

# Two Element Phased Vertical Array System

**COM-PVS-160-A, COM-PVS-80-A, COM-PVS-40-A,  
COM-PVS-30-A, COM-PVS-20-A**

COM-PVS-A-INS-Revision 0



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***Congratulations!*** You are now the proud owner of a PVS-2 Phased Vertical System for a two element array. The PVS-2 uses a 90 degree phase shift matrix for optimum end fire performance, and a Comtek wound UNUN for equal power splits to both verticals for broadside directions. The model number of your system corresponds to the band for which it was manufactured.

A 4-conductor control line between the power supply and relay unit is required and normally customer furnished. Insert the control cable in the back, allowing for approximately 3 inches of wire, Strip 1/4 inch insulation .

Loosen until each one is near flush to the top

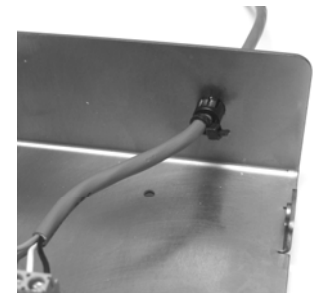


Insert Wires & Tighten

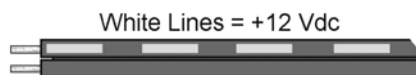


Note: G, 1, 2 and 3 are required to be connected. G to G, 1 to 1, 2 to 2 and 3 to 3.

Use a Tye-Wrap on the cable to avoid accidentally pulling the cable out of the control box.




A 2.1 mm power cord is supplied with unit. The wire with the white stripes is the +12 Vdc.



White Lines = +12 Vdc



**Outer Connection is GROUND**  **Center Pin is +12 VDC.**

Power used must be +12 Vdc, well filtered at 2 amps (fused) minimum.

Simply note the color sequence of the control wires inside and connect them to the same numbered terminals outside.

Measuring from the "G" terminal to the 1, 2, 3 terminals:

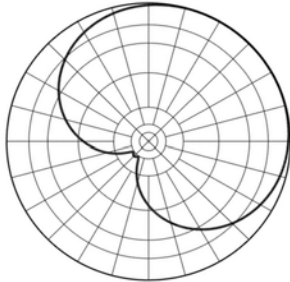


Position		Terminal		
		1	2	3
1	(full CCW)	H		
2	(center)	H	H	H
3	(full CW)		H	

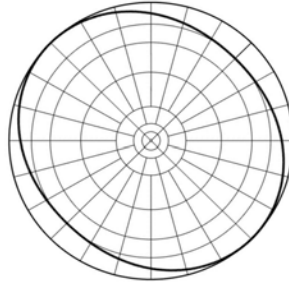
H = positive voltage

**SPECIFICATIONS:**

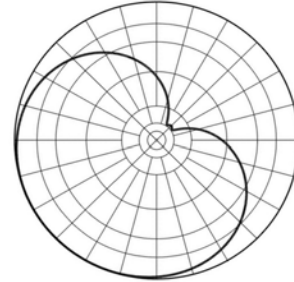
2 KW power limit - Less than .05 dB insertion loss  
 Nominal over 20 dB Front to Back and 3 dB gain over single vertical, end-fire directions, provided the recommended 60 radials per vertical are installed. Fewer radials result in reduced performance and increased ground losses.



Position 1  
End fire



Position 2  
Broadside



Position 3  
End fire

Examples of possible results with vertical antennas spaced 1/4-wavelength in NE/SW positions.

**INSTALLATION:**

The supplied V-Bolt hardware fits 1.0" to 1.5" OD pipe. Locate the pipe in the center of the array, and install the PVS-2 Relay Unit per Mounting Clamp Installation page.

**RECOMMENDED SPACING BETWEEN VERTICALS**

BAND	FREQUENCY	1/4 WAVE FREE SPACE
160 meters	1.835 MHz	134 feet
80 meters	3.650 MHz	67 feet - 5 inches
40 meters	7.100 MHz	35 feet
30 meters	10.125 MHz	24 feet

One quarter wavelength spacing results in low SWR in either end fire direction and slightly higher SWR in the broadside directions.

**Formulas:**

For 1/4 wave spacing:  $\frac{246}{f \text{ (MHz)}}$       example:  $246/3.650 = 67' 5''$

Phasing lines:  $\frac{246}{f \text{ (MHz)}} \times VF$       example:  $246/3.650 \times 0.66 = 44' 6''$

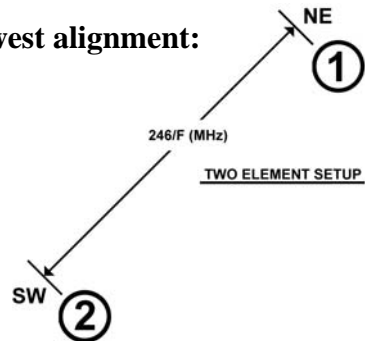
*Center Freq. = 3.650 MHz  
 DXE-213 Velocity Factor = 0.66*

(f = Center Frequency    VF = Velocity Factor of the coaxial cable)  
 Typical VF are .66 for DXE-213, .81 for DXE-8U Foam and .84 for DXE-400MAX.

