



## **TECHNICAL MANUAL**

### **OPERATION AND INSTALLATION INSTRUCTIONS**

# **ANTENNA AS-3770B/U**

Document No: VTM-91-770/B

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## SECTION 1

### GENERAL INFORMATION AND SAFETY PRECAUTIONS

#### 1-1. GENERAL 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 many phases 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 electrical 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 voltages should be familiar with modern methods of resuscitation.

#### 1-2 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 the test equipment is properly grounded, to prevent electric shock.

#### CAUTION

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

#### CAUTION

Do not coat the insulator with any substance; do not paint with lead base paints.

### **1-3. INTRODUCTION**

1-3.1 Purpose. This manual provides general information on the AS-3770B/U, as well as an operational and functional description of the antenna and installation data. Information in this manual will assist in installing and operating the antenna.

1-3.2 Scope. This technical manual is provided to aid in the operation and installation of the antenna.

1-3.3 Applicability. This manual applies to the single whip application of Antenna AS-3770B/U. Where this antenna is used in twin whip application, consult the appropriate antenna group technical manual.

### **1-4. EQUIPMENT DESCRIPTION**

1-4.1 General Description. The antenna, shown in Figure 1-1 is an 18 foot transmitting/receiving whip antenna for general use with HF communications equipment. The antenna has an aluminum radiating element and an integral fiberglass insulator/mounting base.

1-4.2 Capabilities. The antenna provides vertically polarized, omnidirectional azimuth radiation from 10 to 30 MHz when the antenna is operated in a twin whip and tuner configuration. It may be employed for general purpose broadband communications reception from VLF to 30 MHz. It meets high shock requirements and provides minimum mast loadings.

1-4.3 Limitations. When used as directed, the antenna has no limitations.

### **1-5. RELATIONSHIP TO OTHER EQUIPMENT**

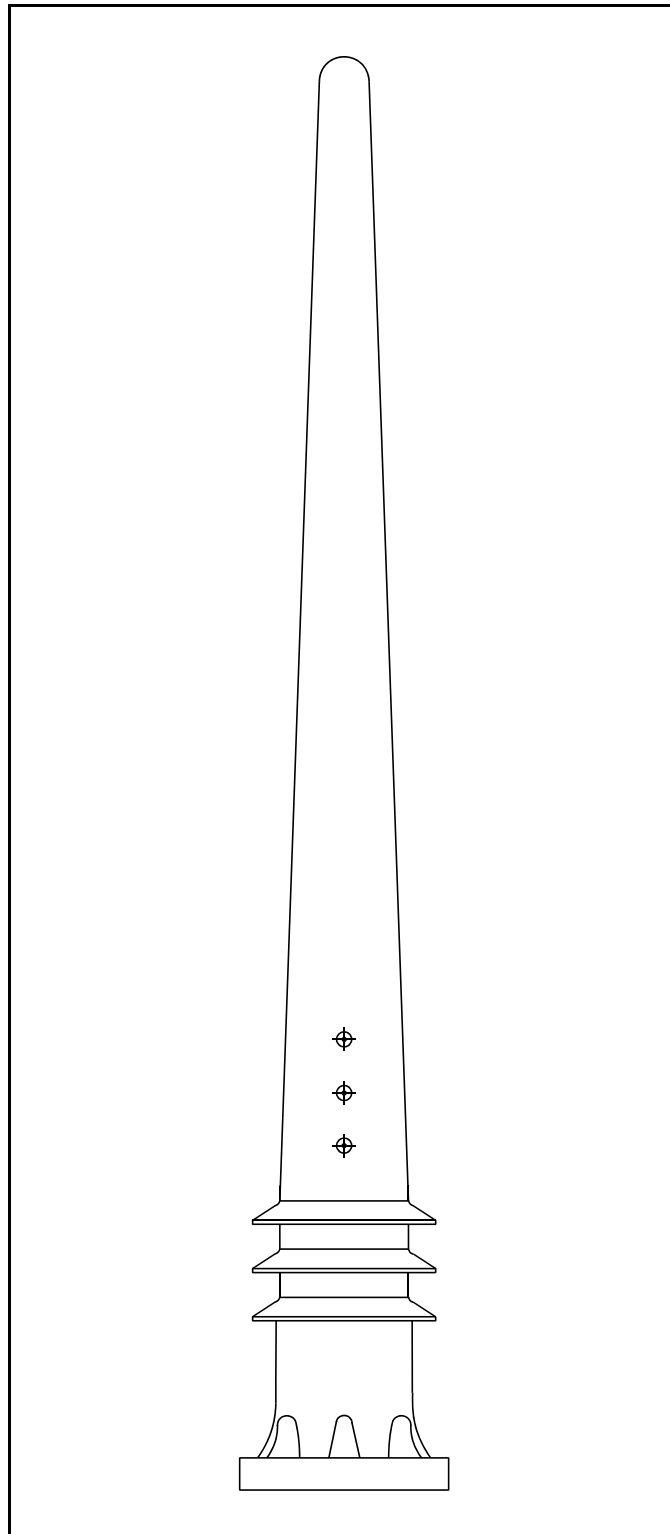
The AS-3770B/U Antenna interfaces with the HF receiving and transmitting equipment.

