

Product Reviews

January 2025

Uniden SDS100 Handheld Communications Receiver

Product Review

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Commanding one of the highest prices for a receiver of its type, the Uniden SDS100 seeks to justify the investment by packing almost every conceivable feature into a handheld package measuring 1.5 × 2.5 × 6.5 inches. The SDS100 weighs 10.6 ounces with the sizable 3.7 V 5400 mAh battery installed. For the radio specifications, see Table 1. For use in the field, Uniden includes a well-designed belt clip that easily attaches to the back panel.

Speaking of included accessories, the SDS100 comes with a USB cable, which you'll use for programming and battery charging, a wall wart-style charger, a flexible antenna, a BNC-to-SMA adapter (very handy for attaching other antenna systems), and an installed 8 GB memory card. The card is located within the battery compartment (Figure 1), and while you can swap in a card with up to 32 GB capacity, I found the 8 GB card to be more than adequate.

The 3.5-inch display screen is colorful and easy to read (Figure 2), which is a good thing because the display can often become quite crowded. Buttons on the side of the SDS100 allow access to settings, while a row of three so-called "soft keys" beneath the display select various functions. The knob at the top of the receiver scrolls through menu items, adjusts volume and squelch, and, with a downward press, acts somewhat like an **ENTER** key. Adjacent to the knob you'll find the obligatory headphone jack.

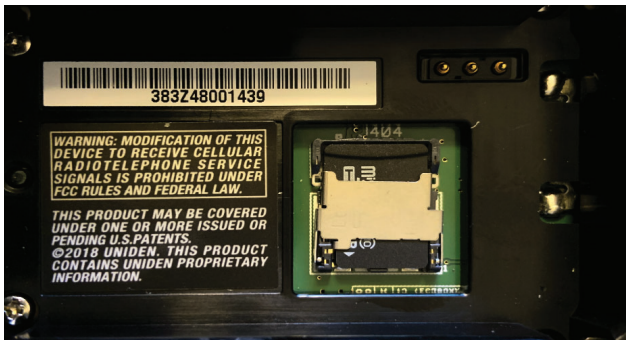


Figure 1 — The SDS100 memory card can be found inside the radio, directly beneath the battery. An 8 GB card is supplied, but you can install a larger card, up to 32 GB.



It was interesting to see that the SDS100 offers two USB ports. Both can be used for computer interfacing, but the larger of the two ports is labeled **CHARGE** for use with the supplied cable and charger. You can charge the battery from a computer or other device, but not all USB ports are created equal. When I attempted to charge from my desktop PC, the display warned that the voltage was "too low." The charger supplied with the radio is your best option.

Bottom Line

The Uniden SDS100 scanner/receiver is a remarkable piece of technology that you can hold in your hand. It is feature rich and offers a wide range of frequencies and mode reception.

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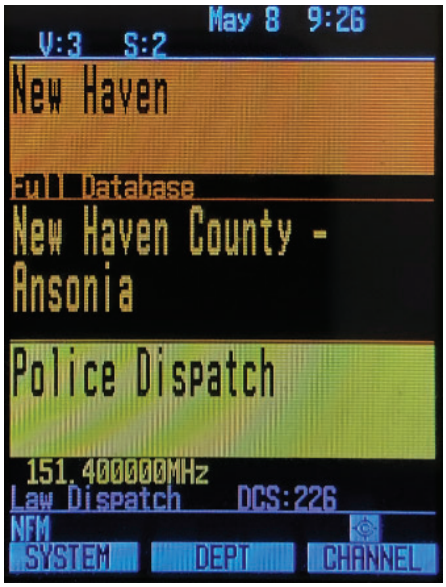


Figure 2 — The SDS100 display is detailed and colorful. It is also customizable.

When it comes to frequencies and modes, the SDS100 is impressive. Coverage spans 25 to 1300 MHz in several bands. Additionally, the SDS100 supports digital trunked radio systems in various formats, including APCO P25 Phase I and II, Enhanced Digital Access Communication System (EDACS), and Logic Trunked Radio (LTR). Of course, it also receives analog FM and AM.

The HomePatrol Approach to Reception

A number of years ago, Uniden released the first of its receivers to include its HomePatrol technology. Among other things, the HomePatrol design uses a massive frequency database contained within the radio itself.

The HomePatrol database is obtained from the Radio Reference website (**www.radioreference.com**), and it is the largest US and Canadian frequency database I've ever seen. When you switch on the radio, it spends the first 30 seconds or so loading this database from the memory card and storing it in RAM for quick access. According to the manual, Uniden obtains a new database from the Radio Reference site every 2 weeks. To keep your database up to date, you need to use Uniden's free *Sentinel* software for Windows (Figure 3). *Sentinel* will use the internet to grab the latest version from the Uniden site and load it to the SDS100 via the USB connection. *Sentinel* is a well-designed software package that makes it much easier to program and configure the SDS100 compared to doing it by wading through menus, twisting the knob, and pressing buttons.

If you program your location into the SDS100, it will limit its scans to those selected services that are within a maximum of 10 miles from your position (this range is expandable). Location programming is a matter of simply entering your zip code, though you can also choose to enter your latitude and longitude coordinates. The SDS100 does not include a Global Positioning System (GPS) receiver. However, if you happen to own a GPS receiver with a USB interface, it can be connected to the SDS100.

