The Beach Brawley Boomer

QSOs made in the shade.

by Dean Frazier NH6XK

Having had a lot of fun building antennas, it occurred to me that my back-yard beach umbrella was an antenna waiting to talk. Some time ago I had loaded up the living room window frame, an old Toyota radiator, a photographic tripod, and a '77 Pinto bumper, all via a random wire tuner (L/C Box) and the tuner in my TS-440S, with some success. In none of these instances, however, had I done any real antenna calculations or trimming. Large impedance mismatches were "covered up" by the double-tuner arrangement, and it is questionable how much power was actually being radiated by these "antennas." From my QTH in Hawaii I made contacts to JA, VK, ZL, South America and the continental U.S. mainland during the peak of Solar Cycle 22, when propagation was so good on most bands that one could virtually yell out the window and be heard by DX. Now, with the solar cycle markedly on the decline, contacts while running power (the previous contacts having all been barefoot) were becoming more of a challenge. So what better time to test one's skill/knowledge of antennas? And by what more incongruous vehicle than a beach umbrella?

Photo A. The beach umbrella antenna in action.

The Beach Brawley Boomer

So named by Tony Thomas ZL2ANT ("brawley" is G-land Speak for umbrella), the Boomer measured 82 inches tall and was made of 1-1/4-inch diameter tubing in two sections, which were electrically bonded with self-tapping screws, scrap braid and wire. The umbrella's canopy measured 68 inches in diameter. Rough calculation indicated that the vertical section had about 274 ohms characteristic impedance, and its length translated into a range from 62 electrical degrees on 12 meters to 18 degrees on 40. The canopy, a disguised capacitance hat, seemed to have about 40 pF capacitance, allowing for the open structure of the ribs and the fact that the ends were not electrically hooked together. This capacitance translated into a range from 61 electrical degrees on 12 meters to 27 degrees on the 40 meter band. Surely there was an antenna here, what with the vertical tube and canopy capacitance hat just staring at me.

Further calculation showed that the umbrella should load up on 12 and 17 meters as is, fed at the base, but that some inductance would be required on 20 or 40 meters. As it turned out, base inductance loading was not needed on 12 or 17, and tuning was poor on 10 and 15 meters and marginal on 20 and 40 without a coil. Sixteen turns of #12 AWG copper wire wound on a 2-inch PVC pipe to a length of 3-1/4 inches provided almost 7 µH of inductance which, with that provided by the L/C box, allowed for tuning on 20 and 40 meters with a good match. The coil was attached to the base of the vertical tube, along with an SO239 connector, and a small pigtail of wire was soldered to the braid side of the connector to make provision for alligator-clipping quarter-wave counterpoise wires. After all, this was to be a temporary endeavor, subject to much fiddling . . . a crude blending of theoretical and empirical experimentation.

Although the Boomer was "stuck" on the roof for only one day and night (I didn't want the neighborhood association to condemn me as totally loony), I made contacts on 12, 17, and 40 meters, to ZL (Tony ZL2ANT), California (Fred N6OHH, Ron KD6FZ, Earl W6CPG, Marvin W2AH), Arizona (Link N7OAY), Kwajalein (Val V73DO), and Utah (Paul WA6EW). Also Grant VK2AXB and Cathy VK4FG joined in the fun. Contacts on 20 meters were not even tried due to the QRM, QRN, and QRC (crowding). Signal reports ranged from 4/1-5/1 on 12 meters, to 5/3-5/6 on 40, to 5/5-5/7 on 17. And all of this was during a very noisy period on the bands: 8/24/92 . . . Solar Flux 111, *Boulder A index 40*, K index 2.

Despite the poor band conditions, we had fun. Everyone seemed to enjoy talking to "that guy in Hawaii using a beach umbrella for an antenna."

Matching/Feeding/Counterpoise

The Beach Brawley Boomer was fed with 50-ohm coax through a random wire tuner. SWRs experienced were 1.1:1, 1.1:1, and 1.4:1 on 12, 17, and 40 meters respectively. During the contacts power ranged from about 70 watts to 400 watts. The cloth canopy suffered no damage at 400 watts.

I had only enough scrap wire on hand for one quarter-wave counterpoise on 40 meters, about 33 feet. I initially tried two 13-foot lengths, each a quarter wave, on 17 meters without much effect. Using this wire plus some other odd bits and pieces soldered together gave me one 33-foot length which helped greatly on 7 MHz as well on the higher bands. It's amazing to me that the Boomer worked as well as it did with just one counterpoise. No umbrella trimming was done . . . I still needed it for the back yard!

