

# The Hamfest Buddy, A QRPp Treat

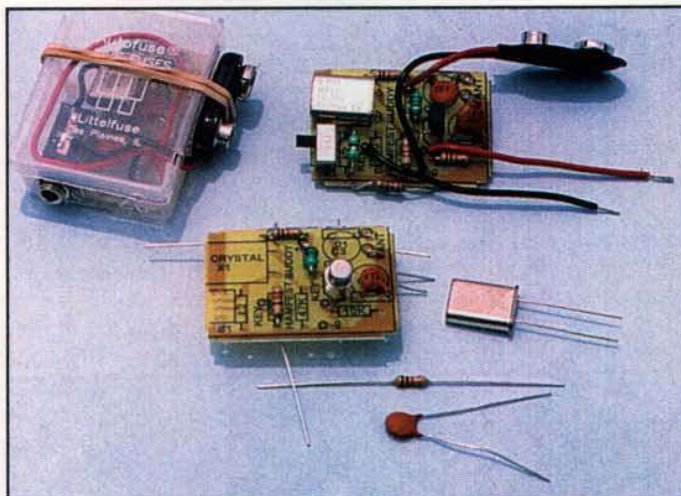
**A**lthough an unconfirmed rumor, we hear some readers have not been on the HF bands in several weeks—possibly one or two months (gasp!). We have the perfect suggestion to boost your interest at least 10 dB—go QRP! Yes indeed, friends and fans. Whether you are stifled by antenna restrictions or a limited budget, or if you have already worked the world with high power, QRP will open a new dimension in real radio enjoyment. Build one or two low-power projects along the way, too. Homebrewing simple circuits is half the fun of QRP.

Is QRP a pursuit for all seasons? You bet, and that point is being proven every day regardless of the sunspot count. While tuning 30 meters only a few nights ago, for example, we spotted US0ZZ calling CQ with no takers. I answered him while running only 4 watts with my little Elecraft KX-1, and he snapped back a heartwarming reply with an RST of 339. After the usual exchange, he also dropped to 4 watts and we enjoyed a solid two-way QRP QSO. Doing the same thing with 50 or 100 watts just would not have the same pizzazz. Yes, we are having fun with QRP, and yes, there's room for you, too. Check out the QRP action on 7040 or 14060 kHz one weekend soon. Now let's bring on the hot news of the month!

## The Hamfest Buddy

We have been promising to reveal a new quick-brew mini project for several months and the time has now arrived. Our new treat is called the Hamfest Buddy (photo A). It is a go-anywhere QRPp transmitter for fun or emergency use, and it also serves as a wireless BFO for monitoring favorite frequency activity with a portable AM-mode shortwave receiver. You can assemble the Buddy in an hour, it operates from an ordinary 9-volt battery, and it is also available as a low-cost kit.

I call it the Hamfest Buddy because it is perfect for putting you in the mainstream of QRP action at hamfests. How so? QRPers attending hamfests habitually gather in an out-of-the-way motel room after show hours to compare circuits and rigs or just to get on the air for fun. The best way to spot that activity is with a semi-wide-bandwidth receiver covering the ever-popular QRP frequency of 7040 kHz. The Hamfest Buddy fills that bill by acting as an adjustable BFO for the receiver, plus it lets you transmit back on the same frequency. In addition, the little transmitter can be used stand-alone style for emergency preparedness while traveling to or from hamfests. Power output is low (50 or 60 milliwatts typical) but quite adequate for general motel-area coverage with only a 2- or 3-



*Photo A—The Hamfest Buddy in various stages of assembly. The little gem fits in a 1.5" x 1.75" plastic fuse box or pill box. It functions as a go-anywhere two-frequency QRPp transmitter and wireless BFO for a mating receiver, and it is a perfect quick-brew project for newer amateurs. Kits are available from K4TWJ (see sidebar).*

foot wire as an antenna. Also, some good QRP records have been set using even less power and an outdoor antenna. Try it. Who knows? You might even outdo Tommy Rockford, K6ATX, when he used a grid-dip oscillator to expose the crook's hideout and call for help in the classic amateur radio novel *SOS at Midnight!*

What about a mating receiver for the Buddy? That's the good part. It works with small AM/FM/shortwave radios such as the little Grundig Mini 300 or Grundig FR200 shown in photo B. These famous-name radios are low-priced, remarkably sensitive, and well-calibrated (the Mini 300 even has a digital readout and clock-radio function for a



*Photo B—Portable AM/FM/shortwave radios such as the hot little Grundig Mini 300 and FR200 shown here are great traveling companions. They are handy for on-the-spot SWling, and when placed near a Hamfest Buddy they make a neat two-frequency mini-transceiver.*

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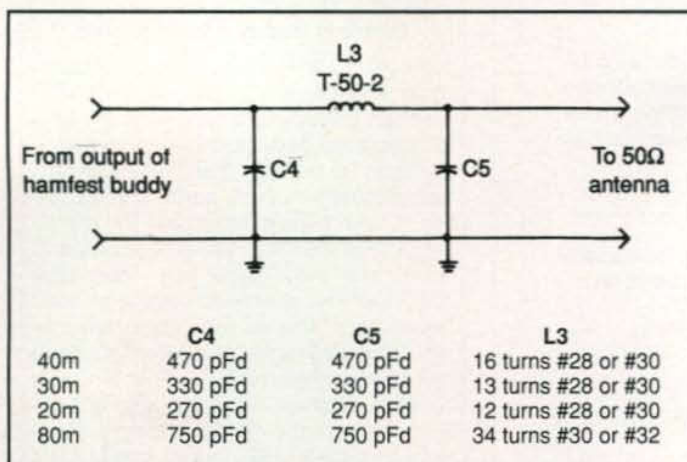


Fig. 2— Values of optional output filter components for various bands.

