



VOLUME 72 ISSUE 3
March 2021

PPRAA Club Officers

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Board	LD Steiner, WØXLD
Board	Michael Walter KEØTWK
Board	Daniel Burtis, KEØWJL

* In final year of 2-year term

+ One year officer position

All officers can be contacted at: boardmembers@ppraa.org

Monthly Ham Breakfast

Western Omelette, 16 S Walnut
Saturday, 3 April 2021
8 – 9:30 AM



PPRAA General Membership meeting (10 March) will be virtual

– There will be an online meeting via Zoom. The business meeting starts at 7 PM, but get your dinner and beverage of choice and check in any time after 6 PM for a social hour. Club members check your email for info or email [Officers](#) to receive the Zoom information.



PIKES PEAK RADIO AMATEUR ASSOCIATION

Minutes of the Board Meeting February 8, 2021

Meeting Start 6:30 PM

In Attendance: Jason K0WTF, Jim KD0KQL, John KD0SFY, Logan KE0KZA, Daniel KE0WJL, Joe KE0TPW, LD W0XLD, Don N6JRL, Lee W0RLG, Anthony KE0LQK, Jerre WA0BCM, Doug N7LEM, Dick W5UDM, Dennis N0ABC

Welcome introductions;

Silent Keys; Dick Thompson W0RAA Moment of

Silence.

Vice President; Joe KE0TPW

10 and 2 meter nets are going well. Guest on Wednesday the general meeting. Mike: Leader of the Colorado Connection and CERN. Would like about 20 minutes.

Treasurer Report , report Dick W5UDM;

\$159 came in from King Soopers. Expenditures: Paypal fees. Income: Member dues.

Jim: If you go to King Soopers and pick up a King Soopers card. Go to their website and you can register and select a charity to donate to.

Asset manager: ~~Mike W07T~~

VEC Testing, Dennis N0ABC:

Venue is still not allowing us in there yet. Hopefully for March. Hopefully with vaccinations we'll be able to test soon.

LD: If the issue is venue, there's a local vet that may be able to coordinate through a VFW or American Foreign Legion.

Dennis: Would probably rather abstain given the current climate.

Zero Beat Report Jerre WA0BCM:

Got it out a day early. Some information is missing, probably won't update this current one.

Web Master Report Doug N7LEM;

Nothing to report on the internet committee. Got an email today, renewal for the domain is up. We're due for CCRC. They've dropped the PO-Box and are doing online.

Don Moves to approve the CCRC membership renewal.

John Seconds

Motion Passes.

Secretary Report; KOWTF

Jason moves to approve notes as presented.

Dick Seconds

Motion Passes.

Update on 97 Repeater

May be able to do some testing tomorrow with a mobile radio. He'll be listening on 93 and transmitting on 97. We will hold off on publishing the notes from the Jan 21 Special session. Will coordinate with WA9WWS. Largest concern of area is a pie-slice from Limon up to the northern edge of Black Forrest.

Joe: Will the 448 be back up?

Don: It should be, just not for testing purposes.

PPARES Report John KD0SFY;

Not a lot is going on in the ARES world at the moment. Doing some coordination with regards to the skywarn training. Will most likely be virtual. Waiting to hear back on some special events. PPIHC may need some radio support. Mountaintop Cycling Club is having an event, don't know if they'll need support yet.

Winlink, Red Cross, Section ARES have been doing exercises.

~~Mega Fest Report Jim KD0NQM;~~

Internet Committee Doug N7LEM; (see above)

Thursday PPRAA net;

16 people. People have been asking about the 10 meter net. 28.390 USB

QCWA Chapter 58 Mike WV7T Don N6JRL

Are going to see if they can gather at Dicks at the end of the month.

Dick: Our rent for the trailer is due. Will hold off until the Wednesday meeting.

Jim: For updating Spotter number, make sure to get a hold of KD8EQ

Dick moves to Adjourn

Joe Seconds Passes.

