THE ROUND TABLE
Monthly Newsletter Of The Denver Radio Club
Since 1917 June 2025

President's Message

By Gerry Villhauer, W0GV

Hello DRC Members,

I hope you all are doing well as we approach summer.

Upcoming event to put on your calendar. DRC Field Day will be June 28-29 at the same location as the last several years, The Prospect Arena, 13805 West 52nd Ave. Arvada, CO. Setup will start at 0800 on Saturday Morning, Jun 28, 2025. We need help setting up the antennas and tents, etc. Please come and help! It is your Field Day and it does not just magically happen, we need your help with set up and tear down on Sunday afternoon. There will be food, coffee, water and soft drinks available for Breakfast, Lunch and Supper on Saturday and Breakfast (probably donuts) on Sunday morning. Sunday morning we plan on doing a Pico Balloon Launch. The launch will be fairly early before the winds pick up as the day gets warmer. Come and "GET ON THE AIR". No matter if you have a ham license or not, you can experience the fun of making contacts on the HF bands. Come and enjoy!

We are planning to start doing Hybrid regular meetings. What is that you ask? A meeting that you can attend in person or participate over the internet; as we have been doing for the last 5 years. Exact start date is not established as we are still acquiring needed equipment and confirming the in person location details. More to come.

Other events for your calendar: The RMHam "Summer Swapfest" on Aug 24, 2025 at the Adams County Fairgrounds. See rmham.org website for more information.

Hamcon Colorado the Rocky Mountain ARRL Convention, being held in Grand Junction, CO on October 23-26, 2025. See hamconcolorado.com for more information.

At this time we do not have a program for our June regular meeting. We are working on getting a program or speaker and any help from the membership would be greatly appreciated.

Thanks to all of our new members who have recently joined the DRC. Your support is very much appreciated. Please come to meetings and events and stay active. Your name and call will be posted in this edition of the Round Table.

73 for now,
Gerry, W0GV
President

Who's New In The DRC?

Provided by Kelly Sobanski, KB8OGP

The DRC is a very active club in the Denver metro area and we'd like to have all of our members listen for these new calls and welcome them to the club and repeaters. Welcome to our newest members:

Nicholas Severn - KF0UBR	John Stischok
Robert Mesenbrink - NB0BN	Michael Kimmey - KF0LGO
John Bunning	Thomas Glivar - KF0TXL

We have a number of activities throughout the year and we'd like very much for you to participate in serving your community. If you have questions please feel free to ask on any of the repeaters or see the contact information on the last page of this publication.

Also, please join us once a month at the regular club meeting on the 3rd Wednesday at 7:00 p.m. For new hams we have the Elmer session which starts at 6:00 p.m. before the regular meeting.

Monthly DRC Lunch - Reminder

By Pete Sobanski, AB8WN and Kevin Schmidt, K0KPS

The address for the monthly lunch has changed. It is now at Sunrise Sunset. It's still on the third Wednesday of each month at 11:30 a.m. The address is 1424 S Wadsworth Blvd, Lakewood, CO 80232. No reservations are required. If you are interested in meeting and talking about radio, or other topics, don't hesitate in coming by. w0tx.org/2024/06/09/denver-radio-club-lunch

DRC Saturdays

By Pete Sobanski, AB8WN

Last year our club hosted summer DRC Saturdays. After great turnout and discussions on Sunday nets, we're planning on running that program again.

Please mark your calendars to attend a virtual planning session on June 14th at 7-8PM here: w0tx.org/meet.

We're excited to gather ideas and resources for events and coordinate volunteers.

