



# EMCOMM III Portable Antenna Operator's Manual

Nevada - USA

[WWW.CHAMELEONANTENNA.COM](http://WWW.CHAMELEONANTENNA.COM)



***VERSATILE – DEPENDABLE – STEALTH – BUILT TO LAST***

## Table of Contents

Introduction .....	3
HF Propagation .....	3
Parts of the Antenna .....	4
Antenna Configurations .....	7
Inverted “L” / Sloping Wire Configurations .....	8
End-Fed Inverted “V” .....	10
Horizontal End-Fed (NVIS).....	11
Recovery Procedure.....	12
Troubleshooting.....	12
Accessories.....	13
Specifications .....	13
Chameleon Antenna™ Products.....	16
References .....	17



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.

All information on this product and the product itself is the property of and is proprietary to Chameleon Antenna™. Specifications are subject to change without prior notice.

## Introduction

Thank you for purchasing and using the Chameleon Antenna™ EMCOMM III Portable antenna. The EMCOMM III Portable antenna, see plate (1), is a portable High Frequency (HF) antenna specially designed for short to long range portable and man-pack HF communications. The EMCOMM III Portable antenna is ideal for hiking, backpacking, and both tent and Recreational Vehicle (RV) camping. It is also highly suitable for military, government agencies, non-governmental organizations (NGOs), Military Affiliate Radio System (MARS), Civil Air Patrol (CAP), Amateur Radio Emergency Service (ARES) / Radio Amateur Civil Emergency Service (RACES), Salvation Army Team Emergency Radio Network (SATERN), and amateur radio operators (hams) involved in field communication and disaster preparedness.

The EMCOMM III Portable antenna is configurable to facilitate Near-Vertical Incident Sky wave (NVIS) communication and will support most Automatic Link Establishment (ALE), frequency-hopping, and spread-spectrum modes and operations. An antenna tuner or coupler may be required for in some instances. The EMCOMM III Portable antenna can be deployed by the operator in the field in less than 15 minutes, using almost any available support, with no masts or guying required.

The EMCOMM III Portable antenna is comprised of a matching transformer, a 73 foot antenna wire on a line winder, and a 25 foot counterpoise - making a highly portable and effective HF antenna system.

Antennas built by Chameleon Antenna™ are versatile, dependable, stealthy, and built to last. Please read this operator's manual so that you may

maximize the utility you obtain from your EMCOMM III Portable antenna.



**Plate (1). EMCOMM III Portable Antenna.**

## HF Propagation

HF radio provides relatively inexpensive and reliable local, regional, national, and international voice and data communication capability. It is especially suitable for undeveloped areas where normal telecommunications are not available, too costly or scarce, or where the commercial telecommunications infrastructure has been damaged by a natural disaster or military conflict.

Although HF radio is a reasonably reliable method of communication, HF radio waves propagate through a complex and constantly changing environment and are affected by weather, terrain, latitude, time of day, season, and the 11-year solar cycle. A detailed explanation of the theory of HF radio wave propagation is beyond the scope of this operator's manual, but an understanding of the basic principles will help the operator decide what frequency and which of the EMCOMM III Portable's configurations will support their communication requirements.

HF radio waves propagate from the transmitting antenna to the receiving antenna using two methods: ground waves and sky waves.

Ground waves are composed of direct waves and surface waves. Direct waves travel directly from the transmitting antenna to the receiving antenna when they are within the radio line-of-sight. Typically, this distance is 8 to 14 miles

for field stations. Surface waves follow the curvature of the Earth beyond the radio horizon. They are usable, during the day and under optimal conditions, up to around 90 miles, see table (1).

Low power, horizontal antenna polarization, rugged or urban terrain, dense foliage, or dry soil conditions can reduce the range very significantly. The U.S. Army found that in the dense jungles of Vietnam, the range for ground waves was sometimes less than one mile.

Sky waves are the primary method of HF radio wave propagation. HF radio waves on a frequency below the critical frequency (found by an ionosonde) are reflected off one of the layers of the ionosphere and back to Earth between 300 and 2,500 miles, depending upon the frequency and ionospheric conditions.

Frequency	Distance	Frequency	Distance
2 MHz	88 miles	14 MHz	33 miles
4 MHz	62 miles	18MHz	29 miles
7 MHz	47 miles	24 MHz	25 miles
10 MHz	39 miles	30 MHz	23 miles

**Table 1. Maximum Surface Wave Range by Frequency.**

HF radio waves can then be reflected from the Earth to the ionosphere again during multihop propagation for longer range communication. The most important thing for the operator to understand about HF radio wave propagation is the concept of Maximum Usable Frequency (MUF), Lowest Usable Frequency (LUF), and Optimal Working Frequency (OWF). The MUF is the frequency for which successful communications between two points is predicted on 50% of the days of in a month. The LUF is the frequency below which successful communications are lost due to ionospheric losses. The OWF, which is somewhere between the LUF and around 80% of the MUF, is the range of frequencies which can be used for reliable communication. If the LUF is above the MUF, HF sky wave propagation is unlikely to occur.

The HF part of the Radio Frequency (RF) spectrum is usually filled with communications activity and an experienced operator can often determine where the MUF is, and with less certainty, the LUF by listening to where activity ends. The operator can then pick a frequency in the OWF and attempt to establish contact. Another method is using HF propagation prediction software, such as the *Voice of America Coverage Analysis Program (VOACAP)*, which is available at no cost to download or use online at [www.voacap.com](http://www.voacap.com). The operator enters the location of the two stations and the program shows a wheel with the predicted percentage of success based on frequency and time. ALE, which is the standard for interoperable HF communications, is an automated method of finding a frequency in the OWF and establishing and maintaining a communications link.

Even under optimal conditions, there is a gap between where ground waves end (around 40 to 90 miles) and the sky wave returns to Earth on the first hop (around 300 miles). NVIS propagation can be used to fill this gap. 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.

