

If your ability to put up an HF antenna is restricted by too little space or too much regulation, consider this new no-radials vertical from Comet Antennas that covers 80 through 6 meters.

CQ Reviews:

The Comet CHA250B HF/VHF Vertical Antenna

BY DAN DANKERT,* N6PEQ

In February, Mick Stwertnik of NCG offered me the opportunity to test the new Comet CHA250B HF/VHF vertical antenna (photo A). With the ARRL SSB DX contest just a couple of weeks away, the timing was perfect! I had the opportunity to A/B test the CHA250B against my home antenna system knowing that plenty of DX stations around the world would be on the air.

The main selling points of this antenna are ease of assembly, simple installation, elimination of ground radials (see photo B) and an SWR of 1.5:1 or less from 3.5 MHz to 57 MHz. An antenna tuner is not needed, thus making portable operation that much easier.

I was intrigued by the possibility of this antenna being an answer for numerous hams who live in areas that frown upon large antennas. How would the CHA250B fare on a crowded HF band during a contest? Would the antenna be "quiet" on receive? Finally, how would it perform across all the ham bands from 6 meters to 80 meters?

Easy Setup

Once the antenna arrived at my home, I was anxious to learn how complex (or painless) the task of assembly would be. Since the instruction sheet is a single-page leaflet (front and back, see photo C), with one side comprised of the antenna's specifications, I asked myself, "How difficult could this be?" The antenna consists of five sections of aluminum tubing of various diameters. These five sections slide into one another and are fastened by either a hose

clamp, self-tapping screws, or Allen screws. The bottom section of aluminum tubing is supplied with the matching network already mounted, which minimizes installation time. There are only two length measurements that need to be taken when fastening the sections together, and these are quite straightforward. Without exaggeration, the antenna was assembled in less than 10 minutes, including opening the box and removing any packaging material. I love efficiency and simplicity, and the CHA250B is the "aerial embodiment" of these two words!

The antenna is designed to mount to a mast with a diameter ranging from 1 inch to 2 inches. I decided to place the antenna atop some aluminum military mast sections that I have set aside for antenna projects. Using four sections of mast, the base of the antenna would be at approximately 15 feet, making the top of the vertical roughly 38 feet. I taped a few turns of coax to form an RF choke as indicated in the instructions, and then



Photo A— The CHA250B mounted on the military mast. The antenna has a low wind foot print, and it almost seems to disappear into the air. This was the setup used for the A/B testing.



Photo B— Here is the base of the antenna mounted to an aluminum mast section. Notice the exceptionally small matching network (black cylindrical section) of the antenna. No extended radials; this is it!

