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## Midland Radio ER-102 Portable All Hazards NOAA Weather Radio

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**Field Evaluation Date:** December 1, 2010

**PRODUCT:** ER-102 Portable All Hazards NOAA Weather Radio

**LOCATION:** NE Ohio / Central Virginia

**EVALUATORS:** Andrew Boggs & ICE PACK Emergency Preparedness Staff

**OBJECTIVE/PURPOSE:** Field Test the Midland Radio ER102 portable All Hazards NOAA Weather Radio for use as a crisis communications radio during extreme weather emergencies and disasters.

### PRODUCT OVERVIEW

We live in a very unpredictable world that can change at a moment's notice. There are hazardous weather conditions, civil unrest, Amber Alerts, terrorist activities and other emergencies which take each and every one of us by surprise. Some with advance notice and just as many where there is none at all! In the case of extreme weather conditions, you may have a few days (hurricane) to as little as a few minutes (tornado) to react. Other disasters are so sudden (earthquake) that we have to take actions after the fact. Having an "All-Hazards" S.A.M.E (NOAA Weather Radio **S**pecific **A**rea **M**essage **E**ncoding) weather radio is essential for home and office use. If you spend a lot of time in the outdoors, it's imperative to have a portable radio when traveling, for recreation and especially during evacuations. If you are at a park with your family on an outing, a surprise thunderstorm can cause real havoc. There have been many golfers who have been struck by lightning out on the links as well those who work outdoors every day. In all of the above instances a portable All Hazards NOAA Weather Radio can be a true lifesaver.

The question is what kind of emergency weather radio would be best for all around use? There is no "one" answer - it depends on the circumstances and conditions in which the radio will be used. Perhaps the five most important considerations when selecting a unit are:

1. The radio should be battery operated (along with other power sources).
2. The radio should have a very sensitive tuner (to reliably receive important broadcasts).
3. The radio should have an "alert" feature as part of its circuitry (to get your attention).
4. The radio should be AM/FM capable (to receive local news and situation updates).
5. The radio should be of rugged construction.

As a matter of fact, FEMA recommends such radios as part of an emergency kit that is easily accessible. If not properly maintained one of the problems you can encounter with a radio in storage is dead batteries. Therefore a back-up means of providing power is a wise consideration. The Midland ER-102 All Hazards NOAA Weather Radio meets the aforementioned needs and more.

The Midland ER-102 is a portable radio that can be powered by multiple power sources. It can be powered by a 120VAC power supply, a hand dynamo crank, NiMH (Nickel Metal Hydride) rechargeable batteries as well three “AA” batteries (we strongly recommend long shelf life lithium batteries). With its hand dynamo crank, it can even provide a charge to many makes of cell phones with dead batteries (you’ll need to provide the necessary cable). The radio includes a three LED flashlight and safety siren or your choice of a visual flashing lamp when the radio picks up the special 1050 Hz tone burst from the National Weather Service. The radio even includes a thermometer with freeze alert. You can listen to the radio through its front-firing speaker or via a mono earphone or stereo headset - of course even on FM, the sound will still be mono. The receiver uses the usual rotatable telescoping rod antenna for improving weak signals both for NOAA broadcasts and FM reception. The AM channel uses an internal ferrite core antenna.



When initially opening the ER-102 box, you will find the radio, an AC adapter as well as an operations manual. The radio itself weighs a little over one pound, with a solid feel and measures 3”x8”x6”. On the radio, you will find twelve buttons and knobs. Some of these controls will serve a dual purpose, however, the learning curve is not too steep as are radios with confusing menu. This is a plus, because in an emergency, simple is certainly better. Read the owner’s manual it’s important as is follow-up practice using the radio - teach every member of your family how to use it as well. Figuring it out in the midst of an emergency situation is just not the right thing to do.





The first thing when preparing the ER-102 radio for use is to fully charge the internal NiMH battery pack (included with the radio). The charging cycle is about twelve hours and the battery is rated at 650 mAh, 3.6 volts DC. Be sure when you charge the radio, its switched to the "AC/Dynamo" position. A small LED light below the main LCD will glow red while the unit is charging. Afterwards you can safely install three AA lithium batteries (not included) as back-up. Remember, the power switch has to be in the "Alkaline" position to work with the AA batteries. Alkaline batteries will work, but they have limitations. As a third option, when all else fails in powering the radio, you can crank the radio's dynamo generator, which should also be used if the unit is used to charge cell phone batteries.

