



HF Portable Loop Antenna 2.0  
(CHA F-LOOP 2.0)  
and  
(CHA F-LOOP 2.0 PLUS)  
Operator's Manual

California - USA

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



WARNING! A tuned loop can exhibit several hundred Volts and concentrated electromagnetic radiation when operating at QRP power levels (5-10 W). At higher RF levels, several thousand volts will be present at resonance! Exercise caution when using this antenna. Operate this antenna at your own risk.

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™ High Frequency (HF) Portable Loop Antenna 2.0 (CHA F-LOOP 2.0) or (CHA F-LOOP 2.0 PLUS). The unique craftsmanship of the CHA F-LOOP 2.0 distinguishes itself from the competition. You are now part of the magnetic loop HF antenna craze that is sweeping the amateur radio community. Easily deployable HF magnetic loop antennas, also called small transmitting loops, have been routinely used for many years in professional defense, military, diplomatic, and shipboard HF communication links, where robust and reliable general coverage radio communication is deemed mandatory. These antennas have only recently become commercially available for amateur radio. You will be amazed by the performance of this antenna. The real practical advantage of the small loop, compared to a short vertical whip tuned against earth or a full sized vertical antenna, is the loop's freedom from dependence on a ground plane and earth for achieving efficient operation; this unique characteristic has profound significance for small restricted space antenna operation. In comparison, the bottom of a vertically oriented the loop does not need to more than a loop diameter above ground making it very easy to site in a restricted space location. There is no significant improvement in performance when a small loop is raised to great heights; all that matters is the loop is substantially clear of objects in the immediate area and towards the desired direction of radiation. Field trials of the CHA F-LOOP 2.0 demonstrated that an inside magnetic loop antenna was only around one to two S-units lower, on both transmit and receive, than an outside full size quarter wave vertical antenna. Remarkable for an antenna that is only less than three foot in diameter and covers 3.5 MHz to 29.7 MHz (80 – 10 meter ham bands)! The magnetic loop is different than typical antennas because it emphasizes the magnetic part of the radio wave (H field) rather than the electric part (E field) of the radio wave. It also has a high Q resonance of 17 KHz on 40 meters, providing immunity from interference outside the bandpass. The CHA F-LOOP 2.0 Antenna was designed with weight, portability, versatility and cost in mind and is ideal for RV/camping, hotels, apartments, condominiums, homeowner's associations, deed restrictions and CCRs (Covenants, Conditions & Restrictions), Shortwave Listening (SWL) and other places where it is not feasible to erect a multi-band wire or vertical antenna.

The CHA F-LOOP 2.0, see plate (1), is comprised of a three foot diameter flexible radiator loop, a coupling loop, a specially designed tuning unit, telescoping mast, and coaxial feedline – all of which fit in the supplied Flat Dark Earth (FDE) / Coyote Brown military-style MOLLE bag. A high-efficiency 1" collapsible aluminum tubing radiator loop, which increases efficiency an average of 142% over the standard flexible radiator loop, and a slightly larger coupling loop is included with the CHA F-LOOP 2.0 PLUS and is also available as an option for the CHA F-LOOP 2.0. The CHA F-LOOP 2.0 doesn't require a ground-plane and doesn't need to be mounted up high. Do not use an antenna tuner or coupler, as it may cause you to mistune the antenna. Antennas built by Chameleon Antenna™ are versatile, dependable, stealthy, and built to last.



**Plate 1. Complete CHA F-LOOP 2.0 Antenna.**

Please read this operator's manual so that you may maximize the utility you obtain from your CHA F-LOOP 2.0 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 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 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.

