

Ham Radio Buying Recommendations

New ham radio operators often ask for recommendations on which radio to buy, putting experienced operators in a difficult position. By analogy, recommending a radio is like recommending a car: few experts agree as there are many objective and subjective aspects to consider. Experienced hams often have more experience with a certain brand and thus aren't as objective when it comes to other brands.

Types of Radios

There are many types of radios. In this note we are focused specifically on radios intended for emergency communications (including drills) as part of the Burlingame Neighborhood Network (BNN), and/or any other groups you may choose to join. This means the focus is on local-area communications between city neighborhoods and command centers using hand-held radios (called "HT's", short for: "Handi-Talkies"). More experienced / advanced operators may supplement with additional vehicle (called "mobile") radios which I don't cover here.

Product Reviews:

The eHam web site maintains product reviews for nearly 400 different hand-held amateur radios (both new and used): <https://www.eham.net/reviews/products/49> Be skeptical of these reviews: unlike consumer products there are very few reviews per device and are often written by people with different needs than our local emergency communications (generally known as "EmComm")! I have found the reviews to be inaccurate compared to my own device experiences. Amazon.com also has reviews for a dozen (or so) lower-cost radios, but again, these are not mass-market consumer products so be skeptical of reviews.

Recommendations?

Without trustworthy review sites, what's a new ham to do? I remember being in your shoes and just wanting someone to narrow down the 400 bewildering choices! I don't know you nor your preferences, I prefer Pepsi and you might be a Coke person. Regardless, I'm going to recommend some radios in a few categories:

- (1) The lowest priced radios available regardless of quality, performance, and features,
- (2) Some popular mid-range radios, and
- (3) High-end radios if you have money to burn and time to kill figuring out complex features as your hobby.

Note: Even though I own four handheld radios, I don't have personal experience with every single radio here.

If you just want a radio for your "EmComm" group participation or personal use and don't want to spend time evaluating the nuances between choices, I suggest you start with an inexpensive (and limited) radio that can be replaced later once you understand the trade-offs. Specifically look at the "Lower End" section below.

What to look for

There are many technical aspects an expert would look at (harmonics, selectivity, sensitivity, etc.), but for beginners let's simplify:

- Dual-band operation – this means a radio that works on the two most popular frequency ranges: 2-meters and 70-centimeters (also known as 2m and 70cm, or 146MHz and 440MHz). The requirement for many EmComm groups is becoming both 2m and 70cm operation. While operation on the 70cm (440MHz) band is not yet required in our immediate area, getting a dual band radio costs very little extra and can be useful in emergencies when using repeaters around the Bay Area or elsewhere in North America.
- Battery capacity and battery life – for obvious reasons! Capacity is measured in milli-amp-hours or watt-hours. You can always compare watt-hours between radios, but milli-amp-hours are only comparable for batteries of the same voltage (you can convert to watt-hours with a formula). Radios have swappable batteries and you can often find larger capacity batteries than your radio comes with. Battery life (time) depends on how efficient the radio is.
- Power output (ERP, effective radiated power) – note that your antenna is more important than power. You'll want a radio that outputs 5 watts or better for local communication in our hills.

Antennas

People often focus their energy on the radio specifications and ignore the antenna. Antennas matter. Consider a stereo system: if you have a powerful receiver and low-quality speakers, you'll get poor sound. The antenna is analogous to your stereo's speakers. Radios often come with low performance "stock" antennas, also known as "rubber duckies" that can be upgraded. Start with your stock antenna, run some tests, and upgrade if you are having issues communicating.

Lower End Radio Picks

These tend to be lower-cost, have fewer Features, are lower performance (in selectivity and sensitivity), may have quality issues, and come with less support (documentation, service, etc.). I'm generalizing, and your experience may differ. They often work fine for close range communications with little fanfare. They'll get better range than an FRS radio due to higher power and the use of repeaters.

RECENT UPDATE 2019-05: An experienced professional in the emergency communications field cautioned against the use of inexpensive radios such as the Baofeng because they are supposedly susceptible to "blinding" (poor adjacent-channel-rejection / selectivity) which means that in a real emergency when many people are transmitting on nearby frequencies these radios may fail to receive on the desired frequency. These radios work fine on a normal day, but with strong radio signals on other nearby channels, they may fail. Six members of the BNN communications group performed testing on various radios and confirmed that the Baofengs are more susceptible to this problem than other radios (Kenwood and Yaesu demonstrated better ACRR). (The BNN Communications team no longer recommends Baofeng radios for use in BNN activities due to the risk posed in a real emergency, but any radio is better than no radio.)

