THE ROUND TABLE

Monthly Newsletter Of The Denver Radio Club

Since 1917 October 2024

President's Message

By Gerry Villhauer, W0GV

Hello DRC Members,

It is October and we are still getting 90 degree days. It is hard not to argue that the weather patterns across the whole U.S. are changing. Hopefully we will have a more manageable fall and winter.

Thank you to all the members that have named the DRC as your choice with the King Soopers Reward Program. We have had an increase in members participating in this program, which gives dollars to the club. If you are a King Sooper shopper and have not yet named the DRC as your choice for the rewards, please do so. It costs you nothing and really benefits the club.

A big thank you to Mr. Riley Hollingsworth, K4ZDH for his very interesting and informative presentation on the Volunteer Monitoring Service for ham radio. It appears that this volunteer monitoring service is effective in keeping activity on the ham bands more in control.

PLEASE READ THIS IMPORTANT NOTICE AND INFORMATION

Our next club meeting will be on Wednesday Oct 16, 2024 at 7 p.m. and will be a Face to Face, in person only meeting. No virtual meeting. I am aware that many members want in person meetings, like we did prior to COVID, and other members prefer to continue with virtual meetings. In an attempt to please both sides of the fence, we will be holding some meetings in person and the majority of the meetings virtually. The upcoming meeting will be similar to our popular DRC Saturday meetings with an instructed hands-on project. See the information below for details about the meeting:

Anderson Power Pole presentation and workshop

Mark Thomas, N0XRX, will be presenting Anderson Power Pole connectors and wire. The presentation will cover the correct way to install the connectors and proper size for your application. The presentation will be followed by a demonstration that will conclude with the audience participation in building their own Anderson Power Pole power jumper wires that they can take home.

All tools and parts needed will be provided but if you have your own tools please bring them to the workshop. Elmers will be assisting in the build session and answer questions or be an extra set of hands if needed.

ARRL ARES has standardized on this type of power distribution and is a re-

quirement to be able to demonstrate the ability to build this type of cable. But even if you don't participate in the public service side of the hobby, this skill would be useful as well.

Meeting location is: Lakewood Police Department. 445 S. Allison Parkway.
Park on the upper level just after you turn in from the Round-a-bout. Come down the stairs on the South side of the parking lot and enter at the front door. (Note: there is a limited number of handicap parking available in front of the building; If you have the proper handicap placard on your vehicle). Please be prompt and arrive on time. If you have previously helped with the Lakewood Siren Test, it is the same location where you had refreshments.

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 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:

Marc Mayzes	KR0X
Rodney Cross	
Kelly Sobanski	KB8OGP
Ashley Harmening	KF0RTD

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

Can an HF SWR meter be used successfully on VHF?

The answer can be found on page 3 of the April 2010 issue of the Roundtable:
https://w0tx.org/RoundtableArchive/2010-RoundTables/RT201004(APR).pdf

DSES Open House

From Bill Thomas, WT0DX

The Deep Space Exploration Society DSES is holding its annual Open House on October 5th. They will be featuring their new building, and giving everyone an opportunity to hear their voice bounced off the moon. More information can be found in the brochure at: https://dses.science/wp-content/uploads/2024/08/DSES-Open-House-2024-Flier-Final.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.

1/4λ HF Vertical Antennas vs Dipoles

By Bill Rinker, W6OAV

A common perception is that HF 1/4λ vertical antennas radiate equally poor in all directions. This is not true if they are properly configured. This article will discuss how to properly build HF 1/4λ verticals and a vertical's performance compared to a horizontal dipole.

The Standard 1/4λ Vertical

One of the primary advantages of HF vertical antennas is that they are omni-directional, meaning they transmit and receive in all directions. (This will be discussed later in this article). With a good set of radials (between 4 and 16), a 1/4λ vertical will produce a good low angle of radiation in all directions. This low angle reduces the number of lossy hops that HF a radio signal must make to reach its destination which makes a vertical antenna a good choice for DX—especially on the lower ham bands. Vertical antennas are normally easy to mount, requiring a single mount at the base. They can be hung from tree branches and be virtually hidden when made of wire which is good in HOA situations. It is also common to build a vertical out of a mobile whip. The articles in [1] below discuss building efficient 1/4λ vertical antennas.

Figure 1a shows the typical RF radiation pattern of a 1/4λ vertical. Note that the RF current is maximum at the base of the vertical. Since the amount of RF radiation is proportional to the amount of RF current, this means that the bulk of the radiation is from the lower half of a ground mounted vertical. Thus the radiation must propagate through structures around the vertical possibly resulting in extra loss to the signal. Figure 1b shows the typical RF elevation (red) and azimuth (blue) radiation patterns of a 1/4λ vertical. The articles in [2] discuss interpreting antenna radiation patterns.

