



**TECHNICAL MANUAL**

**and**

**INSTALLATION INSTRUCTIONS**

**SLOPING VEE  
ANTENNA SYSTEM  
VD-99-00182-1**

Revision A

Designed and Manufactured by:

**Valcom Limited  
Guelph, Ontario, Canada**

**REVISION SHEET**

<b>Revision</b>	<b>Description</b>	<b>Date</b>
A	Original Issue	October 30, 2000

---

**TABLE OF CONTENTS****1.0 INFORMATION**

1.1	General Description .....	1
1.2	Technical Reference Data .....	1
1.3	Electrical Description .....	2
1.4	Mechanical Description .....	2
1.5	Scheduled Maintenance .....	2
1.6	Corrective Maintenance .....	2

**2.0 INSTALLATION**

2.1	Unpacking .....	2
2.2	New Site Preparation .....	3
2.3	Assembly and Raising .....	3
2.4	Electrical Installation .....	3

**3.0 PARTS LIST**

3.1	General .....	4
3.2	Additional Materials Required .....	4

**4.0 QUICK REFERENCE DATA**

4.1	General .....	5
4.2	Manufacturer's Address .....	5

**LIST OF TABLES AND FIGURES**

-	TABLE 3.1 : List of parts for the Sloping Vee Antenna .....	4
-	FIGURE 1 : Drain-hole location .....	3
-	FIGURE 2 : Recommended Ground Installation .....	6
-	FIGURE 3 : Alternate Above-ground Installation .....	6
-	FIGURE 4 : Alternate Tower Installation .....	6
-	FIGURE 5 : Typical VSWR plot .....	7

## 1.0 INFORMATION

### 1.1 General Description

The Valcom Model VD-99-00182-1 Sloping Vee Broadband Antenna is designed for operation from 1.8 MHz to 30 MHz. The antenna comes fully assembled and pre-tuned, no measuring or cutting is required. A counterpoise wire is supplied for employment where ground conditions are poor (see installation instructions for details). This antenna is all weather rated at 1 kW output, 2 kW PEP<sup>1</sup> CW/SSB ICAS<sup>2</sup>, and permits full use of the capabilities of today's continuous coverage transceivers. An added feature is single feedline operation for the entire band.

### 1.2 Technical Reference Data

Electrical Properties	
<b>Frequency Range</b>	1.8 MHz to 30 MHz
<b>Power Rating</b>	500 W Average, 1 kW Peak
<b>Polarization</b>	Horizontal and Vertical Simultaneously <sup>3</sup>
<b>Radiation Pattern, Azimuth</b>	Bi-directional
<b>Input Impedance</b>	50 (nominal)
<b>VSWR</b>	< 2 : 1
<b>Feedpoint Connector</b>	UHF Type SO-239

Mechanical Properties	
<b>Assembled Height</b>	Recommended 30 feet (9.1 metre)
<b>Assembled Dimensions</b>	100 ft x 1 ft x 30 ft (30 m x 0.3 m x 9.1 m)
<b>Weight</b>	Approximately 5 lbs (2.3 kg)
<b>Erection Time</b>	20 minutes, single person
<b>Volume (for storage)</b>	0.5 cu ft (0.0135 m <sup>3</sup> )

<sup>1</sup>Input power to the transmitter

<sup>2</sup>ICAS - International Commercial and Amateur Service

<sup>3</sup>Actual polarization depends on installation method chosen

### **1.3 Electrical Description**

The Sloping Vee Antenna is fabricated with #14 AWG stranded copper-clad stainless steel wire. It features a high impact balun and matching network. The feedline impedance of the antenna is 50  $\Omega$  and comes equipped with an SO-239 (female) coax cable connector.

The antenna is generally mounted in an inverted vee configuration. With the centre 25 to 30 feet off the ground, approximately 100 feet of space is required for installation. This configuration provides the best omni-directional radiation pattern.

### **1.4 Mechanical Description**

The antenna is comprised of 112 feet of antenna wire, 100 feet of counterpoise, a high-impact balun and a rugged matching unit. When assembled in the recommended fashion, the antenna will require a 30 foot mast and will run a length of about 100 feet. The width required will depend solely on whether or not the mast will need to be guyed down.