## Parts of the Antenna

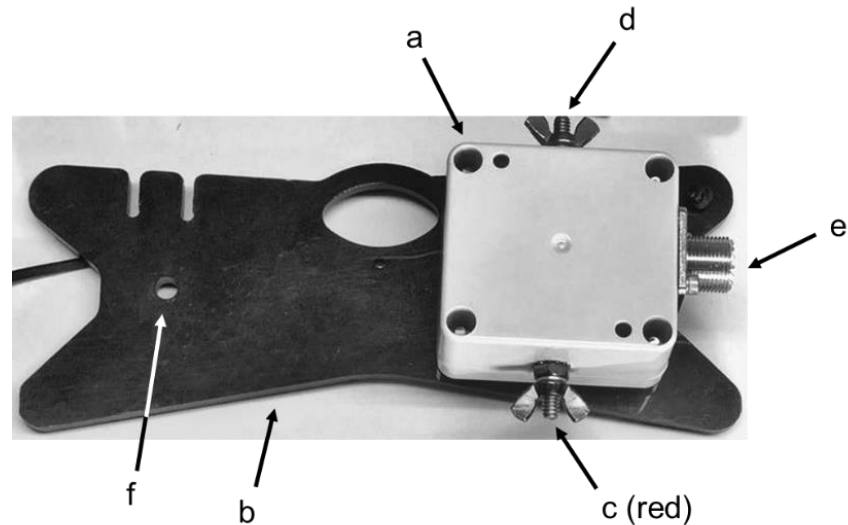
The EMCOMM III Portable antenna is comprised of the following components:

**a. Matching Transformer**

The Matching Transformer, see plate (2), provides impedance matching for the EMCOMM III Portable antenna. It is permanently affixed to the Line Winder (b).

**b. Line Winder**

The Line Winder is used to store the Antenna Wire (g) and enables rapid deployment and recovery of the EMCOMM III Portable antenna. The Matching Transformer (a) is permanently affixed to the Line Winder. The Line Winder is also used as the end support for the erected antenna.



**Plate 2. Line Winder Components.**

**c. Antenna Connection**

The Antenna Connection is the red colored wing nut on the side of the Matching Transformer (a). It is used to connect the Antenna Wire (g) to the Matching Transformer.

**d. Counterpoise Connection**

The Counterpoise Connection is the other wing nut on the side of the Matching Transformer (a) that is not colored red. It is used to connect the Counterpoise Wire (m) to the Matching Transformer.

**e. UHF Socket**

The UHF Socket, SO-239, is located on the bottom of the Matching Transformer (a).

**f. Suspension Attachment Point**

The Suspension Attachment Point is a hole in the top of the Center Line Winder (b) used to allow attachment of Paracord (k) for suspension of the erected antenna.

**g. Antenna Wire**

The Antenna Wire consist of a 73 foot length of black insulated wire, wrapped around the Line Winder (b).

**h. Isolation loop**

An Isolation loop is permanently attached to ends of the Antenna Wire (g). There is also a floating Isolation Loop along the Antenna Wire. They are used to attach Paracord (k) for suspension of the erected antenna.

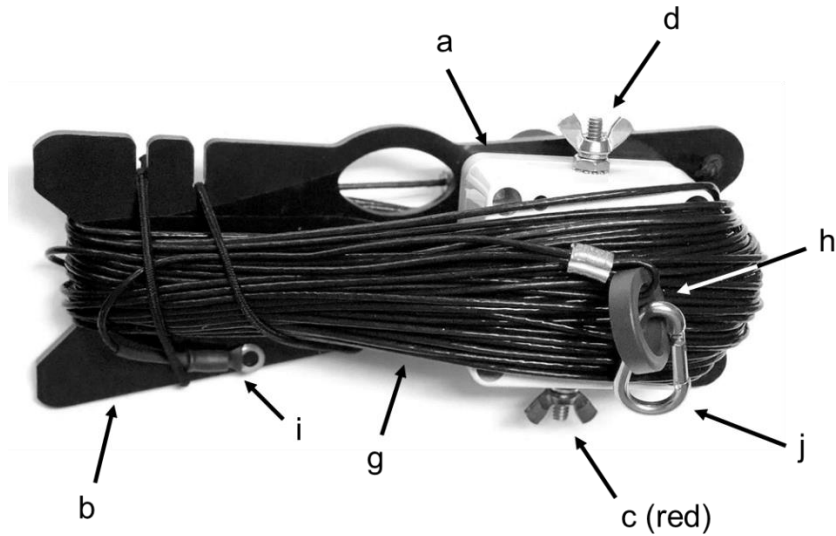


Plate 3. EMCOMM III Portable Antenna Components.

**i. Wire Connector**

The Wire Connector is used to connect the Antenna Wire (g) to the Matching Transformer (a).

**j. Carabiner**

The Carabiner is used to attach Paracord (k) to the Isolation Loop (h) at Wire Connector (i) end of the Antenna Wire (g).

**k. Paracord, 550**

Paracord (*not pictured*) is used to suspend components of the EMCOMM III Portable antenna at the proper height or anchor them to the ground, depending upon the antenna configuration. *Additional 50 foot length of Paracord on a Line Winder are available for purchase from Chameleon Antenna™. At least one assembly is highly recommended for deployment of most antenna configurations.*

**l. Coaxial Cable Assembly**

The Coaxial Cable Assembly (*not pictured, not supplied*) connects to the UHF Socket (e) at one end and the Radio Set at the other. The use of an RF choke at the feed point of the antenna will improve the performance of the antenna. *A 50 foot coaxial cable assembly, with an integrated RF choke, is available purchase from Chameleon Antenna™.*

**m. Counterpoise Wire**

The Counterpoise Wire (*not pictured*) is highly recommend for use in most configurations of the EMCOMM III Portable antenna. *An optional Counterpoise Kit, which contains four 25 foot wire radials secured around Line Winders and four steel Tent Stakes is available from Chameleon Antenna™.*

## Antenna Configurations

Using the supplied components, the EMCOMM III Portable antenna can be deployed into a number of useful configurations. Three basic configurations are described in this manual, each with unique performance characteristics. Table (2) shows the antenna configurations described in this manual. The table can assist the operator to quickly select the most appropriate antenna configuration to meet their operational requirements.

