



# High-Country Static

March 2018

News and Information Concerning  
Amateur Radio in Northern Arizona and  
Beyond

Welcome to the Coconino Amateur Radio Club (CARC) Monthly Newsletter. CARC is a non-profit club devoted to providing communication services to local volunteer agencies and events. Meetings are held the second Thursday of each month at the East side Sizzlers Restaurant Highway 66 at Fanning Dr. Flagstaff, at 7:00PM. All persons interested in amateur radio, whether licensed or not, are welcome to attend.

*Coconino SkyWarn meets 1900 every Monday evening on the 146.98 repeater and at 1930 on the Navajo Mountain CACTUS repeater and 146.480 simplex.*

*Coconino ARES meets 1900 every Wednesday evening on the 146.98 repeater and at 1930 on the Navajo Mountain CACTUS repeater and 146.480.*

## Officers:

President: Vacant

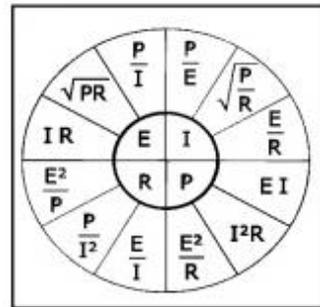
Vice-President: Dan Shearer, N7YIQ

Secretary: Erv Perelstein, KE7QFI

Treasurer: Pat Traber, KE7QFG

PIO: Dan Shearer, N7YIQ

Newsletter: Janice Enloe, KI6WCK



E = voltage I = current  
R = resistance P = power

## Calendar of Events for 2018

### March

- 5 STEM Celebration Day at NAU Skydome 1730 to 1900
- 8 CARC Meeting - Digital Modes, KI6WCK & W7LUX <-----

### April

- ?? PFAC Wild Lands Fire Exercise (Possibly late March)
- 12 CARC Meeting - Radio Equipment Operation <-----
- 21 Amateur Radio Examinations at North Country HealthCare

### May

- 10 CARC Meeting - Field Day Planning <-----
- 18-20 Overland Expo: Demonstrations and Amateur Radio License Examinations  
At Fort Tuthill
- 21-24 Arizona State & Coconino County Exercise; EOC activation 21 May

### June

- 2 Sacred Mountain Prayer Run

9?? CARC Picnic  
14 CARC Meeting - Field Day Planning <-----  
23-24 Field Day (KG7OH & Team)

#### July

4 Munds Park Parade  
12 CARC Meeting -  
21 Amateur Radio License Exams at North Country HealthCare

#### August

4 Toys for Tots/Fat Tire Bicycle Ride  
7 National Night Out  
9 CARC Meeting -  
11 Big Brothers/Big Sisters Run for the Magic  
26? Arizona Trail Marathon at North Rim

#### September

3 Williams 10K Labor Day Run  
13 CARC Meeting -  
22-23 Flagstaff to Grand Canyon 100 Mile Staagecoach Run

#### October

11 CARC Meeting -  
13 Soulstice Mountain Trail Run  
20 Amateur Radio License Exams at North Country HealthCare  
?? MARS COMEX

#### November

?? MARS Comex  
8 CARC Meeting -  
10? Girls on the Run

#### December

1 SkyWarn Recognition Day at NWS Belmont (UTC date)  
9? Christmas party

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### **Next Business Meeting:**

Our next business meeting will be March 8, 2018 at the East side Sizzlers at the corner of Highway 66 and Fanning.  
Dinner @1800 and meeting starts @1900.

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### **From the Vice President:**

Here we are already. We've started March and 3 months already gone for the year. Time flies when you are having fun.

I am sure everyone was just as shocked as I was when Tom tendered his resignation. I was hit pretty hard as I am still learning the ropes and getting settled in. What's even worse is that I don't know everyone's names and calls. I was hoping to spend some time as VP in order to get comfortable with the club and at least help plot a

course on where the club was headed. Well, now that this is not possible and I am filling the position until the club decides who will lead us. This will be decided at the meeting coming up and it will be a decision made by you the club membership. Please attend if you can.

For those that don't know, I was very active in this club back in the mid 90's when I got my license and I was responsible for our old newsletter and I held the VP slot for a little while as well. I changed jobs and got married and so my life moved from one chapter to the next. I stayed active in my operations, but I made maybe 3 contacts a month. Up to about 3 years ago, I operated 2 modes – SSB and CW. I now operate digital modes. I find digital a really neat mode and since I am proficient in computers, it works well for me. This leads me into our presentation for March.

This month's presentation is digital modes. I am a self-learned digital mode HAM. I didn't have an Elmer to help me too much. Joe helped me getting my RTTY and PSK setup modes operating, but for the most part I learned it myself. I operate WSPR, FT8, RTTY, and PSK31. I can operate the other modes as well, but these are the four I use most often. YouTube is a wonderful thing as it can show you a lot about everything including HAM radio. Please make sure you get to the meeting and attend the presentation. It should be a good one.

