

INSTALLATION INSTRUCTIONS:

CLAMP-150[®] “Clamp to Anything” Portable Antenna Mount

These instructions describe how to install the CLAMP-150[®] (“CLAMP”) portable "clamp-to-anything" antenna mount for mobile and portable HF/V/UHF/SHF antennas, for fixed-base, temporary/QRP or EMCOM purposes. Now available are new bases for Buddipole[™] antennas and WiFi/SHF panel type antennas. Also described is the installation of various options for the CLAMP.

It can be clamped to almost any horizontal, vertical or slanted surface, from 0.5 to 9 inches thick, *without drilling, guy wires or a tripod*. It can support one or two (with optional AMB-ARM-2 bracket) mobile antennas: essentially any VHF or UHF, and HF up to medium sized screwdriver or motorized antennas. The CLAMP can be used temporarily or left on permanently. No other clamping type mount does what the CLAMP can do! It includes two grounding points for a simple wire ground counterpoise that the user can install.

The CLAMP can now be purchased without any base or can be ordered with any of our seven (7) interchangeable antenna bases: two 3/8x24 stud bases, NMO, NMO with groundplane, SO239 (PL259), “VersaBase” for Buddipole[™] antennas and “WiFi Kit” for panel type SHF/WiFi antennas. The latter two bases also have detailed instructions available on our [DOWNLOADS](#) page. The bases have an SO239 connector on the bottom for plugging in the coax, except the VersaBase, WiFi Kit and Ant.Mtg Kit.

Options are also available for the CLAMP: second antenna bracket (AMB-Arm2), ground counterpoise “ring” brackets (AMB-Gnd-1, AMB-Gnd-8) and SHUNT100 HF load inductor.

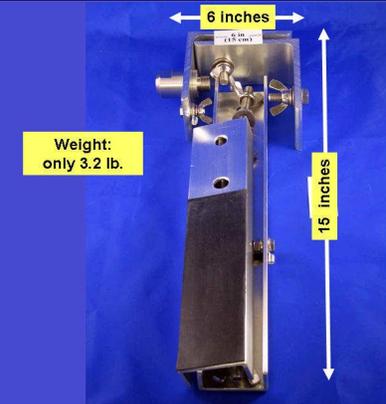
Illustrated photos of the CLAMP and options are shown below. You can also view the most recent version of these instructions with color photos on our [DOWNLOADS](#) page, click on “Manuals”.

CURRENT VERSION UPDATE: These revised instructions provide additional information about the CLAMP as well as information on our **BRAND NEW** “VersaBase”, “WiFi Kit” and “AntMtgKit (3/8x24 bolt, 1-3/4” long, with insulating wafers and washers)”. We now color code the clamping screws on the CLAMP. The version date is shown by the date code at the bottom of each page.

Specifications

- Materials of construction: 6061 & 6063 aluminum with 18-8 stainless steel hardware. The clamping and structural hardware is very strong (3/8”) and the ground points are 1/4”. The thickness of the “L” brackets is 1/4”.
- Gripping surface: both clamping halves have a weather and UV resistant EDPM rubber layer, which provides good grip and helps to protect the mounting surface. It also insulates the CLAMP from metal surfaces, but a side ground point allows you to ground the CLAMP to metal surfaces if so desired.

CLAMP-150[®] Introduction	 REP Design LLC	1-(860) 426-1894 N7EMW@cox.net www.repDesign.us
	<p style="text-align: center;">Introducing the NEW CLAMP-150[®] Portable Antenna Mount</p> <p style="text-align: center;">“1 min. Clamping to Anything” vertical / horizontal / slanted 1/2 to 9 inches thick</p> <p style="text-align: center;">Mount 1 or 2 Mobile Antennas full size VHF-UHF small / medium HF screwdriver 3/8x24, NMO or SO239</p> <p style="text-align: center;">No Tripod Needed EMCOMM / travel / QRP deed restricted neighborhoods</p> <p style="text-align: center;">Small & Light Weight 6 x 15 inches / 3.2 pounds</p>	

CLAMP-150[®] Small & Light	 REP Design LLC	1-(860) 426-1894 N7EMW@cox.net www.repDesign.us
	<p style="text-align: center;">Weight: only 3.2 lb.</p> <div style="border: 1px solid red; padding: 5px; text-align: center; color: red; font-weight: bold;"> THE SOLUTION FOR Portable Antennas EMCOMM Deed Restricted Neighborhoods </div> <ul style="list-style-type: none"> • Installs in seconds • Portable / QRP • Leave up year round or temporary use • No tripod or mast needed – clamp to whatever surface you have 	

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Safety First!

