Tactical Dipole LITE
(CHA TD LITE)
Operator's Manual

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VERSATILE – DEPENDABLE – STEALTH – BUILT TO LAST

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Be aware of overhead power lines when you are deploying the CHA TD LITE. You could be electrocuted if the antenna gets near or contacts overhead power lines.

Introduction

Thank you for purchasing and using the Chameleon Antenna™ Tactical Dipole LITE (CHA TD LITE) antenna. The CHA TD LITE is a broadband High Frequency (HF) antenna specially designed for short to long range portable and man-pack HF communication where rapid deployment and simplicity of operation are essential, but compactness is primary. The antenna will operate from 1.8 - 54 MHz without any adjustment with a wide range antenna tuner. The CHA TD LITE is ideal 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 CHA TD LITE is configurable to facilitate Near-Vertical Incident Sky wave (NVIS) communication and its broadband design supports Automatic Link Establishment (ALE), frequency-hopping, and spread-spectrum modes when used with a wide range antenna tuner or coupler. The CHA TD LITE 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. 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 CHA TD LITE.

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 CHA TD LITE'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.

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.

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. 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 loses. 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. The operator enters the location of the two stations and the program show 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 is 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 CHA TD LITE is comprised of the following components, see plate (1):

a. Matching Transformer, EMCOMM II

The EMCOMM II Matching Transformer, see plate (2), provides impedance matching for the CHA TD LITE.

b. Antenna Wire

The Antenna Wires are two 60 foot lengths of black insulated wire, wrapped around Line Winders (e).

c. Isolation loop

Two Isolation loops, one at each end, are permanently attached to the Antenna Wires (b).

d. Carabiner

The Carabiners are removable pear-shaped stainless steel hooks with a spring-loaded gate.

e. Line Winder

The Line Winders are used to store the Antenna Wires (b). They enable rapid deployment and recovery of the CHA TD LITE.

f. Stakes

The two stainless steel stakes are used to anchor the ends of the CHA TD LITE to the ground, depending upon the antenna configuration.

Plate 1. Tactical Dipole LITE Components.

g. UHF Socket

The UHF Socket, SO-239, is located on the bottom of the Matching Transformer (a), see plate (2).

h. Top Transformer Connection

The Top Transformer Connection is located on the top of the Matching Transformer (a), see plate (2).

i. Bottom Transformer Connection

The Bottom Transformer Connection is located on the bottom of the Matching Transformer (a), see plate (2).

j. Transformer Eyebolt

The Transformer Eyebolt is located on the top of the Matching Transformer (a), see plate (2).

k. Wire Connector

The Wire Connectors are located at one end of the Antenna Wires (b).

I. Mesh Bag

The Mesh Bag, see plate (1), is used to store the components of the CHA TD LITE.

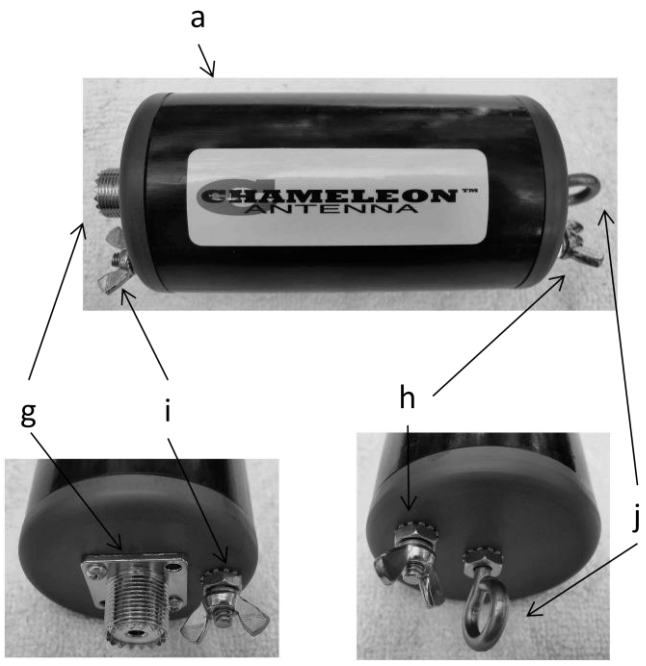

Plate 2. Matching Transformer, Side View (top), Bottom View (left) and Top View (right).

Antenna Configurations

Using the supplied components, the CHA TD LITE can be deployed into a number of configurations. Five configurations, see table (2), are described in this manual, each with unique performance characteristics. 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
Sloping "V"			↕	↑	Bidirectional	Deliberate
Horizontal Dipole		↓	↕	↑	Bidirectional	Deliberate
Sloping Wire	↓		↕		Omnidirectional	Hasty
Inverted "L"	↓		↓		Unidirectional	Hasty
Horizontal NVIS		↓	↑		Omnidirectional	Hasty

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 CHA TD LITE configuration with the corresponding symbol in the appropriate distance column. All CHA TD LITE 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. Most configuration and frequency combinations will require a wide range antenna tuner or coupler.

Sloping "V"

The CHA TD LITE Sloping "V" configuration, see figure (1), is a broadband medium to long range HF antenna. It provides good medium range sky wave propagation on all frequencies and long range sky wave propagation above 16 MHz. This configuration tends to be bidirectional towards the opening and apex of the "V". It requires only a single support and can be mounted at heights from 3 to 40 feet, with around 25 feet providing good overall results.

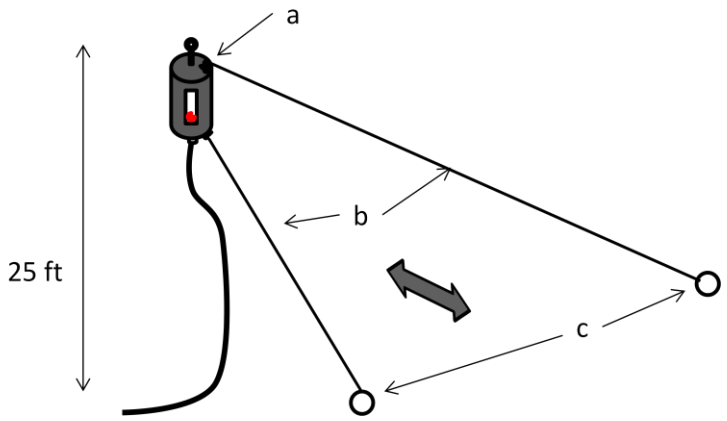

Figure 1. Sloping V Antenna Configuration.