Your acting president,  
Dan – N7YIQ

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### **Thank you and Help Wanted:**

Thank you to all who have run the Monday and Wednesday night nets:  
Flagstaff: Erv KE7QFI, Mike KD8RQV, Mary Lou Hagan, KG7TPK  
Mike Clever, KD8RQV, Glen KG7YDJ

Page: Eric KD7UNI, Nancy KG7WKS and Vince WB7UWW

If anyone one would like to help with the nets, please let Glen know. It is good practice for radio skills and the script is written for you to use.

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### **Licensing Exams for 2018:**

Remember to bring your HAM license and a copy (if you are upgrading your license), a government issued picture ID, a black ink pen, calculator with memory erased and fifteen dollars (exact change is appreciated).

April 21

July 21

October 20

**Arizona Newsletter:** <http://www.arrl.org>

**Tutorials:** <http://www.arrl.org/tutorial>

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### Minutes of the Coconino Amateur Radio Club

Minutes for 8 February 2018

Call to order at 1905

Introductions – I don't have the log so I can't give you attendance.

Secretary's report – Dan read the secretary's report – Motion to accept – Bobbi 2<sup>nd</sup> Pat Unanimous.

Treasurer's report - Pat stated a total of \$4249.84 after a deposit of \$500 – a check from the Arizona Trail Association for the Stage Coach run – 33 paid members 4 life. Glen motioned to approve Craig 2<sup>nd</sup>. Unanimous  
VP's report – Dan reported that Tom has tendered his letter of resignation as president due to personal reasons.  
Looking for someone to fill the spot - Members are to at least send a letter of interest to the club if they'd like to

run for office.

No President's report

Old Business – No updates on the GC repeaters.

Glen gave a short briefing on the upcoming technician/general classes starting this month. We need instructors – If you need information from Glen, email him at his ARRL email address.

Joe provided a quick ARES report. We don't have many HAMS up on the northern Arizona border. A discussion on people from Utah providing support in Fredonia.

If any HAMS have any noise from the power lines or power outside in general, contact Joe. He's been working with APS to solve some issues he has.

Upcoming exercise in May. The 21<sup>st</sup> and 22<sup>nd</sup> of May, the County will participate in the Hospital exercise. We need members to set up and operate at the Alternate EOC on Gemini. More information to come at later meetings.

George NG7A gave his loop antenna presentation.

Motion to Adjourn at 2040 by Pat 2<sup>nd</sup> Glen – Unanimous.

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### **CARC Newsletter Information March 2, 2018**

Coconino County Emergency Management is in the process of changing some of our EOC processes and providing training to our EOC participants to facilitate those changes. Training was provided on February 23 for Operations, Logistics, (including communications) and Plans to review new changes in the EOC forms for General Messaging (General Message Form 213), Resource Request Forms (213RR), and the Unit/Activity Log 214. The Emergency Management Team also provided a review of "Status Boards" that will be used during operations for training and real-time events. There will be future training opportunities to include all Emergency Support Function (ESF) participants.

Coconino County Emergency Management and the Coconino Amateur Radio Club tested a new Diamond X 50 dual band antenna. We determined the antenna was faulty and it was returned on Monday February 26. Ham Radio Outlet exchanged it for a new one, which we hope to test soon.

We are very pleased with the participation of the CARC in our efforts to supply redundant and reliable amateur radio communication during training and real-time events and EOC activations. We are looking forward to your participation in the May National Mass Care Exercise.

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### **Digital Modes and Communications**

Coconino ARES has been asked to demonstrate digital communications during the May 21-22 Mass Care Exercise. The exercise scenario is a large number of evacuees flowing into Arizona and nearby states from a southern California seismic event. Coconino ARES will be stationed at the alternate EOC and at various locations in Coconino County.

There are MANY different digital modes, and there are many (often free) computer programs to help receive and transmit these modes. Most of these programs use a computer sound card to send and receive audio tones to and from a SSB radio. Many recent transceivers have a USB sound card built in to streamline this process. Other radios require an interface between computer and radio.

#### Digital modes/communications offer several advantages over voice:

Better accuracy, especially for lists - think about transmitting a long list of antibiotics and other pharmaceuticals using voice. Some digital modes check and correct for errors.

Help for those of us with declining hearing

Tired of talking all day while working (teaching, sales, etc), but still passionate about amateur radio?

Want to send an ICS 213 or similar form? Digital can do that.

Some common digital modes: RTTY, PSK-31, Olivia, Packet, Pactor, MFSK, MT-63, WSPR, JT-65, and FT8.

Just a bunch of letters? Here is a web page describing many of these modes:

[http://hfradio.org.uk/html/digital\\_modes.html](http://hfradio.org.uk/html/digital_modes.html)

There are hundreds of modes and variations, but what are we most likely to use for emergency communications?

The Arizona State EOC prefers to use the Winlink system for digital messages. Winlink is an amateur radio based, worldwide, store and forward email system. Using Winlink, one can exchange messages with other hams and send and receive email via the Internet. Sailors and RVers who are amateur radio operators use Winlink to stay in touch when far from an Internet connection or cell tower.