Meeting Adjourn 7:07PM



PIKES PEAK RADIO AMATEUR ASSOCIATION

Minutes of the General Meeting February 10, 2021

MEETING AGENDA

49 Attendees.

Meeting start: 7:00pm

PLEDGE Don N6JRL

SILENT KEYS: WORAA Dick Thompson

INTRODUCTIONS:

NEW HAMS/MEMBERS? Scott Heinz KF0DRW, Daniel Settle KCOPAQ, Derek Brown KF0DKG, Jeffrey Mielke KD6IBN, Ray Gierlach KD8EQA, Jody Romero, Steven Williams W0ML

WOXLD fox hunt – We're doing a fox hunt! April 18th! You don't need a license to participate either! LD has antenna plans available as well. ld@w0xld.com if you'd like those!

PPFMA Update: WA9WWS Crews were unable to do any of the outside work they were planning to. Unable to do testing as of yet. Potentially going up tomorrow (2/11) and possibly Monday the 15th. Initial testing will be VHF Only. Signal reports will be sent to qsl@ppfma.org. Please include your call and address. Most interested in areas East to North East of the mountains.

VE Testing Dennis N0ABC – Venue is still not available for public use. Hopeful for March.

TREASURER REPORT: DICK W5UDM – Not too much activity. Dues and interest coming in, Expenses were just bank fees. \$16000 in unrestricted equity. If you sign up at King Soopers, you can designate the PPRAA as a charity to donate to via your King Soopers card.

SECRETARY REPORT: K0WTF Jason -- Meeting minutes should be posted to the website soon.

ZEROBEAT: JERRE WA0BCM – Zero Beat should be out! Submit questions to the board email address.

WEBMASTER REPORT; DOUG N7LEM – Login issues: Accounts will lock between 30 and 90 minutes. Logins are case sensitive. Approvals are a manual process, so please be patient and wait for the approval email.

PPARES REPORT; John Bloodgood KD0SFY – Still in quiet time for PPARES. Moving into Spring looking at logistics surrounding Skywarn training. Will likely be virtual. Conducted by the NWS out of Pueblo. It may be a very bad fire year for us. Make sure your go-kits are ready and make sure you have an emergency preparedness plan in place for your personal access if you need to evacuate.

MEGA FEST REPORT: Jim Rader KD0NQM – We're still on the path of needing to hold off. Many of us buy stuff from Amazon. If you go to Amazon Smile, you can designate PPRAA as a charity and we net a few hundred dollars per year.

VICE PRESIDENT Joe KE0TPW Presentation – KY0JAM // Head of CERN the Colorado Emergency Reporting Net. Also a board member of the Colorado Connection.

CERN was founded in 2018 by Sydney Cleavland. CERN is not the primary method of contacting emergency service. If you can, please contact directly. CERN monitors the Colorado Connection. Setting up schedules for backup monitors which is a great opportunity for newer monitors.

Need to be cognizant of which agency you need to get a hold of given the location of the caller.

145.130 88.3hz tone for the Cheyenne Mountain repeater.

QCWA CH. 58 Report Mike WV7T or Don N6JRL Don will be out of town on the first,

PPRAA ; Thursday night net – Groups have been a bit smaller but keep on going! There's also a 10 meter net at 1900hrs @ 28.390USB

K3ILC – Scholarship // Recommend that someone on the board contact the Foundation for Amateur Radio regarding our scholarship status with them.

NH6EU Moves to adjourn

W0ML seconds

MEETING ADJOURN: 9:00PM OR BEFORE

QSO Today Expo to Include Speaker Track on Amateur Radio Satellites

The [QSO Today Virtual Ham Expo](#) on March 13 - 14 will devote a speaker track to AMSAT and the world of amateur radio satellites.