Once the SDS100 has your location information — added by whatever method you choose — it can bring another of its multitude of features into play: Close Call RF Capture Technology. Close Call automatically detects and tunes to transmissions from sources located within the maximum distance selected. For the Close Call feature to detect a signal, that signal

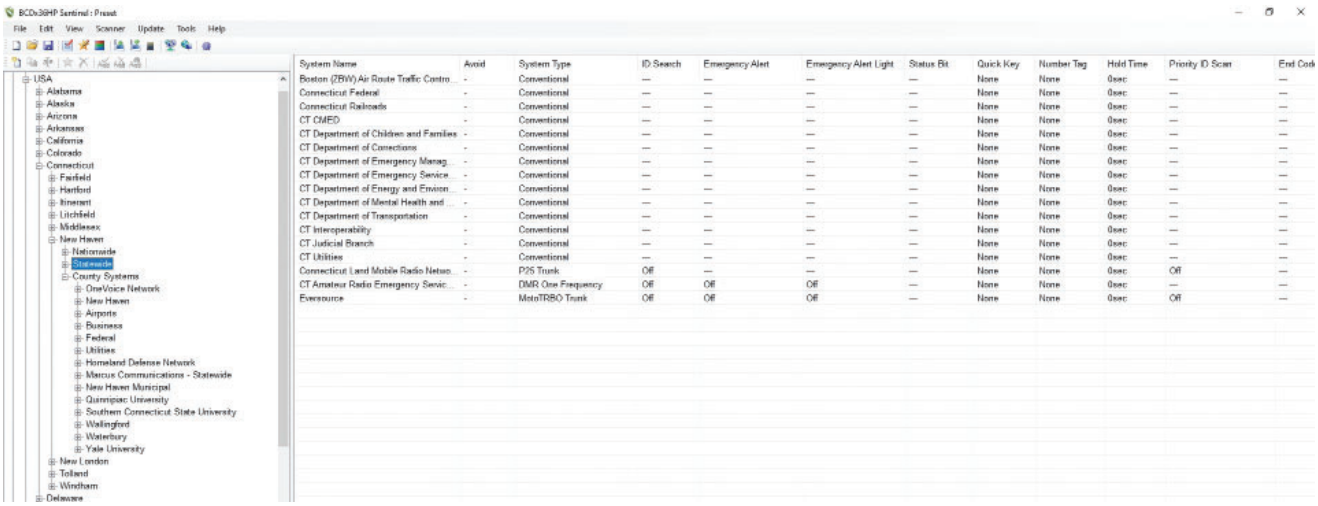


Figure 3 — The free Uniden *Sentinel* software makes it easy to manage the SDS100.

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Table 1

Uniden SDS100, serial number 383Z48001439, FCC ID# AMWUB383, Firmware Version: Main: 1.23.07, Sub: 1.03.05

Manufacturer's Specifications	Measured in the ARRL Lab
Frequency coverage: Many services ranging from 24 through 1240 MHz.	As specified.[1]
Modes: FM, NFM, FMB, WFM, AM. Optional licenses for DMR, NXDN, and ProVoice (receive only).	As specified.
Power requirements, 5 V dc lithium-ion battery. At 161.985 MHz, manual, internal speaker; battery: squelch on, 720 mA; squelch off, 955 mA. USB power: squelch on, 800 mA; squelch off, 1190 mA.	Measured full battery at 4.175 V dc; current draw not tested.
Receiver	**Receiver Dynamic Testing**
Sensitivity: Not specified.	AM, 10 dB S+N/N, 1.5 µV (–104 dBm) 25 MHz; 0.93 µV (–108 dBm) 120 MHz. FM, 12 dB SINAD, 0.26 µV (–119 dBm) 40.9 MHz, 0.38 µV (–115 dBm) 146 MHz, 0.37 µV (–116 dBm) 162.4 MHz, 0.45 µV (–114 dBm) 222 MHz, 0.38 µV (–115 dBm) 440 MHz, 1.9 µV (–102 dBm) 800 MHz.
Audio output: At 8 Ω internal speaker/ 32 Ω phone jack: FM / NFM; 700 mW / 8 mW, FMB / WFM; 670 mW / 13 mW.	Internal speaker not tested. Phone jack: As specified at 2% THD.

Size (height, width, depth): 6.57 × 2.56 × 1.53 inches (excluding protrusions).
Antenna length: 5.75 inches.
Weight: 10.6 ounces (with battery and antenna).
[1] Excludes US cellular frequencies in 800 MHz band.

must be about 15 to 18 dB stronger than the RF noise floor in the band being checked. It may help to think of Close Call as a feature similar to the dual watch function found in many amateur transceivers. Close Call, however, is much more sophisticated. It can, for instance, monitor one band while you are listening to another. You can even designate some frequencies in your database as Do Not Disturb (DND). Whenever you are listening to those frequencies, Close Call won't interrupt.