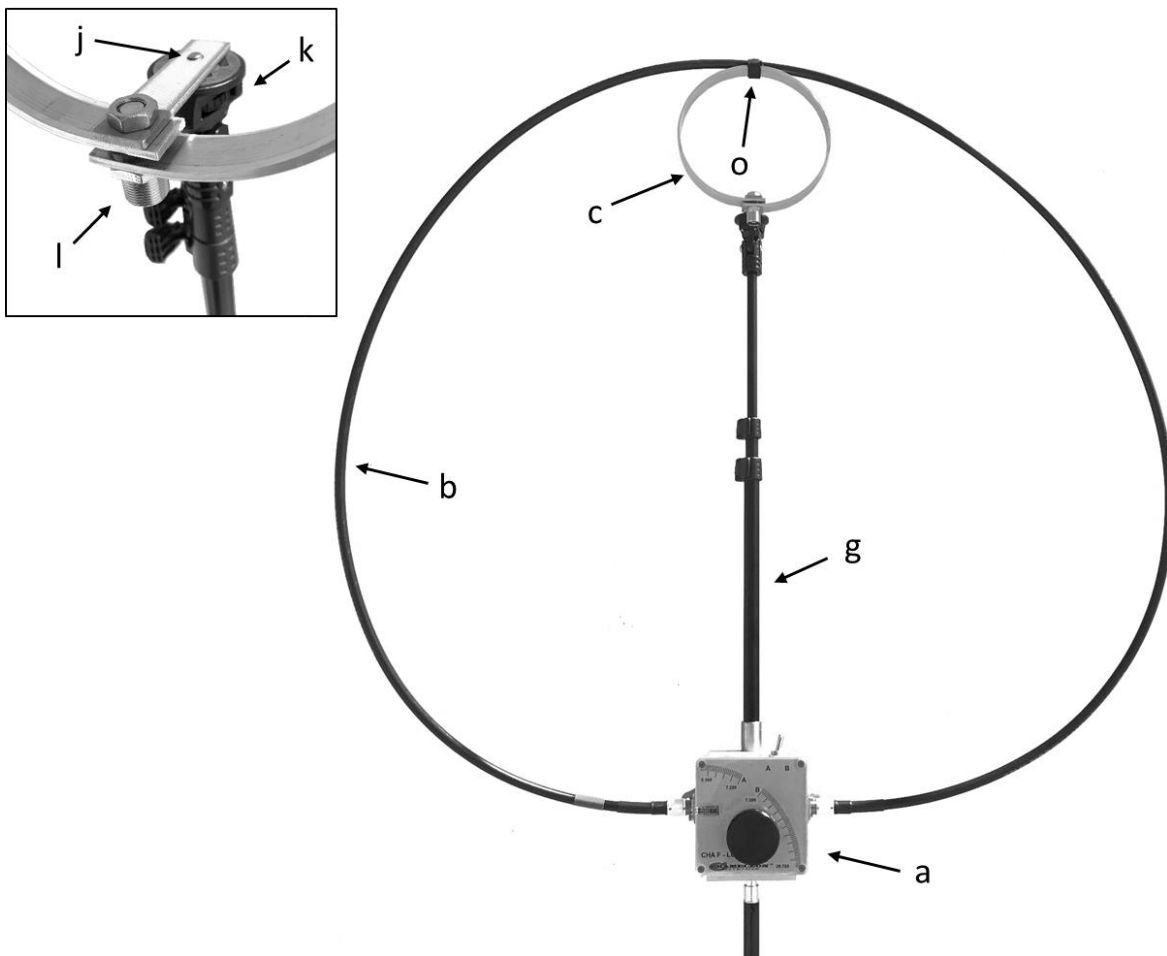
The HF part of the Radio Frequency (RF) spectrum is usually filled with communications activity and an experienced operator can often determine where the MUF is, and with less certainty, the LUF by listening to where activity ends. The operator can then pick a frequency in the OWF and attempt to establish 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 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 normally only 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.

A magnetic loop antenna radiates at all angles from horizon to zenith, making it an equally effective antenna for both local and long-distance (DX) communication. While not specifically designed for NVIS, during field testing of the CHA F-LOOP 2.0, both DX and NVIS contacts were made on the 30 meter ham band within minutes of each other.

## Parts of the Antenna

The CHA F-LOOP 2.0 is comprised of the following components, see plates (2) through (4):



**Plate 2. CHA F-LOOP 2.0 Antenna.**

### **a. Tuning Unit**

The Tuning Unit adjusts the resonant frequency of the CHA F-LOOP 2.0 antenna.

### **b. Flexible Radiator Loop**

The Flexible Radiator Loop consists of a 34 inch diameter (102 inch length) insulated flexible metal loop with UHF Plugs (PL-259) at both ends.

### c. Coupling Loop

The Coupling Loop is a 6.5 inch diameter aluminum loop, which is attached to the end of the Telescoping Mast (g) and used in the CHA F-LOOP 2.0 standard configuration. A larger, 7.0 inch diameter aluminum loop, is used in conjunction with the High-Efficiency Radiator Loop (e) in the CHA F-LOOP 2.0 PLUS antenna configuration.

