Basic Vertical
Resonant Portable Antenna
(CHA BV)
Operator's Manual

Nevada - USA

WWW.CHAMELEONANTENNA.COM

VERSATILE – DEPENDABLE – STEALTH – BUILT TO LAST

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

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

- Photographs and diagrams in this manual may vary slightly from current production units due to manufacturing changes that do not affect the form, fit, or function of the product.

- 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™ Basic Vertical Resonant Portable Antenna – part of the Modular Portable Antenna System (MPAS) family of portable antennas.

Basic Vertical Antenna – The Basic Vertical (CHA BV), shown in plate (1), is an efficient single band at a time 40-6m resonant vertical antenna. The CHA BV is comprised of the following components:

- ✓ CHA SPIKE MOUNT – in ground mount,
- ✓ CHA BLANK – 3/8 in. X 24 to SO-239 or BNC adapter and antenna base,
- ✓ Four CHA B-RADIAL 12'6" – radial wires on line winders,
- ✓ CHA SS17 – 17 ft. telescopic whip,
- ✓ CHA M-COIL – enabling operation on 30 and 40 Meters,
- ✓ CHA PUCK HUB – radial attachment hub,
- ✓ Four CHA TENT STAKES – for staking out the radials, and
- ✓ 12 ft. of Coaxial Cable with an integrated RFI Choke.

Using a building block approach, MPAS enables operators to tailor the antenna configuration based on propagation characteristics, site conditions, and other influencing factors. This unsurpassed antenna component flexibility ensures optimal performance across diverse scenarios and conditions.

MPAS Core Elements

The Core Element of the MPAS are listed below. The components <u>included with the CHA BV</u> are highlighted with a check mark.

1. ***Mount*** – Select the Antenna Mount based on the expected site requirements. If possible, take two different styles to meet unanticipated challenges. Mounts available:
   - ✓ **Spike Mount** – The rugged CHA Spike Mount enables easy in-ground mounting of MPAS antennas.
   - **Universal Clamp Mount (UCM)** - The super heavy-duty CHA UCM lets you easily mount MPAS antennas to virtually any flat surface.
   - **Jaw Mount** – The CHA JawMount is a versatile clamp-style mount that enables MPAS antennas to be mounted on almost any round or flat surface.
   - **Carbon Fiber Tripod** – The ultra-light CHA Carbon Fiber Tripod enables deployment of MPAS antennas where a clamp or ground spike may not be permitted or times when you need the ultimate in portability.

2. ***Base*** – Select the Antenna Base to support the antenna configuration needed for reliable communications.

- **Hybrid Micro** – The CHA HYBRID MICRO is the low power version of the Hybrid Matching Transformer. When used with either the CHA MIL Whip 2.0 + CHA MIL EXT 2.0 or the CHA SS17, it will operate from 1.8 to 54.0 MHz continuously with an antenna tuner (160-6m bands).
- **Hybrid Mini** – The CHA HYBRID MINI is the high power version of the Hybrid Matching Transformer. When used with either the CHA MIL Whip 2.0 + CHA MIL EXT 2.0 or the CHA SS17, it will operate from 1.8 to 54.0 MHz continuously with an antenna tuner (including the 160-6m bands).
- **Multi-Configuration Coil** – The CHA MCC is the core component of the Portable Resonant Vertical (CHA PRV). When used with a CHA SS58, it will operate from 5.4 to 117 MHz continuously (including the 40-6m bands).
- ✓ **Blank Adapter** – The CHA BLANK is the core component of the CHA BV. It is a 3/8 in. X 24 to SO-239 or BNC Adaptor. It enables use of MPAS components to create resonant portable vertical and wire antennas.
- **Hub Adapter** – The Hub Adapter is machined aluminum center piece with one vertical, two horizontal, and two angled 3/8 in. X 24 sockets used in the CHA Tactical Delta Loop (CHA TDL). It can also be used to create an MPAS dipole.

3. ***Radiator*** – The operator should choose the radiator element to meet operational and technical requirements.
   - **MIL WHIP 2.0** – The CHA MIL WHIP 2.0 is a military-style collapsible whip antenna that is 9 ft, 4 in. When used with the CHA BLANK, it has a resonant frequency of around 25 MHz (12m).
   - **MIL EXTENSION 2.0** - The CHA MIL EXT 2.0 is an 8 ft. 10 in. collapsible radiator/mast that when used with the CHA MIL WHIP 2.0 makes an efficient 18 ft. 2 in. radiator.
   - **SS58 Whip** – The CHA SS58 is a highly portable and sturdy 58 in. stainless steel telescopic whip with a length of 19 in. (collapsed) to 58 in. (fully extended).
   - ✓ **SS17 Whip** – The CHA SS17 is a 17 ft. stainless steel telescopic whip with a length of 24 in. (collapsed) to 17 ft. (fully extended), enabling it to resonate from approximately 13.8 to 117 MHz continuous (including the 20 – 6m bands).
   - **SS25 Whip** – The CHA SS25 is a 25 ft. stain stainless steel 13 section telescopic whip. It will improve MPAS and BV performance on frequencies below 14 MHz.
   - **TDL Wire** – The CHA TDL Wire is 25 ft. of wire with clips at each end for use with the CHA TDL.
   - ➢ **60 ft. Lazy Sloper Wire** – The 60 ft. Lazy Sloper Wire (CHA LZ SLOPER WIRE [60’]) is used with the LEFS 4010 to make a self-supporting 40-10 Meter End-Fed Halfwave (EFHW) Sloper antenna. It is also used to extend the Basic Vertical band coverage to 60, 75, and 80 Meters by forming a self-supporting Inverted Lazy “L” wire antenna.

4. ***Loading Coils*** – The Loading Coils allow electrically short antennas to resonate on lower frequencies. Both coils have been updated to enable jumper bypass so you don't need to remove them when changing to a higher band.
   - ✓ **M-Coil** – The M-Coil enables the SS17 Whip to be used on 40 and 30 meters.
   - **M25-Coil** – The new M25 Coil enables the SS25 Whip to be used on 40 meters.
5. ***Counterpoise/Radials*** – The Counterpoise/Radials provide "the other half" of unbalanced antenna designs, such as for vertical antennas or non-resonant end-fed antennas.
   - ✓ **12 ft. 6 in. Radials** – A set of four 12 ft. 6 in. Radials (CHA B-RADIAL 12'6") included with the CHA BV and CHA PRV and usable from 40 to 6m.
   - **25 ft. Counterpoise** – The CHA COUNTERPOISE is a single 25 ft. counterpoise wire included in the MPAS 2.0 and other Chameleon Antenna™ broadband antennas. It is usable from 80 to 6m.
   - ✓ **Puck Hub**. The CHA PUCK HUB is a machined aluminum disk with six holes for Banana Jacks used to attach up to six radials to the antenna.

Plate (1). Basic Vertical.

Additional MPAS components can be purchased to extend the capabilities of your antenna. For example, adding a Hybrid Micro or Mini Matching Transformer changes your Basic Vertical to an MPAS Lite broadband vertical. Incremental upgrades enable you to configure your antenna in more ways to meet new operating requirements or hobby interests and avoid operational obsolescence. Look for the MPAS READY Logo for compatible products. If in doubt, contact Chameleon Antenna™ at support@chameleonantenna.com or ask your local dealer.

The CHA BV by Chameleon Antenna™ sets a new standard for adaptability and performance in portable antennas. With its versatile modular design and high-quality components, operators can confidently deploy the CHA BV in a variety of environments and operational conditions, ensuring reliable and efficient communication.

Please read this operator's manual so that you may maximize the utility you obtain from your CHA BV.

