

Newcomers and Elmers Net: Takin' It To The Streets

By Robert Gulley AK3Q 5-24-15

There are two common ways to go mobile with a radio – in the car/truck/van/bike etc., or going mobile as a means of getting to an interesting spot at which to operate. I will focus on the latter—which can actually include operating in the car but at a great location!

One of the advantages to working portable is the ability to choose locations where noise is minimized, and this may allow use of less complicated radios.

- At the very least one is likely to hear more signals than is typical at home, and the signals will need very little in the way of filtering or digital signal processing.
- instead of boosting signal reception with pre-amps, the attenuate button may be more useful in really quiet locations

Going Mobile

- Going mobile means using your radio in a car, truck, bike, or even backpacking
- doesn't have to be elaborate; HT in the car or carried in your pocket is mobile
- For our purposes we will assume going mobile means hooking up a radio to an external antenna for better range
- HTs have limited range with the standard antenna, but when hooked up to a mobile antenna that is a ½ wavelength or better, these little radios can cover a lot of ground
- if you are in to bike riding or back packing, there are antennas designed to clip onto your bike frame or to a backpack – do a little research on the web and you'll find all kinds of information
- if using a handheld you may want to get a speaker mike which you can clip on close to you, like what police wear for convenience listening/talking
- for more power you can find used amplifiers which take 5 watts input power and put out 20-30 watts which can plug into a cigarette lighter socket

Opportunities

- Besides having a radio in the car (which can make trips a lot more enjoyable, especially when caught in traffic!), being mobile opens up a lot of opportunities
- go hilltopping! Find some good hills in your area and see what you can do! You are not limited to just using repeaters—you can also work FM simplex, and if you have an all-mode radio you can work SSB
- if backpacking or biking, stay in touch with friends or in range of repeaters for safety issues

- work satellites as a mobile station; find a good site from which to operate, especially away from buildings and electrical line noise
- also you may want to add APRS (Automatic Packet Reporting System) to your radio so as to allow folks to track your progress (or find you if something goes wrong)
- mobile capabilities allow you work more types of public service events
- going mobile also allows you to use your radio like a scanner if it has extended range RX for things like police, aircraft, marine, and other bands wherever you are; if the ham bands are quiet, there are other things to listen to

HF - Size and Power

Two of the biggest considerations for going portable with a radio are the size and the power requirements of a given radio.

- Assuming you want HF capability, power requirements vary greatly between QRP rigs and standard 100 watt rigs.
- Choosing between a low-power only rig and a standard rig is really just a matter of choice and convenience.
- Rigs designed for low power only are generally smaller and weigh less.
- However, with advances in technology even full-power rigs can be very small, and they have the ability to reduce power to QRP levels if desired/needed.

How you plans to use the radio may well be the determining factor for which radio to use.

- If using to use the radio while on a backpacking trip or on a mountain, size and weight will be the primary considerations.
- If planning day trips to parks or easily accessible locations, weight and power limitations will be less of an issue, and thus the equipment options can be greater.

If the portable location is somewhere with a picnic table and a bit of room, any radio will work fine, including base station radios.

- The only real issue becomes power options and how much power one is willing to bring along.
- I find a fully charged marine deep cycle battery works well for short trips at 100 watts, while at low power the battery will last a really long time using voice or CW. (Continuous modes such as FM will use a significantly larger amount of power, but will still last a long time for QRP work and short contacts.)

Since most radios come with the ability to reduce power easily, there is nothing wrong with using a base station radio in a portable location, as long as it is manageable in transportation.

-- While there are "portable" radios which emphasize light weight and small size, their main advantages are inconsequential if relocating the radio is relatively easy.

(As an aside, consider equipping all radios with quick connects/disconnects, along with any power supply connections, as this will make things quicker and easier for setup and takedown.

-- The faster one can load up the car and set up, the more likely you will use your radio on the road

Power

Some radios come with optional built-in power sources, such as the Yaesu 897D, 817ND, or the Elecraft KX3

-- The advantage to these radios of course is simplicity and ease of transport. They can also use external power sources, which is usually the best option for extending operating times or for increasing default power levels.

However a big advantage of having a radio with a built-in power option is that the batteries may be switched out easily

-- Furthermore, for the rigs which can run on replaceable AA batteries, they can be bought almost anywhere—that's a real benefit when traveling.

-- Another feature of these radios is the ability to have coverage from HF to 2 meters and beyond.

For less weight and complexity you could go with one of the numerous single-band radios available for QRP work, as well as many different amps designed to boost the power output if needed.

-- Both the radios and the amps come in commercial versions, but there are numerous plans available from clubs and Internet sites for DIY radio projects perfect for going portable.

As I mentioned previously, there is no reason why one cannot use a base radio with its typical 100 watts output, but these small radios using 5-10 watts may be the equal of 100 watts if conditions are right.

-- going portable means you can pick spots better for radio work than you might have at home, lower noise or higher altitudes could allow 5 watts to have the same reach as 100 watts at home

When trying to determine likely usage, try to be realistic. What are the likely portable scenarios in which the radio will be used?

-- If backpacking is the goal, weight will be the ultimate consideration, as portability means carrying radio, power supply, antenna(s), feedline and possibly a tuner, as well as supporting materials for erecting the antenna.

