



TECHNICAL MANUAL

OPERATION AND INSTALLATION INSTRUCTIONS

V33035AM-CL2 PORTABLE AM BROADCAST ANTENNA

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A	Original Issue	February 2, 1999
B	Re-formatted entire manual to current standards. Made changes to simplify understanding.	April 5, 2004
C	Removed erroneous impedance data chart and adjusted dimensions and weights	January 18, 2011

i

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 GENERAL INFORMATION	1
1.1 Introduction	1
1.2 Equipment Description	1
1.3 Safety Precautions	1
1.4 Specific Warnings	1
2.0 INSTALLATION	3
2.1 Site Information	3
2.2 Tools and Materials Required	3
2.3 Unpacking and Re-packing	3
2.4 Installation Procedure	3
3.0 FUNCTIONAL DESCRIPTION	5
3.1 Description	5
4.0 OPERATION	8
4.1 General	8
4.2 Operating Procedures	8
5.0 MAINTENANCE	13
5.1 Introduction	13
5.2 Operator Maintenance	13
5.3 Preventative Maintenance	13
6.0 SHIPMENT AND STORAGE	14
6.1 Shipment	14
6.2 Storage	14
7.0 WARRANTY	15
8.0 QUICK REFERENCE DATA	16
8.1 General	16
8.2 Manufacturer's Address	16

LIST OF TABLES AND FIGURES**TABLES**

Table 1.1 - Electrical Specifications of the V33035AM-CL2	2
Table 1.2 - Mechanical Specifications of the V33035AM-CL2	2
Table 4.1 - Section vs. Frequency Quick Look-up Chart	8

FIGURES

Figure 2.1 - The V33035AM-CL2 Antenna mounted on a trailer	4
Figure 2.2 - The V33035AM-CL2 Antenna Disassembled and ready for transportation	5
Figure 3.1 - Dimensions of the V33035AM-CL2 Antenna	7

1.0 GENERAL INFORMATION

1.1 INTRODUCTION

This manual provides general information on the functional description, as well as, the installation and the operating and maintenance instructions for the V33035AM-CL2 Broadcast Antenna.

1.2 EQUIPMENT DESCRIPTION

The V33035AM-CL2 Broadcast Antenna is a fibreglass whip antenna designed to operate over the AM radio band. The antenna provides vertically polarized, omnidirectional azimuth radiation from 540 to 1,700 kHz when used with an AM transmitter. It is designed for use aboard naval vessels but could easily be used in a land based installation with an appropriate ground screen. The antenna consists of a base section and up to 6 interchangeable top sections to provide full coverage over the AM band. The antenna may also be supplied with a Valcosphere, a top hat assembly or both. The Valcosphere is a spherical termination device mounted on top of the antenna to help reduce the effects of corona at high power levels. A top hat assembly helps reduce the reactance of the antenna and provides a modest improvement to operational bandwidth.

1.3 SAFETY PRECAUTIONS

The following general safety precautions are not related to any specific procedures and therefore do not appear elsewhere in this publication. These are recommended precautions that personnel must understand and apply during any phase of operation and maintenance.

WARNING!

Keep away from live circuits. Operating personnel must at all times observe all safety regulations to prevent serious injury or death due to electric shock.

Do not service or adjust alone. Under no circumstances should any person service or adjust the equipment except in the presence of someone who is capable of rendering aid.

Personnel working with or near high voltage should be familiar with modern methods of resuscitation.

1.4 SPECIFIC WARNINGS

The following specific precautions are related to inspecting and removing the antenna.

WARNING!

Ensure that the transmitting equipment is de-energized prior to inspection of the antenna. Make sure any test equipment is properly grounded to prevent shock.

Make sure the antenna is properly supported before removing mounting hardware.