So what was the point of all of this? To have a bit of fun, of course. The Beach Brawley Boomer doesn't compare with my R5 (12/17 meters) but it did about as well as my 40 meter dipole. Very unscientific "test-

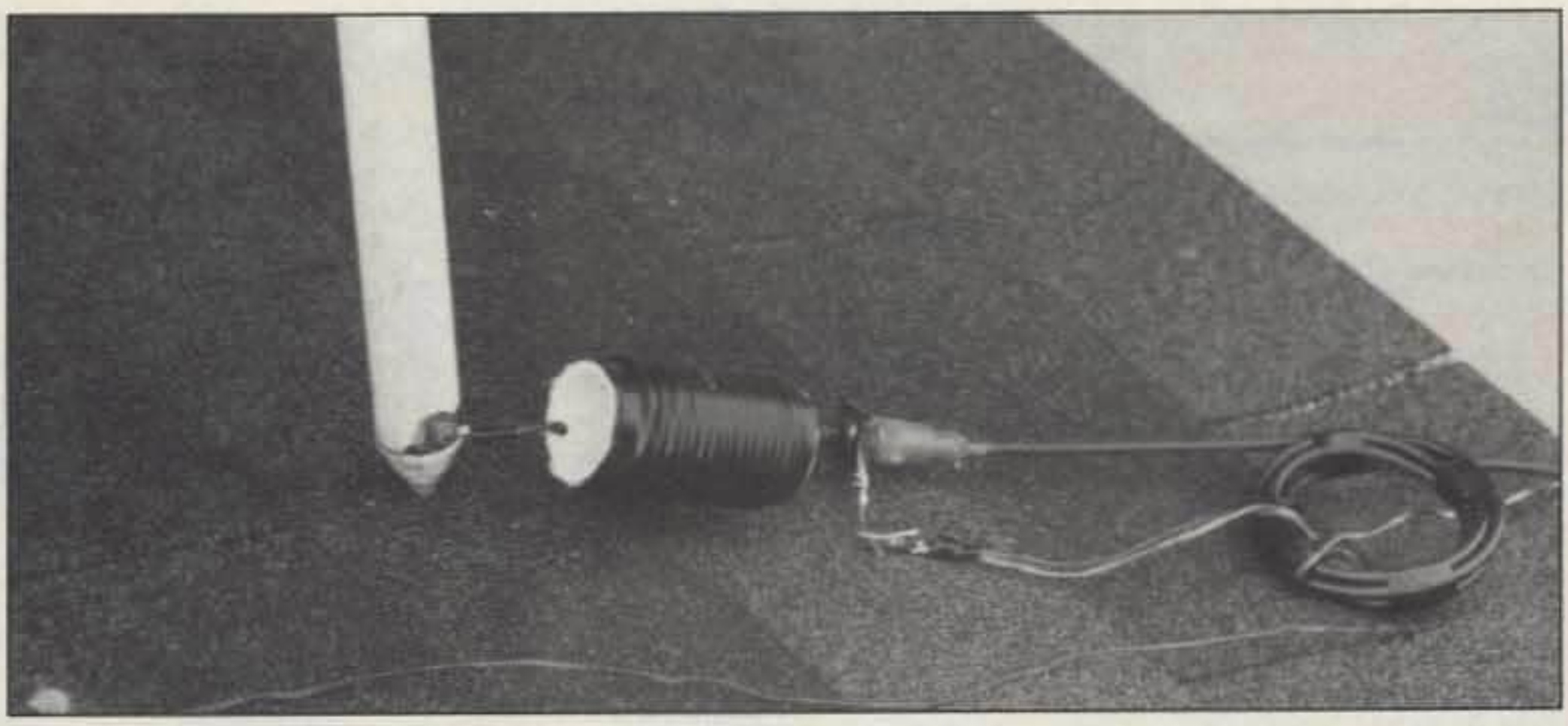

Photo B. The beach umbrella antenna feedpoint.