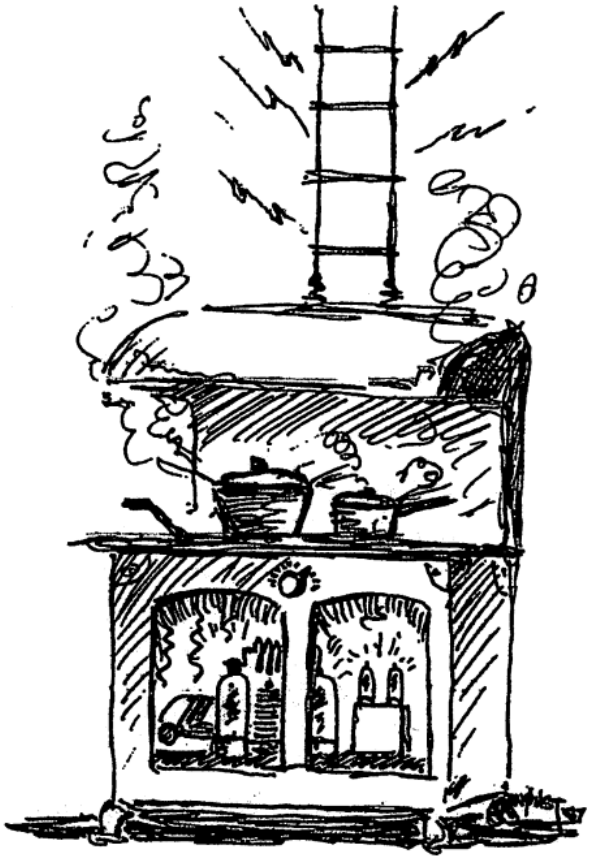
DRC Recipes

Provided By Cathy Villhauer, N0CRZ

Another one from the recipe book that was published by DRC members in 1988.

COOKIN' OVER THE AIRWAYS

The Denver Radio Club, Inc.



Now you're cookin'!

COLESLAW

Mildred Chirhart
xyl of KØDYT

4 c. finely-shredded cabbage
½ c. chopped green pepper
½ tsp. salt
2 T. sugar
2 T. vinegar
½ c. Miracle Whip
½ tsp. prepared mustard
6 T. canned milk

Mix all ingredients except cabbage and green peppers. About 30 minutes before serving, place the dressing over the cabbage and green peppers. Blend well and place in refrigerator to chill.

Malicious USB Spy Cables

By Bill Rinker, W6OAV

In the October 2022 issue of the *Roundtable* there is an article titled "*Don't Get Juice Jacked"* (link is below). Juice jacking is a cybersecurity threat that occurs at public charging stations, such as those found in airports, hotels, shopping centers, and other public spaces. Well, the cybersecurity threat since then has gotten worse! Malicious USB Spy cables are now becoming common. These cables can be distributed through physical placement in environments like offices, hotel rooms, or conference centers during "evil maid attacks," where attackers gain temporary access to devices. Public USB charging stations are another risk area where attackers may place Malicious USB Spy cables.

Malicious USB spy cables are deceptive devices that appear to function as regular USB charging or data transfer cables but contain hidden hardware designed for malicious purposes. These cables are a significant cybersecurity threat due to their ability to exfiltrate data, inject malware, or even take control of connected devices. They contain embedded components such as microcontrollers, Wi-Fi modules, or keyloggers that enable these malicious activities.

The capabilities of malicious USB spy cables are quite extensive. They can steal sensitive information like usernames, passwords, and files. Some versions are equipped with keystroke loggers that record every keystroke on a connected keyboard, while others can deploy ransomware or other harmful software. Advanced models may even allow attackers to control the connected device remotely via Wi-Fi or cellular networks. Additionally, some can record audio or track locations, further expanding their potential for espionage.

The concept of malicious USB cables has been around for some time. Early versions, such as the NSA's "COTTONMOUTH," were expensive and primarily used for espionage. However, over time, the technology has become more affordable and accessible, leading to widespread availability on the internet. Today, tools like the O.MG Cables are sophisticated enough to include Wi-Fi servers and keyloggers capable of logging up to 650,000 keystrokes. They can also perform keystroke injection attacks, tricking devices into executing commands.

The risks associated with Malicious USB Spy cables are substantial. Their stealthy appearance makes detection difficult. Once connected, these cables can serve as a pivot point for attackers to infiltrate larger networks, extract data, or stage ransomware attacks. The fact that they are openly sold online at relatively low prices makes them accessible to both cybersecurity professionals and malicious people. Prices range from $6.74 to $160.00, depending on the capabilities and complexity of the device.

There is an inexpensive tool which is dedicated to identifying Malicious USB Spy cables. The tool is the HAK5 sold Malicious Cable Detector, also known as the O.MG Malicious Cable Detector It is a small, portable tool designed to identify USB cables that may contain embedded malicious hardware. In essence, the Malicious Cable Detector provides a proactive layer of security by enabling users to quickly and easily identify potentially compromised USB cables before they can be used to carry out an attack. It's a valuable tool for security-conscious individuals, penetration testers, and anyone concerned about hardware-based cyber threats.

Figure 1 - One cable is the OMG. Which one?

Overall, Malicious USB Spy cables highlight the need for increased awareness and proactive measures in cybersecurity practices. It's also important to avoid using unfamiliar or unverified USB cables, especially in public charging stations.