An opening angle of 90° will provide good overall performance, but angles from 180° to 60° can be used to fit the antenna to the site or to improve performance. Larger opening angles increase performance on lower frequencies and smaller angles on higher frequencies. At 180°, the antenna becomes an Inverted "V" antenna. The antenna may also be mounted horizontally using three 10 foot tall supports.

Site Selection and Preparation.

1. Select a site to deploy the CHA TD LITE Sloping "V" configuration, see figure (1). The best site should have a tree or other support that would enable the Matching Transformer to be at a height of around 25 to 40 feet. If a tall support is unavailable, any convenient object, such as a fence post or the top of a vehicle, may be used as a field expedient support with reduced performance.
3. Remove the Matching Transformer (a), Antenna Wires (b), and Stakes (f) from the Mesh Bag (l).
4. If not already attached, connect a Carabiner (d) to the Wire Connector (k) ends of the Antenna Wires.

Connect the Matching Transformer. Refer to figure (2) for steps (5) – (10).

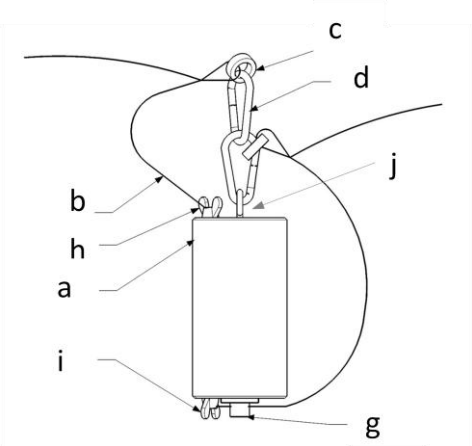

Figure 2. Matching Transformer Electrical and Mechanical Connections.

5. Connect the Carabiner from the Wire Connector end of an Antenna Wire to the Transformer Eyebolt (j).

6. Connect the Wire Connector from the Antenna Wire to the Bottom Transformer Connection (i). Tighten the wing nut finger tight.
7. Connect the Carabiner from the Wire Connector end of the other Antenna Wire to the Carabiner from step (5).
8. Connect the Wire Connector from the Antenna Wire to the Top Transformer Connection (h). Tighten the wing nut finger tight.
9. Using a Bowline or similar knot, tie one end of a long length (around 50 feet) of Paracord to the Carabiner from step (7).
10. Connect the UHF Plug from the Coaxial Cable to the UHF Socket (g) on the Matching Transformer.

Raise the antenna.

11. Using a throw weight or some other method, loop the long length of Paracord over the support.
12. Raise the antenna to the desired height and secure the Paracord to the support with a Round Turn and two Half Hitches, or similar knot.

Extend the Antenna Wires into a "V".

13. Using a Bowline of similar knot, tie a short length of Paracord (around 4 feet) to Isolation Loops (c) at the unconnected end of both Antenna Wires.
14. Extend one Antenna Wire to its full length.
15. Drive a Stake in the ground around two feet beyond the end of the Antenna Wire.
16. Using two Half Hitches, tie the short length of Paracord from the Antenna Wire to the Stake, such that the Antenna Wire is not quite taut.
17. Extend the other Antenna Wire to its full length along the approximate opening angle chosen to form the antenna into a "V" (60 feet between the ends of the "V" for 90°).
18. Drive a Stake into the ground around two feet beyond the end of the Antenna Wire.
19. Tie the Paracord from the Antenna Wire to the Stake, such that the Antenna Wire is not quite taut.
20. Perform operational test.

Horizontal Dipole

The CHA TD LITE Horizontal Dipole configuration, see figure (3), is a broadband short to long range HF antenna. The Horizontal Dipole is the standard for wire HF antennas and will provide good sky wave (including NVIS) propagation. It requires at least two supports (one at each end). A center support is also recommended. The CHA TD LITE Horizontal Dipole should be mounted at a height of around 25 feet for good overall results. When mounted at this height, on lower frequencies the antenna tends to be bidirectional broadside to the antenna. The pattern becomes a clover leaf at higher frequencies. If the ends of the antenna are sloped down to the ground, the antenna becomes an Inverted "V" (see Sloping "V" configuration).

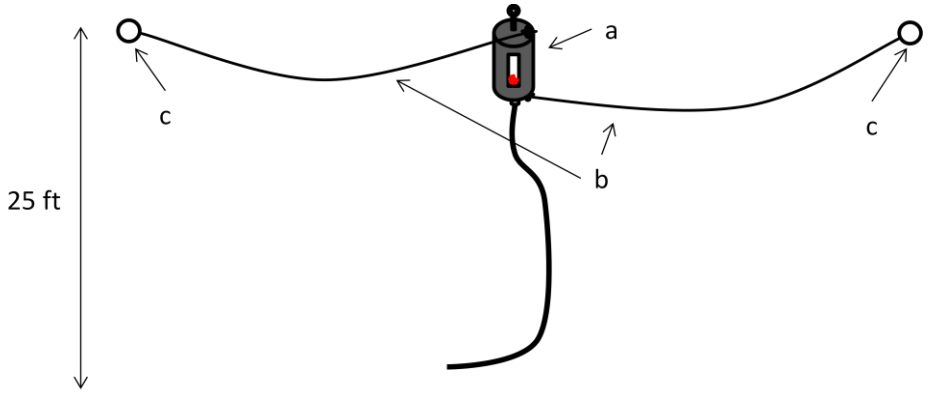

Figure 3. Horizontal Dipole Configuration.

Site Selection and Preparation.