- **Baofeng** - <https://baofengtech.com/pdf/CompareChart.pdf>
 - **UV-5R** - \$25 to \$35 - Least Expensive – Discontinued model, but still widely available, may not be legal to sell in the USA due to an FCC regulation issue, but lots (!) of people

have them. Often the best source to find these radios is on Amazon.com. Baofeng is one of a few Chinese companies that dramatically dropped the price of ham radios. They work well enough in most situations. Mine worked for 2 years before breaking, but at \$35 or less you just get another! Search for them on Amazon or eBay, but sellers may be questionable due to the FCC legal issues.

- **BF-F8HP** - \$65 - Higher power, with a bigger battery, at a higher price, but one of the least expensive widely-available current models that meets FCC regulations. You can select power output between 1-watt, 4-watts, or 8-watts. I recommend you only buy directly from BaoFeng Tech at: <https://baofengtech.com/bf-f8hp>, or the Amazon site (which sells from BaoFeng Tech) at: <https://tinyurl.com/y2lfy6hj>

Mid-range

These more expensive radios are not “throw-away” starters. Get one if you expect to use your radio and want it to last. You often get higher quality, support, documentation, performance (selectivity, sensitivity), and a few more features. By analogy to “auto brands”, I compare these to the Toyota Camry, Honda Accord, and Subaru: high-quality but without heated seats.

- Yaesu – I’m biased as I own three Yaesu radios (2 handheld) – none of which are sold anymore so you can’t copy me. There are nine (!) current models to choose from but I’ve selected two “quick picks” from the mid-range:
 - **FT-60R** - \$169 - <https://tinyurl.com/y66erm6x> - A popular radio with solid construction. The “work-horse” of Yaesu. Tested by time (released in 2004) with good performance and fewer feature frills (less confusing). This radio had a minor problem with a Yaesu feature called “WIRES”, but can be resolved with a software fix.
 - **FT-70DR** - \$180 but often on sale for \$149 - <https://www.gigaparts.com/yaesu-ft-70dr.html> - A recent updated radio that includes a new “Digital voice” mode (C4FM) that let’s you connect to some of the new cutting edge repeaters in the Bay Area and beyond. Yes, it is cheaper and has more features than the FT-60R. Some people pay extra for the less complex and proven FT-60R.
- Wouxun – This Chinese radio brand is now supported by reputable USA dealers that honor the warranty. Compared to other Chinese radios, Wouxun has a reputation for more rugged construction and better frequency parameters
 - **KG-UV6X** - \$190 – An excellent mid-range HT, very popular for both the Amateur bands and the Public Safety bands. Available from Ham Radio Outlet either online <https://www.hamradio.com/detail.cfm?pid=H0-011549> or directly from their local Oakland store.
- Icom – There are currently four models to choose from, but I’ve selected one “quick pick” from the list found here: <http://www.icomamerica.com/en/amateur/> Note I have no personal Icom experience but they are very popular.
 - **IC-T70A** - \$180 – Good reviews, solid radio, no frills. <http://tinyurl.com/ndwgfp6>
- Kenwood – I have no experience with these, but they are very popular

Fully Featured, Top-of-the-Line

These radios are some of the best each company makes, and you pay a premium price. You get many features you may not use unless you are an enthusiast. They are more complex in operation due to all the settings for all those features. Complexity can be your enemy in an emergency unless you practice with these radios on a regular basis. These radios are like the “Cadillac, Lexus, or BMW” of handheld radios.

- Yaesu – FT-2DR - \$300 - <http://tinyurl.com/y6bkmnyu>
- Icom – ID-51A Plus2 - \$330 - <http://tinyurl.com/y5ex2yz9>
- Kenwood TH-D74A - \$510 - <https://www.gigaparts.com/kenwood-th-d74a.html>

Note about Digital and “DMR” Radios

All the radios listed above inter-operate using a standard analog FM signal. There are several incompatible digital modes competing for amateur’s hearts. DMR is a digital mode popular in commercial radio. While DMR isn’t new, it is only recently becoming popular with Amateurs. Some of these DMR radios can operate in the traditional analog FM mode (like the radios recommended above) and in the “new” Digital DMR mode. When you hear someone at the airport calling for a wheelchair and you hear a somewhat “digital robotic” sounding voice, that is likely a DMR radio being used commercially. DMR radios can be quite complex, though you may be able to operate them in the traditional FM mode and use the DMR feature as you gain experience.