References:

Don't Get "Juice Jacked"!
https://w0tx.org/RoundtableArchive/2022-RoundTables/RT202210(OCT).pdf#page=4
Malicious Cable Detector by O.MG
https://shop.hak5.org/products/malicious-cable-detector-by-o-mg
Here Come the Malicious USB Cables
https://www.tomshardware.com/news/malicious-usb-cables-wi-fi-controller,38603.html
Malicious USB Cables
https://counterespionage.com/malicious-usb-cables/
Exposing Malicious USB Cables - BSides Portland 2022
https://www.youtube.com/watch?v=DRDLnTEMrXM
How to Detect Malicious USB Spy Cables
https://www.youtube.com/watch?v=nKnZd_1OdsE

DRC - Blast From the Past

Provided By Woody Linwood, W0UI

Woody Linwood, W0UI, sent over some photos from various DRC events in the past. This one is from the 1982 Christmas banquet.

1982 DRC Christmas Banquet

The Myth and Facts About ½λ Lengths of Coax Feed Lines

By Bill Rinker, W6OAV

The Myth

There have been statements among hams that ½λ lengths coax feed line will automatically solve impedance matching issues and/or improve antenna performance. Not true! This is a common misconception that has persisted in ham radio circles for years.

The idea of using ½λ multiples of coax originated (in the “olden days”) from a specific application for tuning narrowband output stages in older transmitters to the unique types of antennas common then, not for general SWR measurements or antenna performance. This myth is likely due to misunderstanding of transmission line theory, oversimplification of complex antenna

systems and anecdotal evidence due to improper testing.

The Facts

We'll begin with a discussion about a random length of coax followed by a discussion about a ½λ length coax.

For general use, the length of a coax feed line does not significantly affect antenna performance or SWR readings, provided the *antenna itself is properly tuned and matched* to the coax (SWR is close to 1:1). This means using a balun with a balanced antenna such as a dipole. In this case, the SWR should not change with a change with coax length, except for a barely perceptible SWR change because of the corresponding change in line attenuation.

The SWR value along a coax remains essentially the same when operating at the frequency for which the antenna is specifically tuned and matched. However, when deviating from this optimal frequency, SWR variations become more pronounced with changes of frequency or of coax lengths. This phenomenon occurs due to several factors:

- As the operating frequency shifts away from the antenna's tuned frequency, the antenna's impedance changes. This creates a mismatch between the antenna and the coax's characteristic impedance.
- The greater the mismatch between the antenna and coax impedances, the more significant the SWR changes become with variations in coax length.
- This frequency-dependent behavior explains why SWR often varies across different parts of a ham radio band. When tuning across a band, the degree of mismatch between the antenna and feedline changes, resulting in fluctuations in SWR readings.

The SWR in a mismatched antenna system will change with coax length changes because in mismatched systems, standing waves form along the coax. The SWR reading will vary depending on where along this standing wave pattern the measurement is taken. Changing coax length shifts where these measurement points fall relative to the standing wave pattern.

If the SWR does change significantly with a change in coax length, this can mean that:

- The antenna itself is not properly tuned/matched to the coax at that frequency.
- A balanced antenna is without a balun or equivalent network.
- The antenna elements are positioned asymmetrically relative to the coax introducing common mode current on the shield of the coax. (Usually curable with a current balun or RF choke at the antenna feed point).
- The coax is part of the antenna system. Especially with certain antenna types (like end-fed antennas without proper counterpoise), the coax can become part of the radiating system.

Concepts and limitations ½λ lengths of coax

A ½λ length of coax provides some specific useful characteristics, but it's important to understand the context and limitations of this concept:

- *Impedance Replication*: A ½λ length of coax (or multiples thereof) will replicate the impedance at one end to the other end at the ½λ frequency. For example, if the antenna impedance is 10 ohms, a ½λ length of coax will present close to10 ohms at the radio end.
- *Transparency:* A ½λ length of coax reproduces the impedance of the antenna feed point at the transmitter end of the coax, regardless of the characteristic impedance of the coax. Consider the transmission line to be "invisible". This characteristic means that the ½λ

length of coax does not have to be 50 ohms for a 50 ohm radio/antenna.

- *Frequency dependence:* The replication effect is frequency specific. The coax is only a ½λ length at one frequency. As soon as the measurement frequency is changed, even slightly, the coax is no longer electrically a ½λ length and loses its replication ability. The coax begins to act as an impedance transformer.
- *Not a solution for mismatches:* If an antenna is not properly tuned/matched to the coax impedance (typically 50 ohms), using ½λ length of coax won't solve the mismatch problem.
- *Practical limitations:* In real-world applications, especially with multi-band antennas or when operating across a range of frequencies, focusing on ½λ length coax sections is often impractical and unnecessary.

