K9YA Telegraph

Robert F. Heytow Memorial Radio Club

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The PFR-3

On the Air with the Portable Field Radio

Philip Cala-Lazar, K9PL

The Portable Field Radio available from Doug Hendricks, KI6DS, and based on a Steve Weber, KD1JV, design is not only QRP Kits (www.qrpkits.com) latest offering, but may be its greatest. No barebones entry in the QRP gear sweepstakes, the CW-only PFR-3 covers 40-, 30- and 20-meters, from band edge to band edge (the receiver's fixed 300 Hz filter is too narrow to permit intelligible SSB reception); outputs a full "QRP gallon" of five watts; provides a digital frequency dial; built-in two-memory keyer with numerical words-per-minute display; provision to operate from an internal battery supply; offers BNC, balanced-line and end-fed antenna outputs; and boasts a balanced line tuner with LED SWR indicator that also works with coax-fed and random wire antennas. All these features in a rig that weighs 18 oz. (less batteries) and measures 7.2" wide X 4.2" deep and 2.5" high including knob height.

"No barebones entry…"

The high quality PCB arrives with a group of pre-installed surface mount devices. Wiring proceeds in four groups followed by smoke tests. This is a moderately complex kit, but builders with some kit building experience should incur no insurmountable hurdles. I suggest working with both a hard copy of the assembly manual and the PDF version on-screen, which enables you to enlarge the diagrams and photographs for improved clarity.

From gathering my tools and plugging in the soldering station to completion and testing the PFR-3's transmitter absorbed about 20 quite enjoyable hours. In the assembly manual some of the kit's 11 toroids look daunting, but once the actual winding begins everything pretty much falls into place. One caveat: carefully follow the assembly manual—components mount on both sides of the PCB—the manual provides ample warning of what component on which side. The completed PCB and battery holder (eight-AA) then drop into the handsomely finished and silk-screened yellow enclosure.

The one hang up in the process was the kit builder's bane, the missing component. In this case the AWOL item was C76, a 0.01 uf. mono capacitor, half a match head in size, but enough to bring progress to a halt. It took a while to get the capacitor as Doug was on vacation, but upon his return C76 promptly arrived.

Once the rig was up and running the PIC was removed and sent back to Steve Weber for a firmware revision (limited to the first 100 kits) to improve keyer performance. Awaiting the MEGA48's return I modified the balanced line tuner's toroid as suggested by Steve in a post to QRP-L that is now on file at the Yahoo! PFR-3 discussion group (and included in the most recent assembly manual). The modification requires removing turns from the primary, HI-Z and LOW-

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Pedal Radio

John Kirk, VK4TJ

Alf Traeger, VK5AX

QRP CW saves the day! Sounds dramatic, doesn't it? Perhaps the stuff of a juvenile fictional novel? Wrong! If you happened to be a resident of Australia's Outback in the 1920's to 1930's, this would, in fact, be your daily reality.

Picture yourself on a large cattle or sheep property, perhaps, say South Australia's Anna Creek Station, which is larger than Belgium. Your nearest neighbour might be an eight-hour drive away over a rough dirt track, IF you even owned a vehicle (many stations didn't then). You've just been bitten by a King Brown snake, one of Australia's most venomous snakes. Telephoning for help is out—the cost of running several hundred miles of copper line to service one customer made that option a non-starter. The antivenom you so desperately need (and soon!) is chilling in a fridge at the base hospital, some 500 miles distant. Primitive though the aircraft of the day were, medical evacuation by air is distinctly feasible, especially given that you have your own private airstrip, as virtually all cattle and sheep stations did. But HOW TO LET SOMEONE KNOW?

Your 32-volt lighting plant, if you were affluent enough to have one, would not be up to the task of running the primitive tube radios of the era. Expensive B batteries, if they could be obtained at all, were found to go flat rapidly in the humid gulf air.

This was the situation that the Reverend John Flynn, a Presbyterian minister assigned to the Outback, heard repeated over and over again on his visits to remote cattle and sheep stations. As well, he could see that the oppressive isolation of these remote properties was taking its toll on the psychological well-being of his parishioners. A true visionary, he speculated that the two emerging technologies of aviation and "wireless" might substantially improve the quality of life and life expectancy of his flock.

