

Greater Richmond New Ham Kit

Congratulations on Getting Your New Amateur Radio License!

It's exciting to pass your licensing exam... and it's also probably a little intimidating.

Now What?

You're likely asking yourself: "OK, what now? How do I get on the air? Where can I get help and guidance? Who can answer my questions about radios, antennas and what gear I need? What should I buy and where can I buy it? How much do I have to spend? "Once I get set up, how do I operate, make contacts and what do I say?"

Well, don't worry. Those are the same questions every new ham has asked since Amateur Radio began. Luckily, there's plenty of help to get you up and running - and comfortable with your new hobby. This guide is designed to get you on your way!

Join the Club!



First, consider joining the local radio clubs. This will put you in contact with other local hams who are happy to help you get started and answer your questions. Plus, most clubs have "Elmers" -- these are the folks who have been hams for many years and who offer a wealth of knowledge and experience. Elmers are a great resource and they stand ready to guide you. They also know what it's like to be a new ham -- because they were new hams themselves at one time. It's tradition for hams to lend a hand to one another -- so take advantage of their knowledge. We have included information on local clubs later in the guide. If you live out of the area, a quick Google search can help you find a club closer to your home.

Peat and Repeat

Also in this packet is information on Amateur Radio repeaters, including how they work and how you can use them to get on the air. A Technician Class license will give you privileges on VHF and UHF bands, and this is where you'll likely begin. Plus, dual-band portable VHF/UHF hand-held radios can be very inexpensive, with some as low as \$30. You can get on the air without busting your budget and then upgrade your gear as you advance -- both in experience and license class.

You'll also find that the Internet can be a great resource. There are many sites dedicated to ham radio, including information on best operating practices, news updates, equipment reviews and YouTube videos on a wide range of topics. You will also find Amateur Radio equipment manufacturers and retailers on-line, giving you the opportunity to compare gear, specifications and prices. Most clubs also have websites, and many maintain resource pages with links to sites dedicated to ham radio.

The KC4TS website has such a resources page that you can find at: <https://www.kc4ts.org/>

The Band Plan

Also in this information packet is a copy of the "Band Plan" published by ARRL - the American Radio Relay League. This plan shows you all of the frequencies assigned to Amateur Radio and which portions are available to each license class: Technician, General and Amateur Extra. The plan also indicates which types of operation are assigned to the various bands, such as CW (Morse Code), Single Side Band (SSB) Phone, data and so forth. It's important that you only transmit in the bands allowed by your license and to limit them to the appropriate type for the band in which you are operating. (Note: some license classes are no longer issued, but amateurs can still operate if there's is still valid. These include Novice and Advanced class licenses).