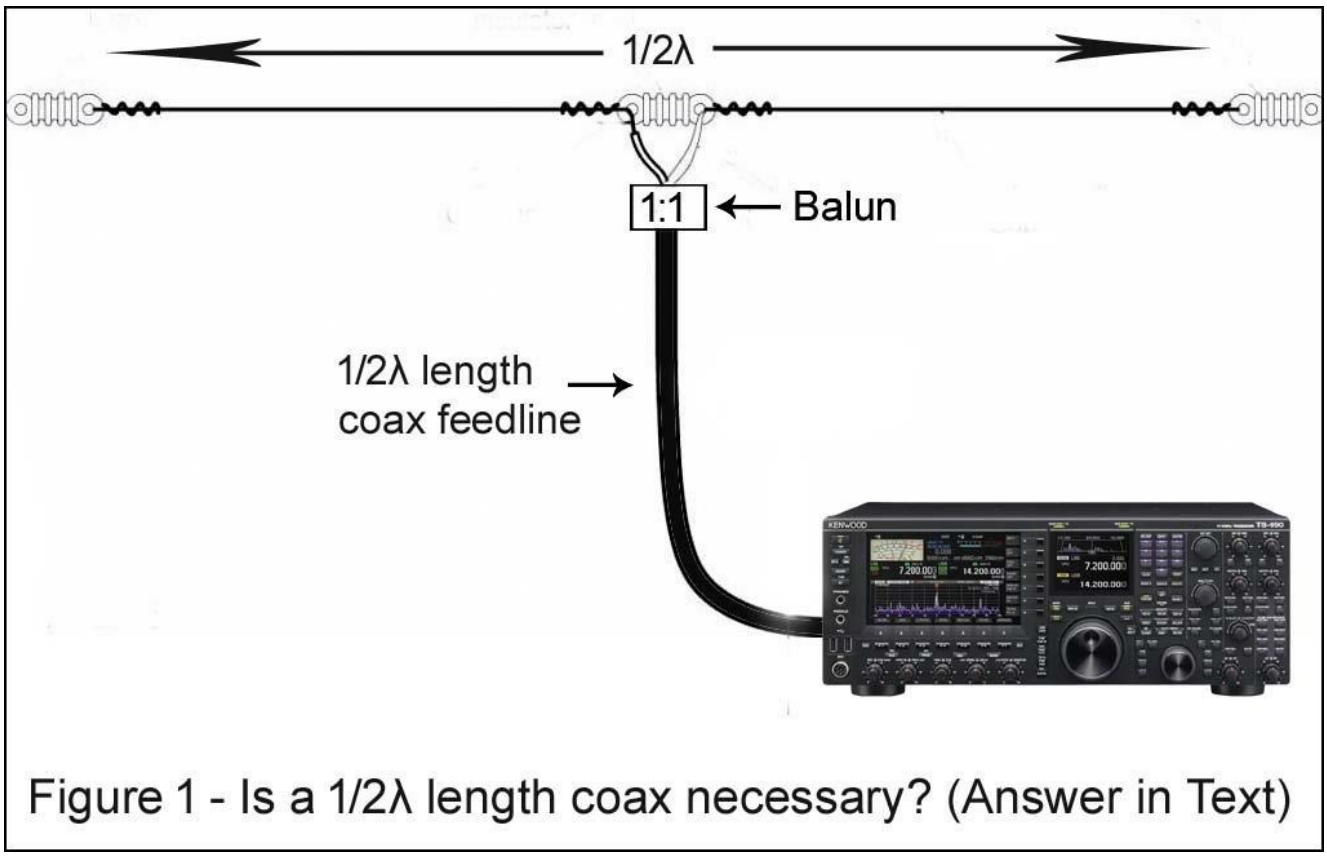


Figure 1 - Is a 1/2λ length coax necessary? (Answer in Text)

Chief benefit for using ½λ lengths (or multiples) of coax.
The impedance replication ability of ½λ length coax can be particularly useful when tuning/matching complex antennas, especially in situations where direct access to the antenna with test equipment is limited or impractical. This technique effectively "relocates" the measurement point from the antenna to the radio end of the coax, offering several practical benefits.

One person can be positioned at the antenna, making physical adjustments while another person remains on the ground with measurement equipment connected to the radio end of the coax. The person on the ground can provide immediate feedback on impedance or SWR changes. This real-time information guides the adjustments being made at the antenna.

