

Testers Gauge Performance, Features, and Durability

Before testing began, all handheld test radios were fully charged using their associated AC chargers. Testers powered the fixed units with an Astron variable voltage DC power supply.

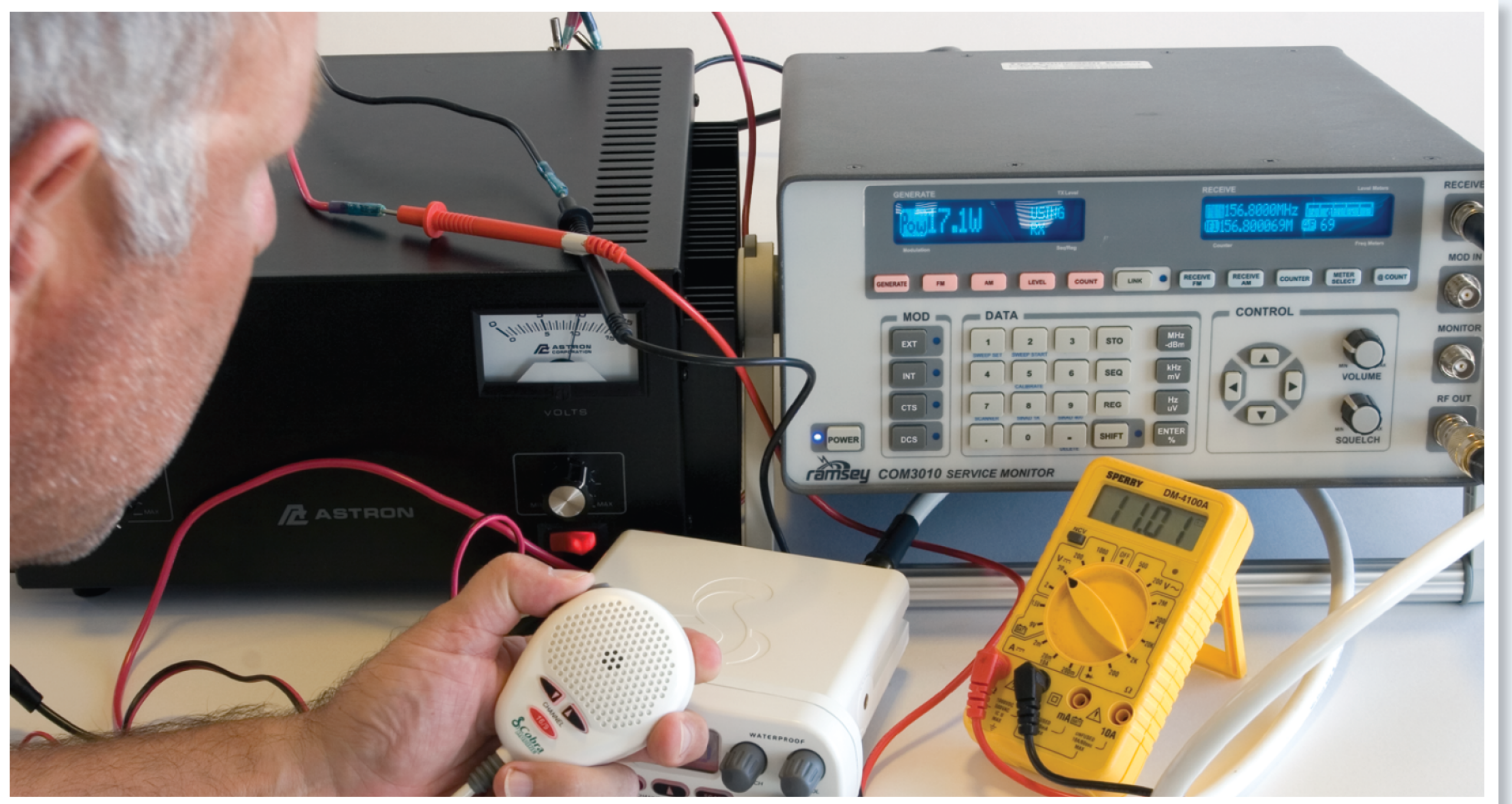
All test radios—fixed and handheld—were run through a series of bench tests using a Ramsey COM3010 monitor.