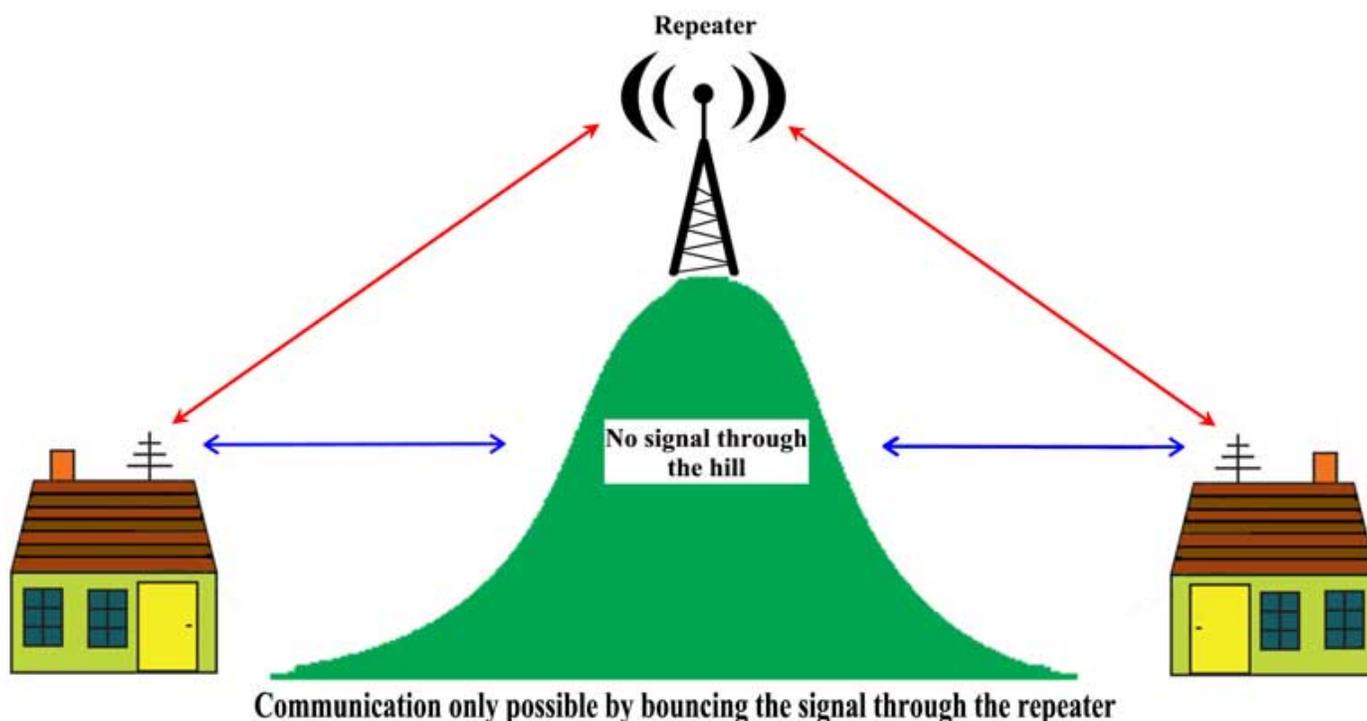
Getting You on the Air -- Repeaters

Repeater Basics:

Repeaters extend the range of your VHF or UHF radio by relaying your relatively weak signal to other stations, by using a higher power system that's usually located at a high elevation which maximizes its coverage. There are several repeaters in the area and they are listed later in the guide. Repeaters work by receiving on one frequency and then re-transmit at exactly the same time on a second "offset" frequency.

For example, on the 2-meter ham band these frequencies are 600 kHz (or 600 kilohertz) apart. On other bands, the offsets are different. As a general rule, if the output frequency (transmit) of the repeater is below 147 MHz, then the input frequency (listening) is 600 kilohertz lower. This is referred to as a negative offset. If the output is 147 MHz or above, then the input is 600 kilohertz above. This is referred to as a positive offset. For example: The W4RAT VHF repeater is 146.880- which means you listen on 146.880 and you transmit on 146.280 (subtracting 0.6 MHz).

Virtually all ham radios sold today set the offset once you have chosen the operating frequency automatically.



PL tones: PL, an acronym for Private Line, is Motorola's proprietary name for a communications industry signaling scheme called the Continuous Tone Coded Squelch System, or CTCSS. It is used to prevent a repeater from responding to unwanted signals or interference. Tone Squelch is an electronic means of allowing a repeater to respond only to stations that encode or send the proper tone. In other words, if a repeater is set up to operate only when a PL tone of say, 74.4 Hz is heard by its receiver, then it will allow the transmitting station access. If your station, (your mobile, base or handheld) does not transmit the tone that the repeater receiver has been programmed for, when you key up, then the receiver of the repeater does not hear you and will not be usable by your station until you set the proper tone in your radio to be transmitted when you key your mic. If a repeater is "In PL mode" that means it requires a CTCSS tone (PL tone) to activate the repeater.

How do you make a call on an Amateur Repeater?

That most exciting day just arrived! You now have passed your Technician Class exam and have been issued your first call sign by the FCC.

You have your station all set up and you are ready for your first contact on a repeater! You chose a local repeater frequency and dial it up on your rig. **First, LISTEN AND LISTEN SOME MORE.....** to make sure that the repeater is not already in use.

NOW BRAIN LOCK SETS IN! "What do I do? What do I talk about? Will I remember all those rules, regulations, theory and all that other stuff I had to study?"

The simple answer is..... probably not..... but don't worry!

When you are satisfied that the repeater is not in use, set your transmitter power to the minimum and increase only as needed to make contact with the repeater, begin with the call sign of the station you are trying to contact followed by your callsign. e.g., "(THEIR CALL SIGN) this is (YOUR CALLSIGN). If you don't establish contact with the station you are looking for, wait a minute or two and repeat your call.

If you are just announcing your presence on the repeater it is helpful to others that may be listening if you identify the repeater you are using AND your callsign. e.g., "This is (CALL SIGN) listening on the 88 machine" -- or you could also say "This is (CALL SIGN) listening on 146.880." This allows people that are listening on radios that scan several repeaters to identify which repeater you are using.

