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The President's Corner: David KR4OE

February is over and we are now into March. However, February is a big month for CFARS as that is the month the North Carolina QSO Party is held. Thanks to all who came out and made this another successful CFARS event. The bands were not as good as last year but the club made the most of it and put forth another great effort. Now the wait is on to see how we did and I am sure we did well. Remember we have won our division every year we have entered and I see no reason why we will not prevail again.

We have two major hamfests this month. CFARS has tables at both events thanks to **Van N4ERM** so if you have some stuff to sell bring it with you and put it out the tables. The Charlotte Hamfest is March 9-10. This is a Friday-Saturday show. The Raleigh Hamfest is Saturday, March 31. Speaking of hamfests, please save the date as the 20th Annual Cape Fear Amateur Radio Swapfest is Saturday, August 11.

If you were at the February meeting you heard the news about our tower located at Methodist University. The news was not good. Please refer to the minutes of the meeting in this newsletter if you were not at the meeting. The committee who was organized to look into the tower issue is working to resolve the issue. The committee met as a group one week prior to the February meeting for about two hours to compare notes and come up with ideas. There have many phone calls and emails exchanged as well as meetings with Methodist University officials. I would like to thank those who emailed and called me to offer support and ideas after the February meeting. The committee was tasked with a job to do at the January meeting. The members of the committee were just as disappointed in the results as you were. This was just a bitter pill to swallow for us as it was for you. I personally struggled for days on how to present the information to the club and I hope it was presented well. I have been a member of CFARS for 27 years and it hit me as hard as did most of you. The committee will keep at it and will report at the next club meeting.

The next club meeting is March 19 and I hope you can attend. If you haven't paid your 2018 dues you will be dropped from the CFARS Roster on March 31 so come on out and see our treasurer, **Chuck KJ4RV** and he will be glad take your cash or check. We will also hold a test session on March 17. If you are looking to upgrade or know someone who would like to test for the first time the CFARS VE Team will be glad to see you.

73 de David KR4OE ... _._

CFARS Officers

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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!



February 2018 Club Meeting Minutes

On February 15th the Cape Fear Amateur Radio Society meeting was held in Room 219 of the Science Building at Methodist University, Fayetteville, North Carolina at 7:30pm. President **David KR4OE** opened the meeting and welcomed all for coming. **David KR4OE** led the *Pledge of Allegiance to our Flag*. **Paul K4PGM** led the invocation. **David KR4OE** led the introductions in the usual CFARS manner.

A motion was made by **Van N4ERM**, seconded by **Jim KI4YRH**, to approve the minutes of the January meeting. By vote the motion carried.



COMMITTEE REPORTS:

Treasurer: **Chuck KJ4RV** gave the treasurer's report. We collected some money and we are still solvent.

Repeater: No report.

Net Manager: **Chuck KJ4RV** reported we gained check-ins and times per net from last month. Apparently, we talk on the radio a lot during cold weather. Remember, these are our repeaters, if we don't use them somebody else might.

Membership: **David KR4OE** read applications for membership from **Ron Dahle** (call sign pending) and **David McGough KB4FXC**. **Jim KI4YRH** made a motion, seconded by **Kelly N4EWG**, to accept Ron and David into CFARS membership. By vote, the motion passed. Both thanked us for allowing them to join the club.

Newsletter: No report..

Health & Welfare: No report.

Field Day: **Bob WA4WHV** and **Paul K4PGM** have offered themselves as adult supervision for the sideband station for Field Day. Let them know if you want to assist.

Swapfest: No report.

VE Testing: VE Testing will be held on Saturday morning March 17. Study up and upgrade!

Emergency Coordinator: **Mike K4JWX** said that repairs to the LEC and rooftop were still a krow in progress. **Van N4ERM** said the antennae were almost ready to be reinstalled.

Field Day: No report.

Public Relations: **Marty W4MLW** has sent PSA requests to several of our local venues and radio stations. An idea was offered that Marty visit with the local broadcast curricula in the local area colleges and universities to let them know what amateur radio is all about.

