

**March 31, 2018**  
Rarsfest  
Raleigh, North Carolina  
[rars.org/hamfest](http://rars.org/hamfest)

### **Calling for Newsletter Articles**

CFARS needs your input to the newsletter. If you have installed a new antenna, mobile rig, made a piece of equipment, tried a new mode of operation or anything else related to amateur radio, take the time to write it up and include pictures. Each month the CFARS News needs your input. Somebody may be wanting to try something new and you just might be the one that spurs that interest or can help out a new or confused older ham. Newsletter articles and pictures can be emailed to [cfars\\_newsletter@yahoo.com](mailto:cfars_newsletter@yahoo.com).

## Magnetic Loop Antenna(STL)

The Small Transmit Loop (STL) is simply a length of wire formed into a circle, with the two ends connected to a variable capacitor. All the rest is how to support and feed the antenna. The length of the loop wire should be around 1/10 wavelength of the frequency you want to use. The variable capacitor will typically be what is in your junk box. How the two work together mathematically can be calculated using this website:

<http://www.66pacific.com/calculators/small-transmitting-loop-antenna-calculator.aspx>

After you link to the website, decide on what frequency you wish to use and enter that into the frequency box. Let's go with 14 Mhz on 20M.

Next, enter the diameter of the cable or wire you want to use. Let's use Mini-8 (RG-8X), and go with 0.2 in diameter. (Outer jacket is 0.242). We connect to only the shield as the loop part of the antenna. The larger the diameter of the cable shield, better the antenna. Solid (tubing) or corrugated (heliac) shield is better than braid. Use what you have, it will work.

Next, enter 12 feet as the **length** of the loop cable we will use. You can see in the calculations this will yield about a 3.5ft dia antenna. This is the typical diameter provided by commercial vendors like Chameleon and AlexLoop. If the length is too long or too short for the 1/10 wavelength, at the frequency, the efficiency will suffer. The web calculator will show that 12ft of cable is too long for 10M and too short for 40M.

OK Last, let's enter the power we will use say 10W, it is optional, as it does not affect the dimensions or the frequency of our antenna, but will tell us how much rf voltage will be across our junk box cap and amperage through the loop and cap. Now click Calculate button and scroll down.

If your wire length is too long or short the comments will be a "red" font, warning you are outside the wavelength boundary. Our 12 ft length is good for 14 Mhz, notice also the min and max length suggested for 14 Mhz. I picked 12 ft. because its half way between the two. The icon shows an octagonal antenna in the event you want to use rigid sections (tubing) to build your antenna. It shows the lengths of each section.

Notice the "efficiency" figure is 41% (with perfect building skills) which is to be expected with the wire length about average for 1/10 wl. for 14 Mhz. As you use a wire close to the max 17.0 ft length the efficiency will increase up to a point.

Ok, the 12 ft of coax is easy, on to the capacitor, the 3rd and 4th line under the calculate button say our variable cap from the junk box needs to be able to provide 77 pf of capacitance. At 10W there will be a whopping 535V of rf across the capacitor, so we have to be careful of the capacitor plate spacing. 1mm or .04" spacing will provide 3000v for 50W. Seems that's about 10 sheets of paper for about .04"... This guy's website: <http://www.n6na.org/magloop> has info on cap spacing and voltage ratings, as well as some great hints on building an antenna.

So, you have your capacitor, a length of coax, you need a box for your cap, two SO-239 connectors for the box. Lowes electric section has good boxes. Put some PL-259 connectors on each end of your coax, soldering the shield to the shell, center conductor is not needed, but can be soldered for antenna stability. Make sure you solder the shield completely around the circumference to the connector. Using a wide braid, or some copper strips from "Michaels Hobby" store, solder from the SO-239 body to one side of the capacitor, repeat with the other side. You could connect to the mounting screws in a pinch. The removable PL-259/SO-239 make it so you can make your antenna portable, and experiment with other lengths for other bands. Fixed caps can be switched in to increase or decrease the range of your variable cap. If you want a quick antenna, you could just use some solid #10 or #12 electrical house wire and just solder it to the capacitor. Figure out how to hold the loop up, and you have build the hardest half of the antenna. MFJ recognized this as a product with the MFJ-933 tuner, you supply the wire.