As comprehensive as the frequency database may be, there is always the possibility that some services may be missing. You can find new signal sources with the SDS100's phenomenal "discovery" function in which the receiver sweeps through a given range of frequencies, recording "hits" in a separate database and even grabbing snippets of audio to go with them. The discovery function is an excellent way to explore a chunk of spectrum without having to park yourself by the radio for hours on end.

None of this is to say that you can't manually enter frequencies of interest on your own. In fact, the SDS100 allows you to create an extensive "favorites" list. You can also tune the radio by manually punching in a frequency using Quick Search (Figure 4). You simply press the right-hand soft key, enter the frequency in MHz, and then press the soft key again.



Figure 4 — The Quick Search function allows you to directly enter a frequency of interest.

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DMR, NXDN, and ProVoice

Out of the box, the SDS100 does not receive digital mobile radio (DMR), Next Generation Digital Narrowband (NXDN), or ProVoice signals. These modes find uses in public service applications, depending on where you reside. In addition, DMR is popular among hams, and there are some amateurs who make use of NXDN as well.

To receive these modes with the SDS100, you're required to purchase individual alphanumeric "keys" and then enter the keys into the radio. To purchase a key, you must first register the radio by establishing a free account and entering the product serial number and electronic serial number at **https://my.uniden.com**. At the time of this writing, the key code to unlock DMR costs $60; the key to unlock NXDN costs $50.

The upgrade process was somewhat tedious, but once it was done, I could hear DMR activity throughout my area, including ham traffic. NXDN is not as common, but I managed to pick up one of the few amateur NXDN repeaters in my state.

ProVoice is a digital voice mode commonly used in EDACS trunked systems. However, it is active in only a few areas of the US (see **https://info.uniden.com/twiki/bin/view/UnidenMan4/ProVoice**). Because there is no ProVoice usage in my area, I chose not to purchase the $50 key that would have enabled reception.

Waterfall Upgrade

Most amateurs are familiar with waterfall displays, but this is a relatively uncommon feature for the scanner community. For those who may not be aware, a waterfall is a continuous display of transmissions and noise levels. The SDS100 implementation presents you with a scrolling 10-second window of activity. The most recent signal observation is at the top, and the oldest observation is at the bottom. Because the waterfall color-codes the strength of signals or noise received, and because observations move downward in time, the display resembles a waterfall — hence the name.

Signals appear as lines whose lengths reflect the lengths of the transmissions. Signal spikes also appear in the dynamic spectrum display above the waterfall. Signal strengths are represented by the colors of the lines. Each color represents a particular range of signal strength, and there are five signal ranges with five colors. The color choices are customizable.

With the SDS100's ample display area, the waterfall feature is easy to use. To listen to a signal, you need only twist the knob and move the green marker line to the spike in the display (Figure 5). You can also adjust the frequency span of the waterfall considerably.

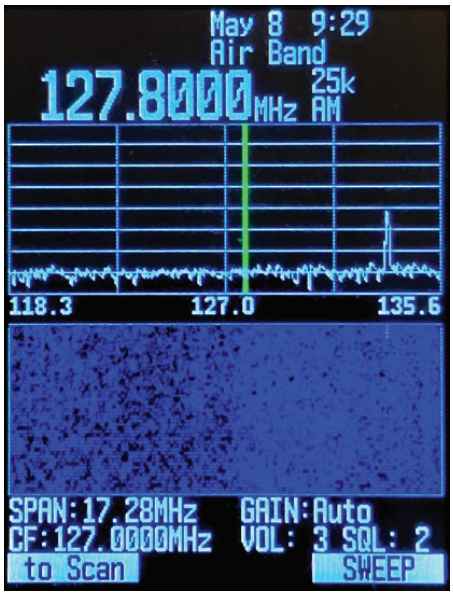


Figure 5 — The optional SDS100 waterfall display shown sweeping through the aviation band.

The catch, however, is that you must purchase a $20 key to activate the waterfall feature. Strictly speaking, the waterfall feature isn't a critical tool; it is more of an enhancement. I chose to buy the key for this review, and I was glad I did. There is something about visual representations of signal activity that I find fascinating, but it isn't for everyone, and I suspect many may choose to forego the upgrade and save $20. Besides, you can always add the waterfall upgrade at a later time.

Impressions

On page 1 of the SDS100 user manual, you'll find the following admonition: "Just as a car owner's manual does not teach you how to drive, this manual does not teach you about radio systems." Take this statement to heart if you are considering the SDS100.

The SDS100 is not a radio for beginners. While the manual is informative, it assumes a base level of knowledge. If you aren't familiar with trunking technology or digital radio systems, don't count on the user manual to teach you. You will also find unfamiliar terminology, including words that have different meanings than what you may be accustomed to in amateur radio. Most hams, for example, consider DMR to be a communication "mode." The SDS100 substitutes the word "system" instead. It also applies the term "conventional" to analog FM and AM modes. These

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nomenclature differences can be baffling until you become accustomed to them.

The SDS100 is not a radio that you're likely to use intuitively straight out of the box. (I had to consult the manual to find the power on/off button!) The SDS100 learning curve is steep. Depending on your experience within the scanner universe, you will need to spend considerable time with the manual. Your patience will be rewarded, however, as you realize what a remarkable piece of technology you are holding in your hand.