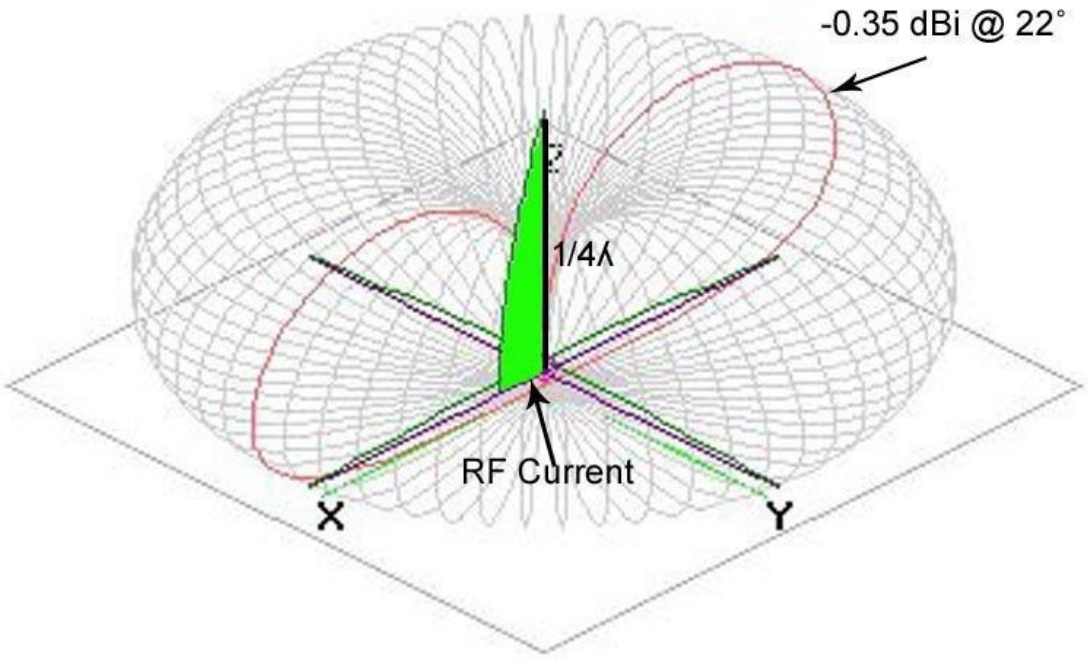

Figure 1a - The 1/4λ vertical

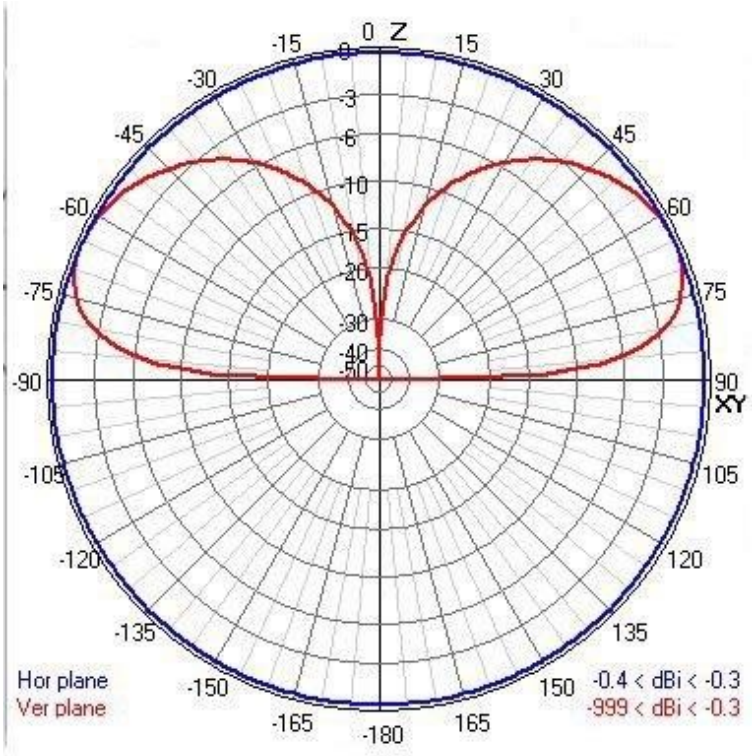

Figure 1b - Radiation patterns of a 1/4λ vertical

1/4ʎ Verticals vs Horizontal Dipoles

Table 1 summarizes the pros and cons of a ground mounted 1/4ʎ vertical verse a horizontal 1/2ʎ dipole.