A man on a mission, back in Adelaide, South Australia, Flynn talked up his wild scheme to any and all that would listen, including local hams, the Wireless Institute of Australia, even local AM broadcasters. Despite design competitions, late night brainstorming sessions and even "informal" access to top secret military data, the conclusion was invariably the same: "This wireless stuff is just too new and too undeveloped to do what you want to do, even if the power supply problems can be overcome."

Enter young Alf Traeger, VK5AX. A recent electrical engineering graduate, at age 22, he certainly wouldn't have been Flynn's first choice as a partner in this mad endeavour. However, there was that private telephone system he had designed, constructed and maintained, all from farmyard parts, at the tender age of 12! His final year EE project was, in fact, a lightweight high-voltage generator set constructed solely from readily available materials. Hmm… a convergence of necessary technologies seemed to be occurring.

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With considerable help from two local hams, Alf cobbled together arguably the continent's first truly portable QRP station, consisting of a single-tube CW transmitter based on a B205 receiving triode, and a two-tube regenerative receiver. The antenna was a decent size—a full quarter-wave end-fed wire complete with a resonant counterpoise. Alf had heard that German field telephones in World War 1 were powered by a pedal-driven generator. He incorporated this concept of generating B+ in his prototype "baby transceiver." Reverse engineering his transceiver (though that term had not been invented); it would seem that it ran a massive watt-and-a-half output, provided the operator could maintain a vigorous pace on the pedals. With 200 volts coming from the generator, the tube was massively overloaded, but apparently survived this abuse cheerfully due to the low duty cycle.

Alf incorporated crystal control of the transmitter, something almost unheard of in that day, reasoning that asking an unskilled operator to maintain frequency control, pedal, and send in the unfamiliar language of Morse all at once might be asking a bit much! This combined with the relatively pure DC available from the pedal generator, ensured at least that all of that signal appeared within the receiver bandpass, no doubt a major contributing factor to his success. The receiver would have been woefully deaf, as the tubes of the day would have had a gain of only 10 or so. Alf incorporated AM broadcast band coverage as well as the assigned "mission" frequency of 2,220 kcs/s, as an incentive for station managers to divest themselves of their scarce cash income to purchase one of his sets.

Alf soon hit the road for proof of concept trials. He reckoned he could train a cowpoke in the tender art of "wireless," basic troubleshooting and Morse code instruction in about 10 days. Curiously, none of his clients ever learned to COPY Morse, as the mission base had plenty of access to commercial power, so was able to run about 50 watts of plate-modulated, crystal clear AM. Several findings came out of these early trials:

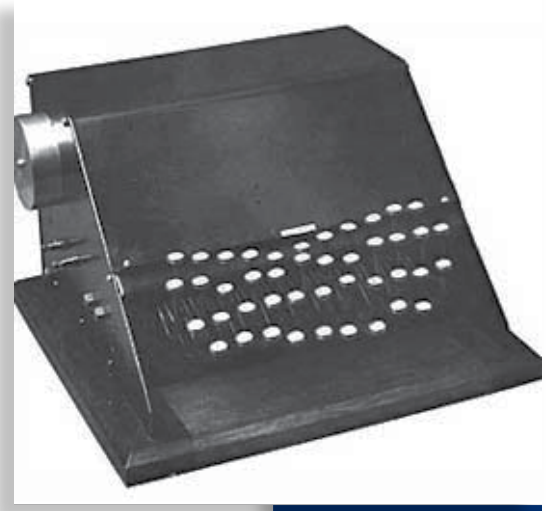
1) Despite the naysayers' predictions of failure, 1.5 watts was in fact enough power to maintain reliable communication. We could have told him that! (Remember that the era of kilowatt spark gap transmitters had only just ended.)

2) Even on the hairy edge of oscillation, the receiver had inadequate gain.

3) While 2.2 Mc/s was an excellent choice for nighttime propagation, it was hopeless during the day.

4) Termites LOVED those wooden cabinets.

Alf remedied these defects by securing an additional frequency of 8,630 kcs for daytime use, swapping out his low gain B205's for recently developed high-mu A109 units, and, of course, employing a metal chassis.



