80m, 40m, 20m, 15m, 10m and 6m Six-band Vertical Antenna

CP-6

10m FM band compatible
Operation Instructions

DIAMOND ANTENNA

*Check the enclosed parts.

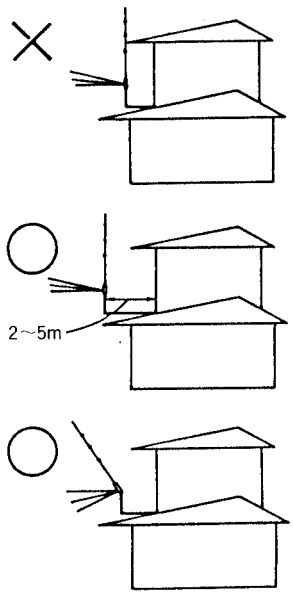
The CP-6 Antenna consists of the following list of parts. Please check the enclosed parts with the list. Each part number is provided for reference when ordering replacement parts.

Part name	Number	Quantity
Mast bracket set	15201	1
Mast support pipe	15202	1
Radial element holder	15203	2
Feedpoint assembly	15204	1
ipe No.1	15205	1
Double element trap coil assembly	15206	1
Single element trap coil assembly	15207	1
Pipe No.2	15208	1
Capacity hat assembly	15209	8
6m radial element trap coil assembly	15210	1
10m radial element trap coil assembly	15211	1
15m radial element trap coil assembly	15212	1
20m radial element trap coil assembly	15213	1
40m radial element trap coil assembly	15214	1
80m radial element trap coil assembly	15215	1
Radial element	15216	6
Radial element fastener ring	15217	6
Grip nut	15218	6
Hex head screw M6×8	15219	5
Spring washer M6	15220	3
Tapping screw M4×8	15221	6
Internal tooth lock washer M4	15222	6
Capacity hat fastener ring	15223	2

*Where are you going to locate your antenna ?

Since resonant frequency of an antenna, especially HF band antenna, changes depending on the place where one is located, find a place where the antenna can de used in its best performance.

1. If the CP-6 is located on the roof of a house or top of a building.
   Look around the roof to see if there are any obstacles such as TV antenna or water reservation tank. The CP-6 has to be located as far away as possible from those things to obtain its maximum performance.
2. If the CP-6 is installed on a balcony railing.
   Installing the antenna to close to the building wall may cause bad effect for electrical characteristics of the antenna. Locate at least 2m to 5m(7′ to 16′) away from the building wall depending on structure of the building. The BK-80 balcony railing antenna installation bracket is available for this use.



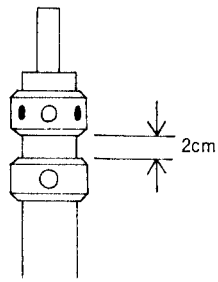
Tilt the antenna to avoid being effected by the building

*Before assembling the antenna··

Required tools
Hand wrenches, such as adjustable, box or open end wrench, Screw drivers
Rigid or flexible rules which is long enough to measure radial element length.

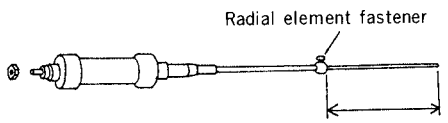
*Note

—Fasten a radial element trap coil assembly into the bracket too tight may result in destruction of the assembly.
—Though it is free to locate each of six radial elements for whichever direction you like if they are spreaded around the vertical element, it is recommended to locate 80m and 40m radial element at as far away as possible from the building for lower frequency radial element tend to be effected more by surroundings.
—If all six radial elements are set for one direction, it is recommended to locate 80m and 40m radial elements at both ends. In this case, move lower radial element bracket ring 2cm(0.8") lower.
—If steel guy wire is used, it is recommended to stretch from mast bracket section and put ceramic insulator at about 1m from the bracket.
—Radial elements for any frequency bands which are not intended to operate can be removed.



*Let's start assembling.

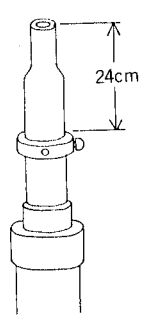
1. Put radial element in each radial element trap coil assembly by referring to the typical element length listed in Tadle A and fasten it with element fastener ring.
2. Set grip nut rightly to treaded part of each radial element trap coil assembly.



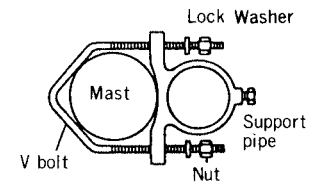
Adjust length of radial element

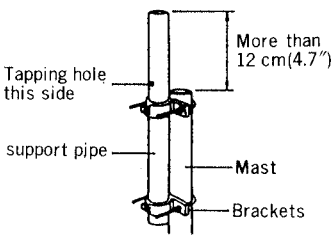
3. Connect piping No.1, double element trap coil assembly, single element trap coil assembly, and pipe No.2 in the vertical element section and fastening them with tapping screws and inner tooth washers by aligning holes in each joint section.
4. Attach four capacity hat assemblies to each capacity hat holder section.

—Capacity hat holders are set at the specified sections in the factory. locations for those capacity hat holders are fixed at about 24cm(9.4") below the top end of single element trap coil assembly for upper capacity hat and about 8cm(3.1") below the top end of double element trap coil assembly for lower capacity hat respectively. Though, Upper and lower capacity hat assemblies do not have to be aligned electrically, it looks better if it is aligned well.