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 II V3'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 multi-hop 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 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 CHA BV is comprised of the following components, refer to plate (2):

A. Blank Adapter. The Blank Adapter (CHA BLANK) is the foundational component of the CHA BV and enables mounting of 3/8 in. X 24 components and electrically connects them to either a BNC or SO-239 connector.

B. Medium Loading Coil. The Medium Loading Coil (CHA M-COIL) enables the CHA BV to operate on 40 and 30 meters.

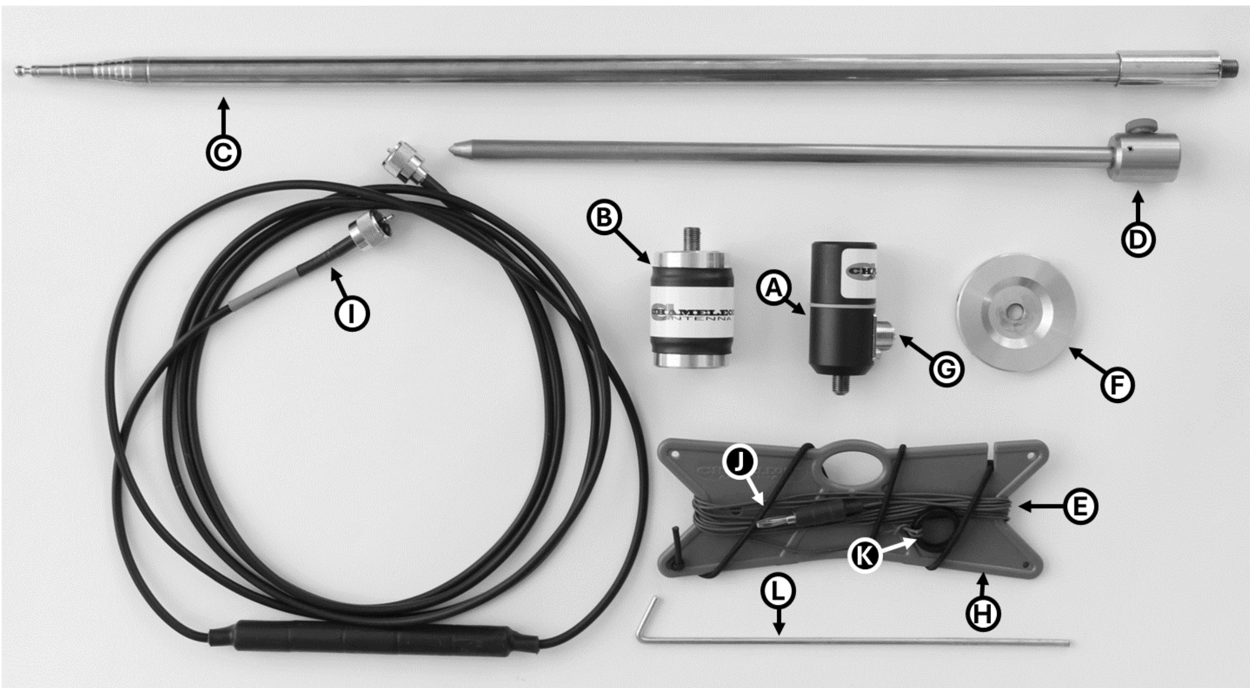


Plate 2. BV Components.

C. SS17 Whip. The SS17 Whip (CHA SS17) is a 17 ft. stainless steel telescopic whip with a length of 24 in. (collapsed) to 17 ft. (fully extended), enabling it to resonate from approximately 13.8 to 117 MHz continuous (including the 20 – 6m bands).

D. Spike Mount. The rugged Spike Mount (CHA SPIKE) enables easy in-ground mounting of the CHA BV antennas.

E. Radials – A set of four 12 ft. 6 in. Radials (CHA B-RADIAL 12'6") are included with the CHA BV and are usable from 40 to 6m. Some of the Radial wire may need to be rolled up onto the Line Winder on 15 Meters and above to attain the lowest SWR.

F. **Puck Hub**. The CHA PUCK HUB is a machined aluminum disk with six holes for Banana Jacks used to attach up to six radials to the antenna.

G. **Coaxial Connector.** The Coaxial Connector is an SO-239 Female UHF Connector or a BNC Female Connector. It is located on the side of the Blank Adapter.

H. **Line Winder**. The four Line Winders are used to store the four Radial wires.

I. **Coaxial Cable.** The Coaxial Cable is 12 ft. of RG-58 with either PL-259 or BNC connectors on each end with an integrated RFI Choke.

J. **Banana Plug.** The Banana Plugs are used to connect the Radials to the Puck Hub.

K. **Isolation Ring.** The Isolation Rings are located at the ends of the Radial wires.

L. **Tent Stake**. The Tent Stakes are used to stake out the ends of the Radial wires.

Basic Vertical Antenna

The Basic Vertical (CHA BV) is an efficient single band at a time 40-6m resonant vertical antenna. Figure (1) shows the Basic Vertical Configuration. With no loading coils, the CHA BV operates from 20 to 6 Meters. Adding a Medium Loading Coil (CHA M-COIL) enables operation on 40 and 30 Meters. Perform the following procedure to deploy the Basic Vertical Antenna.

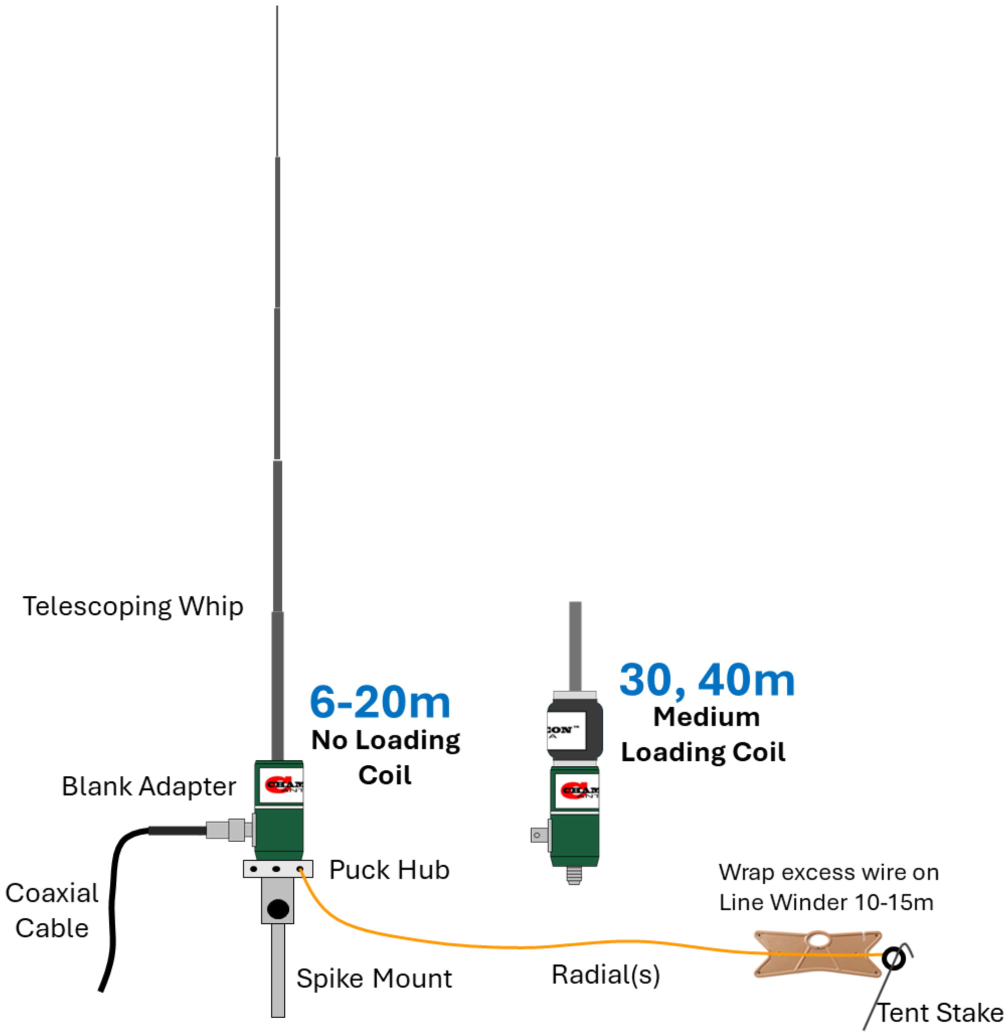


Figure 1. Basic Vertical Configuration.

