**Editor, The CORC Repeater Newsletter**
**Joe Hahn (W8NBA)**
**P.O. Box 166**
**Sunbury, OH 43074-0166**

# The Central Ohio Radio Club
# February 2024 Newsletter

**Over 50 Years of Service to the Amateur community!**

**ARRL Special Services Club**

**Web Page at http://www.corc.us**

Place Label Here

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**Central Ohio Radio Club, Inc.**

# Membership application

# Central Ohio Radio Club, Inc. (CORC)

**Operating Amateur Repeaters Since 1970**

***CORC* operates repeaters with outputs of 52.70, 146.76, 146.97, 147.33, 442.800, 444.200**
**145.49 D-STAR & 444.000 D-STAR**

***Some of the features include:***

**Worldwide linking on our IRLP & D-STAR Repeaters.**
**Repeaters are used by the Central Ohio Weather Net and Central Ohio Traffic Net.**
**Multiple receiver sites located in Franklin, Licking, Delaware, Pickaway and Logan Counties**
**To ensure you excellent coverage throughout Central Ohio.**

**Membership allows full use of the *CORC* facilities, Operating Manual, subscription to the *CORC* Newsletter, and a vote at the annual meeting of the corporation.**

**Family member amateurs at the same address are NO additional charge, (No Vote at annual meeting)**

**$18 / 1 year - $32 / 2 years - $45 / 3 years Dues Enclosed $ _____**
**Optional Donation – CORC is a 501(c)(3) corporation $ _____**
**Total $ _____**

***Please* mark *one:*** ☐ ***New Application*** ☐ ***Renewal Application***

**Call Sign _____ Name_____ e-mail_____**

**Call Sign _____ Name_____ e-mail_____**

**Call Sign _____ Name_____ e-mail_____**

**Street Address_____**

**City_____ State_____ Zip_____**

**Home Phone ( ) _____ Alternate ( ) _____**

**How many of above are ARRL Members ____ (CORC is an ARRL affiliated club)**

**Check to Request Newsletter by e-mail (this saves the club mailing cost) ____**

**Please make check payable to *CORC* and mail application and check to:**

**Central Ohio Radio Club, PO Box 166, Sunbury, Ohio 43074-0166**

**For questions call membership chairman John, W8RXX @ 614-579-0522**
**or visit the *CORC* website at www.corc.us**

***Thank You for your Membership and Support!***

*Rev 1/24*

# The Central Ohio Radio Club Newsletter

**February 2024**

**President**
Laura Perone
**KA8IWB**

**Vice-Pres.**

**Secretary**
Tony Fabro
**N8RRB**

**Treasurer**
Steve Robeano
**WD8JKX**

**Newsletter Editor**
Joe Hahn
**W8NBA**

**Membership Chair**
John Perone
**W8RXX**

**FM Repeaters**

53.70 /
52.94 / 52.70
51.70 /
**W8RRJ**

146.16 / 146.76
**W8AIC**

146.37 / 146 .97
**W8RRJ**

147.93 / 147.33
**W8NBA**
IRLP Node 8094

449.20 / 444.20
**W8AIC**

447.80 / 442.80
**K8NIO**

**D-Star Repeater G3 Gateways**

144.89 / 145.49
449.00 / 444.00
**W8CMH**

## Letter from the President

As you read in my recent letter to you there has been quite a bit going on with the club over the past year. Ideas were being explored to keep the club operating smoothly and efficiently for the future. I want to thank all those that have assisted in this exploration. I also want to thank all the CORC directors that continue to keep the club running. We are always looking for ways to improve operation of the club.

I also want to thank all that have The Central Ohio Radio Club listed as Kroger's charitable organization. The club receives over $300.00 annually thanks to you!

The tech team has been busy installing a new solid-state amplifier on 146.97. They have purchased new VHF and UHF modules for the D-star repeater. These will be installed soon.

I hope everyone is planning to view the upcoming total solar eclipse on April 8th. I was fortunate to view one a few years ago near Nashville, Tennessee …what a spectacular sight. Be sure to get your viewing glasses or build a viewing box before the event. Let's hope for a clear day.

Feel free to bring a friend that may not yet be a CORC member to the next potluck on May 5th.

73, Laura / KA8IWB

# From your CORC Membership Chairman…

**John / W8RXX**

Thanks to everyone that have either joined or renewed their membership since our last newsletter.