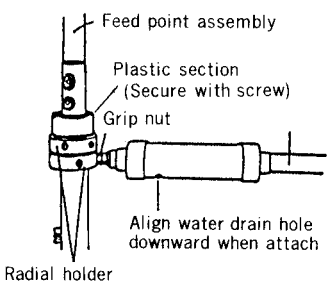


5. Attach mast support pipe to mast with mast brackets. Mast support pipe's tapping hole has to be placed above the brackets and it has to be pointed outside against the mast. Upper end of mast support pipe has to be placed more than 12cm(4.7") above the top end of the mast.





6. Place two radial element holders from upper end of the support pipe and fasten temporary with screw driver. Do not fasten to tightly at this stage, otherwise feedpoint assembly might not be put into the support mast later.
7. Connect a coaxial cable to feedpoint assembly through the support pipe. Then align the hole in the lower part of feedpoint assembly with the hole in the support pipe and secure them with hex head screw and spring washer.
8. Place vertical element on feedpoint assembly and fix with two hex head screws and spring washers.
9. Turn each radial element into radial element holders. Then align water drain hole in each radial element trap coil assembly downward by turning backward and fasten each element with grip nut. Note that 6m radial element does not have trap coil assembly.



Note

To avoid braking each radial element trap coil assemdly, turn it into a holder lightly till it stops and turn backward to align water drain hole downward and secure with a screw.

*After finish assembling, start frequency adjustment.

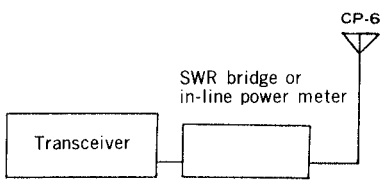
—Note for frequency adjustment.

Practice the following adjustment procedure at the place where the antenna is actually installed.

Test transmission for the adjustment has to be performed for as short time as possible and with as low RF power as possible. Maximum RF power rating of continuous wave(CW) is about 1/3 of it in SSB mode.

If the antenna is installed on a long balcony railing, the railing itself may work as a radial element and VSWR of the antenna may not be changed with the adjustment of attached radial element length, If resonant frequency of the antenna is within a desired range, the antenna can be used normally in this case. If resonant frequency is out of desired frequency range and adjustment is required, the antenna has to be isolated from the railing, moved to a different place or installed on a mast which at least 1m to 2m(3.3' to 6.6') long.

1. Prepare suitable VSWR meter for operating frequencies and output RF power. Then connect it as shown in bellow.



2. Adjustment procedure can de started from any frequency you like. Transmit at desired frequency and trim adjustment length of radial element to have lowest VSWR at the frequency.

*Adjustment length of radial element.

Adjustment length of each radial element is shown in the following table. If you do not have a VSWR meter, adjust it to a typical adjustment length.

Band	Speread radials	Concen-state radials	Length/ frequency
3.5MHz	≒540mm	≒450mm	35mm/ 10KHz
7MHz	≒470mm	≒440mm	10mm/ 10KHz
14MHz	≒490mm	≒400mm	15mm/ 20KHz
21MHz	≒540mm	≒460mm	32mm/ 50KHz
28-29MHz	≒420mm	≒380mm	27mm/ 50KHz
50MHz	≒420mm	≒300mm	50mm/ 1MHz

Table A

*If radial element of a band is made longer, resonant frequency of the band is made lower proportionally.

*Though typical adjustment length of each radial element is set at center frequency of each band, It varies more or less depending on the place the antenna is installed.

Adjustment example:

If center frequency of 40m band is set at 7.050 MHz and real center frequency when the antenna is installed is at 7.010MHz, then frequency difference between the two is:

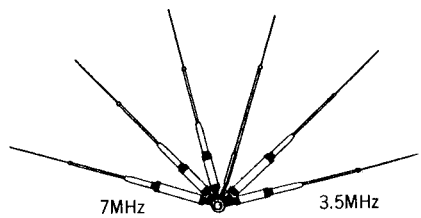
7.050MHz(desired center frequency) —7.010MHz (real center frequency) = 40KHz.

From Table A, adjustment length at 40m band is about 10mm per 10KHz, therefore:

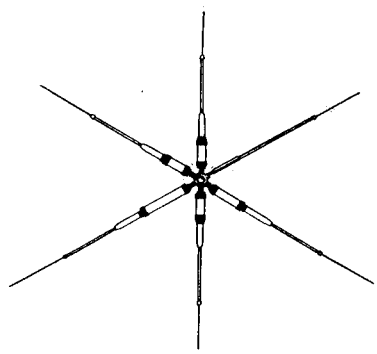
10(mm) × 40(KHz) / 10(KHz) = 40(mm)

Since real center frequency is lower than desired center frequency, radial element has to be made 40mm shorter to have 7.050MHz center frequency.

*One direction style radial elements



*Spread around style radial elements



Specifications

Frequency range	3.5, 7, 14, 21, 28, 50MHz
Feed point impedance	50 ohm unbalanced
VSWR	1.5 or less
Maximum power rating	200 w pep
Maximum wind resistance	90 MPH(40m/sec.)
Vertical element length	177"(4.5m)
Radial element length	71"(1.8m)
Weight	9.9 lbs. (4.9Kg)
Mast diameter accepted	1-1/5" to 2-1/3" (30~62 φ)
Desigh	6 band trap vertical antenna with trap radials

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