THE ROUND TABLE
Monthly Newsletter Of The Denver Radio Club
Since 1917 December 2024

President's Message

By Gerry Villhauer, W0GV

Hello DRC Members,

The weather is looking good the week I am writing this and hopefully will carry forward to our Holiday Party on Dec 14, 2024. The long-range forecast only goes out till December 9 at this time and looks good until then.

Our annual DRC Holiday Party is upon us! Saturday December 14th. 2024. The location will be Highlands Masonic Center, 3550 N. Federal Blvd. Don't miss the FUN - FOOD - PROGRAM and PRIZES. Deadline for us to receive your reservation is Dec 11, 2024 and there are NO tickets sold at the door. Go to the DRC website to find the reservation form and get it in now please. Our program will be presented by Dave and Rita Baysinger on their recent trip to Africa. Dave and Rita are both very accomplished photographers and excellent speakers. I guarantee you will find their presentation very interesting and entertaining. Don't miss the show, get your reservations in today!

Thanks to Bob Witte, K0NR for his presentation on test equipment for ham radio use at our November meeting. If you missed the program check it out on our DRC website. And remember there will be no DRC regular meeting on December 18, due to our Holiday Party on December 14.

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.

Cathy and I would like to wish all of you and your families a very Merry Christmas and blessed holiday season! And hopefully Santa will put that new rig under your tree!

73 for now,
Gerry, W0GV
President

Who's New In The DRC?

Provided by Doron Ben Chaim, K1DBC

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:

Devin Langer	KF0OPL
Vincent Keller	KF0KAR
Aaron Hicks	

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.

Question of the Month

By Bill Rinker, W6OAV

What is a Grasswire HF antenna?

The answer can be found on page 6 of the May 2017 issue of the Roundtable:
https://w0tx.org/RoundtableArchive/2019-RoundTables/RT201905(MAY).pdf

An Overview of Wi-Fi Generations

By Bill Rinker, W6OAV

Navigating the world of Wi-Fi can be confusing, especially with new standards emerging all the time. While hams don't need to become Wi-Fi experts, understanding the basics of the different Wi-Fi versions can offer valuable knowledge for "future-proofing" their Wi-Fi system and getting the best performance. Let's take a quick look at the world of Wi-Fi:

Obsolete Protocols (not discussed here):
- Wi-Fi 1: 802.11b (1999).
- Wi-Fi 2: 802.11a (1999) and 802.11g (2003).
- Wi-Fi 3: 802.11n (2009).

Current Protocols:
- Wi-Fi 4: 802.11n (2009).
- Wi-Fi 5: 802.11ac (2013).
- Wi-Fi 6: 802.11ax (2019).
- Wi-Fi 6e: 802.11ax (2019).

Bands & Channels:

WiFi Version	Bands	Number of Channels	Channel Bandwidth Options
Wi-Fi 4 (802.11n)	2.4 GHz	3 non-overlapping	20 MHz
	Total:	3	20 MHz
Wi-Fi 5 (802.11ac)	2.4 GHz	3 non-overlapping	20 MHz
	5 GHz	32 non-overlapping	20 MHz, 40 MHz, 80 MHz
	Total:	35	20 MHz, 40 MHz, 80 MHz
Wi-Fi 6 (802.11ax)	2.4 GHz	3 non-overlapping	20 MHz
	5 GHz	32 non-overlapping	20 MHz, 40 MHz, 80 MHz
	Total:	35	20 MHz, 40 MHz, 80 MHz
Wi-Fi 6e (802.11ax)	2.4 GHz	3 non-overlapping	20 MHz
	5 GHz	32 non-overlapping	20 MHz, 40 MHz, 80 MHz
	6 GHz	144 non-overlapping	20 MHz
		7 non-overlapping	160 MHz
	Total:	183	20 MHz, 40 MHz, 80 MHz, 160 MHz

Speed:
- Wi-Fi 4: ≤ 150 Mbps, good for basic tasks like web browsing and low-resolution streaming.
- Wi-Fi 5: ≤ 3.5 Gbps, perfect for high-definition streaming and online gaming.
- Wi-Fi 6: ≤ 9.6 Gbps, ideal for 4K/8K streaming, VR gaming, and large file transfers.
- Wi-Fi 6e: Has the potential for even faster speeds due to the new 6 GHz band.

