How To Use a Baofeng UV-5R

by Tunnel Rabbit October 4, 2019

The following is a piece intended to supplement three readily-available World Wide Web resources:

1. How to manually program a Baofeng UV-5R
2. Download the free programming software called Chirp
3. How to program a Baofeng using a computer

After punching in some frequencies, set the radio up for a ‘tactical’ operations by:

1.) Turning off the lighting in the display, and all beeps and bells and whistles.

2.) Set the power level on low for all tactical frequencies.

3.) Select the narrow band option to reduce the range further.

4.) Use several coats of black nail polish to ‘black out’ the LED light, but better yet is to use JB Weld or another epoxy, to form a cap over two of the small buttons on the side. This in ensures the flashing light and siren are not inadvertently triggered. Be sure **not** to do this to the big button that is in between the two smaller ones. That one is the Push To Talk (PTT) button. (Unless you do not want that radio to transmit.

Note: Should one find the need to use one of these capped button to access the flashlight or FM radio, simply use your K-Bar to carefully pry the ‘cap’ off. One should always have fighting knife handy for these occasions.

Given the several antennas that usually come on these radios, I would test them, but if not, at least limit the range that the radio will transmit on in the ‘memories’ section in Chirp, to 144 to 153 Mhz, and 430 to 450 Mhz for the most common antenna. The shortest antenna that a UV-5r normally is supplied with is good for only 144 to 148 Mhz, and is no good for the 70 cm band. It is also no good for MURS or VHF business band (itinerants). If you have one of these short antennas on all, and any of your set of radios, then replace it! Standardize every aspect of your radios, so that they look and function the same.

We would not want to shorten the life of the radio by transmitting outside the antenna’s design range. So don’t do so, except in a pinch. The external antenna that can be used on a vehicle, that best matches the Baofeng UV5R’s useful transmit range, is the Tram 1181. This antenna–unlike most antennas offered–is pre-tuned, and could also be used as a base station antenna for either a mobile, or a handheld.

To make full make use of the Baofeng’s range, a discone antenna is necessary. This kind of antenna is suitable only for base stations, and is best as a antenna for scanners, however we are not necessarily interested communicating at the furthest range our equipment is capable of. Just the opposite. We should strive to *limit* the range, or have a range that is far enough to make reliable communications with those whom we would talk to, and no one else.

Use the correct antenna for the frequency, and the radio will have a longer service life. If it is necessary to transmit on an antenna not design for a frequency, always use the lowest power setting.

If you feel the radio getting warm, then you are talking on it too much. The ‘duty cycle’ or the amount of time one should transmit on high power of 4 watts, is only a few minutes. Set on the lower power setting, and the ‘talk’ time increases significantly, and so does the battery life. We will also limit how many people may listen in, if low power is used. If high power is necessary, let it cool off, lest it may over-heat, and fail.

If an older Baofeng no longer transmits, these make for good receivers to monitor a single channel, or to make slow scanner. I would limit it’s ‘scan’ list to no more than 27 frequencies, or to a list of frequencies that it can scroll though in less than 3 seconds. These 27 frequencies would be my first choice to scan, and are GMRS, FRS, and MURS. Using another Baofeng, I would also scan all the repeaters in the area, and especially the Amateur Radio, and GMRS repeaters, and the national calling frequency for the service, i.e. , 2 meter, and 70cm, and public emergency services frequencies.

Buy extra Baofengs to do service as scanners, and these can also be pressed into the rotation if necessary. Persons on ’look out’ dusty can carry an extra Baofeng, in addition one for monitoring the primary frequency, and for only the purpose of scanning GMRS, FRS, and MURS, and radio traffic that would most likely be used by attackers. Of course a standard scanner would do that job better, but it would cost more, and it will never transmit. All Baofengs used for security work can be set up to scan the same list, so that if necessary, any one on the ‘team’ can scan even when not on ‘watch’. Scanning for traffic will improve ‘situtational awareness’, and may alert to one to trouble in the area, or trouble at your doorstep.

A Uniden SR-30C scanner with a Close Call feature is the good for this work, but I’ll cover that in another article.

Or better yet, get a frequency counter. Adjust the sensitivity, or use an external antenna. Anything that puts out RF (radio frequency) will show up, including cell phone traffic or drones (2.4Ghz). Look for a pattern of RF signatures, or sets of different frequencies in use, that may be associated with different types of persons, or organizations. But this kind of thing is covered in another article. [**JWR Adds:** A frequency couter is also useful detecting bugs or “bumper beeper” car trackers.]