Configuration	Ground	Short	Medium	Long	Directionality	Deployment
Inverted "L" / Sloping Wire	↕		↕	↑	Omnidirectional	Deliberate / Hasty
End-Fed Inverted "V"	↕		↕		Bidirectional	Hasty
Horizontal End-Fed (NVIS)		↓	↑		Bidirectional	Deliberate

**Table 2. 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 EMCOMM III Portable configuration with the corresponding symbol in the appropriate distance column. All EMCOMM III Portable 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. "Hasty" and "Deliberate" in the deployment column indicate the relative complexity of site selection and setup for each antenna configuration.

To operate efficiently, all EMCOMM III Portable antenna end-fed configurations need one or more counterpoise wires. A single non-resonant counterpoise with a length of 25 feet will provide satisfactory performance on all frequencies. However, increasing the number of counterpoise wires will increase the efficiency of the antenna, with four being a good compromise between performance and practicality. Chameleon Antenna™ offers a counterpoise kit (CHA COUNTERPOISE KIT), which consists of four 25 ft radials and Tent Stakes. Contact Chameleon Antenna™ for availability and price. If fabricating your own counterpoise, table 3 shows the recommended wire lengths by Amateur Service bands.

BAND	LENGTH (FT)
160	52
80	27
60	18
40	13
30	9
20	7
17-10	5

**Table 3. Recommended Counterpoise Length.**

An antenna tuner or coupler may be required with some configurations and frequencies to obtain a suitable transmitter match.

### Inverted “L” / Sloping Wire Configurations

The EMCOMM III Portable antenna, Inverted “L” and Sloping Wire configurations, see figure (1), are medium to long range HF antennas. They should provide acceptable ground wave and sky wave propagation. The Inverted “L” and Sloping Wire configurations are excellent general-purpose antennas and are a good choice when two supports are available (for the Inverted “L”) or one support (for the Sloping Wire) and there is sufficient time for site selection and installation. Installing the antenna at a height of around 25 feet or higher will provide good performance. These configurations are predominately omnidirectional on lower frequencies, slightly favoring the end of the antenna on upper frequencies.

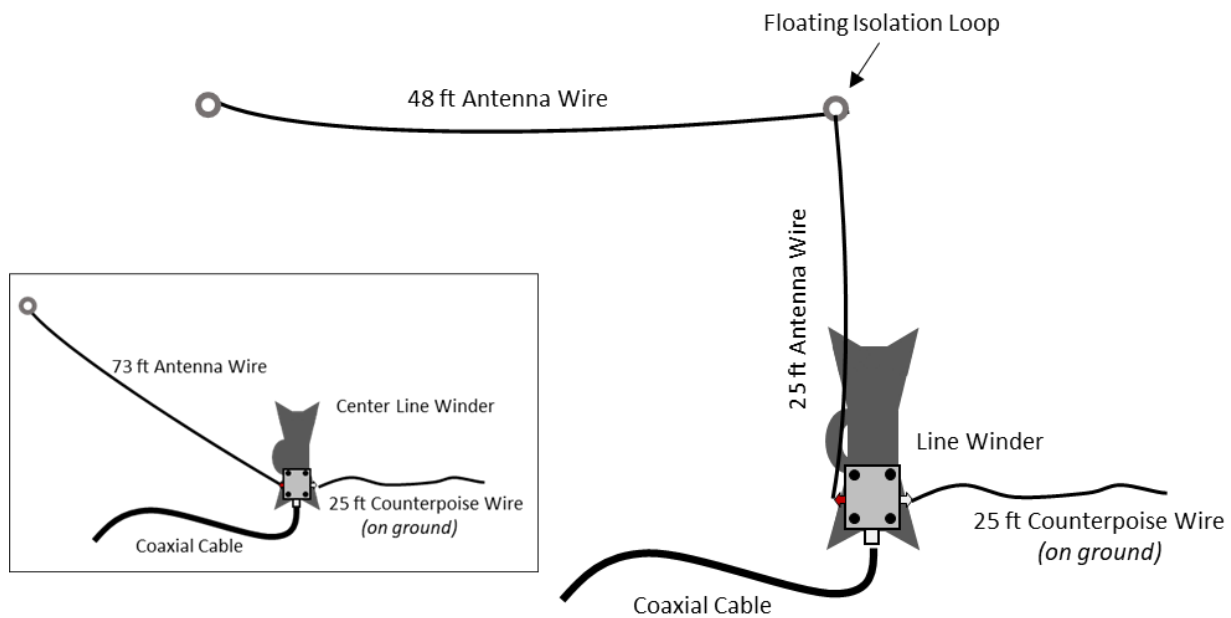


Figure 1. Inverted “L” and Sloping Wire (inset) Configurations.

#### Site Selection and Preparation.

1. Select a site to deploy the EMCOMM III Portable antenna Inverted “L” configuration, see figure (1). The best site should have two trees or other supports where the height of the supports and the distance between the supports equal the length of the Antenna Wire, which is 73 feet. In the example configuration shown in figure (4), the height is 25 feet and the distance between the supports is 48 feet for a total of 73 feet. The Sloping Wire configuration requires only one support. If tall supports are unavailable, any convenient object, such as fence posts or the top