Range:
- Wi-Fi 4: *Indoors*: ≤ 98 feet, *outdoors*: ≤ 328 feet.
- Wi-Fi 5: *Indoors*: ≤ 131 feet, *outdoors*: ≤ 410 feet.
- Wi-Fi 6: Similar to Wi-Fi 5, but with potential for improvement due to features like MU-MIMO and OFDMA that optimize signal transmission for multiple devices.
- Wi-Fi 6e: *Indoors*: Similar to Wi-Fi 6, but the 6 GHz band might have slightly lower penetration through walls and obstacles. *Outdoors*: Similar to Wi-Fi 6, with the potential for improved range in some cases due to the 6 GHz band's wider channels.

Latency (average):
- Wi-Fi 4: 10-15 milliseconds.
- Wi-Fi 5: 5-10 milliseconds.
- Wi-Fi 6: 3-7 milliseconds.
- Wi-Fi 6e: 2-5 milliseconds (potentially lower in ideal conditions).

Security:
- Wi-Fi 4: Uses WPA2 security, which has vulnerabilities.
- Wi-Fi 5: Uses latest WPA2.
- Wi-Fi 6: Uses WPA3.
- Wi-Fi 6e: Uses the latest WPA3 security for enhanced protection.

Performance:
- Wi-Fi 4: Struggles with limited overlapping channels, congestion and interference in crowded environments.
- Wi-Fi 5: Introduces MU-MIMO for better handling of multiple devices.
- Wi-Fi 6: Utilizes OFDMA and TWT for more efficient data transfer and reduced battery drain.
- Wi-Fi 6e: Offers the best congestion management with the 6 GHz band.

Compatibility:
- Wi-Fi 4: Most devices are compatible.
- Wi-Fi 5: Becoming increasingly common, but not as ubiquitous as Wi-Fi 4.
- Wi-Fi 6: Growing in popularity, but some devices are still not compatible.
- Wi-Fi 6e: Still relatively new, with fewer compatible devices.

Overall:
- Wi-Fi 4: Best for basic needs and older devices.
- Wi-Fi 5: Good for streaming, gaming, and multiple devices.
- Wi-Fi 6: Ideal for demanding users and “future-proofing”.
- Wi-Fi 6e: The future of Wi-Fi, offering the best performance but with limited compatibility.

Note: The IEEE is developing Wi-Fi 7 (802.11be) scheduled for release in 2024. The protocol will have speeds of up to 46 Gbps and operate in the 2.4, 5 and 6 GHz bands. It will revolutionize the Wi-Fi world!

The best Wi-Fi choice depends on individual needs and budget. Consider internet usage, the number of devices to be connected, and future needs to make an informed decision.

YouTube References:

Wi-Fi 6 vs. Wi-Fi 5: Comparing Wireless Standards:
https://www.youtube.com/watch?v=Ww2CI6FrByQ

Wi-Fi 6 vs WiFi 6E - The One Huge Difference:
https://www.youtube.com/watch?v=SrVTzRgi8uA

Wi-Fi 6 vs 6E vs 7 Explained: Real-World Speed Testing:
https://www.youtube.com/watch?v=FUG8XhHmQ1Q

A Description of Wi-Fi 5, Wi-Fi 6 & Wi-Fi 7:
https://www.youtube.com/watch?v=nIlFnksVqkY

