Product Reviews

May 2015

Product Reviews:

Alinco DX-10 10 Meter Transceiver


West Mountain Radio DC-to-Go Battery Box with RIGrunner4008 and

Super PWRgate PG40S

Spiderbeam Aluminum Telescopic Mast

Phonema KSP3 Ham Speaker
Alinco DX-10 10 Meter Transceiver
An inexpensive single-band transceiver for mobile, portable, or home station use.

Reviewed by Bob Allison, WB1GCM
ARRL Senior Test Engineer
wb1gcm@arrl.org

A couple of solar cycles ago, my wife, Kathy, KA1RWY, and I each had a 10 meter mobile transceiver in our car. With a base loaded, magnetic mount antenna, our 25 W PEP radios could reach our home station up to 30 miles away. When the band opened, Kathy always attracted DX with her melodious voice and managed to talk to more than 60 countries from her Oldsmobile station wagon. I was grateful to have 10 meters aboard my rickety Mercury Comet.

Many newly licensed Technicians have told me they were attracted to the lure of DX and local communications on 10 meters, but were afraid to invest in an expensive multiband HF transceiver. I’ve also overheard a few amateurs express their desire for a simple 10 meter mobile radio that comes with a warranty. Alinco’s DX-10 can meet the needs of both groups.

But it’s…
Yes, I know the DX-10 looks like a CB transceiver. It has some of the features you would find on a CB radio, such as an echo chamber and roger beep (that are best left turned off), public address feature, and two-digit CHANNEL display. In other parts of the world, identical-looking transceivers with various brand names and model numbers are marketed as Citizen’s Band transceivers.

Regardless of its looks, make no mistake: The Alinco DX-10 is a 10 meter-only multimode transceiver from an established Amateur Radio manufacturer and available through established Amateur Radio dealers. It is one of the few options for an amateur wishing to use 10 meters without the cost of a multiband HF transceiver. I opted to focus on function, not looks.

Overview
The DX-10 covers the entire 10 meter band and operates on USB, LSB, CW, AM, and FM. RF power output is 25 W for SSB and 12 W for CW, AM, and FM. There is no subaudible tone function or split transmit/receive feature for FM repeater operation.

The radio has power supply polarity and SWR protection. Current consumption is 6.5 A maximum, requiring a modest dc supply. Included accessories are the Alinco EMS-70 hand microphone, microphone clip, mobile mounting bracket, and mounting hardware.

The DX-10 uses an unusual frequency tuning arrangement. The radio has six memory banks that are preprogrammed at the factory, with each bank covering a span of 300 kHz using 60 memory channels. The banks are selected by the A B C D E F switch on the left side. Channels are spaced 5 kHz apart. For example, memory bank A covers 28.0 to 28.3 MHz, with CHANNEL 01 equaling 28.000 MHz and CHANNEL 60 equaling 28.295 MHz. A separate CLARIFIER knob adjusts the fine tuning of the frequency of each channel ±10 kHz in steps of 10 Hz, 100 Hz, 1 kHz, or 10 kHz. This tuning arrangement is much different than continuous tuning accomplished with a single knob, as found on virtually all other conventional amateur transceivers.

A Closer Look
Front panel pushbutton functions are: FUNC (function), RB/BP (roger beep/beep), NB/ANL/LOCK (noise blanker/lock), D/W/LCD OFF (dual watch; select another frequency to be monitored and the receiver switches between the two/display off), SCAN/SC LIST (scan/scan list), +10 kHz/Hi-CUT (bumps the receiver up 10 kHz/high cut audio filter to reduce hiss), COL/TOT (display color/time-out timer), EMG/S/RF (switch to user-selected emergency channel/meter function). From left to right, the knob controls are memory banks A – F, mode, VOL/SO (volume/squelch), ECHO/TONE, RF GAIN/RF PWR, CLARIFIER, and CHANNEL.

In addition to the front panel controls, the DX-10 has a menu for 16 parameters such as microphone gain and sidetone level. Enter the menu setup by pressing and holding the FUNC button for 2 seconds. Then press FUNC repeatedly to select the desired parameter. The user has 5 seconds to rotate the CHANNEL knob to adjust the parameter. The display reverts to the tuned frequency in 5 seconds after a change is made.