The last part of the antenna is the FEED. I found the best way to feed is to take a length of stiff wire, 1/5 the

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length (28") of the main loop (12') and solder ends between an SO-239 or bnc connector. At the opposite end from your capacitor fit (hang) the loop inside the main loop with some ties. Make sure one or both of the loops are insulated from each other, Inductive coupling is what we want. Attach your feed line and get your antenna analyzer and set it to the frequency you want, and tune the capacitor for min swr... This web site illustrates various feed types, scroll down about 1/4 screen:

[https://www.nonstopsystems.com/radio/frank\\_radio\\_antenna\\_magloop.htm#top-of-page](https://www.nonstopsystems.com/radio/frank_radio_antenna_magloop.htm#top-of-page).

Your done connect it and enjoy.

If your junk box is new or lacking there is this: <http://chameleonantenna.com> provides a barebones DIY antenna kit (\$99.00US) with (600Vrms variable tuning capacitor and mount plate, PL/SO connectors, knob & 6:1 drive, 12 ft LMR400 coax for loop). You provide the box, pvc support pipe, and feed loop. If you are a QRO op or want a butterfly cap it can be had here: <https://www.mfjenterprises.com/Product.php?productid=MFJ-23>. 4200V butterfly capacitor, has no rotary joints. 18-136pf range. MFJ23 and the MFJ19 smaller less voltage. (bring your wallet)..

Some theory: This antenna is a simple capacitor and inductor, when the capacitor and inductor are resonant on your frequency, maximum current flows in the loop, hopefully equally distributed around the loop. The radiation resistance is a paltry 0.153 ohm. For 10W the current is 3.6A and 8.14A at 50W and 11.5A at 100W. Maximum voltage is present at the capacitor. ANYTHING that causes the slightest series resistance to that big current makes the antenna efficiency worse. The ANYTHING includes rotary capacitor joints, thin loop wire, thin wire connecting the loop to the cap, nut and bolt crimped ring connectors, and any poor soldered connections. After the antenna is constructed a simple rule of thumb for efficiency is how narrow does the antenna tune, the narrower the better.

The high current at the opposite cap end, is what gives rise to the "Magnetic" affect of the antenna. But at 11% distance in wavelength from the antenna, there is no difference between the dipole electric field or the STL magnetic radiation field both are mostly equal. [https://www.w8ji.com/radiation\\_and\\_fields.htm](https://www.w8ji.com/radiation_and_fields.htm) I say this because the STL "low noise pickup" is more of a myth, as the noise sources can usually be further than 11% the wavelength away.

The theory being the magnetic field does not pickup local noise, where the dipole being a voltage device is more affected by local noise. This is a myth...Nonetheless, for HOA and other restricted antenna operators, the STL is a great antenna, and if remotely tuned with a motor, can be a usable antenna. Typically these antennas, as you saw from the above calculations, can only be two or at most three bands per one length of loop. I have three different loop lengths to cover 40 thru 10M with a pretty wide range capacitor. You can add fixed capacitance to force resonance for a certain loop length, but efficiency suffers. Efficiency, is what percent of your rf power is turned to heat and how much is radiated. For 10 watts a 20% efficient antenna, turns 8W into heat and radiates 2 Watts. A dipole is near 90% efficient. Most STL are in the 20-30% after all the compromises required to build...

When using elevated rf power, be aware of rf radiation hazard to yourself and others close to this antenna. <http://home.earthlink.net/~w6rmk/qstrfsafety.htm>

Here are some building web sites:

[https://www.nonstopsystems.com/radio/frank\\_radio\\_antenna\\_magloop.htm#top-of-page](https://www.nonstopsystems.com/radio/frank_radio_antenna_magloop.htm#top-of-page)

<http://kf5czo.blogspot.com/search/label/magnetic%20loop>

<http://www.n6na.org/magloop/building>

<http://www.aa5tb.com/loop.html>

<http://www.qsl.net/kp4md/balconyloop.htm>

<http://www.qsl.net/kp4md/magloopphf.htm>

**Dick WB7OND**

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