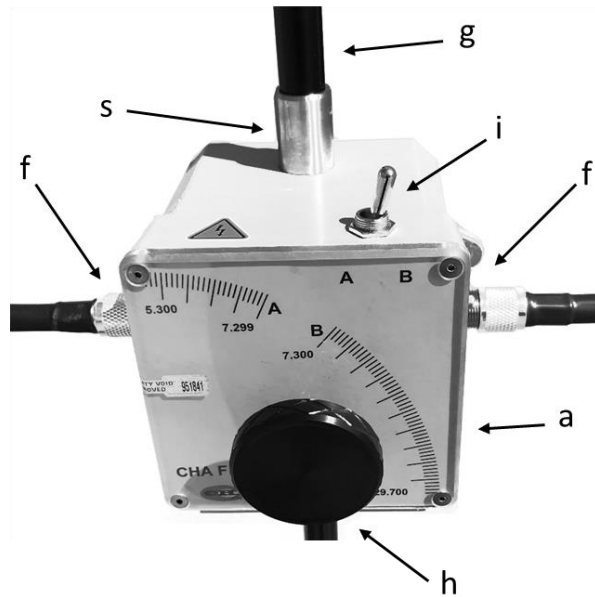


Plate 3. CHA F-LOOP 2.0 Tuning Unit.

### d. Flexible Radiator Loop Extension

The Flexible Radiator Loop Extension consists of a 92 inch length of insulated flexible metal loop with UHF Plugs at both ends. The Flexible Radiator Loop Extension enables the CHA F-LOOP 2.0 to operate the 80 meter ham band.

### e. High-Efficiency Radiator Loop

The High-Efficiency Radiator Loop consists of two sections of rigid aluminum tubing with end fittings and is used with the CHA F-LOOP 2.0 PLUS antenna configuration.

### f. Flexible Radiator Loop Connections

The Flexible Radiator Loop Connections are UHF sockets (SO-239) located on the right and left sides of the Tuning Capacitor Box (a). These connections are not used in the CHA F-LOOP 2.0 PLUS antenna configuration.

### g. Telescoping Mast

The Telescoping Mast attaches the Tuning Unit (a) to the Coupling Loop (c).

### h. Tuning Knob

The Tuning Knob is located on the front of the Tuning Unit (a) and is used to adjust the resonant frequency of the loop. The relative position of the tuning capacitor, which rotates around 2 ¾ revolutions is shown on the front panel Tuning Quadrant Indicator. Left, or counter-clockwise, increases the resonant frequency of the antenna. Right, or clockwise, decreases the resonant frequency of the antenna.

**i. Band Switch**

The Band Switch, see plate (3), is located on the top of the Tuning Unit (a). It has two positions, marked “A” and “B”. Table (2) shows the approximate frequency range of the CHA F-LOOP 2.0 in the three antenna configurations.

Antenna Configuration	Frequency Range (MHz) in A Position	Frequency Range (MHz) in B Position
Standard	4.9 – 22.0	6.8 – 29.7
Double	2.9 – 12.0	4.1 - 14.3
High-efficiency	5.2 – 24.0	7.5 – 29.9

**Table 2. CHA F-LOOP 2.0 Frequency Range.**

**j. Coupling Loop Attachment**

The Coupling Loop Attachment is used to attach the Coupling Loop (c) to the top of the Telescoping Mast (g).

**k. Coupling Loop Adjustment**

The Coupling Loop Adjustment is used to tighten the Coupling Loop Attachment (j).

**l. Loop Connection**

The Loop Connection is a UHF socket located on the bottom of the Coupling Loop (c).

**m. Coaxial Cable Assembly**

The Coaxial Cable Assembly (*not shown*) is a 12 foot length of coaxial cable, with an RF isolator at the antenna end, used to connect the CHA F-LOOP 2.0 Antenna to your radio.

**n. Aluminum Base Plate**

The Aluminum Base Plate is on the bottom of the Tuning Unit (a). It is used to provide a stable base for placing the CHA F-LOOP 2.0 on a flat surface, such as a table, or to mount the CHA F-LOOP 2.0 to a tripod or other antenna mount with a 3/8” stud.

**o. Portable Bag**

The Portable Bag (*not shown*) is a high quality Flat Dark Earth (FDE) / Coyote Brown military-style MOLLE bag used to store and transport the components of the CHA F-LOOP 2.0, making it highly portable.

**p. High-Efficiency Radiator Loop Connections**

The connections for the CHA F-LOOP 2.0 PLUS High-Efficiency Radiator Loop (e), see plate (5) are brackets located on the rear edge of the Tuning Unit (a). They are not used in the CHA F-LOOP 2.0 standard configuration.

**q. Telescoping Mast Stud**

The Telescoping Mast Stud is located on top of the Tuning Unit (a) and is used to attach the Telescoping Mast (g) to the Tuning Unit.

**r. Loop Extension Barrel Connector**

The Radiator Loop Barrel Connector is used to join the Flexible Radiator Loop (b) to the Flexible Radiator Loop Extension (d), which enables the CHA F-LOOP 2.0 to operate the 80 meter ham band.