The expo is in "full planning mode" and promises "many exciting new things" for the upcoming event, which will include a world-class lineup of more than 60 speakers and workshops for beginners to experts. Presenters at nine AMSAT sessions will discuss the broad spectrum of ham radio satellites, including:

- Introduction to Amateur Radio Satellites (Douglas Quagliana, KA2UPW)
- Getting on the Air with Satellites (Clint Bradford, K6LCS)
- How to Enjoy Amateur Radio Contacts with the International Space Station (Frank Bauer, KA3HDO)
- Implementation of LDPC Encoder on FPGA (Anshul Makkar)
- Debris Mitigation in Earth's Orbit (Anshul Makkar)
- Digital Multiplexing Transponder from the Open Research Institute (Michelle Thompson, W5NYV)
- Solving the ITAR and EAR Problem for the Amateur Radio Satellite Service (Michelle Thompson, W5NYV)
- Remote Labs for P4XT Engineering Development (Paul Williamson, KB5MU)



Thompson, an AMSAT Board Member, said working satellites is one of the most rewarding privileges of holding an amateur radio license.

"There has never been a better time to be involved in amateur radio satellites, since some long-standing regulatory burdens have been lifted and advanced technology has never been more affordable and accessible," Thompson remarked. "We have opportunities now that were not available as of even a few years ago. AMSAT is fortunate to contribute to the expo by showcasing the truly amazing work going on around the world in the amateur satellite scene. And the Expo is an ideal partner to show it off to the wider ham audience."

AMSAT will have a booth at the expo, where attendees can talk to experts, enthusiasts, operators, and technicians and obtain contact and membership information for the 30 AMSAT societies around the world.

Early-bird tickets are \$10 (to help cover the cost of this event) and \$12.50 "at the door." That includes entry for the live, 2-day event as well as access during the 30-day on-demand period following the event. [Register](#) on the QSO Today Virtual Ham Expo website.



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THE BEST WAY TO OPERATE HF

**EASY INSTALLATION
EXCELLENT PERFORMANCE
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CC&R FRIENDLY (XYL ALSO)**

CAPTURE AREA

What is it? Does it mean the bigger the antenna the more performance it will have.

A very large antenna that has not been resonated can receive and transmit very poorly. If you resonate the antenna by a tuner or other technique, it will become quite affective. The size of the antenna will have an affect.

Not everyone can put up BIG antennas. Therefore, how can you determine if the antenna has sufficient capture area?

Keep in mind, this is an "area", not length. A wire has little area per foot. Making long skinny antennas will give the capture area needed. However, at the same time it needs to be resonant somehow or it will not perform well and your radio will reject it.

So, do you want to use sheets of 4'X 8' plate steel for this "area"?

If you want you could, but there is a better way to determine if the antenna has enough capture to be affective.

Start with a very small resonant circuit. A capacitor and inductor in series. I am referring to components you would find on a circuit board. The circuit is resonant just like an antenna. Why would you not put this on your 60 foot tower? Because it would not impress anyone that tries to see it. It would not be impressive to anyone trying to hear it either, why?

A series resonant circuit using small components is certainly doing the same thing electrically as the big antenna. Except for one value that you can measure. Radiation resistance. A small circuit will have a radiation resistance close to zero ohms. This means it is close to a dead short. Or, it means the circuit will have to operate at a very high current. This plummets efficiency.

Try making the circuit bigger. Use a bigger coil and an air spaced capacitor. You are also increasing the radiating area of the antenna. If you measure the radiation resistance, you will find it has increased. It will also start to radiate more efficiently.

Keep increasing the physical area of the resonant circuit and you eventually achieve 25, 50, 100 ohms and higher. When you start to get radiation resistance readings at resonance of these values, the antenna becomes quite efficient.

For example, you make the coils and capacitor large enough to develop 50 ohms of radiation resistance. This is convenient since most radios match to 50 ohms. If you do this using only an inductor and large plated capacitor your efficiency can be figured as:

$$\text{radiation resistance} \div \text{radiation resistance} + \text{pure resistance.}$$

Since your pure resistance is the resistance of the coil (using an ohm meter), it will be very close to zero or just a fraction of an ohm. This puts your efficiency almost to 100%.

Making the antenna bigger will offer little improvement since your efficiency is maxed out.

So, how big do you make it to have this 50 ohm radiation resistance?

It is sales pitch time. The sizes of the Isotrons are based on having enough "Capture Area" to develop 50 ohms of radiation resistance or more to provide a fully efficient antenna. It will be evident initially at the receiver, it will come alive. Putting the antenna in a good location will offer good transmit performance.