The ½-inch-high digits on the LCD are easy to read. The meter in the lower right corner of the display can switch between S meter/RF power output and dc input voltage. Momentarily pressing the COLOR button selects one of seven backlight colors. I incidentally found that by double-clicking the COLOR button when the display is pea green, the backlight color will automatically

Bottom Line
The Alinco DX-10 is a multimode mobile transceiver that provides access for new radio amateurs to the 10 meter band. It is also useful for the seasoned operator looking for a simple, inexpensive mobile transceiver.
change every second. Pressing COLOR once more stops this light show.

The rear panel heat fins protrude 1.5 inches from the chassis. Connections include an SO-239 antenna jack, ¼-inch jacks for external speaker and CW (straight) key, and dc power. There is also a mini USB data jack for PC programming with an optional cable, though no programming software was available from Alinco at the time of publication. A 2-inch speaker is located behind the bottom panel of the chassis.

**Lab Testing**

ARRL Lab testing (Table 1) revealed some good results and some not so good. Let’s start with the good. Overall receiver sensitivity is very good. The two-tone third-order IMD dynamic range is only 73 dB at 20 kHz spacing. That’s not as good as recent multiband transceivers I’ve tested, but is adequate for use with a mobile antenna or modest home station antenna. The DX-10 also has very good image and IF rejection. I was pleased to see the wide range of squelch sensitivity, 1 µV to nearly 7.6 mV. Adjusting the receiver to make it less sensitive is handy in high-noise environments to minimize false squelch openings from noise sources.

The most troublesome finding is the keying waveform and timing. Figure 1 shows a lengthy 120 ms delay from the time the key is pressed to the time RF comes out the antenna jack. Unfortunately, this delay also applies to the CW sidetone heard from the speaker. Press the key and it’s a 120 ms pause until you hear what you just sent in the sidetone. With such a delay, sending CW is confusing and maddening for the user unless you turn off the transceiver’s sidetone and use an external sidetone.

Figure 2 shows rather wide keying sidebands at 60 WPM, which will interfere with nearby stations if signals are loud enough. Figure 3 shows that close to the carrier the DX-10’s transmitted phase noise is higher than most other transmitters I’ve tested.

I found that receiver audio output reached the 10% THD threshold at 2.3 W. The volume can be increased further, but only with increased audio output distortion. At a comfortable listening volume (1 V RMS), audio distortion is 7%. This level of distortion may cause operator fatigue in a quiet room, but will not be very noticeable while riding in an automobile.

---

**Table 1**  
**Alinco DX-10, serial number A000592**

<table>
<thead>
<tr>
<th>Manufacturer’s Specifications</th>
<th>Measured in the ARRL Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency coverage: 28 – 29.7 MHz.</td>
<td>Receive and transmit, as specified.</td>
</tr>
<tr>
<td>Power requirement: Receive, 13.8 V dc ±15% transmit, 6 A max; receive, 750 mA max, 350 mA squelched.</td>
<td>At 13.8 V dc: Transmit, SSB, 6.5 A (max), 1.1 A (min); CW, 5.0 A (max), 2.6 A (min); AM and FM, 5.0 A (max), 2.5 A (min). Receive, 560 mA (no signal, max volume).</td>
</tr>
<tr>
<td>Modes of operation: LSB, USB, CW, AM, FM.</td>
<td>As specified.</td>
</tr>
</tbody>
</table>

**Receiver**

| CW sensitivity: 0.25 µV. | Noise floor (MDS), CW mode, 2.4 kHz filter: 135 dBm. |
| AM sensitivity: 0.25 µV. | 10 dB (S+N)/N, 1 kHz, 30% modulation, 6 kHz filter: 0.6 µV. |
| FM sensitivity: 0.50 µV. | For 12 dB SINAD, 15 kHz BW: 0.2 µV. |

**ARRL Lab Two-Tone IMD Testing (2.4 kHz bandwidth)**

<table>
<thead>
<tr>
<th>Band</th>
<th>Spacing</th>
<th>Measured IMD Level</th>
<th>Measured Input Level</th>
<th>Measured IMD DR</th>
<th>Calculated IP3</th>
</tr>
</thead>
<tbody>
<tr>
<td>28 MHz</td>
<td>20 kHz</td>
<td>‒135 dBm</td>
<td>‒62 dBm</td>
<td>73 dB</td>
<td>+25 dBm</td>
</tr>
<tr>
<td>28 MHz</td>
<td>20 kHz</td>
<td>‒97 dBm</td>
<td>‒39 dBm</td>
<td>+10 dBm</td>
<td></td>
</tr>
<tr>
<td>Second-order intercept point: Not specified.</td>
<td>28 MHz, +41 dBm.†</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FM adjacent channel selectivity: Not specified.</td>
<td>82 dB.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FM two-tone, third order IMD dynamic range:</td>
<td>67 dB.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S meter sensitivity: Not specified.</td>
<td>For S9 signal, 4.78 µV.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Squelch sensitivity: Not specified.</td>
<td>1 µV (min), 7.58 mV (max).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| IF/audio response: Not specified. | Range at –6 dB points (bandwidth):
| | CW: 294-2840 Hz (2546 Hz) |
| | USB, 309-3998 Hz (3689 Hz) |
| | LSB, 328-3980 Hz (3659 Hz) |
| | AM, 210-3571 Hz (6722 Hz) |
| Receiver audio output: 3 W. | 2.3 W @ 10% THD. THD @ 1 V RMS, 7%. |
| IF and image rejection: Not specified. | IF rejection, 98 dB; image rejection, 111 dB.* |