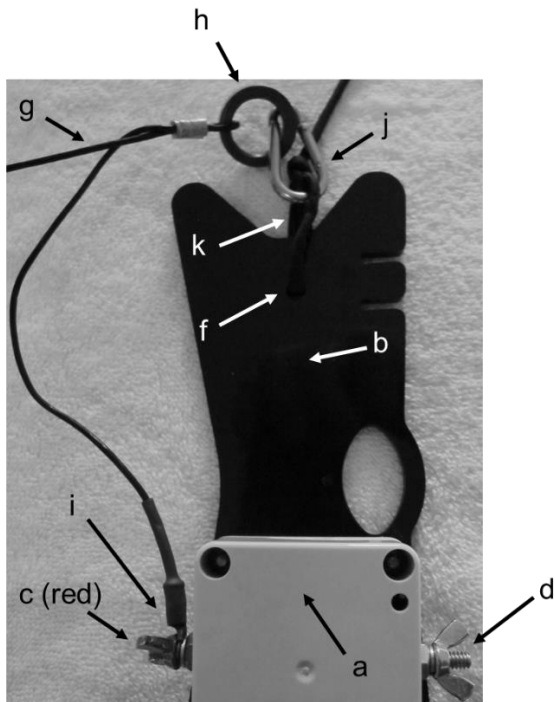
of vehicles, may be used as a field expedient supports with reduced performance.

2. Unwind the Antenna Wire (g) from the Line Winder (b).
3. Pass one end of a short length of Paracord through the Suspension Attachment Point (f) and tie a Square Knot or similar knot, forming a loop. This will be used for strain relief and to anchor the bottom end of the antenna to the ground in later steps.

Connect the Matching Transformer. Refer to plates (2) through (4) for following steps.



4. Attach a Carabiner to the Isolation Loop (h) on the Wire Connector (i) end of the Antenna Wire (g).
5. Connect the Wire Connector from the Antenna Wire to the Antenna Connection (c). *This is the red wing nut.* Tighten the wing nut finger tight.
6. Hook the Carabiner to the Paracord loop from step (3). This provides strain relief.



**Plate 4. Antenna Wire Connection.**

7. Connect the Counterpoise Wire (*not supplied*) to the Counterpoise Connection (d) on the Matching Transformer (a). Tighten the wing nut finger tight.
8. Connect the Coaxial Cable Assembly (p) to the UHF Socket (e) on the Matching Transformer.

*Extend the Antenna Wire.*

9. Secure the Line Winder to the ground with the short length of Paracord from step (3) and a Tent Stake (*not supplied*).
10. Extend the Antenna Wire to its full length to a position near the desired end point of the antenna.

*Raise the antenna.*

11. Using a Bowline or similar knot, tie a long length of Paracord to the floating Isolation Loop on the Antenna Wire.

*Inverted "L" only, perform steps 12 and 13*

12. Using a throw weight or some other method, loop the free end of the Paracord from the floating Isolation Loop on the Antenna Wire over the near end support.
13. Raise the floating Isolation Loop to the desired height and secure the free end of the Paracord to the support with a Round Turn and two Half Hitches or similar knot.
14. Tie a long length of Paracord to the Isolation Loop on the end of the Antenna Wire.
15. Using a throw weight or some other method, loop the free end of the Paracord from the end Isolation Loop over the far end support.
16. Pull the end Isolation Loop up to the desired height, such that the Antenna Wire is somewhat taut, but still has sufficient sag to allow for swaying. Secure the end of the Paracord to the end support using a Round Turn and two Half Hitches or similar knot.
17. The Counterpoise Wire should be extended on the ground, in a mostly straight line, in any convenient direction. The end of the Counterpoise Wire may be left free or it can be secured to the ground using a Tent Stake (*not supplied*).

18. Perform operational test.

## End-Fed Inverted “V”

The EMCOMM III Portable antenna End-Fed Inverted “V” configuration, see figure (1), is a medium range HF antenna. The End-Fed Inverted “V” is a good compromise between performance and ease of installation since it requires only one center support, has a reasonably small foot-print, and provides good sky wave propagation. The center should be mounted at a height of around 25 feet and when mounted at this height, the antenna will be omnidirectional at lower frequencies and predominately bidirectional broadside to the antenna on upper frequencies.

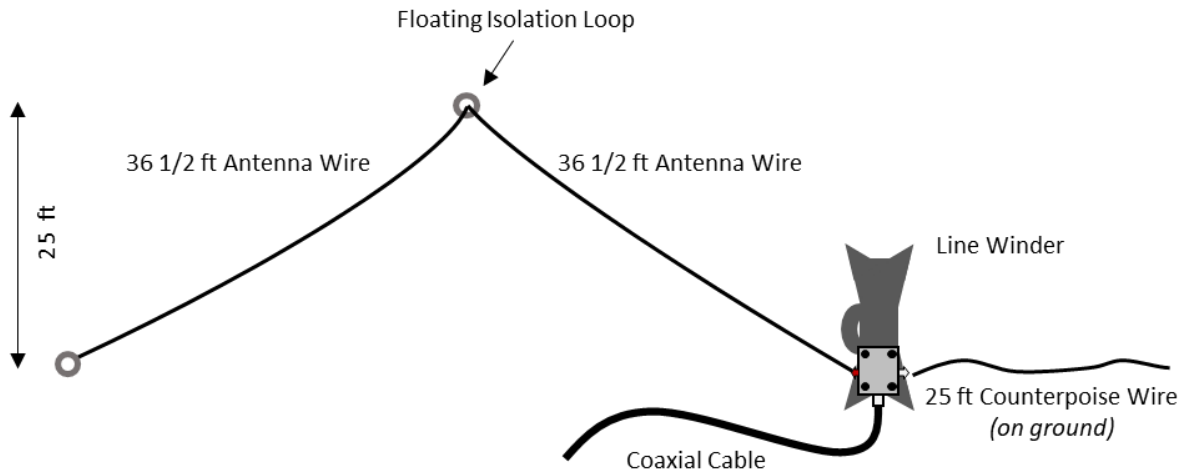


Figure 2. End-Fed Inverted “V” Configuration.