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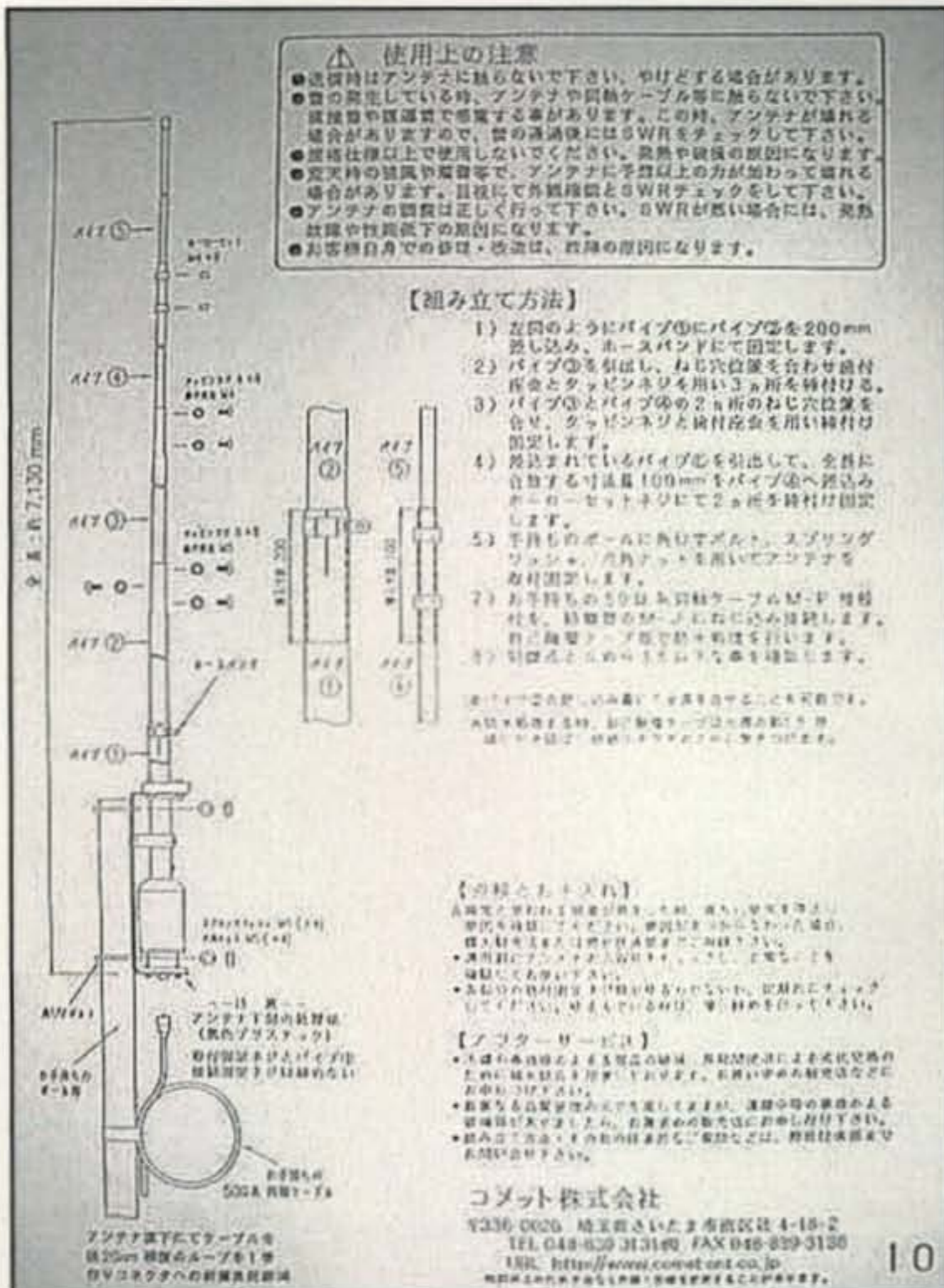


Photo C— This is the single sheet of instructions that is supplied with the antenna. Although it is printed in Japanese, the detailed drawing clearly indicates how the sections are joined together. Also specified are the two dimensions (in millimeters) that are to be measured during installation. You certainly do not need to know how to read Japanese in order to understand the assembly instructions. Ideally, it would be nice if in the future the instructions are provided in English.

SO-239 connector. Hoisting the antenna into position was a breeze thanks to the antenna's lightweight (7 lbs!) construction. I secured the antenna/mast assembly to the eave of my house, and connected the transmitter end of the coax to one of the remote antenna switches located at the base of my antenna tower. This would make for effortless switching between the CHA250B and other antennas when comparing signal levels.

With the antenna safely secured and the coax run, it was time to see how this antenna would perform! It was just past 0000Z, and the ARRL DX SSB contest had already started. I fired up the IC-7800 and switched to the CHA250B. I heard plenty of signals, and many were quite loud. I measured the SWR, and sure enough it was 1.3:1 or less across the entire 10-meter band. Hmm . . . I wondered what it would read on the other bands? I checked 12 meters, then 15 meters and so on. Sure enough, the SWR was 1.3:1 or less on all bands from 6 meters to 40 meters. On 75/80 meters the SWR peaked at the low end of 80 meters with a reading of 1.5:1, and then gradually dropped across the band until it reached a minimum of 1.2:1 at the high end of 75 meters. I was beginning to wonder if this antenna was simply a real long dummy



Photo D— A snapshot of the IC-7800 spectrum scope while on 20 meters with the CHA250B. The frequency range displayed is 14.140 to 14.340 MHz. Notice the large number of strong signals across the band.