Give priority to learning how to program your radio, one way or another, even if you can get to talk on only one channel. If only on one channel, it’ll work. We’ve all been there. That is your starting point on the learning curve.

Study YouTube videos on the topic, learn how to program it manually, and via Chirp. And if it is simply too technical for you at this time, then approach a Ham, and offer them some radios, or cash in trade for their services. Give them a frequency list that you would prefer, and ask for their suggestions. The radio is of little use otherwise. If the programming is not complete, then the radio will not serve at all, or to it’s full capacity. So why did you buy it for? At least one person in a group should have a functional grasp of how to operate the radio if even only on one channel, so that they can train others. Without comms of some form, the ability to warn others of an attack, or danger, is a serious deficit that needs to be overcome and solved, *now*. I’d consider at least having one air horn, and whistles for all, as two

back up means for that purpose. You need redundant means as part of a good commo plan any way. If the Baofeng is too much to handle, get and an FRS or MURS radio that are more simple to operate. We'll look at pre-programmed, plug and play options that are somewhat of the beaten path as we can get with common radios. These can be another and inexpensive, or not so inexpensive layer of your commo plan.

MURS Band

Of course we know about MURS radios. Here is a high quality fully-compliant 2 watt, 11.5khz band width radio that has less range than a Baofeng, and it is only $189. But you gotta get 2 of them to talk to someone.

And then there is a hand-held radio that accompanies the Dakota Alert Sensors, that sells for only $85. Lower quality, no better than Baofeng, 2 watts, narrow band, 11.5 Khz as specified by the FCC. But it is caveman simple to use, and that could be for you, or someone else in the family, particularly older folk like myself. These are Low Power, Short Range Handheld FRS/GMRS, Their range is 1/4 mile to 2 miles if you are lucky. [**JWR Adds:** These can be set to teh same frequency as rou driveway alarm, so you can get intrusion alerts and push-to-talk in the same hand-helfd, that you carry on your belt.]

Here is a video of a Range Test.

FRS Band

FRS has the huge advantage of being very low power, but the disadvantage of being ubiquitous, or in that every body and their hunting buddy, and his kid has one, but if used only in an emergency, or rarely, it is worth the risk of short transmissions. Saying "help, come here", or such is good enough. If you suddenly realize that the Baofeng is simply too much for you, then I would consider the paying more for the Midland GTX series of radio that has FRS/GMRS with the scramble feature that is seldom found on FRS/GMRS combination. The 'target market' for these radios are outdoors enthusiasts, so they are somewhat rugged and water resistant, added bonuses. They have rechargeable batteries, but also can accept rechargeable or standard AA batteries. The ear piece is adequate, yet a high quality ear and mic set that have the 'Kenwood' plug will work with the GTX. It also has a vibrate alert, and animal sounds that can used as a brevity codes. There are other interesting features as well. If keeping it simple is watt works for you, then this a smart way to go. Of course the simplest option is those cheapo kid toy radios. They work!

The Midland GXT1050VP4 is $73 for a pair. (This has a scramble feature that can be used on very low power FRS, that adds a layer of security.)

The GMRS side puts out about 3 watts, so use that as your alternative frequency, and use a FRS frequency that is limited to less that 500mw, 1/2 watt ERP as your primary. That is, if the range is enough for your retreat, or within your perimeter that should be less than 5 acres. You hopefully have defenses farther out, and not at the 'mailbox', so that the 3 watt GMRS frequency that is the highest power setting is probably enough. It has a surprisingly good range.

The big advantage of the GTX is that it has a scramble feature, and a more powerful GMRS output of 3 watts. Be sure to use it. Using the scramble limits your audience, and using low power 1/2 watt FRS and 'scramble', make it's really tough to for others to determine how close, or far away you are, and to

understand what is being said. They can ony understand the conversation if they have the same Midland GTX radio that have been on the market for years.

One way to extend the range of these ‘bubble pack’ radios in a neighborhood network, as part of a base station, is to mount an external antenna high up outside, and use a scanner, or a Baofeng as a receiver. Listen to the incoming traffic on the scanner or handheld, and talk to the other station with the Midland GTX handheld, or use the Baofeng or other brand handheld attached to the external antenna, to get the greatest range. There are also high gain GMRS antennas that can be used. This one is high gain and rugged. Mount at least 20 feet high to get the most range out of it.

