



TECHNICAL MANUAL and INSTALLATION INSTRUCTIONS

V-425 SERIES 36-FOOT HEAVY DUTY WHIP ANTENNA

VTM-03-016

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V-425 Series

REVISION SHEET

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1.0 V-425 INFORMATION

1.1 Introduction

This section describes the electrical and mechanical properties of the V-425 series of fiberglass whip antennas. Information necessary to install, operate and maintain the antenna system is covered in the sections to follow.

1.2 Technical Reference Data

Mechanical Properties			
	V-425	V-425FT	V-425CL
Top Section Length	18.5 ft (5.67 m)		
Base Section Length	17.5 ft (5.33 m)		
Typical Assembly Length	36.0 ft (11.0 m)	36.9 ft (11.3 m)	
Weight	155 lbs (70.3 kg)	160 lbs (72.5 kg)	
Conductor Material	36.0 ft (11.0 m) 155-175 lbs (70-80 kg) Copper wire and strips embedded in the fiberglass and thermo-setting epoxy resin composite		
Finish	Polyurethane paint		
Mounting Position	Vertical		
Base Diameter	17.5 inches (43.75 cm)		
Mounting Hole Diameter	0.718 inches (1.79 cm)		
Joints	Bronze ferrule C/W locking screw		
Mounting Holes Dimensions	12 holes equally spaced on a 14.625 inch (36.56 cm) diameter bolt circle		
Storage Temperature	-140F to +158F (-95C to +70C)		
Operating Temperature	-76F to +140F (-50C to +65C)		
Wind Loading Test	Up to 150 mph (240 km/hr) relative		
Abrasion Resistance	Very good		
Water absorption	After 24 hours immersed: 0.2% After 48 hours immersed: 0.6% After 168 hours immersed: 2.0%		

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Electrical Properties			
	V-425	V-425FT	V425- CL
Frequency Range	1.6 to 30 MHz	1.6 to 30 MHz	0.28 to 1.6 MHz
Resonant Frequency	6.1 MHz (nominal)	5.9 MHz (nominal)	0.1 to 2.0 MHz
Power Rating	5kW (average)	5kW (average)	1 kW (average)
Dry Withstanding Voltage	25 kV		
Electrical Length	34.5 ft (10.5 m)	36.9 ft (11.3 m)	varies with fo

1.3 General Description

The V-425 Heavy Duty Whip Antenna is a commercially available version of the AS-5085/SR Naval whip antenna that has been designed to the strict requirements of the Canadian Navy.

1.4 Electrical Description

The Valcom V-425 antenna models are field proven 36-foot (11 m) epoxy fibreglass antennas. They are capable of operating with an average power of up to 5 kW over the frequency range of 0.28 MHz to 30 MHz. The antenna is available as a side-feed (standard option), a feed-through-the-base (FT) option and a coil-loaded (CL) option.

1.5 Mechanical Description

Top-Section. The top-section is a hollow, tapered cylinder made of circumferentially and longitudinally wound fibreglass filaments using a thermosetting epoxy resin matrix. Copper strips are embedded in the composite and are secured at the top end to a hemispherical corona ball and at the bottom to a female threaded ferrule into which the base section is secured. The surface is sanded to a smooth finish, then it is primed and painted with a polyurethane surface coating.

Base-Section. The base-section is constructed and finished in the same fashion as for the top-section, except that the diameter expands out to meet the integral fibreglass mounting base. In the standard version, embedded copper conductors are connected to the threaded male ferrule at the top and to a conducting ring near the bottom. The side feed terminal extends from the bottom ring to the surface of the antenna approximately 18.0 inches from the bottom of the base flange. In the CL version, the embedded copper straps connect to an internal loading coil before terminating to the threaded male ferrule at the top. Both the standard version and the CL version are available as an FT version, where the lower feedpoint at 18 inches is internally extended to the bottom of the antenna to a heavy-duty fibreglass insulator. The base can withstand a flash-over voltage of 25 kV.

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1.6 **Scheduled Maintenance**

The antenna is virtually maintenance free. The external finish is a polyurethane two part compound paint. The minimum finish life before showing signs of deterioration should be at least ten years under normal climate condition.