1. Select a site to deploy the CHA TD LITE Horizontal Dipole configuration, see figure (3). A good site should have two trees or other supports that are 120 feet apart and are tall enough that the ends of the antenna will be at a height of around 25 feet. The best site will have an additional support for the center of the antenna. If the right supports are not present, any convenient objects, such as fence posts or the tops of vehicles, may be used as a field expedient support with reduced performance.
2. Remove the Matching Transformer (a) and Antenna Wires (b), from the Mesh Bag (l).
3. If not already attached, connect a Carabiner (d) to the Wire Connector (k) ends of the Antenna Wires.

Connect the Matching Transformer. Refer to figure (2) for steps (4) – (8).

4. Connect the Carabiner from the Wire Connector end of an Antenna Wire to the Transformer Eyebolt (j).
5. Connect the Wire Connector from the Antenna Wire to the Bottom Transformer Connection (i). Tighten the wing nut finger tight.
6. Connect the Carabiner from the Wire Connector end of the other Antenna Wire to the Carabiner from step (4).
7. Connect the Wire Connector of the Antenna Wire to the Top Transformer Connection (h). Tighten the wing nut finger tight.
8. Connect the UHF Plug from the Coaxial Cable to the UHF Socket (g) on the Matching Transformer.

Extend the Antenna Wires.

9. Fully extend both Antenna Wires in a straight line in opposite directions along the ground.
10. Using a throw weight or some other method, loop the Paracord over the end supports.
11. Using a Bowline or similar knot, tie a long length (around 50 feet) of Paracord to the Isolation Loops (c) at the free ends of the Antenna Wires.
12. If a center support is available, use a Bowline or similar knot, tie one end of another long length of Paracord to the Carabiner from step (6) and loop it over the center support.

Raise the antenna.

13. Raise the antenna to the desired height and secure the Paracord to the supports with a Round Turn and two Half Hitches, or similar knot.
14. Perform operational test.

Sloping Wire

The CHA TD LITE Sloping Wire configuration, see figure (4), is a broadband short to medium range HF antenna. It is designed to provide acceptable ground wave and sky wave propagation. This configuration is predominately omnidirectional, becoming more bidirectional towards both ends as the frequency increases. The Sloping Wire requires one support, is a good general-purpose antenna, and is excellent for hasty deployment. It should be mounted at a height of 25 to 40 feet for best performance.

Site Selection and Preparation.

1. Select a site to deploy the CHA TD LITE Sloping Wire configuration, see figure (4). The best site should have a tree or other support that would enable the end of the antenna to be at a height of around 25 to 40 feet. If a tall support is unavailable, any convenient object, such as a fence post or the top of a vehicle, may be used as a field expedient support with reduced performance.
2. Remove the Matching Transformer (a), Antenna Wires (b), and a Stake (f) from the Mesh Bag (l).
3. If not already attached, connect a Carabiner (d) to the Wire Connector (k) ends of the Antenna Wires.

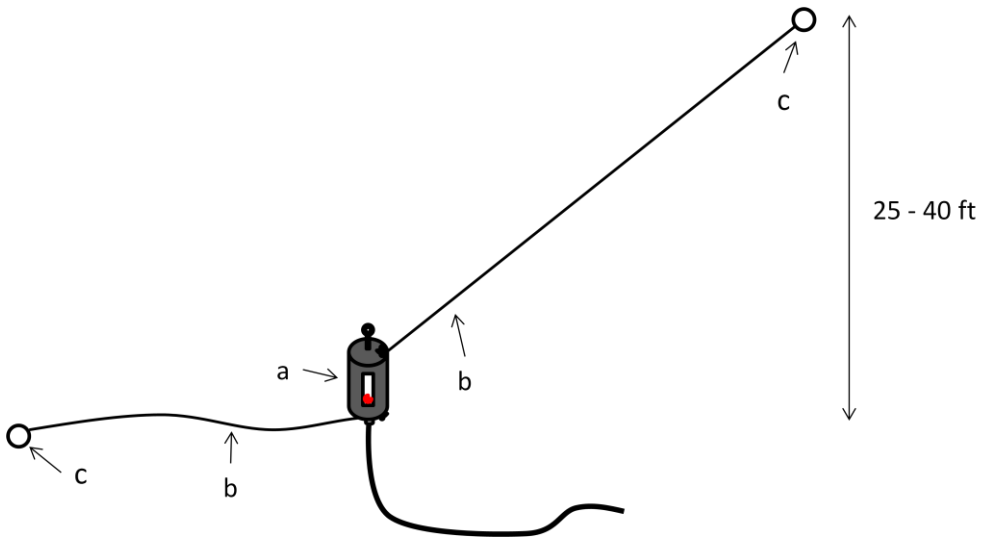

Figure 4. Sloping Wire Configuration.

Connect the Matching Transformer. Refer to figure (2) for steps (4) – (10).

4. Connect the Carabiner from the Wire Connector end of an Antenna Wire to the Transformer Eyebolt (j).
5. Connect the Wire Connector from the Antenna Wire to the Bottom Transformer Connection (i). Tighten the wing nut finger tight. *This is the counterpoise for this configuration.*
6. Using a Bowline of similar knot, tie one end of short length (around four feet) of Paracord to the Carabiner connected in step (4).
7. Connect the Carabiner from the Wire Connector end of the other Antenna Wire to the Carabiner from step (4).
8. Connect the Wire Connector from the Antenna Wire to the Top Transformer Connection (h). Tighten the wing nut finger tight.
9. Using a Bowline or similar knot, tie a long length (around 50 feet) of Paracord to the Isolation Loop (c) at the free end of the Antenna Wire.
10. Connect the UHF Plug from the Coaxial Cable to the UHF Socket (g) on the Matching Transformer.

Raise the Antenna.

11. Using a throw weight or some other method, loop the long length of Paracord over the support.
12. Raise the end of the Sloping Wire antenna to the desired height and secure the Paracord to the support using a Round Turn and two Half Hitches or similar knot.

Extend the Antenna Wire and Counterpoise Wire.

13. Fully extend the Antenna Wire.
14. Drive a Stake around two feet beyond the end of the Antenna Wire.
15. Using two Half Hitches, tie the short length of Paracord from the Matching Transformer to the Stake, such that the Antenna Wire is not quite taut.
16. Extend the counterpoise Antenna Wire along the ground in any convenient direction.
17. Perform operational test.