See figure (2) for assembly order.

1. Select a location to install the CHA BV. The best site will be a mostly clear circular area with a diameter of around 26 ft.
2. In the center of the area, drive the Spike Mount (D) into the ground using a rubber or plastic mallet.
3. Attach the Puck Hub (F) to the Blank Adapter (A). The side with the indentation goes up. Tighten hand tight.
4. Attach the Blank Adapter to the Spike Mount. Tighten hand tight.
5. If operating on 40 or 30 Meters, attach a Medium Loading Coil (B) to the Blank Adapter. Tighten hand tight.

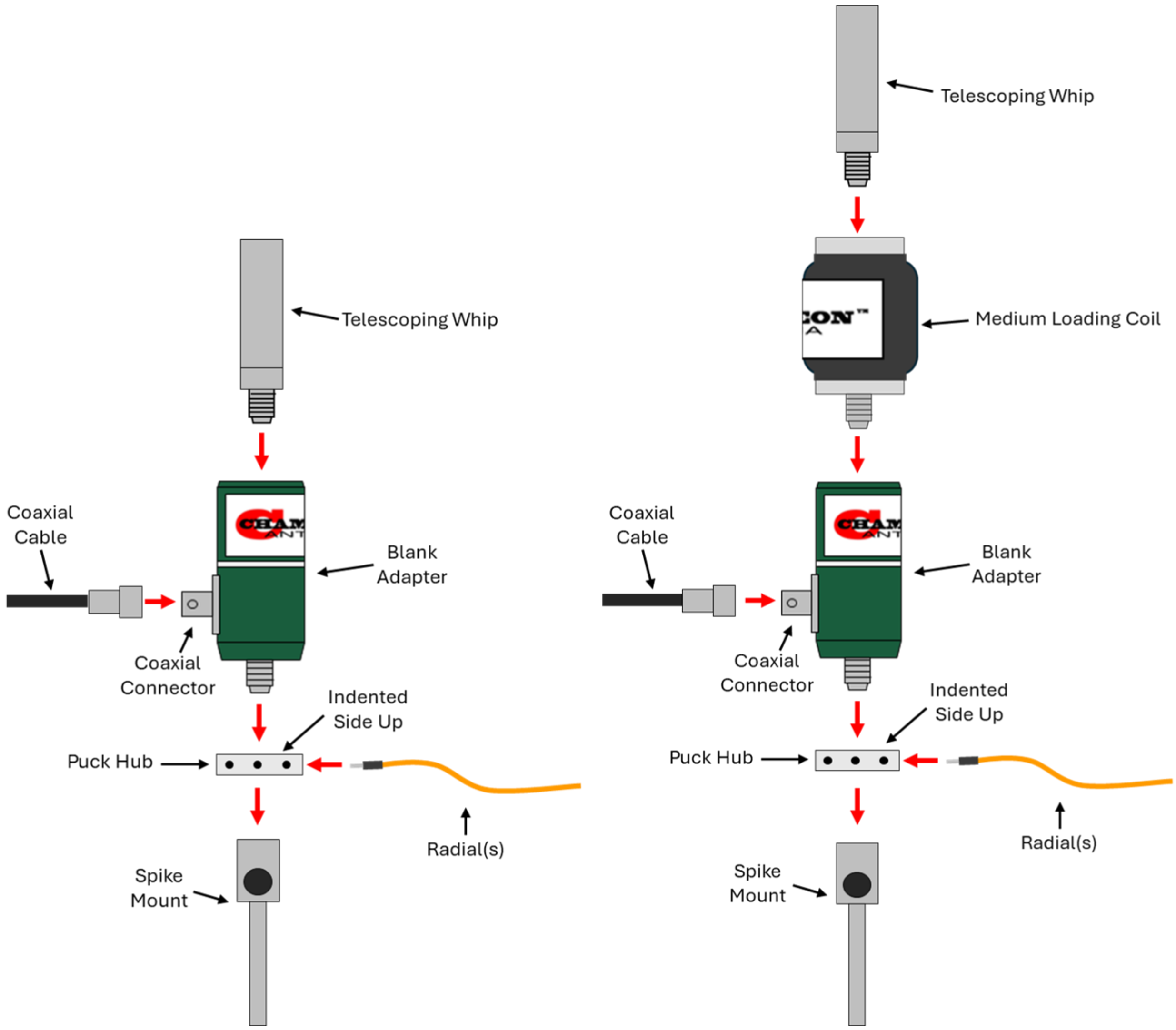


Figure 2. Basic Vertical Assembly.

6. Carefully extend the Telescoping Whip, one section at a time, starting from the top, until it is fully extended.
7. Lay the Telescoping Whip on the ground.
8. Use table (2) to determine the initial length of the telescoping whip.
9. Use a tape measure and measure from the bottom of the telescoping whip until you reach the length for the band on which you want to operate.
10. Carefully collapse the Telescoping Whip, starting at the top, until the tip is at the length measured in the previous step.
11. Attach the SS17 Whip (C) to the top of the Blank Adapter or the Medium Loading Coil, as shown in figure (2). Tighten hand tight. *Use caution when performing this step because the motion of the whip makes it hard to start the threads without cross-threading.*

		SS17 Whip Length			
Band	Loading Coil	Feet	Inches	Sections Up (Incl. Base)	Radials
40	M-COIL	16	0	Nine and a Half	3 X 12ft. 6in.
30	M-COIL	7	5	Four and a Quarter	2 X 12ft. 6in.
20	-	17	0	Fully Extended	4 X 12ft. 6in.
17	-	12	7	Seven and a Half	4 X 12ft. 6in.
15	-	11	5	Six and Three Qtrs	4 X 9ft.
12	-	9	7	Five and a Half	4 X 6ft.
10	-	8	10	Five and a Quarter	4 X 5ft.
6	-	4	10	Two and Three Qtrs	4 X 3ft.

Table 2. Basic Vertical Initial Settings.

12. Connect the number of Radials (E), shown in table (2), to the Puck Hub using a Banana Plug (J).
13. Adjust the Radial length, as shown in table (2). Roll the excess amount onto a Line Winder and secure with the attached shock cord.
14. Use a Tent Stake (L) to fix the end of the Radial to the ground.
15. Connect the Coaxial Cable (I) to the Coaxial Connector (G) on the side of the Blank Adapter.
16. Connect the Coaxial Cable to the Transceiver and conduct and operational test.
17. Adjust the length of the Telescoping Whip for best SWR using the guidance found in the "Tuning Resonant Antennas" section.

Inverted Lazy "L" Antenna

The band coverage of the Basic Vertical (CHA BV) can be extended to 60, 75, and 80 Meters (one band at a time) by purchasing an optional 60 ft. Lazy Sloper kit (CHA LZ SLOPER [60']).

The optional CHA LZ SLOPER (60') kit includes 60 Feet of lightweight 26 Gauge Kevlar insulated wire with alligator clip and a Line Winder.

To install the CHA BV Inverted Lazy "L" antenna, perform the following procedure. Refer to figure (3) during assembly.