This procedure reduces the need for multiple trips up and down a tower or roof. It allows for more rapid and precise adjustments. By using this ½λ coax technique, antenna installation and tuning can become more efficient, accurate, and safer, especially for complex or elevated antenna systems.

Creating a ½λ coax feedline

The procedure for creating a ½λ coax feedline includes measuring to account for real-world factors such as variations in coax manufacturing or slight differences in dielectric properties, the effects of connectors and adapters and help verify that calculations are correct. Fine-tuning with measurement equipment is recommended for precise results, especially at 50 MHz and above where small changes in length can produce large effects on ½λ resonance. While measuring can provide more precise results, just calculating HF coax lengths is often adequate for most practical purposes. For example, cutting an inch off a ½λ of coax (0.66 VF) resonant at 20 meters would increase the resonant frequency by approximately 52 kHz. Doing the same to a ½λ of 2 meter coax would increase the coax resonant frequency by approximately 5.7 MHz!

Following is an example for creating a ½λ coax feedline with solid polyethylene for 14.2 MHz:

1. Determine the coax velocity factor:
   Coaxes have a velocity factor (VF) that affects the signal speed. Typical values are:
   - Solid polyethylene: 0.66 (to be used in this example)
   - Foam polyethylene: 0.78-0.88
   - PTFE (Teflon): 0.70

2. Calculate the wavelength (λ) in free space (speed of light in free space is 984 feet per microsecond):
   Formula: λ = 984 / Frequency (MHz):
   λ = 984 / 14.2 = 69.3 feet

3. Calculate the free space ½λ:
   Formula: ½λ =(λ) in free space / 2:
   ½λ = 69.3 / 2 = 34.65 feet

4. Account for the velocity factor of the coax:
   Formula: Physical length = ½λ * Velocity factor:
   Physical length = 34.65 * 0.66 = 22.87 feet

5. Cut the coax to the calculated length, plus a small extra amount (e.g., 1/2 inch) for fine-tuning.

6. Fine tune the length:
Use a network analyzer or SWR meter, to check the electrical length:
- Solder a proper connector to the station end of coax.
- Connect the connector to the analyzer.
- Leave the far end open.
- Trim small amounts (1/8 inch at a time) from the open end until you see the desired ½λ characteristics. At ½λ resonance, the following characteristics should display on the test equipment:

- *Impedance:* The input impedance will appear very high, theoretically infinite. In practice, it will show as an open circuit or a very high resistance.
- *SWR:* The SWR will be very high, approaching infinity theoretically. Most analyzers will show this as their maximum readable SWR value.
- *Return Loss:* The return loss will be very low, close to 0 dB, indicating that almost all of the signal is being reflected back.

Summary

While ½λ lengths of coax feeders do have some theoretical benefits in terms of impedance matching and measurement, they are not essential for proper antenna operation. The most important factors are to use high-quality coax of only sufficient length, a properly tuned antenna and, if necessary, a good tuner at the radio end of the coax (See the last reference below).

References:

All About Coax:
http://dx-antennas.com/Coax.htm

Half Wavelength Coax Runs - what you need to know:
https://www.youtube.com/watch?v=-Nl5_3YLWGM

Ham and CB Radio Myth - Coax Transmission Lines Must Be A Specific Length:
https://www.youtube.com/watch?v=ysXPGRmFsjU

SWR - The persistent myth:
https://zs6wr.co.za/documents/SWR.pdf

Mismatched Antenna Feed Line:
https://www.youtube.com/watch?v=gZWnFpOpovQ&t=0s

SWR Demystified: David Casler (Ask Dave):
https://www.youtube.com/watch?v=QWmx1_-V1-o

Don't Worry About High SWR! (Page 8):
https://w0tx.org/RoundtableArchive/2016-RoundTables/RT201602(FEB).pdf

The DRC needs you!

Please contact W0GV (president@w0tx.org) if you are interested in helping with the open positions.

See the list at the end of the newsletter.