73,
Ralph WD0EJA

MARCH 2021

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137 MANCHESTER DR.
FLORISSANT, CO. 80816 U.S.A
PH/FX: 719/687-0650
wd0eja@isotronantennas.com

Bandwidth and Interference

With the HF bands being in a slump for so long, many have found it advantageous to increase the power output of their station. This increase in power is normally appreciated by the receiving station.

This has made a disturbing situation. Regretfully there are a number of operators that drive their amplifiers much too hard. How can you determine this?

I have heard conversations where one or both parties have a slight distortion on their audio. The two in QSO seem to be oblivious of it. I imagine that the poor quality of digital audio as with cell phones have made this common place. However, on the air it is unacceptable. Why?

It is not only unpleasant to listen too, it causes severe interference to other stations trying to use the same band.

Most transceivers will not allow this to happen. However, if you add an amplifier it can happen quite easily. Most amplifiers do not have the capability to determine distortion. The ALC function will not do this. It is up to a good operator to determine the limits on driving the amplifier from the transceiver.

A linear amplifier basically takes a signal from the transmitter and amplifies it producing the same signal out, only stronger. The linear amplifier can only handle a certain amount of drive power from the transmitter. If you stay within this parameter, your signal will be stronger, but have a good quality to it and produce little IMD's.

What are IMD's? "Intermodulation-distortion".

What does this do? It will increase the bandwidth of your signal. In most cases it will not increase your signal strength. You have already saturated to that point.

In practical terms, we should be able to be 3 KHz's away from another station with no interference (IMD). However, over driving can cause an increase in IMD's. This means the signal produced will have audio fluctuations that far exceed 3 KHz. If a station is set at 14.300 MHz, it will interfere with stations far beyond 14.303 and 14.297 MHz. Some stations are so badly distorted that you can not use a frequency 10 KHz from the offending station.

Using an amplifier requires being responsible to operate it properly. It will produce severe IMD's. With the increase in better propagation coming, we will find the bands less usable if this distortion is a practice among operators. There are operators that do not care. It does little good to advise them. However, those that want good operating practices need to be informed so their signals will be clean and allow more room on the band for others to operate.

73,
Ralph WD0EJA

How to prevent ESD damage

By Dan Romanchik, KB6NU

Here are some tips from Keysight Technologies, one of the leading electronic test equipment companies, on how to prevent ESD from damaging your electronics.

- **USE A GROUNDED WRIST STRAP** whenever you are handling equipment boards. Using a grounded wrist strap prevents your body from building up charge and causing damage when this built-up charge discharges into your equipment or test boards. Make sure to connect that alligator clip to ground!
- **USE GROUNDED WORK SURFACES MATS** for your boards. Do NOT use static generating or insulating materials as a work surface. Non-grounded mats and static generating/insulated materials can inductively charge boards, especially exposed ones. When connecting a charged board to equipment, the board can cause damage by discharging into the equipment's inputs.
- **KEEP CHARGED MATERIALS AT LEAST 0.3 METERS FROM EXPOSED ASSEMBLIES.** This includes plastics, foam, or other materials that can build up charge. Having a charged material near an exposed assembly can inductively charge the assembly. The assembly can then discharge into the equipment's inputs.
- **DISCHARGE YOUR CABLES BEFORE CONNECTING THEM TO YOUR EQUIPMENT.** Electrostatic charges can build up on test probes and test leads, so it's import to discharge them before connecting them to your test equipment:



- Ensure your device is off.
- Connect your cable to your device.
- Attach a 50 Ω shunt to the open end of the cable.
- Remove the shunt and immediately attach your device to your equipment. This prevents the center conductor of your cable from discharging stored charge into your equipment. A charged assembly can charge connected cables.
- **USE BOARD STANDOFFS AS NEEDED.** In some situations, you need board standoffs to provide extra insulation for your exposed assemblies. This prevents your grounded mats from making unwanted connections on your board.
- **NEVER USE “PINK” PACKING MATERIAL FOR BOARD TRANSPORT OR AS A WORK SURFACE.** While many people think pink packing material is ESD safe, in most cases it easily builds up unwanted charge. Unless continuous, thorough testing is done, treat pink packing materials as charged.
- **CAP UNUSED EQUIPMENT INPUTS** to avoid accidental ESD and physical damage. Damage often occurs by accidentally contacting equipment inputs. Capping unused inputs protects them from incidental ESD damage.
- **USE ESD-SAFE BAGS WHEN TRANSPORTING BOARDS.** This protects boards from ESD damage while moving between ESD-safe locations.
- **DO NOT OVERDRIVE EQUIPMENT INPUTS.** Start your testing at the least sensitive input setting and zoom in on your signal. Additionally, observe the maximum input levels for your specific equipment. The least sensitive setting is the most resilient, so starting there ensures that your inputs are at safe operating levels

After I posted this to my blog, Dave, N8SBE offered some further tips. He writes:

- Grounded heel straps also help reduce static charge. Test them with a floor tester every time you put them on. The floor needs to be somewhat conductive—not metal, that’s a safety hazard—so use conductive wax on tiles, or conductive carpet to drain of electrostatic charges.
- Keep materials, such as styrofoam cups, that form electrostatic charges easily away from your workspace. A styrofoam cup can generate thousands of volts.
- Keep the humidity up in the workspace. That helps to keep static generation down as well.

I like to think that I follow ESD-safe procedures, but there are a couple of things here that I hadn't thought about before. For example, I'd never really thought about discharging test equipment cables before connecting them. I think that's a good tip

To learn more, go to <https://www.keysight.com/find/PreventESD>

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Dan Romanchik, KB6NU, is the author of the KB6NU amateur radio blog (KB6NU.Com), the "No Nonsense" amateur radio license study guides (KB6NU.Com/study-guides/), and often appears on the ICQPodcast (icqpodcast.com). When he's not worrying about electrostatic discharge, he teaches online ham radio classes and operates CW on the HF bands.



New PPRAA members Derek W (N0DCW) and Derek B (KF0DKG) work overseas stations during the ARRL DX contest, March 6-7. New hams and new members learned about the PPRAA station and contest operations by talking to hams as far away as Finland, Spain, Brazil, Chile, and Japan

Major Events

PPRAA Field Day 2021

Who: PPRAA encourages members to work from home as a Class D or E station to support social distancing. A very limited number of hams (priority to club members) are invited to participate from the Ellicott club station if they do not have equipment to participate from home. Anyone interested in operating from the club station should contact a Club Officer to coordinate a time.

When: 1800Z, Jun 26 - 2059Z, Jun 27 Entries due: 2059Z, Jul 27

Where: Ellicott Fire Station
75 N Ellicott Hwy, Calhan, CO

Talk In: 146.460 simplex. We will also monitor repeater 146.970-



Computer Program:

N1MM ([Get it here.](#))

Note: Full Field Day Rules can be [found here.](#)

Rule waivers for 2020 can be found [here.](#)

You shop. Amazon gives.

Amateur Radio Emergency Links Info

Amateur Radio and Emergency Communications

<https://alertfind.com/amateur-radio-and-emergency-communications/>

Disaster Preparedness on a Budget

<https://couponfollow.com/research/disaster-preparedness-on-a-budget>

From the annals of PPRAA history

March 1982:

Spring Novice class will start in mid-March at North Jr. High at 7:30. AI ADØZ reports the hamfest this year will be on April 18, with a backup date of April 25. Tables will cost \$5. Greg will write the letter requesting the hangar at Peterson Field. The PPRAA will resurrect the club net on 10 meters instead of 2 meters. Meet on 28.845 MHz and 146.52 MHz; Novices can monitor on 28.125 MHz. Still need to work out the details. Greg KAØFOZ gave the program on radio astronomy. Membership dues remain at \$12 for single, \$15 for family. Irvin Ebel WØKWV passed away this month. Irv was a strong supporter of the club. Dave NØDV writes a short article on ham radio education, and all the benefits in geography, science and math. And it's fun! Fox hunt on March 13. The board passed a motion to clean the club's typewriter and reimburse Don KBØKQ. Les reviewed the old bylaws and presented a rough draft for discussion.