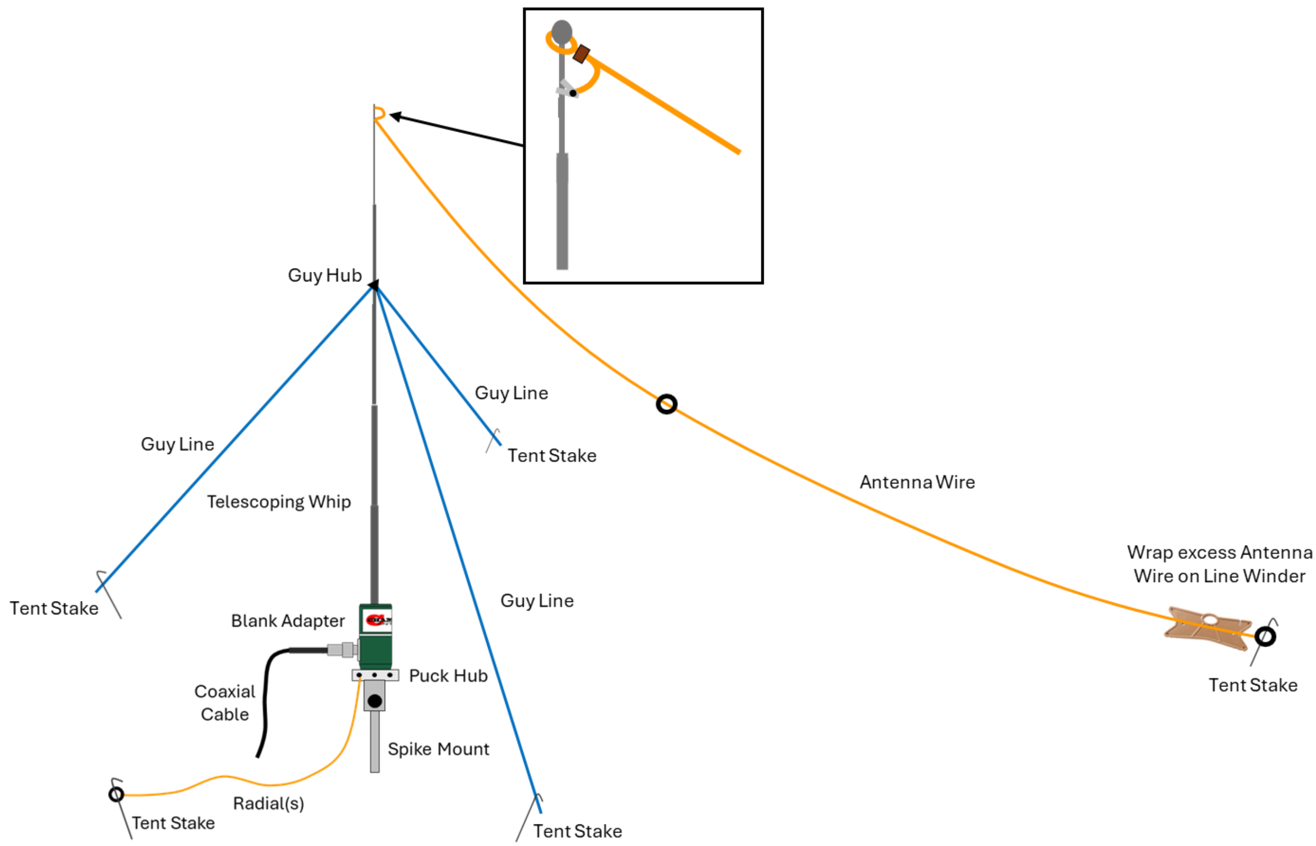


Figure 3. CHA BV 60, 75, and 80 Meter Inverted Lazy "L" Antenna.

1. Select a location to deploy the CHA BV Inverted Lazy "L" antenna. The best location would be a mostly clear area with around 62 feet of space.
2. About 10 feet from the edge of the selected area, drive the Spike Mount (D) into the ground using a rubber or plastic mallet.
3. Attach the Puck Hub (F) to the Blank Adapter (A). The side with the indentation goes up. Tighten hand tight.
4. Attach the Blank Adapter (A) to the Spike Mount. Tighten hand tight.

5. Extend the top two sections of the Telescoping Whip.
6. Position the Antenna Wire strain relief loop over the Corona Ball at the top of the Telescopic Whip.
7. Clip the Antenna Wire to the top section of the Telescoping Whip.
8. If used, install guy lines.
9. Fully extend the Telescoping Whip.
10. Fully extend the Antenna Wire.
11. Ensure there is plenty of sag in the Antenna Wire and secure the end to the ground using a Tent Stake (L) through the Isolation Ring.

    Note: *The SWR can be improved by elevating the low end of the Antenna Wire by around 3 feet.*

    Caution: *Avoid over-stressing the Telescoping Whip and Antenna Wire.*
12. Connect the four Radials (E) to the Puck Hub using a Banana Plug (J).
13. Extend them in opposite directions and fix them to the ground using Tent Stakes.
14. Connect the Coaxial Cable (I) to the Coaxial Connector (G) on the Blank Adapter.
15. Connect the Coaxial Cable to the Transceiver and perform an operational test.
16. The Antenna Wire is cut for the low end of the 80 Meter band. To reduce the length of the Antenna Wire for 75 or 60 Meters, wrap turns around the Line Winder and secure with attached Shock Cord or a Bongo Tie.

Note: 1. It is highly recommended that you guy the Telescoping Whip to counterbalance lateral stress when using it with Lazy Sloper wire antenna. The Universal Guying System (CHA UGS) is available for purchase from Chameleon Antenna™ or your great dealer.

Note 2. The CHA SS25 is not recommended for this configuration.

25-Foot Vertical Antenna

The 25-Foot Vertical Antenna, shown in figure (4), uses many of the components of the BV along with a 25-foot telescopic whip (CHA SS25) and new Medium 25 Loading Coil (CHA M25-COIL) to make a 40 through 6 meter resonant quarter wave vertical antenna. Operation on 40 meters is achieved using the CHA M25-COIL and 30 through 6 by varying the length of the telescopic whip for resonance. The initial settings for the 25-Foot Vertical are listed in table (3). The CHA M-COIL and CHA M25-COIL are the same physical size and similar in appearance, but the CHA M25-COIL has fewer turns and is distinguished from the CHA M-COIL by a red covering. The CHA M25-COIL can be quickly and easily bypassed using the two 4mm banana plug sockets in the top and bottom edges of the coil, as shown in the inset of figure (4). *Jumper not included.*

The assembly procedure for the 25-Foot Vertical Antenna is the same as the Basic Vertical Antenna.

