



We used a Bird Model 43 wattmeter to measure the output of the ICOM 504 DSC VHF radios on our test boat.

HOW WE TESTED

We asked each manufacturer to provide us with two samples of each antenna, so we could have a spare on hand in case we had any performance doubts about a particular product.

Our 3 dB antenna test was straightforward. We set up a control base at a local marina that had an unobstructed line of sight to Block Island Sound off Rhode Island. At the base, we used an Icom M604 VHF radio (connected to an 8-foot, 6 dB commercial station master antenna about 14 feet above sea level) to send voice broadcasts to our test boat. On our test boat, a 26-foot Scout powerboat, we fitted the antennas on top of 8-foot poles.

On the boat we had two new Icom 504 DSC VHF radios mounted side by side. We ran each antenna—one at a time—into a “Bird Model 43” wattmeter to test the VSWR (Voltage Standing Wave Ratio). The VSWR reading is a meter measurement of the quality of the impedance match of the antenna to

ELECTRONICS

the VHF radio. We were looking for a low VSWR reading of 1.5:1 or less, which would have indicated that all of the power that was being transmitted by the VHF radio was radiated by the VHF antenna. A high VSWR reading would have indicated that radio output power was reflected prior to being radiated by the antenna. This could indicate either a bad VHF antenna or a shorted antenna fitting or cable. All of the antennas that we tested had very low VSWR readings (2 watts or less of reflected power), and both Icom radios measured identical transmit output power of 23 watts. (Measured input voltage was 13.6 volts.)

For the test, we ran the boat south of the control point on a predetermined track into open water. With each test antenna in use, we moved away from the control point until voice communications were unintelligible. Only one test antenna was vertical at a time to eliminate the possibility of interference from idle antennas. The vessel route/track line was recorded via a Raymarine E-80 chartplotter. Waypoints were entered as each antenna lost communication with the base, and the entire track with antenna waypoints was saved to a Compact Flash memory card. The vessel's speed was idle during communication periods with the base.

On the day that we tested the 3 dB VHF antennas, the seas were running about four feet.

The winner in each group was the antenna that communicated the farthest from the control point base. Once we'd reached the most distant waypoint where communication was still possible with the best antenna, each of the other antennas was again connected to the radio and given one more chance to communicate with the base.

Our evaluation also included a thorough examination of the innards of these sticks. We cut open each antenna and studied the construction of the radiating element in hopes of identifying the cause of some performance differences. We also rated the quality of materials and overall construction of each antenna.