Photo E— A snapshot of the 31-meter shortwave broadcast band. The frequency range displayed is 9.465 to 9.965 MHz. Plenty of strong signals to listen to here!

load, or if I would actually be able to work some DX with it. Time to go make some Qs!

On the Air

I set the transmitter output power to approximately 100 watts and began calling stations. Within a short period of time, from my QTH in southern California I had worked several stations in South America on 10 meters, and 15 meters provided contacts into Asia, South America, Central America, and the Caribbean. I generally made contact within one or two calls. So far, so good. Signal levels on 10 and 15 meters were definitely lower than on my tri-band Yagi, but the CHA250B is an easy to put up vertical designed to be quickly raised and lowered in areas that are "antenna unfriendly." You obviously cannot achieve this simplicity with a Yagi, rotator, and tower.

The following day brought many more contacts on 10, 15, and 20 meters. Approximately 90 countries were worked over the weekend with minimal operating time. Ten-meter contacts included R1ANF, 9Y4W, KH7X, HP3BS, PJ4G, and ZF2NT. Fifteen-meter contacts included OHØR, SKØX, ES5RW, S9SS, OH3RR, S58A, R1ANF, and 8R1EA. Twenty-meter

Amateur Bands Covered: 6, 10, 12, 15, 17, 20, 30, 40, and 75/80 meters
 Transmit Frequency Range: 3.5–57 MHz
 Receive Frequency Range: 2.0–90 MHz
 SWR: <1.5:1
 Height: 23 ft. 5 in.
 Weight: 7 lbs. 1 oz.
 Wind Survival: 67 mph
 Transmit Power Rating: 250 watts SSB and 125 watts FM
 Country of Origin: Japan

Table I—The Comet CHA250B manufacturer's specifications.

Band	DXCC QTH	Comet CHA250B	2-el Yagi @ 45'
10 m.	XE	S4	S9
10	LU	S3	S8
10	CE	S2	S7
10	W4	S3	S9
10	VE7	S4	S9
10	VK	S2	S7
15 m.	YB	S3	S8
15	W4	S7	S9+20
15	3D2	S3	S7
15	PY	S8	S9+20
15	JA	S4	S9
15	W7	S7	S9+20
15	9G	S2	S7
15	EA	S2	S7
20 m.	JW	S3	S8
20	JT	S3	S8
20	8R	S5	S9
20	W0	S7	S9+20
20	W4	S7	S9+20
20	V3	S6	S9+20
20	EA	S6	S9+20
20	G	S4	S9
20	JA	S6	S9+20

Table II—The A/B comparison of signal strength between the Comet CHA250B antenna and a triband Yagi for selected contacts on 10, 15, and 20 meters from the author's southern California QTH.

contacts (see photo D) included TF3CW, EA8ZS, SO2R, OH6KN, UW2I, J68RI, RU1A, CN2R, and EI7M. Over the next week I made abundant contacts on bands from 10 through 30 meters using several modes, including SSB, CW, RTTY, and PSK, some of which included BG1JJR, ZD8AD, 9M6BG, YB7M, EA9EU, T77CD, HG3X, and 9Z4FE. I was pleasantly surprised at how well the antenna played on 30 meters. Some of the stations logged on 30 meters were: JW0HS, TO7C, XT2JZ, V31TR, FS/KT8X, VP2V/DL7DF, FG/F5CWU, CE/W3WKP/M, and even FT5XO on Kerguelen Island!