QSL Card - N8BIF

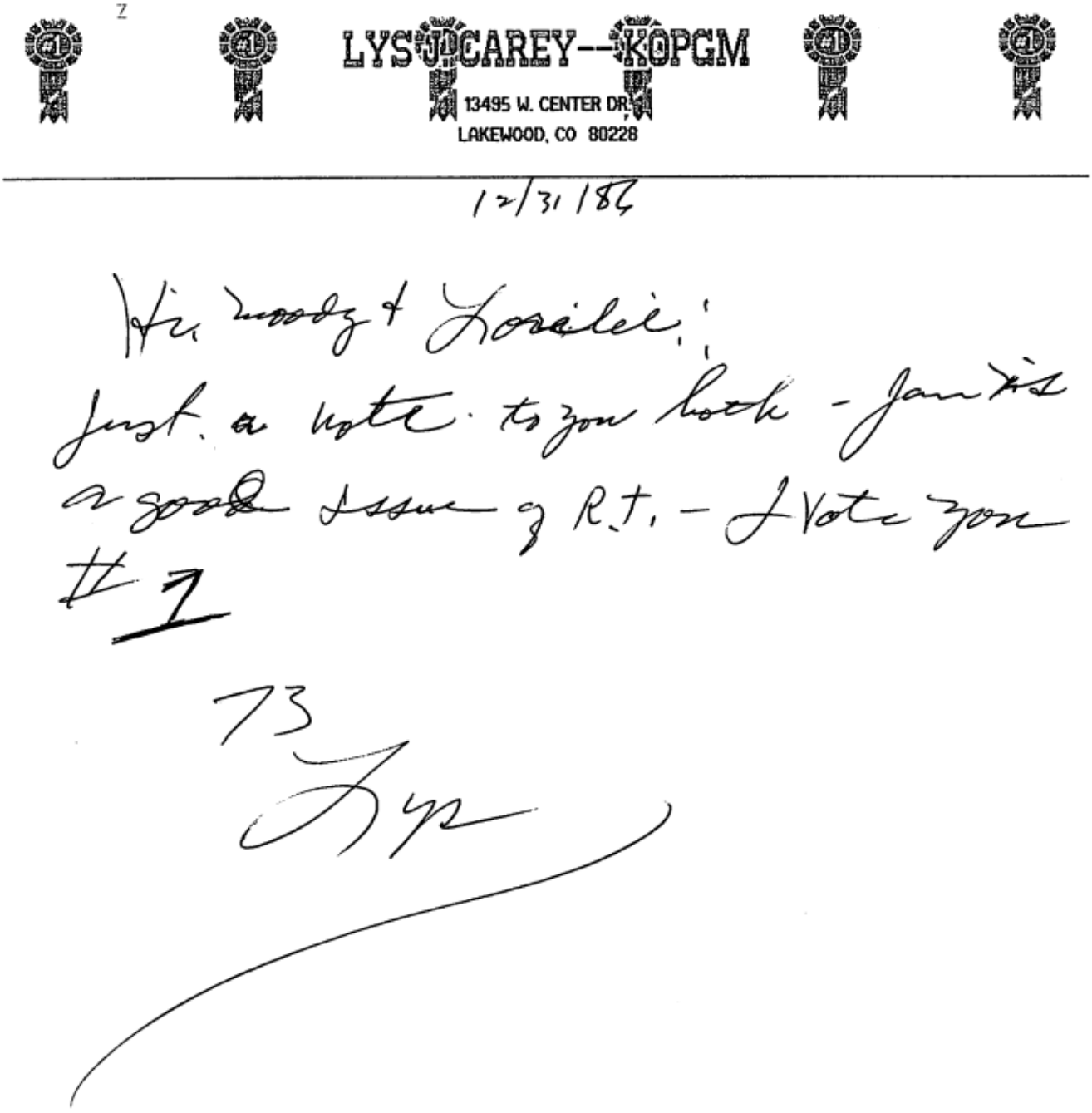
HamCon Colorado is Coming!

From John Maxwell, W0VG

The Rocky Mountain Division Convention is coming back to Colorado after nearly 9 years! We're going to have a great convention with some fantastic speakers and forums on every topic imaginable. We look forward to seeing you all October 23-26, 2025 in Grand Junction.

Thank you for your interest in HamCon Colorado. If you would like more information, go to hamconcolorado.com.

From the Archives



LYS J. CAREY -- KOPGM
13495 W. CENTER DR.
LAKEWOOD, CO 80228

12/31/84

Hi Woody & Lorraine!

Just a note to you both - Jan '85 is a good issue of R.T. - I vote you #1

73

Lys

DRC's Emergency Response Info

In the event of a disaster in the metro area, please monitor our repeaters on 145.490/448.625 (primary) and 449.350 (secondary).

The emergency Net Control Operator will provide information and/or requests to members for assistance.