Inverted "L"

The CHA TD LITE Inverted "L" configuration, see figure (5), is a broadband short to medium range HF antenna for frequencies below 12 MHz. This configuration is tends to be unidirectional, favoring the end of the horizontal part of antenna. It is also provides effective ground waves communication during the day time on frequencies between 1.8 – 4.0 MHz without using sky wave propagation. The Inverted "L" requires two supports and is suitable for

hasty deployment. It should be mounted at a height of 25 feet for best performance, but will provide good performance at a height of 10 to 20 feet and is usable when mounted as low as three feet.

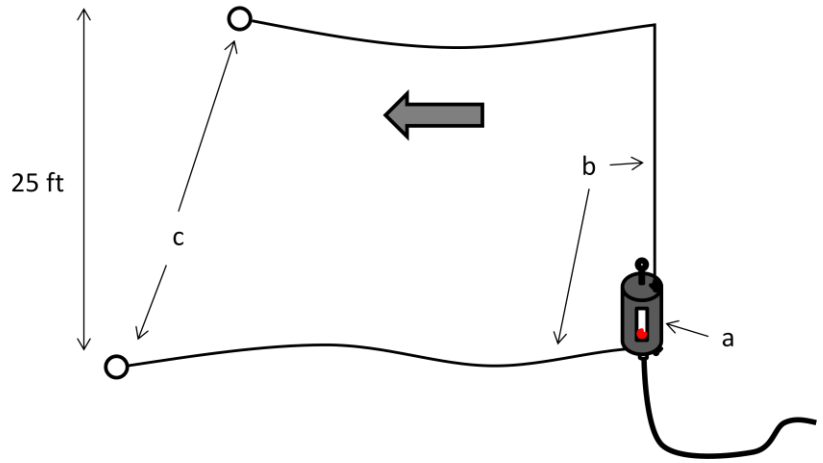

Figure 5. Inverted L Configuration.

Site Selection and Preparation.

1. Select a site to deploy the CHA TD LITE Inverted "L" Wire configuration, see figure (5). The site should have two trees or other support that would enable the end and corner of the "L" in the Antenna Wire to be at a height around 25 feet. If the right supports are unavailable, any convenient object, such as a fence post or the top of a vehicle, may be used as a field expedient support with reduced performance.
2. Remove the Matching Transformer (a), Antenna Wires (b), and Stakes (f) from the Mesh Bag (l).
3. If not already attached, connect a Carabiner (d) to the Wire Connector (k) ends of the Antenna Wires.

Connect the Matching Transformer. Refer to figure (2) for steps (4) – (10).

4. Connect the Carabiner from the Wire Connector end of one of the Antenna Wires to the Transformer Eyebolt (j).
5. Connect the Wire Connector from the Antenna Wire to the Bottom Transformer Connection (i). Tighten the wing nut finger tight. *This is the counterpoise in this configuration.*
6. Connect the Carabiner from the Wire Connector end of the other Antenna Wire to the Carabiner from step (4).
7. Connect the Wire Connector from the Antenna Wire to the Top Transformer Connection (h). Tighten the wing nut finger tight.
8. Using a Bowline of similar knot, tie one end of a short length (around four feet) of Paracord to the Carabiner connected in step (4).
9. Drive a Stake in the ground below the support closest to the location of the radio set.
10. Using two Half Hitches, tie the short length of Paracord from the Matching Transformer to the Stake.
11. Connect the UHF Plug from the Coaxial Cable to the UHF Socket (g) on the Matching Transformer.

Raise the Antenna.

12. Using a Bowline or similar knot, tie a long length (50 feet or more) of Paracord to the Isolation Loop (c) at the free end of the Antenna Wire.
13. Using a throw weight or other method, loop the Paracord over the support that is closest to where the radio set will be located.
14. Pull the Antenna Wire over the support.
15. Using a throw weight or some other method, loop the Paracord over the other support.
16. Raise the Inverted "L" antenna so that the vertical and horizontal sections are not quite taut.

17. Secure the Paracord to the support using a Round Turn and two Half Hitches, or similar knot.

Extend the Counterpoise.

18. Extend the counterpoise Antenna Wire from step (5) along the ground under the raised horizontal section of the antenna.
19. Perform operational test.

Horizontal NVIS

The CHA TD LITE Horizontal NVIS configuration, see figure (6), is a special configuration designed to provide good NVIS propagation on lower frequencies. It is predominately omnidirectional and also provides medium range sky wave propagation on frequencies above 10 MHz. It is suitable for hasty deployment and requires two supports that will enable the antenna to be raised to a height of 10 – 12 feet. Use the following procedure to install the Horizontal NVIS configuration.

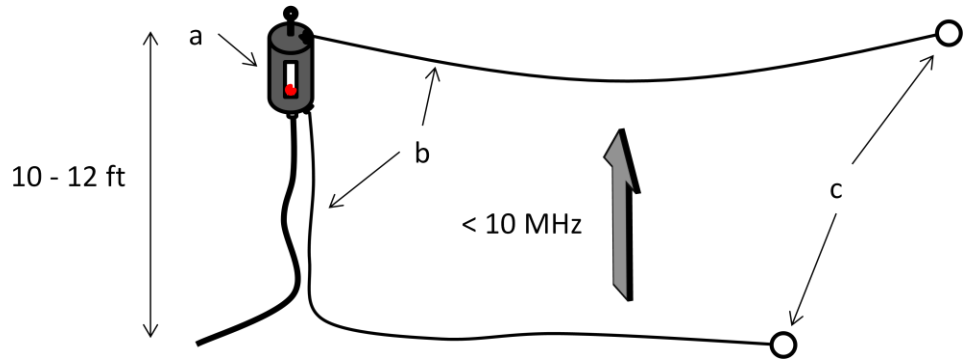

Figure 6. Horizontal NVIS Configuration.

Site Selection and Preparation.