U.S. Federal Communications Commission (FCC) regulations restrict the maximum power output of a fixed-mount marine VHF transmitter to 25 watts, and a portable handheld VHF is limited to 5 or 6 watts. The FCC also specifies a low-power setting for harbor use, typically 1 watt, for all radios.

Practical Sailor tested each transmitter on channel 16, at the highest and lowest power settings, at room temperature (75 degrees) and after the radios faced temperature extremes. The less variation in power and frequency, the higher the radio was rated.

To chill the radios to their minimum operating temperature, testers put them in a freezer (at 15 degrees) for four hours. We used a fish smoker to get the handheld radios to high-temp extremes, and each was left to cook for two hours at 122 degrees. Because the fixed VHF's wouldn't fit in the smoker, testers instead used a truck dashboard—at mid-day on a sunny, South Florida day—as the heat chamber, baking the radios for two hours at about 122 degrees.

Frequency accuracy is defined as the ability of the transmitter to send signals out on the selected frequency. Frequency stability measures the transmitter's ability to maintain frequency accuracy over its entire temperature and voltage operating range. The closer to the selected frequency a transmitter stayed, the higher testers rated it. FCC regulations require an accuracy of 10 parts per million, which equates to about 1550 Hz in the marine band. Industry groups typi-



Bench testing evaluated each radio's transmitter power, frequency accuracy and stability, and receiver sensitivity.

cally call for half that amount.

Amperage draw was recorded using a Fluke 336 clamp-on ammeter when transmitting at both 13.8 and 11.0 volts DC, or the minimum voltage at which the radio would transmit. We also checked each unit's low-power setting, measuring both power input and output. Measurements were taken directly off the radios' antenna ports.

Receiver sensitivity is the ability of the receiver to hear a weak signal. Typical marine receiver sensitivity ratings run from .22 to .35 microvolts; industry groups recommend a minimum .50 microvolts. Each radio receiver was tested for the minimum signal it could receive at a specific industry standard setting between background noise and generated signal. All test radios were rated Good or better, meaning they are sensitive enough to pick up very weak incoming signals.

Another receiver standard is selectivity, or the ability of the receiver to reproduce only the signals on the selected channel, not those on other channels. Our test equipment did not allow us to test each radio for this, so we've listed manufacturers' specs in the Value Guides on pages 18-21; a higher number is better.

The displays were rated on screen size, the quality and readability of the data displayed, and backlighting.

A marine VHF transmission must be heard over wind, seas, or any other noise. Testers measured sound pressure at max

volume while inputting a 1 KHz tone. The measurements were taken at a distance of 1 meter from the fixed-mount radios and one foot from the handhelds. Testers also monitored a weather channel and rated the quality of sound.

Handheld radios typically face more abuse than fixed models and must be able to stand up to drops and falls, and the occasional dousing with rain or sea spray, not to mention the likelihood they may take a dip overboard. We conducted a series of tests on only the handhelds to gauge their ruggedness.

To check the radios' water resistance, each was submerged in fresh water for 30 minutes, then operated immediately after and again the next day. The radios were dropped from a height of 4 feet onto concrete. Testers used a pass/fail rating system for these tests.

One noted drawback of handheld radios is their limited battery life. To get an idea of how long the test models could be expected to operate on one charge of their rechargeable battery, testers allowed them to run for 15 hours. Testers accomplished full power transmissions and voice reception every hour until the battery died or the unit began to malfunction.

Some of the test radios also can operate on alkaline batteries. Although alkalines rarely have as long a run time as rechargeables, they are handy to have for emergency power when the main battery goes.