Wi-Fi 6 Explained:
https://www.youtube.com/watch?v=Y7OWUg_kmK4

2.4 GHz vs 5 GHz Wi-Fi: What is the difference?
https://www.youtube.com/watch?v=J_bf_KE5llQ

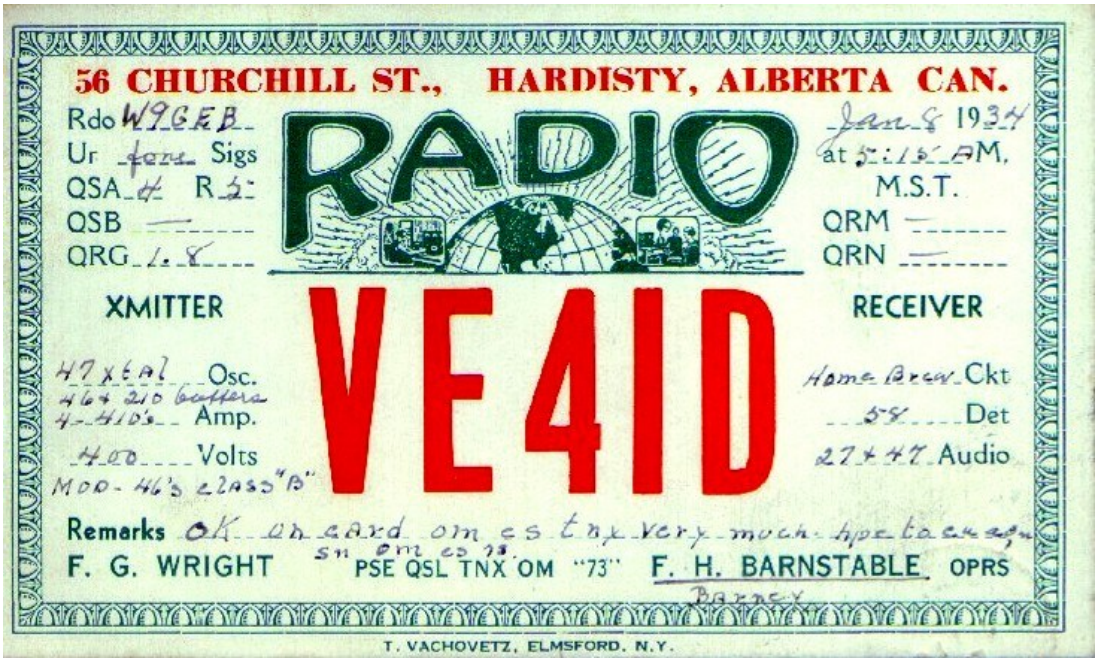
(Credit: René Ramos; Wi-Fi Alliance; Getty Images/LIORIKI)

Calling All QSL Cards

By Editor

If you would like to have your QSL card featured in an upcoming edition of the Roundtable please send a copy of it (i.e. PDF or JPG) to roundtable@w0tx.org.

Alternatively, if you have received a unusual or exotic one in the past and would like to share it, then send it on over.



Ham Radio in the 21st Century

By Bill Rinker, W6OAV

The EDN website has a very interesting article about ham radio titled “Ham Radio in the 21st Century”. This website is of interest to many hams as it offers a wealth of resources for engineers and technical people. The site provides technical articles, blog posts, white papers, webinars, and reference designs. It covers a wide range of topics, from analog and digital circuits to embedded systems, power management, and wireless technologies. Check out the article at: https://www.edn.com/ham-radio-in-the-21st-century/

EDN

Caring for CDs and DVDs

By Bill Rinker, W6OAV

There is a fact about scratches on CDs and DVDs that is not widely known. This fact appeared in the December 20, 2023 issue of the *How-To-Geek* newsletter.

“Most people take great care not to scratch the bottom of their CDs and DVDs, but in reality, it's the top that you should protect. The actual data on an optical disc is stored in an extremely thin layer of aluminum under the label side, and if scratched, it cannot be polished back to a showroom shine like the plastic bottom layer.”

VARAC vs FT8

By Bill Rinker, W6OAV

Two weak signal data protocols are taking ham radio by storm: VARAC and FT8. These protocols can successfully transfer data even when they are buried in noise! So, the question for someone wanting to explore weak signal data is which protocol to try? The following chart highlights the features of both protocols.

