Multi-Configurations
Hub System
Operator's Manual

Nevada - USA
WWW.CHAMELEONANTENNA.COM

VERSATILE – DEPENDABLE – STEALTH – BUILT TO LAST

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WARNING! Never mount this, or any other antenna near power lines or utility wires! Any materials: ladders, ropes, or feedlines that contact power lines can conduct voltages that kill. Never trust insulation to protect you. Stay away from all power lines.

WARNING! Never operate this antenna where people could be subjected to high levels of RF exposure, especially above 10 watts or above 14 MHz. Never use this antenna near RF sensitive medical devices, such as pacemakers.

Introduction

Thank you for purchasing and using the Chameleon Antenna™ Multi-Configurations Hub System (CHA MC-HUBS). The Multi-Configuration Hub System enables creation of multiple portable High Frequency (HF) antenna configurations (when used with components from the Chameleon Antenna™ Modular Portable Antenna System 2.0) that can provide additional communications capabilities that are tailored to your operational needs, see plate (1) for examples. The CHA MC-HUBS was especially designed for highly portable, quick set-up, Near-Vertical Incidence Skywave (NVIS) propagation on the lower HF frequencies and medium-range communications on higher HF frequencies. This antenna is also ideal for camping, recreational vehicles, or temporary installation in a condo, townhome, or other home with a small yard or antenna restrictions, or as backup EMCOMM antenna. The CHA MC-HUBS can operate on all amateur radio bands from 1.8 to 54.0 MHz (160-6m) when used with a wide-range antenna tuner or coupler, but is most effective on the bands from 7.1 to 29.7 MHZ (60-10m) for longer-distance communication and 5.4 to 10.15 MHz bands (60 - 30m) for shorter-range Near-Vertical Incidence Skywave (NVIS) propagation.

The Multi-Configuration Hub System can easily be configured in a variety of operationally useful configurations; seven of which, along with several variations, will be described in this manual. An antenna tuner or coupler may be required for operation, depending upon the frequency and antenna configuration used *(see specifications)*. Setup can typically be accomplished by one operator in 5-15 minutes, depending upon the complexity of the configuration.

The CHA MC-HUBS is comprised of the following components:

- One Anodized Aluminum Multi-Configuration Hub;
- Three SS17 Stainless Steel Telescoping Whips;
- Four 33-foot Antenna/Radial Wires on Line Winders;
- Four Stainless Steel Shackles;
- Four Stainless Steel Tent Stakes;
- Three 15-foot lengths of Paracord; and
- Four 3-foot lengths of Paracord.

To assemble the configurations described in this manual, you will need the following components from your CHA MPAS 2.0:

- Hybrid Mini/Micro Matching Transformer;
- CHA MIL EXT;
- Coaxial Cable; and
- Spike Mount.

Plate (1). Multi-Configuration Hub System Antenna Examples.

Antennas built by Chameleon Antenna™ are versatile, dependable, stealthy, and built to last. Please read this operator's manual so you may obtain the maximum utility from your Multi-Configuration Hub System.

Parts of the System

The Multi-Configuration Hub System is comprised of the following components, see plate (2):

a. Matching Transformer

The Matching Transformer *(not pictured)* is either a CHA HYBRID MICRO or CHA HYBRID MINI. *It is part of your existing CHA MPAS 2.0 and is included here to aid in assembly discussion.*

b. Antenna Wire / Radial Wire.

The Antenna Wire / Radial Wire is 33-feet of wire on a Line Winder and is used as either an Antenna or Radial Wire, depending on the configuration. The Line Winder enables rapid deployment and recovery of the wire.

Plate 2. Multi-Configuration Hub System Components.

c. Multi-Configuration Hub.

The Multi-Configuration Hub is an anodized aluminum hub with 3/8” x 24 threaded sockets used to attach the Telescoping Whips (e) and Shackles (f).

d. Telescoping Whip.

The Telescoping Whip is a telescoping stainless-steel radiator. It extends to 17 feet and collapses to 24 inches.

e. Shackle.

The Shackle is a stainless-steel shackle with a 3/8" x 24 threaded stud used to connect the Radial Wire (b) or Telescoping Whips (d) to the Multi-Configuration Hubs (c).

f. Mast.

The Mast (CHA MIL EXT) *(not pictured)* is an 8 ft 9 in extended, 28 3/4 in collapsed, aluminum metal pole, normally used to extend the length of the MPAS 2.0 vertical, but in this system, it is primarily used as a mast. *The CHA MIL EXT is part of your existing CHA MPAS 2.0 and is included here to aid in assembly discussion.*

g. Spike Mount.

The Spike Mount *(not pictured)* provides the center base for the antenna. *It is part of your existing CHA MPAS 2.0 and is included here to aid in assembly discussion.*

h. Tent Stake.

The Tent Stakes are used to anchor the Guy Lines (i) or Radial Wires (b) to the ground.

i. Guy Line.

The Guy Lines are three 15-foot lengths and four 3-foot lengths of 550 Paracord used to support the antenna.

j. Coaxial Cable.

The Coaxial Cable *(not pictured)* is a 50-foot length of RG-58 cable with an integrated RF Choke. *It is part of your existing CHA MPAS 2.0 and is included here to aid in assembly discussion.*

Antenna Configurations

Using the supplied components, and components from your Modular Portable Antenna System (MPAS) 2.0, the Chameleon Antenna™ Multi-Configuration Hub System can be configured and deployed into many useful configurations – seven of which are and described in this manual. Each has unique operational performance characteristics. Table (1) can assist the operator to quickly select the most appropriate antenna configuration to meet their operational requirements.

Configuration	Ground	Short	Medium	Long	Directionality
NVIS Inverted V Dipole		↓	↑		Bi-directional
Short Sloping Wire	↑	↓			Bi-directional
Elevated Vertical	↕		↓	↑	Omni-directional
Tall Vertical	↑		↕		Omni-directional
Portable Vertical	↕		↕		Omni-directional
Portable Horizontal Dipole		↕			Bi-directional
Portable V Dipole		↓	↑		Bi-directional

Table 1. Antenna Configuration Selection.

To use the table, decide which distance column (Ground = 0 to 90 miles, Short = 0 - 300 miles, Medium = 300 – 1500 miles, Long > 1500 miles) best matches the distance to the station with whom you need to communicate. Then,

determine if the OWF is in the lower (↓ = 1.8 – 10 MHz) or upper (↑ = 10 – 30 MHz) frequency range. Finally, select the antenna system configuration with the corresponding symbol in the appropriate distance column. Most of the antenna configurations provide some capability in each distance category, so depending upon the complexity of your communications network, you may need to select the best overall configuration. The directionality column indicates the directionality characteristic of the antenna configuration. When using NVIS, all the configurations are omnidirectional. Remember, when using NVIS, the frequency selected must be below the critical frequency, so NVIS can normally only be used on frequencies from around 2 to 10 MHz. Frequencies of 2 – 4 MHz are typical at night and 4 – 8 MHz during the day.

NVIS Inverted V Dipole Configuration

The NVIS Inverted V Dipole configuration, see figure (1), is a short to medium range HF antenna. It can provide NVIS propagation below 10 MHz and medium range communications above 10 MHz. This configuration is predominantly bidirectional broadside to the inverted "V" of the antenna above 10 MHz and omni-directional below 10 MHz. This is a quick setup, low visibility configuration.

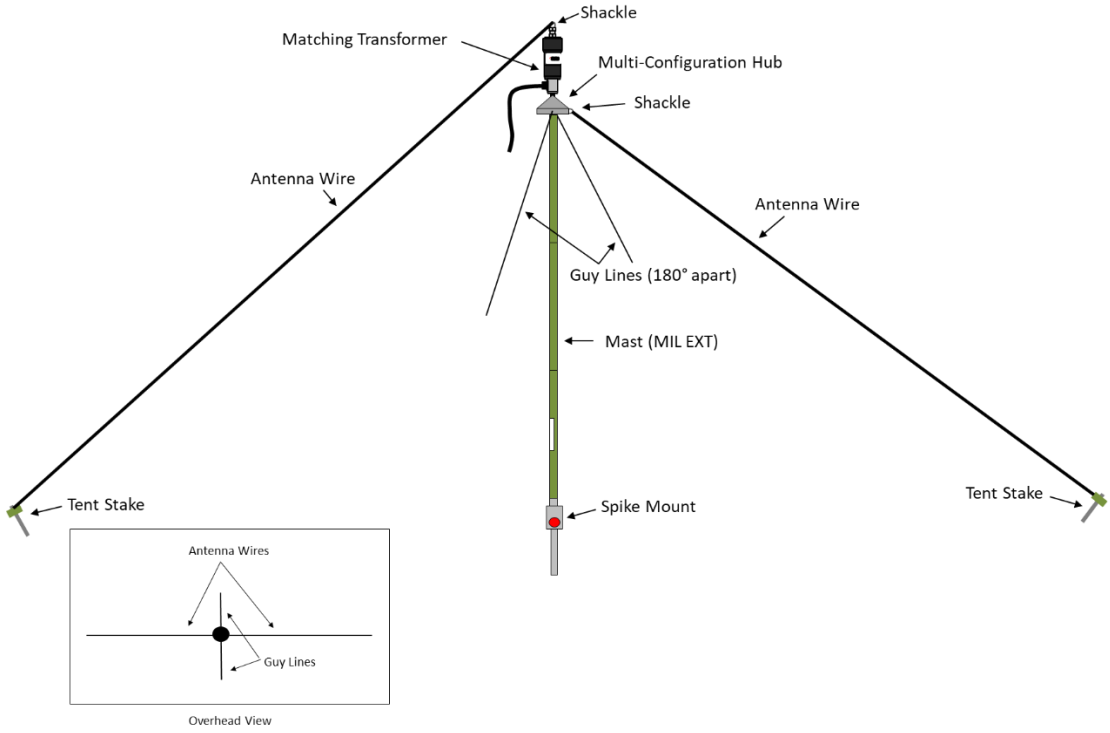


Figure 1. NVIS Inverted V Dipole Configuration.