**s. Power Compensator (*optional*)**

The optional Power Compensator attaches to Flexible Radiator Loop Connection (f) on the left side of the Tuning Unit (a). It is used to increase the power handling capability of the CHA P-Loop 2.0.

## **Standard Single Flexible Loop Assembly**

The CHA F-LOOP 2.0 antenna should be installed near the radio set; either indoors or in a sheltered outside area, such as a balcony or porch. Because the magnetic component of an electromagnetic wave is maximum at the boundary between the ground and the space above, loop performance is usually best when the loop is located near the ground at a distance outside of the loop's close-in induction field (just a loop diameter or two). The CHA F-LOOP 2.0 is not waterproof and must be installed in an area protected from the weather. Do not use an antenna tuner or coupler with this antenna, as it may cause you to mistune the antenna.

Perform the following steps to assemble the Standard Flexible Loop Antenna, see plates (2) and (3).

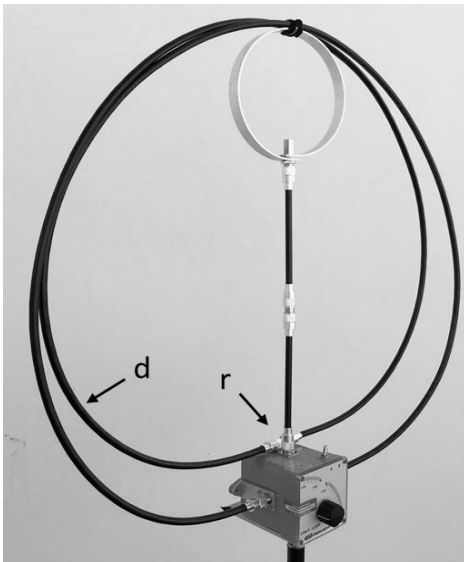
1. Select a location to setup the CHA F-LOOP 2.0 antenna. The location can be indoors or in an outdoors area protected from the weather. The location must facilitate accessibility by the operator to the Tuning Knob (h). The operator needs to be able to adjust the Tuning Knob while listening to the receiver, activating the transmitter, and observing the SWR meter. If used indoors, the location should also be reasonably away from switching power supplies, Internet routers, and other sources of electrical and electronic interference.
2. Remove the CHA F-LOOP 2.0 components from the Portable Bag (o).
3. Attach the Telescoping Mast (g) to the Tuning Unit (a) by screwing the bottom of the Telescoping Mast onto the Telescoping Mast Stud (q), located on the top of the Tuning Unit. Tighten snugly, by gripping the base of the Telescoping Mast and turning clockwise. Do not grip the mast tubing or use tools when tightening.
4. Attach the Coupling Loop (c) to the Coupling Loop Attachment (j), located at the top of the Telescoping Mast, by placing the threaded hole in the Coupling Loop bracket over the Coupling Loop Attachment stud and turning the Coupling Loop Adjustment (k) knob until snug. The UHF



- connector should be in front of the Telescoping Mast and point down, as shown in Plate (2).
5. Extend the lower Telescoping Mast section so that the Telescoping Mast is 24 inches in length.
  6. Connect one end of the Flexible Radiator Loop (b) to the left Radiator Loop Connection (f).
  7. Connect the other end of the Flexible Radiator Loop to the right Radiator Loop Connection.
  8. Secure the top middle of the Flexible Radiator Loop to the top middle of the Coupling Loop with one of the attached Sticky Straps.
  9. Shape the Flexible Radiator Loop into a circular shape. The Coupling Loop and Flexible Radiator Loop should be in the same plane.
  10. Place the CHA F-LOOP 2.0 on a flat surface, such as a table top, or attach the Aluminum Base Plate (n) to a tripod or other compatible antenna mount.
  11. Connect the Coaxial Cable Assembly (m) to the Loop Connection (l).
  12. Secure the Coaxial Cable Assembly along the Telescoping Mast to ensure easy tuning and consistent low SWR.
  13. Perform an operational test (see procedure below).
  14. This completes installation of the CHA F-LOOP 2.0 standard configuration.

## Double Flexible Loop Assembly

The CHA F-LOOP 2.0 Double Flexible Loop configuration allows you to use the CHA F-LOOP 2.0 on the 80 meter ham band by extending the lower frequency of the CHA F-LOOP 2.0 down to 2.9 MHz. See Plate (4) and perform the following steps.



