



VTM-13-002

TECHNICAL MANUAL

and

INSTALLATION INSTRUCTIONS

**AS-5088/FRC
54-FOOT HEAVY DUTY
WHIP ANTENNA**

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1.0 AS-5088/FRC INFORMATION

1.1 Introduction

This section describes the electrical and mechanical properties of the AS-5088/FRC fiberglass whip antenna. Information necessary to install, operate and maintain the antenna system is covered in the sections to follow.

1.2 Technical Reference Data

Mechanical Properties	
Top Section Length	18.0 feet (5.49 meter)
Middle Section	18.5 feet (5.67 meter)
Base Section Length	17.5 feet (5.33 meter)
Typical Assembly Length	54.3 feet (16.6 meter)
Weight	Approximately 251 lbs (114 kg)
Conductor Material	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	-95°C to +70°C (-140°F to +158°F)
Operating Temperature	-50°C to +65°C (-76°F to +140°F)
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%

Electrical Properties	
Frequency Range	0.6 MHz to 30 MHz (with tuner)
Resonant Frequency	4.0 MHz (nominal)
Power Rating	10kW (average), 20kW (PEP) from 2 MHz to 30 MHz
Dry Withstanding Voltage	25 kV
Electrical Length	32.8 feet (16.1 m)

1.3 General Description

The AS-5088/FRC Heavy Duty Whip Antenna is specifically designed to the strict requirements of the Canadian Navy and the world's best antenna in its class.

1.4 Electrical Description

The Valcom, AS-5088/FRC model, is a field proven 54-foot (16.6 m) epoxy fibreglass antenna. It is capable of operating with an average power of up to 10 kW (20 kW peak power) over the frequency range of 2 MHz to 30 MHz.

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 end to a female threaded ferrule. The surface is sanded to a smooth finish, then it is primed and painted with a polyurethane surface coating.

Middle-Section. The middle-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 male threaded ferrule and at the bottom end to a female threaded ferrule. 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 and middle sections, except that the diameter expands out to meet the mounting base. 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. The base can withstand a flash-over voltage of 25 kV.

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.

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.**

2.0 INSTALLATION

2.1 Unpacking

Open the shipping crates and remove the antenna sections. Remove all packing material including the male ferrule protector on the antenna section. The AS-5088/FRC 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

Check to see that the underside of the steel base plate at the site is free of cables and other obstructions.

2.3 Assembly and Installation of Antenna on the Site

The following steps should be followed to assemble the AS-5088/FRC Heavy Duty Naval Whip antenna.

- (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 60 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 middle 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 4, Table 3.1). Install the set-screws and seal with the sealant provided (items 5 and 7). A final torque between 65-85 in-lbs is acceptable for the set-screws.
- (6) Use two additional (or remove two of the saw horses supporting the base and middle sections) and use them to support the top section in line with the other two sections.
- (7) Make sure the threads of the male and female ferrule on the base and top sections are clear of foreign material and not damaged.

- (8) Assemble the top antenna section onto the middle section and tighten to align the arrows (if applied) at the joint using the strap wrench supplied (Item 4, Table 3.1). Install the set-screws and seal with the sealant provided (items 5 and 7). A final torque between 65-85 in-lbs is acceptable for the set-screws.
- (9) 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.
- (10) Once the antenna is in the vertical position, secure the antenna to its mounting plate with using 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.
- (11) Connect a suitable feedline wire from the antenna coupler to the feed point of the antenna.

3.0 PARTS LIST

3.1 General

A list of parts shipped with Valcom AS-5088/FRC whip antenna appears in Table 3.1.

Table 3.1 - List of Parts for the AS-5088/FRC Whip Antenna

Item No.	Part Number	Description	Qty	Notes
1		Base Section (AS-5088/FRC)	1	
2		Middle Section	1	
3		Top Section	1	
4		Strap Wrench	1	
5		Set Screw Kit	1	
6		Hex Key	1	
7		Silicone Sealant	1	
8		Technical Manual and Installation Instructions	1	

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

4.2 Outline Drawing