1. Select a site to deploy the NVIS Inverted V Dipole configuration. The best site would be a clear area around 64 feet in length and 15 feet in width.
2. Drive the Spike Mount (g) half way (approximately eight inches) into the ground in the center of the cleared area. Use a plastic or rubber tent mallet to avoid damaging the face of the Spike Mount.
3. Thread the base stud on the bottom of the Mast (f) into the socket on top of the Spike Mount. Tighten by hand until snug.
4. Pull the top two sections of the Mast up and then tilt them over, as shown in Plate (2), to enable assembly of the top part of the antenna without requiring a step-ladder.
5. Attach a Multi-Configuration Hub (c) to the top of the Mast by carefully threading the stud on the

bottom of the Hub to the socket on the top of the Mast. Tighten by hand until snug.

Use Caution when assembling all threaded connections. Ensure the connections are not cross-threaded and that there is no grit on the threads to avoid galling of the machined threads. Use of an anti-seize lubricant, such a Permatex™, is highly recommended.

6. Attach the Matching Transformer (a) to the top of the Multi-Configuration Hub by carefully threading the stud at the bottom of the Transformer to the socket on top of the Hub. Tighten by hand until snug.
7. Place the Terminal Ring at the end of one of the Wire Assemblies (b) over the stud on the bottom of a Shackle (e).
8. Attach the Shackle to the Multi-Configuration Hub by carefully threading the stud of the Shackle into one of the outer angled sockets on top of the Hub. Tighten by hand until snug.

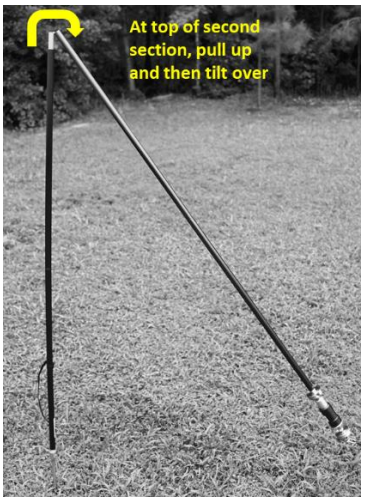


Plate 2. Tilting the Top of the Mast.

9. Attach two more Shackles on opposite sides of the Multi-Configuration Hub into the horizontally oriented sockets. Tighten by hand until snug.
10. Attach a Carabiner to the Isolation Ring at the end of the Antenna Wire from step (7).
11. Attach the Carabiner onto the Shackle from step (8).
12. Using a Bowline or similar knot, tie a 15-foot Guy Line (i) to both the Shackles from step (9). The assembly should look like that pictured in plate (3).
13. Place the Terminal Ring at the end of the other Antenna Wire over the stud on the bottom of a Shackle.
14. Attach a Shackle to the Matching Transformer by carefully threading the stud of the Shackle into the top of the Transformer. Tighten by hand until snug.

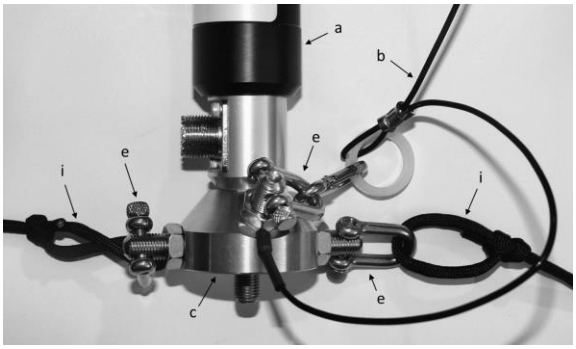


Plate 3. Hub Assembly Connections.

15. Attach a Carabiner to the Isolation Ring at the end of the Antenna Wire from step (13).
16. Attach the Carabiner onto the Shackle from step (14). The electrical and mechanical connections of the Antenna Wire and Shackle should look similar to plate (4).

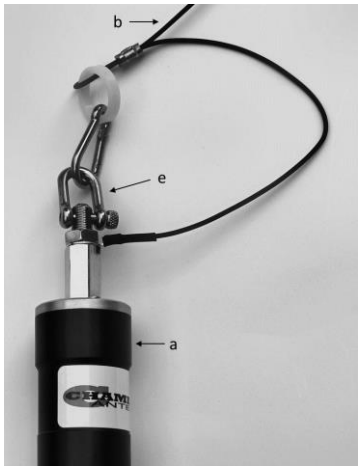


Plate 4. Transformer Electrical and Mechanical Connections.

17. Unwind the Antenna Wire from the Antenna Wire Line Winders.
18. Attach the Coaxial Cable (j) to the Matching Transformer.

19. Replace the top section of the Mast.
20. Pull the Antenna Wires in opposite directions until full extended.
21. If not already attached, use a Bowline or similar know to tie a 3-foot Guy Line to the Isolation Ring at the end of both the Antenna Wires.
22. Drive the Tent Stakes (h) approximately one foot beyond the end of Antenna Wires.
23. Using a round-turn and two half hitches, or similar knot, tie the 3-foot Guy Lines at the end of the Antenna Wires to the Tent Stakes. The Antenna Wires should have a slight catenary curve and not be taut.
24. Position the 15-foot Guy Lines from step (12) around 7 feet on each side of the Mast and perpendicular to the Antenna Wires. Drive a Tent Stake into the ground at those two locations.
25. Using a round-turn and two half-hitches, or similar know, tie the Guy Lines to the Tent Stakes to support the Mast.
26. Perform operational test.

Short Sloping Wire Configuration

The Short Sloping Wire configuration, see Figure (2), is a short-range HF antenna. It can provide short range line-of-sight and groundwave propagation from 1.8 to 54 MHz *(see specifications),* NVIS propagation below 10 MHz, but with limited usable skywave propagation from 10 to 27 MHz. This configuration is omni-directional below 10 MHz; slightly bidirectional, broadside to the Antenna Wire above 10 MHz; and favoring the high end of the Antenna Wire from 27 to 54 MHz - where the antenna has its best performance. Use this configuration if you need broadband, short communication and a stealthy, lightweight, rapid deployment antenna.

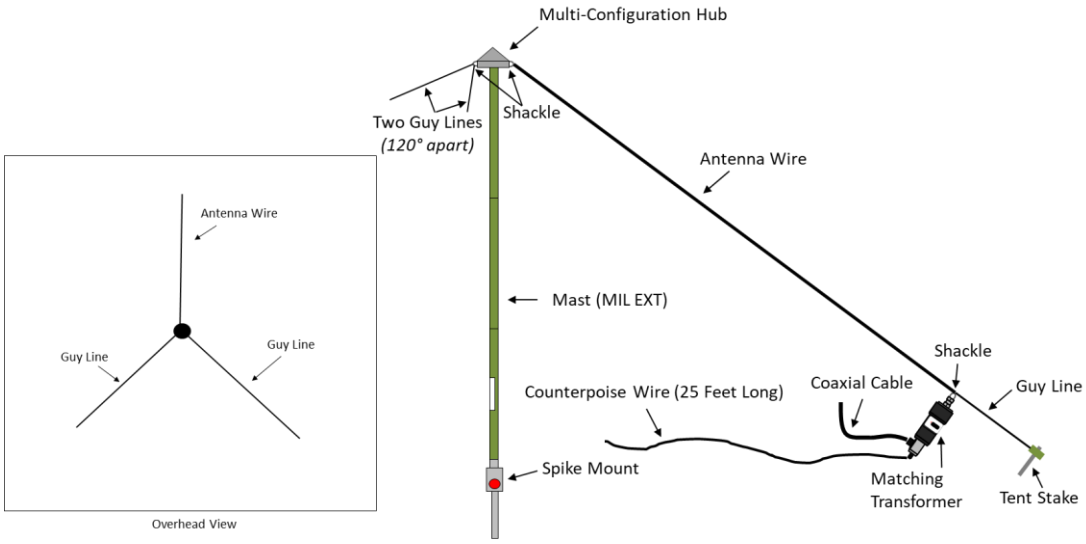


Figure 2. Short Sloping Wire Configuration.