**Plate 4. Double Flexible Loop Antenna.**

1. Perform assembly of the Standard Single Flexible Loop configuration.
2. Disconnect one end of the Flexible Radiator Loop (b) from the Flexible Radiator Loop Connection (f).
3. Connect the free end of the Flexible Radiator Loop to the Loop Extension Barrel Connector (r).
4. Connect one end of the Flexible Radiator Loop Extension (d) to the open Flexible Radiator Loop Connection from step 2.
5. Form the Flexible Radiator Loop Extension into a loop, like the Flexible Radiator Loop.
6. Attach the top of the Flexible Radiator Loop Extension to the top of the Coupling Loop (c) using the attached sticky strap.
7. Connect the free end of the Flexible Radiator Loop Extension to the open end of the Loop Extension Barrel Connector.
8. Set Band Switch (i) to the "A" position.
9. Perform an operational test (see procedure below).
10. This completes installation of the Double Flexible Loop configuration.

## High-Efficiency Loop Assembly

The CHA F-LOOP 2.0 PLUS includes a rigid aluminum high-efficiency radiator loop. This loop increases performance of the CHA F-LOOP 2.0 Antenna, particularly on 60 through 20 meters. The CHA F-LOOP 2.0 PLUS antenna should be installed near the radio set; either indoors or in a sheltered outside area, such as a balcony or porch. Because the magnetic component of an electromagnetic wave is maximum at the boundary between the ground and the space above, loop performance is usually best when the loop is located near the ground at a distance outside of the loop's close-in induction field (just a loop diameter or two). The CHA F-LOOP 2.0 PLUS is not waterproof and must be installed in an area protected from the weather. Do not use an antenna tuner or coupler with this antenna, as it may cause you to mistune the antenna.

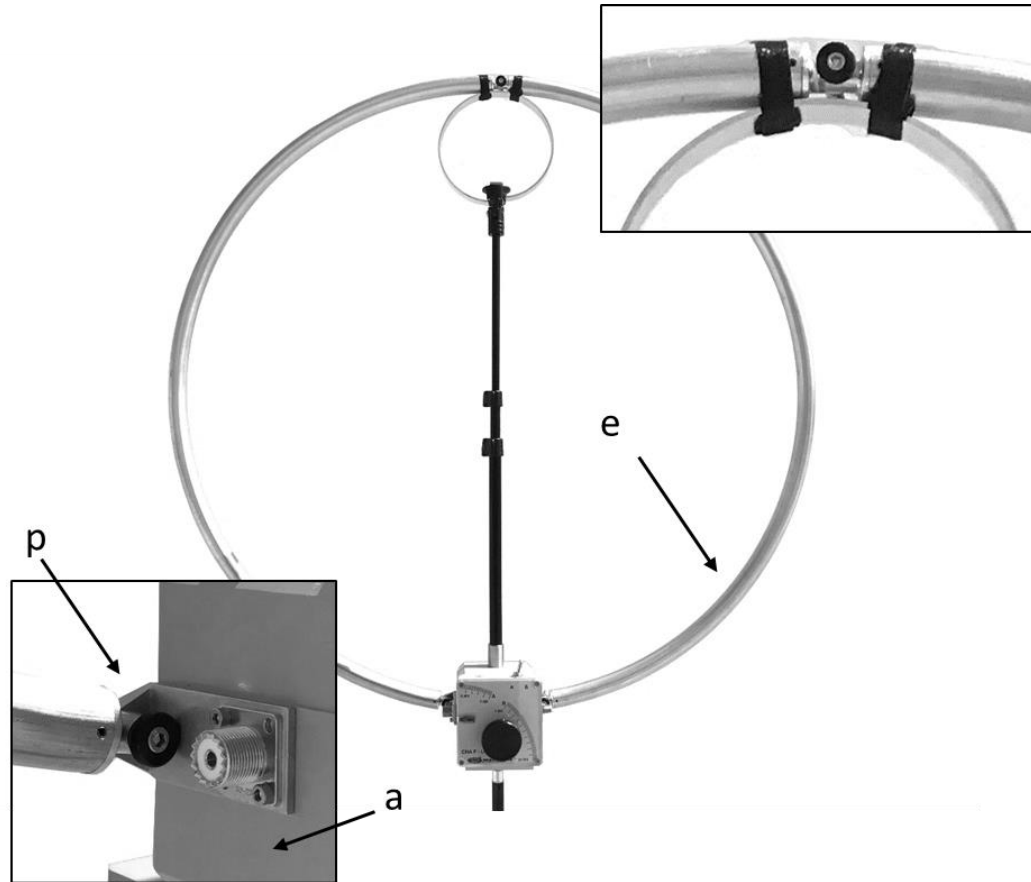
Perform the following steps to assemble the High-Efficiency Loop Antenna, see plate (5).

