

DP-CP5

ASSEMBLY INSTRUCTIONS for DP-CP5 80-10 Meters 5 Band Trap Vertical Antenna with Trap radials

Read the instructions carefully before the antenna is assembled. The excellent performance of your Diamond antenna can only be achieved if the antenna is assembled in accordance with the instructions supplied.

Description

- 1 Compact, light weighted and very easy to assemble.
- 2 It is completely self-supported and does not need any guy wires.
- 3 Trap radials could be concentrated on one direction instead of spreading them around the antenna. This is especially convenient if the antenna is installed on balcony railing or window side of condominiums and urban apartments.
- 4 Since the antenna is direct dc ground at the feed point, coaxial cable and transceiver are being protected from the high voltage caused by lightning.
- 5 Center frequencies of the antenna are adjustable in each band simply by changing the length of each radial element.
- 6 Top loading structure utilizing capacitive hat enables the antenna to operate with full quarter wave length antennas in its performance.
- 7 It is rigid and rugged enough to withstand the wind pressure over 90 MPH.
- 8 Mast brackets are adjustable to accept 1 1/8" to 2 1/3" dia-ster mast.
- 9 Feed point section is kept water proof by covering it with support pipe.

Assembly instruction:

- 1 Attach support pipe to a suitable mast with brackets accompanied as shown in Fig. 1. Tapping hole in support pipe should be placed above brackets and it should be turned outside against the mast. The top end of support pipe should be set more than 12 cms (4.7") above the top end of the mast as shown in Fig. 1.

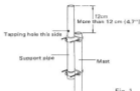


Fig. 1

- 2 Place radial holders on support pipe and secure them temporarily with screws. Do not tighten screws at this time, otherwise feed point assembly will not be able to be inserted into support pipe properly.
- 3 Connect suitable coaxial cable with UHF connector to feed point assembly through support pipe. Then align the holes in the bottom of feed point assembly with the holes in support pipe securing with screw and lockwasher.

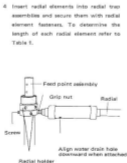


Fig. 2

- 5 Screw radial trap assemblies with radial elements to radial holders with hands. Then align water drain holes of radial trap downward and fasten them with grip nuts as shown in Fig. 2. To concentrate radials on one direction, place 3.5 Mhz and 7 Mhz radials at both ends and others on center. Caution: To avoid breaking radial traps, be sure to screw radial traps with hands until they stop and align water drain holes by turning them back and forth. Then fasten them with grip nuts.

- 6 Place radial holders at the upper end of support pipe immediately underneath the plastic section of feed point assembly. Then set each radial for desired direction and tighten screws which secured radial holders temporarily.

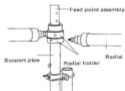
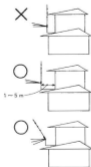


Fig. 3

- 7 Now start assembling vertical element. Align the holes in tubing #1 with the holes in the upper part of double trap assembly securing with screws and lockwashers.

- 8 Attach four capacitive hot spikes to the spoke holder already placed on the upper part of double trap assembly and fasten them with grip nuts.
 - 9 Insert single trap assembly into the top of double trap assembly and align the holes. Then secure them with screws and lockwashers.
 - 10 Attach the remaining four capacitive hot spikes to spoke holder already placed on the upper part of single trap assembly and fasten them with grip nuts.
 - 11 Insert tubing #2 into the top of single trap assembly and align the holes. Then secure the holes with screws and lockwashers.
 - 12 Attach assembled vertical element to feed point assembly and align the holes. Fasten them with screws and lockwashers.
- Notice: Keep lower frequency radials as far away from the buildings as possible, since they tend to be more affected by the surrounding buildings than higher frequency ones.



Tilt the antenna to avoid being affected

Fig. 4

Adjustment Procedure

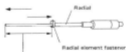
Notice: The following adjustment should be performed at the place where the antenna is actually installed, since a resonant frequency of a HF antenna changes depending on the surroundings of the installation place. If the antenna is installed on balcony railing or window side of the building, it should be placed at least 1-5 meters (3'-16') away from the building wall to avoid the antenna being out of adjustment range. (See Fig. 3)

- 1 Connect suitable SWR bridge or in-line power meter such as WELZ SP-300 between the transceiver and the antenna as shown in Fig. 4.