CW Keyboard

Some of the cowpokes must have flunked out of CW sending class rather spectacularly. Hey, with no sidetone, trying to send intelligible CW by watching an "aerial current" flashlight lamp flicker, I'd probably have been one of them! Alf almost immediately set out to design what may have been the world's first CW keyboard. A brilliant piece of work, it sent flawless 10-wpm CW, and even had a mechanical interlock to prevent two keys from being pressed simultaneously.

The days of QRP CW were numbered, however. With advancements in hollow-state technology, it became practical to directly modulate the transmitter with little more than a carbon microphone and a step-up transformer. Then "bush radio" really took off!

The "galah[1] session" which followed the all-important daily medical call-in, provided an important social link for isolated cattle and sheep station wives, as well as spawning the School of the Air and the Royal Flying Doctor Service, both hugely important elements of Aussie culture even today.

Alf was recognized for his achievements by being awarded an OBE in 1944, and is forever immortalised in the Australian lexicon by the phrase "I'll give yer a hoy[2] on the Traeger," now applied to any means of HF communications. ■

1 A native Australian bird of the parrot family with an undeserved reputation for noisy chatter.

2 Call.

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The Making of a Ham

Darron Sanchez, WA5TCZ

Philmore Crystal Set

The very first time I heard a shortwave radio it was 1948; I was nine years old, it was a new Hallicrafters Sky Buddy receiver and boy was it pretty. All black and shiny, with the orange-backed main tuning dial and S-meter. It was as pretty as anything I had ever seen. However, I was somewhat disappointed, I could look, listen, but not touch.

My second encounter with ham radio was a pile of old radio magazines given me by an uncle. There were a few copies of *QST* and *CQ* and several radio distributors' catalogs. I read them over and over wishing I could build or buy something from them.

I did manage to save enough money to buy a Philmore crystal set, and set about getting permission to erect an antenna on my father's house. Not knowing exactly what to do, I put up a wire about 50 feet long (the length of the roof) between two insulators, drove a ground rod, hooked all this to my crystal set and proceeded with great excitement to tweak the cat whisker across the galena crystal. The results were very good, and I was amazed you could hear radio signals without batteries, tubes and a whole bunch of wires.

"RETURN TO DEALER FOR SERVICE"

The real shock came one evening when I heard a man announcing some strange call letters. He said he was Al, W5OVV, in Baton Rouge, and that's where I lived. I knew I had to find where this was coming from. As luck would have it, Al lived only two blocks away, I found out because Al lived back-to-back to a good friend I played with.

Sitting there in Al's back yard was a neat little shack. While visiting my friend I looked through the window by cupping my hands to get a glimpse inside, and to my amazement I thought, this must be all the radio equipment in the world.

Then came the day when the lights were on and I could see someone inside. I timidly approached the door, and there he was—a ham in action. He was busy adjusting knobs and talking into a microphone, while I stood there bug-eyed with my mouth wide open looking at the racks of shiny equipment lining one side of the wall and a nice console where he sat talking.

He finally noticed me, introduced himself and invited me in. I was so taken in by it all I don't think he could make sense out of my babbled name. Here I sat in radio heaven. Not only did I see a real live ham in action, talking to another ham many miles away, but also had my name mentioned on the air as a visitor to his shack. If that was not enough, Al pointed the mic at me and at that moment it was as if someone had pointed a gun at me. I numbly remember Al telling me to say something and I believe I mumbled a few words. When Al took back the mic I thanked him and mumbled I would be back again. I don't remember walking home and to this day I don't know whom I talked to or what I said. I went to his shack many times after that and enjoyed watching him operate his radios.

Not long after this my aunt gave me an old radio with all the shortwave bands. The radio was like a pot of gold. I went to her house, picked it up and could not wait to return home to put it in my shack. My shack was a cubbyhole on the back porch. It held my father's garden tools and just about everything else you could fit in there. There was a small shelf to hold the new shortwave radio—the crystal set now pushed aside. I spent many enjoyable hours listening to all kinds of foreign broadcasts and, yes, there were the hams. As they talked about their rigs I listened and learned what ham radio was all about.