## New Members… Welcome All!

The following have recently joined CORC. Please thank them for joining the club when you hear them on the air.

KE8DRF - Jeremy KC2LVP - Justin KC8ZYB - Jeff W8LV - William N8VW - Pat KE8TZF - Dave
KC8TE - Ron K8MHW - Mark KE8ZKU - Gary W8AJN - Arthur KC8ULK - David K8KXK - Jason
K8SGT - Richard KF8AAR – Mike K8SGT – Richard K8JMX – Jeff AD8HR - Doug WA8CLT – John
KE8UTK – Alexandru

## Donations… MANY Thanks!

Thank you, thank you, to those who have donated their time, talent, money, printing, etc. since the last newsletter. This extra income helps keep CORC financially sound.

W8RRJ W8NBA N8RRB WA3UOO KB8CIQ KD8RTP KC8ASF N8SY KE8KJX
N8VW WB8LAP WD8JKX WA8KKN KA8IWB W8RXX K8NIO KE8TZF KC2LVP
AC8TZ W8AJN K8KXK AD8HR KN8ITR W8JMX WA8CLT K8BRJ KE8UT
K8KDR KE8FUR K9BE W1DOD KB8UVF KROGER

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## Guest Speaker on May 5th.

John, W8RXX will speak on the history of club equipment and sites, and all the improvements made during the past few years.

## Next ARRL VE Test Session

The 2024 schedule is up on the **www.ae8fp.net** website.

All sessions are PRE-REGISTRATION ONLY
Date: **April 27, 2024** (Registration will open April 1, 2024 - No Fooling!)
Time: 10:00 am (No Walk-ins)Location: Westerville Fire Dept #111 Classroom
400 W. Main St
Westerville, OH 43081
For registration information go to www.hamtestco.org .

# RF Exposure, You, and Your Station

Rick Tressler, WA3UOO
With Supplemental Information Supplied by the ARRL Website

I am providing the first part of my article with italicized text taken directly from the ARRL's website relating to FCC RF exposure rules. This will bring you up to speed fundamentally with the dates of the most recent rules. I'll then cover the high points of the task of station assessment regarding what information you'll need to gather to conduct the task. The League has gone to considerable lengths to collect a considerable cache of technical information, web links, FCC rules and online calculators to make performing an RF exposure safety assessment/analysis a quick and painless task.

*From ARRL's website - http://www.arrl.org/rf-exposure*
*"Radio is basically a safe activity. In recent years, however, there has been considerable discussion and concern about the possible hazards of electromagnetic radiation, including both RF energy and power-frequency (50-60 Hz) electromagnetic fields. To allay such concerns, the FCC set limits on the amount of RF energy people can be exposed to. Some stations now need to be evaluated to ensure they are in compliance with RF exposure limits.*

*As detailed in a May 2023 QST article by Greg Lapin, N9GL, the rules which took effect on May 3, 2021 now require amateur radio operators to perform station evaluations. The Amateur Radio Service is no longer categorically excluded from certain aspects of the RF exposure rules, and licensees can no longer avoid performing an exposure assessment simply because they are transmitting below a given power level.*

*A two year transition period was implemented to allow existing stations to make any necessary changes, but as of May 3, 2023, the transition period ends and all transmitters operating in the US are expected to comply with the exposure rules. The ARRL has on its website an RF Exposure Calculator to assist amateurs in performing station assessments.*"

To keep this short for the newsletter, I am going to give you the reader's digest version of performing an RF exposure assessment of your station. I suggest you explore more on the League website relating to RF exposure. There's a lot of good information there. You do not need to report the results of your assessment to the FCC. However, it's a good idea to have the data available in case you need it later. Basically, you'll need to calculate the worst-case RF exposure levels to people at your base and mobile station. In the end, minimum approach distances will be calculated for you using the information you give the web-based calculators. You'll have two possible distances: controlled and uncontrolled environments.

