

# The Newport Antenna Shootout

Members of the Newport County Radio Club took their best shot, using the RBN as an impartial judge.



The east passage of Narragansett Bay, as seen from Fort Adams State Park in Rhode Island. The antenna shootout faced west toward Conanicut Island. [Rob White, KB1ZZU, photo]

## Jim Sammons, KA1ZOU, and Bob Beatty, WB4SON

In the world of contesting and DXing, antennas are usually sophisticated, fixed structures. But among portable operators, there is an ongoing search for smaller, lighter, and better antennas. This was the inspiration that led a small, experienced group of portable operators from the Newport County Radio Club (NCRC) to put their best emitters forward in the first antenna shootout held in Newport, Rhode Island.

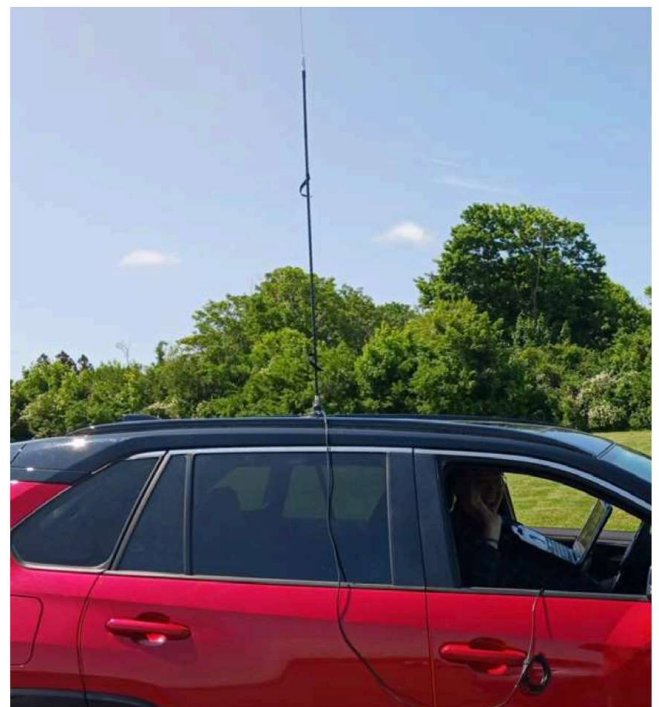
Our purpose was twofold: to see how different portable antennas compared in a controlled setting, and to test the activity as a means of introducing newer club members to HF field operating. So, on a beautiful morning in June 2023, six members of NCRC set up their entries on the lawn of Fort Adams State Park, overlooking Narragansett Bay.

## The Contenders

Bob Beatty, WB4SON, has long used an MFJ 20-meter hamstick clone for Parks on the Air® and other portable operations. His ground plane was provided by his car roof center via a magnetic mount (see Figure 1).

Jim Sammons, KA1ZOU, has strung “invisible” #19 AWG wire all over New England and chose to hoist 90 feet of it as a non-resonant inverted V, with a 49:1 balun

as an end feed point. The center support was provided by a 30-foot Jackite kite pole. A long coaxial feed line laying on the ground provided the ground plane.



**Figure 1** — Bob Beatty’s, WB4SON, magnetic-mounted hamstick clone. [Rob White, KB1ZZU, photo]



**Figure 2** — John Mills, K1JSM, and his delta loop that he dubbed “El Diablo.” [Rob White, KB1ZZU, photo]

John Mills, K1JSM, put the most effort into his submission. He constructed a collapsible PVC “Y” structure to hold two telescoping fishing poles; these poles supported the corners of a #19 AWG wire tuned delta loop antenna (see Figure 2). The feed point was a 4:1 balun at the bottom of the loop. The delta loop needed no ground plane.

Mike Seil, AA1XQ, mounted his base-loaded vertical on the center of his truck roof with a Hustler Super Magnetic Mount (see Figure 3). The vertical was a 17-foot Wolf River Coils telescoping antenna mounted on a Wolf River Coils Silver Bullet Mini loading coil. His truck roof served as the ground plane.

Rob White, KB1ZZU, used an Alpha Antenna 10 – 80-meter, tuner-free off-center-fed vertical (see Figure



**Figure 3** — Mike Seil, AA1XQ, and his roof-mounted vertical. [Rob White, KB1ZZU, photo]

4). Rob put his vertical on the ground with a tripod. He laid two radials on the grass for a ground plane.

Willy Maclean, W1LY, put up the tallest antenna. His Jackite collapsible kite pole supported a 33-foot vertical dipole that was fed with coax to a 1:1 balun at the center of the kite pole. He pulled the bottom leg of the dipole off to the side for the best match.