TABLE 1.1 - Electrical Specifications of the V33035AM-CL2

Frequency Range	540 - 1,700 kHz (using multiple top sections)
Input Impedance	Varies with frequency
Polarization	Vertical
Azimuth Coverage	Omnidirectional
Input Connector	3/8-24UNF-2B threaded Terminal Lug
Dry Withstanding Voltage	30 kV - Standard construction
Current Handling	24 A _{RMS}
Power Handling	2 kW

TABLE 1.2 - Mechanical Specifications of the V33035AM-CL2

Base Insulator Material	Epoxy fibreglass
Joints	Bronze threaded section with locking pins
Wind Loading	< 150 mph (241 km/h)
Ice Loading	0.75" (1.9 cm) ice at 100 mph (161 km/h)
Abrasion Resistance	Good
Centre of Gravity	180" (457 cm) from base
Temperature	-60 °F to 150 °F (-51 °C to 65 °C)
Humidity	0 - 100%
Finish	Polyurethane, white
Approximate Weight	400 lbs (181.5 kg) (varies with each coil loaded 2 nd section)
Height Overall	36' 4" (11.1 m)
Base	17.5" (44.5 cm) diameter
Mounting Holes	12 holes of 0.718" (1.8 cm) diameter, equally spaced on a 14.625" (37.1 cm) diameter bolt circle

2.0 INSTALLATION

Note: The following section represents a typical installation of the V33035AM-CL2 antenna. Individual situations may require a different approach.

2.1 SITE INFORMATION

The V33035AM-CL2 is designed primarily to be portable and for temporary installations as a backup for the main transmitting antenna. The antenna can be installed in either a shipboard environment or a land based environment. For land base installations the antenna can be mounted to a concrete foundation or it can be mounted and transported on a trailer (see figures 2.1 and 2.2). Here, a suitable ground screen must be employed for optimal performance. The antenna should be installed in a non-obstructed environment, clear from any contiguous structures such as masts, bulkheads or other metal objects.

2.2 TOOLS AND MATERIALS REQUIRED

A drive socket for 5/8" hex head bolts, a ratchet and a strap wrench are required. Four 3 foot high sawhorses are also very useful.

2.3 UNPACKING AND RE-PACKING

Remove the screws from the top of the packing crate and carefully remove each antenna section. Remember to save the crate for reshipment purposes. Do not drop any heavy objects on the antenna sections and ensure the sections do not strike any sharp objects when handling.

2.4 INSTALLATION PROCEDURE

- A) Place the 4 sawhorses (or other supports that will hold the complete antenna horizontally at a convenient working height) near the assembly area. The assembly area must be a cleared working space approximately 40' long and 5' wide.
- B) Support the base section on 2 of the sawhorses and tie it in place. If the antenna is being mounted on a hinged base plate, the bottom section may be bolted to the base plate at this time using twelve 5/8" hex bolts along with appropriate nuts, flat washers and lock washers. Be aware of the location of the feedpoint at this time.
- C) Select a top section whose frequency range covers the desired operating frequency. Refer to Chapter 4 for details on this.
- D) Support the top section using 2 sawhorses so that the two sections lie in the same straight line.

- E) Move the top section toward the bottom section and carefully turn the top section with the strap wrench until the top section begins to screw onto the bottom section. Take care not to cross-thread the coupling. Continue threading the two sections together with the strap wrench until the coupling is fully secure. This is evident when the two arrows are aligned.
- F) When both sections are secured, insert the supplied 1/4-20UNC hex-socket set screws and tighten.
- G) If the antenna was shipped with a top hat assembly or a Valcosphere (or both), install these items now. The top hat whips thread into the eight 3/8-24 threaded holes found in the top of the second section. The Valcosphere threads into the very top of the second section into the 1-8 threaded hole. Install the supplied 10-32 set screw to lock the Valcosphere in place.



Figure 2.1 V33035AM-CL2 mounted on a trailer.

- H) If the antenna has been mounted on a hinged base plate, it may now be carefully erected. Otherwise carefully move the antenna to its mounting location using a crane or other suitable means. Secure the antenna to the base using 5/8" hex bolts and appropriate nuts, flat washers and lock washers. Be aware of the location of the feedpoint at this time.
- I) The antenna is now ready for connection to the matching coupler.



Figure 2.2 The V33035AM-CL2 disassembled and ready for transportation.

3.0 FUNCTIONAL DESCRIPTION

3.1 DESCRIPTION

The V33035AM-CL2 Broadcasting Antenna is a base mounted, monopole whip antenna which provides omnidirectional coverage from 540 kHz to 1,700 kHz. The antenna consists of a base section and a series of interchangeable coil-loaded top sections. The base insulator has two functions. First, it electrically isolates the radiating section of the antenna from the ground and second, it physically supports the antenna. The overall length of the antenna is approximately 36 feet when fully assembled. Refer to Figure 3.2 for antenna dimensions.