1. Select a location to setup the CHA F-LOOP 2.0 PLUS antenna. The location can be indoors or in an outdoors area protected from the weather. The location must facilitate accessibility by the operator to the Tuning Knob (h). The operator needs to be able to adjust the Tuning Knob while listening to the receiver, activating the transmitter, and observing the SWR meter. If used indoors, the location should also be reasonably away from switching power supplies, Internet routers, and other sources of electrical and electronic interference.
2. Remove the CHA F-LOOP 2.0 PLUS components from the Portable Bag (o). Note that the High-Efficiency Radiator Loop (e) will not fit in the Portable Bag.
3. Attach the Telescoping Mast (g) to the Tuning Unit (a) by screwing the bottom of the Telescoping Mast onto the Telescoping Mast Stud (q), located on the top of the Tuning Unit. Tighten snugly, by gripping the base of the Telescoping Mast and turning clockwise. Do not grip the mast tubing or use tools when tightening.
4. Attach the larger, 7.0 inch diameter, Coupling Loop (c) to the Coupling Loop Attachment (j), located at the top of the Telescoping Mast, by placing the threaded hole in the Coupling Loop bracket over the Coupling Loop Attachment stud and turning the Coupling Loop Adjustment (k) knob until snug. The UHF connector should be in back of the Telescoping Mast and point down, as shown in Plate (4).
5. Extend the lower Telescoping Mast section so that the Telescoping Mast is 25 3/8 inches in length.
6. Connect one section of the High-Efficiency Radiator Loop (e) to the High-Efficiency Radiator Loop Connection (p) on the left side of the Tuning Unit (a) by inserting a hex bolt through the curved side of the tubing section end fitting. Then position the flat edge (if the edge is rounded, rotate the tubing section end-over-end) of the tubing section end fitting against front of the bracket on the side of the Tuning Unit and push the knurled bolt through the hole in the bracket. Place a flat washer and then a split washer on the knurled bolt on the back of the bracket. Place a wing nut on the end of hex bolt and tighten securely (finger tight).
7. Attached the other section High-Efficiency Radiator Loop to the right side of the Tuning Unit as instructed in step (6). The Flexible Radiator Loop Connections (f) are not used in this configuration.
8. Attach the two sections of the High-efficiency Radiator Loop together at the top by inserting a knurled bolt through the round side of one of the tubing sections. Place the hole in the end fitting of the other section over the knurled bolt. The flat edges of the tubing section ends should be together. Put a flat washer and then a split washer over the end of the knurled bolt. Attach a wing nut on the

end of the knurled bolt and tighten securely (finger tight).

9. Secure Coupling Loop (c) top to the top middle of the High-efficiency Radiator Loop using the attached sticky straps. A 1/4 inch

gap between the top of the Coupling Loop and High-Efficiency Radiator Loop will usually provide good results, although some adjustment may be necessary.

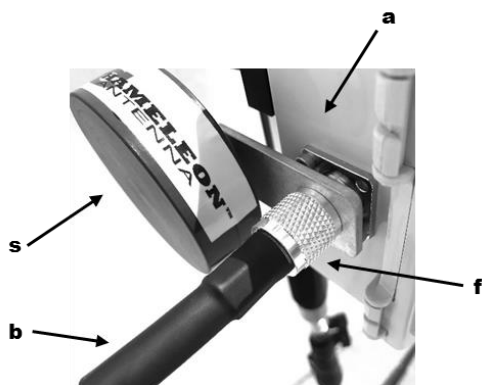


**Plate 5. CHA F-LOOP 2.0 PLUS Antenna.**

10. Connect one end of the Coaxial Cable Assembly (m) to the Loop Connection (l).
11. Secure the Coaxial Cable Assembly along the Telescoping Mast to ensure easy tuning and consistent low SWR.
12. Place the CHA F-LOOP 2.0 on a table top or attach the Aluminum Base Plate (n) to a tripod or other antenna mount.
13. Perform an operational test (see procedure below).
14. This completes installation of the CHA F-LOOP 2.0 PLUS antenna.

## Power Compensator Installation

The optional Power Compensator will increase the power handling capability of the CHA F-LOOP 2.0 to 60W intermittent duty cycle (SSB telephony) and 25W continuous duty cycle (CW, AM, FM, RTTY, and SSB-based digital). To install the Power Compensator, place the bracket of the Power Compensator (s) over the left Flexible Radiator Loop Connection (f) and position the canister as shown in Plate (6).