Well it was a short-lived hobby. After a month or so the old radio went on the blink. Here is a kid who knows nothing about the insides of that big box, especially when the back cover says: **CAUTION, DO NOT REMOVE BACK COVER, RETURN TO DEALER FOR SERVICE.** I just had to take the

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darn thing out of the cabinet. How was I supposed to know you weren't to poke around inside with a screwdriver with your hand on the metal parts? The first real electric shock zapped me. I threw down the screwdriver because I thought it was going to get me again. Fortunately, I did not get hurt and found out later from a friend it was only a bad tube.

At that time I knew very little about electronics. I still wanted to be a ham. I wanted my license so bad I would sit in my shack for hours a day, dreaming how it would be to call my first CQ.

As time passed I did learn a little about electronics and got my hands on a popular WWII carbon hand mic; had someone had offered me a million bucks for it, I would have said no. I finally got up the nerve to start poking around the insides of the old radio again. I found I could hook up my prized mic to the local oscillator and transmit to another radio a couple of feet away. I would sit and call CQ until I was blue in the face pretending I was talking to all kinds of exotic DX.

Once, while listening around the 75-meter band, I heard my friend talking to someone, by that time I knew what break meant. I picked up my mike and started shouting break. Sure that I was not getting out more than a few feet on the local oscillator, at that precise moment my friend said, "Go breaker." I thought he was talking to me and got scared. I knew from reading you had to have a license to transmit or the FCC (whoever they were) would do some very bad things to you like put you in jail and fine you large sums of money. With all these thoughts running through my head, I threw my prized mic on the floor, shut everything down and ran into the house sure the FCC would be there any second to lock me up. My mother asked why I was so pale, I said, "Oh! Nothing!" and went to sleep that night dreaming the FCC caught me. After a few days I figured I could start playing with the radio again as they were not coming.

Darron, WA5TCZ

My first real shortwave receiver was an old navy surplus National that weighed about 60 pounds. I saved every nickel and dime I could get my hands on and paid $35. That was a lot of money.

By this time the radio bug had bitten hard. My friend Al tried to help me with the code but I liked listening to my heroes on 75-meters and it was more fun listening to them than the racket CW made. I was getting older, about 13, as my interest switched from ham radio to girls. I eventually quit going to my friend's house and ham radio took a back seat until some 17 years later. ■

The Croatian Telegraphy Club (CTC) invites all telegraphy enthusiasts across the world to become members.

If your application (no form—just name and callsign) is by e-mail, membership is free and at the same time you become a member of the European CW Association (EUCWA).

Additional information is available at the CTC Web site:

www.hamradio.hr/ctc

ctc@hamradio.ctc

ARCI Recognizes K9PL

K9YA Telegraph editor, Philip Cala-Lazar, K9PL, received a "Certificate of Appreciation" from The Antique Radio Club of Illinois (www.antique-radios.org) for his "valuable contribution to the *ARCI News*." (See: *K9YA Telegraph*, March 2008, pg. 7)

The Moment You Knew...

Of course you remember the defining moment when you had to get your ham ticket. Your eyes opened wide and you couldn't soak it in fast enough. Tell us about it—your Elmer—your first contact—your first rig, etc.

Send us an e-mail at: telegraph@k9ya.org

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Ham Origins

These are Your Stories

Mark Danner, AB7MP

After years of SWL'ing and one futile attempt to get my ticket, I decided to get serious and started living and breathing W1AW's code practice sessions. As my code speed passed 5-wpm and was approaching 10-, I saw an announcement about a ham radio demonstration at a local library. That's where I met my elmer, Earl Smith, W1BML. After he wowed everyone with some blazing CW (I think it was about 40-wpm, but I really don't know for sure) I talked with him and setup a time to take my Novice test. My wife, Ruth, and I went to Earl's house and while Ruth got to know Earl's wife, Trudy, Earl and I went to the basement and he gave me my test. Being over prepared helped me through my "nerves of pasta" and I passed the test easily.

Then, of course, came the dreaded "waiting period" which gave me time to engineer my first dipole and purchase my first rig. It was a three-band rig, but didn't have any side tone! My ticket arrived just after Christmas in 1977 and Earl and I scheduled my first contact for New Year's Day.