Fig. 5

- 2 Place the transceiver in transmit at desired frequency in each band where you usually operate. While observing VSWR or reflected power, adjust radial element for lowest VSWR or reflected power. Refer typical adjustment length of each radial element to Table 1. (See Fig. 5)



Adjust length of radial element

Fig. 6

Caution: Tune-up should not be done continuously with the transceiver's output power exceeds 1/3 of maximum power rating.

Table 1
Typical radial element length at each band

Bands	Spread radials	Concentrate radials	Length/ Frequency
3.5MHz	= 495 mm	= 495 mm	35 mm/ 10 KHz
7 MHz	= 485 mm	= 420 mm	19 mm/ 10 KHz
14 MHz	= 420 mm	= 350 mm	15 mm/ 20 KHz
21 MHz	= 350 mm	= 320 mm	30 mm/ 50 KHz
30 MHz	= 560 mm	= 530 mm	27 mm/ 50 KHz

If radial element of a band is made longer, a center frequency of the band becomes lower proportionally. For instance, if your desired center frequency at 3.5 MHz band is 3535 KHz but the actual center frequency when the antenna is assembled is 3505 KHz. Then all you have to do is as follows;

3535 KHz (Desired center frequency) - 3505 KHz (Actual center frequency) = 30 KHz (Frequency difference)

From Table 1, adjustment length is 35 mm for 10 KHz therefore; 35 (mm) x 30 (KHz)/ 10 (KHz) = 105 (mm)

From the equations above, actual center frequency is 30 KHz lower than desired

Spread around style radials



One direction style radials (Concentrate radials)



● V. SWR



center frequency. Therefore, radial element has to be shortened for 106 mm to achieve 3535 center frequency.

Notice: A center frequency might not be changed by adjusting radial element, if the antenna is mounted on long steel railing which is long enough to work as a ground. If this is the case, electrical isolation of brackets or separation of radials from steel railing is needed.

Specifications of the DP-CPS

Frequency range	3.5, 7, 14, 21, 28 MHz
Feed point impedance	50 ohm unbalanced
VSWR	1.5 or better
Maximum power (dBm)	200 wpm
Maximum wind resistance	90 MPH (40 m/sec.)
Vertical element length	177" (4.5 m)
Radial element length	71" (1.8 m)
Weight	9.9 lbs. (4.5 kg)
Max diameter occupied	1 1/5" to 2 1/3" (39 - 62 g)
Design	5 band trap vertical antenna with trap radials

General Notice

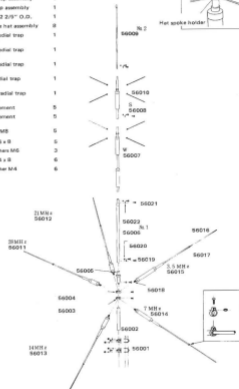
- Radials have to be used either for spread around style or one direction style.
- Do not change the positions of hat spoke holders which are fixed at the specific positions in the factory. The positions of hat spoke holders are at 180 mm from the top end of single trap assembly for the upper hat and 80 mm from the top of double trap assembly for the lower hat.
- Since the DP-CPS is direct to ground, circuit across the center and the outer conductor is short-circuited when it is measured by volt-ohm meters.

Parts List

When ordering replacement parts for the antenna, refer to parts number, parts name and type of the antenna.

Parts #	Parts Name	Quantity
56001	Bracket with screws, lockwashers and nuts	2
56002	Support pipe	1
56003	Radial holder (two holes)	1
56004	Radial holder (three holes)	1
56005	Feed point assembly	1
56006	Tubing #1 1/5" O.D.	1
56007	Double trap assembly	1
56008	Single trap assembly	1
56009	Tubing #2 2/5" O.D.	1
56010	Capacitive hat assembly	2
56011	28 MHz radial trap assembly	1
56012	21 MHz radial trap assembly	1
56013	14 MHz radial trap assembly	1
56014	7 MHz radial trap assembly	1
56015	3.5 MHz radial trap assembly	1
56016	Radial element	5
56017	Radial element fastener	5
56018	Grip nut M8	5
56019	Screw M6 x 8	5
56020	Lockwashers M6	3
56021	Screw M4 x 8	6
56022	Lockwasher M4	6

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