### Site Selection and Preparation.

1. Select a site to deploy the EMCOMM III Portable antenna End-Fed Inverted “V” configuration, see figure (2). The best site should have a tree or other support that would enable the center of the Antenna Wire to be raised to a height of around 25 feet. If tall supports are unavailable, any convenient object, such as a fence post or the top of a vehicle, may be used as field expedient supports with reduced performance.
2. Unwind the Antenna Wire (g) from the Line Winder (b).
3. Pass one end of a short length of Paracord through the Suspension Attachment Point (f) and tie a Square Knot or similar knot, forming a loop. This will be used for strain relief and to anchor the bottom end of the antenna to the ground in later steps.

*Connect the Matching Transformer. Refer to plates (2) through (4) for following steps.*

4. Attach a Carabiner (j) to the Isolation Loop (h) on the Wire Connector (i) end of the Antenna Wire.

5. Connect the Wire Connector from the Antenna Wire (g) to the Antenna Connection (c). *This is the red wing nut.* Tighten the wing nut finger tight.
6. Hook the Carabiner to the Paracord loop from step (3). This provides strain relief.
7. Connect the Counterpoise Wire (*not supplied*) to the Counterpoise Connection (d) on the Matching Transformer (a). Tighten the wing nut finger tight.
8. Connect the Coaxial Cable Assembly (p) to the UHF Socket (e) on the Matching Transformer.

### *Extend the Antenna Wire.*

9. Secure the Line Winder to the ground with the short length of Paracord from step (3) and a Tent Stake (*not supplied*).
10. Extend the Antenna Wire to its full length to a position near the desired end point of the antenna.

### *Raise the antenna.*

11. Using a Bowline or similar knot, tie a long length of Paracord to the floating Isolation Loop on the Antenna Wire.

12. Using a throw weight or some other method, loop the free end of the Paracord from the floating Isolation Loop on the Antenna Wire over the center support.
13. Raise the floating Isolation Loop to the desired height and secure the free end of the Paracord to the support with a Round Turn and two Half Hitches or similar knot.
14. Tie a short length of Paracord to the Isolation Loop on the end of the Antenna Wire.
15. Pull the end Isolation Loop, such that the Antenna Wire is somewhat taut, but still has sufficient sag to allow for swaying. Secure the end of the Paracord to the ground using a Tent Stake (*not supplied*).
16. The Counterpoise Wire should be extended on the ground, in a mostly straight line, in any convenient direction. The end of the Counterpoise Wire may be left free or it can be secured to the ground using a Tent Stake (*not supplied*) through the Isolation Loop.
17. Perform operational test.

### Horizontal End-Fed (NVIS)

The EMCOMM III Portable antenna Horizontal End-Fed (NVIS) configuration, see figure (3), is a short to medium range HF antenna. The Horizontal End-Fed configuration will provide good NVIS propagation on lower frequencies and medium range sky wave propagation on upper frequencies. It requires two supports and should be mounted at a height of around 25 feet for good overall results. When mounted at this height, the antenna is omni-directional on the lower frequencies and predominantly bidirectional towards the ends of the antenna on the upper frequencies. A special variation of this configuration is a high-gain long wire antenna for the 50 MHz (6 Meter) Amateur Radio Service band. In this configuration, the operator uses a 4 ft 8 in (56 in) wire as the Antenna Wire and the supplied Antenna Wire as the counterpoise, as shown in the inset in figure (3).

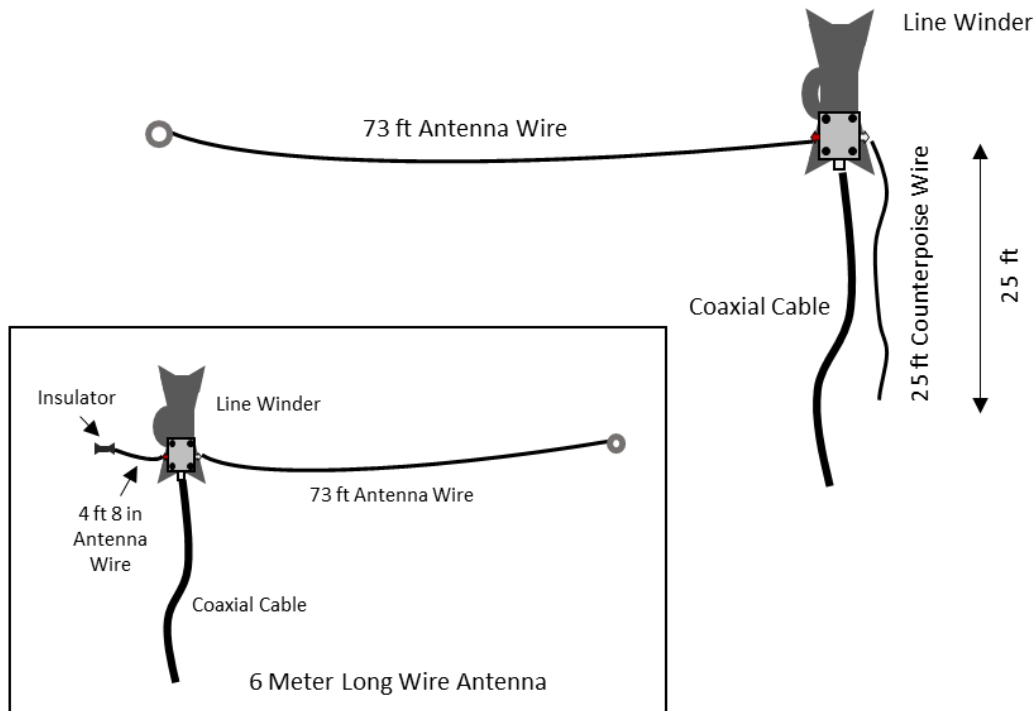


Figure 3. Horizontal NVIS Configuration.

