



John Dilks, K2TQN, k2tqn@arri.org

The Heathkit HW-30 “Twoer”

Harold Kramer, WJ1B, fondly remembers the “Benton Harbor Lunchbox.”

If you were a Novice in the 1960s, the Heathkit “Twoer,” model HW-30, might be familiar. It was a 5 W, 2 meter AM transceiver — ideal for the days when Novice amateurs were permitted to operate AM phone from 145 to 147 MHz. Back then a bare-bones Twoer offered an easy way to get on the air. It cost \$44.95 (\$350 in today’s dollars) and included a 45 page manual and a ceramic microphone. It was a kit, however I did not build mine. I purchased my Twoer from one of my Elmers. I mowed a lot of lawns to earn the \$35 that it cost!

Along with the Twoer, Heathkit sold other transceivers with similar features including the “Sixer” for 6 meters and the “Tener” for 10 meters. The first ads for these radios appeared in December 1960 issue of *QST*. Heathkit sold thousands of these radios through the end of the decade.

I put my Twoer on the air in the late 1960s. At that time many of my teenage ham radio friends were active on 2 meters, but FM had yet to catch on. Using 2 meter AM I could work local hams, participate in local Civil Defense activities; (CD was the predecessor to Homeland Security) and join The Connecticut Mobileers, an early Emergency Communications group. With some luck and a decent antenna, you could work stations a few hundred miles away when the band opened.

The Twoer was nicknamed the “Benton Harbor Lunchbox” because Heath Company was located in Benton Harbor, Michigan and it actually looked like a lunchbox with its metallic beige case, boxy shape and its handle on the top (see Figure 1). There was even a handy slot on the side of the case to hold a copy of your license. The front panel had only three controls: **On/Off/Volume**; **Tuning**; and **Transmit/Receive** — with both PTT and lock positions on transmit. It



Figure 1 — WJ1B’s Heathkit “Twoer.” It is still in reasonably good shape after almost half a century.

weighed only 6½ pounds and was factory configured for 110 V operation, although it could also run on 6 or 12 V dc with Heath’s GP-11 external power supply.

Inside the Twoer’s Design

The Twoer had only five tubes (see Figure 2). It used a super regenerative receiver, a circuit popular in the 1920s and early 1930s. The receiver itself used half of a 6BS8 triode and was plenty sensitive, particularly since the other half of the 6BS8 was an RF preamp. Heath claimed the sensitivity was “as low as one microvolt at the antenna terminals.” Receive sensitivity was set with a “Regeneration” pot on the back of the transceiver.

Selectivity was not the receiver’s strong point and separating signals was a problem. This did, however, make it easy to listen for other stations since you could set the tuning knob midway between 144 and 146 MHz and hear just about any signal on that portion of the band.

A downside of the design was that the superregen receiver produced a lot of RF noise that got into the other receivers in my shack. I installed a switch on the back of my Twoer to disable its receiver when it was not in use.

The transmitter was crystal controlled. Most stations operated between 145.2 and 145.7 MHz and that required 8 MHz crystals. The standard FT-243 crystal socket was inconveniently located inside the

case, so you had to remove the case to change crystals. I relocated the crystal socket to the rear of the case where it could be reached easily. This was a very common modification among Twoer owners.

The transmitter used a Pierce oscillator and two 6BA8 tubes that tripled the 8 MHz

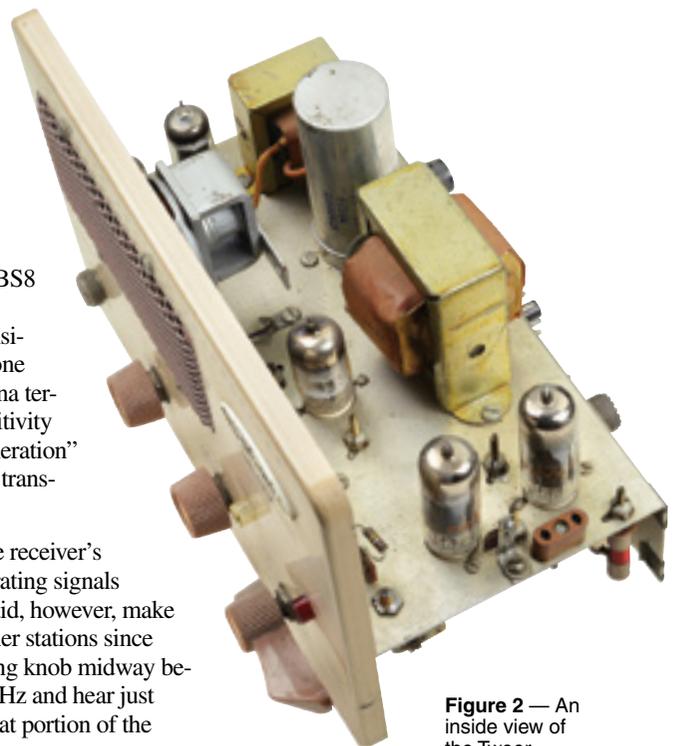


Figure 2 — An inside view of the Twoer.