Parker Radio Association

PPRAA Team,

Be sure to join us for our weekly nets Monday and Tuesday evenings!

First, Monday, at 8:30pm, on D-Star XRF223B, the PRA holds its D-Star net. There is plenty of conversations from everything digital to the latest projects and devices... from DStar / DMR / Fusion / Brandmeister / Hotspots, and even CW. This can be accessed via your local hotspot. Also, many have linked via the WOCD5 2M repeater as well. Considering our KOPRA repeater is being relocated, using the WOCD5 2M side would be best (please follow common/courteous practice when linking).

Second, at 8:00pm on Tuesday, is the PRA weekly analog net on the WOCFI 448.675 – (100Hz) repeater. This is a great way to catch up on the happenings of the PRA and is a great environment to ask any question related to the hobby or to give yourself some bragging rights on a recent license, upgrade, or new piece of equipment.

We'll see you on the air!

73, KØPRA Your Friends at the Parker Radio Association

www.facebook.com/parkerradioassociation parkerradio.org

[@ParkerCORadio](https://twitter.com/ParkerCORadio)

ARRL Outgoing QSL Bureaus

www.arrl.org/outgoing-qsl-service

ARRL affiliated-club stations may use the service when submitting club QSLs for its members in bulk ("pooling" their members cards together in one package) by indicating the club name inside the package. Club secretaries should check club affiliation on the ARRL web site to ensure that their affiliation is current. In a "pooled" package, each club member using this service **must also be an ARRL member**. Cards should be sorted "en masse" by prefix and a proof of membership should be enclosed for each ARRL member. QSLs for unaffiliated club calls may also be sent via the outgoing bureau to foreign destinations if the trustee of the club call is a member in good standing. The trustee's proof of membership must be included with the club call-QSLs.



PPRAA VE EXAMS

(MONTHLY) FEBRUARY EXAMS HAVE BEEN CANCELLED

PPRAA VE session has relocated and will be held at 10:00 am on the second Saturday of the month at Pikes Peak Regional Office of Emergency Management
3755 Mark Dabbling Blvd, Colorado Springs, CO 80907, USA

Organizer: ve@ppraa.org

TESTING IS FREE. Applicants will need the following items at the session:

1. A valid **PHOTO ID**, driver's license preferred (if you do not have a valid photo ID, please call for alternative identification requirements).
2. Your **FRN NUMBER** (Please obtain in advance of the session).
3. A copy of your **amateur radio license** (if any).
4. The **ORIGINAL** of any relevant **CSCEs** you have **AND a PHOTOCOPY** for the VE Team to keep.

PPRAA VE Team policy, as with many VE Teams, is to not allow same day retests on failed exams. Anyone passing their Technician Class examination at a PPRAA test session will receive a free year's membership to the Pikes Peak Radio Amateur Association.

Jim Bishop kd0kql@hotmail.com, 719 332-5283, 000PPRAA VE Contact



MARC VE EXAMS

(January, March, May, July, September, November)

The Mountain Amateur Radio Club (MARC) VE Team conducts VE exam sessions in Woodland Park every odd month at 10 am on the first Saturday in the Community Meeting Room of the Woodland Park Library, 218 East Midland Avenue. The MARC VE Team is affiliated with the ARRL/VEC and examinations for all classes of license will be offered.

Full information, including driving directions to the Woodland Park Library, is available under "VE Sessions" on the MARC website at <http://www.nx0g.org/ve.html> or contact Wes Wilson (KØHBZ) at k0hbz@arrl.net or call (719) 687-8758.

If attending, please BE SURE to bring the following items to the session:

A valid PHOTO ID, driver's license preferred (if you do not have a valid photo ID, please call for alternative identification requirements).

- 1. Your FRN NUMBER** (now required – this includes children Please obtain in advance of the session).
- 2. Your ORIGINAL amateur radio license** (if any) **AND a PHOTOCOPY** for the VE Team to keep.
- 3. The ORIGINAL of any relevant CSCEs** you have **AND a PHOTOCOPY** for the VE Team to keep.