Perimeter	Table 1 - 1/4ʎ Vertical vs Horizontal Dipole
Noise	About the same as a dipole at 20 meters and above. Noisier below 20 meters.
RF Pattern	Omni whereas a dipoles has a figure 8 pattern.
Installation	Easier to install and usually more economical as a dipole requires height and 3 supports.
Visibility	Stealthier compared to a dipole (Good for HOA situations).
DX Angle*	Favors DX angle. Dipole must be high for same radiation angle. (An issue at 40m and below).

*A horizontal dipole needs to be at least 1/2ʎ above ground to have better low-angle performance than a 1/4ʎ vertical. Getting a horizontal dipole that high could be an issue on 40 meters and below. See Figure 2a which compares the elevation radiation patterns of a 40 meter 1/4ʎ vertical with those of 40 meter dipoles at 1/4ʎ and 1/2ʎ heights. Note that the vertical's pattern in the DX angle is approximately 2 dB less than that of a dipole 1/4ʎ high and approximately 6 dB less (1 S Unit) than that of a dipole at 1/2ʎ high. However, a 1/4ʎ vertical does have gain over a horizontal dipole when comparing the radiation patterns off the ends of the dipoles. Figure 2b shows that the vertical's radiation pattern is stronger and at a lower angle then that off the ends of a dipole. These patterns are valid when extrapolated to any ham band.

A common recommendation is to have both a vertical and a horizontal antenna fed via a coax switch. Antennas with vertical and horizontal polarized radiation work well together. If one fails, the other will usually succeed.