**Transmitter**

| Power output: AM, FM, CW, 1 to 12 W (adjustable); SSB, 0 to 25 W (adjustable). | AM, FM, CW, 1.6 – 11.4 W; SSB, 0 – 27 W PEP. Power output was identical at 11.7 V dc. |
| Spurious-signal and harmonic suppression: Not specified. | 64 dB. Complies with FCC emission standards. |
| SSB carrier suppression: Not specified. | USB, 53 dB; LSB, 59 dB. |
| Undesired sideband suppression: 80 dB. | USB, 47 dB; LSB, 48 dB. |
| Third-order intermodulation distortion (IMD): Not specified. | 3rd/5th/7th/9th order: ‒25/‐38/‐50/‐55 dBc. |
| Transmit-receive turn-around time (PTT release to 50% audio output): Not specified. | S9 signal, 123 ms. |
| Receive-transmit turn-around time (tx delay): Not specified. | 117 ms. |
| Size (height, width, depth): 2.0 × 6.7 × 9.3 inches including protrusions; weight, 3.1 lb. | Price: $280. |

*Second-order intercept point was determined using S5 reference.  
*Measurement was noise limited at the value indicated.
had fun, but came to the conclusion that the tric controls, with a pinch roller effect. I still would get stuck between two of the concentric knobs was sometimes a problem for ing the multiple tuning controls. Spacing be

After a while, I grew a little weary from turn

the echo chamber and was quickly chided in calling a DX station, I accidently turned on I heard. At one point, in the excitement of output was enough to contact every station ground plane antenna. The DX-10's 25 W SSB as I tuned the band using my elevated

Contest. Band conditions were good and on Sunday morning of the ARRL 10 Meter I had an opportunity to try the transceiver

On the Air with the DX-10

I had an opportunity to try the transceiver on Sunday morning of the ARRL 10 Meter Contest. Band conditions were good and there were plenty of stations to contact on SSB as I tuned the band using my elevated ground plane antenna. The DX-10’s 25 W output was enough to contact every station I heard. At one point, in the excitement of calling a DX station, I accidently turned on the echo chamber and was quickly chided in a language I didn’t understand.

After a while, I grew a little weary from turning the multiple tuning controls. Spacing between knobs was sometimes a problem for my large fingers. At times, my index finger would get stuck between two of the concentric controls, with a pinch roller effect. I still had fun, but came to the conclusion that the DX-10 is not suited for quickly tuning the band during a contest.

On a more casual day, I had a pleasurable time exchanging 10-10 numbers with stations via short skip. Transmitted audio reports were mostly “sounds OK” or “sounds good.” I tried AM and FM sim-

plex operation with positive results.

The DX-10’s SWR protection worked when I accidently transmitted into the wrong antenna. The radio stopped transmitting, beeped and displayed 5 Hi, warning of high SWR. I couldn’t get the built in SWR meter to work. The manual indicates the band control must be set to D and channel 20 selected to activate the SWR meter, but I had no luck.

Going Mobile

Kathy agreed to let me try the DX-10 in her Ford Fusion. An opening in front of the stick shift that is normally used for storage happened to be a perfect place for it (see Figure 4). A 12 V dc accessory outlet provided power to the DX-10, since the 5-foot-long dc power cord provided could not reach the car’s battery. I wouldn’t recommend using the accessory socket on a permanent basis, but with this particular automobile, it worked, aside from some slight ignition noise crackle. The noise blanker reduced this noise significantly when engaged.

As a mobile transceiver, the DX-10 has more than enough volume from the speaker. The frequency display is at times difficult to read. All display options are rich in color, but low in brightness. Yellow, as an option, would have been helpful. While driving, I found random tuning around the band difficult with the multiple frequency controls. I found it best to leave the fine tuning step set to 100 Hz. For trips around town, I left the frequency knobs alone and talked to Kathy.