W0TX Repeater Directory

Kings Soopers Reward Program - Help the DRC.

kingsoopers.com/i/community/community-rewards

citymarket.com/i/community/community-rewards

Random Site Of The Month

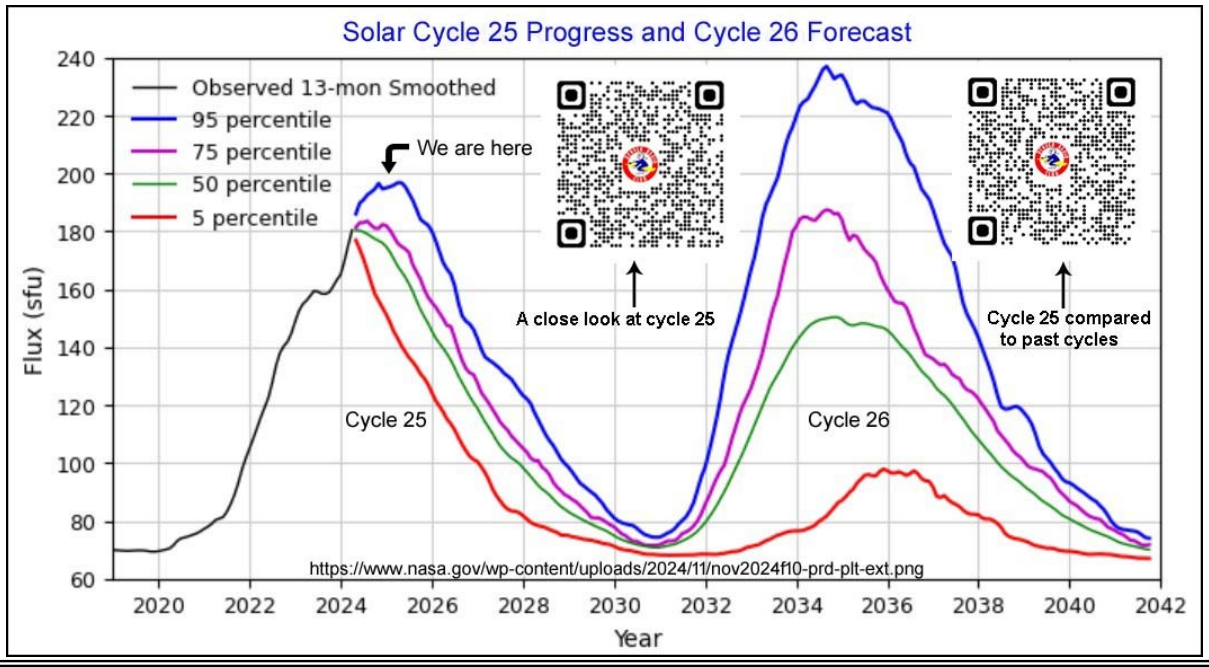
Oxley Region ARC

The Round Table Archive and Article Index

w0tx.org/roundtable

Propagation Forecast

By Bill Rinker, W6OAV



Upcoming Events

Hamfests & Conventions

Event	Date	Location	Sponsor Website
Montrose ARC Tail Gate Party	Jun 7th	Lions Club Pavillion	montrosehamradio.org
Western CO ARC Hamfest	Aug 9th	Grand Junction	w0rrz.org
Summer Swapfest	Aug 24th	Brighton	rmham.org

Upcoming QSO Parties

The following are the Contests not sponsored by the ARRL. Please submit additions for future issues.

State/Province	Start Date	End Date	Sponsor Website	Notes
Kentucky	06/07/2025	06/08/2025	Kentucky Contest Group	
West Virginia	06/14/2025	06/15/2025	West Virginia State Amateur Radio Council	
Alabama	07/26/2025	07/27/2025	Alabama QSO Party	
Maryland-DC	08/09/2025	08/10/2025	Anne Arundel Radio Club	
Hawaii	08/22/2025	08/24/2025	Hawaii QSO Party	
Ohio	08/23/2025	08/24/2025	Ohio QSO Party	
Colorado	08/30/2025	08/31/2025	Pikes Peak Radio Amateur Association	
Kansas	08/30/2025	08/31/2025	Kansas QSO Party	
Tennessee	09/07/2025	09/08/2025	Tennessee Contest Group	
Iowa	09/20/2025	09/21/2025	Story County ARC	
New Hampshire	09/20/2025	09/21/2025	Port City Amateur Radio Club	
New Jersey	09/20/2025	09/21/2025	Burlington County Radio Club	
Texas	09/20/2025	09/21/2025	Texas DX Society	
Washington	09/20/2025	09/21/2025	Western Washington DX Club	
Maine	09/27/2025	09/28/2025	Wireless Society of Southern Maine	
California	10/04/2025	10/05/2025	California QSO Party	
Arizona	10/11/2025	10/12/2025	Arizona QSO Party	

Source: qsoparty.eqth.net/index.html See contestcalendar.com/contestcal.html for a larger QSO parties list.