**NOTE:** For North America & South America users, it is suggested placing the verticals in a North East & Southwest alignment for best results, since the majority of DX countries are from Europe and the Pacific.

**POSITION DIRECTIONS with Northeast & Southwest alignment:**

- 1 = NE end-fire
- 2 = BROADSIDE
- 3 = SW end-fire



Install at least 40 radials at the base of each vertical. Use of optional DX Engineering **DXE-RADP-3** Radial Plates under each vertical antenna will facilitate radial installation. **Best performance is with 60 radials per vertical.**

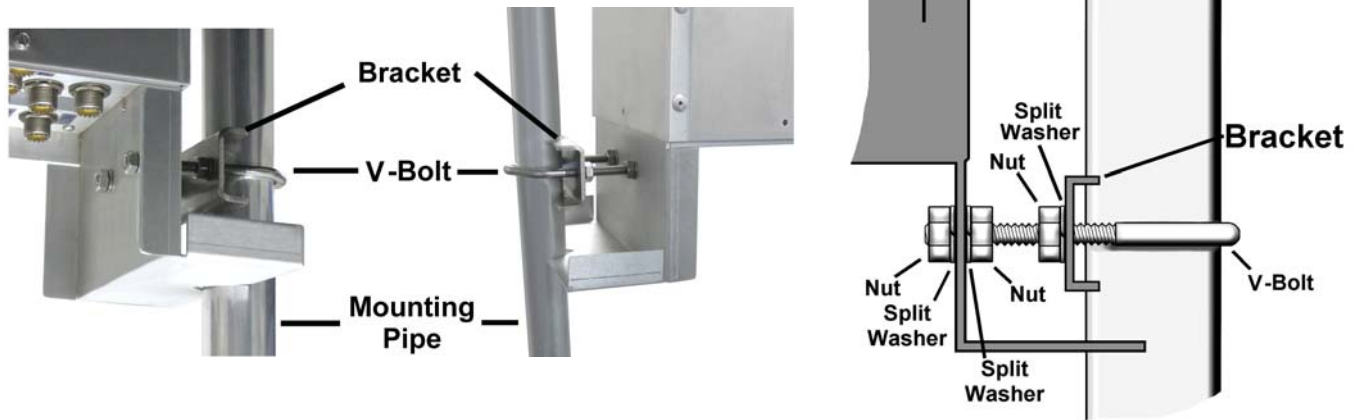
Prepare a 4 conductor control cable to connect the inside control box to the relay unit. Control cable and feedlines should be installed under the radial system.

Connect your two electrical one quarter wavelength **50-ohm** lines from the **PVS-2** ports 1 and 2 to the vertical feed points respectively. The Comtek **VFA-1** vertical feedpoint assembly option makes for a smooth transition to attach your feed line to the vertical.

Connect a 50-ohm dummy load to the load port. The dummy load must be capable of handling 5% of the transmitter input power to the **PVS-2**. The 50-ohm coaxial cable for the dummy load may run to the shack for relative metering of dumped power.

**SUGGESTION:** Make several copies of the "Dumped Power Chart" on the last page of these instructions. After recording the levels measure to the 50-ohm load, save for future comparisons, which will alert you to changes in the antenna system.

## MOUNTING CLAMP INSTALLATION



Thank you again for purchasing a Comtek Systems **PVS-2** Phased Vertical System. Comtek has manufactured hybrids since 1989, and have models in use world wide by major contest and DX stations.

*Enjoy your two element phased array performance while contesting and DXing.*

73,

**Comtek Systems** [www.comteksystems.com](http://www.comteksystems.com)

### **PVS Series Part Numbers:**

COM-PVS-160-A	160 Meter Relay Unit and Control Console
COM-PVS-80-A	80 Meter Relay Unit and Control Console
COM-PVS-40-A	40 Meter Relay Unit and Control Console
COM-PVS-30-A	30 Meter Relay Unit and Control Console
COM-PVS-20-A	20 Meter Relay Unit and Control Console
COM-PVS-2A	Control Console
COM-PVS-160	160 Meter Relay Unit
COM-PVS-80	80 Meter Relay Unit
COM-PVS-40	40 Meter Relay Unit
COM-PVS-30	30 Meter Relay Unit
COM-PVS-20	20 Meter Relay Unit

## COMTEK SYSTEMS 2-ELEMENT DUMPED POWER CHART

Dumped Power  
In Watts

200				
150				
100				
50				
0				

1.8	1.9	2.0	
3.5	3.6	3.7	3.8
7.0	7.1	7.2	7.3
14.0	14.1	14.2	14.3
21.0	21.1	21.2	21.3
28.0	28.1	28.2	28.3
28.4	28.5	28.6	28.7

Record dumped power levels at these frequencies, depending on which PVS-2 model phasing system is installed. Keep this with your instructions as a reference in the event SWR or dumped power levels change.

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## Technical Support

If you have questions about this product, or if you experience difficulties during the installation, contact Comtek Systems at (330) 572-3200. You can also e-mail us at:

Info@comteksystems.com

For best service, please take a few minutes to review this manual before you call.

## Warranty

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