Overall, my experience with the DX-10 was favorable and brought memories of the usefulness of 10 meters in a car.


Reviewed by Rick Palm, K1CE
QST Contributing Editor
k1ce@arrl.net

You’ve got to love a product that does not come with, nor needs, an instruction manual. The Aspect Solar EnergyBar 250, a battery pack and inverter that is rechargeable via several options, is such a product. It’s that simple to use.

The EnergyBar 250, which features a 20 Ah (amp-hour) Lithium Iron Phosphate (LiFePO4) battery, is a lightweight (8 pounds), well-constructed, easy-to-use 12 V power source. Amateurs might use it for applications ranging from running mobile VHF FM radios or low power HF rigs, to powering drop-in handheld radio chargers, to charging smartphones and tablets or running a laptop computer. It’s a good, portable power source for emergency/disaster response, operating stations at remote aid/checkpoints on bike-a-thon courses, DXpeditions, VHF/UHF stations at remote aid/checkpoints on bike-mountain-topping, you name it.

Overview
The battery is rated to have a long lifespan (10 years or longer and 1000 charge cycles; longer life and more charge cycles than typical lead-acid batteries). The battery contains only 24 grams of lithium, making it suitable for carry-on air travel. It’s only 2 inches thick, with a control housing that is also thin. The housing front panel has multiple sockets for different plugs for different devices and power requirements.

The EnergyBar 250 is rechargeable by a supplied wall cube charger, an optional automobile accessory socket charger, and lastly and most importantly, by the optional companion EP-55 solar panels. (Since we purchased the review units, the EP-55 has been replaced by the EP-60 solar panels; more on this later.)

The solar panels can be daisy-chained for more power, which would help for times of limited sunlight. I found that wall and automobile accessory socket chargers brought the battery to full charge a bit more quickly than the solar panels. On the other hand, when there is no power available from commercial mains, power generators or car batteries in a disaster area or portable operating location, solar panel power is your only option. It’s a perfectly viable (and green-compatible!), albeit slower, power/charging source.

What It Can Power
The manufacturer claims 20 Ah (256 Wh) for the Lithium Iron Phosphate battery, and thus it can power a 10 W load of mobile devices, chargers, small fans, or GPS units for 25 hours, or 12.5 hours for a 20 W load. Laptops or large fans that require 60 to 70 W can be powered for 3.5 to 4.5 hours, and so on. Maximum output is 100 W.

The unit can power mobile VHF and HF radios for long periods of time as power requirements on receive are nominal. Transmitting, of course, requires much more power, but transmissions are usually kept to a minimum during service in a disaster/emergency, or for a public event such as a marathon or bike-a-thon, and when SSB voice is used. The duty cycle does increase, of course, when the operator is transmitting FM or digital modes.

For example, given the battery’s maximum output of 100 W, the operator of a mobile FM radio would have to limit his/her transmitter power output to approximately 30 W (or even less, given inefficiencies), considering that a typical VHF or UHF transceiver draws roughly 15 A at 65 W RF output. (The specs I used for this example are for my Icom IC-2200H 2 meter FM transceiver). A 100 W HF radio would have to be run at fairly low power due to the current supply limit.

Connections
The EnergyBar 250 is charged through a 15 V, 4 A dc input socket. (All switches and sockets are on the front panel.) The output of the supplied wall charger/switching power supply is 15 V at 4 A, the same as for the optional automobile cigarette lighter socket charger. The EP-55 solar panel power output is rated at 55 W (15 V, 3.7 A maximum).

The EnergyBar 250’s outputs include four USB sockets (5 V, 2 A maximum); a 12 V, 10 A dc cigarette lighter socket; and a universal ac socket for switchable 115 V/230 V ac from the built-in inverter. There is a main power off/on rocker switch, and a separate on/off pushbutton switch for the ac inverter. A small slider switch changes the ac output from 115 V to 230 V. A battery charge meter is located on the right side of the front panel and is easy to read. The bars roll as the unit is charged.

EP-55 Solar Panel
A note about the EP-55 solar panel: It’s my first experience with using a solar panel of any kind, and I had good luck with it. It was interesting, fun, and easy to set up. I had a visceral reaction to it: I was getting true electrical power from a completely natural source, the Sun! Although I’ve heard of solar

Bottom Line
The EnergyBar 250 and EP-55 solar panel provide a renewable 12 V dc energy source for low-power portable operation.

