

HOW WE TESTED

INSIDE AND OUT

We tested the antennas in two groups: 8-foot and 16-foot. We requested a spare from each manufacturer in case we had any performance doubts about a particular product.

Because of the many variables that can influence any test at sea, our evaluation cannot be considered a perfect evaluation of an antenna's absolute range, but rather a limited comparison of different antennas under specific, nearly identical conditions. However, the antennas were tested at the same time under virtually the same conditions, and we feel the results are useful and informative.

For the performance test, we set up a control base at a local marina that had an unobstructed line of sight to Block Island Sound in Rhode Island. At the base, we used an Icom M604 VHF radio (connected to an 8-foot, 6-dB antenna mounted about 40 feet above sea level) to send voice broadcasts to our test boat. A second VHF radio and separate Station Master commercial antenna were also installed, so base and boat could communicate.

We installed each 8-foot antenna on the oversized T-top of the test powerboat, a 26-foot Scout center-console. All three 16-foot antennas were tested on the same mounting platform 5 feet above the waterline. Only one test antenna was vertical at a time to eliminate the possibility of parasitic oscillation interference between idle antennas.

We ran the test boat 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. The vessel route/track line was recorded, and waypoints were entered as each antenna lost communication with the base, and the entire track with antenna waypoints was saved to a flash memory card. The vessel's speed was 20 knots, except when we slowed to idle during communication periods with the base; seas were running 4 to 8 feet.

After voice communication was lost, we turned our bow into the sea and then turned again to run with the sea to minimize side-to-side roll. We were able to complete the 16-footers' test, but due to deteriorating weather conditions, testing the 8-foot antennas was postponed.

Several days later, seas were calmer and we tested the 8-foot antennas. After testing the 8-footers, we decided to retest the 16-footers. The results mirrored the outcome on the initial test. To double-check our final results, at the last waypoint location entered for each group, all antennas that were previously eliminated were connected and given one more chance to communicate with the base. This, we believed, would help rule out any channel interference that might have affected their range evaluation.



Digital 529-VW

Shakespeare 5206-C

Testers found that the radiating element of the \$36 Shakespeare 5206-C is significantly thinner than that of the \$149 Digital 529-VW.

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We also cut open each antenna to study the construction of the radiating element and rate the quality of materials and construction.

For the record, here are the chief concerns raised by the manufacturers regarding our range comparison:

Comrod's Vidar Bakke suggested that the Shakespeare antenna may have outdistanced the two others because it is 18 inches longer. He said Comrod has performed tests similar to PS's indicating that "only small variations of the antenna height gave relatively large variations of receive signal strength."

Digital Antenna was concerned about the "on-the-water" nature of the range tests and the installation of the 16-foot antennas, which company officials feel may have handicapped their 10-dB antenna. "An open-range test of monopole antenna must be conducted on an extremely level surface and is typically done on land," said John Jones, Digital's vice president of engineering. Jones suggested that because our results exceeded line-of-sight distances, environmental factors may have influenced our maximum range findings.

Jones also said the Digital 16-foot should have been mounted higher (at least one-wavelength, 6.25 feet above sea level), and that it should have been mounted where there would be fewer surrounding obstructions. "Our antenna provides more gain and distance; however it is more sensitive to improper installation. Our 10-dB gain antenna is designed to be mounted a minimum of 1 wavelength above water level," said Jones. (The information that was sent with the Digital antenna did not provide these details, and we did not find this information on the Digital website.)

Given our experience with Digital, we have no reason to doubt that its 16-foot antenna, had it been installed as Jones suggested, would have likely matched the top results in our range test. This is not taking away anything from the other antennas that excelled in the field, which also would have done better with the company-recommended installation.