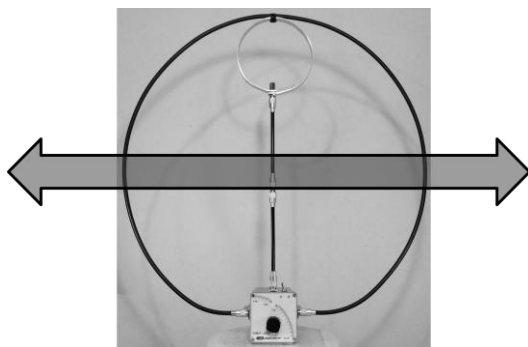
**Plate 6. Power Compensator.**

CAUTION: When using the Power Compensator, exceeding the specified power limits or prolonged transmission with an SWR above 2.0:1 will permanently damage the internal components of the Power Compensator. Also, dropping or rough handling the Power Compensator will permanently damage the internal components. *Damage caused by these conditions is not covered by the warranty.*

## Loop Operation

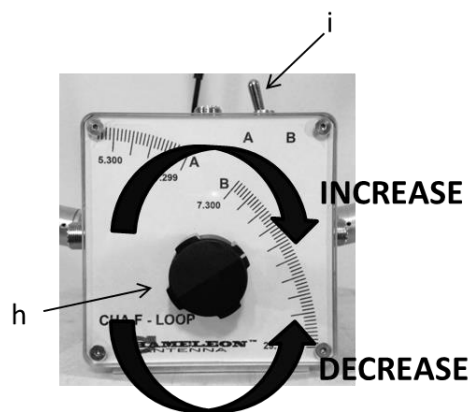
The CHA F-LOOP 2.0 is very easy to use. Perform the following steps whenever you change frequency.

1. The CHA F-LOOP 2.0 is bidirectional favoring the sides, see plate (7). If possible, point one side toward the target signal and rotate the antenna for maximum signal strength.



**Plate 7. CHA F-LOOP 2.0 Antenna Directivity.**

6:1 reduction drive which allows for fine adjustment and will rotate approximately  $2\frac{3}{4}$  revolutions from lowest to highest frequency. Do not attempt to force the Tuning Knob past the stops.



**Plate 8. CHA F-LOOP 2.0 Antenna Tuning.**

2. Set the Band Switch (i) to the desired frequency range.
3. Adjust the Tuning Knob (h) for maximum receive signal strength. Turn the Tuning Knob counterclockwise to decrease the resonant frequency, see Plate (8). You will know when you are close to resonant frequency because you will start hearing signals and a marked increase in receiver background noise. The Tuning Knob uses a

4. Ensure your transmitter is set for no more than 5 Watts during tuning.
5. Transmit a carrier and gradually turn the Tuning Knob counterclockwise and then clockwise, around the highest receive signal point found in step 3, to obtain the lowest SWR. An SWR of 1.5:1 or less is satisfactory. Your hand may slightly influence the resonance of the loop while

turning the Tuning Knob. This is completely normal and you may have to “touch up” the adjustment slightly. The bandwidth of the loop at 60 meters is only 8 KHz, so once you

are close to resonance, make only the slightest of Tuning Knob adjustments.

6. Increase transmitter power to no more than 15 Watts, see specifications

## Disassembly

1. Disconnect Coaxial Cable Assembly (m) and neatly coil cable.
2. If used, disconnect Flexible Radiator Loop (b), carefully coil loop, and secure with attached sticky strap.
3. If used, disconnect Flexible Radiator Loop Extension (d), carefully coil loop, and secure with attached sticky strap.
4. If used, detach High-Efficiency Radiator Loop (e) and secure pieces with attached sticky straps.
5. Fully collapse Telescoping Mast (g).
6. Remove Coupling Loop (c) from the Telescoping Mast.
7. Remove the Telescoping Mast from the Tuning Unit (a).
8. Clean and inspect antenna components and then place them into the Portable Bag (o).
9. The antenna is now ready for transport and storage.

## Troubleshooting

1. Ensure the loop is away from metal surfaces. Sometimes simply reorienting, relocating, or elevating the loop around two to four feet higher will reduce the SWR.
2. Ensure Radiator Loop Connections (f) are securely tightened.
3. Inspect Flexible Radiator Loop (b) for damage. Replace if damaged.
4. Ensure the Coaxial Cable Connection (m) is securely tightened to the Loop Connection (l).
5. Inspect Coaxial Cable assembly for cuts in insulation or exposed shielding. Replace if damaged.
6. Ensure Band Switch (i) is set for your frequency range.
7. Turn Tuning Knob (h) fully counterclockwise.
8. Adjust Tuning Knob over entire range listening for a marked increase in received signal strength and receiver background noise.
9. If still not operational, replace Coaxial Cable assembly. *Most problems with antenna systems are caused by the coaxial cables and connectors.*
10. If still not operational, contact us for technical support.