So, you just keyed your mic, gave out your call sign and now you hear.....your call sign and someone coming back to you with his call sign..... he or she un-keys and the repeater is waiting for YOU!

First thing.... try to write his call sign down and if he gives his name, that too. Lots of good operators recognize a new ham instantly on the air and they will guide you with patience, understanding, maybe some fun prodding and picking at you to get you to relax and have fun with your new license.

He or she will WELCOME you!

A good operator will never make you feel unwanted on the air. He may ask you to repeat your call sign just to make certain he understood who he is talking to and if you forget to give your name, he will ask for it. Most hams don't like to talk to a "call sign", so getting names and location helps to start the conversation.

If you make mistakes.... the other station will most likely let you know what you did wrong and inform you as to the correct way in a friendly manor.

Don't be surprised if your new contact asks you all the questions instead of the other way around. He or she is just trying to get you to feel relaxed on the air. As your experience grows in ham radio, always try to remember your first contact and how excited and nervous you were. Now it's your turn and you are the one responding to a new ham and his first contact! Make him or her feel at home and..... be a good operator..... like your first contact was!

Repeater ID.....you and it!

You must transmit your call sign at the end of a contact and at least every 10 minutes during the course of any communication. You do not have to transmit the call sign of the station to whom you are transmitting. Never transmit without identifying. For example, keying your microphone to turn on the repeater without saying your station call sign is illegal. If you do not want to engage in conversation, but simply want to check if you are able to access a particular repeater, simply say "(your call sign..... testing)."

Remember! This is not CB radio!

Don't use CB lingo on any ham band such as 10-4, what's your 20, etc..... and don't say BREAKER!

Using the words BREAK, or BREAK, BREAK or BREAK, BREAK, BREAK or any combination of them on Ham radio can be misunderstood by an operator depending on his experience. The word "break" or combinations of it carries many different meanings in the ham community and in the English language.

According to THE EMERGENCY COORDINATOR'S MANUAL: The word "break" is never used UNLESS there is an emergency."

If a station needs to report an emergency, STOP TRANSMITTING IMMEDIATELY and allow the other station access to the frequency.

Talking to other stations:

Use plain language on a repeater. If you want to know someone's location, say "Where are you.... or what's your location?" If you want to know whether someone you're talking with is using a mobile rig or a hand-held radio, just ask: "What kind of radio are you using?" You get the idea. Most repeater use is of a "local" nature so signals will be usually of very high quality. The use of the phonetic alphabet is very helpful at times.

Don't call "CQ" to initiate a conversation on a repeater. Just simply listen to make certain the repeater is not in use and then key your mic and say your call sign and "listening". If someone happens to be listening and they want to talk to you, they will respond.

Getting Experience

One of the best ways of getting experience is by participating in nets and public service events where local radio clubs provide communications support. Such events include 5k road races, Halloween Pumpkin Patrols, and emergency communication drills held by local ARES groups (Amateur Radio Emergency Services). Check with local clubs to learn about their public service activities. These types of events provide real-world hands-on experience that's invaluable.

The Future - HF!

Once you get on the air, chances are you'll want to do more -- including upgrading your license to gain more operating privileges. Passing your General license exam will open up a whole new world to you, including the enjoyment and thrill of long-distance communications on the HF bands with hams hundreds or even thousands of miles away.

The General exam is not difficult -- if you are willing to invest some time studying. There are many study guides available, both in book form and on-line. There are also practice tests on-line so that you can check your knowledge and understand where you need to focus your studies. There are even cell phone apps you can download and install so that you can study wherever and whenever you have a free moment!

As always, remember that Elmers are always ready to help you learn and understand. The concepts behind what makes radio work may seem overwhelming and intimidating, but the basic theory is not hard to understand, especially once you begin your journey on the air! We look forward to hearing you on the air! Welcome!

Amateur Radio Relay League



The ARRL is the national association for Amateur Radio in the US. Founded in 1914 by Hiram Percy Maxim as The American Radio Relay League, ARRL is a noncommercial organization of radio amateurs. ARRL numbers within its ranks the vast majority of active radio amateurs in the nation and has a proud history of achievement as the standard-bearer in amateur affairs. ARRL's underpinnings as Amateur Radio's witness, partner and forum are defined by five pillars: Public Service, Advocacy, Education, Technology, and Membership.