-- As mentioned previously, a QRP rig in the right conditions can perform as well as a 100 watt base unit when noise levels are reduced by 1-2 S-units (6-12dB).

-- That is not at all an insignificant drop in noise levels, and is easily obtainable by just getting into a quieter location.

Similarly there is a big difference in taking a day trip vs. weekend camping trips vs. week long vacations. The more remote the location the more supplies will be needed for an extended stay, and this further adds to the load considerations.

Daytime operation bands are different than nighttime operation, and doing both will require a multiband radio and antenna.

-- Fortunately on the antenna side of things a simple multi-band wire antenna and ladder line can cover most bands, assuming there are trees or other supports nearby.

-- This may also require adding a tuner to the equipment list if one is not built into the rig, but these are available in very small, lightweight models as well, especially for QRP rigs.

For my particular situation I can only do short outings which means I have to have a setup which can be deployed quickly and then taken down just as easily.

-- Since my van is always involved, a power source is never an issue, and neither is an antenna most of the time. I have two main antenna options: one is a push-up fiberglass pole with a simple wire dipole attached, or when staying in the truck a multiband magnetic mount antenna.

-- The latter represents a definite compromise in performance, but when I only have an hour or two it allows for almost immediate operation with minimal setup time.

My feeling is that features are less important on a rig for portable operations than on a base/home rig. The quieter location typically has better S/N ratios and less interference.

Another aspect of quiet portable operation is the many of the DSP features upon which we have come to rely are also not likely to be needed (unless one likes to go portable during contests!).

Many of the DSP options are designed to deal with electrical noise sources such as power lines, automobile alternator whine, and appliance noises.

-- Hopefully one's portable destinations will be free of these issues, or reasonably so.

-- Most DSP filters tend to degrade the received signal a bit, so it is likely without them the audio will be more intelligible as well.

Antennas

There are numerous portable antenna options, some very inexpensive, and other commercial options quite expensive.

-- One of the more intriguing options I have run across, beyond just the simple wire dipole antenna, are collapsible fiberglass fishing poles. They can be made to be quite compact and are lightweight, and two mounted horizontally on a PVC stand and very thin wire can make a decent 20- or 40-meter dipole, depending on the length of the poles.

-- Their main advantage is in the ability to collapse them down to a manageable travel size without being awkward to carry.

It would not be inconceivable to take 4-6 of these lightweight fishing poles to make a 2- or 3-element portable Yagi antenna for some serious 20m DX work.

Likewise PVC pipe can be joined in segments and broken down to be carried in a backpack fairly easily, but the weight is likely to be significantly more.

-- The plus side to PVC pipe is that it is more sturdy, and therefore more rigid, which might be useful for an antenna which will be in changing weather conditions.

Portable antennas should not be complicated

Realistically, few antennas will have any gain in a portable situation, particularly when working HF, despite manufacturer's claims to the contrary. Again this is fairly intuitive, as issues such as height above ground, practical antenna size limitations, and available ground plane issues will severely limit gain. Even if we could carry a 10 meter Yagi around on our backpack, the 6-8' height above ground would introduce losses which would minimize the positive effects of the antenna's directivity gain. We would be far more likely to have a Hamstick or at best an antenna with a capacitive hat on it for Pedestrian Mobile operation.

The reasoning is simple: a high gain antenna typically has a fairly low take-off angle which could easily be blocked by the surrounding hills or obstructions. A lower gain antenna typically has higher take-off angles, which while shortening to distance of the subsequent hops, will likely allow signals to go over the local obstructions. This assumes one is working stations along the path—if the final destination is the only operating point, antenna choices will be determined by that one location.

mobile antennas will have a loading coil to make up for short lengths on HF bands, but coil placement becomes an issue. A top-loaded coil offers the

most amount of radiation from the antenna, but this can result in a reduction of the capacitance to ground, which in turn requires a larger coil to make the antenna resonant. The top-loaded coil also puts more stress on the structure overall, and may not be suitable for cycling or pedestrian mobile.

Placing the coil at the base is structurally more sound, but this reduces the radiation efficiency significantly, which means a lot of the limited power available is being wasted. Placing the coil in the center offers a good compromise between inductance and capacitance, as well as maintaining reasonable radiation efficiency. It is also less prone to damage than the top-loaded coil (think tree branches!).

Wrap-up

Going portable gives one options both in terms of quieter locations and in terms of portable antennas.

-- The radio(s) used will depend more on the travel conditions and the usage desired, such as multiband work or QRP, and the differences between available options comes down more to price and need, rather than one brand of radio being superior to another.

Weight, accessibility, and power options will guide most of the equipment decisions, as will the length of stay.

-- The main thing is to try it at whatever level is comfortable, and if possible, try different equipment options before making any big purchase. Chances are good there are folks in the local clubs who have worked portable operations before, and they can be a good source of recommendations for all the little things which might not readily come to mind in terms of supplies, techniques, and even locations.

Finally, going portable might allow for experimenting with antenna options not possible in one's base location. I simply do not have the room in my yard for a full 20-meter Yagi, but a portable version is a great option for a nice day out on a hilltop!