As 1978 arrived and with great fear, I answered Earl's call and my first QSO was underway. Running CW without a side tone was a challenge as was the arcing that took place in the rig (I guess I had a little spark gap going on) Earl helped me through some adjustments and my ham career was born.

Ruth (now KK7CJ) and I have moved several times and lost contact with Earl. Recently, though, I learned that Earl's son had a Web site and I was able to contact his son via e-mail. He says that Earl and Trudy are still doing fine and Earl is still an active ham.

Often, I get that first QSL card out and enjoy the great memories of a super elmer and my first QSO. ■

Ward Silver, NØAX

Mine came in 1966, I believe, when browsing through the magazine racks of the Daniel Boone Branch of the St. Louis County Public Library in Ellisville, Mo. My mom would drop me off there while she went shopping or one of my siblings had a swimming lesson or something. I must have spent days there over the course of a summer.

Anyway, there was the May 1966 *QST* and I was 11 years old, a bit of a mad scientist and desperately wanted to be building or doing something science-y. From that point on, chemistry and physics began to wane and electronics and radio began to wax. It was five years before I found another teenage ham (WNØDYV, now KJ7PC) who would teach me the code and helped me figure out how to get my Novice ticket, but the first step was finding that first *QST*. ■

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All Hands on Deck

The Ship and Ham Radio—Great Equalizers

Rod Newkirk, VA3ZBB/W9BRD

Howard Street, on Chicago's northern border, is the de facto dividing line between city apartment dwellers and the north shore mansion people. In the 1930s almost every Chicago block had one or more hams making QRM. Amateurs farther north, though fewer in number, made their share of noise. On Howard, tucked between a bowling alley and a movie theatre, was a popular bistro with a nautical motif. Oars, nets and life preservers adorned its walls. Its cuisine, of course, was mainly seafood. But its bar was the thing,

Probably just another parking lot now, the place at that time had a special attraction for the area's hams. It was where Chicago amateurs and suburban OMs often assembled informally on Friday and Saturday nights before heading off on dates. Old money from the north mingled jovially with new money, or lack thereof, from the south. Beer was the beverage of choice while those below drinking age held their own with pop or juice. I was in the latter category and, as a relative newcomer, did a lot of listening.

Ham Radio's Digniaries

There you might encounter Jim, W9TO, of autokeyer fame. And there was young W9INN who had the enviable assignment of maintaining the Winnetka kilowatts of banking mogul W9SZW. Also DX'ers W9s FJB and GRV, who once tried a mammoth longwire between their estates, which worked fine unless they were on the same band. Oh, there was an insulator midway. The original prototype Elmer, W9NUF, was on hand to give you tips on firing up a newfangled Yagi. We even had an authentic Jeeves, W9ISG, a genuine gentleman's gentleman and head butler for a prominent Evanston family.

On a sunny Saturday my friend Phil, W9VES, and I would occasionally accept an invitation to visit an on-the-air north shore buddy. We would hop on our second-hand bicycles and head north on hilly Sheridan Road. Parking in front of a shiny palace, we would be grandly ushered to the young master's radio room by a maid or butler. The interior opulence dazzled us. But we were soon comfortably discussing the young master's new breadboard power amplifier built from *QST*. The young master dressed for his hobby in an immaculate white smock.

The young master might pump little Phil, our CW hotshot who could do 50-per, for hints on raising his code speed, Phil would advise "Practice, patience and more practice.

The Ship

Soon syllables pop out at you, followed by whole words." Easier said than done, I couldn't even type that fast. Eventually it was time to return to our real world of beans, hot dogs or anything else our hardworking parents could put on the table. "Those folks actually dress for dinner," Phil observed. "See you later at the Ship!" No Ship for me that night. I had already spent my limited weekly fun money on a new *Callbook*. ■

Ham History DICK SYLVAN, W9CBT

REMEMBER THE KNIGHT SPAN MASTER SOLD BY ALLIED RADIO?