Once I became comfortable with the SDS100, using the radio to explore all the signal activity in my area was a pleasure. Even within a 10-mile range, there were a remarkable number of signals to hear. I was eavesdropping on everything from aviation chatter, to local police, to shopping mall security, to railroads.

I used the adapter to connect the SDS100 to my HF dipole antenna, just for grins. The result was a flood of activity from low VHF to UHF.

I should note that an increasing number of public service agencies, such as police and fire, are switching to encrypted digital radio systems. I encountered a few of these, and the result was unlistenable gibberish. Encryption technology comes at a considerable cost, however, so this trend may evolve slowly. My guess is that only agencies in major metropolitan areas will choose to make the investment, at least initially.

Conclusion

Because the Uniden SDS100 uses software-defined radio architecture (or "true I/Q," as they call it), the radio can be upgraded easily by downloading and installing new firmware. In fact, before I began this review, I installed the *Sentinel* software and then used it to download and install the latest firmware version. The ability to perform firmware upgrades at a moment's notice goes a long way toward securing the usefulness of your investment for years to come.

For those looking for a scanner receiver for a stationary installation in the shack, Uniden offers a mobile/base station version (the SDS200) that is similar technically to the portable version.

Manufacturer: Uniden, 301 International Pkwy., Suite 460, Flower Mound, TX 75022, **www.uniden.com**. Price: main unit, $649.99; optional software activation: ProVoice, $49.99; DMR, $60.00; NXDN, $50.00; Waterfall, $20.00.

PowerFilm Solar Foldable Solar Panels

Reviewed by John Leonardelli, VE3IPS
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Portable power has been a discussion point since the founding of ARRL in 1914. Modern technologies and improved quality over the past 2 decades have allowed operations outdoors not tied to commercial power to flourish. Radio, battery, and solar power manufacturers have responded with gear designed especially for portable operators.

Years ago at Hamvention, I learned about PowerFilm Solar solar panels by word of mouth from the Dayton ARES team. They told me that the panels were lightweight and strong, worked as advertised, and were made in Iowa. I bought a 15 W rollable panel to charge

Bottom Line

You can rely on the PowerFilm foldable solar panels to provide reliable solar charging capability for your amateur radio and outdoor pursuits.



NiCad packs and an SLA battery. It continues to serve me well after 10 years, with no degradation in performance and no breakage at the connector or internal wiring.

Now that I use a 20 Ah and 100 Ah LiFePO4 battery, the 15 W panel will not charge the battery fast enough for my use. I needed more power. I tried various mid-level

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Table 2 — PowerFilm F16-3600 60 W Foldable Solar Panel Specifications

Manufacturer's Advertised Specifications (not tested in the ARRL Lab)

Power output:	3.6 A at 15.4 V dc (approx. 60 W peak)
Solar panel type:	Amorphous silicon
Dimensions:	Folded: 13.0 × 7.5 × 2.7 inches (330.2 × 190.5 × 68.6 millimeters) Unfolded: 47.0 × 51.5 inches (1,193.8 × 1,308.1 millimeters)
Weight:	2.6 pounds (1.2 kilograms)
Output socket:	Aptiv (formerly Delphi)

consumer brands, but they were too heavy, too large, and poorly made. I called PowerFilm and found out that they had a foldable solar panel line. I knew that Chris, W6HFP, really liked them, as did François Léger-Savard, a Montreal-based outdoor photographer/cinematographer, so I calculated my power requirements and obtained a 120 W (model F16-7200) and a 60 W (model F16-3600) foldable solar panel (see the lead photo). You will find the specifications of the 60 W panel in Table 2, and the 120 W panel in Table 3.

I like modularity, and following the "Two is one and one is none" philosophy, I knew the two panels would be the ideal solution for my needs.

Description

PowerFilm solar panels are monolithically integrated, which means they are manufactured in layers. This eliminates the need for damage-prone manual connections of individual solar cells. PowerFilm flexible solar panels are made using amorphous silicon and are naturally free from harmful heavy metals like cadmium, which are used in other technologies.

The foldable solar panels are lightweight, durable, and extremely portable. The solar panels are mounted to weather-resistant fabric that quickly folds for storage and unfolds for use. They are built with durability that allows for use in the harshest environments (compliant with MIL-STD-810G standard), and the panel works even after portions are damaged. This compact panel fits easily into most backpacks. The power connector is marine-grade and plug and play for easy use with different connector options.



Figure 6 — The PowerFilm foldable solar panel typical deployment.

Design and Build Quality

Construction is top notch and what is expected at this price point. PowerFilm also has a long-standing reputation for making high-quality products that are also used by military and public safety agencies. The panels are designed, engineered, and manufactured in the US. This shows in the high-quality materials used with solid stitching and a robust power connector assembly. The military rating is an important design standard that speaks to its usage in its intended environment — typically harsh conditions.

The MIL-STD-810 specifications address a broad range of environmental conditions that include: low pressure for altitude testing; exposure to high and low temperatures plus temperature shock (both operating and in storage); rain (including windblown and freezing rain); humidity, fungus, and salt fog for rust testing; sand and dust exposure; explosive atmosphere; leakage; acceleration; shock and transport shock; gunfire vibration, and random vibration.