### **1-6. REFERENCE DATA**

Table 1-1 lists the reference data for the antenna.

### **1-7. EQUIPMENT ACCESSORIES, AND DOCUMENTS SUPPLIED**

Table 1-2 lists the equipment and documents supplied.



**Figure 1-1.** Antenna AS-3770B/U

**Table 1-1.** Reference Data

PARAMETER	SPECIFICATION
NOMENCLATURE	ANTENNA AS-3770B/U
MANUFACTURER	VALCOM MANUFACTURING GROUP, INC. 35736
FREQUENCY RANGE	TRANSMITTING: 10 TO 30 MHZ (TWIN WHIPS AND TUNER) RECEIVING: VLF TO 30 MHZ
IMPEDANCE	VARIES
POLARIZATION	VERTICAL
POWER CAPABILITY	5 KW SINGLE ANTENNA
RADIATION PATTERN	OMNIDIRECTIONAL
TEMPERATURE	OPERATING: -54°C TO +65°C NON OPERATING: -62°C TO +71°C
WIND VELOCITY	120 MPH
HUMIDITY	95%
SHOCK	QUALIFIED TO MEET MIL-S-901C, GRADE A
VIBRATION	QUALIFIED TO MEET MIL-STD-167-1 TYPE I

**Table 1-2.** Equipment, Accessories and Documents Supplied

QTY	NOMENCLATURE	OVERALL DIMENSIONS (INCHES)				WEIGHT (POUNDS) UNCRATED
		CRATED		UNCRATED		
		HEIGHT	DIA	HEIGHT	DIA	
1	ANTENNA AS-3770B/U	---	---	216	8.50 (BASE)	78
1	TECHNICAL MANUAL FOR AS-3770B/U ANTENNA VTM-91-770					
1	DC-4 ELEC INSULATING COMPOUND					

## **SECTION 2**

### **OPERATION**

#### **2-1. INTRODUCTION**

This chapter provides operating instructions for the antenna.

#### **2-2. CONTROLS AND INDICATORS**

The antenna contains no controls or indicators.

#### **2-3. OPERATING PROCEDURES**

2-3.1 Operator Turn-On. No operator turn-on procedures apply since no power is required to operate the antenna. However, the antenna is coupled to RF equipment (transmitter/receiver) and to associated systems which may require energizing. For operating instructions, consult the appropriate technical manuals.

2-3.2 Modes of Operation. The antenna operated automatically, and no operator intervention is required other than interconnecting various associated equipment with the antenna.