Model HW-29A
\$44.95

lowest cost transceivers on the air

- Operate from low-frequency crystals for greater stability
- Push-to-talk Transmit/Receive switch
- Variable receiver tuning
- Built-in AC power supply—easy conversion to mobile operation, using accessory vibrator power supply

2, 6 & 10 METER TRANSCEIVER KITS (HW-30, 29A, 10)

These three outstanding transceiver models bring you top performance at the lowest prices offered in complete amateur facilities. Each model has a crystal controlled transmitter and tunable, superregenerative receiver with RF preamplifier. Receivers pull in signals as low as 1 mV and the 5 watt transmitters are ideal for emergency work or "local" net operation. Features include push-to-talk transmit/receive switch, metering jack, ceramic element microphone, and two power cables. Less crystal, 10 lbs. each.

Model HW-10 (10 meter) ... \$4 dn., \$5 mo.....	\$39.95
Model HW-29A (6 meter) ... \$4.50 dn., \$5 mo.....	\$44.95
Model HW-30 (2 meter) ... \$4.50 dn., \$5 mo.....	\$44.95

Attn. HW-29 owners: Convert your "Sixer" to the new improved "A" model with this easy-to-install conversion kit. Allows use of 8 mc crystal for maximum stability.
Model HWM-29-11 b **\$4.95**

A Heathkit Twoer advertisement from the December 1960 issue of *QST*.

crystal frequency to 24 MHz, then tripled it again to 72 MHz and finally doubled it to 144 MHz where it went "straight through" the final amplifier, a 6AQ5 power pentode that ran "approximately 5 watts," according to the manual. The 6AQ5 also served as the audio power amplifier for the receiver. The Twoer used plate modulated AM with good quality audio. It could also run CW, more or less, but the manual cautioned that there would be "considerable back wave that may result due to the fact that the previous transmitter states are running constantly." I tried CW a couple of times and the other stations could hear the transmitter even when it was not keyed!

The internal power supply used a power transformer, solid state rectifiers and a full wave voltage doubler circuit to provide 260 V at 90 mA when transmitting. My Twoer has a homebrew 12 V power supply attached to the rear of the cabinet. You can see it protruding behind the handle in Figure 1.

Tuning and Operating

Like most Twoer owners, I changed the original phono plug antenna jack to an SO-239 because it made a more secure connection. To tune the final, you placed a #47 lamp dummy load in the antenna jack and adjusted the tuning capacitor for maximum brightness.

Unfortunately, the tuning capacitor was inside the case so you had to poke a screwdriver through a hole in the side of the case to get to it. In accordance with a suggestion found in a 1965 *QST* "Hints and Kinks" column, I put some heat shrink tubing over the screwdriver's metal blade since I found from

personal experience that sparks would result if I accidentally touched the screwdriver to the metal case while tuning up! There was also a power output metering circuit jack that, when used with an external meter, was used to tune the final tank circuit for maximum power and to measure cathode current. The metering jack was also put to work for CW keying.

Good Times

I made hundreds of contacts with my Twoer. My first antenna was a 19-inch (¼ wavelength at 2 meters) coat hanger bent 90 degrees at the bottom with a banana plug that was pushed into the SO-239. I was able to work stations easily in the city where I lived, although it helped that my parents lived on the top of a hill.

My next antenna was a 2 meter halo, essentially a half wave dipole bent in a circle. I mounted this antenna on a pole outside the house and was able to extend my range to 15 miles or so. Eventually, I installed a roof tower and a Cushcraft beam with a Channel Master TV rotator. It was no big deal in those days to have a tower on your roof since outdoor TV antennas were very common. With all of 5 W, I could consistently work stations 30 miles from home. During band openings, I managed to work five or six states from my Connecticut location, including a station in Maryland, which was my farthest 2 meter DX.

It was not that easy to work VHF DX since most everyone was rockbound and the procedure for calling CQ and tuning for a reply was quite different. When calling CQ, you also defined your tuning range. For example, "WJ1B calling CQ and tuning from 145.20

to 145.40 for a call." You used this method so you would not miss stations calling you on different frequencies.

My most memorable experience with the Twoer was when the local Emergency Communications authorities asked me to bring the Twoer to the Waterbury, Connecticut Armory during the Great Northeast Blackout of 1965. As a teen, it was quite a thrill to operate my Twoer on generator power, and pass messages to hams at other support facilities in adjacent towns.

The Heathkit Twoer and I have a long history together. It still occupies a proud place in my shack and reminds me that my early experiences with this little rig gave me my start in the communications industry where I have spent my entire career. I am sure that many of us have similar stories.

Harold Kramer, WJ1B, is the ARRL Chief Operating Officer. You can contact him at hkramer@arri.org.

New Products

Solderless BNC Connectors for Times Microwave LMR-400 Cable

Times Microwave Systems now offers two new BNC connectors for LMR-400 coaxial cable. The EZ-400-BM is a BNC male straight connector, and the EZ-400-BM-RA is a BNC male right angle connector. The new crimp-style connectors do not require soldering of the center conductor into the contact. These connectors are compatible with the Times Microwave CST-400 cable prep tool and either the CT-400/300 or HX-4 (with Y1719 dies) crimp tools. Price: EZ-400-BM (part no. 3190-2611), \$21; EZ-400-BM-RA (part no. 3190-2612), \$33. For more information, visit your favorite dealer or www.timesmicrowave.com.

Membership Just Got Even Better!

QST \$19.95

Antennas

Check out the QST Digital Edition www.arri.org/qst