It has a weather-resistant finish, and the fabric is easy to clean, though I am particular in making sure it's not tossed in mud or areas where foot traffic may damage it.

The outputs are provided at 15.4 V, which makes it easy to integrate with almost any battery and charging system. I added the optional adaptor for the Aptiv connector to the Anderson Powerpole®. They can also be daisy-chained to increase the output current.

Their light-sensitive technology absorbs more light even in cloudy and hazy conditions (see Figure 6), allowing more charging performance over other technologies. Because they use amorphous technology, they are less efficient than solid and rigid panels that use monocrystalline technology. PowerFilm compensates for the lower efficiency by increasing the size of the panels to produce an equivalent current.

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Table 3 — PowerFilm F16-7200 120 W Foldable Solar Panel Specifications

Manufacturer's Advertised Specifications (not tested in the ARRL Lab)

Power output:	7.2 A at 15.4 V dc (approx. 120 W peak)
Solar panel type:	Amorphous silicon
Dimensions:	Folded: 14.5 × 14.0 × 3.0 inches (368.3 × 355.6 × 76.2 millimeters) Unfolded: 86.5 × 55.0 inches (2,197.1 × 1,397.0 millimeters)
Weight:	6.3 pounds (2.9 kilograms)
Output socket:	Aptiv (formerly Delphi)

The larger footprint proved to be a non-issue because the panels are lightweight and do not take up as much space as you would think with a 4-foot footprint (60 W) or 7-foot footprint for the larger one (120 W). That is better than one or three rigid panels that are 3 feet in length and weigh 8 pounds each. I do not want to carry three glass aluminum-framed panels and 24 pounds of weight in a backpack or in a vehicle.

The layered silicon approach they use in each sub-panel allows damaged sections to be bypassed so that power is still produced. They also resist point damage extremely well with minimal loss of output even after being punctured. This is what would be expected when operating away from commercial power to still be able to charge your batteries or devices if damaged. A video shows it being shot at with a Glock pistol (see **https://youtu.be/Nkx1837KJds**), and with nine bullet holes the solar panel lost less than 20% of its power. Some of the big, bulky, and low-efficiency panels I used in the past would just shatter and stop working.

The panels include extremely useful rugged corner grommets for tying the panels to tables, tents, and other structures. I added two rolls of paracord 550 to my kit.

I did confirm that a reverse blocking diode is part of the design. A reverse blocking diode is connected in series with a solar panel. Its purpose is to block the reverse current from the battery to the panel at night or when the panel is not producing enough power. As promised, it still produced output power during cloudy or shady conditions (not at full power but enough to keep the charger working).

I chose two panels in two different power wattages so I could support various battery sizes and use them independent of each other. I could use the 60 W on a 2-meter station on its own on a 20 Ah battery, while the 120 W panel would support the HF station with a 30 Ah battery. For faster charging, I can put both together for more than 10 A of current to charge bigger batteries or reduce charging time.

You do not want to connect the solar panels directly to your radio, as over-voltage damage will result. Solar panels convert sunshine to voltage, but some power management or a charger is still required.

You must use a LiFePO4-compliant solar charge controller. Use a controller that has multi-power point tracking charging technology, as they typically do not generate radio frequency interference (RFI). I prefer a power manager instead of a standalone solar charge controller to add additional functions by using a Buddipole POWERmini. Rick Palm, K1CE, reviewed the Buddipole POWERmini in the May 2019 issue of *QST*. I use Renogy standalone solar charge controllers as well.

The solar panels have a strong warranty — that is, 1-year defects and 3-year guaranteed 80% power output.

The PowerFilms are also useful for emergency power at your home during power outages or camping. This is an area where your investment goes beyond just ham radio.



Figure 7 — The PowerFilm foldable solar panel power output during very cloudy conditions.

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Typical Scenario

If I spend a day at the park or operating from a campsite, I always charge the battery while operating. This allows me to use the 60 or 120 W panel and operate my Yaesu FT-891 all day. When the sun goes down, I have another 5 hours of usage before the battery needs to be charged. I can charge the battery in less than 5 hours with the 60 W panel and half that time with the larger panel. I fit all my solar load-outs in a Pelican box as an easy-to-grab solution.

As with any solar panel, it is important that it faces or is angled toward the sun to maximize current output. I found that just by deploying it on the ground, it delivered output power matching its specified performance power curve. Because the panel is foldable, draping it over a structure allowed sun capture at various angles to also generate maximum power output (see Figure 7). By having two panels, I can daisy-chain them for 180 W of solar power to decrease battery charging times or to offer more output on cloudy days.

During a POTA outing, I forgot my battery and used the car battery for the activation, and ended up depleting the weak battery beyond the ability to crank the engine. I laid the 120 W panel on the roof, attached it to the battery, and waited about 45 minutes to be able to supply enough current to bring the battery voltage to 12 V. No need to call my wife for a rescue mission — this alone was well worth the purchase cost.