This is a secure as it gets for this category of simple radios. Baofengs are not for everyone.It is best that the user learn how to use whatever radio they can master, even it is only an FRS radio. Any device is good to have only if it can be *used*. Keeping it simple is usually the right choice, and it must be ‘stupid simple’ for the least skilled member of the team. If you are ham, then there are other options for communicating at longer distances, but at home, the lowly FRS radio that can be used by all, is the best choice. The security team can use something more sophisticated. However, the Baofeng can be programmed to be simple to operate, and as a single channel radio that is almost foolproof, so don’t discount tehm as “too complicated.”

Distance Communications for a Family

A set up in complexity is getting a license for GMRS radio. For 80 bucks, and some paperwork will get you a license for not only the family, but also extended family that is good for many years. This means a programmed and high powered GMRS radio capable of transmitting 50 watts can be used to communicate to friends and family within a 25 mile radius, and even further if there is a GMRS repeater in the area. Most handhelds are not programmed for repeater use, but the Baofeng can be, but there are some programmed hand helds that can use GMRS repeaters.

The default, or commonly used tone for most GMRS repeaters is 141.3. The owner of the repeater can use any tone they care to, and so can you, if you’d like a semi-private network. Even if you do not need the complexity, and range that comes with using a repeater, these radios have the power to talk 25 miles, or more simply by selecting a channel 1 thru 8, and you are in business. Used as a base station, the powerful mobile GMRS radio on a good antenna can talk to the Midland GTX, or lower powered ‘bubble pack’ radio, at much greater distances that a GMRS to GMRS handheld can talk, at least three times the range. So one base, plus a box of cheep handheld GMRS radio, and you got both short, and medium range comms.

A coupel of examples:

BTECH Mobile GMRS-50X1 50 Watt GMRS Two-Way Radio, GMRS Repeater Capable, with Dual Band Scanning Receiver (136-174.99MHz (VHF) 400-520.99MHz (UHF))

GMRS Repeater-Capable Handheld.

CB SSB

Perhaps a better long/mid range way to communicate that is off the beaten path, and more obscure than either of the previous options is CB radio with single side band (SSB). These have the equivalent of 12

watts of power and transmit on modulation mode not available to standard 4 watt, 40-channel CBs that are common. At least they *were* common, but these days CB is mostly a trucker thing, and even they have moved on to other VHF options. There are tons of dusty CBs in boxes, but half of them have succumbed to the dust of the ages and no longer work as they did when stored, and they may not have a functioning antenna either. Good luck with that. In many areas of the country, CB is mostly forgotten, or in disuse. And fewer yet have CBs with SSB!

Standard CBs broadcast no more than 4 watts and in AM mode, or AM type of modulation. A regular CB, cannot talk to a CB using SSB. This has become quieter part of the spectrum that is affordable and license-free, and the most secure place for unlicensed users, especially if a horizontal polarized antenna used. I have been buying CBs at yard sales for years, and I still do not own one that has the SSB feature. SSB CB is not a common radio. Unfortunately I am unaware of a hand held option. However, use the antenna from a handheld CB on a small mobile CB with SSB, and use a day pack as a way to carry it. Or just use the SSB CB for a network, or for base (house) to mobiles (car), and a MURS or FRS/GMRS handheld for around the ranch. I would not use handheld CB unless out in the boonies, and these are typically big bulky bricks to carry around. And there short rubber ducky antennas are way too short to be decent radiators. However, there are fewer low power CBs in use than another license free option.

Here are some web resources for you:

A Beginners Guide To SSB CB Operation

Why You Should Invest Or Upgrade To A SSB CB Radio

Uniden mobile CB with SSB (single side band)

Baofengs, the most versatile

A Technician license from the FCC makes it legal to be a ham, but does not instantly make the person competent. It can be like processing a surfboard in the middle of the desert. The experienced Ham will understand that. Find an experienced General Class Amateur to help you. For instance, ask the guy who taught your “Ham cram” class. He is there to help. I often program radio for others, and am a ‘sucker’ for another radio in my box, and have spent hours programming cases and cases of Baofengs, Wouxons, mobiles etc, and there are more on the way. Provide the programming cable for your radio, and the software if it is not included in Chirp.

I’ll assume that you bought a few Baofeng UV-5Rs before the sales ban went into effect. For now, use MURS channel 1. Enter 151.820 into the VFO (variable frequency oscillator), by pressing the orange button thingy marked ‘VFO’, and you are good to go! Do not be afraid to turn the radio on, and monkey poke the buttons to see what it does. If the siren goes off, simply turn the radio off, and it will reset. No, the FCC will not come to looking for you.

Here is an example of a frequency list prepared for a prepper/survivalist radio network.

Tunnel Rabbit, “out”.