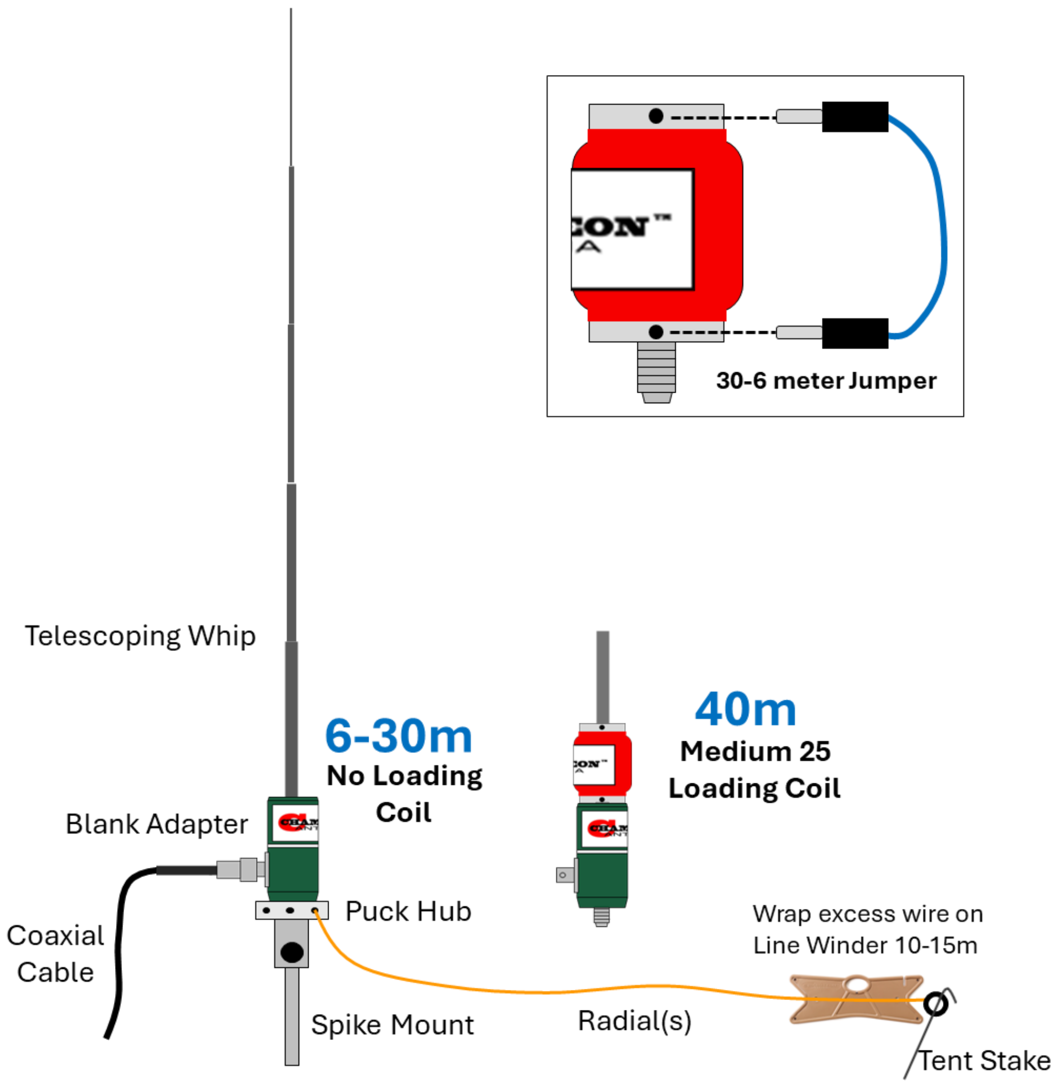


Figure 4. 25-Foot Vertical Antenna.

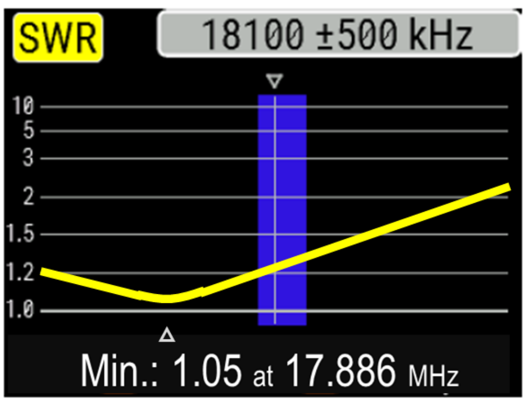
		SS25 Whip Length			
Band	Loading Coil	Feet	Inches	Sections Up (Incl. Base)	Radials
40	M25-COIL	24	1	Thirteen and a Half	4 X 12ft. 6in.
30	-	24	10	Almost Fully Extended	4 X 12ft. 6in.
20	-	17	0	Nine and a Half	4 X 12ft. 6in.
17	-	12	7	Seven	4 X 12ft. 6in.
15	-	11	5	Six and a Quarter	4 X 9ft.
12	-	9	7	Five and a Quarter	4 X 6ft.
10	-	8	10	Four and Three Qtrs	4 X 5ft.
6	-	4	10	Two and a Half	4 X 3ft.

Table 3. 25-Foot Vertical Initial Settings.

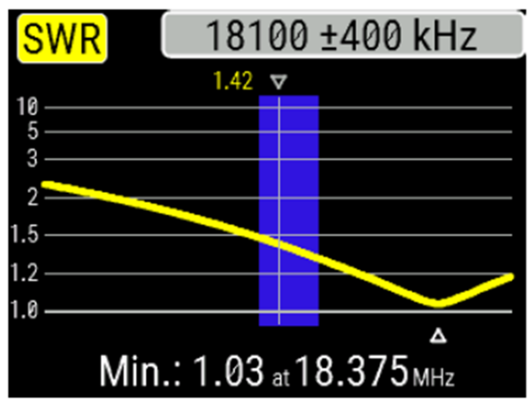
Tuning Resonant Antennas

The lengths of the vertical telescopic whip, radial wires, and resonant wire antenna configurations were calculated using accepted formulas and then field tested. However, antenna height, ground conductivity, nearby objects, and other factors can cause the antenna to be detuned. The following explanation and procedure will help you to adjust your antenna to resonance and achieve a low SWR.

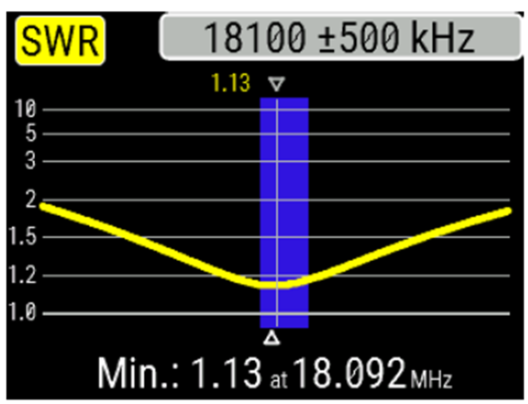
a. Connect an Antenna Analyzer with a frequency sweep function between the Transceiver and Antenna. If you do not have an Antenna Analyzer, record measurements using an SWR meter.
b. Sweep broadly in frequency from below the band to above the band.
c. As shown in figure (4), four results are possible:



Resonant Frequency Below Band
Antenna Too Long



Resonant Frequency Above Band
Antenna Too Short



Resonant Frequency Near Center of Band
Antenna Right Length

Figure 4. Antenna Resonance vs. Antenna Length.

1. **Below the Band.** The resonant frequency may be below the band or for wide bands like 80/75 meters, may be too low in the band. In this case, the antenna is too long.

Decreasing the length of the Telescoping Whip is easy - grasp the section just above the bottom section and carefully push it down the desired amount. Remeasure SWR.

2. **Above the Band.** The resonant frequency may be above or too high in the band indicating the antenna is too short. Locate a section of the Telescoping Whip that is not fully extended. Pull that section out the desired amount. Remeasure SWR.

3. **Within the Band, but Shallow SWR Dip.** The resonant frequency is within an acceptable portion of the band, but the dip in SWR is shallow and measures greater than 2.0:1. The antenna is close to the correct length, but there are too many radials or the radials are too long.
   a. Try disconnecting one to three radials *(one at a time)*.
   b. Alternatively, wind a couple feet of wire from all four radials onto their line winders. If necessary, wrap more wire onto the line winders until the SWR dips less than 2.0:1.

   The general rule-of-thumb for best performance is you want as long and as many radials as the antenna will tolerate– it's a tradeoff. As you make changes to the radials, you may need to adjust the length of the antenna.

4. **Within the Band.** The resonant frequency is near the center of the band or is within an acceptable portion of the band. The antenna is the correct length and no further adjustments are necessary.