Attention

The DRC Board of Directors meetings are held on the 4th Wednesday of each month via Google Meet and are open to any member. If you wish to attend, please contact a board member prior to the meeting night for specific information.

DRC Repeaters

BAND	Freq / Shift / PL Tone	Additional Information
6m	53.090MHz (-1MHz) 107.2Hz PL	
Packet	145.05MHz	**Metro Denver Area Coverage**
2m	145.490MHz (-) 100Hz PL	**Linked to 70cm / 448.625MHz. Primary frequency during emergency net.**
2m	147.330MHz (+) 100Hz PL	**Local area. Does not TX a PL.**
1.25m	224.380MHz (-) 100Hz PL	
70cm	447.825MHz (-) DCS~073; NB 12.5; +/- 2.5	**Saint Anthony's. Note: This is a narrow band repeater requiring DCS.**
70cm	448.625MHz (-) 100Hz PL	**Linked to 2m / 145.490MHz. 1° disaster net freq.**
70cm	449.350MHz (-) 100Hz PL	**Wide area coverage with Echolink, node # 4140. Secondary frequency during emergency net.**
70cm	449.775 MHz (-)	**Yaesu digital, C4FM, Wires-X, DN, VW & Data. No analog FM. W0TX Room 40931.**
70cm	446.7875MHz (-)	**BrandMeister Repeater: Slot 1 – Wide Area Traffic, Slot 2 – Local Talk Group 310804**

DRC's Trading Post

Don't forget you can find locally-sourced, ham-grown merchandise at: w0tx.org/trade

JUNE 2025

DRC Net Sundays at 8:30 p.m. on 145.490 / 448.625 (no PL)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	**2** First Quarter	**3**	**4** **Learning Net** 7:30 p.m. 145.490 / 448.625 (No PL)	**5**	**6**	**7** Int'l Digital Contest
8 Int'l Digital Contest	**9**	**10**	**11** **Learning Net** 7:30 p.m. 145.490 / 448.625 (No PL) Full Moon	**12**	**13**	**14** **DRC Saturday Planning Discussion**, 7—8 PM w0tx.org/meet June VHF 
15 June VHF 	**16** June VHF	**17**	**18** **DRC Lunch** 11:30 @ Sunrise Sun-set, Lakewood **DRC Meeting** Elmer 6 p.m. General 7 p.m. Last Quarter	**19**	**20**	**21** Kid's Day
22	**23**	**24**	**25** **Learning Net** 7:30 p.m. 145.490 / 448.625 (No PL) New Moon	**26**	**27**	**28** 
29 	**30**					

See arrl.org/contest-calendar for additional details about contests.

DRC Board of Directors

President	W0GV	Gerry Villhauer	303-467-0223	president@w0tx.org
Vice-President	K0KPS	Kevin Schmidt	303-475-9234	k0kps@arrl.net
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Board Member	AB8WN	Peter Sobanski	720-884-7470	ab8wn@w0tx.org
Board Member	N6WHV	Dick Nelson		n6whv@w0tx.org
Board Member	KB0CHT	Jeff Irvin	Check Roster	Check Roster

DRC Staff and Volunteers

Benevolent		Carolyn Wolf	303-279-1328	benevolent@w0tx.org
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Education Coordinator	Open			elmer@w0tx.org
EmComm Coordinator	Open			emcomm@w0tx.org
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Website & YouTube	K1DBC	Doron Ben Chaim	720-254-1561	websiteadmin@w0tx.org

Please Let Us Know

Over the years we occasionally hear from hams who have read the Round Table in other states and countries around the world. We appreciate the comments and we would like to know where you are located. So if you live outside the Front Range or Denver Metro Area and read the newsletter either online, email or hard copy please send a short note via email with your *City, State* or *City, Country*.
We will publish it at a later date in our new regular feature called Round Table Round World.
To respond to this request send your information to roundtable@w0tx.org.

Subject: I'm located in…

Editor's Note

DRC members - this is your newsletter. Please email your club or amateur radio related suggestions to the editor. Members are the heart of The Denver Radio Club, so if you have an expertise or an interest in a particular segment of ham radio that you'd like to write about, you may email your submissions to roundtable@w0tx.org. The submission deadline is the 25th of the Month. ~ Editor