Field Day Scenario

For ARRL Field Day I will use a 100 Ah battery to power a 100 W HF radio and, thus, need the 120 W panel. Extra points are given out as a reward to operators using emergency power sources to develop operating readiness with alternate power sources. Daisy-chaining the panels to offer as much as 10 A of current in full sunshine will charge the batteries 30% faster. I can also use the panels separately and use the smaller one to power a GOTA station easily. To me, ARRL Field Day is about operating using quiet solar power, and not a gas-powered generator, as an emergency power source.

Backpack/QRP Scenario

The 60 W panel would be ideal for 20 W radios, but many will use a 5 or 10 W radio. The 60 W panel is still ideal for this. I had no problems with it fitting in a backpack, or it can even be shock-corded to the pack body. The panels fold up almost to the size of a three-ring binder. My backpack battery is usually an 8 Ah version, so a lighter and smaller-footprint 20 or 30 W panel may be my next purchase.

Electronic Devices Scenario

The battery solution leads to charging drones, cameras, smartphones, and CPAP machines. There are USB converters that can be added to take the 15.4 V down to 5 V and be used to charge your electronic gadgets, or you could use a pure sine wave inverter to allow for charging a 19 V laptop. I have a couple that are rated at 100 W and work fine for their intended purpose. They do generate RFI, and squelching it with ferrite cores helps. Many power stations, like a Goal Zero, offer solar panel inputs and USB charger outputs, adding additional interoperability for your investment. Check your power station solar panel input wattage specifications, as they may have a wattage limit.

Maintenance

These panels are not designed to be used in the rain for long periods of time, but they are water-resistant. If they do get wet, you must allow time to air-dry them before packing them away for storage. Also, the actual panel itself should be kept clean, especially if deployed near bird's nests. The water sprinkler quality control method proved that it will survive after a short-duration rainfall. I have had no issues with the power connector and its power connector base attached to the fabric. This is a common failure point, and using marine-grade connectors increases the panel's reliability substantially.

Conclusion

The solar panels manufactured by PowerFilm are a top-tier choice for portable radio operators. They are premium products, and it shows in the use of the highest-quality materials and panel chemistry for efficient output. The durability and water-resistant fabric ensure that they can take rainfall and tossing around in the trunk of your vehicle. I am incredibly happy with them fitting in various backpacks that I use. They pack up to a small size for storage and offer consistent charging output as specified. The investment goes beyond the hobby because of their universal use for any outdoor, non-radio activities, and they are an essential component of an emergency power solution, making these solar panels a worthwhile investment.

Manufacturer: PowerFilm Solar, Inc., 1287 XE Pl., Ames, IA 50014, **www.powerfilmsolar.com**. Price: F16-3600 60 W version, $899.95; F16-7200 120 W version, $1,649.95; optional Aptiv-to-Anderson Powerpole adapter, $16.99.

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Radioddity HF-008 HF Mobile Antenna



Reviewed by Richard Lawn, W2JAZ
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I am always looking for a new, easy-to-deploy antenna for portable operations, especially when we venture to the Pocono Mountains area of Pennsylvania or the New Jersey shore. My criteria for such antennas are quite simple and well defined: small, lightweight, easy to set up, inexpensive, and multi-band possibilities. This new HF-008 offered by Radioddity seemed to fit the bill and attracted my attention.

Description

The HF-008 is designed to perform on nine amateur bands including 80, 40, 30, 20, 17, 15, 12, 10, and 6 meters. The manufacturer also claims resonance on 11 meters (CB band). The HF-008 is not self-supporting, nor is it an antenna I would feel comfortable traveling with down a highway at the speed limit, but more on that later. It seems sturdy though and solidly constructed of good materials. The antenna is rated at 200 W PEP on SSB and 100 W on CW. In short, the package contains everything you need to get on the air with a portable installation quickly, except some sort of base mounting setup, which could be a magnetic mount for mobile rooftop mounting or some sort of post or mast if you aren't near your vehicle. Overall antenna length depends on the tuning whip adjustment, but in no instance will it exceed 69 inches, and in most cases it will be shorter. For the manufacturer's specifications, see Table 4.

Bottom Line

The Radioddity HF-008 nine-band antenna provides lots of band coverage for an attractive price.

The antenna comes with a base section with the band tuning ports (26.4 inches), the intermediate threaded extension (12.5 inches), two tuning whips (22.4 and 30.7 inches), an Allen wrench for tuning the whips, a band-selection jumper wand, and a one-page manual.



Figure 8 — The Radioddity HF-008 mobile installation with a magnetic mount.

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Table 4 — Radioddity HF-008 Mobile Antenna

Manufacturer's Specifications (not tested in the ARRL Lab)	
Operating band:	80, 40, 30, 20, 17, 15, 12, 10, and 6 meters
Center frequency:	3.56, 7.05, 10.1, 14, 18, 21.1, 24.9, 27, 29, and 50 MHz
Connector:	PL-259/SL16-K
Impedance:	50 Ω
Whip length:	Adjustable (2-millimeter Allen key for grub screws included)
Material:	Copper, stainless steel
Power:	200 W (SSB), 100 W (CW)
SWR:	1.0 – 1.5
Weight:	22.9 ounces (0.7 kilogram)

Assembly, Setup, and Resonance Check

I initially elected to check the resonance on each band using a magnetic mount on the roof of my wife's Honda Fit (see Figure 8). I used the Quick Guide provided by the manufacturer for starting measurements. SWR readings on my RigExpert AA-650 were occasionally slightly erratic due to capacitance and ground proximity, as well as other aspects of the mobile installations. But it is safe to report that the antenna is very broad-branded on the higher bands and easily tuned with an auto tuner. I was actually more impressed with the results than I expected to be, as shown in my measurements in Table 5. Unsurprisingly, for such a small antenna, the bandwidth on 40 and 80 meters is rather narrow. Of course, your mileage may vary based on the installation.