May 2015 ARRL, the national association for Amateur Radio® www.arrl.org
power for years, to actually harvest it for myself amazed me.

The panels seemed well made, and are housed in a heavy-duty neoprene fabric carrying case and backing to prop up the panels at an angle into the Sun. A power regulator and cord with plug for the EnergyBar 250 meant it was plug ‘n’ play between the two components.

Since we purchased the review units, the EP-55 has been replaced by the EP-60, with three solar panels instead of the EP-55’s two. The EP-60 carries a rating of 60 W (15 V, 4 A) and a manufacturer-claimed EnergyBar 250 charge time of 7 to 13 hours.

**Lab Testing**

The Lab tested the EnergyBar 250 using the same techniques as for standalone inverters and portable generators with inverters. For amateur use, the two main concerns are the purity of the output ac waveform and conducted emissions that might interfere with receivers, particularly at HF.

The Lab measured the EnergyBar 250’s conducted emissions with the ac charger plugged in, with and without a load at the dc output. They also looked at the conducted emission at the ac output of the inverter. Note that, as with inverter generators, the EnergyBar 250 is considered a power source, so Part 15 regulations for conducted emissions do not apply. Nonetheless, measurements are of interest to amateurs concerned about levels of interference generated across the spectrum. With a 100 W load, emissions with the wall charger plugged in are good. If this were a Part 15 device, it would pass.

Figure 5 shows the conducted emissions at the inverter ac output measured with the ARRL Lab’s Rohde & Schwarz LISN (Line Impedance Stabilization Network) and Rohde & Schwarz EFH3 handheld spectrum analyzer. Emissions, particularly at 15 MHz and lower frequencies, are higher than Part 15 limits and offer the potential for interference, particularly if used with a long extension cord that acts as an antenna.

Figure 6 shows the ac waveform at the inverter output. Yes, it is supposed to be a sine wave. This “modified sine wave” is actually stepped square waves, with spikes at the leading and trailing edges. While this quality output is typical of modified sine wave inverters and is fine for lights and such, you may want to think twice before powering sensitive electronics with it. The cigarette lighter plug dc output is clean dc.

**Putting the EnergyBar to Work**

My experience with the EnergyBar 250 and EP-55 solar panel was very good. I tried it with charging my mobile devices (an iPhone 5 and an iPad), and used it with my laptop, running it for more than four hours of constant typing (drafting this review!). The unit/battery supplies appropriate amounts of power for basic Amateur Radio applications/requirements. You won’t be running your kilowatt RF power amplifier from it, but it is sufficient for low power operation with HF, VHF, or UHF transceivers. The battery housing is rugged, with an attractive, utilitarian front panel with heavy-duty components/sockets.

In my view, what would have made this unit even more suitable for Amateur Radio applications would have been the incorporation of binding posts for dc power output for easier and more secure connection to the stripped ends of the dc power cables provided with almost all modern radios. An Anderson Powerpole output would have been nice, too,
since these connectors are almost a standard now for many Amateur Radio applications.

The universal ac socket offers flexibility in that it accepts several types of 240 V ac power plugs as well as international plug configurations. However, it has the slightly irritating characteristic of sloppy play when used with a standard US two-prong power plug. Not a big deal, though, and a reasonable trade-off for the wider, universal plug compatibility if you need that feature.

**Conclusion**

As I tested this unit in the house and driveway, I imagined myself on a team of ARES members providing communications services in a disaster area, with my solar panels propped up and charging the EnergyBar 250. I envisioned my mobile devices plugged into the USB slots charging, drop-in chargers with handheld radios docked, and a mobile FM transceiver monitoring the action. I was geared up, fully accessorized, self-sufficient — and ready to rock and roll!

**West Mountain Radio DC-to-GO Battery Box with RIGrunner 4008 and Super PWRgate PG40S**

Reviewed by Harold Kramer, WJ1B
ARRL Chief Operating Officer
wj1b@arrl.org

No power? No problem! West Mountain Radio’s DC-to-GO system will power your station when ac mains are not available. Depending on the model chosen, it can charge the battery and monitor state of charge when operating from a dc power supply and, with an appropriate battery installed, provide uninterruptible dc power for home or portable operation. The DC-to-GO has other helpful features that I’ll discuss later.