Recovery Procedure

To recover the BV, perform the following steps:

1. Disconnect the Coaxial Cable from the transceiver.
2. Collapse the Telescoping Whip, one section at a time, starting from the bottom.
3. Disconnect the Coaxial Cable from the Blank Adapter.
4. Carefully roll *(do not twist)* the Coaxial Cable.
5. Disconnect the antenna components from each other.
6. Remove dirt from antenna components and inspect them for signs of wear.
7. Apply a light coating of anti-seize compound to 3/8 in. X 24 threads. We recommend Permatex(R) Anti-Seize Lubricant.
8. Store antenna components in a tactical bag so they will be together and ready for next deployment.

Troubleshooting

1. Ensure the antenna components are assembled correctly according to assembly instructions and diagrams.
2. Ensure antenna components mechanical connections are snug.
3. Check that the Coaxial Cable is securely connected to the Blank Adapter.
4. Check that the Radials are connected according to instructions and tables.
5. Inspect antenna components for signs of breakage, strain, wear, or excessive mud.
6. Particularly inspect the Coaxial Cable for cuts in insulation or exposed shielding.
7. Inspect Coaxial Connectors Adapters, if used.
8. If still not operational, replace Coaxial Cable. *Most problems with antenna systems are caused by the coaxial cables and connectors.*
9. If still not operational (SWR > 5:1), contact Chameleon Antenna™ at support@chameleonantenna.com for technical support, be sure to include details on the antenna configuration, symptoms of the problem, and what steps you have taken.

Accessories

The following accessories are recommended for use with your antenna. They are available from www.chameleonantenna.com or your great dealer.

- **60 ft. Lazy Sloper kit.** The 60 ft. Lazy Sloper kit (CHA LZ SLOPER [60']) contains all components necessary to create an effective 60, 75, an 80 Meter self-supporting Inverted Lazy "L" antenna with the CHA BV.
- **Universal Guying System.** The Universal Guying System (CHA UGS) provides the support needed for the Telescoping Whip when using it with Lazy Sloper wire antennas.

Specifications

- Frequency: Resonant frequency in the range of 6.9 to 117.0 MHz (including all Amateur Radio Service bands 40 - 6m). 40 and 30 meters require use of the included Medium Loading Coil. 60 meters requires a second optional Medium Loading Coil.
- Power: 300 W SSB Phone, 200W CW and Digital Modes.
- RF Connection: UHF Female Connector (SO-239) or BNC Female Connector.
- SWR: Less than 2.0:1 across a band, but subject to frequency, configuration, and location. See figures (5) – (14) for measured SWR graphs.
- Length: Up to 17 ft. (25 ft. with optional CHA SS25)
- Weight: Approximately 4 lbs.
- Water Resistant.
- Personnel Requirements and Setup Time: one trained operator, less than 10 minutes.

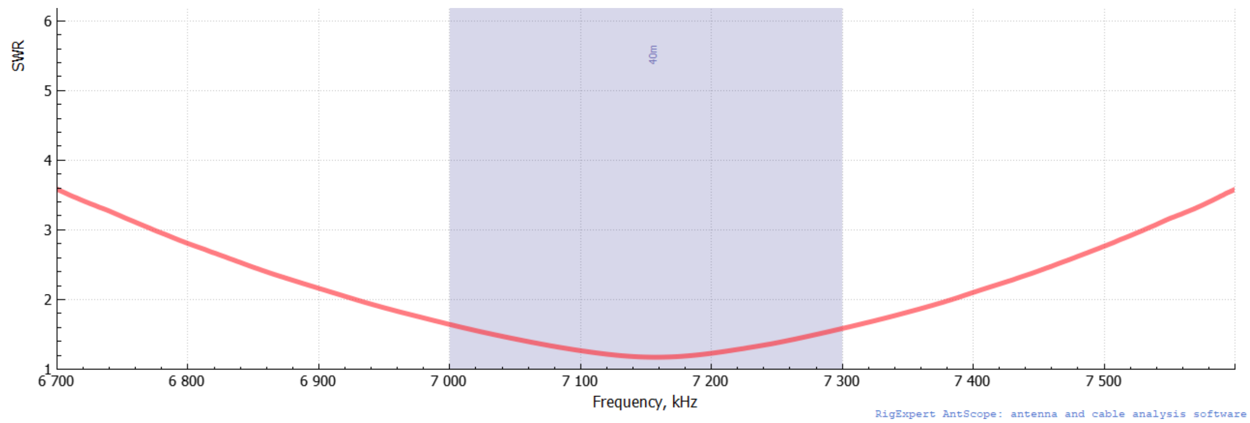


Figure 5. 40 Meter SWR Graph.

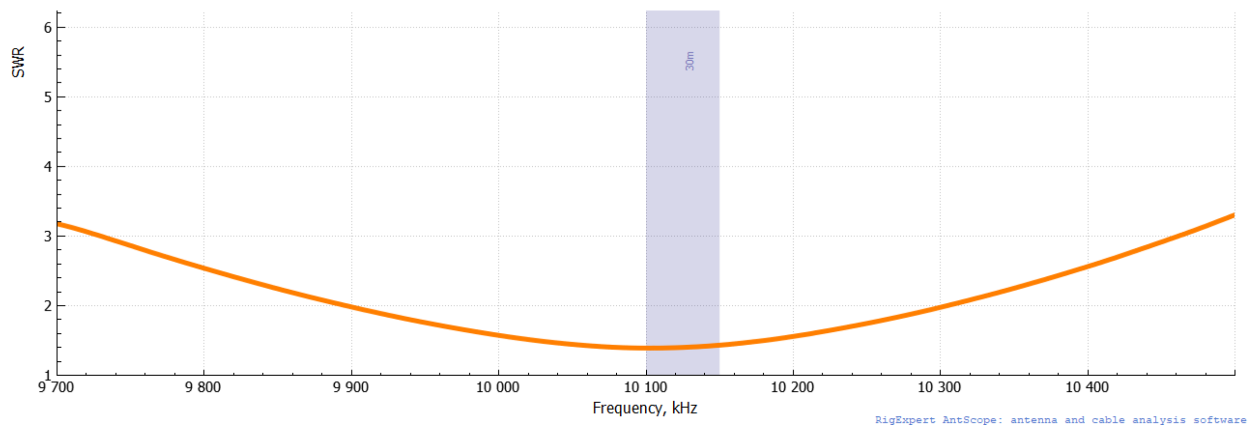


Figure 6. 30 Meter SWR Graph (CHA SS17).

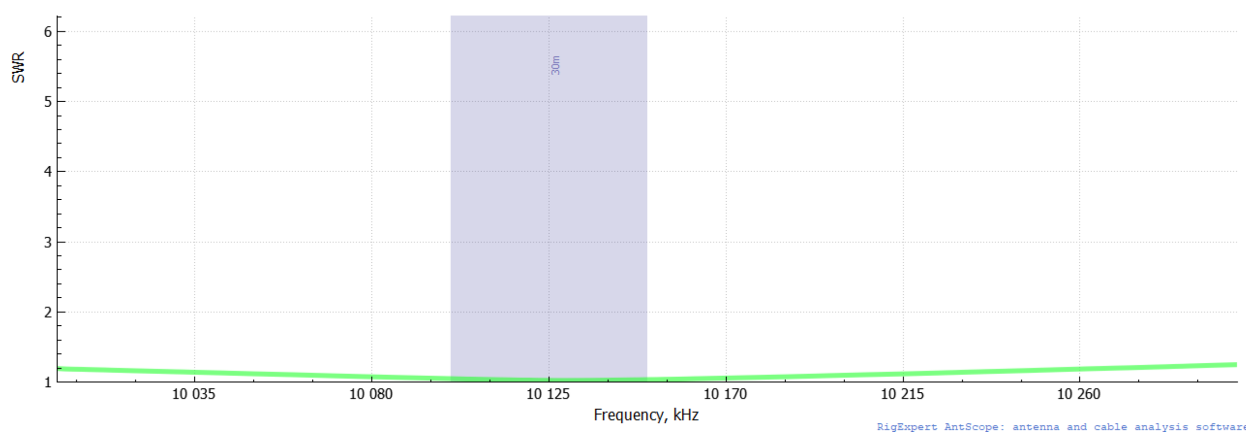


Figure 7. 30 Meter SWR Graph (optional CHA SS25).