The measurements provided in the one-page early-production copy of the Quick Guide I received were misleading. My measurements included in this review are based on the length of the whip insert, not including the intermediate metal extension that screws into the long black base coil section. The whip is adjusted by using the provided Allen wrench to tighten the whip in a collet that screws onto the intermediate threaded extension. The Radioddity website now offers a revised Quick Guide that clarifies the various whip measurements, and they confirmed to us that the latest packaging will come with the revised version. My own measurements of the whip (short or long), from the collet to the tip of the whip, don't always agree with those found in the old or revised Quick Guide.

I found that a shorter whip might enable higher band coverage on 80 meters, but it's doubtful such a short antenna will perform well on the lower bands.

The manual also describes which whip to use and the port to plug the jumper cable into for desired band resonance. It would be more convenient if the band was labeled on the coil covering so there is no mistaking which band has been selected. I made that mistake more than once! The uppermost jumper port at the very top of the coil is for 6 meters, followed by the 10-meter port, then 12 meters, and so forth moving down the black coil section. No jumper is used for 80 meters. The antenna design has been around for years, and similar products are available from different companies.

I also set up the antenna on a fence post and added three 32-foot radials to see how the antenna would perform in such a temporary installation. The bottom coil section of the antenna, which includes a built-in PL-259 for connection to a mobile mount, can be removed, exposing the standard threaded stub to make use of other styles of portable mounts. The antenna performed better with the radials about 3 feet or so above the ground. As expected with this radial length, the antenna resonated well on 40 and 20 meters and demonstrated band coverage and SWR characteristics similar to the mobile mount situation, with a few adjustments to the whip length. I have no reason to doubt that the antenna would perform well on other bands if proper-length radials were added.

On the Air

As they say, the proof is in the pudding, and in this case I must say I was impressed. On the afternoon of April 23, 2024, in southern New Jersey (in case anyone wants to check propagation and solar flux index), I mounted the antenna on the car roof with the magnetic mount and set my FT-710 on a tray table. Using my previous whip measurement, I tuned to the 20-meter

Table 5 — Radioddity HF-008 Mobile Antenna — W2JAZ's SWR Measurements*

Frequency Range	Corresponding SWR Measurements
50.000 – 51.490 MHz	1.38:1 – 2.0:1
28.000 – 29.050 MHz	1.04:1 – 2.0:1
24.890 – 24.970 MHz	1.36:1 – 1.28:1
21.000 – 21.450 MHz	1.6:1 – 1.8:1
18.068 – 18.168 MHz	1.48:1 – 1.20:1
14.000 – 14.350 MHz	1.6:1 – 2.1:1
10.100 – 10.150 MHz	1.7:1 – 1.9:1
7.075 – 7.175 MHz	2.0:1 – 3.0:1 (7.125 was 1.02:1)
3.55 MHz	1.5:1 (shorter whip needed for best resonance)

** W2JAZ's SWR measurements with the RigExpert AA-650 of the antenna mounted on a vehicle using a magnetic mount (see Figure 8).*

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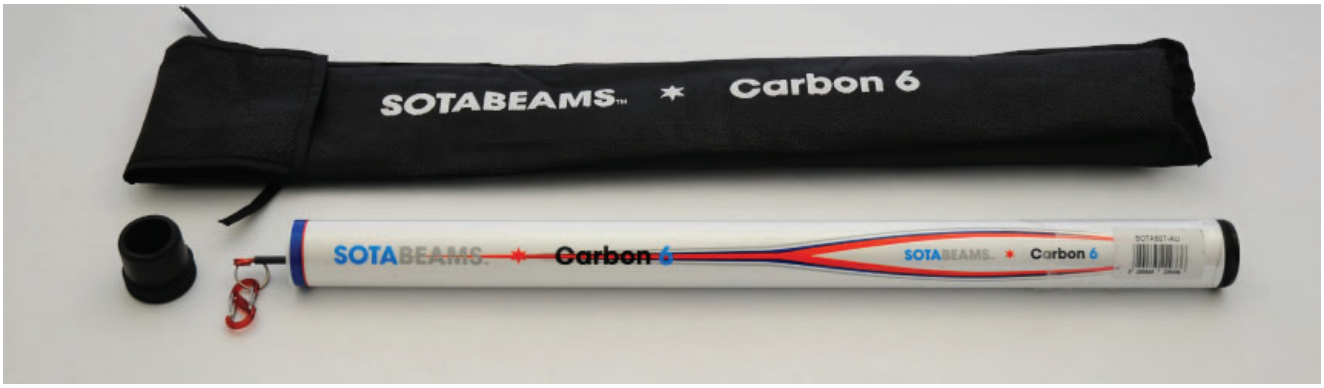
SSB segment of the band and heard quite a few signals. I heard a small pileup on S51DX, who quickly returned my call and gave me a fine signal report. I was running 100 W and was amazed thinking I was probably just lucky! I then found a station from Serbia and immediately worked him with a 57 report. This QSO was immediately followed by another station in Madrid who gave me an honest 59 report. Without adjusting the whip, I tuned down to the CW portion of the band and used the radio's built-in tuner to make any necessary adjustments. I quickly achieved a 1:1 match, and in no time I worked a station in Germany and another in Slovenia. At this point I became convinced that this antenna would be a keeper and function very well for POTA and other portable operations. It might work well in a moving mobile situation, but I would not trust the rooftop magnetic mount at highway speeds. For driving around town, or with a bumper or hatch mount, it would likely be fine.