The DC-to-GO system reviewed here is an integrated uninterruptible dc power system consisting of a rugged battery box, a high performance battery, a RIGrunner 4008 dc power distribution system, and a Super PWRgate PG40S charge controller-switching device that turns DC-to-GO into a seamless uninterruptible 12 V dc power supply. The connections all use Anderson Powerpole connectors. The battery is purchased separately so that it can be sized to a user’s requirements. WMR also offers a version of the DC-to-GO system with a RIGrunner but without the Super PWRgate, as well as a version that uses a smaller (and lighter) battery.

**Bottom Line**

West Mountain Radio’s DC-to-GO offers an integrated solution to a backup or portable 12 V power source.

vides additional safety because the battery terminals are protected inside the battery box. There are handles with rolled edges on each side that make it easier to lift the battery box. A heavy-duty battery strap is used to hold down the top cover and can be used to secure the battery box to the floor of a vehicle. According to Attwood, the hold-down straps are specified to resist 350 pounds of force. The battery box instructions are molded into the inside cover.

**The Battery**

Batteries are purchased separately and not included with the DC-to-GO. West Mountain Radio sells two Group 24 batteries — a 73 Ah (amp hour) gelled electrolyte, deep cycle battery for $235, or a 79 Ah AGM (absorbent glass mat) battery for $200. For this review, we purchased an Optima deep cycle AGM battery at a local automotive parts store for about $200 (Figure 7).

AGM batteries are heavy-duty sealed lead-acid batteries originally designed for military aircraft to reduce weight and improve reliability. Unlike conventional lead-acid cells, they are spill-proof and there is no need to add acid to activate them. AGM batteries have lower internal resistance and provide more efficient power output and faster recharges. The optimum charging voltage for AGM batteries is 14.4 to 15.0 V. That is a little higher than a typical lead acid battery, and the PG40S has a provision for increasing the charging voltage via an internal jumper.

AGM batteries are more expensive and weigh more than conventional batteries. As an occasional sufferer of back pain, I did not try to lift the 50 pound battery and I would not want to lift it in or out of my car. For my personal use, I would look at the version that uses a smaller and lighter Group U1 battery (half the weight), even though it means sacrificing some energy capacity.

**The Super PWRgate PG40S**

The Super PWRgate PG40S consists of an OR gate that switches between a dc power supply or the battery, and it is also a four-stage battery charger that is attached to the side of the battery box. When a dc power supply is connected to the PWRgate, it powers the radio and simultaneously charges the battery. When external dc is no longer present, the PWRgate seamlessly switches to the internal battery. I connected my Icom706MKIIG to the DC-to-GO and pulled the plug on the dc power supply 10 times and there was no discernible power interruption or hiccup.

The battery charger is quite sophisticated with four charging states: trickle charge, bulk charge, peak voltage, and float. Float is a maintenance state that keeps the battery at 13.5 V. Green, yellow, and red LEDs labeled ON, PK (peak), and FL (float) indicate the state of the charge. The PWRgate charger determines the proper charging state automatically and its logic circuitry prevents overcharging. After I discharged the battery and then charged it up again, the indicators accurately indicated the state of the battery and charger. The maximum amount of current supplied by the charger can be set by changing the arrangement of the automotive fuses on the PWRgate — a very clever system.

West Mountain Radio claims that the logic in the PG40S charges the battery quickly and extends the lifespan of the battery. The PG40S can also be used as a standalone battery charger for an external battery, provided, of course, that it is connected to a dc power supply.

**The RIGrunner 4008**

If you need only one dc-powered device, you can connect it directly to the PWRgate. For additional dc connections, the RIGrunner 4008 can provide dc power (up to 40 A) to multiple devices using Anderson Powerpole connectors. The 4008 has nine pairs of Powerpole connectors — one pair for the input voltage and eight pairs (hence the 4008 designation) of output connectors. Each connection is fused separately with standard color-coded automotive blade fuses.

The RIGrunner 4008 comes with the automotive blade fuses installed, although I would be sure to have a few spares in the shack. In its supplied configuration, the highest current fuses are located on the left and the lower amperage fuses are on the right. The power is normally connected to the 40 A fuse (the maximum current rating) that is the first fuse in line. After the 40 A fuse, there are three 25 A, two 10 A, one 5 A, and two 1 A fuses. The power supply can be plugged into any of them depending on the amount of current protection desired. This is a well thought out design that can be configured to provide the right amount of protection for a particular device.

Along with power distribution, the 4008 has visual and audible alerts for both under and over voltage that let you know when there are problems. When the voltage to the RIGrunner drops to 12.8 V, a yellow LED lights and an audible alert sounds. I like this feature because, when you are on the air, you do not always pay attention to the LED indicators, particularly if they are out of your sight line. However, the insistent yelp of the alert is hard to ignore. Each fuse connection also has an LED that lights when a fuse blows.