### *Site Selection and Preparation.*

1. Select a site to deploy the EMCOMM III Portable antenna End-Fed Horizontal (NVIS) configuration, see figure (3). The best site should have two trees or other supports where the distance between the supports is at least 73 feet. If sufficiently tall supports are unavailable, any convenient object, such as fence posts or the top of vehicles, may be used as a field expedient supports with reduced performance.
2. Unwind the Antenna Wire (g) from the Line Winder (b).
3. Using a Bowline or similar loop knot, tie the end of a long length of Paracord to the Line Winder through the Suspension Attachment Point (f). This will be used for strain relief and to suspend the end of the antenna in later steps.

### *Connect the Matching Transformer. Refer to plates (2) through (4) for following steps.*

4. Attach a Carabiner (j) to the Isolation Loop (h) on the Wire Connector (i) end of the Antenna Wire (g).
5. Connect the Wire Connector to the Antenna Connection (c). *This is the red wing nut.* Tighten the wing nut finger tight.
6. Hook the Carabiner to the Paracord loop from step (3). This provides strain relief.
7. Connect the Counterpoise Wire (*not supplied*) to the Counterpoise Connection (d) on the Matching Transformer (a). Tighten the wing nut finger tight.

8. Connect the Coaxial Cable Assembly (l) to the UHF Socket (e) on the Matching Transformer.

### *Extend the Antenna Wire.*

9. Extend the Antenna Wire to its full length to a position near the desired end point of the antenna.
10. Using a Bowline or similar knot, tie a long length of Paracord to the Isolation Loop on the end of the Antenna Wire.

### *Raise the antenna.*

11. Using a throw weight or some other method, loop the free end of the Paracord from the Line Winder over the near end support.
12. Raise the Line Winder to the desired height and secure the free end of the Paracord to the support with a Round Turn and two Half Hitches or similar knot.
13. Using a throw weight or some other method, loop the free end of the Paracord from the end Isolation Loop over the far end support.
14. Pull the end Isolation Loop up to the desired height, such that the Antenna Wire is somewhat taut, but still has sufficient sag to allow for swaying. Secure the end of the Paracord to the far end support using a Round Turn and two Half Hitches or similar knot.
15. The Counterpoise Wire may be left dangling or the end may be secured to the ground using a Tent Stake (*not supplied*).
16. Perform operational test.

## **Recovery Procedure**

To recover the EMCOMM III Portable antenna, perform the following steps:

1. Disconnect the Coaxial Cable Assembly (p) from the radio set.
2. Lower the antenna to the ground.
3. Disconnect the Coaxial Cable Assembly from the Matching Transformer (a).
4. Carefully roll (do not twist) the Coaxial Cable Assembly.
5. Wind the Antenna Wire (g) onto the End Line Winders (b) and secure with attached shock cord.
6. Remove dirt from antenna components and inspect them for signs of wear.

## **Troubleshooting**

1. Ensure Wire Connectors (i) are securely connected.

2. Inspect the Antenna Wire (g) for breakage or signs of strain.
3. Ensure UHF Plug from the Coaxial Cable Assembly (l) is securely connected to the UHF Socket (e).
4. Inspect Coaxial Cable Assembly for cuts in insulation or exposed shielding.
5. If still not operational, replace Coaxial Cable Assembly. *Most problems with antenna systems are caused by the coaxial cables and connectors.*
6. If still not operational, contact Chameleon Antenna™ at [support@chameleonantenna.com](mailto: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](mailto:support@chameleonantenna.com) for current prices and availability.

- **Counterpoise Kit.** The Counterpoise Kit is ideal for portable antenna deployment. The system will create the ground-plane needed for any EMCOMM III Portable end-fed antenna configuration. It contains four 25 foot wire radials secured around plastic wire winders and four steel Tent Stakes.
- **50' Paracord and Line Winder Assembly.** One assembly is recommended to enable installation the EMCOMM III Portable configurations that require more than one support.
- **Coaxial Cable Assembly.** 50 feet of RG-58 with integrated RFI Choke. Used to connect the EMCOMM III Portable to the radio set. This is a highly recommended accessory if you are not using a CHA RFI CHOKE.

## Specifications

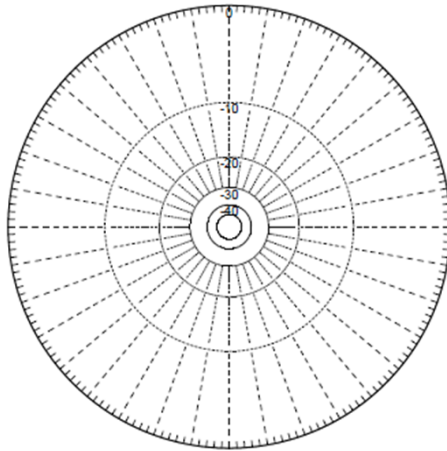
- Frequency: 1.8 MHz through 55.0 MHz continuous (including all Amateur Radio Service bands 160m to 6m)
- Power: 50 W continuous duty cycle (CW, AM, FM, RTTY), 100 W intermittent duty cycle (SSB and SSB-based digital modes)
- RF Connection: UHF Plug (PL-259)
- SWR: Subject to frequency and configuration, as measured see table (4), but typically less than 2.0:1. An antenna tuner or coupler may be required.
- Length: 73 ft
- Weight: Approximately 1 lb
- Ingress Protection comparable to IP42 standard (*not tested*). Ingress protection from most wires, screws or similar objects and from vertically dripping water when device is tilted at an angle up to 15 degrees
- Personnel Requirements and Setup Time: one trained operator, less than 15 minutes
- Far Field plots for the three basic and special EMCOMM III Portable antenna configurations are shown in figures (4) through (7)

FREQUENCY	SWR
1.9	1.9
3.6	1.9
5.4	1.6
7.1	1.4
10.1	1.9
14.1	2.0
18.1	1.6
21.1	1.5
24.9	1.5
28.5	1.3

Table 4. EMCOMM III Portable Antenna Measured SWR.