1. Select a site to deploy the CHA TD LITE Horizontal NVIS configuration, see figure (6). The site must have two trees or other supports that will position the Matching Transformer and the end of the Antenna Wire to be at a height of between 10 and 12 feet and 60 feet apart. Higher or lower heights may be used, but may reduce NVIS performance.
2. Remove the Matching Transformer (a) and Antenna Wires (b) from the Mesh Bag (l).
3. If not already attached, connect a Carabiner (d) to the Wire Connector (k) end of the Antenna Wires.

Connect the Matching Transformer. Refer to figure (2) for steps (4) – (8).

4. Connect the Carabiner from one the Antenna Wires to the Transformer Eyebolt (j).
5. Connect the Wire Connector from the Antenna Wire to the Bottom Transformer Connection (i). Tighten the wing nut finger tight. *This will be the counterpoise in this configuration.*
6. Connect the Carabiner from the other Antenna Wire to the Transformer Eyebolt.
7. Connect the Wire Connector from the Antenna Wire to the Top Transformer Connection (h). Tighten the wing nut finger tight.
8. Connect the UHF Plug from the Coaxial Cable to the UHF Socket (g) on the Matching Transformer.

Raise the Antenna.

9. Using a Bowline or similar knot, tie the end of a long length (50 feet or more) of Paracord to the Carabiner from step (6).
10. Using a throw weight or other method, loop the Paracord over the support that is closest to where the radio set will be located.
11. Raise the Matching Transformer end of the antenna to a height of 10 to 12 feet and secure it to the support using a Round Turn and two Half Hitches, or similar knot.

12. Using a Bowline or similar knot, tie another long length of Paracord to the Isolation Loop (c) at the free end of the Antenna Wire.
13. Using a throw weight or some other method, loop the Paracord over the other support.
14. Raise the free end of the Antenna Wire to a height of 10 to 12 feet, such that the Antenna Wire is not quite taut, and secure it to the support using a Round Turn and two Half Hitches, or similar knot.

Extend the Counterpoise.

15. Extend the counterpoise Antenna Wire from step (5) along the ground under the raised horizontal section of the antenna.
16. Perform operational test.

Recovery Procedure

To recover the CHA TD LITE, perform the following steps:

1. Disconnect the Coaxial Cable from the radio set.
2. Lower the antenna to the ground.
3. Disconnect the Coaxial Cable from the Matching Transformer (a).
4. Carefully roll (do not twist) the Coaxial Cable.
5. Untie the Paracord from the Matching Transformer and Antenna Wires (b), as applicable.
6. Disconnect the Antenna Wires from the Matching Transformer.
7. Wind the Antenna Wires onto their Line Winders (e) and secure with attached shock cord.
8. Pull the Stakes (f) from the ground.
9. Remove dirt from antenna components and inspect them for signs of wear.

Packing Procedure

Note: If you have just received your CHA TD LITE, you may want to go through this procedure to pack your new antenna in its storage bag.

Note: This suggested packing procedure will make deployment easier and help to ensure you don't lose any CHA TD LITE components during recovery.

To pack the CHA TD LITE in the Mesh Bag (l), perform the following steps:

1. Place the Matching Transformer (a) into the Mesh Bag.
2. If not already connected, attach a Carabiner (d) to the Isolation Loops (c) at each end of both Antenna Wires (b), see plate (1).
3. Place both Antenna Wire assemblies into the Mesh Bag.
4. Place the Stakes (f) into the Mesh Bag.
5. Store the Operator's Manual in the Mesh Bag.

Troubleshooting

1. Ensure Wire Connectors (k) are securely connected.
2. Inspect Antenna Wires (b) for breakage or signs of strain.
3. Ensure UHF Plugs are securely tightened.
4. Inspect Coaxial Cable assembly for cuts in insulation or exposed shielding. Replace if damaged.
5. If still not operational, connect a Standing Wave Ratio (SWR) Power Meter and check SWR.

6. If SWR is greater than 10:1, check antenna tuner or coupler using the technical manual or manufacturer's procedure. Be sure to check the Coaxial Patch Cable that connects the radio set to the antenna tuner or coupler.
7. If still not operational, replace Coaxial Cable assembly. *Most problems with antenna systems are caused by the coaxial cables and connectors.*
8. Connect a Multi-Meter to the Antenna Wires to check continuity. Replace assemblies that do not pass a continuity check.
9. If still not operational, replace Matching Transformer (a).

Specifications

- Frequency: 1.8 MHz through 54.0 MHz continuous (including all Amateur Radio Service bands 160m to 6m). Wide range antenna tuner or coupler required.
- Power: 250 W continuous duty cycle (CW, AM, FM, RTTY), 500 W intermittent duty cycle (SSB and SSB-based digital modes)
- RF Connection: UHF Plug (PL-259)
- SWR: Subject to frequency and configuration
- Length: 120 ft (maximum), 60 ft (typical), 35 ft (minimum)
- Footprint: 1,800 sq ft (maximum)
- Weight: Less than 3 lbs
- Personnel Requirements and Setup Time: one trained operator, less than 15 minutes
- Figures (7) through (11) show Far Field plots for the various CHA TD LITE configurations