27. Select a site to deploy the Short Sloping Wire configuration. The best site would be a clear area around 33 feet in length and 15 feet in width.
28. Drive the Spike Mount (g) half way (approximately eight inches) into the ground in the center of the cleared area. Use a plastic or rubber tent mallet to avoid damaging the face of the Spike Mount.
29. Thread the base stud on the bottom of the Mast (f) into the socket on top of the Spike Mount. Tighten by hand until snug.
30. Pull the top two sections of the Mast up and then tilt them over, as shown in Plate (2), to enable assembly of the top part of the antenna without requiring a step-ladder.
31. Attach a Multi-Configuration Hub (c) to the top of the Mast by carefully threading the stud on the

bottom of the Hub to the socket on the top of the Mast. Tighten by hand until snug.

Use Caution when assembling all threaded connections. Ensure the connections are not cross-threaded and that there is no grit on the threads to avoid galling of the machined threads. Use of an anti-seize lubricant, such a Permatex™, is highly recommended.

32. Attach two Shackles (e) to the Multi-Configuration Hub using both of the horizontally oriented sockets on the sides of the Hub by carefully threading their studs into the sockets on the Hub. Tighten by hand until snug.
33. Using a Bowline, or other suitable knot, tie two 15-foot Guy Lines to one of the Shackles and one Guy Line to the other Shackle.
34. Attach one Shackle to one of the outer angled sockets on top of the Multi-Configuration Hub by carefully threading the stud into the socket on the Hub. Tighten by hand until snug.
35. Unwrap the Antenna Wire from the Line Winder and if necessary, attach a 3-foot Guy Line to the Isolation Rings at each end of the Antenna Wire, using a Bowline or similar knot.
36. Using a Bowline or similar knot, attach the free end of the 3-foot Guy Line at the end of the Antenna Wire (the end that does not have a Terminal Ring) to the open Shackle on the Multi-Configuration Hub.
37. Place the Terminal Ring, at the beginning of the Antenna Wire, over the stud on the bottom of a Shackle.
38. Attach a Shackle to the Matching Transformer (a) by carefully threading the stud of the Shackle into the top of the Transformer. Tighten by hand until snug.
39. Clip a Carabiner to the Isolation Ring at the beginning of the Antenna Wire.
40. Clip the Carabiner to the Shackle on top of the Matching Transformer. The connections from these steps should look similar to that shown in Plate (4).
41. Place the Terminal Ring at the end of the Radial Wire over the stud on the bottom of a Matching Transformer.
42. Thread a 3/8" x 24 (fine thread) nut onto the stud on the bottom of the Matching Transformer. Tighten until snug. The assembly from steps (6) through (16) should look like that pictured in Plate (5).

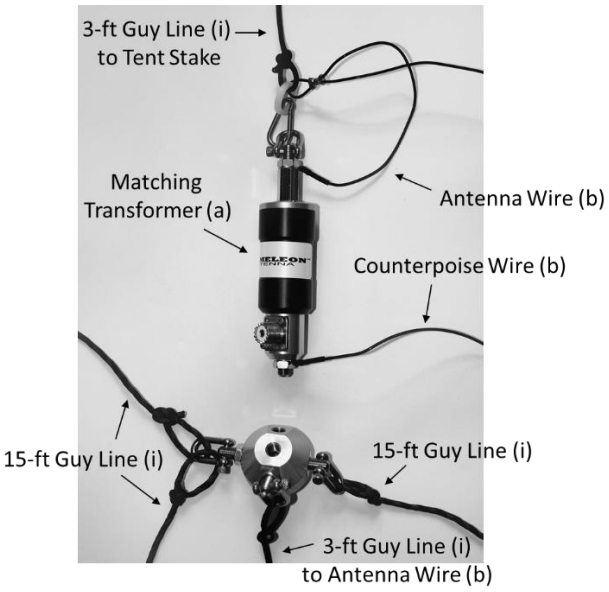


Plate 5. Configuration Connections.

43. Extend the Antenna Wire its full length to near the location of desired end point.
44. Drive a Tent Stake into the ground around one foot beyond the end of the Antenna Wire.
45. Using a Round Turn and two Half Hitches, or similar knot. Attach the free end of the 3-foot Guy Line to the Tent Stake.
46. Extend, in any convenient direction, approximately 25 feet of the Radial Wire *(leaving around 8 feet wrapped on the Line Winder)* on the ground for use as a counterpoise.
47. Position one of the 15-foot Guy Lines around 7 feet from the Mast and about 120° from the Antenna Wire.
48. Drive a Tent Stake into the ground and attach the Guy Line using a Round Turn and two Half Hitches, or similar knot.
49. Repeat steps (21) and (22) for the remaining Guy Line.
50. Tighten all Guy Lines so that the Antenna Wire has only a slight catenary.
51. Connect the Coaxial Cable (j) to the Matching Transformer.
52. Perform an operational test

Elevated Vertical Configuration

The Elevated Vertical configuration, see figure (3), is a short to long range HF antenna. It can provide good general-purpose communications from 1.8 to 54.0 MHz *(see specifications)*. The elevated radials improve antenna efficiency over a ground mounted vertical. This configuration is omnidirectional and easy to setup with the radials also acting as guys. A slick variation of this configuration is an Off-Center Fed Vertical Dipole (OCFVD). Simply replace the four Radial Wires with the three 15-foot Guy Lines in the procedure below for a quick and easy set-up, small footprint, no-radial vertical.

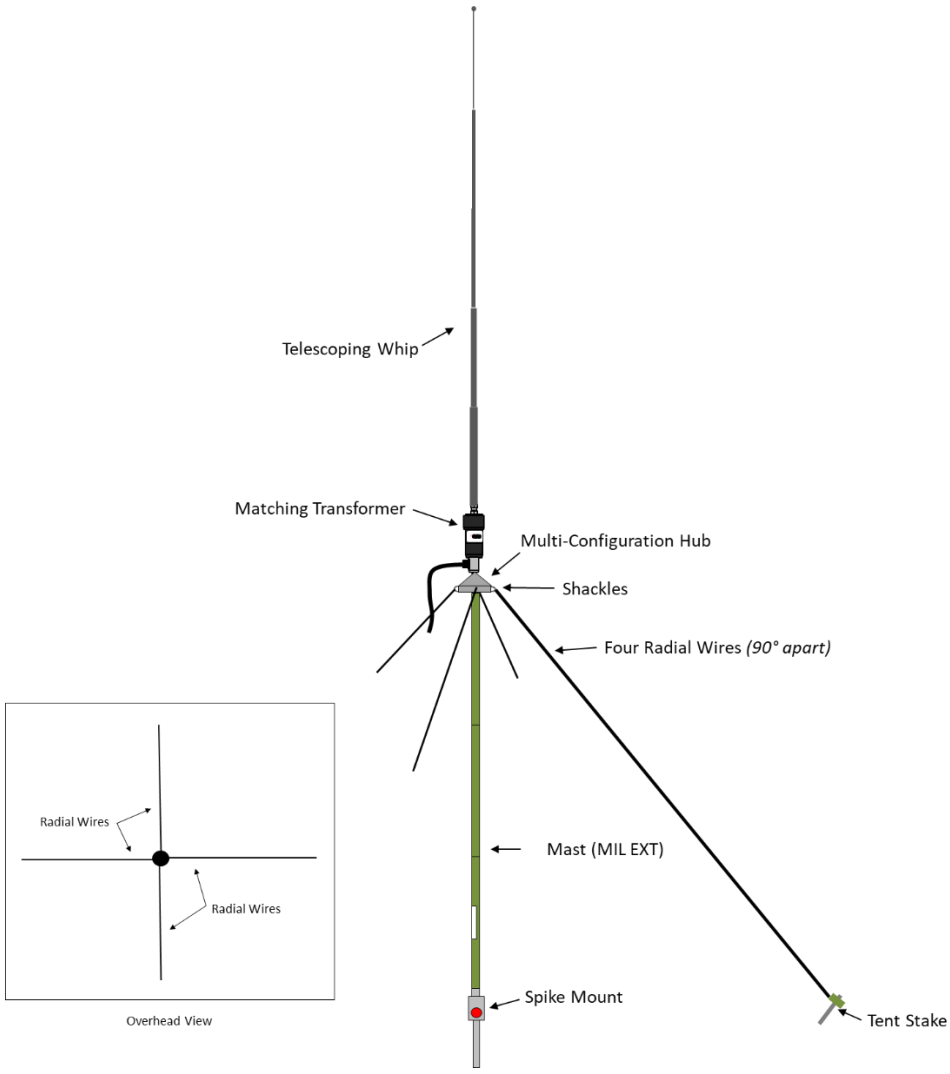


Figure 3. Elevated Vertical Configuration.

1. Select a site to deploy the Elevated Vertical configuration. The best site would be a clear circular area with a diameter of around 66 feet.
2. Drive the Spike Mount (g) half way (approximately eight inches) into the ground in the center of the cleared area. Use a plastic or rubber tent mallet to avoid damaging the face of the Spike Mount.
3. Thread the base stud on the bottom of the Mast (f) into the socket on top of the Spike Mount. Tighten by hand until snug.
4. Pull the top two sections of the Mast up and then tilt them over, as shown in Plate (2), to enable assembly of the top part of the antenna without requiring a step-ladder.