A very experienced Amateur and Public Safety operator let me know that the newer DMR radios are coming on-line and are becoming widely used. He recommends the best two models at the best prices as:

- Anytone AT-D868UV - \$180 - Digital DMR Dual-band HT available at: <https://powerwerx.com/anytone-atd868uv-dmr-dual-band-handheld>
- Anytone AT-D878UV - \$220 - Digital DMR Dual-band HT, available at: <https://powerwerx.com/anytone-atd878uv-dmr-dual-band-handheld-gps-roaming>

It may be harder to find an amateur operator who can help you program these newer types of radios, so ask before you buy. For more information on DMR, see:

https://en.wikipedia.org/wiki/Digital_mobile_radio and,
https://www.raqi.ca/~ve2rae/dmr/Amateur_Radio_Guide_to_DMR.pdf

Other Brands

Yes, there are many other well-known brands that make great radios. I haven’t mentioned TYT, Alinco, and many others. I don’t have direct experience with them, but I know people who have them and are happy. Remember: recommending a radio is like recommending a car. Ugh.

Accessories – Programming Cables

Many radios come with the radio, a basic (replaceable/upgradeable) antenna, (replaceable/upgradeable) battery, and a charger. Out of the box your radio won’t work well until it is

programmed to the specifics of your local group's frequencies and protocols. It can be hard (and slow) to program a radio without a computer, but it is possible and is the cheapest (and difficult) option.

If you want to program your radio from a computer, you'll need a radio-to-computer "Programming Cable" where one end plugs into your computer USB port and the other end into your radio. Many radios do NOT come with programming cables, but some do. You can borrow someone else's programming cable because you'll rarely use it.

There are two considerations:

- 1) Programming cables are specific to each type of radio. They are not interchangeable. You need to get the correct cable for the type of radio you purchase.
- 2) There are many inexpensive Programming Cables that use a Chinese counterfeit chip that mimics the chip designed by either FTDI or Prolific. Hardware-wise these counterfeit chips work fine but the software in Windows and MacOS may not recognize them (Windows and MacOS have built-in support for genuine FTDI and Prolific chips). What this means is that to get the counterfeit cables to work you'll have to install drivers from a Chinese company and hope that their software isn't loaded with a virus. Installation of the special drivers can be problematic and require an expert to get working.

As for upgrading your battery and your antenna: those topics are beyond this intro guide. Get your radio, practice a bit, and then study what accessories you might need.

And Finally, Two Quick Picks

If you want me to blindly pick your radio, and I don't know who you are, here are a two at different price points:

- Low Cost Choice – About \$86 total (radio + cable)
 - **Baofeng (BTECH) BF-F8HP package** (radio, antenna, battery, charger) - \$65 - Does **NOT** come with a programming cable to program your radio from your computer (optional) <https://tinyurl.com/y2lfy6hj>
 - **Radio Programming cable** to go between your computer and a Baofeng / BTECH / Kenwood / Anytone radio -: <https://tinyurl.com/y5z3u75d> - \$21 - NOTE: if you come to the BNN "New Ham Class" at the Burlingame Library (June 1, 2019) I will have the cable available to program these specific radios right away. You'll need to purchase a programming cable for your specific HT for future programming additions and changes (which happens with more experience).
- Upgrade Pick: - \$140 in a complete package
 - Yaesu FT-70DR package (radio, antenna, battery, charger, and **programming cable**) - \$140 - <https://www.gigaparts.com/yaesu-ft-70dr.html>

Where to buy

- Low End Equipment:
 - Amazon – in most cases they only carry lower-end radios from a variety of Chinese companies.
- Mid-range to High End Equipment

- Ham Radio Outlet – they have a local Oakland retail store <https://www.hamradio.com/>
- GigaParts – <https://www.gigaparts.com/>
- DX Engineering - <https://www.dxengineering.com/>
- Ham City - <https://hamcity.com>
- Universal Radio - <https://www.universal-radio.com/>
- ... and many others...

Close

Are you an experienced ham with a better idea for this quick guide? A beginner who found an issue with these notes? Send feedback to b@ab6d.com

Did you get your FCC license and a radio and want to use them for more than just your local “EmComm” group drills? Here is a starter book on what else you can do with your handheld and local repeaters: <http://tinyurl.com/y5clnbjm>