

# **DIAMOND ANTENNA**

## **CP6**

### **6 Band Trap Vertical 80-6m**

#### **Instruction Sheet**

The CP6A is a multi-band trap-vertical antenna for HF bands, covering the 80, 40, 20, 15, 10m & 6m amateur bands. Made from heavy duty aluminum, the CP6 is easily assembled, yielding excellent performance and reliability from a compact base station antenna.

#### **Specifications**

FREQUENCY:	80 – 40 – 20 – 15 – 10 – 6m
POWER:	200 Watts P.E.P.
IMPEDANCE:	50 Ohms
VSWR:	1.8:1 (Nominal). See table A for tuning.
ELEMENT PHASING:	1/4 Wave trap vertical groundplane.
GROUNDING:	Direct Grounding. Antenna element & radials connected to mounting pipe.
MAX WIND RATING:	80 MPH (no ice)
MAX DIA ACCEPTANCE:	1.2 – 2.4 inches
OVERALL LENGTH:	15.10 feet (4.9kg)
WEIGHT:	9.9 lbs. (130 g)
CONNECTOR:	SO-239 female UHF

#### **Antenna Location & Mounting**

The CP6 is a compact vertical antenna using loading-coil radials. The compact size offers many options on mounting location. When choosing a mounting location, keep the following factors in mind:

- (1) Resonant frequency of HF antennas can change based on location. Antenna should be mounted away from trees, buildings and other antennas.
- (2) If mounting near house or balcony, best performance will be achieved if mounted at least 15 feet away from structure.
- (3) To avoid unsafe conditions, do not install near electrical or power lines.



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## Antenna Assembly Instructions

(1) Before assembly, verify all parts are included for proper assembly. The following tools will be required for assembly: tape measure, phillips screwdriver, and two crescent wrenches or metric open-end wrenches.

(2) *Radial Assembly.* Assemble each radial trap coil (part #: 15210-15215) to a radial element (part #: 15216) using fastener ring (part #: 15217); see figure A. Adjust for proper radial length. See table A (page 3). Lightly tighten setscrew at this time, as later adjustment may be required for VSWR tuning.

(3) Assemble mast pipe #1 (part #: 15205); double element trap coil assembly (part #: 15206); single element trap coil assembly (part #: 15207); and mast pipe #2 (part #: 15208) together with self-tapping screws & washers enclosed (part #: 15211 & 15222). Align holes in each joint section and fasten.

(4) Assemble capacity hat assemblies (part #: 15223) with radials (part #: 15209). Assemble 80m capacity hat (top) with standard radials (13-3/4"). Assemble 40m capacity hat with 2 standard radials (13-3/4") and 2 longer radials (20").

Note: some applications will require adding additional longer radials to tune 40m bands to desired frequency. See #12 below for additional tuning info.

Secure radials with lock nut fasteners. Attach capacity hat assemblies in proper location.

Note: capacity hat holder is located 9.4" (24cm) below the top end of single element trap coil assembly. See figure B. The lower holder is located 3.1" (8cm) below the top end of double element trap coil assembly. Align capacity hat assemblies for proper appearance.

(5) Attach support pipe to mast with brackets and U-bolts. Support pipe's bolt hole must be above brackets and pointed away from mast (see figure C). Support pipe must be 4.7" (12cm) above tip of mast; this provides adequate clearance for radial assemblies.

(6) *Lightly attach* element holders on support pipe.

Note: Damage may occur to support pipe if fastened too tight, as matching network will not fit into support pipe.

(7) Insert coax-cable through support pipe and attach to matching network (part #: 15204). Align threaded hole with matching network and fasten bolt.

(8) Place assembled vertical elements on matching network with fasten bolts.

(9) Attach radials to element holders (see figure D).

Note: Position of radials is not critical, but 80m and 40m radials should be positioned further from surrounding objects or structures.

If mounting radials in one direction, 80m and 40m must mount on opposite ends from each other. You must lower element holder 0.8" (2cm). See figure E.

(10) Thread radial until snug and reverse until water drain hole is in downward position (see figure D). Secure radial with lock nut attached to trap.

(11) After antenna assembly is complete, securely fasten all screws and fastener bolts.