5. Attach a Multi-Configuration Hub (c) to the top of the Mast by carefully threading the stud on the bottom of the Hub to the socket on the top of the Mast. Tighten by hand until snug.

Use Caution when assembling all threaded connections. Ensure the connections are not cross-threaded and that there is no grit on the threads to avoid galling of the machined threads. Use of an anti-seize lubricant, such a Permatex™, is highly recommended.

6. Attach the Matching Transformer (a) to the top of the Multi-Configuration Hub by carefully threading the stud at the bottom of the Transformer to the socket on top of the Hub. Tighten by hand until snug.
7. Thread the base stud of the Telescoping Whip into the socket on top of the Matching Transformer. Tighten by hand until snug.
8. Place the Terminal Ring at the end of a Radial Wire over the stud on the bottom of a Shackle.
53. Attach a Shackle to the Multi-Configuration Hub by carefully threading the stud of the Shackle into one the sockets in the Hub. Tighten by hand until snug.
9. Attach a Carabiner to the Isolation Ring at the end of the Radial Wire from step (8).
10. Attach the Carabiner onto the Shackle from step (9). The electrical and mechanical connections of the Radial Wires and Shackles should look like that pictured in Plate (6).
11. Unwind the Radial Wire from the Line Winder and extend it away from the Mast in any convenient direction.
12. Attach a 3-foot Guy Line to the Isolation Ring at the end of the Radial Wire.
13. Repeat steps (8) – (13) for the remaining three Radial Wires.
14. Attach the Coaxial Cable (j) to the Matching Transformer.
15. Starting at the bottom, extend the Telescoping Whip (d), one section at a time, until it is fully extended.
16. Replace the top section of the Mast.

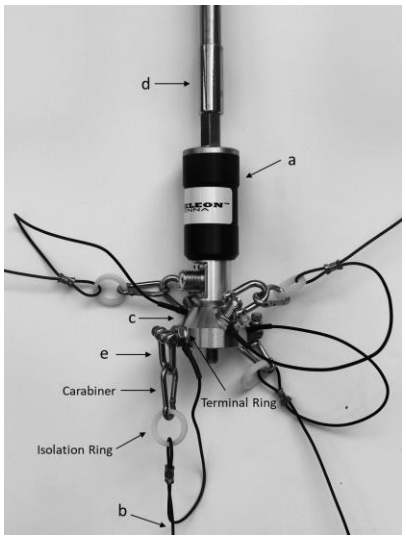


Plate 6. Hub Assembly Connections.

17. Arrange the Radial Wires 90° apart as shown in the inset in Figure (3).
18. Drive a Tent Stake around one foot past the end of the Radial Wire.
19. Attach the free end of the 3-foot Guy Line to the Tent Stake using a Round Turn and two Half Hitches, or similar knot.
20. Repeat steps (19) and (20) for the other three Radial Wires. *The Radial Wires will also act as Guy Lines in this configuration.*
21. Perform operational test.

Tall Vertical Configuration

The Tall Vertical configuration, see figure (4), is a short to medium range HF antenna. It can provide good general-purpose communications from 1.8 to 54.0 MHz *(see specifications)*. The longer vertical radiator improves antenna efficiency, particularly on lower frequencies. This configuration is omnidirectional and easy to setup.

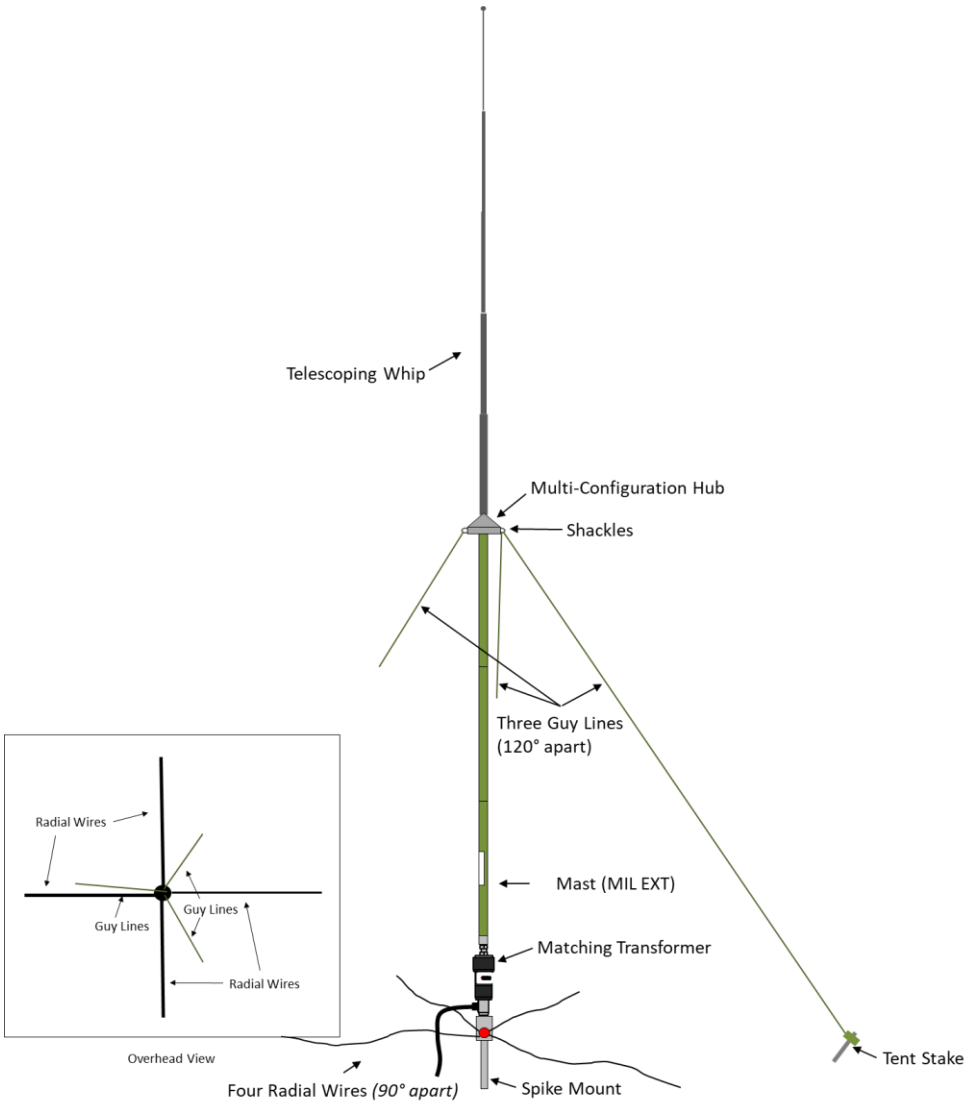


Figure 4. Tall Vertical Configuration.

1. Select a site to deploy the Elevated Vertical configuration. The best site would be a clear circular area with a diameter of around 52 feet.
2. Drive the Spike Mount (g) half way (approximately eight inches) into the ground in the center of the cleared area. Use a plastic or rubber tent mallet to avoid damaging the face of the Spike Mount.
3. Attach the Matching Transformer (a) to the top of the Spike Mount by carefully threading the stud at the bottom of the Transformer to the socket on top of the Mount. Tighten by hand until snug.

Use Caution when assembling all threaded connections. Ensure the connections are not cross-threaded and that there is no grit on the threads to avoid galling of the machined threads. Use of an anti-seize lubricant, such a Permatex™, is highly recommended.

4. Thread the base stud on the bottom of the Mast (f) into the socket on top of the Matching Transformer. Tighten by hand until snug.
5. Pull the top two sections of the Mast up and then tilt them over, as shown in Plate (2), to enable assembly of the top part of the antenna without requiring a step-ladder.
6. Attach a Multi-Configuration Hub (c) to the top of the Mast by carefully threading the stud on the bottom of the Hub to the socket on the top of the Mast. Tighten by hand until snug.
7. Thread the base stud of the Telescoping Whip (d) into the socket on top of the Multi-Configuration Hub. Tighten by hand until snug.
54. Attach two Shackles (e) to the Multi-Configuration Hub by carefully threading the stud of the Shackles into two opposite sockets in the Hub. Tighten by hand until snug.
8. Attach two 15-foot Guy Lines to one of the Shackles and one Guy Line to the other Shackle using a Bowline, or similar knot. The assembly should look that shown in plate (7).
9. Starting at the bottom, extend the Telescoping Whip, one section at a time, until it is fully extended.
10. Replace the top section of the Mast.
11. Drive a Tent Stake into the ground around 7 feet from the Mast.
12. Attach a Guy Line to the Tent Stake, using a Round Turn and two Half Hitches or similar knot.
13. Repeat steps (12) and (35) for the other two Guy Lines. The Guy Lines should be approximately 120° apart.
14. Tighten all Guy Lines.