When used in salt-water environments, it is recommended to wash the antenna base with fresh water to remove any build-up of dried salt residue. This should be performed on a monthly basis or after prolonged exposure to sea-spray.

Use a small wire brush to clear any debris from the drain groove found in the bottom of the antenna base. In the case of the FT version, there is a small drain hole located on the side of the insulator. This hole should be kept clear from blockage using a small length of stiff wire.

All threaded hardware, including the base mounting bolts, the set-screws at the joint and the input power connection should be inspected for signs of damage and to ensure proper tightness (suggested torque settings can be found on pages 8 and 9). In most cases a quick visual inspection is all that is required. This must be performed on a monthly basis or whenever practical.

1.7 **Corrective Maintenance**

Generally, no corrective maintenance is possible or required. If one section is severely damaged, it must be replaced by a new section. Workshops having experience in handling epoxy fibreglass composite structures may attempt the repair of minor surface damage if practicable.

NOTE

DO NOT USE LEAD BASE PAINT TO TOUCH-UP OR REPAINT THE ANTENNA. USE ONLY EPOXY BASE PAINT.

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2.0 INSTALLATION

2.1 **Unpacking**

Open the shipping crates and remove the antenna sections and any possible accessories purchased with it. Remove all packing material including the male ferrule protector on the antenna section. The V-425 antenna, as shipped, consists of the items listed in Table 3.1. Check that all of the items are present and in good condition.

2.2 **New Site Preparation**

The following are the basic steps to erect a complete V-425 antenna system on land. Other configurations should be handled accordingly.

- (1) Check to see that the site is free of cables, debris and other obstructions.
- (2) Excavate and pour concrete pad in the site chosen.
- (3) Excavate trench in site chosen as required.
- (4) Install Ground Screen in site chosen.
- (5) Lay cables and backfill all trenches.
- (6) Erect antenna.

2.3 **Assembly and Installation of Antenna on the site**

- (1) Obtain four saw horses or other supports that will hold the complete antenna horizontally at a convenient working height and place them in the assembly area. The assembly area must be a cleared working space approximately 40 feet long and 20 feet wide.
- (2) Support the base section (Item 1, Table 3.1) on two of the saw horses.
- (3) Support the top section (Item 2, Table 3.1) on the other two saw horses so that the two sections lie in the same straight line.
- (4) Make sure the threads of the male and female ferrule on the base and top sections are clear of foreign material and not damaged.
- (5) Assemble the second antenna section onto the base section and tighten to align the arrows (if applied) at the joint using the strap wrench supplied (Item 3, Table 3.1). Install the set-screws and seal with the sealant provided (items 4 and 6). A final torque between 65-85 in-lbs is acceptable for the set-screws.
- (6) The antenna is now ready to be raised to its final position. Raise antenna into position using a gin pole and winch or a bucket truck or a crane.

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(7) Once the antenna is in the vertical position, secure the antenna to its mounting plate with eight 5/8-11 hex head cap screws (not provided), along with two flat-washers, a split-lock-washer and a nut. Bolt length will need to be determined by the installing activity. A final torque between 90-100 ft-lbs is acceptable for the bolts.

2.4 **Electrical Installation**

Connect a suitable feed wire from the antenna coupler to the antenna feedpoint (found either on the side of the antenna or the bottom of the antenna).

Connect a suitable lead wire from the ground lug of the antenna coupler to the antenna ground screen.

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3.0 PARTS LIST

3.1 General

A list of parts shipped with Valcom V-425 whip antenna appears in Table 3.1.

Table 3.1 - List of Parts for the V-425 whip antenna

Item No.	Part Number	Description	Qty	Notes
1		Base Section	1	
2		Top Section	1	
3		Strap Wrench Set	1	
4		Screw Kit	1	
5		Hex Key	1	
6		Silicone Sealant	1	
7		Technical Manual and Installation Instructions	1	

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4.0 QUICK REFERENCE DATA

4.1 **Manufacturer's Address**

Postal address:
Valcom Manufacturing Group, Inc. P.O. Box 603 Guelph, Ontario Canada N1H 6L3

Shipping address:
Valcom Manufacturing Group, Inc. 175 Southgate Drive Hanlon Industrial Park Guelph, Ontario Canada N1G 3M5

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4.2 Outline Drawing