The coil-loaded top sections change the impedance values of the antenna in order for the matching coupler to be tuned for specific operating frequencies. There are six top sections and each one pertains to a specific sub-band within the entire operational band. Refer to Table 4.1 for a cross-reference chart of each antenna section and its corresponding frequency band.

The Valcosphere is a spherical termination device mounted on top of the antenna to help reduce the effects of corona at high power levels. The top hat assembly helps reduce the reactance of the antenna and provides a modest improvement to operational bandwidth.

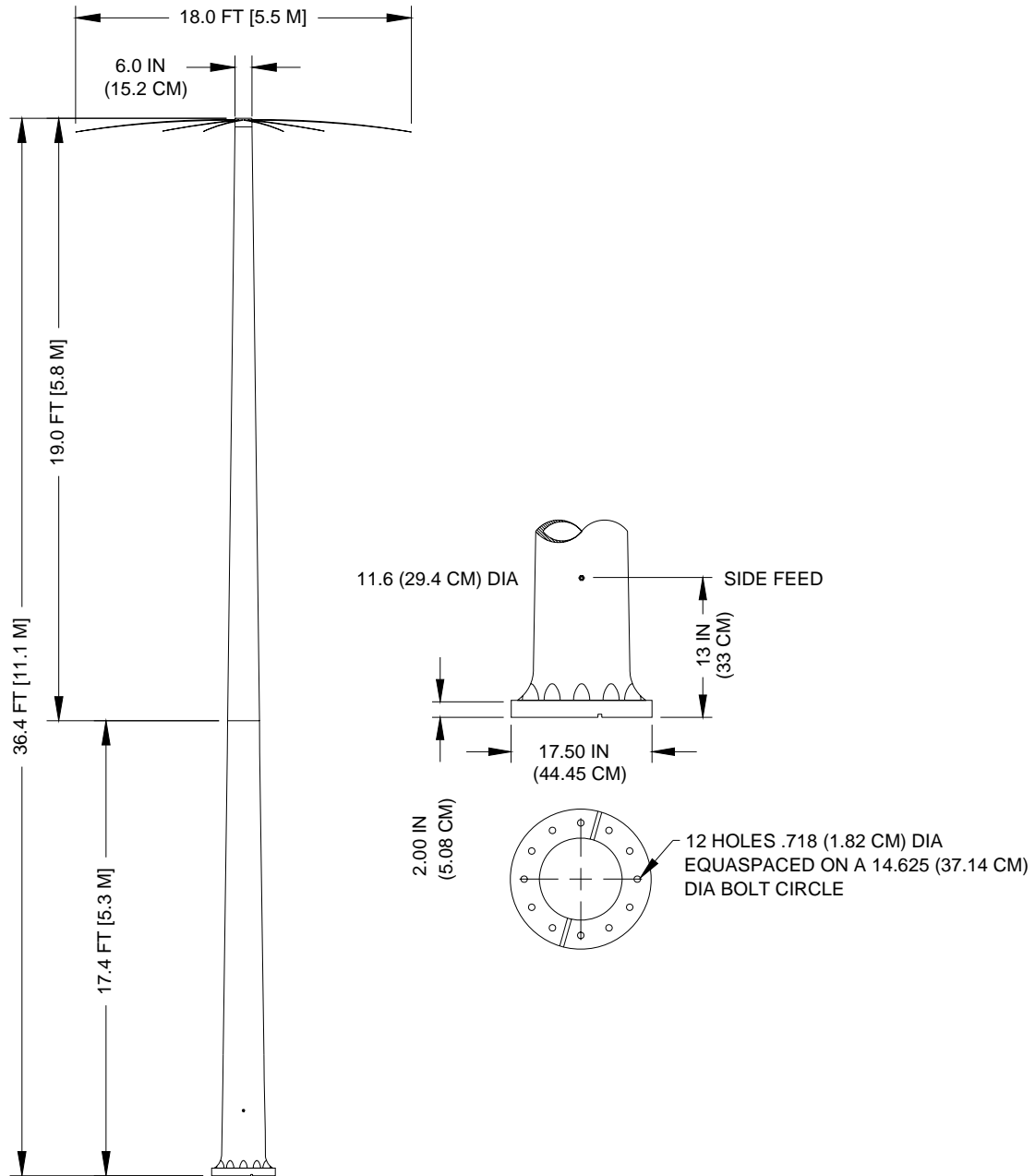


Figure 3.1 - Dimensions of the V33035AM-CL2 Antenna

4.0 OPERATION

4.1 UPPER SECTION

The V33035AM-CL2 antenna comes with a series of interchangeable, coil-loaded upper sections. The appropriate upper section must be selected prior to assembly. Table 4.1 is a quick look-up chart which offers the approximate sub-bands each section is capable of operating in when used with a simple L-C type manual coupler.