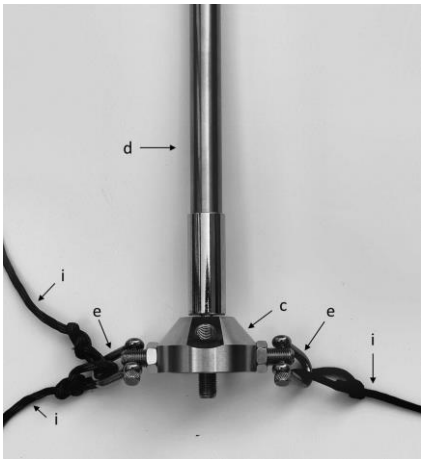


Plate 7. Hub Assembly Connections.

15. Attach the Terminal Rings for all four Radial Wires to the Knurled Knob on the Spike Mount.
16. Extend the Radial Wires on the ground to around 25 feet *(approximately 8 feet of wire will remain on the Line Winder)* from the Mast and 90° apart, as shown in Figure (4).
17. Attach the Coaxial Cable (j) to the Matching Transformer.
18. Perform operational test.

Portable Vertical Configuration

The Portable Vertical configuration, see Figure (5) is a short to medium/long range HF antennas. It can provide good general-purpose communications from 1.8 to 54 MHz *(see specifications)*. It has a low take-off angle on frequencies above 10 MHz and is omnidirectional. The "L" variation of this configuration, shown in the inset of Figure (5), is somewhat directional towards the single radial.

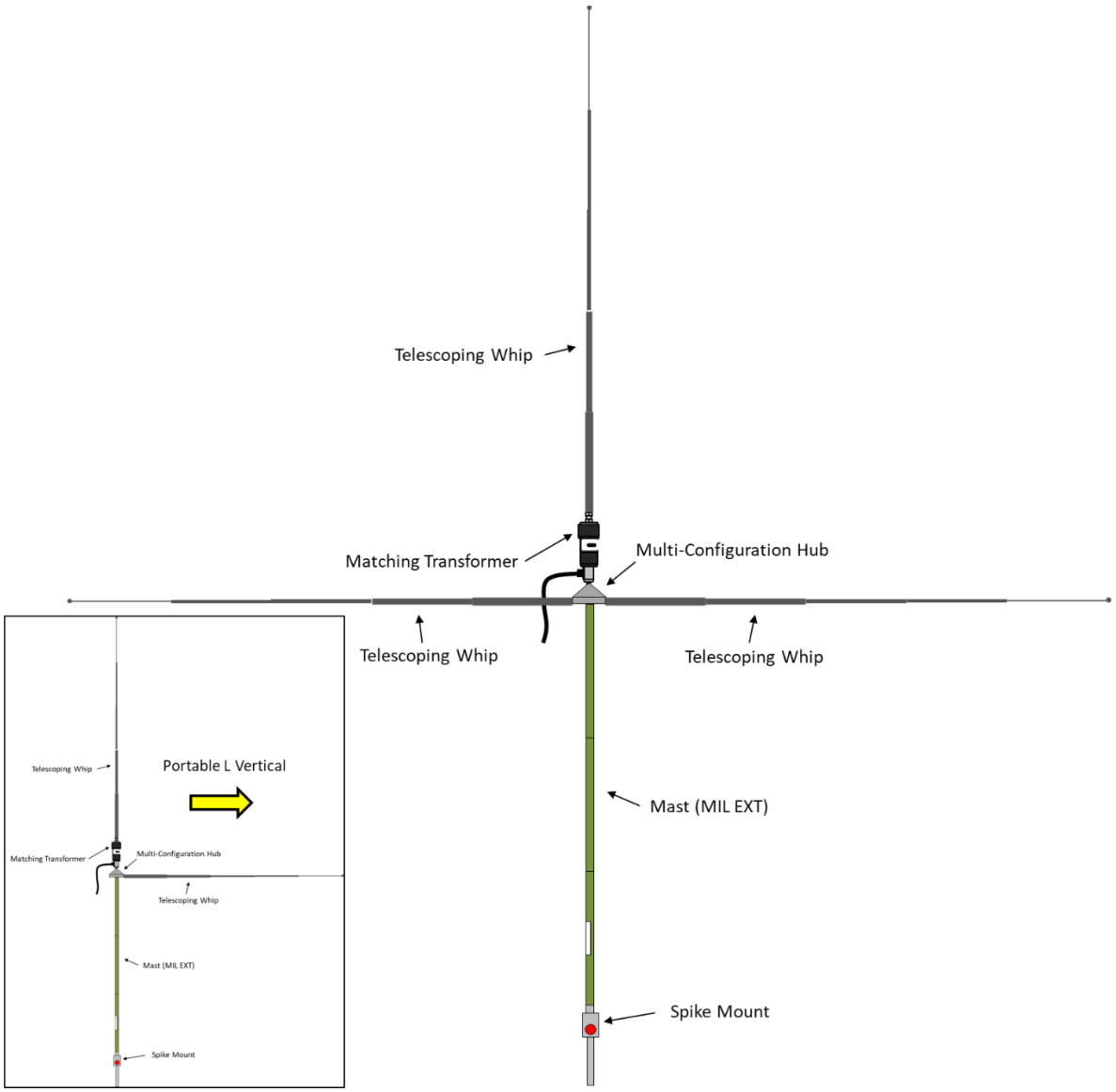


Figure 6. Portable Vertical Configuration.

1. Select a site to deploy the Portable Vertical configuration. The best site would be a clear circular area with a diameter of around 36 feet.
2. Drive the Spike Mount (g) half way (approximately eight inches) into the ground in the center of the cleared area. Use a plastic or rubber tent mallet to avoid damaging the face of the Spike Mount.
3. Thread the base stud on the bottom of the Mast (f) into the socket on top of the Spike Mount. Tighten by hand until snug.

4. Pull the top two sections of the Mast up and then tilt them over, as shown in Plate (2), to enable assembly of the top part of the antenna without requiring a step-ladder.
5. Attach a Multi-Configuration Hub (c) to the top of the Mast by carefully threading the stud on the bottom of the Hub to the socket on the top of the Mast. Tighten by hand until snug.

Use Caution when assembling all threaded connections. Ensure the connections are not cross-threaded and that there is no grit on the threads to avoid galling of the machined threads. Use of an anti-seize lubricant, such a Permatex™, is highly recommended.

6. Attach the Matching Transformer (a) to the top of the Multi-Configuration Hub by carefully threading the stud at the bottom of the Transformer to the socket on top of the Hub. Tighten by hand until snug.
7. Attach the Coaxial Cable (j) to the Matching Transformer.
8. Thread the base stud of a Telescoping Whip (d) into the socket on top of the Matching Transformer. Tighten by hand until snug.
55. Attach two Shackles (e) to the outer two angled sockets on top of the Multi-Configuration Hub. Tighten by hand until snug.
9. Using a Bowline or similar knot, tie two 15-foot Guy Lines (i) to one Shackle and one Guy Line to the other.
10. Attach two Telescoping Whips *(one if making an "L")* to the Multi-Configuration Hub. The completed assembly show look like that pictured in plate (8).
11. Starting at the bottom, extend the Telescoping Whips, one section at a time, until they are fully extended.
12. Replace the top section of the Mast.
13. Drive a Tent Stake (h) into the ground around 7 feet from the Mast.

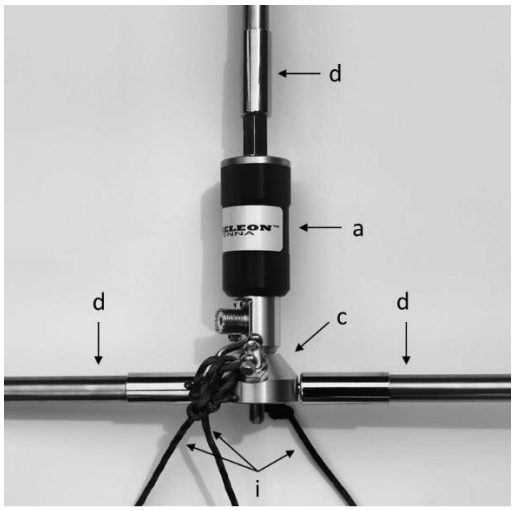


Plate 8. Hub Assembly Connections.

14. Attach the Guy Line to the Tent Stake, using a Round Turn and two Half Hitches or similar knot.
15. Repeat steps (14) and (15) for the other two Guy Lines. The Guy Lines should be approximately 120° apart.
16. Tighten all Guy Lines.
17. Perform operational test.

Portable Horizontal and V Dipole Configurations

The Portable Horizontal and V Dipole configurations, see figures (7) and (8), are a short to medium range HF antennas. They can provide general-purpose short-range communications from 1.8 to 54 MHz *(see specifications)* and NVIS propagation below 10 MHz. Above 18 MHz, the V Dipole has gain over a half-wave dipole and will provide medium-range communication using skywave propagation. The V Dipole configuration is recommended over the Horizontal Dipole as it gets the ends of the antenna up, away from the ground and has better overall performance. These configurations are bi-directional (broadside to the antenna) and very fast and easy to setup.