*Use caution if you are installing your antenna on a balcony or location where the antenna could fall on someone or cause damage if it were to fall, and if so, you might want to consider attaching an insulated "safety line" from your antenna/mount to the mounting surface in the event that it was to come loose. As with any antenna installation, be careful around thunderstorms and lightening, and you may want to remove your antenna or disconnect the coax BEFORE a storm appears - remember that if you can hear thunder you can be struck by lightning! Do not install any antenna near power wires or where it could fall on power wires! It is up to the user to ensure that everything is installed securely and safely. These instructions are meant to provide general guidelines but cannot provide all of the details on how to safely install your mount and antenna, as each installation is unique. If you feel that you cannot safely install your antenna on the CLAMP, or it does not meet your needs, you may return it for a refund within two weeks (see Warranty for details). **SAFETY FIRST!***

Tools Needed

No special tools are required. For smaller antennas the 3/8" wing nuts can be tightened by hand. You can use pliers to further tighten the wing nuts; this is recommended for larger antennas. Just be careful *not to damage the threads* on the screws when using pliers on the wing nuts.

What You Need In Addition to the CLAMP

In addition to the CLAMP, you will need the following items to complete your antenna installation.

1. Mounting surface for the CLAMP: railing, fence, table, chair, bench, ladder, highway guard rail, support post, vehicle door (if left open and care is used) and many other surfaces. It just needs to be sturdy enough to support your antenna. NO GUY WIRES or TRIPOD are needed. See photos at the end of these instructions for examples.
2. Antenna base(s) for the CLAMP – you can use our optional six interchangeable bases or any base that will mount into a 3/4 inch diameter hole with a panel thickness of 1/4 inch.
3. Your antenna – example list of mobile type antennas that can be used with the CLAMP:
 - Small to largest V/UHF mobile antenna
 - HF "ham stick" type antennas
 - HF single band "loading coil" antennas, such as "Hustler" brand
 - Outbacker "clip-lead" type HF antennas
 - Manually tunable HF antennas such as:
 - Buddipole™ and Buddistick™ antennas, with even the long radials
 - Super Antennas MP-1
 - MFJ-1624 HF mini-Bug Catcher Mobile Antenna
 - MFJ's various models of 6 Thru 40 Meter Portable Screwdriver Antennas
 - and others
 - Small to medium HF motorized / screwdriver antennas such as:
 - smaller (up to 3 and 4 series) Hi Q Antennas motorized HF antennas - *I even tested it with my LARGE Hi Q Antennas RT-5/160 with a 10 ft. whip and four 10-12 ft. telescoping whips as the ground counterpoise* - fully supported the antenna!
 - High Sierra "Sidekick" or larger HS-1800 type
 - Tarheel "Little Tarheel"; one customer is using his Tarheel Model 100 on his deck with the CLAMP150!
 - Super Antennas MP-2
 - and others
 - WiFi and other SHF panel type antennas that can mount to a 1-1/16" diameter (OD) mast.
4. Coax – use RG58 or similar for most installations, depending on length and frequency; PL259 connector plugs directly into the SO239 receptacle on our antenna bases (except VersaBase, WiFi Kit & AntMtg Kit).
5. For HF screwdriver / motorized antennas, a cable connecting the antenna motor to your up/down switch or automatic tuner.
6. Ground counterpoise / groundplane: see **Section (8)**.
7. Ferrite bead filters: install on the outside of your coax near the antenna and, for motorized/screwdriver antennas, on the motor wires. See **Section (9)**.