Old Business: Van N4ERM reminded us that the Charlotte and Raleigh HamFests are coming up, and that we have tables reserved at each of them. Get your stuff together and put it on the tables. **David KR4OE** reported the committee looking into tower repairs had met and made their report. The committee consisted of **KR4OE**, **K4JWX**, **W4MLW**, **KN4XP** and **KB4XFC**. **Allen Pier** from a local tower construction company had made an inspection, spoke to the group concerning his findings, and answered questions presented by members. He presented a couple quote regarding our options and **David KR4OE**

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read the quote. **David** said the committee had also met with the Facilities Manager and his assistant as well as the Chief of the Campus Police at Methodist University regarding the findings. Methodist University has determined that the tower is a liability and told us that we need to take it down based on the inspection report and the fact that Methodist University no longer has a use for our tower. They have offered an alternate location atop a light post @100'-120' near the Police Station at the rear of the soccer field near the entry to the University. According to Methodist University this site is twenty feet higher in elevation from where the repeater is currently located. **Allen** stated there was space available on several commercial towers in the area that might be available for our purposes and he would inquire for us to see if we could relocate to one of these sites. **Allen** also said he would donate one day of labor from his company to the club to relocate the repeater. His daily rate is \$2200.00. There was quite a bit of discussion regarding the findings, costs involved, alternative financing, other options. The committee is waiting on a price quote to have the tower taken down. A motion was made by **Paul K4PGM**, seconded by **George KM4ODS**, that we allow the committee to continue their task to determine costs involved in removing the tower and finding a suitable relocation. By vote the motion carried.

New Business: **David KR4OE** received an email from **KM4CRK** inviting us to assist in providing communication for the Sandblast Rally on March 3. **Van N4ERM** reminded all of the *NC QSO Party* coming up this weekend (Feb 24-25) at Smith Lake. We will begin setting up after breakfast at the K&W (@9:00). **Ben** and **George KM4ODT** and **KM4ODS** have a handle on the SSB station, **Bonne KF4LVF** on the VHF station, **Chuck KJ4RV** on the CW station and **Fred N4ZCG** for digital. Come on out, bear a hand with setup and tear down, and sit a spell and krow the radios. All are welcome. **Larry N4USB** passed out surveys to all present regarding interests and possibilities for programs.

Program: None.

Door Prize Drawing: **Marty W4MLW** held the drawing. **Chuck KJ4RV** offered a QRP Pixie keyer won by **John W4RDU**. **George KM4ODS** won a tape measure.

A motion was made by **Mike KN4XP**, seconded by **Bonne KF4LVF**, to adjourn the meeting, By vote the motion carried. The meeting was adjourned at 8:45 pm. We had thirty-five (35) members and four (4) guests at the club meeting. The next club meeting will be March 19, 2018.

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

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.

Return Loss and Why We Care

I recently refurbished my Cubex 2M/440 Quad antenna. After I did the painting and replaced the nocks that hold the quad wires, I swept and saved the antenna display with my Fox Delta SWR Analyzer as a reference install, SWR plot measured right at the antenna. Fox Delta sells these inexpensive antenna analyzer kits for \$54.00 with a metal case. All thru hole soldering. And you are left with a very nice antenna analyzer that will sweep your antenna, and provide you with both SWR and "return Loss" on the same plot. The free software provided by I2TZK has an excellent user interface that allows you to save your "sweeps" for later comparison. MFJ also sells an analyzer that is capable of sweeping your antenna called the MFJ-225, considerably more expensive. MFJ uses an open source program to sweep and display the output, as well as a small LCD screen on the device itself.

I want to talk about return loss for a moment. When your analyzer sends a known amount of rf down the coax to your antenna, one of three things happen. 1. **ALL** of it returns (reflects) back down the line (minus feedline losses) with an **open** or **short** at end of the cable. 2. **Some** of it comes back down the line (minus feedline losses) depending how good/poor a match your antenna is to 50 ohms, the amount will be somewhere between a solid open or solid short. 3. **None** of it comes back and it is all used by the antenna (radiated) (minus feedline losses) also known as good 50 ohm match or 1:1 SWR.

Now, your antenna analyzer knows exactly how much signal it sent down the line, it will measure how much comes back (reflected) and plots a db ratio of the two. So, if half the amount comes back the return loss is 3db. If (half again as much (1/4th) comes back it is 6db return loss. If 1/10 of the signal sent down the line comes back it's called 10db return loss. Return loss is a tricky word, the loss part is a poor choice of wording, makes you think bad things about your antenna measurement, 'loss' connotes something undesirable. Not in this case. The larger the return loss, the less of the signal sent down the line came back, the more the antenna "used" (radiated) (minus cable loss). The larger the return loss number, the closer to 1:1 good antenna SWR you are **or** your coax is really, really lossy. The coax cable loss will add to the return loss figure of the antenna, as the coax loss allows less of the signal sent by the analyzer to return. This can be confusing, and will make you think your antenna is better than it really is. In the SWR world, it will just show up as a better SWR from the antenna. If you measure the SWR of a really lossy cable with an open or short at the end of the cable, it can make you think a good antenna is connected. Let's make some swr references. If I have a 3:1 swr that is an equivalent of 6db less of the signal coming back (1/4th). If I have a 2:1 swr then 9.5 db return loss (rl) or close to 1/10th of the signal came back. See how the db rl number gets bigger the closer you get to SWR of 1:1... If 1/100th (20db rl) of the signal comes back, you are at 1.2:1, great in anybody's book... So why do we care about return Loss??