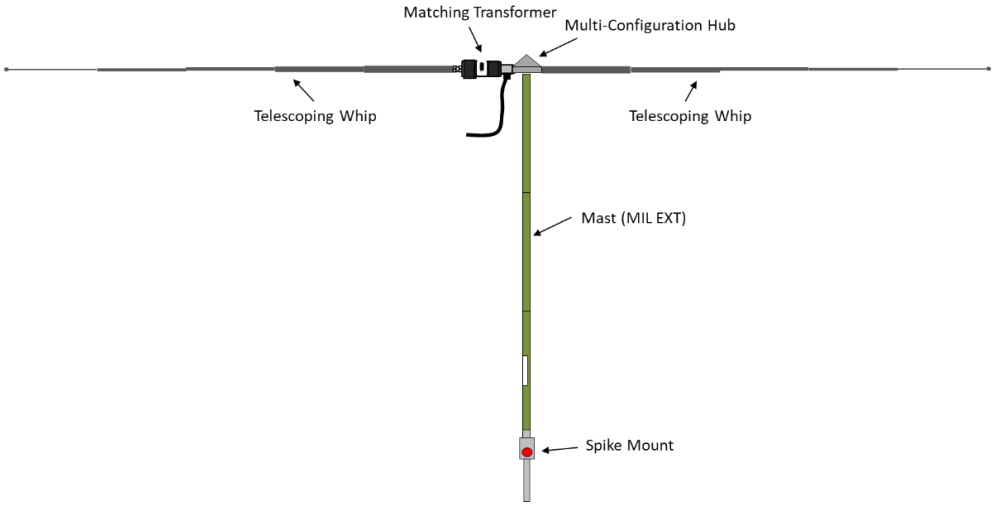


Figure 7. Portable Horizontal Dipole Configuration.

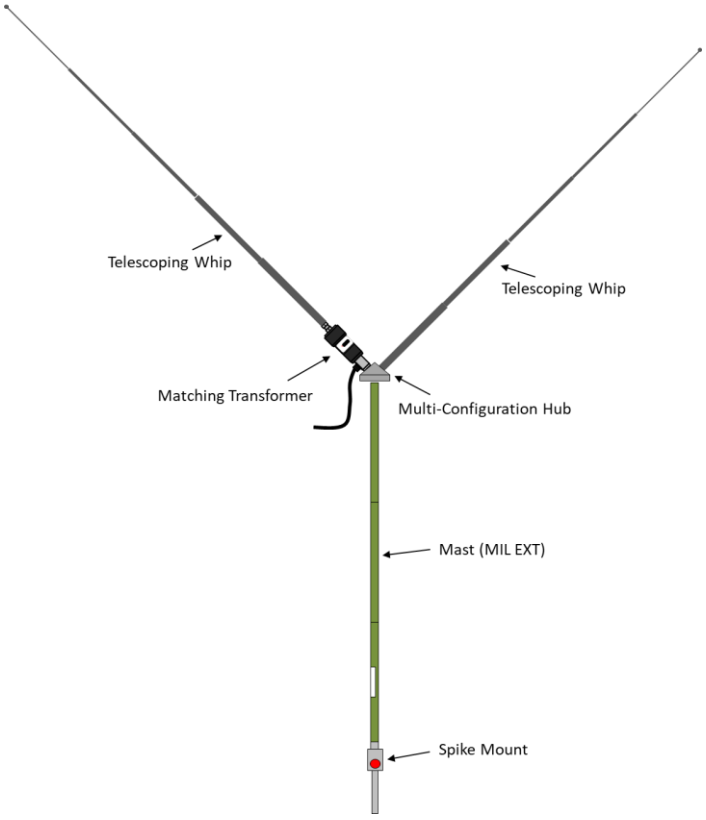


Figure 8. Portable V Dipole Configuration.

1. Select a site to deploy the Portable Horizontal Dipole or V Dipole configurations. The best site would be a clear circular area with a diameter of around 36 feet.
2. Drive the Spike Mount (g) half way (approximately eight inches) into the ground in the center of the cleared area. Use a plastic or rubber tent mallet to avoid damaging the face of the Spike Mount.
3. Thread the base stud on the bottom of the Mast (f) into the socket on top of the Spike Mount. Tighten by hand until snug.
4. Pull the top two sections of the Mast up and then tilt them over, as shown in Plate (2), to enable assembly of the top part of the antenna without requiring a step-ladder.
5. Attach a Multi-Configuration Hub (c) to the Mast by carefully threading the stub at the bottom of the Hub into the socket on top of the Mast. Tighten until snug.
6. **Horizontal Dipole:** Attach the Matching Transformer (a) to the one of the horizontally oriented sockets on the side of the Multi-Configuration Hub by carefully threading the stud at the bottom of the Transformer into the Hub socket. Tighten by hand until snug.

Use Caution when assembling all threaded connections. Ensure the connections are not cross-threaded and that there is no grit on the threads to avoid galling of the machined threads. Use of an anti-seize lubricant, such a Permatex™, is highly recommended.

7. **Horizontal Dipole:** Attach a Telescoping Whip (d) to the other horizontally oriented socket on the opposite side of the Multi-Configuration Hub by carefully threading the stud at the bottom of the Whip into the Hub socket.
8. **V Dipole:** Attach the Matching Transformer (a) to the one of the outer angled sockets on top of the Multi-Configuration Hub by carefully threading the stud at the bottom of the Transformer into the Hub socket. Tighten by hand until snug.
9. **V Dipole:** Attach a Telescoping Whip (d) to the other outer angled socket on the opposite side of the Multi-Configuration Hub by carefully threading the stud at the bottom of the Whip into the Hub socket.
10. Thread the base stud of the Telescoping Whip into the socket on top of the Matching Transformer. Tighten by hand until snug.
56. Attach two Shackles (e) to the two free sockets on the Multi-Configuration Hub by carefully threading the stud of the Shackle into the Hub socket. Tighten by hand until snug.
11. Tie two 15-foot Guy Lines (i) to one of the Shackles and one Guy Line to the other Shackle using a Bowline or similar knot. The completed assembly should look like that pictured in Plates (9) or (10), depending on the configuration.
12. Attach the Coaxial Cable (j) to the Matching Transformer.

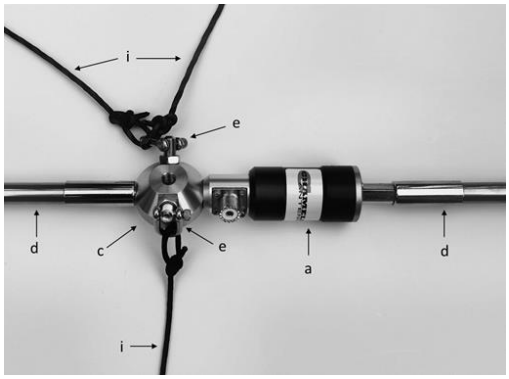


Plate 9. Horizontal Dipole Connections.

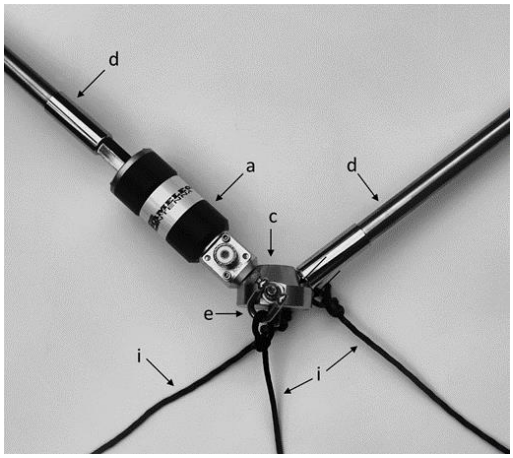


Plate 10. V Dipole Connections.

13. Starting at the bottom, extend the two Telescoping Whips, one section at a time, until they are fully extended.
14. Replace the top section of the Mast.
15. Drive a Tent Stake (h) into the ground around 7 feet from the Mast.
16. Attach one Guy Line to the Tent Stake, using a Round Turn and two Half Hitches or similar knot.
17. Repeat steps (16) and (17) for the other two Guy Lines. The Guy Lines should be approximately 120° apart.
18. Tighten all Guy Lines.
19. Perform operational test.

Recovery Procedure

To recover the Multi-Configuration Hub System, perform the following steps:

1. Disconnect the Coaxial Cable from the radio set.
2. Disconnect the Radials or Guy Lines from the Tent Stakes.
3. Pull the Tent Stakes out of the ground.
4. Pull the Spike Mount out of the ground and lower the antenna.
5. If used, collapse the Telescoping Whips. Start from the top, collapse one section at a time until the Telescoping Whips are completely collapsed.
6. Detach all components from Multi-Configuration Hub.
7. Rewind Antenna Wires and Radials onto the Line Winders.
8. Disconnect the Coaxial Cable Assembly from the Matching Transformer and carefully roll (do not twist) the Coaxial Cable Assembly.
9. Remove dirt from components and inspect them for signs of wear.
10. Return MPAS 2.0 components to backpack.
11. Store the remaining Multi-Configuration Hub components together ready for next antenna deployment.