2-3.3 Operation Under Interfering Conditions. No additional or alternate instructions are necessary to operate the antenna under interfering conditions.

2-3.4 Operator Turn-off. Since no power is required to operate the antenna, no operator turn-off is required. However, the specific equipment connected to the antenna may require operator turn-off. Consult the associated technical manuals for turn-off procedures.

2-3.5 Emergency Operation. No additional or alternate steps are necessary to operate the antenna under emergency conditions.

2-3.6 Emergency Turn-off. The antenna requires no emergency turn-off. For emergency turn-off of specific equipment connected to the antenna, consult the associated technical manuals.

## SECTION 3

### FUNCTIONAL DESCRIPTION

#### 3-1. INTRODUCTION

This chapter provides the functional description of the antenna.

#### 3-2. OVERALL LEVEL

The antenna is a base mounted, high-power antenna which provides omnidirectional coverage for general purpose communications reception from VLF to 30 MHz and for transmission from 10 to 30 MHz when used in a twin whip and tuner configuration.

#### 3-3. MAJOR FUNCTION LEVEL

The antenna consists of an aluminum radiating element and an integral fiberglass insulator/mounting flange. The aluminum radiating element tapers from approximately 5 inches in diameter at the base insulator to approximately 2.62 inches in diameter at the top. The integral fiberglass insulator/mounting flange isolates the radiating element of the antenna from the ground and physically supports the element. The insulator/mounting flange is constructed of high-strength, laminated epoxy fiberglass materials.

When the antenna is used for transmitting, an antenna coupler is required. When used for receiving, the antenna requires the use of a termination box. For transmitting or receiving, a feedwire assembly is required to connect the antenna to the antenna coupler or termination box.

3-3.1 Feedwire Assembly. The feedwire assembly is provided by installing activity and provides a means of attaching the antenna tuner or termination box to the antenna.

## **SECTION 4**

### **INSTALLATION**

#### **4-1. SITE INFORMATION**

Valcom's AS-3770B/U HF Antenna is designed primarily for shipboard installation. The antenna can also be used at shore installations. The antenna should be installed in a non-obstructed environment, clear from any contiguous structures, such as masts, bulkheads, or other metal objects.

#### **4-2. TOOLS AND MATERIALS REQUIRED**

No special tools and materials are required for installation.

#### **4-3. UNPACKING AND REPACKING**

Table 1-2 gives data on the overall dimensions, volume, and weight of the crated antenna. To unpack, carefully remove the screws holding the cover, and remove the antenna from the container. Save the container to pack the antenna for reshipment. No special handling procedures are required; observed normal precautions when handling the antenna.

#### **4-4. FOUNDATION**

The antenna should be installed vertically on a mounting plate that has bolt holes matching those in the antenna base (see figure 4-1).

#### **4-5. INPUT REQUIREMENTS**

The antenna has an rf power handling capability of 5 kW when used singularly or 10 kW when used in a twin whip configuration with tuner in the 10 to 30 MHz frequency range.

#### **4-6. INSTALLATION PROCEDURES**

After unpacking the antenna, proceed with its installation as follows:

- a. Examine the exterior of the antenna for damage; make sure that the radiating element and the base has not been damaged, misaligned, or fractured.
- b. Carefully lift the antenna to its mounting platform. Align the mounting holes of the base flange with the mounting holes in the platform.

- c. Secure the antenna to its mounting plate with the eight 1/2-13 hex head cap screws, flatwashers, split lockwashers and nuts. Hardware to be determined and supplied by the installing activity.
- d. Connect the system feedline to the antenna at anyone of the three feedpoints. After connection to the feedpoint has been made, coat the feedpoint with the electrical insulating compound to provide a weatherseal at the feedpoint.

#### **4-7. INSTALLATION CHECKOUT**

Checkout of the antenna after installation can only be accomplished by operating the receiving and transmitting equipment that is used with the antenna.

Note: If replacing an existing antenna with a new antenna, it is recommended that new mounting hardware be used.