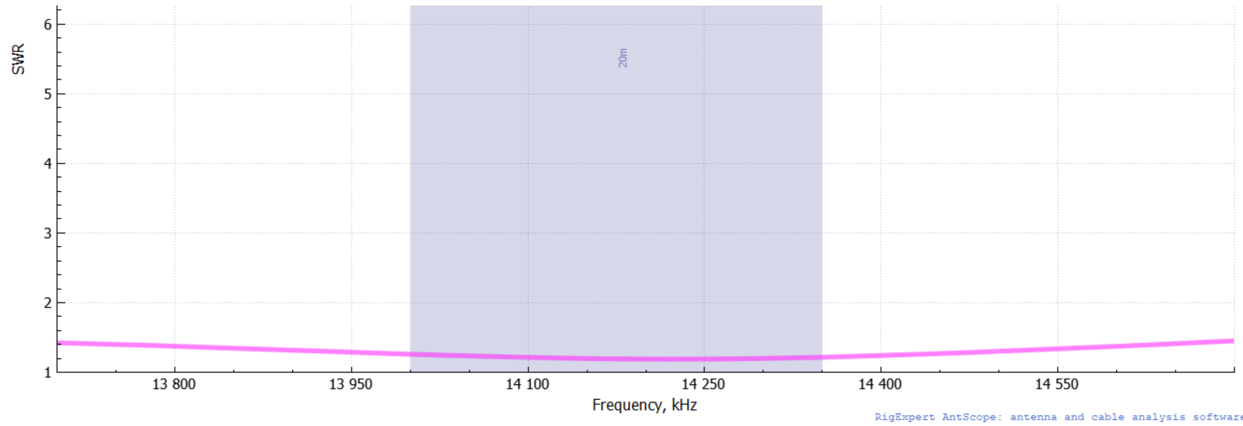


Figure 8. 20 Meter SWR Graph.

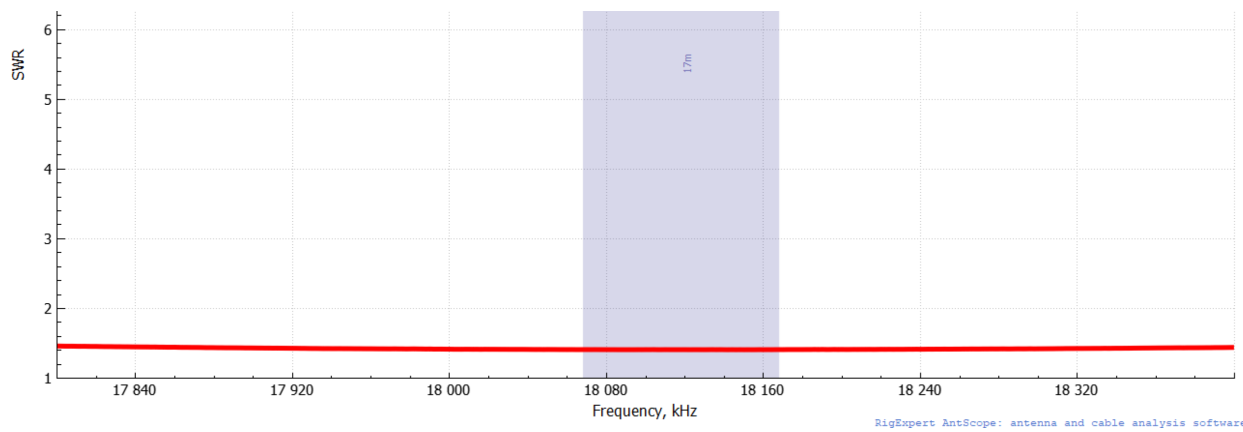


Figure 9. 17 Meter SWR Graph.

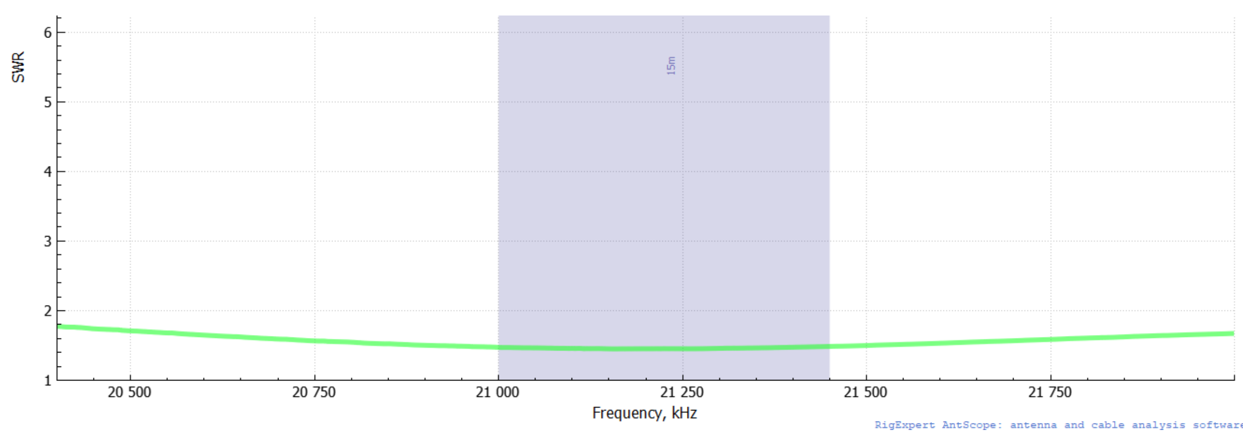


Figure 10. 15 Meter SWR Graph.

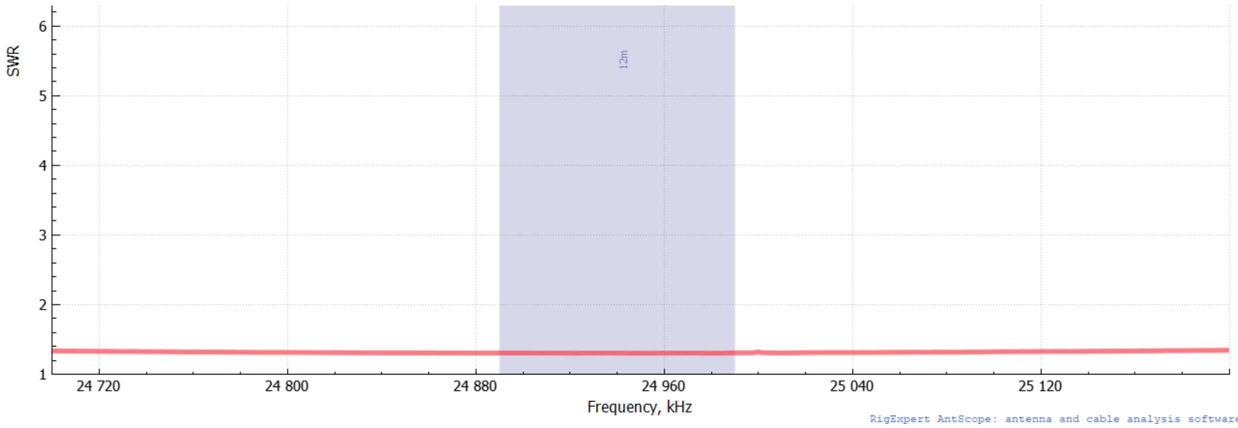


Figure 11. 12 Meter SWR Graph.