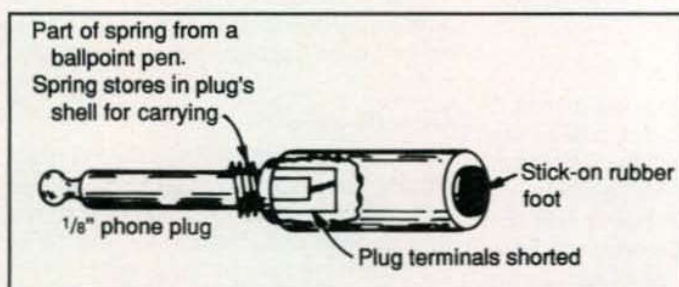


Fig. 3— Outline of a super-simple "plug key" for on-the-spot use with the Hamfest Buddy.

two resistors connected to the transistor's emitter. During key up or receive, the 10K-ohm resistor limits circuit current to approximately 0.8 ma and output to 10 or 20 microwatts. This is the ultra-weak (BFO) signal that radiates to a nearby receiver tuned to the Buddy's frequency. There it beats with incoming signals to copy CW tones. Switching VXO inductor L2 in/out of the circuit then shifts the receive range a couple of kilohertz for tuning.

Closing the key connects the 100-ohm resistor in parallel with the 10K-ohm resistor so circuit current rises to approximately 30 ma and output increases to 50 or 60 milliwatts. This change in current also produces an automatic 500- or 600-Hz frequency shift, which makes a good CW offset. Since the oscillator runs continuously, there are no noticeable key clicks or chirps like those found in many single-transistor circuits.

You now probably are asking if slightly more power can be squeezed out of the transmitter, and the answer is yes—with a caveat. A 2N2222 is capable of 250 to 400 milliwatts of output by increasing collector potential to 12 volts and reducing the (100 ohm) emitter resistor's value, but experiment carefully here. The transistor may overheat and die when emitter resistance is less than 60 or 70 ohms.

AGC action in low-cost shortwave radios (especially those without an RF gain control) usually leaves much to be desired, so the receiver may experience front-end overloading during transmit. A short jumper wire clipped between the radio's whip antenna and earphone socket's ground connection helps reduce such overloading. If you mate a communications-grade SSB/CW receiver with the Hamfest Buddy and do not need its wireless BFO function, incidentally, disconnect one end of the 10K-ohm emitter resistor (that way it will be readily available for future in-field use with an AM-only shortwave receiver).

Overall size and portability was a prime consideration when I designed the Hamfest Buddy, so I made its output/band-pass filter optional and placed it outside the box (a 1.5" x 1.75" AGC/ cartridge fuse box is perfect; a dental-floss case or pill box also works well). The filter is not mandatory when using a 2- or 3-foot clip lead for an antenna, but it should be included when used with an outdoor antenna such as a dipole or vertical. Values of filter components for various bands are included in fig. 2.

## Assembly Notes and Operation

While the Hamfest Buddy's low parts count and simple design make it an ideal first "build it" project for newer amateurs, a few helping Elmer notes always warrant mention.

Remember, when working with small parts, transistors, and PC boards, always use a low-wattage "pencil" iron and extra-thin solder (such as RadioShack .022 silver bearing solder) to avoid bridges between close-spaced connections. Using a hand magnifier also helps.

Note the 10-μHy RF choke between the positive battery connection and the transistor's collector. Do not confuse it with the 4.7-μHy VXO coil or frequency shift will be high and output will be low. Watch the transistor's base wiring, too. It is easy to transpose locations of the 10K-ohm and 4.7K-ohm resistors.

If the Buddy's wireless BFO signal is too strong (that is, if it overloads or "blocks" the receiver rather than mixing with incoming signals), move the Buddy back a foot or two from the receiver. If you are using an outdoor antenna with the Buddy, disconnect it during receive to lower the BFO level.

If your assembled Buddy doesn't seem to work, insert a milliamp meter in series with a battery lead. It should indicate approximately 0.8 ma key up and 30 to 35 ma key down. High current indicates a dead short. Low current indicates an open circuit (did you remember to include an RF choke between +V and the transistor's collector?). If current is within limits but you do not hear the Buddy's signal, tune ±10 kHz of the crystal frequency. The VXO coil or the receiver's calibration may have altered exact frequencies. If necessary, connect a 2- or 3-foot clip lead to your receiver's antenna socket and place it near the Buddy until you hear its signal. If you only hear the Buddy on key down, try a lower value emitter resistor in place of the 10K resistor. Maintain diligence and patience. Troubleshooting is a good learning experience.

The Buddy also makes a neat, fun item for club meetings and hamfests. Just sneak up behind a friend tuning a receiver and ask if he/she hears the rare DX calling him/her on 7040 kHz (or your particular Hamfest Buddy's frequency). Then make up a wild DX call and transmit to the nearby receiver with the Hamfest Buddy in your pocket (no antenna needed here). What a gag!

## Conclusion

We wrap up this month's column with a guaranteed-to-please topping for the Hamfest Buddy—a mating (and ridiculously simple) pocket key for emergency use (fig. 3). The key (and I use the term loosely!) is a monaural 1/8-inch phone plug with its terminals shorted and part of a spring cut from a ballpoint pen slipped over its end. You just half-insert the plug in the Buddy's socket and then press down on the plug to send CW. Adjust spring length for comfortable tensioning, and store the spring in the plug's back section for carrying. It's funky, but it works! Remember the Hamfest Buddy is a flea-power fun rig and enjoy!

73, Dave, K4TWJ