One of the nice features of the ER-102 radio is the clock with alarm function - useful to wake up to at home or when camping outdoors. You'll find a "radio-buzzer" switch on the back of the radio. The only thing missing is snooze! Unusual is the ER-102's capability to show the temperature on its display, including a "freeze" alert which can be set for Celsius or Fahrenheit readings. When the red LED is not indicating the charging of the unit, its primary action is to signal a weather alert from the National Weather Service.

Turning the dynamo to generate power is a little of an imprecise science. The charging time is dependent on how fast and how long one turns the crank. Also the play time is based on variables as loudness setting of the audio volume, whether speaker or headphones are being used, and whether the unit is being used for its flashlight and/or its radio function. Make every effort to use the AC, or on-board NiMH battery power source for everyday use and save the back-up AA batteries for emergency use.



The alert function gives you three choices - either the built-in siren, or flashes the flashlight like a strobe, or alerts can be tuned-off completely. "WX" will also flash on the display to indicate an emergency. Typically, most weather radios only have a reception range of around twenty-five miles. The ER-102 is rated to receive weather stations up to fifty miles away. Realize there is no precise calculator of distance - considerations include terrain between transmit to receive range - transmitter power, type of building its used in as well as structures between transmitter and radio receiver. Bad weather itself can also play a factor in reducing reception range. Even the condition of the batteries can have an effect on performance of the radio. In "alert" mode, the radio will sound a siren for eight seconds, then returns to regular broadcast mode. In "flash" mode, the radio's built-in LED flashlight will flash (danger Will Robinson, danger) and sound a siren. To hear information about the emergency requires flipping the frequency band switch to 'WX' (weather).



The thermometer displays whether the radio is switched on or off. To select a choice between temperatures in Celsius or Fahrenheit requires pressing the "C/F/Freeze" button to toggle between both indicators. The earphone jack takes a standard 1/8<sup>th</sup> inch earphone or stereo headphone plug. As noted earlier, you will hear mono content even if you are listening through stereo headphones or earplugs. The flashlight button is on top of the radio next to the "backlight" display button under the carrying handle. The large volume control knob is on the lower right side of the radio while the tuning control is at the very top, making both very intuitive to find even in the dark. The band switch rests between the two.

Of the many great features offered by the Midland ER-102 is its ability to recharge cell phones via dynamo generator or AC power through the radio. Just remember to switch the unit's power switch to the "off" position before using a user supplied cable to connect the cell phone to the radio. If using the dynamo hand crank, make two revolutions (turns) per second either clockwise or counter-clockwise should work. Tuning the radio itself is pretty standard. Select between AM or FM, and turn the volume up a little and then tune the radio. I should point out the ER-102 has no station memories to set, it's pretty basic in this department. When switched to 'WX'



to listen to weather broadcasts - select between seven pre-set frequencies for the one with the strongest signal. In a decent location, you may not even need to extend the telescoping antenna. For information on finding the closest weather radio station transmitter in your area, go to [www.nws.noaa.gov/nwr](http://www.nws.noaa.gov/nwr) on the Internet.

The radio has a silver-gray and black color, with an amber backlit dial and a black speaker grill. It's actually very light yet still has a solid quality feel. The slide switch used for selecting a weather station frequency has a light feeling to it, but clicks into place where it should. Realize however, it can be knocked off frequency if your hand accidentally brushes against the weather channel slider switch. Not a big worry, it can easily be reset. The rectangular buttons surrounding the display have a nice tactile feel similar to keys on a handheld calculator. While the frequency for stations are featured as digital numbers on the display, it's actually an analog tuner for both AM and FM bands.