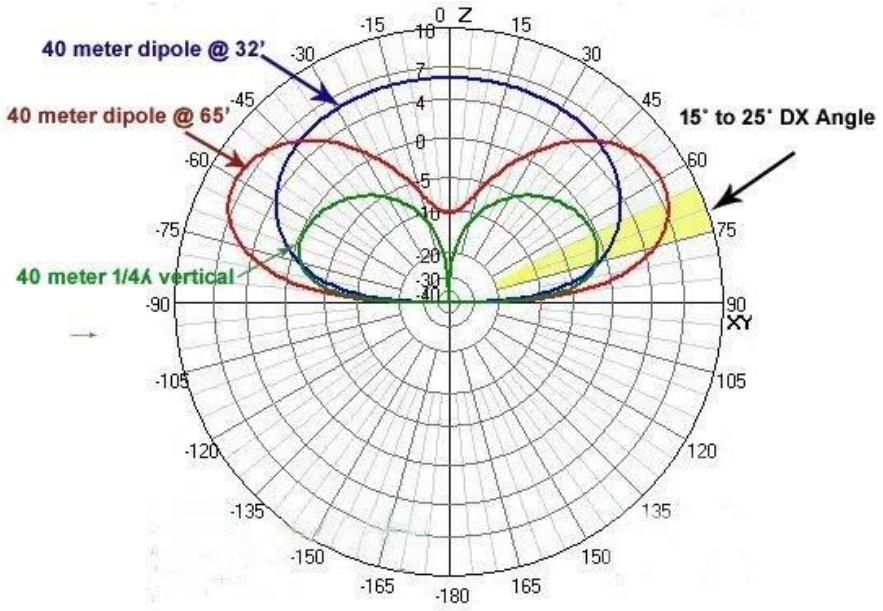

Figure 2a - A vertical vs a horizontal dipole radiaton patterns

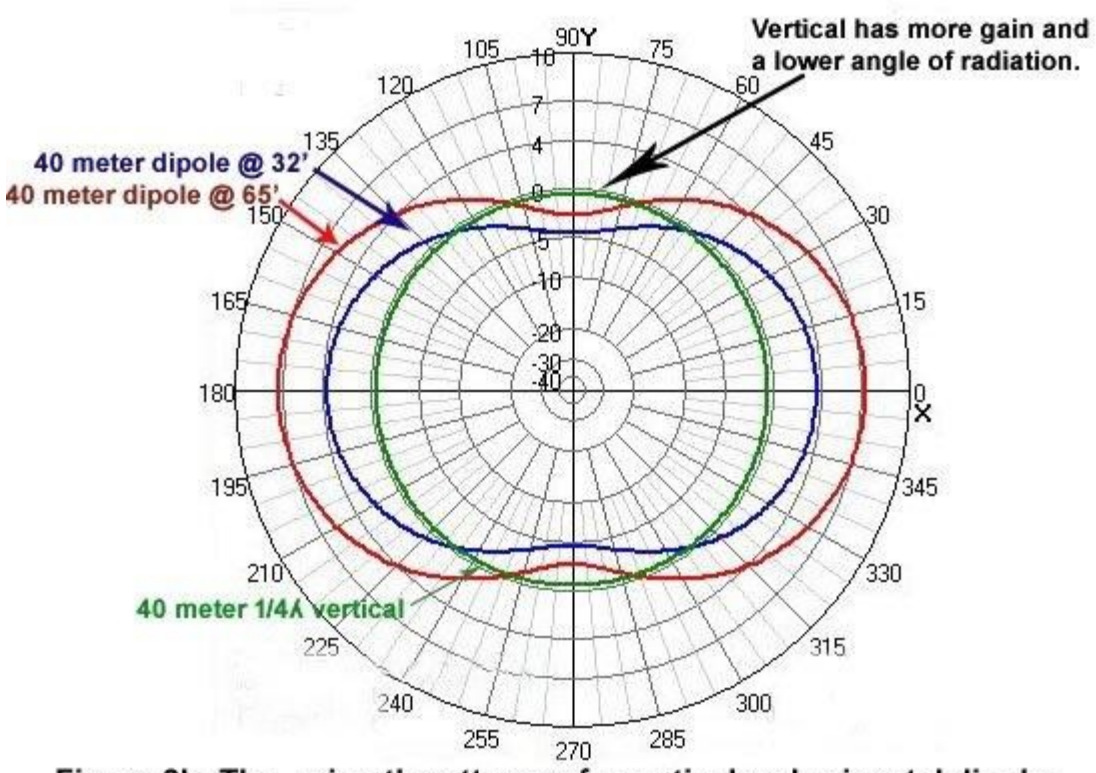

Figure 2b -The azimuth patterns of a vertical vs horizontal dipoles

References

[1]. Radials Demystified:
https://w0tx.org/RoundtableArchive/2008-RoundTables/RT200804(APR).pdf, Page 3.
https://w0tx.org/RoundtableArchive/2008-RoundTables/RT200805(MAY).pdf, Page 3
https://w0tx.org/RoundtableArchive/2008-RoundTables/RT200806(JUN).pdf, Page 3
[2]. What is an Antenna Pattern?:
https://w0tx.org/RoundtableArchive/2010-RoundTables/RT201010(OCT).pdf, Page 3
https://w0tx.org/RoundtableArchive/2010-RoundTables/RT201011(NOV).pdf, Page 3

~Editor's Note: We would love to publish a monthly column profiling DRC members' stories about how they got into the ham radio hobby, their interests and backgrounds. You may be boring but your story is probably interesting! Please submit your story to roundtable@w0tx.org.

VHF/UHF Path Loss

By Bill Rinker, W6OAV

Have you ever noticed that your 6 meter signal seems to propagate further than your 2 meter signal or that your 2 meter signal seems to propagate further than your 70 centimeter signal? Well, this phenomenon is true!

The weakening of signals with distance is influenced by several factors, including the frequency of the signal. When comparing VHF and UHF propagation, the following factors contribute to the greater signal attenuation of UHF signals:

Free Space Path Loss:
Free space path loss refers to the natural attenuation of the signal as it travels through space without any obstructions. Higher frequency signals, such as UHF, experience higher free space path loss compared to lower frequency signals like VHF. This is due to the physics of electromagnetic wave propagation, where UHF signals are more prone to scattering, diffraction, and absorption by atmospheric gases. [1].

1. Signal Spreading:
UHF signals spread more than VHF signals with distance because their shorter wavelength makes them more susceptible to atmospheric conditions (rain, fog, dust, etc.), leading to greater attenuation and scattering effects. See Figure 1.