Here is a link that describes the book in more detail:

<http://www.ke7x.com/successful>

Follow us on www.facebook.com/KE7XBOOKS to keep up-to-date on book news and to be notified of book discounts at www.lulu.com.

This book has 267 pages, 211 figures and diagrams, and 53 tables of data to make understanding the sometimes complicated ham radio operations much easier. The book follows KE7X's philosophy of presenting material in several forms to accommodate people with different learning styles -- reading, visualizing, hands-on -- with the many figures and text explanations and there are hands-on exercises throughout the book that can help you learn more about your particular radio.

Follow us on www.facebook.com/KE7XBOOKS to keep up-to-date on book news and to be notified of book discounts at www.lulu.com.

One instructor for new and advanced ham classes has said, "This book is exactly what is needed. I've seen some other books targeting the new hams that are less than satisfying both technically and in content but this one is right on the mark and covers so much information that I so often get asked about, during and after teaching classes."

Here are more details on the content:

- With nearly 110 years of ham radio experience between them, the authors are still excited about the challenges this wonderful hobby offers. *The Successful Ham Radio Operator's Handbook* will guide you when exploring some of these.
- Its goal is to help new operators and returning old-timers learn about the breadth of exciting ham radio activities and challenges available today.
- It answers the question "Why is ham radio relevant in the Internet age?"
- It covers a wide range of topics, helping the reader to understand the excitement of different facets of ham radio and to choose a challenging and exciting activity to pursue.
- It helps the reader better understand how the radio works. Many hams only use a small fraction of the features of their radio. For example, if you understand how a noise blanker or a roofing filter or the AGC works, you will be able to more easily use these, and other, features of your radio to your benefit.
- It provides exercises designed to apply the knowledge to cement your understanding of how your radio works without being radio-specific. It is good for all makes and models.
- It helps the reader get enough background to understand much of the jargon hams who pursue special activities, such as the various digital modes, VHF contesting and moon bounce. It quickly takes the novice reader to higher level of understanding and provides URLs and websites that help the reader go deeper into new interests.
- Antennas remain a key area where all hams can still successfully experiment and create a key part of their station. This book provides information to help new hams get started cutting their own verticals and dipoles. It explains why some popular multiband antennas may have compromises that impact performance.

- It gives practical guidelines about choosing transmission lines and building and using baluns and chokes.
- Digital modes such as RTTY, PSK and the new WSTJ modes are explained. The computer-to-radio connections needed for these modes are discussed and illustrated.
- Many hams are motivated by public service and emergency preparedness. This book describes typical local emergency organizations and national networks.
- Hams who like to operate while traveling will find practical information on reciprocal international agreements and how to get permission to operate legally.

Online Practice Test Sites



Study for your Amateur Radio License exam:

[Technician \(2018-2022\)](#)

[General \(2019-2023\)](#)

[Amateur Extra \(2019-2020\)](#)

[Other...](#)

HamExam.org Amateur Radio Practice Exams

Log in using <https://hamexam.org> or click [**register**](#) to create an account. If this is your first visit to the site, please read my brief [**introduction**](#).

QRZ.COM <https://www.qrz.com/hamtest/>

Eham <https://www.eham.net/exams/>

AA9PW.COM

Membership Application
Pikes Peak Radio Amateur Association, Inc.
P.O. Box 16521, Colorado Springs, Colorado 80935

Date: _____ New Membership Renewal

Name: _____

E-mail address: _____

Address: _____

City: _____ State: _____ Zip: _____

Call: _____ License Class: _____ Telephone: _____

Are you an ARRL member? Yes No

Additional Name: _____ Call _____ Class _____ ARRL member? Yes No

Additional Name: _____ Call _____ Class _____ ARRL member? Yes No

Additional Name: _____ Call _____ Class _____ ARRL member? Yes No

Full Member - \$15.00

Full Member over 65 - \$10.00

Free - VE Signature Required:

Family Membership (same address) - \$18.00

Family Membership (both over 65) - \$12.00