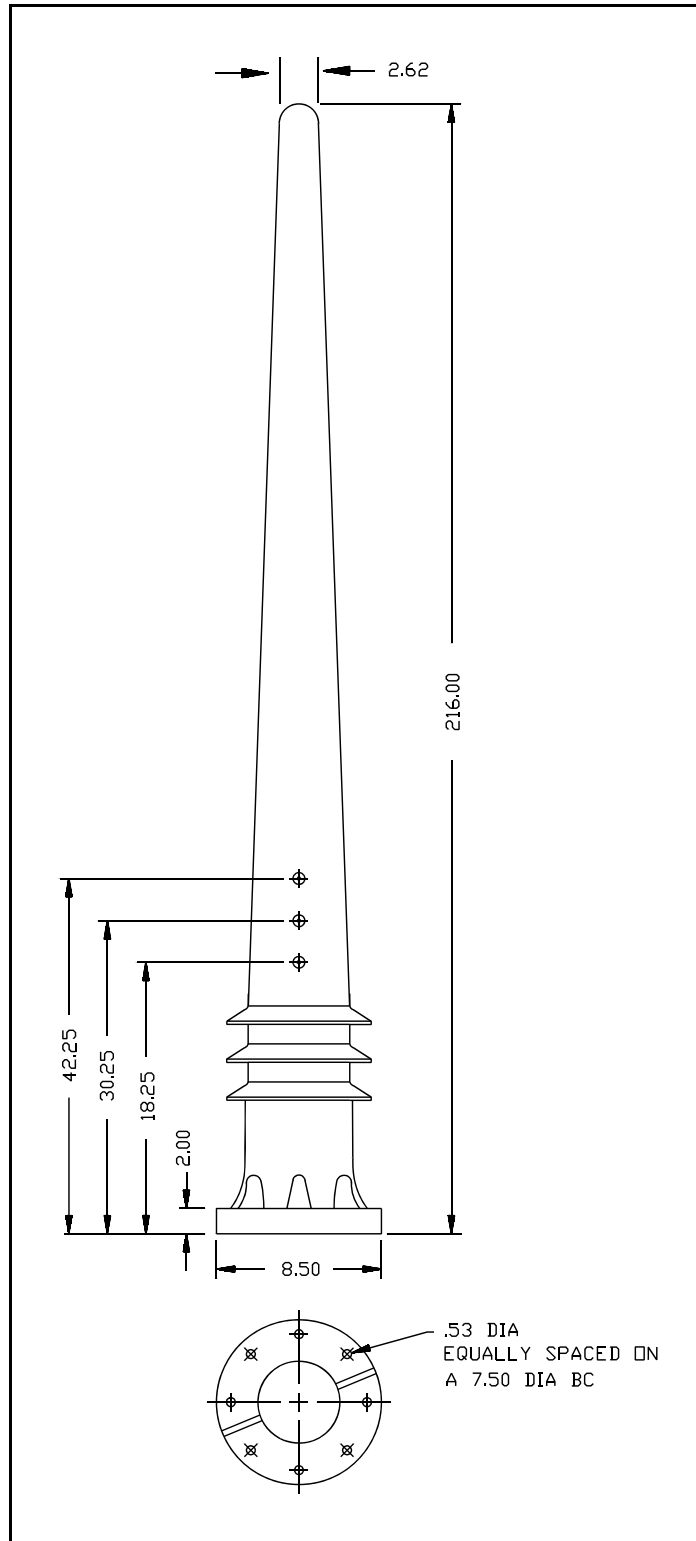


Figure 4-1. Installation Data

## **5.0 MAINTENANCE**

### **5.1 Scheduled Maintenance**

The antenna is virtually maintenance free. The external finish is a silicone alkyd paint. The minimum finish life before showing signs of deterioration should be at least six years under normal climate conditions.

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.

### **5.2 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 and/or aluminum construction 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.**