**The DC-to-GO System**

The DC-to-GO system comes with the Battery Box, RIGRunner 4008, and Super PWRgate PG40S. West Mountain Radio also supplies a battery connection cable, 12 pairs of 30 A Powerpole connectors, and a well-written, printed manual. The critical user decision when using the system is determining the type and size of the battery. That depends on the user’s requirements including power consumption, weight, and the number of devices to be powered.

*Manufacturer: West Mountain Radio, 1020 Spring City Dr, Waukesha, WI 53186; tel 262-522-6503; www.westmountainradio.com. Price: $249.95.*
There are times when a tower is simply too much support for what you need. If you operate portable a lot, such as for Field Day, a DXpedition, or because you can’t operate regularly from your home location, a good mast is essential. QRPers get by with trees and low-weight wire configurations and have known about the lightweight military surplus fiberglass masts for years. If you want a more traditional gain antenna (such as a small Yagi, quad or hex beam), you need something more substantial.

Spiderbeam has a line of sturdy telescoping aluminum masts for just this purpose. These are extremely rugged, well-built masts that come in a range of sizes from 33 feet to 49 feet. There are separate hardware pieces available for guying, mast stabilization and rotator accommodation. For this review we used a 10 meter (33 foot) mast with the optional guy ring hardware, 6 mm guy rope, and baseplate (see Figure 8).

While the Spiderbeam masts are certainly rugged enough to be used as a permanent antenna support at your home station, their high-quality build and small packing size make them ideal for car-camping, a weekend at the cottage, public service use or a long-term DXpedition. With the 33-foot mast weighing in at 20 pounds, however, it’s not going to go very well with your backpack QRP kit.

**Mast Construction**

The 33-foot review mast uses nine telescoping sections, tapering from 2 3/4 inches at the bottom to 1 3/8 inches at the top. Collapsed, the mast is about 4 1/2 feet long. The top of the mast is designed for use with a Spiderbeam or Folding Antennas hex-style beam, and you can slide one of those antennas (or an antenna of your choice) directly on the top of the mast. It works brilliantly (see Figure 9).

Each section has a compression clamp, similar to a hose clamp, that uses an 8-mm hex key to loosen each segment and tighten it back down. These clamps are very sturdy and made of stainless steel; they will definitely keep the mast from sliding back down. An Allen wrench is supplied with the mast.

If most of your work will be portable or temporary, there are also optional knobs that replace the Allen-head bolts. The knobs, which are easy to turn by hand without tools, offer faster set-up and tear-down time. This comes at the expense of less torque on each mast section, though. If you’re planning on a permanent installation or using a fairly heavy antenna, you should stick with the Allen-head bolts.

**Installation**

The stoutness of this mast doesn’t mean that it is difficult to erect. W1AW Station Manager Joe Carcia, NJ1Q, and I erected the mast on a pleasant fall day in the side yard at ARRL HQ (see Figure 10).

Although both of us worked on the mast, the stainless-steel clamps with each telescoping section allow for relatively easy installation by a single person. Spiderbeam’s website offers detailed instructions on how to erect the mast, which it says was designed for one-man DXpeditions. Indeed, it would be easy to transport a Spiderbeam mast, a small hex-style beam, feed line, and various support hardware with a golf club travel bag. Keep it under 50 pounds (the standard weight limit of checked baggage on many airlines), put your transceiver in a carry-on, and voila, you have a DXpedition in a bag!

Many options are available to make the mast even easier to use. There are tripods to assist in stabilization, but we used the base plate option for ground-mounted, flat surface installation. The base plate is about 8 inches square with small “teeth” to grip into soil. Simply place the plate where you want the mast, step on it, and you have a secure resting pad for the bottom of the mast.

The optional guy hardware allows the entire mast to rotate, easy enough to do by hand. Standard antenna rotators are easily accommodated, and there are a few different adapters available to install a rotator at the base of the mast, allowing complete mast rotation. This is not as difficult as it may sound, especially if you are using a hex-style beam.

**Bottom Line**

Spiderbeam’s telescoping aluminum mast offers an easy-to-assemble and sturdy support for directional antennas in the field. A variety of optional hardware makes for a versatile installation.
If you are looking for a robust, portable mast, look no further than the Spiderbeam mast. Reasonably lightweight, easy to ship on most airlines, ridiculously sturdy, and easy to set up with one person (with a few optional items), this mast will be a part of your portable gear for a long, long time.