MMANA-GAL basic v. 3.0.0.31

3.5 Mhz



MMANA-GAL basic v. 3.0.0.31

14 Mhz

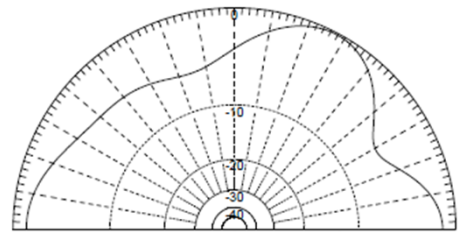
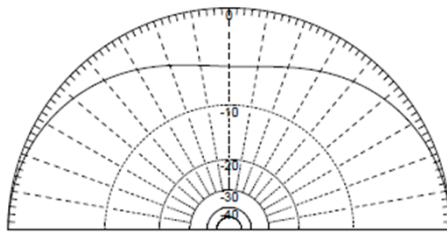
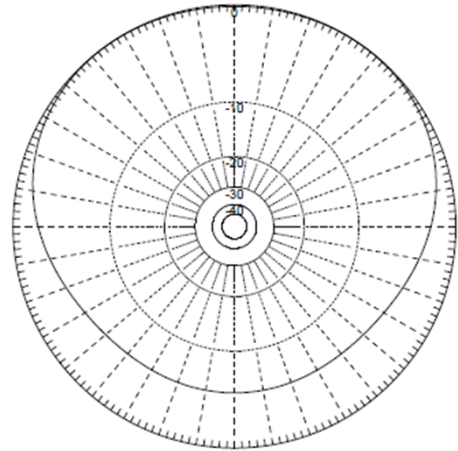
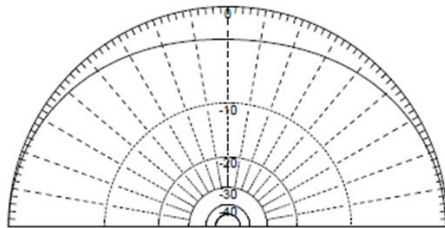
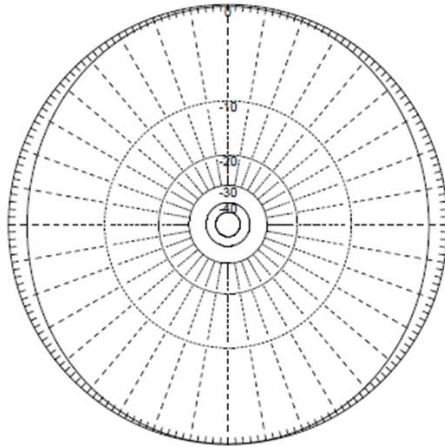


Figure 4. Inverted "L" Far Field Plot.

3.5 Mhz



14 Mhz

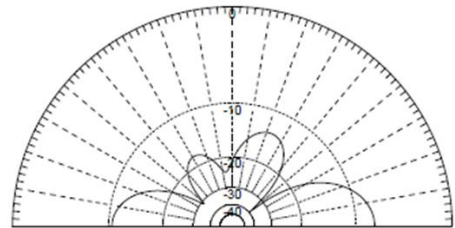
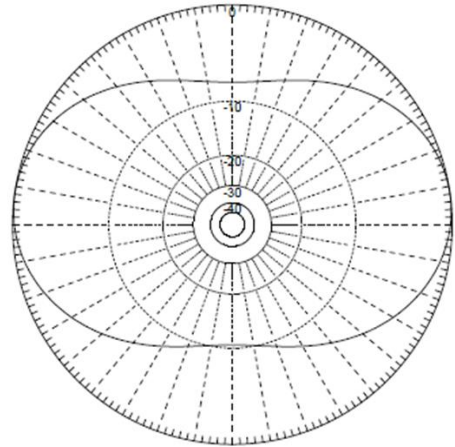
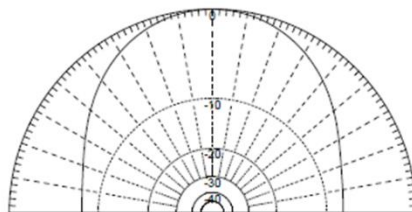
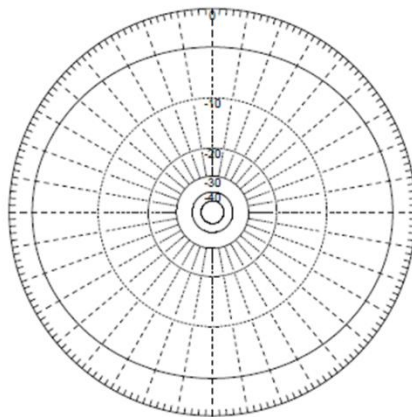


Figure 5. End-Fed Inverted "V" Far Field Plot.

3.5 Mhz



14 Mhz

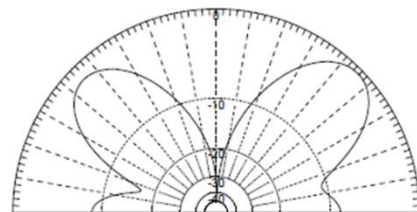
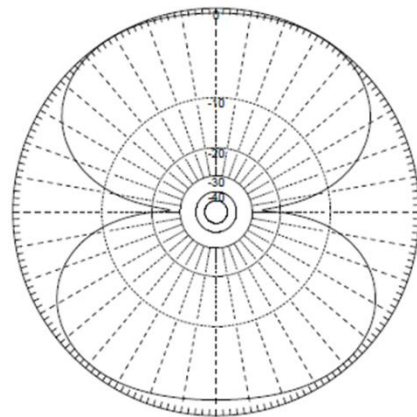


Figure 6. Horizontal End-Fed Far Field Plot.