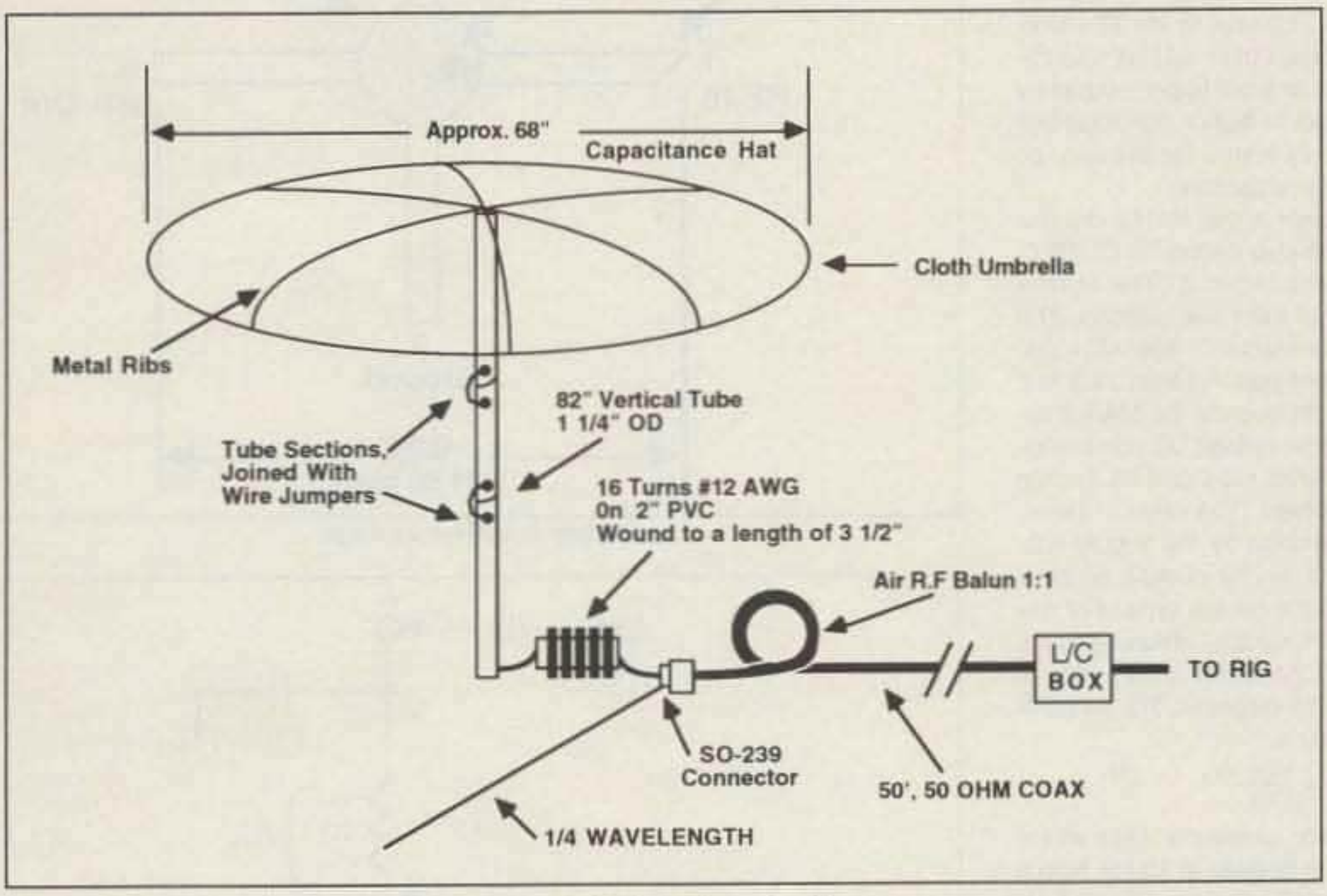

Figure 1. Diagram of the beach umbrella antenna system.

ing" was done, if any was done at all. The point was to have fun and to demonstrate that almost anything can be loaded up and be made to "talk."

Of deeper significance, however, was the demonstration of "Antenna in an Emergency." To me, and I think to many hams, when your antenna is "down" that is indeed an *emergency*. I know of one particular ham, a good friend of mine, who is very dependent on the weather for operation. When the wind blows, down comes the tower, down comes the beam antenna, and my friend goes QRT. But a good stout vertical will stand all but the most ferocious of winds (Hurricane Andrew?) and allow some degree of operation. So, although it would seem that the exercise with the Beach Brawley Boomer was purely for fun, the real ulterior motive behind it all was to show that an emergency antenna, even an umbrella, can allow operation to continue.

It is my opinion (please allow me while I'm on the soapbox) that a vertical of some kind, if only used as an emergency standby antenna, is fundamental, a prerequisite to any ham's family of antennas. Why, even a beach umbrella will do in a downpour. 73

BEACH BRAWLEY BOOMER DATA

Band (meters)	Frequency (MHz)
12	24.985
17	18.113
40	7.163

ELECTRICAL LENGTHS, DEGREES*

Vertical Tube	Canopy Hat	Coil	Total	Approximate Total Wavelength
62	61	15	138	3/8
45	53	17	115	1/3
18	27	42	87	1/4

*Note: For calculations and formulae, see *QST*, September 1978 (Walter Schulz K3OQF), regarding capacitance hat loading; and *The ARRL Compendium Vol. 1* (Bruce Brown W6TWW) regarding the base loading coil design.