Troubleshooting

1. Ensure the UHF Plug from the Coaxial Cable is securely connected to the UHF Socket on the Matching Transformer.
2. Inspect Coaxial Cable for cuts in insulation or exposed shielding.
3. If still not operational, replace Coaxial Cable. *Most problems with antenna systems are caused by the coaxial cables and connectors.*
4. If still not operational, contact Chameleon Antenna™ at support@chameleonantenna.com for technical support, be sure to include details on the antenna configuration, symptoms of the problem, and what steps you have taken.

Accessories

The following accessories are available for purchase from Chameleon Antenna™. Please contact us at support@chameleonantenna.com for current prices and availability.

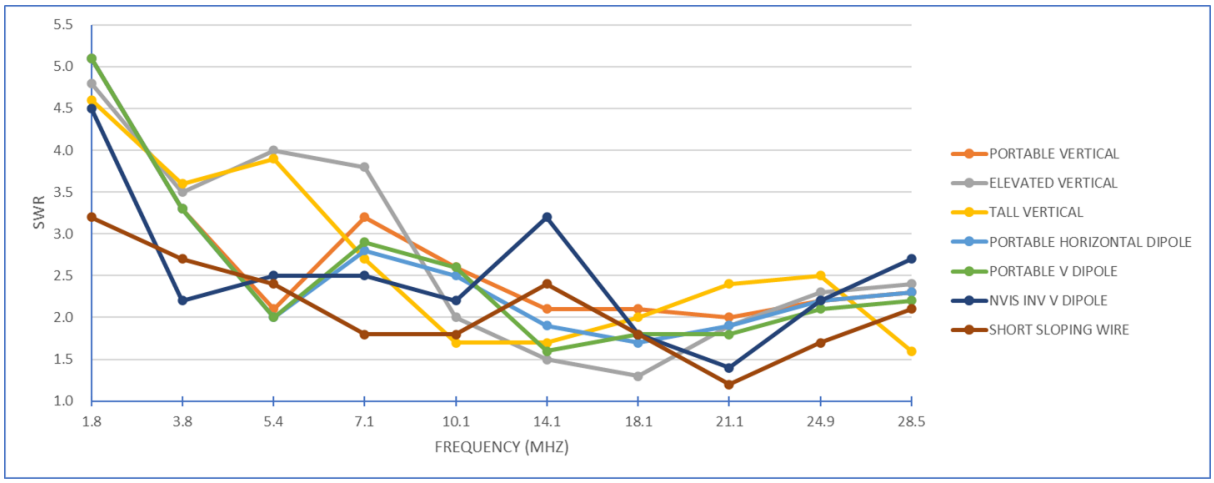
UNIVERSAL GUYING SYSTEM. The CHA UGS was specifically developed to provide support for the CHA MIL WHIP and CHA MIL EXT portable vertical antenna used in the Modular Portable Antenna System (MPAS). The components of the system are: a delta-shaped insulating guy ring, three 15” ground stakes, and three 25-foot

lengths of 1/8” ultra-low stretch, abrasive-resistant, non-conductive guy line on line winders. The guy lines have carabiner-style clips and tension adjustors for ultimate convenience. This is a highly recommended accessory for the MPAS.

UNIVERSAL CLAMP MOUNT. The super heavy-duty CHA UCM Universal Clamp Mount, is the first ham radio antenna mounting system, purposely designed for extreme portable operations. This is a rugged, robust product, intended to support considerable antenna loads. The CHA UCM is by far the ultimate mounting system on the market. It is durable and perfect for use in semi-permanent or portable installations.

Specifications

- Frequency: Amateur Radio Service bands 1.8 MHz through 54.0 MHz (160 - 6m), depending on configuration. Performance is limited on the 1.8 MHz band (160m).
- Power: See specifications for CHA MPAS 2.0.
- SWR: Subject to frequency and configuration, as measured see Figure (9), but typically less than 2.6:1 above 10.1 MHz (30m). An antenna tuner or coupler may be required for operation on some frequencies and configurations.
- Length: 26 ft when configured as a vertical monopole and 64 ft when configured as an Inverted V dipole.
- Weight: approximately 6.2 lbs.
- Personnel Requirements and Setup Time: one operator, approximately 5-15 minutes, depending on the configuration used.
- Example Far Field plots for each configuration are shown in figures (10) through (16).



	SWR						
FREQUENCY (MHZ)	PORTABLE VERTICAL	ELEVATED VERTICAL	TALL VERTICAL	HORIZONTAL DIPOLE	PORTABLE V DIPOLE	NVIS INV V DIPOLE	SLOPING WIRE
1.8	5.1	4.8	4.6	5.1	5.1	4.5	3.2
3.8	3.3	3.5	3.6	3.3	3.3	2.2	2.7
5.4	2.1	4.0	3.9	2.0	2.0	2.5	2.4
7.1	3.2	3.8	2.7	2.8	2.9	2.5	1.8
10.1	2.6	2.0	1.7	2.5	2.6	2.2	1.8
14.1	2.1	1.5	1.7	1.9	1.6	3.2	2.4
18.1	2.1	1.3	2.0	1.7	1.8	1.8	1.8
21.1	2.0	1.9	2.4	1.9	1.8	1.4	1.2
24.9	2.2	2.3	2.5	2.2	2.1	2.2	1.7
28.5	2.3	2.4	1.6	2.3	2.2	2.7	2.1

Figure 9. Typical Measured SWR.

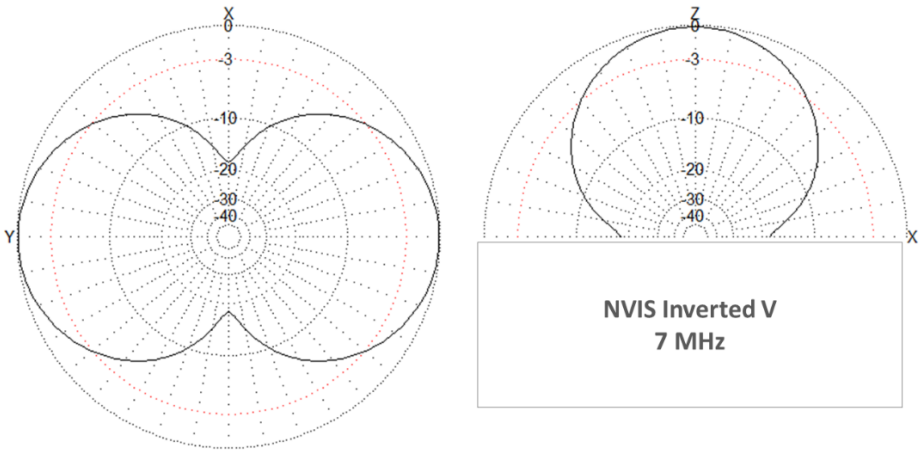


Figure 10. Horizontal NVIS Dipole Far Field Plot.

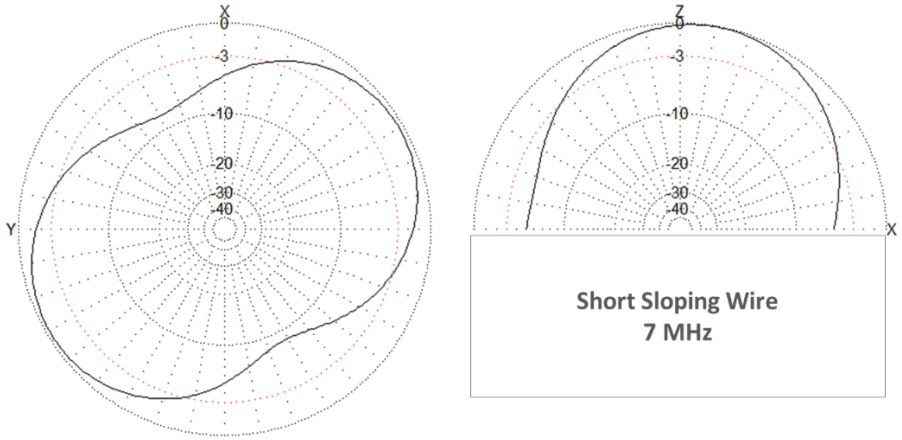


Figure 11. Short Sloping Wire Far Field Plot.