To use the Winlink system used to require an expensive Pactor modem, but the Winlink team developed the sound card mode Winmor to allow wider access to the Winlink system. One weakness: Winlink is an Internet based system. If the Internet suffers a major outage, Winlink would be seriously degraded...but we all know the Internet will never fail.

Much more information about the Winlink system:

<https://winlink.org/>

And their recommended program, Winlink Express, including Winmor:

<https://winlink.org/WinlinkExpress> (used to be RMS Express)

If you have some time, download and experiment with Winlink Express. You don't need a radio hookup at first; you can use the program to send via the Internet (Telnet Winlink "mode"). W7LUX-10 also operates a Packet Winlink gateway on 145.010 MHz; connect via ELDEN.

Just in case the Internet is unavailable, what modes would allow peer-to-peer communications during an emergency? RTTY (radio teletype) and PSK-31 are good and popular modes, but they have no error checking. FT8, other WSJT modes, and WSPR are specialty modes for weak signal, contest type operation, and propagation checking. Pactor modems start at an expensive \$1150.

Several emergency organizations currently use Olivia and MFSK. Army MARS used to use MT-63; they now use a propitiatory system. These modes all offer some error checking. Olivia can pull weak signals out of the noise. There are weekly HF radio nets to practice these modes.

For the May exercise, we will concentrate on using Winmor because the state EOC wants to use the Internet based Winlink system. For backup, Olivia, MFSK, and possibly MT-63 seem appropriate - and are currently being used. MT-63 works especially well on VHF.

The Fldigi suite transmits and receives all these modes except Pactor and Winmor. Fldigi is available from (be patient):

<https://sourceforge.net/projects/fldigi/files/?source=directory>

You will need Fldigi, FImsg, Flamp and the manuals/help files. These also run very well on Linux; KF7YRS has them running on a Raspberry Pi and a Windows 10 stick computer. And FImsg for your Android tablet or phone will encode and decode most modes - available from the Play Store.

Janice and Joe plan to demonstrate digital modes and communications during the Thursday CARC meeting. Come and bring your questions.

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### **From Yuma Hamfest**

Bob Brehm, AK6R, is Chief Engineer at Palomar Engineers. During the Yuma Hamfest, Bob gave a highly informative presentation about Radio Frequency Interference (RFI) and noise suppression for amateur radio. The slides for this presentation (and others) are available at:

<http://palomar-engineers.com/speaker-presentations>

Palomar, of course, sells ferrite products that help reduce RFI:

[www.Palomar-Engineers.com](http://www.Palomar-Engineers.com)

Their feed line choke information is at:

<http://palomar-engineers.com/antenna-products/1-1-balun-kits/choosing-a-feedline-choke>

Three key points from the presentation:

Select the proper ferrite to match the interfering signal frequency.

The more turns through or around a ferrite, the better (usually).

A common mode choke at your receiver input may help reduce noise. George, NG7A, demonstrated this at our Christmas party.

Unfortunately, ferrites are not effective in reducing radiated power line or other noise picked up by your antenna. The choke cannot tell the difference between noise and that weak DX signal you are trying to hear. A choke will stop noise picked up by your coax feedline.

G3TXQ has an informative and useful web page about common mode chokes at:

<http://www.karinya.net/g3txq/chokes/>

Several charts show the measured effectiveness of various chokes at different frequencies. These charts help in designing the most effective choke for each situation.

There is a down side to reducing your noise: a Connecticut ham, who had serious line noise, had a modest station and could work every station he heard. He found the source a half mile away, and the electric utility fixed the problem. Then this ham could hear more stations than he could work. This resulted in considerable expense buying a new, bigger radio and antenna, so he could work the weak ones!

# Common-mode Choke Impedances - G3TXQ

(Last update: 15 May 2012)

## Ferrite-cored

- 17T RG58 on FT240-43
- 12T RG58 on FT240-43
- 8T RG58 on FT240-43
- 17T RG58 on FT240-31
- 12T RG58 on FT240-31
- 8T RG58 on FT240-31
- 9T bifilar on 2 x FT240-31
- 10 x FB-31-1020 beads on RG213
- 6 x FB-31-1020 beads on RG213
- 4T RG174 on binocular 2x FB-31-1020
- 11T RG58 on 2 x FT240-52
- 16T RG174 on FT140-61
- 17T RG58 on FT240-61
- 12T RG58 on FT240-61
- 8T RG58 on FT240-61
- 14T bifilar on 4 x FT240-61

## Air-cored

- 10T RG58 on 2" air cored
- 25T RG58 on 4.25" air cored
- 20T RG58 on 4.25" air cored
- 15T RG58 on 4.25" air cored
- 10T RG58 on 4.25" air cored
- 7T RG58 on 4.25" air cored
- 5T RG58 on 4.25" air cored
- 10T RG213 on 7" air cored
- 7T RG213 on 7" air cored
- 5T RG213 on 7" air cored
- 16T RG213 on 4.25" air cored
- 11T RG213 on 4.25" air cored
- 7T RG213 on 4.25" air cored
- 5T RG213 on 4.25" air cored

