

***** New Product Review *****
Comet CHA250B HF/VHF Vertical Antenna

By: Dan Dankert N6PEQ
n6peg@dxer.com

In February, Mick Stwertnik of NCG offered me the opportunity to test the new Comet CHA250B HF/VHF vertical antenna. With the ARRL SSB DX contest just a couple of weeks away, the timing was perfect! I had the opportunity to A/B 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 is ease of assembly, simple installation, elimination of ground radials 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 that live in areas that frown upon large antennas. How would the CHA250B fair on a crowded HF band during a contest? Would the antenna be “quiet” on receive? Lastly, how would it perform across all the ham bands from 6 meters to 80 meters?

Comet CHA250B Manufacturer's Specifications	
Amateur Bands Covered	6, 10, 12, 15, 17, 20, 30, 40 & 75/80 Meters
Transmit Frequency Range	3.5 to 57 MHz
Receive Frequency Range	2.0 to 90 MHz
SWR	<1.5:1
Height	23' 5"
Weight	7 lbs 1 oz
Wind Survival	67 mph
Transmit Power Rating	250 Watts SSB & 125 Watts FM
Country of Origin	Japan

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 & back), with one side comprised of the antenna's specifications, I asked myself, “How difficult could this be?” The antenna consists of 5 sections of aluminum tubing of various diameters. These 5 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. This included 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” to 2”. I decided to place the antenna atop some aluminum military mast sections that I have set aside for antenna projects. Using 4 sections of mast, the base of the antenna would be at approximately 15’, making the top of the vertical roughly 38’. I taped a few turns of coax to form an RF choke as indicated in the instructions, then connected the coax to the antenna's SO-239 connector. Hoisting the antenna into position was a breeze thanks to the antenna's light (7 lbs!) weight construction. I secured the antenna/mast assembly to the eve of my house, and connected the transceiver 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.

- The top-left picture shows 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 that the instructions are provided in English.
- The top-right picture shows 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.



- The bottom picture shows 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!

With the antenna was safely secured and the coax run, it was time to see how this antenna performs! 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 was hearing 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, 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 load, or would I actually be able to work some DX with it? Time to go make some Q's!

I set the transmitter output power to approximately 100 watts, and began calling stations. Within a short period of time, 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 acquired contact within 1 or 2 calls. So far, so good. Signal levels on 10 & 15 meters were definitely lower than on a 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 would bring many more contacts on 10, 15, & 20 meters. Approximately 90 countries were worked over the weekend with minimal operating time. 10 meter contacts included: R1ANF, 9Y4W, KH7X, HP3BS, PJ4G & ZF2NT. 15 meter contacts included: OH0R, SK0X, ES5RW, S9SS, OH3RR, S58A, R1ANF & 8R1EA. 20 meter contacts included: TF3CW, EA8ZS, SO2R, OH6KN, UW2I, J68RI, RU1A, CN2R & EI7M. Over the next week, I made abundant contacts on bands from 10 thru 30 meters using several modes, including SSB, CW, RTTY & PSK. Some of which included: BG1JJR, ZD8AD, 9M6BG, YB7M, EA9EU, T77CD, HG3X & 9Z4FE. What was surprising is how well it 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 managed to work FT5XO on Kerguelen Island!



The top photo shows a snap shot 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.



The bottom photo is a snap shot 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!

As I proceeded down in frequency, it became more difficult to make long haul QSO's. 10, 12 & 15 meters were quite easy to work whatever DX stations you could copy. 17 & 20 meters were more difficult, usually taking a few more calls to establish a contact. The weaker stations tended not to respond to me. 30 meters was surprisingly easier to make contacts than 17 & 20. This is most likely due to the less crowded band conditions, plus stateside stations are limited to a maximum power of 200 watts output on 30 meters. 40 meters was more of a challenge, 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. 75/80 meters were very difficult as would be expected. The antenna is only 23' tall, so the fact that the antenna loads up well and is broad banded 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 attain 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 & UTE bands. Being an avid shortwave listener, I found this be a nice attribute. An SWL that would like an antenna that is "all bands in one", low profile and simple to erect, should find this antenna to fit the bill nicely.

The following tables exhibit signal levels received on the CHA250B versus larger antennas at my station. As you can see, the signal levels on the CHA250B are consistently lower than that of the bigger antennas as would be anticipated. In spite of this, I was still able to work many stations as well as numerous DXCC countries!

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

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

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

At the get-go of this antenna project, I found myself pondering if this antenna would radiate at all due to its small size and lack of an extensive 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 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 harsh antenna restrictions. If you are a ham or SWL and live in an antenna restricted area, or if you just prefer to operate incognito, without question you will be forced to make significant compromises. I found the CHA250B to be an excellent choice for these circumstances. 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 quick and easy mini-DXpedition to a campground or a nice tropical island! In short, the Comet CFA250B is simple to assemble, painless to elevate and is easy on the eyes, while at the same time getting you on 6 meters thru 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!