A bona fide interest in Amateur Radio is the only essential qualification of membership; an Amateur Radio license is not a prerequisite, although full voting membership is granted only to licensed radio amateurs in the US.

Information on becoming a member of the ARRL is available at <http://www.arrl.org/membership>

As a member of the ARRL, here are some of the benefits you will enjoy:

- *QST*, On the Air, NCJ, QEX Magazines
- Online Services –
 - Magazine digital editions
 - Magazine Archive and Periodical Search
 - Product Review Archive
 - Email forwarding
 - E-Newsletters – delivered to your inbox
- A voice in the affairs of ARRL and ham radio through locally appointed volunteers
- Publication Specials and on-line course discounts
- Emergency Communication Services
- Technical and Regulatory Information Services
- Operating Awards
- Ham Radio Equipment Insurance Plan Available
- Outgoing Foreign QSL Service
- Plus much more!

On the Air magazine covers a range of ham radio interests and topics, delivering introductory techniques and stories to help anyone with a beginner-to-intermediate-level of experience. From making your first radio contact to selecting the right equipment to project building and getting involved with public service or your local clubs. It is a great resource for newly licensed hams.



Amateur Radio Emergency Service

The Amateur Radio Emergency Service® (ARES) consists of licensed amateurs who have voluntarily registered their qualifications and equipment, with their local ARES leadership, for communications duty in the public service when disaster strikes.

ARES Membership Requirements

Every licensed amateur, regardless of membership in ARRL or any other local or national organization is eligible to apply for membership in ARES. Training may be required or desired to participate fully in ARES. Please inquire at the local level for specific information. Because ARES is an Amateur Radio program, only licensed radio amateurs are eligible for membership. The possession of emergency-powered equipment is desirable but is not a requirement for membership.

More information about ARES can be found on the ARRL website at <http://www.arrl.org/ares>

There are several ARES groups in the Richmond area including Hanover/Henrico, Chesterfield, Powhatan, Colonial Heights, Dinwiddie and others. If you are interested in learning more about joining an ARES group in the area, please email George Starke at wb4vwr@arrl.net.



Local Ham Clubs and Organizations

Catastrophic Amateur Tactical Squad (CATS)

<http://www.kc4ts.org>

An extra-social club dedicated to exploring amateur radio and furthering camaraderie among Richmond-area ham radio operators. The Cats meet weekly, monthly, and quarterly to enjoy good company, eat food, play radio and send SSTV images.

The CATS meet weekly at Windy Hill Sports Complex in Midlothian at 7pm Monday nights to participate in the PARC NCO Training Net, Goochland Emergency Communications Net and to have fellowship with other area hams. It's a great opportunity to come out, get on the repeaters and ask questions.

Powhatan Area Radio Club (PARC)

<https://www.n4pow.com>

Where the FUN Begins! The club was formed to expand Amateur-Radio within Powhatan County. Club meetings are the 3rd Tuesday of every month except December.

Richmond Amateur Telecommunications Society (RATS)

<https://www.rats.net>

Club meetings are held the 3rd Friday of every month.

Richmond Amateur Radio Club (RARC)

<https://www.rarclub.net>

Club meetings are held the 2nd Friday of every month

The RARC has been the "teaching club" for 40 or more years. It teaches the FCC exam prep classes – Technician, General, and Extra – every spring and fall. It has a testing team of Volunteer Examiners who give tests every odd month. The club also offers enrichment classes such as Morse Code, DMR and DStar setup and operations, antenna modeling, and remote controlled station operations based on demand. The monthly meetings usually include a 45-minute technical presentation. The club has an over-the-Internet remotely controlled HF-VHF-UHF station for use by members. It's for members who can't have a station where they live or whose station can't transmit on certain bands. The RARC runs the three DStar repeaters in Richmond. One of the oldest ham radio clubs in the nation, it was founded in 1916, two years after ARRL started.

Richmond Metropolitan Repeater Association (MRA)

<http://www.mrarichmond.org>

The Metropolitan Repeater Association is a group of Amateur Radio Operators dedicated to providing a high quality, wide coverage area two-meter repeater for the Richmond Virginia metro area and surrounding counties. The MRA is not a club, rather, it's an association of people interested in ensuring the repeater remains maintained, supported and most importantly, used!

RVAHams

<https://www.rvahams.com>

<https://rvahams.slack.com> – Slack Workspace

RVAHams is a club independent website dedicated to bringing the radio community of Central Virginia together.