As you might have guessed from the above we can take advantage of the cable return loss measurement if we only have access to one end of the cable and can remove the load from the other end. The normal way you measure the loss of coax is to apply power into one end of the coax and measure the power out of the other end. You have to connect both ends to the instrument/s, or take a measurement meter out to the other end of the cable. With return loss, you can take advantage of the open/short load measurement when the opposite end of the coax is inaccessible. I have experimented with an unterminated (open) 100 ft piece of "mini-8" Wireman(tm) CQ-118 with an advertised loss at 450 mhz of 6.2db. When I sweep the coax with an S21 measurement (apply power to one end, measure the other end) I get 6.22 db which is very close to the mfg spec. When I sweep the same cable with an S11 measurement (swr/returnloss) from **one** end of the cable, I get 12.69db /2 or a one way "loss" of 6.35db, pretty close and much easier to measure. Remember return loss is two way trip through the cable so you have to divide the return loss reading by 2. The MFJ 259 series analyzers do this for you in the 'coax loss' mode. This measurement on the MFJ 269 at UHF is less than optimum. For the same cable at 30Mhz, mfg spec. loss is 1.5 db/100', S21 measured loss is 1.67 and the S11 return loss is 3.33/2 one way 1.66 from **one** end of the cable. FoxDelta measures 3.1db/2 or 1.55, a fairly accurate measurement from one end. As a further experiment I swept the S11 return loss from a FoxDelta of a precision 6db attenuator, the return loss was 12.1db/2 displayed the attenuator as 6.05db.

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The MFJ 269 displayed 5.5 as the "coax loss".

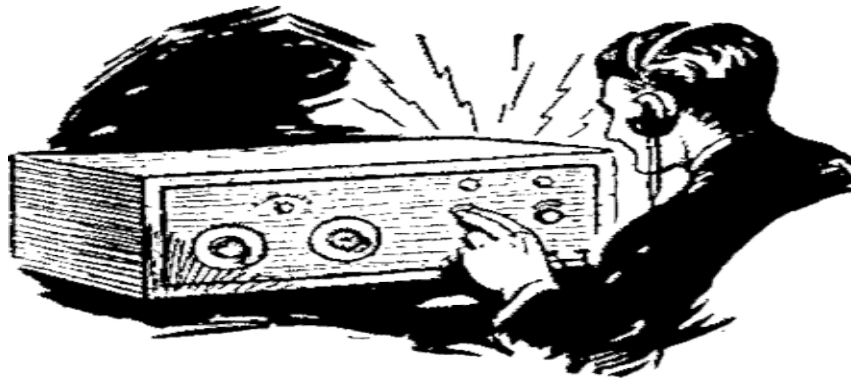
So let's summarize. Return loss is the ratio of the signal heading down a coax minus the forward trip coax loss, to the amount that returns to the analyzer minus the return trip coax loss. You can take a length of coax and perform a return loss measurement from one end, without a load at the other end and **estimate** the coax loss, by dividing the return loss measurement by 2. Your cable losses make your antenna match look better by absorbing some of the rf both ways. It is always good practice to sweep and save an image of the return loss for your newly installed antenna, and perform some periodic comparisons with current sweeps to monitor the coax deterioration.

Here are some web links.

FoxDelta Analyzer: <http://www.foxdelta.com/products/aaz-0217.htm>

FoxDelta software: <http://www.i2tzk.com/download>

ReturnLoss-SWR chart: <https://www.amphenolrf.com/vswr-conversion-chart/>



Upcoming Hamfests

March 9, 2018

Charlotte Hamfest
Concord, North Carolina
charloteehamfest.org

April 21, 2018

Catawba Valley Hamfest
Morganton, North Carolina
cvhamfest.com

March 18, 2018

Winterfest 2018
Annandale, Virginia
Viennawireless.net/wp/events/winterfest

May 5, 2018

59th Blue Ridge ARS Upstate SC Hamfest
Spartanburg, South Carolina
brars.cc

March 31, 2018

RARSfest
North Carolina State Convention
Raleigh, North Carolina
Rars.org/hamfest

May 12, 2018

Rockingham County ARC Swapfest
Reidsville, North Carolina
n4iv.org