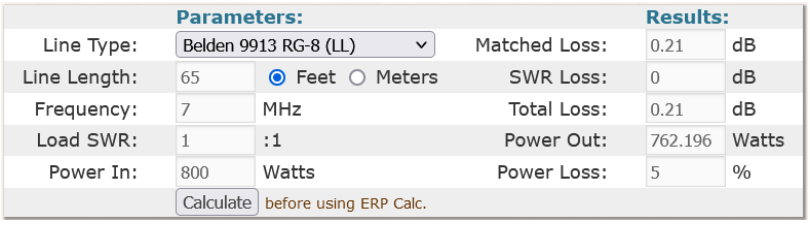
What information do you need? Think for a few minutes about your station setup. What modes do you operate? AM? FM? SSB? CW? RTTY? How much RF power you use comes into play. Are you a QRP op running 5 watts or are you a contester using a legal limit amplifier to multielement antenna or somewhere in between? What is the gain figure for your antennas? What bands do you operate on? How much RF is making it to the antenna feed point? What is the antenna elevation above ground? Think of that last one another way; how far away are those antennas from people on the ground or in adjacent buildings with elevation above ground? You'll have to do a bit of research. The hard work, however, is done for you courtesy of the internet and the ARRL.

## Assessment Example

**WA3UOO Station Equipment for 40 Meters**
**Transmitter**: Yaesu FT-950, 100 watts output
**Linear Amplifier**: Ameritron AL 811H, 800 watts PEP SSB output (use on other modes results in different power output and duty cycles and must be given to accurately assess the station)

**Duty Cycle**: 20% ( SSB conversational, no speech processing)
**Antenna**: Cushcraft R7 trap vertical multiband antenna
**Gain**: 3 dbi (decibels over and isotropic radiator)
**Feedline**: RG9913 (RG8),
**Feedline Length**: 65 feet
**SWR**: 1:1
**Transmission Line Loss**: 38 watts
**Power at the Antenna**: 762 watts

First, determine the loss in the transmission line because this is the first thing you need to start the process. To do this, I used an ARRL recommended calculator at KV5R.COM. Refer to Figure 1. The URL is [http://kv5r.com/ham-radio/coax-loss-calculator/](http://kv5r.com/ham-radio/coax-loss-calculator/). There are others. It is easy to use.

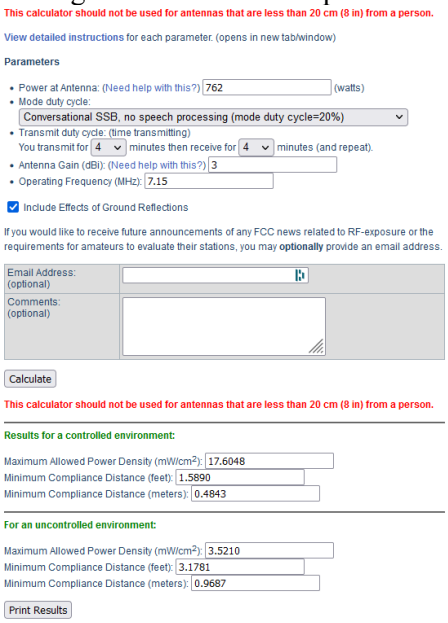


| | Parameters: | | | Results: | |
|---|---|---|---|---|---|
| Line Type: | Belden 9913 RG-8 (LL) | | Matched Loss: | 0.21 | dB |
| Line Length: | 65 | Feet / Meters | SWR Loss: | 0 | dB |
| Frequency: | 7 | MHz | Total Loss: | 0.21 | dB |
| Load SWR: | 1 | :1 | Power Out: | 762.196 | Watts |
| Power In: | 800 | Watts | Power Loss: | 5 | % |
| | Calculate | before using ERP Calc. | | | |

**Figure 1**
KV5R.COM Coax Loss Calculator

Once you have calculated the power at the antenna, you can go to the ARRL RF Exposure Calculator and run the numbers. Refer to Figure 2. Here, you'll simply need to enter the appropriate data and select the Mode Duty Cycle from the dropdown. Click Calculate. You may need to scroll down to reveal the results. Here, you'll see the final calculations for maximum power density and minimum compliance distances for both controlled and uncontrolled environments.

Please take a few minutes to read the article by [May 2023 QST article by Greg Lapin, N9GL](#) mentioned at the beginning of this article. Among its various topics, it discusses the controlled versus uncontrolled environment minimum compliance distances better than I can. Additional calculations may be required. As I mentioned at the beginning of this article, this is a reader's digest version of this topic.



This calculator should not be used for antennas that are less than 20 cm (8 in) from a person.