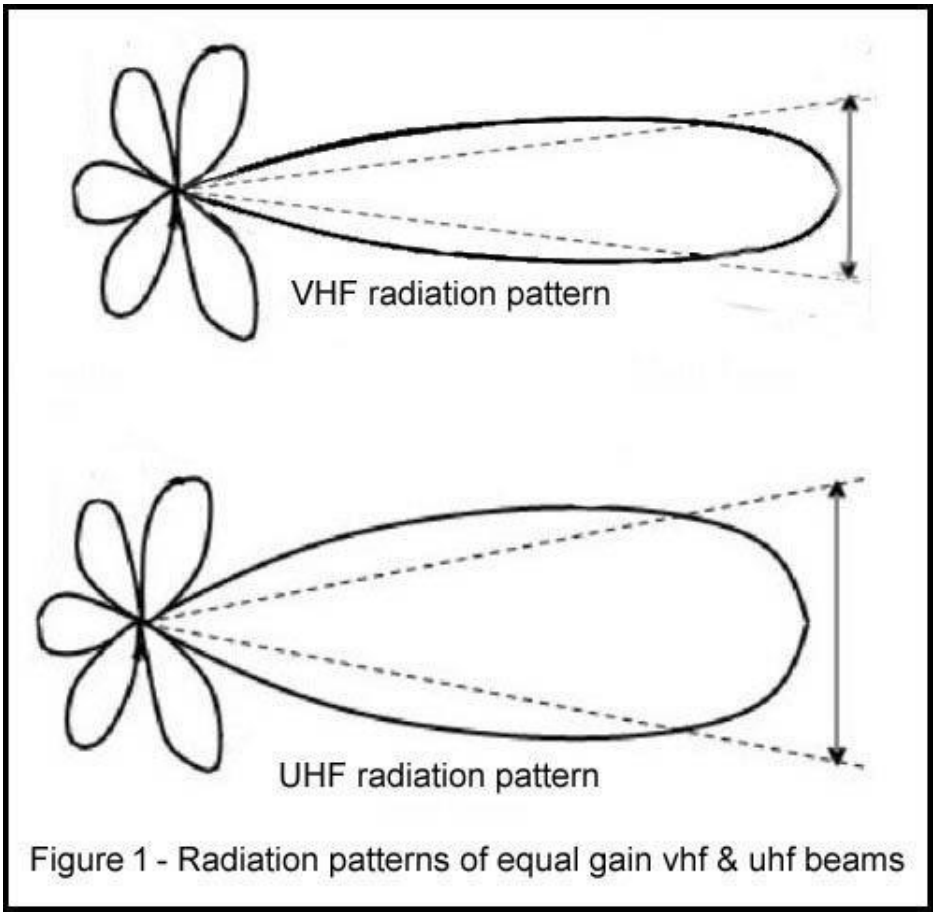

Figure 1 - Radiation patterns of equal gain vhf & uhf beams

2. Signal Penetration**:**
UHF signals due to their shorter wavelengths have poorer object (wood, concrete, trees, etc.) penetration characteristics. They tend to be more affected by obstacles like buildings, foliage, and other objects. This can lead to greater signal loss compared to VHF signals. However, UHF can better penetrate building openings (windows, doors. wood, etc.).

3. Refraction and Ducting:
Refraction and ducting are atmospheric phenomena that can affect signal propagation. While both UHF and VHF signals can experience these effects, UHF's shorter wavelengths signals are more prone to strong refraction and ducting, which can cause signal spreading and unpredictable propagation paths, leading to signal loss.

Calculating Free Space Loss:
The Friis Transmission Equation, also known as the Friis Free Space Equation, is an equation used to calculate the received power in a wireless communication system between two line of site antennas. It provides a theoretical estimation of the power transfer between the transmitting and receiving antennas in free space. The equation assumes ideal conditions, such as free space propagation without obstructions or interference and that the transmitted power decreases inversely with the square of the distance. [2] [3].

For those mathematicians reading this article, the Friis equation is:

$P_r = P_t * (G_t * G_r * \lambda^2) / (4\pi * d)^2$

Where:
P_r is the received power.
P_t is the transmitted power.
G_t is the gain of the transmitting antenna.
G_r is the gain of the receiving antenna.
λ is the wavelength of the signal.
d is the distance between the two antennas.

The following chart using the Friis Transmission Equation illustrates the free space path loss at various frequencies. In this example 0 dBi gain verticals are separated by 10 miles.

FREE SPACE LOSS ON VARIOUS HAM BANDS
WITH 0 dBi GAIN VERTICALS SPACED 10 MILES

MHz	dB Loss		MHz	dB Loss
28	85.5		146	99.9
52	90.1		446	109.6

Note: The loss ratios between various ham band signals shown in the chart would be greater in the real world.

In summary, according to the Chierda Company website [4], *"The general rule-of-thumb is if you are using the radio primarily outdoors where you will have clear line-of-sight then VHF is a better choice because it's signal will travel farther. BUT, if you will be using your radio in or*

around buildings, in urban areas, or heavily wooded areas, then UHF is a better choice because its signal will navigate around structures better, not being blocked as easily as VHF. The trade-off you are making is longer distance (VHF), vs avoiding possible "dead spots" in and around structures (UHF)".

References:
[1]. Understanding Radio Signal Path Loss:
https://www.electronicsforu.com/resources/understanding-radio-signal-path-loss

[2]. The Friis Equation:
https://www.antenna-theory.com/basics/friis.php

[3]. Friis Transmission Calculator:
https://www.everythingrf.com/rf-calculators/friis-transmission-calculator

[4]. VHF Vs UHF Which Is Better?
https://www.chierda.com/vhf-vs-uhf-which-is-better/

Additional reading materials:

Radio Wave Propagation: How Waves Attenuate with distance:
https://sfdxa.com/wp-content/uploads/Presentations/ke4pt-2016-Feb-QST-propagation.pdf

Path Loss, by K2LMG, November 1961 QST magazine:
https://webpubs.arrl.org/pubs_archive/46032

AI's Definition of Ham Radio

By Bill Rinker, W6OAV

The other day I asked ChatGPT (an AI website) for the definition of ham radio and received the response shown below. I plan to keep a copy of the response so that I can present this information to show anyone interested in our hobby. Perhaps the club might want to make copies to hand out at various events, such as field day.