50 Mhz

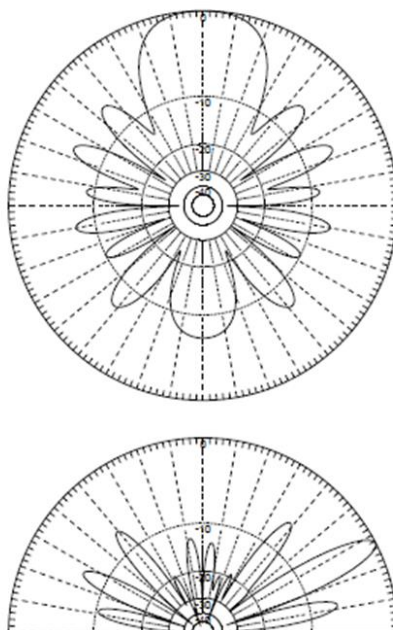


Figure 7. Six Meter Long Wire Far Field Plot.

## Chameleon Antenna™ Products

The following products are available for purchase at Chameleon Antenna™.

Go to <http://chameleonantenna.com> for ordering and more information.

**CHA P-LOOP 2.0** - The CHA P-LOOP 2.0 was designed with portability, ease of use simplicity, ruggedness and high performance in mind. Unlike any other similar antennas on the market, the CHA P-LOOP 2.0 is made with premium materials that are precisely manufactured and assembled in the USA! This is an exciting new product from Chameleon Antenna. Easily deployable HF magnetic loop antennas, also called small transmitting loops, have been routinely used for many years in military, diplomatic, and shipboard HF communication links, where robust and reliable general coverage radio communication is a necessity. Covers 7.0-29.7 MHz.

**CHA F-LOOP 2.0** – The CHA F-LOOP 2.0 was designed with portability, ease of use simplicity, ruggedness and high performance in mind. Unlike any other similar antennas on the market, the CHA F-LOOP 2.0 is made with premium materials that are precisely

manufactured and assembled in the USA! Easily deployable HF magnetic loop antennas, also called small transmitting loops, have been routinely used for many years in military, diplomatic, and shipboard HF communication links, where robust and reliable general coverage radio communication is a necessity. Covers 3.5-29.7 MHz.

**CHA WINDOM 40** – The CHA WINDOM 40 Antenna is designed for 40, 20, and 10 meters. Amateur Bands from 60 through 10 meters can be operated using an antenna tuner. Built with the portable operator in mind, it is very light weight, easy to set up, and comes with a military-style pouch.

**CHA SKYLOOP** - The CHA SKYLOOP is a 250' full wave loop antenna cut for 80M. With the help of an antenna tuner, the CHA SKYLOOP will cover all the bands between 80M and 6M.



**CHA Hybrid Mini – Portable HF Antenna Base** - The CHA HYBRID-MINI Base is the portable version of the regular HYBRID. The unit can be differentiated by the color of the lid and the base connector, which is black instead of gray. The HYBRID-MINI is also smaller and about 50% lighter than the regular HYBRID. An external antenna tuner is required to provide a low VSWR. The connector provided with the antenna is a SO-239 sealed. The entire unit is also waterproof. The HYBRID-MINI will serve as impedance transformer matching network and will greatly reduce the VSWR at the load for the following antennas: V1, V1L, V2L and MIL.

**CHA V2L Mobile Antenna** - The CHA V2L is a rugged multiband HF antenna designed for smaller vehicles.

**CHA VHF/UHF Magnetic Mount Mobile Antenna** - The CHA VHF/UHF is a simple but great dual band antenna for 2M and 70CM.

**CHA MIL Whip** - The CHA MIL whip is a broadband (28 to 54 MHz) monopole antenna designed for portable or man-pack radios requiring compact but rugged antenna systems. Its design has been borrowed from similar antennas utilized by many armies all over the world. The CHA MIL is very hardy, sturdy and portable (being collapsible). Un-mounted the entire antenna length is less than 29". The 5 aluminum sections are hold together by a piece of 1/8th inch US GI MIL SPEC shock cord. The CHA MIL Whip and a CHA HYBRID-MINI Base perfectly complements the capability of the CHA HYBRID - MINI / MICRO.

**CHA MIL EXT Whip Extension** - The CHA MIL EXT whip has been designed to offer maximum portability and performance for those already using the portable CHA MIL whip for man-pack antenna system. This collapsible antenna extension needs to be used with

the CHA MIL to create a 17'4" long portable antenna. When combined with any HYBRID series antenna bases the CHA MIL EXT will operate at all frequencies in the 1.8-54 MHz band without any adjustment with most modern external antenna tuners.

**CHA TD Terminated Dipole 2.0** - The CHA TD 2.0 is a HF broadband antenna specially designed for portable HF communication where rapid deployment and simplicity of operation is essential but compactness is a primary consideration. The antenna will operate at all frequencies in the 1.8-54 MHz band without any adjustment with most modern internal antenna tuners. No masts or guying are required.

**CHA TD Tactical Dipole** - The CHA TD (Tactical Dipole) Antenna is a HF broadband antenna specially designed for portable HF communication where rapid deployment and simplicity of operation is essential. The antenna will operate at all frequencies in the 1.8-30 MHz band without any adjustment with most modern internal antenna tuners. It is ideal for use in conjunction with modern, digitally configured, HF communication transceivers where features such as ALE and frequency hopping require true broadband capability. The antenna will work successfully supported by trees, masts, the tops of vehicles or any convenient object or structure. The CHA TD can also be used without antenna tuner, as the SWR will stay under 2.5:1 between 10M and 80M and under 2.75:1 on 160M.

**CHA FT-817 BRACKETS 2.0** – CHA FT-817 Brackets are built exclusively by the skilled machinists of Chameleon Antenna™. It is a military-style pair of precision fabricated brackets and high quality carrying strap for the popular Yaesu FT-817 series portable QRP transceiver. The CHA FT-817 Brackets will ruggedize and help protect your FT-817 from the many hazards of field operations.

## References

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2. 1987, *Tactical Single-Channel Radio Communications Techniques (FM 24-18)*, Department of the Army, Washington, DC.

3. Turkes, Gurkan, 1990, *Tactical HF Field Expedient Antenna Performance Volume I Thesis*, U.S. Naval Post Graduate School, Monterey, CA.