For other types of couplers or for better control of the impedance matching, contact the factory for impedance values.

4.2 OPERATING PROCEDURES

The antenna has no controls or indicators built into it. No special procedures are required for its operation.

TABLE 4.1 - Section vs. Frequency Quick Look-up Chart

Section	Frequency Sub-band
A	540 kHz to 600 kHz
B	600 kHz to 720 kHz
C	720 kHz to 840 kHz
D	800 kHz to 980 kHz
E	980 kHz to 1,400 kHz
F	1,400 kHz to 1,700 kHz

5.0 MAINTENANCE

5.1 INTRODUCTION

This chapter provides operator and preventive maintenance instructions for the V33035AM-CL2 Broadcast Antenna.

5.2 OPERATOR MAINTENANCE

- A) The V33035AM-CL2 antenna does not contain any moving parts. Operator maintenance is limited to visual inspection of the antenna. Any maintenance of the antenna can be incorporated into the overall scheduled maintenance of the ship or station.
- B) Visually inspect the antenna for dirt or salt build up especially around the input connector. Wash the antenna with soap and clean water.
- C) Visually inspect the antenna surface for wear, chipping or damage. **DO NOT USE LEAD OR OTHER METALLIC PAINT ON THE BASE INSULATOR!**
- D) Visually inspect the drain groove in the bottom of the antenna's base and ensure it is clean and clear of all debris.

WARNING!

Ensure that the transmitting equipment is de-energized before performing any inspections.

5.3 PREVENTIVE MAINTENANCE

The antenna preventive maintenance is limited to ensuring the antenna is free from dirt or salt build up and ensuring the exterior of the antenna and the input connector is not damaged or worn. The preventive maintenance of the antenna can follow the ship or station's preventive maintenance system.

If the antenna is used in coastal regions or close to a salt-water body, the antenna base should be washed down with clean fresh water periodically to remove any salt residue and prevent possible corona burning at the base.

6.0 SHIPMENT AND STORAGE**6.1 SHIPMENT**

The V33035AM-CL2 antenna is shipped in a reuseable wooden container. After unpacking the antenna, the container can be saved for later use if the antenna is to be moved. If the original container is not available, it is recommended that a container similar to the original wooden one be constructed and the antenna shipped in that. Care is to be exercised that neither the antenna's exterior or the coupling threads get damaged.

6.2 STORAGE

When not in use, the V33035AM-CL2 antenna itself, or the unused upper sections, should be stored in the original wooden container (or similar) to prevent damage. The antenna has a storage temperature rating of (-51 °F to 65 °F). The antenna does not have a shelf life limit.

7.0 WARRANTY INFORMATION

The warranty covering the V33035AM-CL2 Broadcast Antenna includes the period of five years after the date of sale and is restricted only to the replacement of defective material. The warranty is applicable only if the antenna is used within the specifications listed in the tables found on page 2 of this manual.

Note about Corona Discharge - During high corona discharge conditions, damage to the antenna can occur. Valcom cannot warranty damage to the antenna resulting from Corona Discharge due to the unpredictable nature of Corona Discharge. Current and voltage ratings must not be exceeded on the antenna.

8.0 QUICK REFERENCE DATA

8.1 GENERAL

Manufacturer's contact information can be found in this section.

8.2 MANUFACTURER'S ADDRESS

Postal address:	Shipping address:
Valcom Manufacturing Group, Inc. P.O. Box 603 Guelph, Ontario Canada N1H 6L3	Valcom Manufacturing Group, Inc. 175 Southgate Drive Hanlon Industrial Park Guelph, Ontario Canada N1G 3M5
Or directly at:	
Phone : (519) 824 - 3220 Fax : (519) 824 - 3411 e-mail : enquiries@valcom-guelph.com Internet : www.valcommfg.ca	