"Ham radio, also known as amateur radio, is a type of radio communication that is conducted by amateur radio operators, or "hams." Ham radio operators use a variety of equipment, including transmitters, receivers, and antennas, to communicate with other amateur radio operators around the world.

Unlike other types of radio communication, such as commercial broadcasting or military communication, ham radio is a non-commercial, non-profit activity that is primarily focused on self-training, technical experimentation, and international goodwill. Ham radio operators are licensed by their respective national governments and must pass an examination demonstrating their knowledge of radio theory, regulations, and operating procedures.

Ham radio communication can take many forms, including voice communication, digital communication, and even satellite communication. Some ham radio operators also participate in contests and events, such as field days, where they compete to make as many contacts as possible within a certain time period.

Overall, ham radio is a fascinating hobby that combines technical expertise, community building, and international communication. It has a rich history and continues to play an important role in emergency communication, scientific research, and even space exploration."

Where Are The Hams In My Neighborhood?

By Bill Rinker, W6OAV

Would you like to know how many hams are in your area, their calls, their license classes, and their locations? The February 2009 issue of the *Roundtable* provided a URL to access a website for a map containing this information. Unfortunately, that website is no longer active. However, there is a website provided by KT1F titled *Amateur Radio License Map* that provides a Google map with this information. Click https://haminfo.tetranz.com/map and enter a callsign, a grid square, a zip code, or an address. A map similar to Figure 1 will display. In this example I entered my call sign to see if there were any hams around my location. There was a nearby ham! I clicked his icon to get his address and to go over to introduce myself.

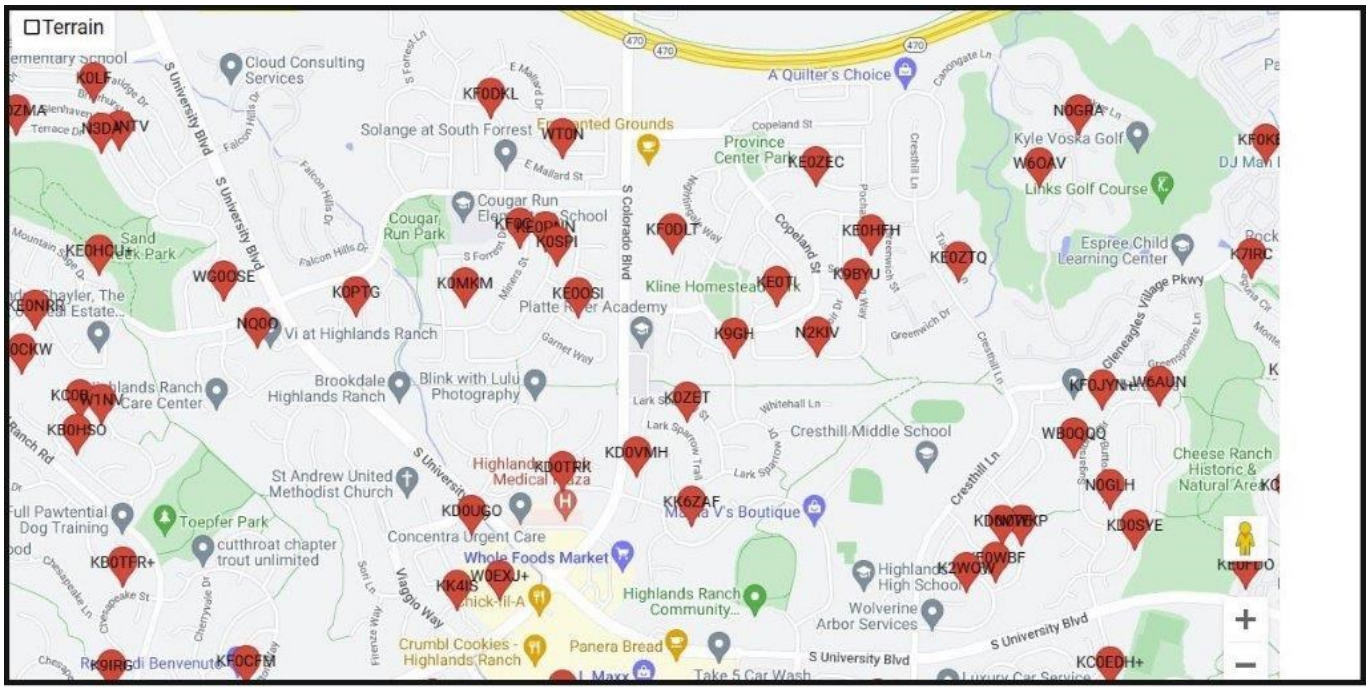

Figure 1 - Sample of Amateur Radio License Map

Past Round Table Pages

Provided By Woody Linwood, W0UI

From the September 1960 edition.