## Preventive Maintenance

Like all of our products, the CHA P-LOOP 2.0 is built to be rugged, long lasting and with details in mind. The craftsmanship of the system is unique to Chameleon Antenna™. The materials used in this antenna are water and rust resistant and do not require preventive maintenance, but they should be inspected for damage and cleaned with mild household cleaners after field use.

## Specifications

- Frequency: Single Flexible Loop: 4.9 – 29.7 MHz (60 through 10 meter ham bands), Double Flexible Loop: 2.9 – 14.3 Mhz (80 through 20 meter ham bands).
- Power: 25W intermittent duty cycle (SSB and SSB-based digital), 10W continuous duty cycle (CW, AM, FM, RTTY).

- Diameter: 34 Inches
- Ingress Protection: Not water resistant. Equivalent to IP30 (*not tested*).
- RF Connection: UHF Plug (PL-259)
- SWR: Operator tunable, typically not greater than 1.5:1 at resonance.
- Table (3) shows typical 2:1 bandwidth for the three antenna configurations.

BAND	2:1 SWR BANDWIDTH (KHZ)		
	STANDARD	DOUBLE	HIGH-EFFICIENCY
80	-	8	-
60	8	12	9
40	17	17	16
30	27	42	31
20	40	40	44
17	60	-	75
15	100	-	110
12	160	-	160
10	210	-	180

**Table 3. 2:1 SWR Bandwidth.**

- Weight: 4 lbs
- Personnel Requirements and Setup Time: one operator, around 2 minutes
- Do not use an antenna tuner or coupler with this antenna

## 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.

- **High-Efficiency Radiator Loop.** A high-efficiency 1" collapsible aluminum tubing radiator loop and larger coupling loop, which increases efficiency an average of 142% over the standard flexible radiator loop, is available as an option.
- **Booster Flexible Loop.** A 146 inch long (48 inch diameter) flexible loop, which increases CHA F-LOOP 2.0 efficiency from 40 to 15 meters.
- **Power Compensator.** Increases power handling of the CHA F-LOOP 2.0 from 25W to 60W for SSB telephony.
- **Coaxial Cable Assembly.** 50 feet of RG-58 with integrated RFI Choke. Used to connect the CHA F-LOOP 2.0 to the radio set.
- **RF Choke Assembly.** The CHA RFI CHOKER will prevent, greatly reduces or totally eliminates the RFI carried by the coax cable. This accessory is recommended if you are not using the Chameleon Antenna™ Coaxial Cable Assembly.
- **Remote Tuner – Remote Rotator.** The CHA RT-RR enables remote tuning and rotation of the CHA F-LOOP 2.0 from up to 20 feet away from the operator to allow the antenna to be positioned in a more advantageous location.

Recommended non-supplied accessories:

- SWR Power Meter.

- Multi-Meter.
- Heavy-Duty Tripod.

## Chameleon Antenna™ Products

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

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

**CHA MPAS** - The Modular Portable Antenna System (MPAS) is a concept allowing the radio operator to configure and deploy the antenna system in a variety of configurations. Some of the possible deployment configurations: Vertical, Horizontal, Sloper, Inverted "V", Inverted "L", NVIS, Balcony, Vehicle (Stationary), or Man-Pack.

**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 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 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 – Portable HF Antenna Base** - The CHA HYBRID-MINI Base is the portable version of the regular HYBRID. The HYBRID-MINI is 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 Hybrid Micro - Portable HF Antenna Base** - The CHA HYBRID-MICRO is a lightweight highly portable broadband antenna system designed to offer maximum portability and performance. The antenna weighs 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 antenna will work successfully supported by trees, masts, the tops of vehicles or any convenient



object or structure. The antenna works most effectively when elevated at a reasonable height.

**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 F-LOOP 2.0.

**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 LITE** - The CHA TD LITE (Tactical Dipole LITE) is a HF broadband antenna specially designed for portable HF communication

where rapid deployment and simplicity of operation is essential but compactness is primordial. 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.

**CHA TD Tactical Dipole** - The CHA TD (Tactical Dipole) Antenna has been designed as an add-on for the CHA F-LOOP 2.0. 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.

**FT-817 Brackets 2.0.** The CHA FT-817 BRACKETS 2.0 CHA are a military-style pair of precision fabricated aluminum brackets and high quality carrying strap for the popular Yaesu FT-817 series portable QRP transceiver. The brackets have built-in folding legs to tilt the front panel of the FT-817 toward the operator during use. There is also a custom-made microphone holder.

## References

1. Silver, H. Ward (editor), 2013, *2014 ARRL Handbook for Radio Communications*, 91<sup>st</sup> 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.