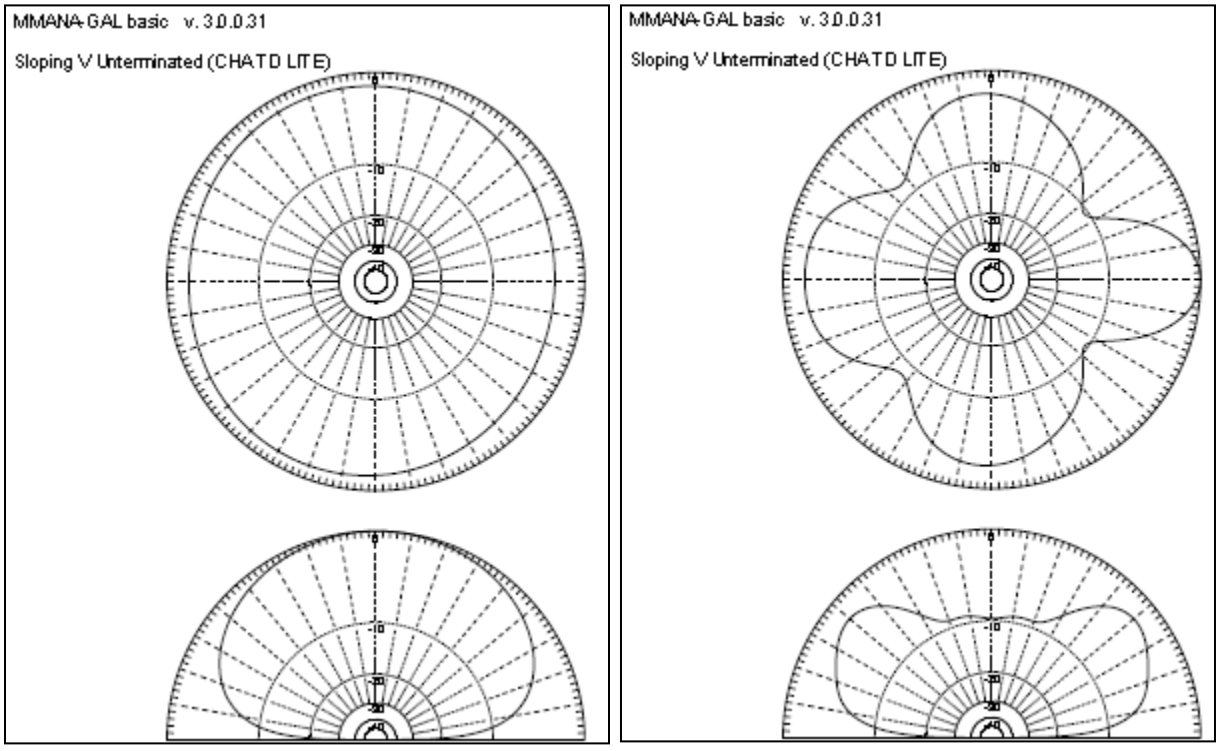

Figure 7. Sloping "V" Far Field Plots, 7 (left) and 21 (right) MHz.

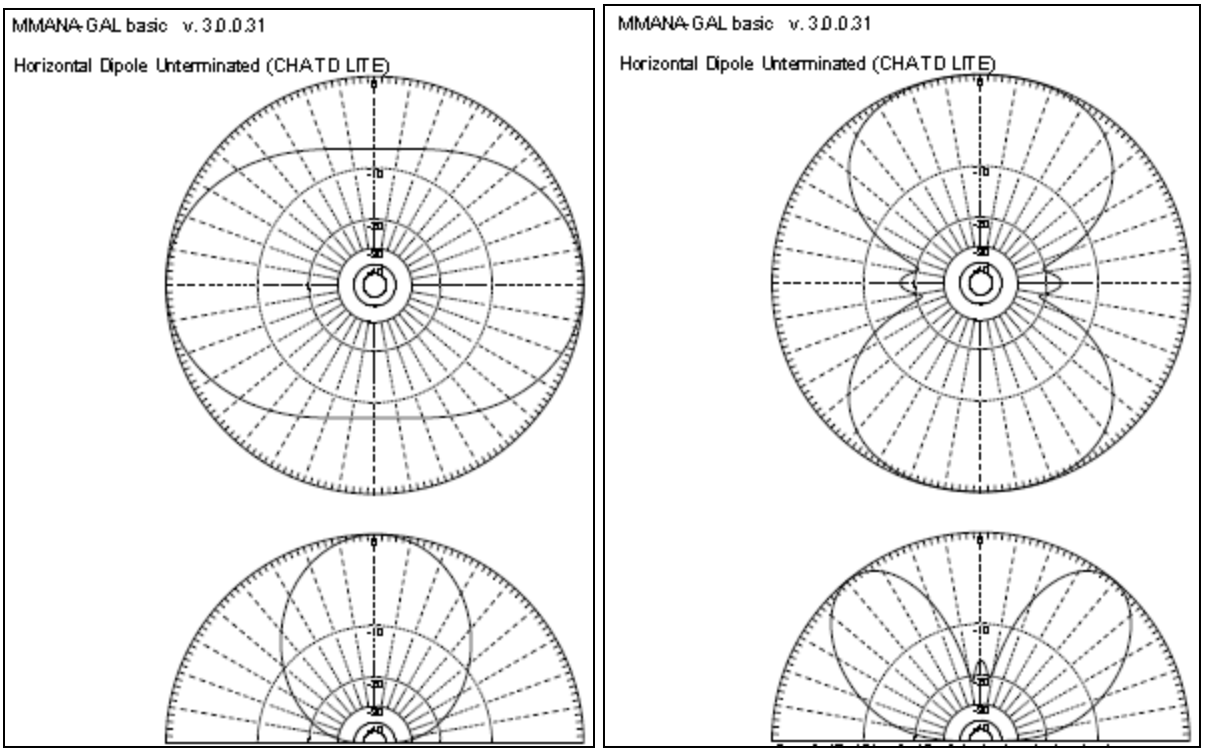

Figure 8. Horizontal; Dipole Far Field Plots, 7 (left) and 14 (right) MHz.