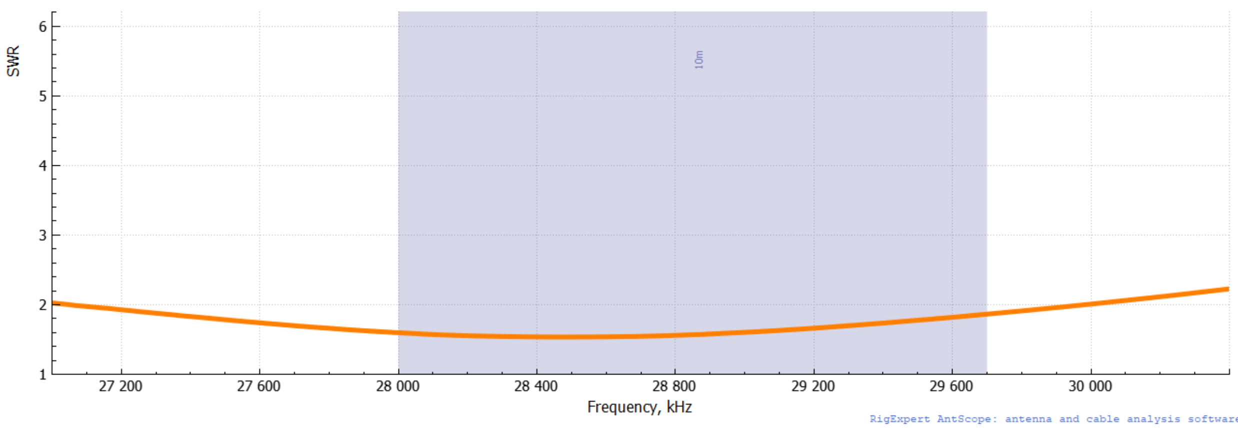


Figure 12. 10 Meter SWR Graph.

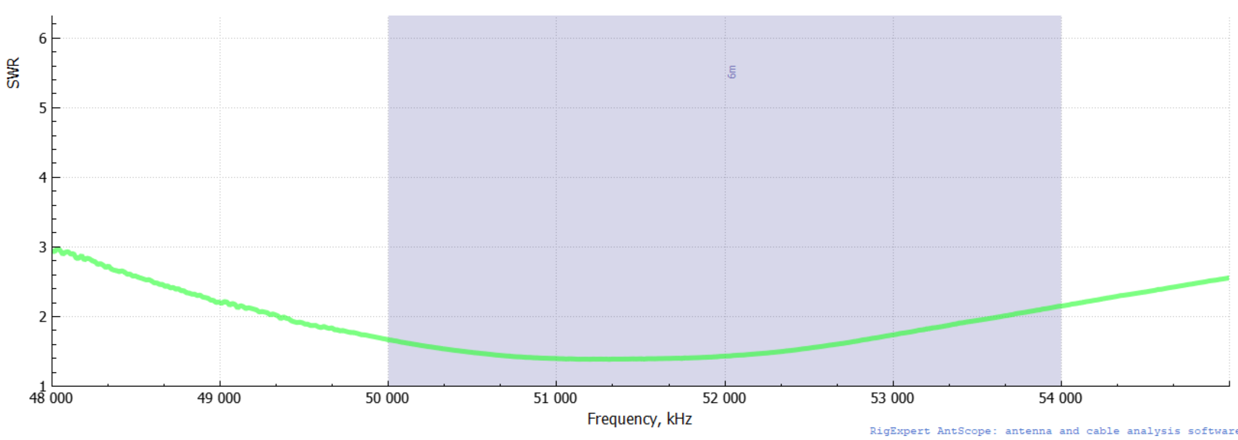


Figure 13. 6 Meter SWR Graph.

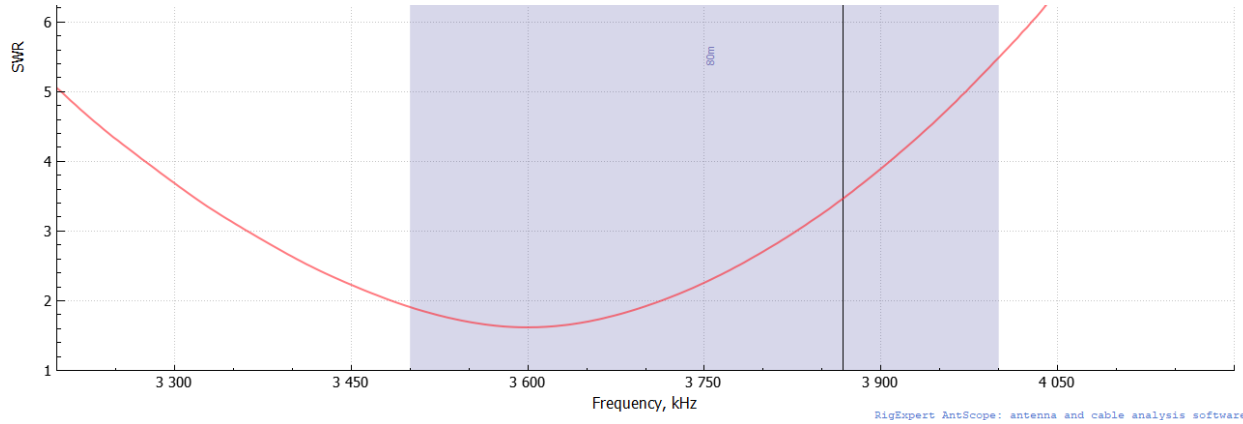


Figure 14. 80 Meter Inverted Lazy "L" SWR Graph.

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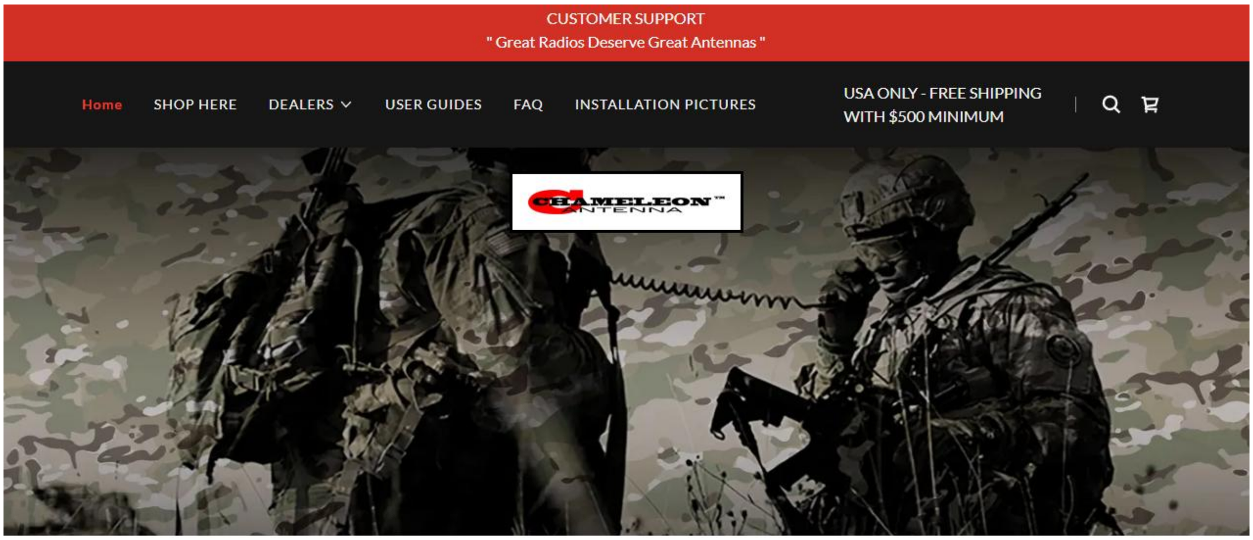

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