View detailed instructions for each parameter. (opens in new tab/window)

Parameters

- Power at Antenna: (Need help with this?) 762 (watts)
- Mode duty cycle:
  Conversational SSB, no speech processing (mode duty cycle=20%)
- Transmit duty cycle: (time transmitting)
  You transmit for 4 minutes then receive for 4 minutes (and repeat).
- Antenna Gain (dBi): (Need help with this?) 3
- Operating Frequency (MHz): 7.15

Include Effects of Ground Reflections

If you would like to receive future announcements of any FCC news related to RF-exposure or the requirements for amateurs to evaluate their stations, you may **optionally** provide an email address.

| | |
|---|---|
| Email Address: (optional) | |
| Comments: (optional) | |

Calculate

This calculator should not be used for antennas that are less than 20 cm (8 in) from a person.

Results for a controlled environment:

Maximum Allowed Power Density (mW/cm²): 17.6048
Minimum Compliance Distance (feet): 1.5890
Minimum Compliance Distance (meters): 0.4843

For an uncontrolled environment:

Maximum Allowed Power Density (mW/cm²): 3.5210
Minimum Compliance Distance (feet): 3.1781
Minimum Compliance Distance (meters): 0.9687

Print Results

# Technical Committee Report

By Chuck Wood WA8KKN

The technical committee has a few items that will be of interest to the users. We have been busy, and it will continue in the coming months.

1. DSTAR New Equipment
2. Solid State Amplifier  W8RRJ Repeater (146.970 MHz) --→
3. D-STAR Server Network Outage.
4. IRLP Audio

**D-STAR New Equipment**

CORC's board of directors decided to be proactive concerning the D-Star system equipment when a special deal came along from Ham Radio Outlet (HRO).
CORC's present RF hardware equipment is running fine without problems. The radios are 15 years old and because of their age, are not supported by ICOM. Also, there are no problems with the present gateway server. This server is not manufactured by ICOM.

HRO had the latest D-STAR modules for $400 each on a one day sale. CORC purchased two modules (VHF & UHF). Also, a new Gateway server has been donated to the club.
This means CORC will have a cold standby system once all the bugs are worked out with the newer hardware and server. In case of a failure, the older equipment can be placed in service.

**W8RRJ Repeater (146.970 MHz) Solid State Amplifier**

As many of you know, the 146.970 MHz repeater had a catastrophic power amplifier failure when the power company's pole transformer blew up. The repeater's high voltage supply failed as well as other non CORC equipment in the building. It was over 40 years old.

The technical committee and the board of directors decided to replace the tube amplifier with a solid-state unit like what we did 5 years ago with the 146.76 MHz repeater. CORC also scrounged up a 60 AMP power supply (at no cost) to power the new amplifier.

For approximately 3 weeks, the repeater was operating with 10 watts up the coax until the new amplifier arrived. The 146.970 MHz repeater is now operating at full legal power with the new amplifier.

We have replaced it with a Henry Electronics 250-watt solid state amplifier. This is the same final amplifier used on the 146.76 repeater.  CORC can now say that there are no more "TUBES" in the CORC repeater system.

These amplifiers DON'T come cheap. In the last few years, they went up nearly 30 percent. This purchase made a dent in the club's savings account. Any donations would greatly be appreciated.

**D-STAR Server Network Outage**
Presently, the gateway to the world has been fixed. The D-STAR system is up and running. The gateway outage was due CORC's 15 year old router with may be 15 years of old CPU / firmware bugs. . Rebooting the router fixed the problem. This is like what you do with your Home PC every so often.

At no time were the two nodes (VHF & UHF) off the air. The linking functions via the Internet were down. Local repeater traffic was never affected. This older router is not a commercial grade unit. CORC purchased a commercial router last year to replace it. Mr. Murphy as in Murphy's Law struck. Something went wrong in our software programing of the new router. Additional work is required. Until then, we continue to use the older router. If you are unfamiliar with Mr. Murphy, please look at the following web site: https://en.wikipedia.org/wiki/Murphy's_law

**IRLP Audio improvements to the W8NBA Repeater 147.330 MHz**
The IRLP audio has been improved so the sub-audible tones (PL Tones) are not heard. An audio high pass filter was added to reduce the PL Tone levels being heard. We had reports that these low frequency tones were annoying.

**Other CORC Repeater systems**
The 52.700 MHz (W8RRJ), 444.200 MHz (W8AIC), 147.330 MHz (W8NBA), 442.800 (K8NIO) and 146.76 (W8AIC) have been operating normally without issues.