VARAC and FT8 Data Protocols Based on Their Key Characteristics:

Characteristic	VARAC	FT8
Purpose	HF and VHF messaging, file transfers, email, chat	Quick signal exchanges (Callsign, RST, etc.)
Speed and Efficiency	Relatively high data throughput, suitable for larger files. Up to 1000 bps	Quick exchanges in about 15 seconds. Up to 3.125 bps
Maximum Message Size	Up to350 characters	13 characters
Real-Time Communication	Supports real-time two-way communication	Automated, not suitable for interactive conversations
Flexibility	Adapts to changing conditions, adjusts transmission parameters	Structured and automated, less flexible
Frequency Range	All bands HF, VHF, UHF	Primarily used on HF bands
Weak-Signal Performance	As low as -25 dB SNR	As low as -21 dB SNR
Error correction	Robust	Strong
Automation	Supports both manual and automated operation	Highly automated, minimal user intervention
Ease of Use	Relatively straightforward setup and operation	Slightly more complex setup and operation
Popularity	Growing user base	Widely adopted and established

Summary
VARAC stands out for its versatility, offering a range of communication modes beyond simple text messaging. It enables real-time chat, file transfer, and digital image exchange, making it a well-rounded choice for a variety of weak signal communication scenarios. VARAC is a work in progress with new features added constantly.

On the other hand FT8 is efficient and automated, ideal for DXing, contesting, and quick contacts exchanging callsign, RST, grid square etc.

References:
VARA Weak Signal Digital Mode:
https://w0tx.org/RoundtableArchive/2023-RoundTables/RT202310(OCT).pdf
VARAC Like FT8 Only Better!:
https://k0pir.us/varac-like-ft8-only-better/
Stop Doing FT8 And Try This!:
https://k0pir.us/stop-doing-ft8-and-try-this/
VARAC Client for VARA HF – Better than FT8:
https://www.youtube.com/watch?v=Dw12-MguZd4
What You Need to Know About FT8:
https://www.minnesotahamradio.com/what-you-need-to-know-about-ft8/#:~:text=It's%20one%20of%20the%20most,even%20be%20possible%20on%20CW