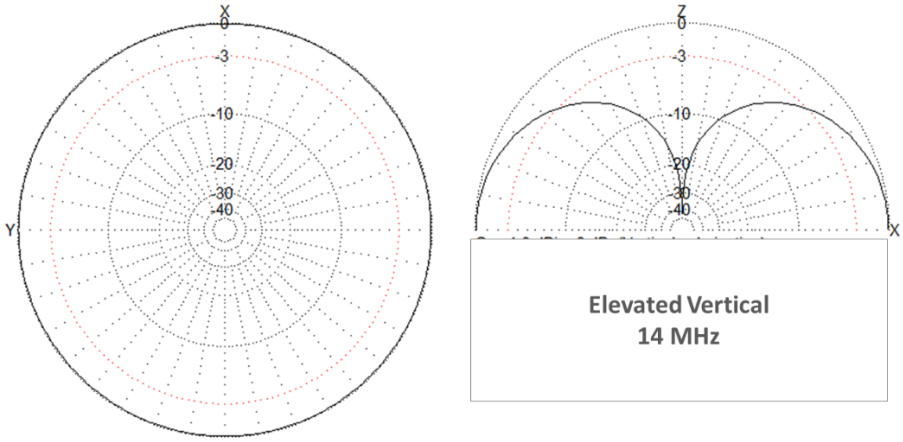


Figure 12. Elevated Vertical.

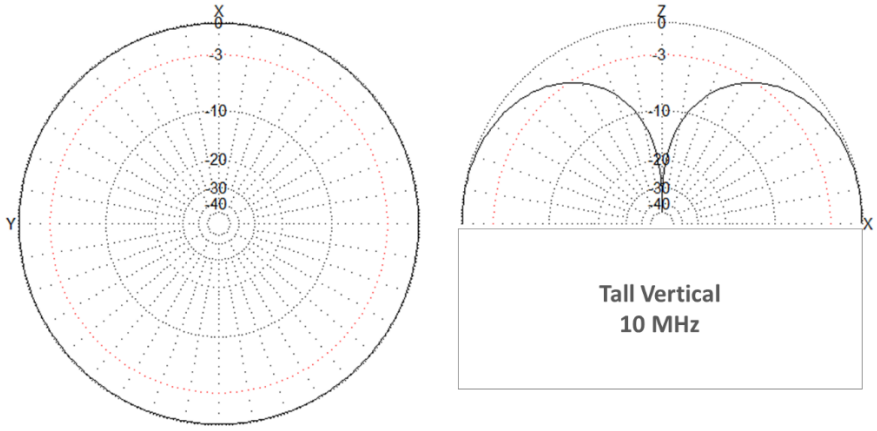


Figure 13. Tall Vertical.

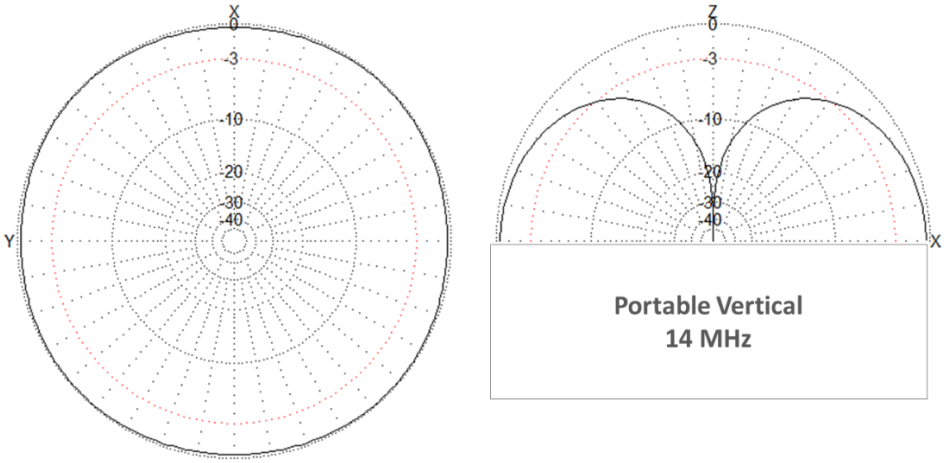


Figure 14. Portable Vertical.

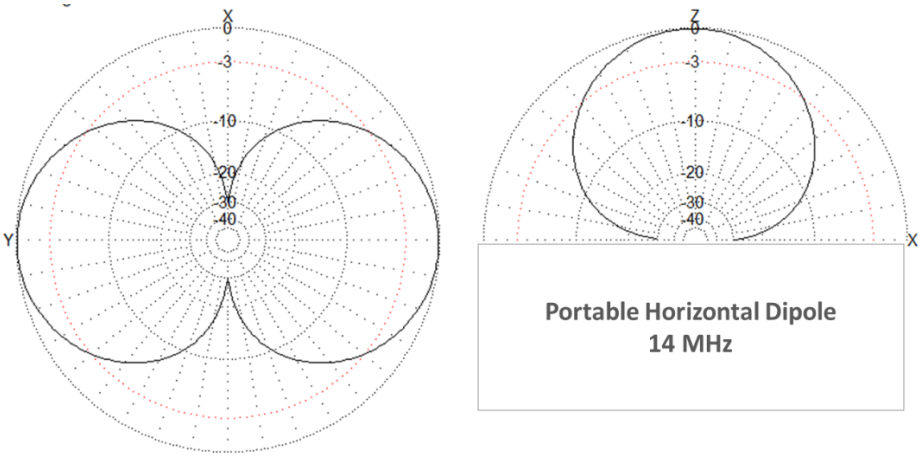


Figure 15. Portable Horizontal Dipole.

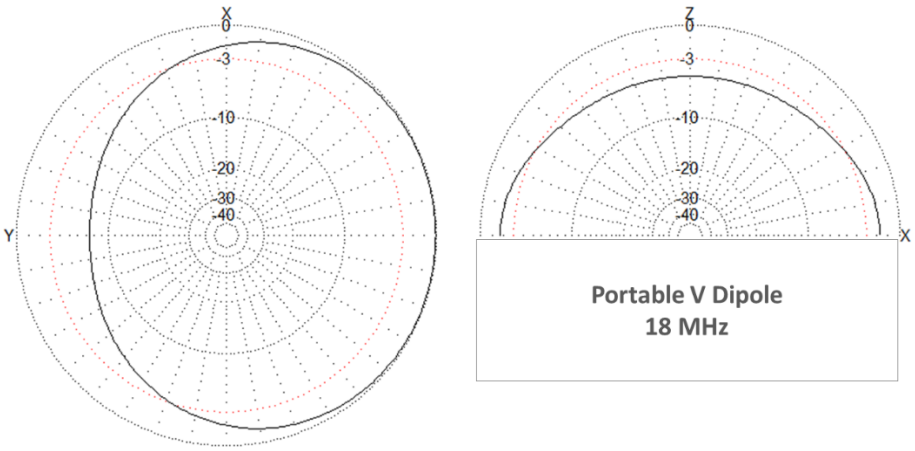
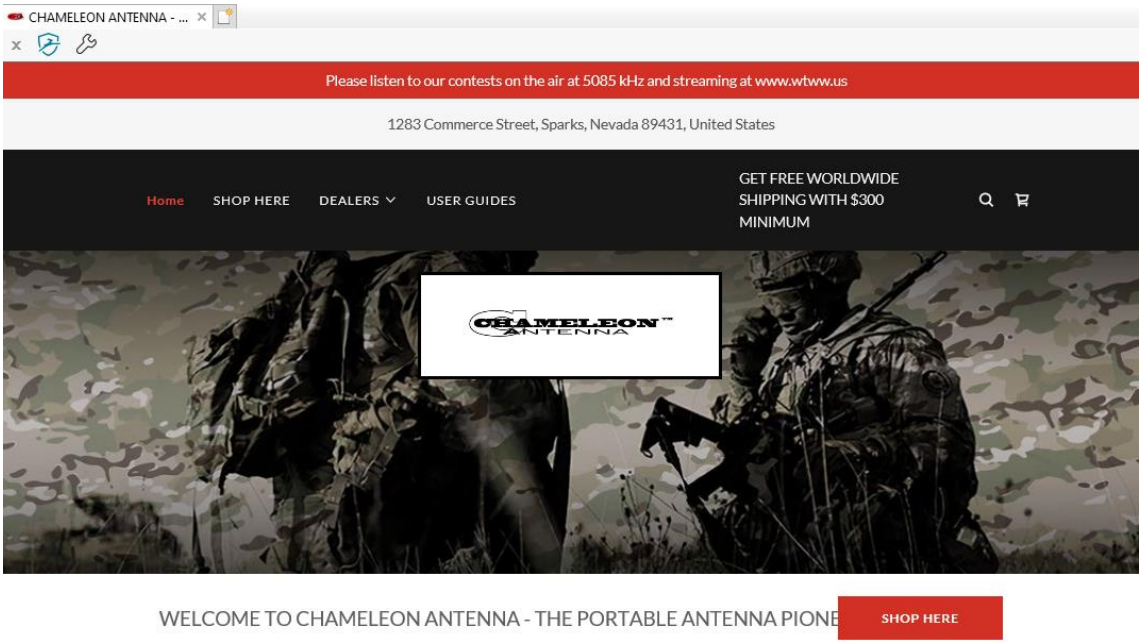


Figure 16. Portable V Dipole.

Chameleon Antenna™ Products

Please go to http://chameleonantenna.com for information about additional quality antenna products available for purchase from Chameleon Antenna™ – The Portable Antenna Pioneer.



References

Silver, H. Ward (editor), 2013, *2014 ARRL Handbook for Radio Communications*, 91st Edition, American Radio Relay League, Newington, CT.