Local 2M/70CM Repeaters

Name	Frequency	Duplex	Offset	Tone	rToneFreq	cToneFreq	Mode	Location
KG4MRA	145.43	-	0.6	Tone	74.4	74.4	FM	Richmond, WTVR-TV Tower
W4RAT	146.88	-	0.6	Tone	74.4	74.4	FM	Bon Air, WCVE Tower
KN4SKI	146.94	-	0.6	Tone	74.4	74.4	FM/C4FM	Richmond, James Monroe Building
KE4SCS	146.985	-	0.6				FM/C4FM	Petersburg
KD4RJN	147.06	+	0.6	Tone	74.4	74.4	FM/C4FM	Beaverdam, Ashland Berry Farm
KG4DCX	147.09	-	0.6				FM/C4FM	Hopewell
W4FJ	147.255	+	0.6				DSTAR	Richmond
WB4IKL	147.27	+	0.6	Tone	203.5	88.5	FM	Goochland
N4POW	147.315	+	0.6	Tone	74.4	74.4	FM/C4FM	Powhatan, Powhatan Water Tower
KA4CBB	147.36	+	0.6				FM	Chester
WA4FC	147.39	+	0.6	Tone	74.4	74.4	FM	Petersburg
KD4OUZ	442.225	+	5	Tone	131.8	131.8	FM	Louisa
W4RAT	442.55	+	5	Tone	74.4	74.4	FM/C4FM	Bon Air, WCVE Tower
WA4FC	442.6875	+	5				DMR	Petersburg
N4POW	443.35	+	5				DMR	Powhatan, Falling Creek Park Water Tower
WA4FC	443.5375	+	5				DMR	Richmond
W4RAT	443.5875	+	5				DMR	Bon Air, WCVE Tower
W4FJ	443.7125	+	5				DSTAR	Richmond
KG4YJB	444.275	+	5	Tone	103.5	103.5	FM	Prince George, South Point Business Park
WA4FC	444.35	+	5	Tone	74.4	88.5	FM	Columbia
WA4FC	444.6125	+	5				DMR	Beaverdam
KK4QAK	444.975	+	5	Tone	74.4	88.5	FM	Petersburg

Repeater information changes as repeaters are activated, shutdown and switched to new modes. If you are looking for up-to-date repeater information one good source is <http://www.repeaterbook.com>.

DMRVA is a linked network of DMR amateur repeaters throughout the state. There are several DMRVA repeaters in the Richmond area. You can visit their website at <https://www.dmrva.org> to learn more and download programming codeplugs for some of the more popular DMR radios.

Local VHF/UHF Nets

An amateur radio net, or simply ham net, is an on the air gathering of amateur radio operators. Most nets convene on a regular schedule and specific frequency, and are organized for a particular purpose, such as relaying messages, discussing a common topic of interest, in severe weather (for example, during a Skywarn activation), emergencies, or simply as a regular gathering of friends for conversation.

A formal, or *directed* net has a single *net control station* (NCS) that manages its operation for a given session. The NCS operator calls the net to order at its designated start time, periodically calls for participants to join, listens for them to answer (or *check in*) keeps track of the roster of stations for that particular net session, and generally orchestrates the operation of the net.

It's a good practice to listen to how a net operates before trying to join for the first time.

Net	Repeater	Day	Time
PARC NCO Training Net	N4POW - 147.315	Monday	7pm
Goochland EMCOM	WB4IKL - 147.270	Monday	8pm
Chesterfield ARES	KA4CBB - 147.360	Tuesday	9pm
Tri-Cities ARES	WA4FC - 147.390	Wednesday	8pm
VA Statewide DMR	VA Statewide TG 3151	Wednesday	8pm
RARC DSTAR	W4FJ - 147.255 / 443.7125	Wednesday	8pm
KC8MTV System Fusion	N4POW - 147.315 Wires X Room: 21625	Saturday	8pm
RARC 6M	50.135 USB	Sunday	7pm
RATS	W4RAT - 146.880	Monday & Wednesday	7pm
Central VA SSB Net	50.215 USB	Daily	8am

The idea for this new ham kit came from the East Greenbush Amateur Radio Association (<https://www.egara.club>). Some material has been reused from their kit with permission.

If you see anything that needs to be updated or have other suggestions to make the kit better, please send an email to n4mdr@arrl.net. You can always find the most up to date version of this document at: <https://kc4ts.org/#exams>