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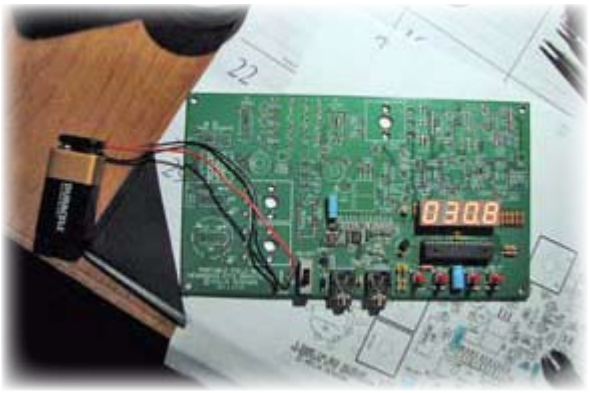
Z windings, and fully meshing the trimmers on the TUNE control, a polyvaricon. These modifications absorbed another 2.5 hours and wasn't quite the hassle anticipated.

The PFR-3 tunes with tactile switches, one switch for up frequency and one for down frequency—it works better and more accurately than I thought it would—and requires little acclimation. Another tactile switch controls RIT and, when held for a couple of seconds, direct frequency entry with a paddle. The fourth tactile switch controls the keyer menu (speed, iambic mode, tune mode and two memories) and provides keyer speed digital readout.



QSO number one was an unscheduled one with *K9YA Telegraph* staffer, Dick, W9CBT. On 40-meters I was looking for my first QSO with the new rig and, as luck would have it, Dick answered my call. The receiver proved quiet, sensitive and sufficiently selective to separate CW signals on a busy, nighttime 40-meter band. This contact was followed with a check-in to the weekly K9YA CW Net; Washington, D.C.; Pea Ridge, Arkansas; Louisville, Kentucky; and from the shores of Cache Lake located in Algonquin Provincial Park, Ontario. The op at Cache Lake was sitting in his tent and running two watts—a great QRP to QRP QSO.

Borne by less than auspicious propagation and a dipole antenna, I jumped into the North American QSO Party Saturday afternoon, on 20-meters and worked 11 states in 15 minutes: ME, NY, SC, MA, KS, AL, CT, PA, GA, FL and NC. Feeling lucky I bopped onto 40-meters for a minute and worked VA and WV. Pretty nice work and something like shooting fish in a barrel—with 5 watts.

When first built the rig drifted up and down from 50 to 100 Hz, evidenced on the digital display and audibly, no matter how long the warm-up period. After performing the BLT modification and reinstalling the updated PIC the drifting has disappeared. I can't explain it, but now using the rig for an hour or two the drift is no longer apparent.

The modified built-in tuner flattens the SWR on all three bands with my near-resonant 10-80 meter, coax-fed, fan dipole. I was unable to test my PFR-3 with a balanced line antenna, so I cannot comment on the BLT's strengths or weaknesses with that system.

Some observations: The construction manual would benefit from the clarification of a few building steps, additional detailed photographs, a circuit description section and a bit more proofreading.

If you decide to build the PFR-3 be sure to visit the QRP Kits Web site to download the latest version of the construction manual and errata. I started building the kit with revision 1A and completed it with revision B.1. (Revision B.2 issued September 22, 2008.)

Find the very useful, friendly and supportive PFR-3 Yahoo! Group at:
http://groups.yahoo.com/group/pfr3_group/

For additional *K9YA Telegraph* QRP kit reviews see: "A Pipsqueak for All Seasons," June 2007 and "A Bigger Squeak," June 2008.

The PFR-3 Paddle Kit

QRP Kits offers the optional PFR-3 paddle which, along with the rig's built-in tuner, keyer and battery pack, offers the portable operator a complete compact package—you add the lightweight antenna of your choice.

The paddle's professionally machined bracket and paddle support and stainless steel paddle leaves terminated in vinyl caps offer a convenient alternative to tethered paddles, bugs or straight keys. The paddle is mounted to the PFR-3 with two black plastic capped thumbscrews and an integral stereo plug.

The paddle does not offer a gap adjustment and relies on the paddle leaves' inherent resilience rather than springs or magnets to provide recoil. A binding head screw does for the center contact.

How does it work? In my experience, admirably to about 25-wpm, above that speed the paddle leaves are too springy and the non-adjustable gap too great to provide the immediate response and recoil needed for high-speed work.

On balance, the PFR-3 and paddle combination present an attractive standalone package for the QRP'er on the go. ■

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