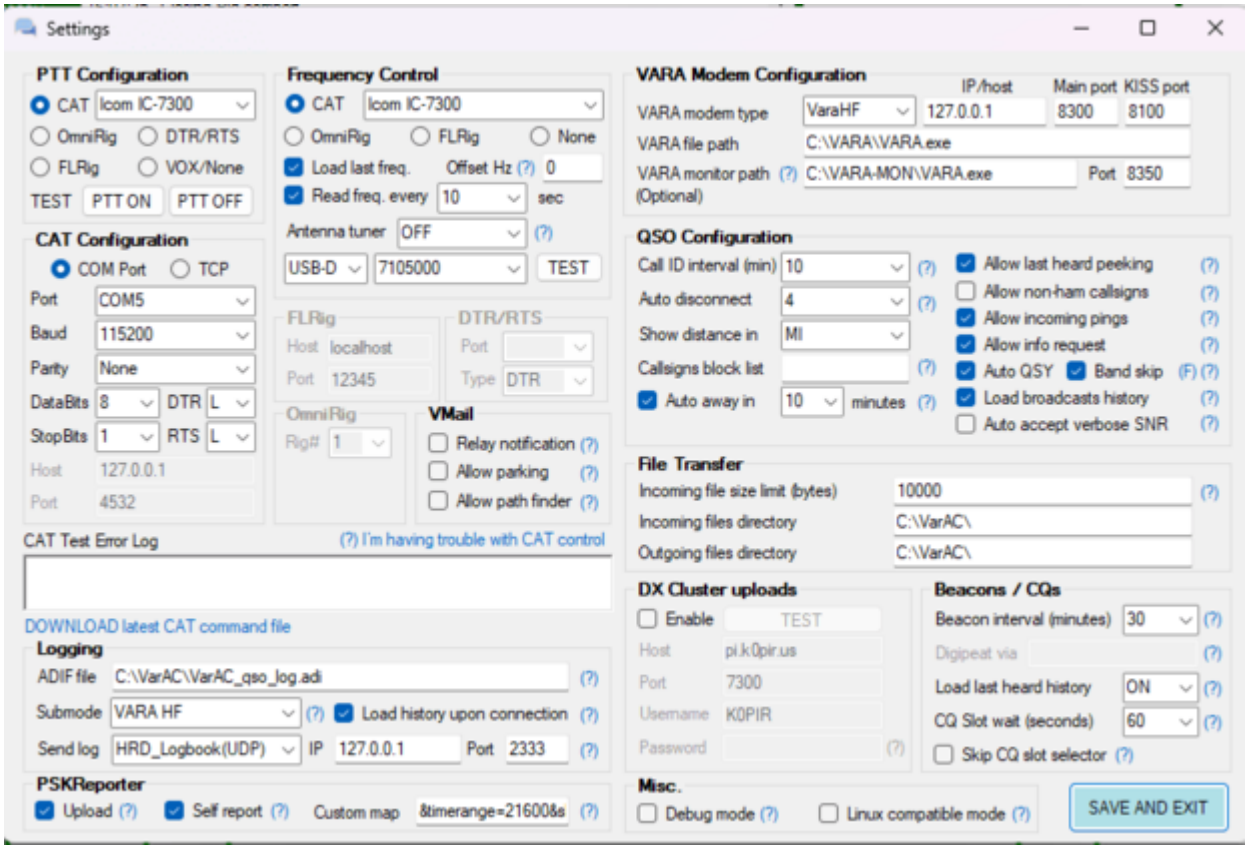


Image: VarAC Settings Screenshot from K0PIR. k0pir.us/stop-doing-ft8-and-try-this

Past Round Table Pages

Provided By Woody Linwood, W0UI

From the September 1960 edition.

SIX METERS AND UP

By GLENN, WØLJR

It seems that the summer bug has bitten a number of us on six meters. There still is quite a bit of activity but the mountain air and outside activities are getting the best of us. DX has been pretty rare this past month but we always hope for the best.

We sure will miss KP4AMN/Ø, Vic and family who will be leaving Denver. Vic is in the Air Force and is now heading for Japan, we hope to work him as a JA someday! We would like to welcome KØWJH, Lou, WØAJH, Roy, K5TLDØ, Fred, and also WØVZQ, John, who puts in a terrific signal from Morrison.

The C.A.P. is helping some of us to experiment with aeronautical mobile. KØRtC, Earl, made a trip to Limon and worked us all the way with only a "Sixer." Various points in the Colorado area and possibly over the borders will be attempted. Various tests with refraction will be conducted over the mountain areas. As most of us know VHF is line-of-sight operation but refraction is a means of bending an RF signal over any mountain-type object. This should prove quite interesting.

The Highbanders have voted to move the Calling and Net frequency from 50.3 Mc. to 50.55 Mc. Eight Mc crystals will be bought by the net and sold to the net members. A definite transfer time to the new frequency will be announced soon. We want to give everyone time to get set up with any modifications that may have to take place.

Here's a terrific modification that came to us from KØTSD, Perry, and has proven to be real helpful in controlling the known drift on the Heathkit "Sixer" and also allows operation with inexpensive 8 Mc. crystals instead of the higher-price 25 Mc. crystals. Instructions for the modification are as follows: Install a 24 mmf. mica condenser across the oscillator coil and change the coupling condenser to the final from a 4.7 mmf. to a 40 mmf. capacitor. Thanks, Perry; it sure helped your "Sixer."

Just a reminder to be around for the VHF QSO Party coming up September 17 and 18. See you then!

Letters to the Editor

Editor:

It has been my honor and privilege to serve as president of the Denver Radio Club for the 1959-1960 term.