(12) Check VSWR (see figure F) with quality meter (Bird, Coaxial Dynamics, Diamond, etc. MFJ Analyzer is not recommended for this antenna) and adjust each radial to desired center frequency. Refer to table A for tuning adjustments.

Note: VSWR tuning may vary based on mounting location and obstructions.

40m tuning can be adjusted by adding additional longer capacity hat radials. The longer radials will have the effect of raising the center frequency. Once adjustment range is achieved, 40m tuning radial can be adjusted for best VSWR.

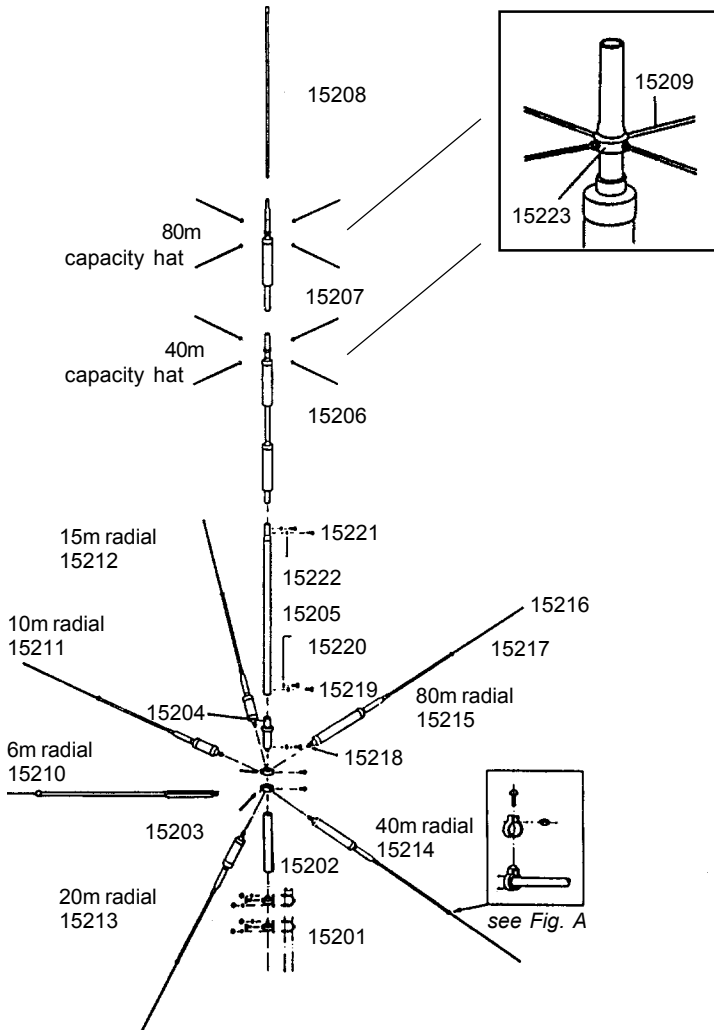
(13) After antenna VSWR adjustment, an antenna tuner may be utilized to extend useable bandwidth.

We suggest mounting immediately beneath the antenna a one-turn choke coil of approximately 6-10" diameter. This will act as an isolation choke, and release strain on connector. The coil diameter is not critical.

Note: Some cables require a larger diameter coil to prevent movement of center conductor. Tape coil to mast (see figure G).

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## Antenna Description



## Part Description

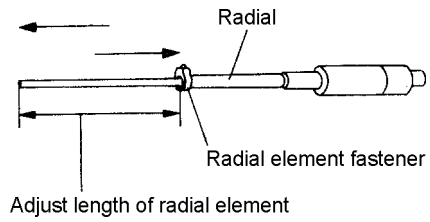
Part #	Description	Quantity
15201	Mounting clamps w/u-bolts	2
15202	Support pipe	1
15203	Radial element holders (CP-6)	2
15204	Matching network	1
15205	Assembly pipe #1	1
15206	Double element trap coil assembly	1
15207	Single element trap coil assembly	1
15208	Assembly pipe #2	1
15209	Capacity hat radials w/lock nuts	8
15209A	40m capacity hat radials (long)	4
15210	6m radial assembly	1
15211	10m radial assembly	1
15212	15m radial assembly	1
15213	20m radial assembly	1
15214	40m radial assembly	1
15215	80m radial assembly	1
15216	Radial elements w/lock nut (CP-6)	6
15217	Radial element fastener rings (CP-6)	6
15218	Radial lock nut (CP-6)	6
15219	Heck head bolts M6X8	5
15220	Lock washers M6	3
15221	Self tapping screws M4X8	6
15222	Internal tooth lock washers	6
15223	Capacity hat radial holders	2

**Table A**

Note: VSWR tuning varies based on mounting location. Adjust for minimum VSWR.