### **1.5 Scheduled Maintenance**

The antenna is virtually maintenance free. Care should be taken not to bend or kink the antenna wire or counterpoise when installing or packing antenna.

### **1.6 Corrective Maintenance**

Generally, no corrective maintenance is possible or required. If one of the components of the antenna are severely damaged, it must be replaced by a new component or have the antenna replaced completely.

---

## 2.0 INSTALLATION

### 2.1 Unpacking

The Sloping Vee antenna is packaged within a series of bags. Remove all items from the bags and ensure all items are present and in good condition. A list of supplied materials is found in Table 3.1.

### 2.2 New Site Preparation

---

#### WARNING

Outdoor antennas and lead-in conductors from antenna to building shall not cross over electric light or power circuits and shall be kept well away from all such circuits so as to avoid the possibility of accidental contact. Where proximity to electric light or power service conductors of less than 250 volts can not be avoided, the installation shall be such so to as to provide a clearance of at least 2 feet. Where practical, antenna conductors shall be installed so as to not cross under electric light or power conductors.

---

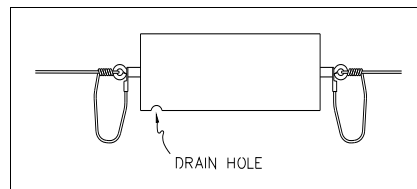
Determine how and where the antenna will be installed. Study all of the illustrations (Figures 2 -4) to determine which installation best fits your individual requirements. Trees, sides of buildings, utility poles, etc. make good supports. Supports may be conductive such as a metal pole, but be certain to use insulators to keep the antenna wire from making contact.

The antenna may be set up in shapes other than those shown, or shortened, with minimal effect on the bandwidth. However, the radiation efficiency at the lower frequencies will be reduced somewhat. **DO NOT INSTALL PARALLEL TO POWER LINES.**

### 2.3 Assembly and Raising

When installing the antenna, ensure that the drain holes of the balun and matching network are facing down. Refer to Figure 1.

The antenna is pre-assembled. Once the mast (if used) is secured, fasten each of the two ends of the antenna to a couple of well-placed ground rods.



**Figure 1**

## 2.4 Electrical Installation

The antenna ends may be attached in various ways, refer to figures 2 - 4. Good ground rods are recommended at each end. If the location has good, moist soil conditions the counterpoise may not be required. If needed, the counterpoise wire should connect to the ground side of the balun. The antenna may work best with the opposite end of the counterpoise *not* connected to the ground side of the balancing network. Try both to determine the best results for the specific installation. The counterpoise is essential in poor ground, dry soil, or above ground installations. Its length is not critical, and *does not* have to run directly under the antenna wire.

A good quality 50  $\Omega$  coaxial cable should be used for the feedline. Length is not critical, but it is best *longer* than 50 feet. The cable should be rated to easily handle the amount of power to be used and mate with an SO-239 UHF cable connector.

The Sloping Vee is pre-tuned at the factory for an average VSWR of 1.4:1 with a maximum of 2.0:1, depending upon the frequency used and surrounding objects, ground conditions, etc. If you wish to optimize performance, experiment with the counterpoise and the grounds, taking VSWR readings as a guide.

### 3.0 PARTS LIST

#### 3.1 General

A list of parts as supplied with the Valcom Sloping Vee Antenna appears in Table 3.1.

**Table 3.1** - List of Parts for the Sloping Vee Antenna

Item No.	Part Number	Description	Qty	Notes
1	VD-99-0182-1	Balancing Network	1 ea	These items are supplied pre-assembled
2	VD-99-0182-2	Balun	1 ea	
3	VD-99-0182-4	Antenna Wire	1 ea	
4	VD-99-0182-6	Ground Wire	2 ea	
5	VD-99-0182-5	Counterpoise	1 ea	These items are supplied loose for use as required.
6	AI-5	Insulator	2 ea	

#### 3.2 Additional Requirements

The Sloping Vee Antenna is not supplied with ground rods (2 required) or a centre mast. A means of stabilizing the centre mast will also need to be supplied by the user.