The notched knob has definite stops at the end of their travel on either end. It can be a little tricky to set the precise frequency at first. Both the tuning and volume controls have a little drag resistance to the touch, but they feel smooth in travel. My only nitpick with the volume control is it would have been easier to grip if it too were 'notched' rather than its smooth surface. The large push



button at top has a rubberized coating and has the dual function of turning off a weather alert as well as illuminating the display background for approximately five seconds before shutting off. The small button to the left is for the three element LED flashlight curved into the upper left hand corner on the radio. The built-in flashlight itself is bright enough for seeing most nearby items, but it's not a harsh light as some LED lights tend to be. As to the dynamo crank itself, it has just the right amount of rolling resistance and can be equally cranked clockwise or counter-clockwise in charging its internal NiMH battery pack. The carrying handle is a ribbed cloth with leatherette tubing that covers most of it. The handle is very comfortable, will not be damaged in a fall, and can be easily replaced.

The radio's single cone speaker is a 2-1/2" round and its sound field is designed to be more in the treble range for clarity, but not harsh on the ears - there are no adjustable tone controls for purposes of simplicity. The sound quality and loudness is found to be acceptable if one keeps in mind the radio's purpose. In the back you'll find a 1/8" female headphone jack as well as a female USB connect point for

cell phone recharging purposes and a 6V DC power jack under a protective black rubber flap that keeps out dust, dirt and moisture. The flap is hinged on top. The battery compartment can be accessed below via a dual spring on both sides of the door which swings down but remains attached to the radio. Inside you'll find a 3.6 volt 650 mAh NiMH battery pack similar to those found in cell phones. It comes out easily for replacement if ever needed. Next to it are places for three standby "AA" batteries.

As to sound quality, it has a midrange to treble sound that has enough depth to be somewhat pleasant under its design circumstances. Perhaps the most important aspect, it has good vocal clarity - making it easy to understand what the announcer has to say - especially important when listening to weather reports and hazard information. I also tested the sound via a pair of stereo ear buds and through a pair of professional broadcast Sony MDR-7506 stereo headphones where the sound quality shined for such a small radio. Using more common ear buds, sound depth drops a little. The nearest weather station is around seventy miles west from where the Midland ER-102 was tested in NE Ohio. It had no problems in signal sensitivity even with the antenna down. With the aerial up, it was spot on. The radio tunes from 521 kHz to 1709 kHz on AM, 87.0 MHz to 108.1 MHz on FM, easily covering both bands.

The last tests included the dreaded drop test. We dropped the radio onto the floor from a height of 5' on carpet and in a second test onto hard tile flooring to see whether the Midland ER-102 could take an accidental drop and continue to function. The radio was similarly "spritzed" to see whether the radio would continue to work if it accidentally got wet. A word of caution, the radio is not submersible, and second, our test was conducted under battery power only. On both drop tests, the radio survived - all parts intact and worked without a hitch. On the spritz test, we gave it a water spray for two minutes to simulate the radio being carried in a moderate rain. Guess what, after spritzing the whole radio, including the speaker grill, the radio simply worked. Nice!





**Conclusions**

Overall, we like the radio very much and have adopted it for use in all of our ICE PACK Emergency Sustainment Systems. It does what it's supposed to do and does it well. The only real improvements we would ask Midland to consider in the future is a S.A.M.E text alert feature as found on its WR300 desktop receiver as well a way to charge other small electronic devices (e.g.; a small LCD TV) through its dynamo crank power port. Another possible addition would be a small built-in solar panel to keep a trickle charge on the on-board NiMH battery pack. The Midland ER-102 has excellent reception, fairly well built, offers good audio clarity, and one should never have a real problem powering the radio under diverse and challenging environments.

**GENERAL COMMENTS**

1. Multiple power sources on the ER-102 should always provide reliable service.
2. The ER-102 has a well thought out built-in three-element LED flashlight.
3. Another feature is the simple slider switch which allows you to manually select the strongest NOAA weather broadcast frequency.
4. The ER-102 is simple to operate and provides All Hazards Alerts, NOAA Weather Reports, AM and FM broadcast reception.
5. A very good crisis communications value.

| FIELD TEST RATING    |  |
|----------------------|--|
| Suitability          |  |
| Durable Construction |  |
| Quality              |  |
| Ease of Use          |  |
| Reliable             |  |
| Effective            |  |
| Cost                 |  |

5-Shields – Excellent ♦ 4-Shields – Very Good ♦ 3-Shields–Good ♦ 2-Shields – Average ♦ 1-Shield - Poor