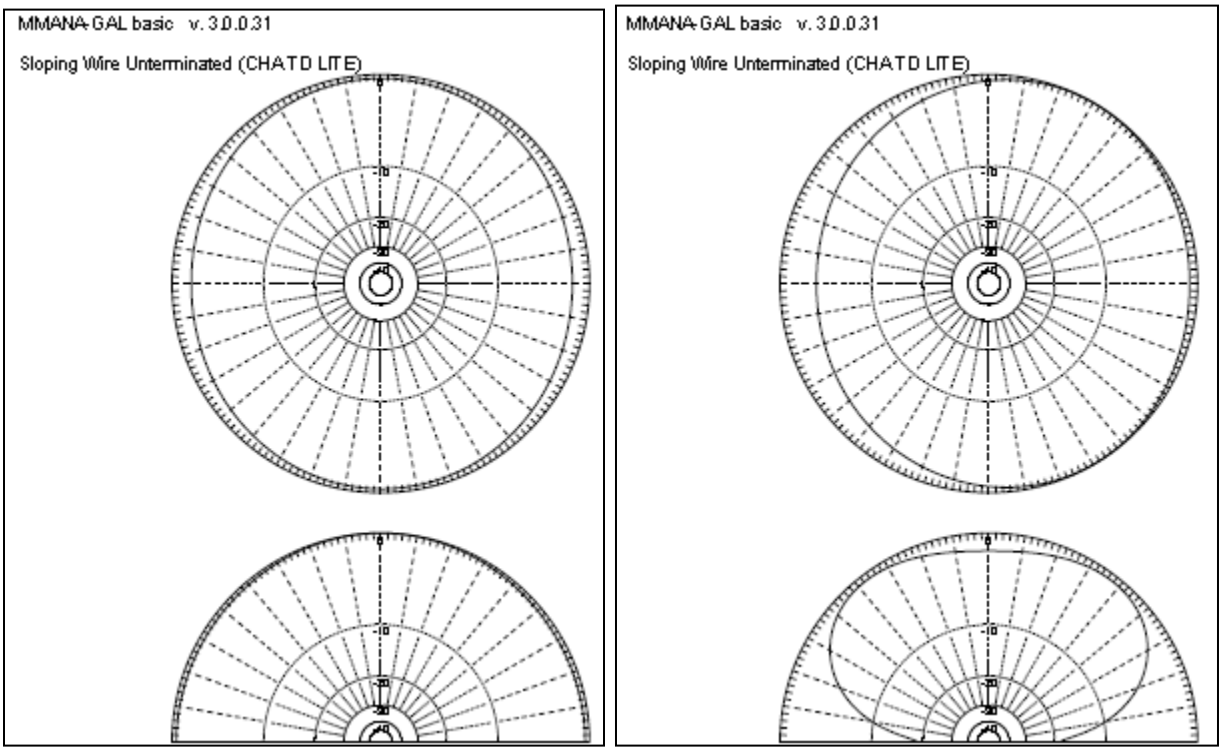

Figure 9. Sloping Wire Far Field Plots, 7 (left) and 14 (right) MHz.

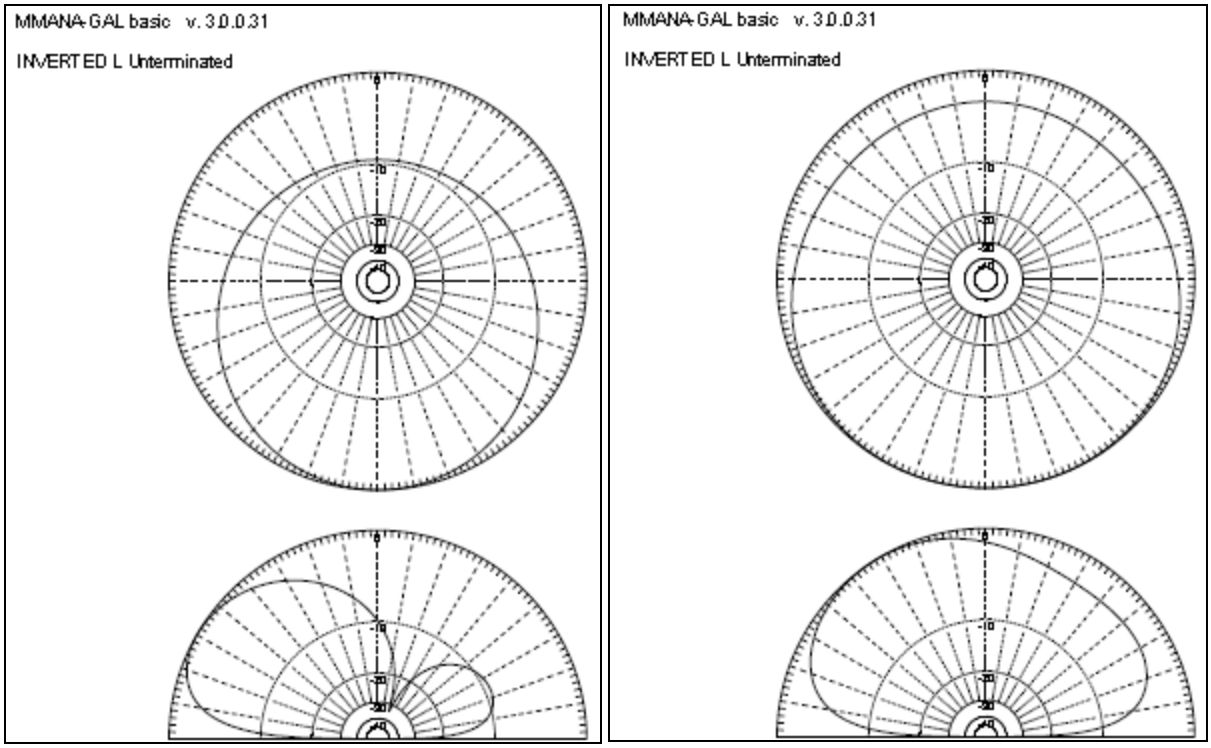

Figure 10 Inverted "L" Far Field Plots, 3.7 (left) and 7 (right) MHz.