---

## 4.0 QUICK REFERENCE DATA

### 4.1 General

Quick reference engineering data and illustrations for use during planning and installation of the Sloping Vee Antenna are presented on the following pages.

Figure 2; Recommended Installation scheme.

Figure 3; Alternate Above-ground Installation scheme.

Figure 4; Alternate Tower Installation scheme.

Figure 5; Typical VSWR plot.

### 4.2 Manufacturer's Address

<b>Postal address:</b>
Valcom Limited P.O. Box 603 Guelph, Ontario Canada N1H 6L3

<b>Shipping address:</b>
Valcom Limited 175 Southgate Drive Hanlon Industrial Park Guelph, Ontario Canada N1G 3M5

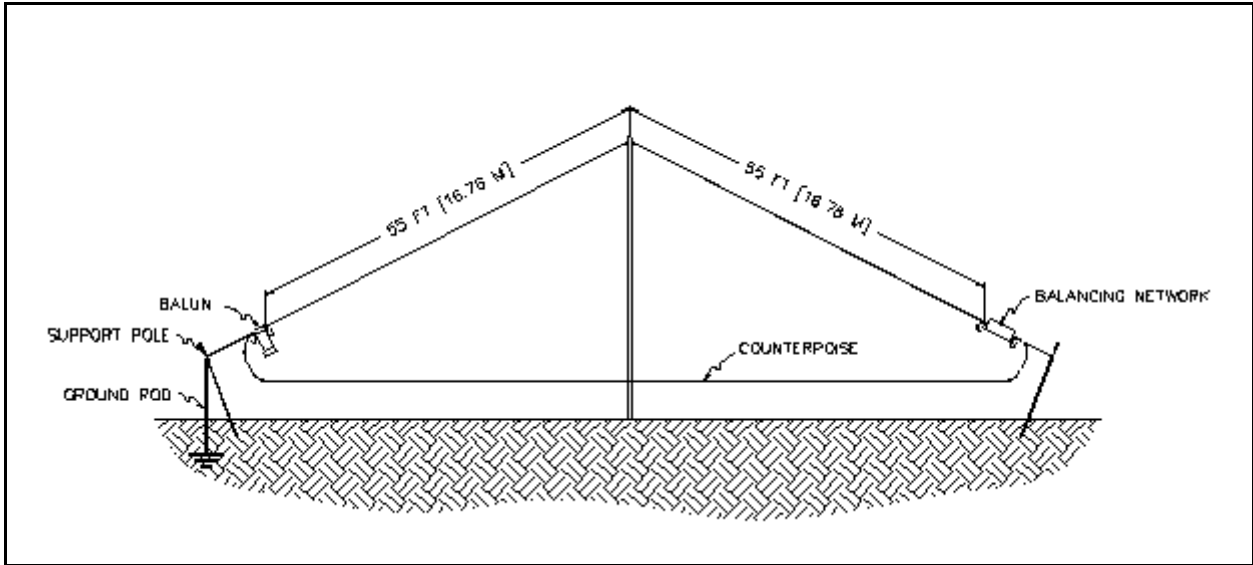


Figure 2 Recommended Ground Installation

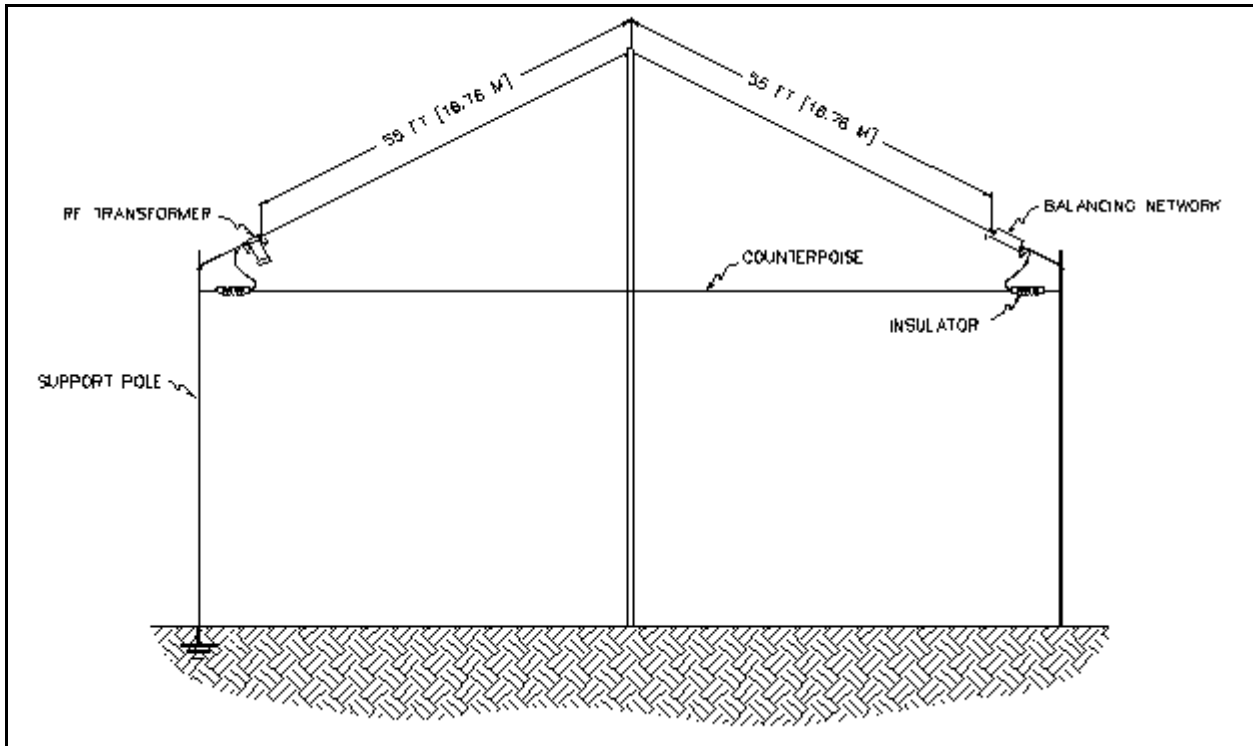


Figure 3 Alternate Above-ground Installation

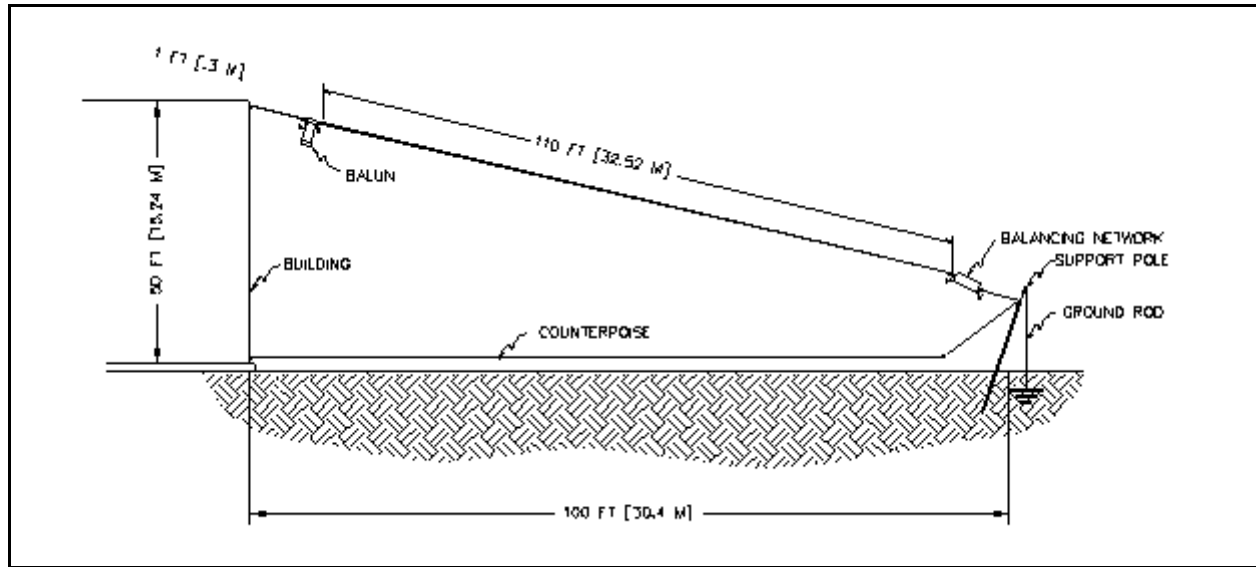


Figure 4 Alternate Sloping Installation

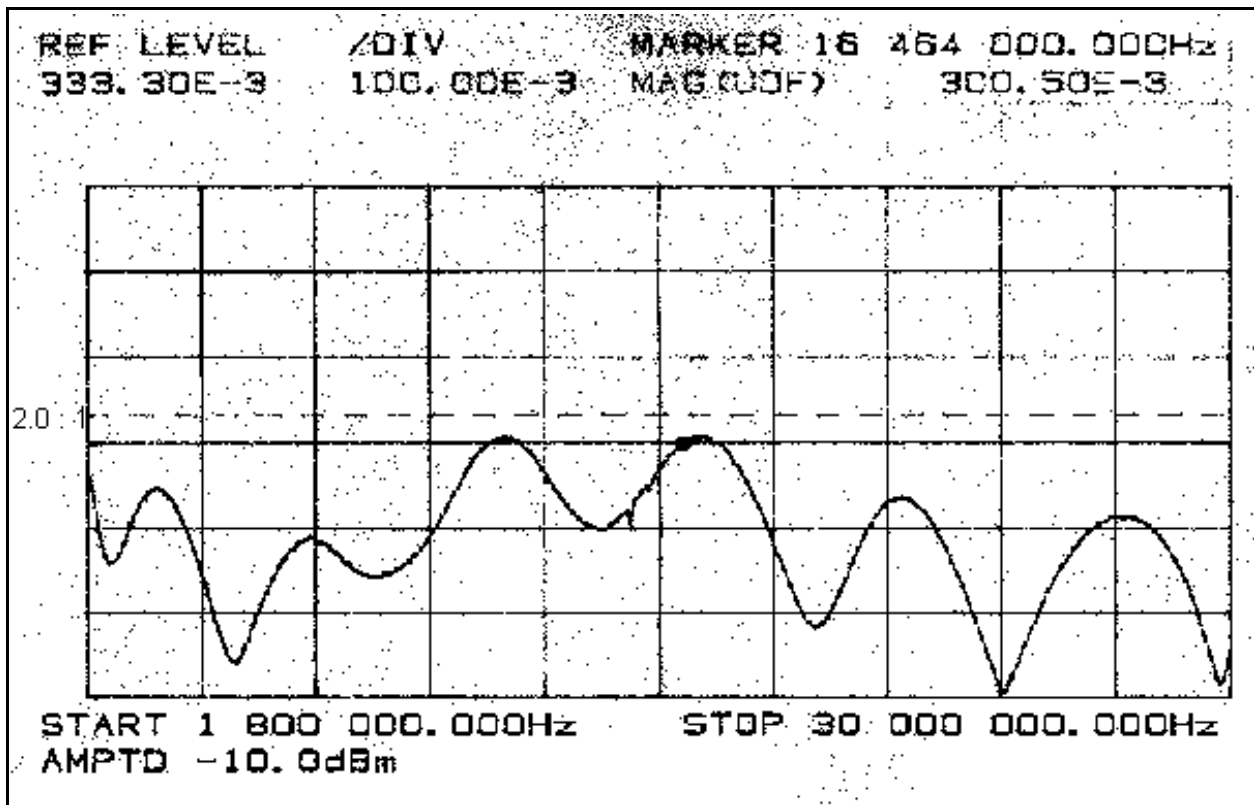


Figure 5 Typical VSWR plot