Conclusion

If you are looking for an inexpensive, multi-band antenna that offers fairly broadband performance that can easily be tweaked with modern radio auto tuners, this might be a good option. But remember, you must retune the antenna whip and relocate the band jumper each time you change bands. You will need a mobile or stationary mount and band-specific radials if you intend to mount this as a portable antenna without the benefit of the counterpoise provided by a vehicle. The antenna also seems to be well made to last for some time.

Manufacturer: Radioddity, **www.radioddity.com**. Price: $99.

SOTABEAMS Carbon-6 Ultra-Light Telescopic Mast



Reviewed by John Leonardelli, VE3IPS
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One of the most useful items for a portable radio operator is a telescopic antenna mast. These masts come in materials such as fiberglass, carbon fiber, and aluminum, with varying lengths (keep the number of ends to a minimum). I've used several types, but they all collapse to more than 28 inches, making them inconvenient for travel. Additionally, many inexpensive fishing poles aren't durable enough for amateur radio use — they often crack or snap in the field, which can be frustrating.

I wanted something that was tested outdoors, specifically designed for ham radio, and compact enough to fit into my Icom LC-192 backpack side pocket. It had to be strong and supported by a brand that offers spare parts in case of damage.

Bottom Line

The SOTABEAMS Carbon-6 mast's portability and ease of use make it a popular choice for operators who prefer to travel light and engage in all forms of portable operation.

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Table 6 — SOTABEAMS Carbon-6 Ultra-Light Telescopic Mast

Manufacturer's Advertised Specifications (not tested in the ARRL Lab)

Extended length:	19.6 feet (6 meters)
Packed length:	17 inches (43 centimeters)
Number of sections:	18
Wall thickness:	0.04 inch (1 millimeter)
Weight:	11.1 ounces (315 grams)
Mast material:	Carbon fiber
Tube diameter:	Base: 1.2 inches (31 millimeters); top: 3/32 inch (2.4 millimeters)
Base cap diameter:	1.25 inches (32 millimeters)

Description

The SOTABEAMS Carbon-6 Ultra-Light Telescopic Mast extends to just over 19 feet and collapses to 17 inches, making it ideal for portable operators. It's built from carbon fiber, designed for ham radio, and is perfect for lightweight antenna setups made with #26 Stealth wire. The compact size and portability make it a key tool in my portable operations, and the carrying bag is included. For the manufacturer's specifications, see Table 6.

Out in the Field

The SOTABEAMS mast is lightweight and easily fits well into my Icom 705 go bag. I use it primarily for supporting an antenna in an inverted-**V** configuration, but it also works with sloper, inverted-**L**, or half-square setups. It's easy to set up, and with a custom mount I simply deploy the ground spike, mount the mast, and clip on the wire. Each section locks with a slight twist, and I've tested it in light rain without issue, ensuring to dry it thoroughly afterward. Although I can't speak about long-term durability, many SOTA operators use it in harsh conditions like snowy mountain summits. SOTABEAMS states, "Since the Carbon-6 is quite flexible near the top, anything except a vertical antenna is best attached a couple of sections down rather than at the very tip." I found this to be true.

During a trip to Jamaica, I realized how useful a portable mast would have been when I was struggling to find suitable natural supports for my dipole antenna. Its compact size allows it to fit in my carry-on luggage and pair with my lightweight antennas, so next time I will be active on 40, 20, 15, and 10 meters, without needing a tuner, directly from the beach.

Please note that carbon fiber is slightly conductive, so make sure to not contact power lines.

Improvements

The smallest top sections of the mast lack strength and are very flexible. To fix this, I collapsed the top two sections into the next larger one and secured them with glue. I also added a wire loop at the top to attach a carabiner, reducing the height but keeping a functional length of 16 feet. Additionally, I built a custom ground spike mount and mast holder with a 3/8-24 stud for a sturdy setup.

Conclusion

I've used the SOTABEAMS Carbon-6 on every activation, and it has exceeded my expectations. It's a simple, well-made telescopic mast, perfect for portable ham radio operations.

Manufacturer: SOTABEAMS, Unit 1 The Green, Green St., Macclesfield, SK10 1JH, UK, **www.sotabeams.co.uk**. Price: $57.99.

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