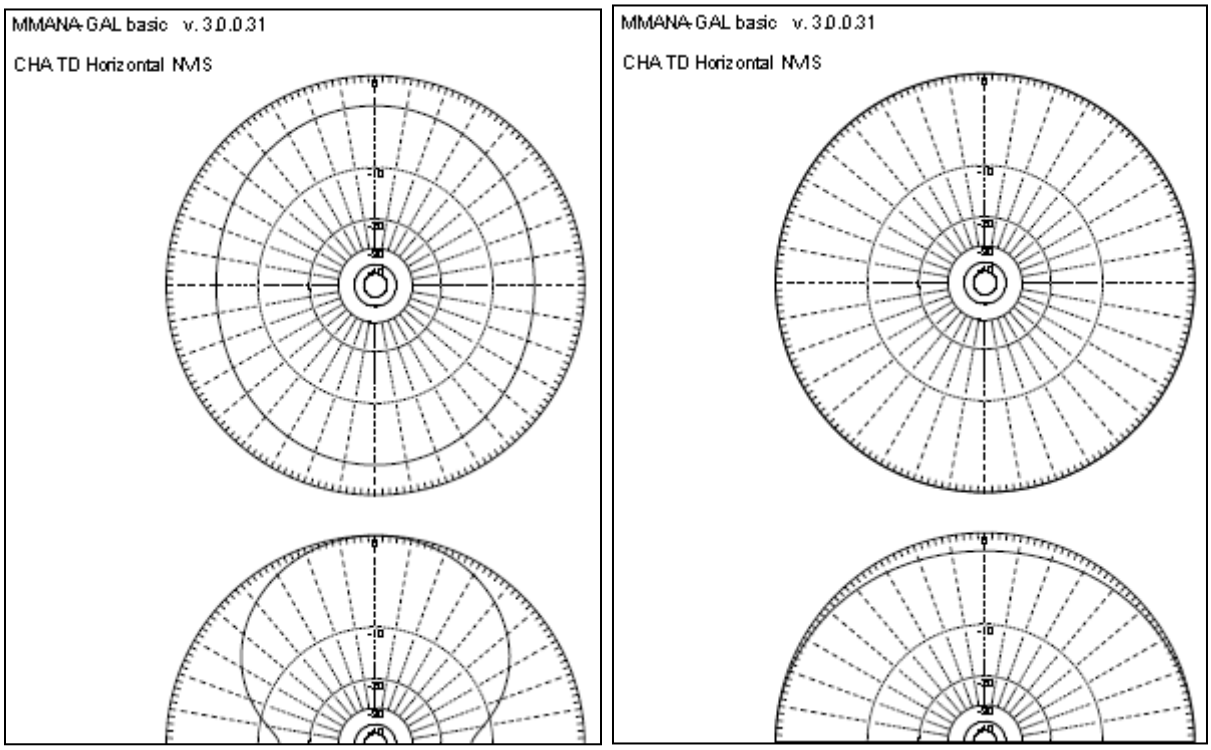

Figure 11. Horizontal NVIS Far Field Plots, 3.7 (left) and 7 (right) MHz.

Accessories

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

- **50' Paracord and Line Winder Assembly.** Two assemblies are highly recommended to enable installation of the CHA TD LITE in all configurations, especially when available supports are not optimally situated.
- **Coaxial Cable Assembly.** 50 feet of RG-58 with built-in RF isolation. Used to connect the CHA TD LITE to the radio set. This is a highly recommended accessory.

Recommended non-supplied accessories:

- Wide range antenna tuner or coupler. Required for most configurations.
- Flashlight.
- Multi-tool.
- Throwing weight and string.
- Tape measure.
- Mallet.
- SWR Power Meter
- Multi-Meter
- #10x24 stainless steel wing nut. Recommend one for use as a spare.

Chameleon Antenna™ Products

The following products are available for purchase at Chameleon Antenna™.
Go to http://chameleonantenna.com *for ordering and more information.*

CHA F-LOOP – The CHA F-LOOP was designed with weight, durability, portability, versatility and cost in mind. The unique craftsmanship of the CHA F-LOOP distinguishes itself from the competition. The antenna is built to last. The unit covers everything between 10M to 60M (or 29.700MHz to 5.300MHz) continuously. The unassembled antenna comes into a high quality MOLE tactical bag for easy carry and storage.

CHA P-LOOP – The CHA P-LOOP is designed to be rugged, portable, and versatile. It is ideal when you require highly portable communication capability - such as when hiking, camping, staying in a hotel, preparing for emergencies or disasters, and other activities and places that preclude erecting a full-size wire or vertical antenna. The CHA P-LOOP has several notable quality design features. First, there is minimal body induction while tuning the loop. The SWR will remain stable while holding and tuning the loop. It is supplied with a Khaki colored classic military-style messenger bag.

CHA MPAS – The CHA Modular Portable Antenna System (MPAS) is designed to be the most versatile, high performance, and rugged portable / manpackable HF antenna available using the building block approach, as described by Survival Tech Nord. The core components of the antenna system are: a CHA HYBRID-MICRO portable base, 60 feet of wire, a 10'8" military-style collapsible whip antenna (CHA MIL WHIP), and a clamp-style antenna mount (CHA JAW MOUNT).

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 EMCOMM II - The CHA EMCOMM II Antenna has been specially designed for backup emergency HF system or permanent installation. The integral broadband impedance matching network allows broadband antenna tuning.

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 Vehicular Base - The CHA HYBRID Vehicular Base is designed to enhance the capabilities of the common HF radio application by allowing faster tuning operation across the HF bands including MARS/CAP frequencies. This antenna base has an integral broadband impedance matching network allowing broadband antenna tuning. The CHA HYBRID can be used mobile with the CHA V1L and V2L mobile antennas or stationary with the provided 30' wire.

CHA V1 Mobile Antenna - The CHA V1 antenna is our first and classic broadband HF mobile antenna that we designed. It has been updated from fiberglass to 7075 alloy and stainless steel.

CHA V1L Mobile Antenna - The CHA V1L antenna is a rugged multiband HF mobile antenna that can be erected in a minimum of time and space.

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 HYBRID-MINI 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. The CHA HYBRID-MINI Base and a CHA MIL Whip perfectly complements the capability of the CHA TD LITE.

CHA HYBRID-MICRO Antenna - The CHA HYBRID-MICRO is a lightweight highly portable broadband HF antenna system designed to offer maximum portability and performance. The antenna weights about 1 lb. The antenna will operate at all frequencies in the 1.8-54 MHz band without any adjustment with most modern external antenna tuners. No masts or guying are required. The CHA HYBRID-MICRO is a great quick deployment backup for the CHA TD LITE. The CHA HYBRID-MICRO and a CHA MIL Whip perfectly complements the capability of the CHA TD LITE.

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 TD LITE.

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 Tactical Dipole - The CHA TD (Tactical Dipole) Antenna has been designed as an add-on for the CHA EMCOMMII. The CHA TD 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. No masts or guying are required. 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.

References

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