## The Competition

The following rules were determined by John and Bob:

- Stations will run 100 W.
- Stations will transmit within a few kHz of each other on the 20-meter band.
- All transmitters will be pre-programmed to send “CQ TEST CQ TEST DE <call> <call>” at 25 WPM CW.
- All stations will transmit simultaneously.
- Reception by the Reverse Beacon Network (RBN) will be the impartial judge.

Following this procedure, at the sound of an air horn, all six transmitters sent their code strings. Ten seconds later, the same strings were re-transmitted. The purpose of transmitting at the same time was to reduce the effect of propagation variations that would have muddled the results if stations transmitted randomly at different times.

The signals were received and recorded by the RBN ([www.reversebeacon.net](http://www.reversebeacon.net)). The RBN provided two crucial bits of information for each spot: how far our stations reached, and how well they were received. The scoring system was designed by Bob — determined by summing the distance (in miles) to each spot multiplied by its linear signal-to-noise ratio (SNR) as a proxy for a signal report. In short:

- $\text{Score} = \text{sum}(\text{distance to RBN} \times \text{linear SNR})$
- More spots, more distance, and better SNR = higher score

In his summary of the results (see Table 1), Bob observed:

It wasn't even close — Mike won the first antenna shootout with a score of more than 6 million! Second place was Willy, and third place was me. It was an interesting project, and propagation was amazingly consistent. The total number of spots had a spread from 30 to 53, but DX distances were not spread as much (2,471 miles versus 3,500 miles). For the most part, all of us were heard by

**Table 1 — Antenna Shootout Results**

Operator/Antenna	Score	Total Spots
AA1XQ/truck whip	5,700,000	41
W1LY/vertical dipole	2,980,000	42
WB4SON/hamstick	2,260,000	38
KA1ZOU/inverted V	1,790,000	27
K1JSM/delta loop	1,490,000	35
KB1ZZU/vertical	623,000	34

the same group of spotting stations. The big difference was SNR, with Mike consistently putting out a stronger signal. Size and complexity didn't influence the outcome. Jim's inverted V was the longest, and John's delta loop was the most complex, but Mike's winning antenna was a simple vertical on the roof of his car, and so was mine. Willy earned second place with a ¼-wave vertical wire. But, as is beneficial for portable operations, Mike and I needed only a few minutes to set up and take down our antennas.

Willy wondered if the results might be different if an operator were interested in only US contacts, such as for a Worked All States certificate. To explore that question, Bob removed all of the European data and re-scored the antennas. As expected, the scores were a bit lower, but the finish order and conclusions were unchanged (see Table 2). The "Longest" contact row has been removed, as that data is not relevant in this context.

## Conclusion and What's to Come

All of these antennas performed well. To paraphrase Rob, "The best [antenna] is the one you have with you." One important realization is that antenna choice should be determined by its intended purpose. A backpacker would probably choose Mike's whip and substitute several wire radials as a ground plane. Alternatively, someone who needs near vertical incidence skywave for hilly terrain might want the non-resonant inverted V.

This challenge was simple and a lot of fun. Now that it's been tested, our plan is to repeat the shootout with



**Figure 4** — Rob White's, KB1ZZU, Alpha Antenna vertical. [Rob White, KB1ZZU, photo]

our newer club members. We might focus on specific antenna configurations — for example, finding the best easy-to-transport antenna and seeing how magnetic loops and Buddipole-type antennas compare. We anticipate that both our new General-class licensees and old hands will find the simplicity of such an exercise attractive, and that other clubs can replicate this and come to the same conclusions.

Amateur Extra-class licensee Jim Sammons, KA1ZOU, was first licensed in 1991, and he learned about electronics from his Air Force communications officer father. Also known as Greenlee (punch) Lad, he fabricated many vacuum tube chassis for homebrew transmitters, and he still refers to small condensers as "micro mikes." Jim enjoys portable operations of any kind. He can be reached at [jimsa@cox.net](mailto:jimsa@cox.net).

Amateur Extra-class licensee Bob Beatty, WB4SON, was first licensed in 1970. He leveraged his interests in radio and electronics into a lifelong career. Bob has participated in almost every aspect of the hobby (Earth-moon-Earth is still on his to-do list), and he is most passionate about education, having given license classes to about 15% of all hams in Rhode Island. He can be reached at [wb4son@gmail.com](mailto:wb4son@gmail.com).

**Table 2 — Antenna Shootout Results  
(Europe Data Removed)**

Operator/Antenna	Score	Total Spots	Longest (Miles)
AA1XQ/truck whip	6,070,000	48	3,496
W1LY/vertical dipole	3,500,000	53	3,500
WB4SON/hamstick	2,300,000	41	2,493
KA1ZOU/inverted V	1,850,000	30	3,182
K1JSM/delta loop	1,520,000	36	2,481
KB1ZZU/vertical	733,000	40	2,471

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