Phonema KSP3 Ham Speaker

Reviewed by Joel R. Hallas, W1ZR
QST Contributing Editor
w1zr@arrl.org

Phonema intends to provide external speakers designed to work with most popular amateur transceivers. As we write this, their only product is the KSP3, designed to complement the popular Elecraft K3 transceiver. They have announced plans to offer similar units for current Icom, Kenwood, TEN-TEC, and Yaesu radios.

Elecraft seems like a logical starting point, since the Elecraft team has elected to focus on their radios, amplifiers, tuners and test gear, leaving external speakers and power supplies to others. Based on the success of their primary products, this seems to have been a good choice. It does leave a space for others to fill, and Phonema has jumped in.
The KSP3 Speaker

The KSP3 is a front-firing speaker in a medium-density fiberboard enclosure with the same height and depth as the K3, so it will look right at home next to the radio. The speaker enclosure is black, matching the color of the K3. The finish is not as smooth as that of the K3, but black is black, after all. While the K3 has a flip bail to raise the front panel off the desk, the review unit came with tubular extensions for the front feet that can raise the front of the speaker to match the angle of the K3, as shown in Figure 11. If the K3 is sitting flat, the KSP3 lines up without the extensions. Phonema indicates that they have changed the feet to a bail which is similar to the one on the K3.

Hooking it Up

As you might expect, the KSP3 is a monaural speaker and is connected via a single phono jack at the rear. I used one with phono plugs on each end and an adapter that connects both tip and ring of a stereo 3.5 millimeter (½ inch) phone plug to a single phono jack. Even though it is a single channel speaker, it is important not to plug a mono phono plug directly into the K3 SPEAKER jack because the longer sleeve of the mono plug will short out one of the K3 output channels. While a revision to the K3 is designed to avoid damage in that circumstance, it’s best not to fight Mother Nature.

For my usual speaker arrangement, I fabricated a Y adapter with a stereo plug that goes to the K3. It has two mono jacks, one on each channel. My K3 is equipped with a second receiver and I can thus have one receiver going to each of my two wall-mounted speakers, separated by about 5 feet. For a single receiver, the two speakers can be used to hear the special spatial audio effects that the K3 can provide, and two KSP3 speakers could be used, one on either side of the radio. For my evaluation, I had my usual speaker on one channel and the KSP3 on the other, allowing a direct comparison by moving the position of my head toward either speaker. Included in the box was a single folded page containing specifications and information about the speaker. In addition, there were some excerpts from the Elecraft K3 Owner’s Manual describing the menu options relating to stereo and mono operation, as well as using phones and speaker(s) simultaneously. I can’t imagine anything else that would be needed.

How it Sounds

The ARRL Lab does not have the capability to test speaker fidelity or response, so we’re left with a reviewer’s subjective impression. I compared the KSP3 to one of my three-way stereo speakers, which has a woofer of comparable size to the speaker in the KSP3. While my speaker also has a tweeter and super-tweeter, I think the sound output of the K3 all falls into the range covered by the small woofers.

I found whether listening to AM with the 12 kHz roofing filter and a 5 kHz audio bandwidth, SSB with a 1.8 to 2.5 kHz bandwidth, or CW with a 500 Hz bandwidth, the KSP3 provided sound quality as good as that of my stereo speaker, both doing a good job of reproducing the output of the K3. Interestingly, I noticed that the K3’s much smaller top-firing internal speaker, one that I generally just use while traveling, sounded almost as good as either. My opinion is that it comes down to how many speakers you want and where you want to locate them with respect to the radio position. Front firing speakers will, of course, work much better than the internal top-firing speaker if there is a shelf above the K3.

Manufacturer: Phonema Speakers, C/Dr. Fleming, 7 2nd-2nd 08340, Vilassar de Mar (Barcelona), Spain; www.phonema speakers.com.

New Products


The International Shortwave Broadcast Guide (Winter 2014-2015 edition), by Gayle Van Horn, W4GVH, is a Kindle e-book that offers a 24-hour station/frequency guide to stations broadcasting on shortwave radio at time of publication. This shortwave resource offers a by-the-hour schedule that includes all language services, frequencies and world target areas for each broadcast station. There are new chapters that cover basic shortwave radio listening and Who's Who in the shortwave radio spectrum. This edition includes improvements said to increase readability on the various Kindle platforms. Price: $4.99. For more information, or to order, visit www.amazon.com.