Newcomers and Elmers Net: Roadworthy: Going Portable!
By Robert Gulley AK3Q 4-6-14

Radios used to be monstrosities in the olden days, literally becoming a centerpiece of furniture in the living room or family room.
-- Go back far enough and only one person could listen to a radio at a time, as all radios needed headphones. Speakers were a great improvement, to say the least!
-- It was not long before folks wanted to "go portable" with radios, and the trend has never abated (1923 first portable radio by guy who invented FM Radio, Edwin Armstrong)

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

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

There are a lot of people who have radios mounted in vehicles for portable operation, but here I am going to stick with discussing portable operation outside of the car at a chosen location.

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 example, the Yaesu 817ND is a QRP rig allowing a maximum output of 5 watts from 160m through 440 MHz (excluding 220 MHz).
-- It has multiple antenna connectors to go between HF and VHF/UHF modes.

The Elecraft KX3 is a similarly full-featured radio with 160-6 meters (2 m with KX3-2M module), SSB/CW/DATA/AM/FM modes and 10 watts output (with a matching amp available to up the output to 100 watts).
-- I am highlighting these two QRP rigs just to identify some of the features available in radios with a very small footprint—no pecuniary interests!!

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

Inexpensive Options
Not surprisingly there are some new QRP radios on the market from the Chinese which are significantly cheaper, and at least initially seem to have good specs
-- advancements being made in DSP and SDR technology have significantly lessened material costs for filters and other electronic components, and this in turn allows for lower manufacturing costs.

Some of these models include: HF-One MKII, KN-920, X1M, and the XIEGU 20W HF rig. For more information on these rigs, visit:
http://radioaficion.com/cms/tag/qrp/

Another interesting alternative, and a possible hint of much more to come in this area, is the TEN-TEC 506 Rebel for CW. They are billing this as an "open source" radio built around the Arduino programming environment.
-- It comes ready for 20m or 40m operation, but can be programmed by the user to handle other bands.
-- I would not be surprised if a number of "user-programmable" radios start appearing on the market over the next few years, as it seems a very logical progression of radio/computer technology.

Similarly a common approach to portable operation is single-band SSB radios such as those offered by MFJ and others—the potential advantages

here are the simplicity of operation, resonant antennas for the specific band, and no need for a tuner.
-- If working QRP batteries may also be self-contained, or small external battery packs may last all afternoon.

What is the Best Radio?
With all of the usual disclaimers I thought it might be useful to make several suggestions based on use and features, rather than on brand names.
-- From the commercial side of things I think almost any radio one gets will be of sufficient quality to be worthy for use.
-- That being said, dollar-for-dollar the all-mode radios which put out 100 watts down to QRP ranges allow for the broadest range of application.
-- I personally want SSB capability for 2m and 440, so an all-mode rig is a must. Even if you don't care about SSB capability for the higher bands, there are several rigs on the market which offer all mode for under $1000 (U.S.). -- QRP models are significantly less.
-- On the other end of the scale single-band radios can be built or bought very inexpensively

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 truck 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.

Weekend and Vacation Trips
If you plan portable operations over a weekend or during a week-long vacation, far more factors come into planning than simply which radio to take and which antenna to use.
-- If staying (and operating) from a house or fixed location with electricity available and easy access, the sky is the limit (so to speak!).
-- If the extended trip is still going to be in locations where there is no electricity and no real accommodations, then in addition to the things mentioned above, long-term power needs will have to be addressed, as will some additional issues for antenna supports and options.

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 PCV 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.

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!