TROUBLE SHOOTING

By Bill Cohen, KØAYG

PART ONE

With the advent of cooler weather (I hope, since this is being written over a month before any of you get a chance to file it in your waste basket), maybe we ought to get down to serious business and quit beating around the bush. To be perfectly frank, I'd rather keep entertaining you with more miscellaneous stuff about vacuum tubes, because anyone who gets himself involved in a detailed discussion on troubleshooting is rushing in where angels fear to tread. Nevertheless, I will proceed to agitate this battered Underwood with all the might and main that I can summon in two or more of my fingers.

Troubleshooting can be either an awful lot of fun or a most exasperating chore, depending on just exactly what it was that caused your electronic trashbox to lie down and die as someone offered to do for Bonnie Annie Laurie in the song of the same name. Somehow there doesn't seem to be much middle ground between the two extremes. A lot depends on your attitude and your approach. If you're a mystery or detective story addict, you may make a game of it by pretending you're Sherlock Holmes, Philo Vance, or Joe Friday tracking down a criminal. You'd be surprised how much the processes of crime detection and electronic troubleshooting have in common. I won't take time to enlarge on this idea other than to point out that gathering "all the facts, ma'am" from the evidence at hand is the most important part of both.

Before getting into the subject at hand, let it be understood that I have few illusions as to what this series may accomplish. Not very long ago, an article in QST advanced the thesis that a large number of hams do not even bother to read the instruction manuals that come with the equipment they use. (After reading some of these manuals, I am willing to concede that the sin is at least partly forgivable.) So what chance do I have, writing about a subject that, like a hoopskirt, covers everything in general but touches nothing in particular?

In our discussion we will use the word "malfunction" quite often. Despite usage in the military over a period of years, this word somehow hasn't managed to find its way into most dictionaries. It means "the failure of a piece of equipment or of a part of that equipment to function normally; an instance of such failure."

The troubleshooting process can be boiled down to four steps that can be expressed in the following sequence:

1. Recognize the existence of a malfunction.
2. Localize the cause of the malfunction.
3. Eliminate or correct the cause of the malfunction.
4. Check to see that the action performed in the previous step
   (a) actually corrected the cause and

(Continued on page 8)

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BUY-SELL-SWAP

FOR SALE—DX-35 with new 6146; Knight VFO, two months old; SX-99, new condition. Good deal. Call Dave Miller, KØUYQ, SK. 6-4984.

FOR SALE—Ash trays and mugs with handle and call letters. Bob Roberts, KØWLR, GL. 5-2765.

FOR SALE—Globe Chief 90A with companion plate modulator, $70. Westinghouse ½hp-H.D. 110 v.a.c. motor, $20. Winchester Model 12 shotgun, pump action, 30-inch full-rib barrel, with full grain cowhide case, excellent condition. Mark 218 20-power spotting scope with adjustable tripod, $40 or trade for ham gear. Howard Eldridge, 3156 West 25th Ave. GE. 3-3802.

FOR SALE—Hallicrafters S40B with S meter and Heath Q Multiplier $65. KØLMD, Ron, WE. 5-0776.

WANTED—Low-power novice transmitter in working condition. EA. 2-1549.