As I proceeded down in frequency, it became more difficult to make long-haul QSOs. On 10, 12, and 15 meters it was quite easy to work whatever DX stations I could copy. Seventeen and 20 meters were more difficult, usually taking a few more calls to establish a contact. The weaker stations tended not to respond to me. Surprisingly, it was easier to make contacts on 30 meters than on 17 and 20. This is most likely due to the less-crowded band conditions, plus the fact that stateside stations are limited to a maximum power of 200 watts output on 30. Forty meters was more of a chal-

lenge, although the signal levels seemed relatively decent, with stateside stations typically hearing my signal. I was able to work into Central America and the Caribbean as well, but that was the extent of the DX on 40 meters. As would be expected, 75/80 meters was very difficult. The antenna is only 23 feet tall, so the fact that the antenna loads up well and is broadbanded on this band is an accomplishment in itself. I was able to work west coast stateside stations on 75/80 meters, and I was able to work one station in Alaska. The antenna also seemed "quiet." I live in an area that is generally quiet as far as noise is concerned, and I did not seem to acquire any greater level of noise with the CHA250B. In addition, I did not appear to pick up any "new" noise.

I did not work any stations on 6 meters. This was not the fault of the antenna, but rather the fact that I live in southern California, which happens to be "the pits" for 6-meter propagation. However, I was able to verify that the antenna does load on this band.

Another nice feature of the CHA250B is that not only is it resonant on the ham bands, but it is also resonant on the shortwave broadcast bands. The CHA250B does an admirable job as an all-around receiving antenna for the shortwave broadcast bands. Signal levels were excellent on the major SWBC and UTE bands (see photo E). Being an avid shortwave listener, I found this to be a nice attribute. An SWL who would like an antenna that is "all bands in one," low profile, and simple to erect should find this antenna to fill the bill nicely.

Tables II, III, and IV show signal levels received on the CHA250B versus larger antennas at my station (Table I is the manufacturer's specifications for the antenna). As you can see, the signal levels on the CHA250B are consistently lower than those of the bigger antennas, as would be anticipated.

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Band	DXCC QTH	Comet CHA250B	Rotatable Dipole @ 45'
30 m.	W0	S9+10	S9+25
30	W4	S9+20	S9+20
30	UA0	S7	S9
30	ON	S9	S9+10
30	YO	S6	S8
30	LU	S9+10	S9+20
40 m.	W7	S9+15	S9+35
40	W9	S8	S9+20
40	FT5X	S8	S9+10
40	JA	S9+10	S9+20
40	LU	S8	S9+10
40	OE	S7	S9+10

Band	DXCC QTH	Comet CHA250B	82' Long Dipole @ 35' (NW/SE)
75/80 m.	W7	S9+20	S9+35
75/80	BV	S4	S7
75/80	UA0	S7	S9+10
75/80	YV	S7	S9+10
75/80	VK	S5	S9
75/80	EI	S7	S9+10

Table IV— A/B comparison on 80/75 meters between the CHA250B and a much-less-than quarter-wave dipole.

Table III— A/B comparisons on 40 and 30 meters between the Comet vertical and a two-band rotatable dipole.

In spite of this, I was still able to work many stations as well as numerous DXCC countries!

Conclusions

At the get-go of this antenna project I found myself pondering whether this antenna would radiate at all due to its small size and lack of a radial system. As we all know, bigger is better in the antenna world, and if you have room to install a large antenna system, I highly suggest your doing so. This antenna is not designed to replace a Yagi or any other full-size antenna, but rather is intended to assist a specific segment of the amateur market that is forced to manage with antenna or space restrictions. If you are a ham or SWL and live on a small lot or in an antenna-restricted area, or if you just prefer to operate incog-

nito, without a question you will be forced to make significant compromises. I found the CHA250B to be an excellent choice for these circumstances. While we don't recommend violating any rules governing your QTH, one person can effortlessly raise the antenna at night when no one can spot it and take it down before daybreak. This antenna is also a great choice for portable operations, such as a quick and easy mini-DXpedition to a campground or a nice tropical island!

In short, the Comet CFA250B (estimated price \$400 to \$425) is simple to assemble, painless to elevate, and easy on the eyes, while at the same time getting you on 6 meters through 80 meters without the requirement of an antenna tuner and ground radials. You'll even be able to work some DX while you're at it!

More information on the Comet CHA250B can be obtained by contacting Comet's North American distributor: NCG Companies Inc., 1275 North Grove Street, Anaheim, CA 92806 (phone 1-800-962-2611, fax 714-630-7024, e-mail: <sales@natcommgroup.com>, on the web: <http://www.cometantenna.com>.