Band	Approximate Radial Length for VSWR adjustment	Approx. Length/Frequency Change	Approx. Bandwidth 1.8:1 SWR or better
80m/3.5 MHz	18 inches	1.4 inches / 10 KHz	± 20 KHz
40m/7 MHz	31 inches	0.4 inches / 10 KHz	± 40 KHz
20m/14 MHz	18 inches	0.6 inches / 20 KHz	± 100 KHz
15m/21 MHz	17 inches	1.25 inches / 50 KHz	± 200 KHz
10m/28 MHz	26 inches	1.1 inches / 50 KHz	± 500 KHz
6m/50 MHz	13 inches	2.0 inches / 1 MHz	± 3 MHz

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(see Table A)  
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Fig. A

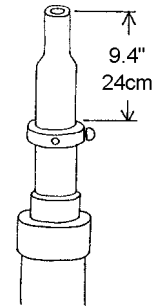


Fig. B

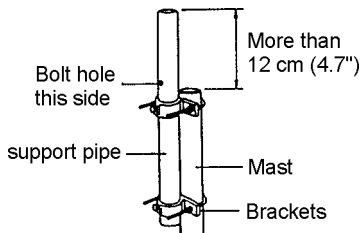


Fig. C

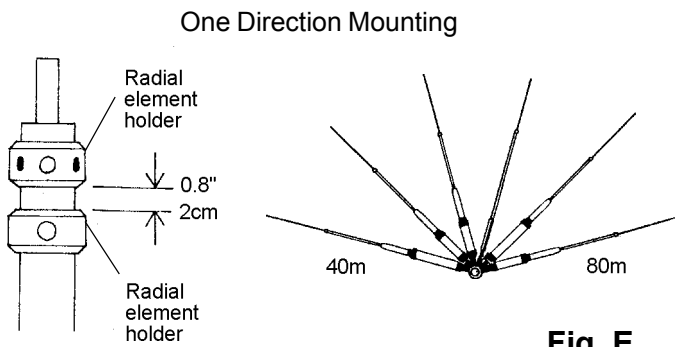
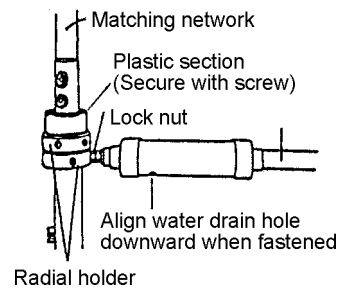


Fig. E

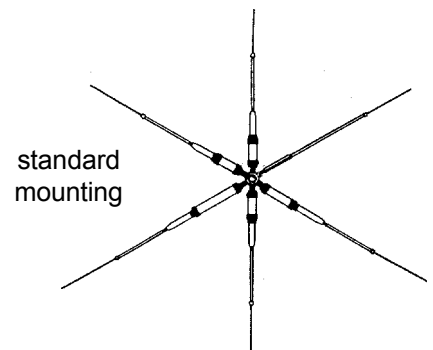


Fig. D

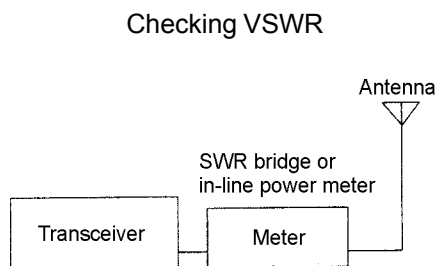


Fig. F

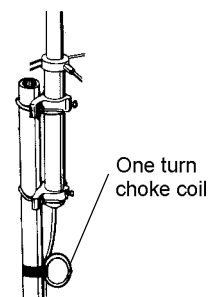


Fig. G