Page Five

DRC's Emergency Responses

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

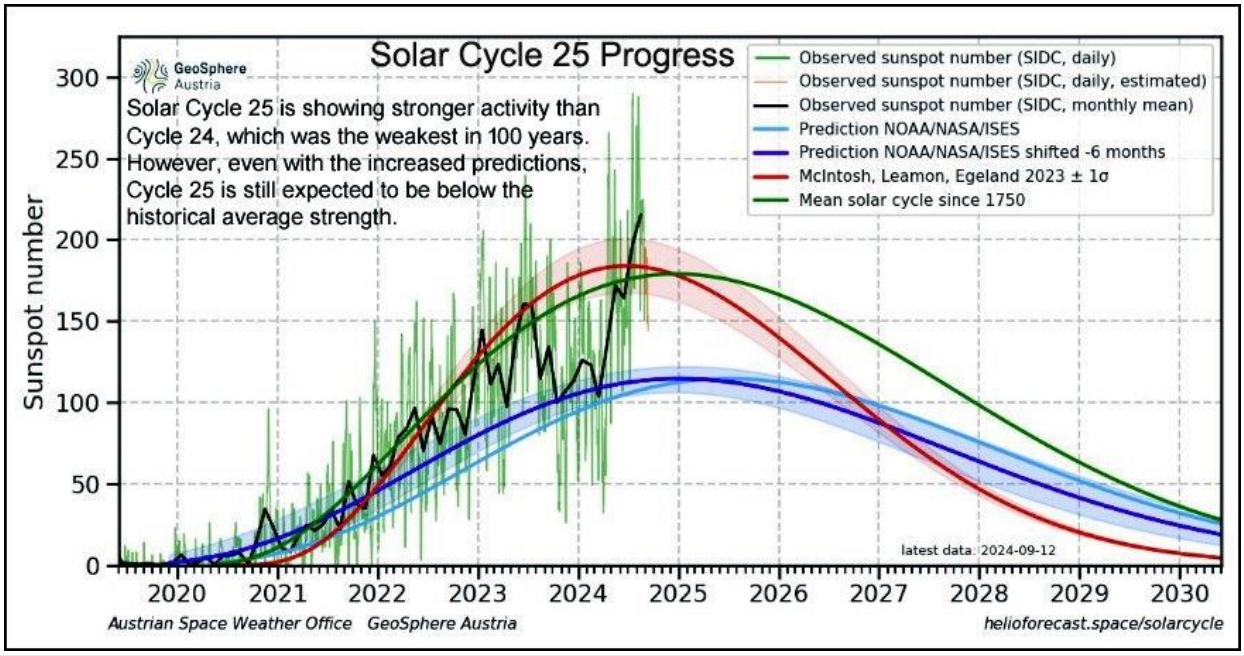
Liechtenstein ARC

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
BARCfest	10/6/24	Boulder Cty Fairgrounds Exhibit Bldg	Barcfest Info

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
California	10/05/2024	10/06/2024	California QSO Party	
Nevada	10/11/2024	10/13/2024	Sierra Nevada Amateur Radio Society	
Arizona	10/12/2024	10/13/2024	Arizona QSO Party	
Pennsylvania	10/12/2024	10/13/2024	The PA QSO Party Association	
South Dakota	10/12/2024	10/13/2024	Prairie Dog Amateur Radio Club	
New York	10/19/2024	10/20/2024	New York State QSO Party	
Illinois	10/27/2024	10/28/2024	Western Illinois Amateur Radio Club	

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

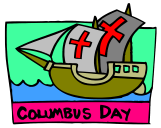
BAND	Freq / Shift / PL Tone	Additional Information
6m	53.090MHz (-1MHz) 107.2Hz PL	
Packet	145.05MHz	**Metro Denver Area Coverage**
2m	145.490MHz (-) 100Hz PL	**Linked to 70cm / 448.625MHz. Primary frequency during emergency net.**
2m	147.330MHz (+) 100Hz PL	**Local area. Has voting receivers. Does not 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

OCTOBER 2024

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

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2 **Learning Net** 7:30 p.m. 145.490 / 448.625 (No PL) New Moon	3	4	5
6	7	8	9 **Learning Net** 7:30 p.m. 145.490 / 448.625 (No PL)	10 First Quarter	11	12
13	14  	15	16 **DRC Lunch** 11:30 @ Valley Inn Restaurant, Lakewood. **DRC IN PERSON Meeting** Elmer 6 PM Meeting 7 PM	17 Full Moon	18	19 EME 50 - 1296 MHz
20 EME 50 - 1296 MHz	21 School Club Roundup	22	23 **Learning Net** 7:30 p.m. 145.490 / 448.625 (No PL)	24 Last Quarter	25 End School Club Rndup	26
27	28	29	30	31 		

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
Secretary	WW0LF	Orlen Wolf	303-279-6264	secretary@w0tx.org
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Board Member	KB0CHT	Jeff Irvin	Check Roster	Check Roster

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Benevolent		Carolyn Wolf	303-279-1328	benevolent@w0tx.org
Club Librarian	WG0N	Dave Baysinger	303-987-0246	wg0n@arrl.net
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Education Coordinator	Open			elmer@w0tx.org
EmComm Coordinator	KE0HFH	Michael Vespoli	303-215-8862	emcomm@w0tx.org
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RT Associate Editor	W6OAV	Bill Rinker	Check Roster	Check Roster
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Tech. Committee Chair	Open			tech@w0tx.org
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VE Team	K0RAP	Robert Pickett	720-336-0114	k0rap@w0tx.org
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