This has been an outstanding year for the DRC, which has shown an increase in membership and a substantial gain in the club treasury. The overall picture has never looked so good.

We have had a greater participation in club activities, as evidenced in the Field Day and the Hamfest, which was the largest ever held in this area.

I want to personally thank the board of directors and those who were not on the board but eagerly volunteered their services to make this an exceedingly successful year. Without these people, it would not be possible to have a growing club.

At the same time, I want to urge your continued support of the Denver Radio Club under the next administration.

E. Fontaine LaRue
President

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"Club Characters," the monthly feature usually seen on page two of THE ROUND TABLE, does not appear this month because the author, Roy "Scoop" Raney, is on vacation.

Private Intercom

Doctors at the new Naval hospital at Great Lakes, Ill., are being equipped with pocket radio receivers, each tuned to a different frequency. The idea is to be able to reach each doctor instantly, and directly, without paging him or disturbing others. In case of emergency, what's your frequency, Doc?

Page Seven

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

KING Soopers

Random Site Of The Month

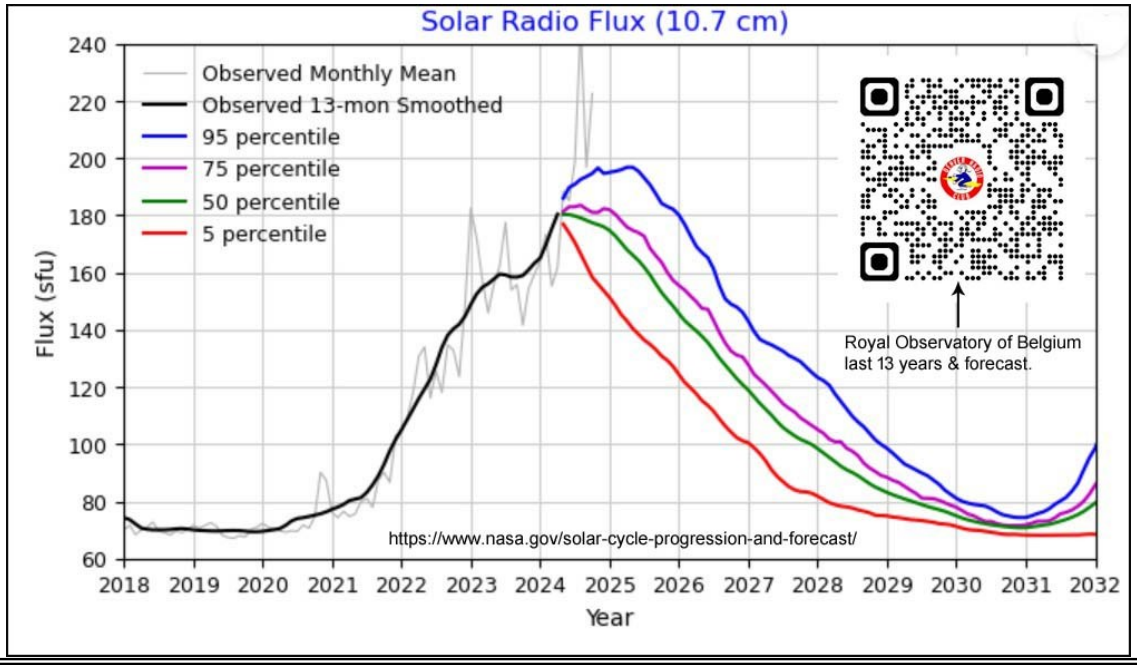
5V0DX - Togo

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
Winter Hamfest 2025	1/18/25	McKee 4-H Youth & Community Bldg	ARRL page
The Swapfest	2/16/25	Adams County Fairgrounds	ARRL page
LARCfest 2025	04/05/25	Longmont	W0ENO page

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

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. Has voting receivers. 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

DRC Board of Directors

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Board Member	KB0CHT	Jeff Irvin	Check Roster	Check Roster

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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