CLAMP Parts List

The photo below shows all of the components that come with the CLAMP. Please note that the CLAMP can now be ordered *without any base* or with *any or all of our seven (7) interchangeable bases (Section (5))*. The parts consist of:

- Two (2) aluminum channels (“clamping halves”) that clamp around the mounting surface – longer one mounts to the antenna “L” brackets. Both clamping halves have a weather-proof rubber surface for gripping and protecting the mounting surface.
- Two (2), 10 inch long x 3/8 inch screws that fasten the two clamping halves together:
 - **Screw “B” - nearest the antenna:** two wing nuts, one standard nut, three flat washers and one lock washer. *Two BLUE markings* show where to install this screw: (1) screw end that sticks out of the SHORT half and (2) its hole in the SHORT half. This helps locate the proper position of the *two mounting screws that MUST be installed in the correct holes for the CLAMP to work.*
 - **Screw “A”:** two wing nuts, two flat washers and one lock washer. This is installed in the other holes.
 - **NOTE: Section (2) on the next page shows screws “A” and “B”.**
- Two (2) “L” brackets with mounting hardware – allow rotating the antenna in two dimensions:
 - **“L” for mounting antenna base:** has a 3/4 inch hole (panel thickness 1/4 inch), 1/4 inch ground bolt with wing nut, and 3/8 inch mounting bolt with two flat washers, one lock washer and one wing nut.
 - **Second “L”:** bolts between the antenna base “L” bracket and the longer CLAMP aluminum channel: has a 3/8 inch mounting bolt with two flat washers, one lock washer and one wing nut.



- Options – details in **Section (6)**

CLAMP Installation and Setup

(1) Considerations for Mounting the CLAMP.

The CLAMP can be mounted to essentially any vertical, horizontal or slanted surface that is 0.5 to 9 inches thick, and sturdy enough to hold your antenna without breaking or tipping over. It can mount to flat or curved surface, such as a curved top railing (**photos at back of these instructions**). For curved surfaces, the clamping “halves” can be tilted closer together at the ends farthest from the antenna to grip and fasten around curved surfaces. If your mounting structure has round tubes or pipes, you need at least two of these to hold the clamp.

The CLAMP has been tested on a wide variety of surfaces, including: railings, fences, tables, ladders, highway guard rails, vertical support posts, vehicle doors (if left open and care is used), chairs, canoes, and other surfaces. You may be surprised how many surfaces there are to mount it to! Examples are shown in the **photos at the end of these instructions**, and on our web site and Photo Gallery have even more photos from our testing and from our customers.

Be sure to read the “**Safety**” section on page 2 for additional considerations.

(2) Assembly of the CLAMP Before Mounting to a Surface

QUICK ASSEMBLY GUIDE

The **left photo** illustrates how to assemble the CLAMP with “Quick Assembly” instructions. The **right photo** shows the CLAMP mounted vertically and horizontally; it can also be mounted to a slope surface.

CLAMP-150[®] Quick Assembly Guide	 REP Design LLC	1-(866) 426-1894 N7EMW@cox.net www.repDesign.us	CLAMP-150[®] Main Features	 REP Design LLC	1-(866) 426-1894 N7EMW@cox.net www.repDesign.us			
<p style="background-color: yellow; text-align: center; font-size: small;">Shown in "horizontal" configuration (same assembly applies to "vertical" configuration)</p>			<p style="background-color: yellow; text-align: center; font-weight: bold;">Mount Your Antenna to Almost ANY SURFACE!!</p> <ul style="list-style-type: none"> • Ant. Bases: 3/8x24 stud / SO239 / NMO / Buddipole™ / WiFi • Full size VHF/UHF mobile antennas • Small HF "ham stick" to medium screw driver antennas • Optional 2nd antenna bracket with groundplane! 			<p>THE SOLUTION FOR Portable Antennas EMCOMM Deed Restricted Neighborhoods!</p>		
<ol style="list-style-type: none"> 1. Remove hardware on Screws A & B on SHORT clamping half ends. 2. Insert both screws from the RUBBER side into the SHORT half, sticking out approx. 1 inch. 3. On EACH screw, on INSIDE of SHORT half, install flat washer, lock washer and wing nut - screw on approx. 1/2" (quick disassembly). 4. On Screw B, on RUBBER side of SHORT half, install flat washer & Nut B, tighten against SHORT half. 5. Place Wing Nut B with FLAT side facing LONG half, and a flat washer that rests on LONG half. 6. Insert both screws into LONG half. 7. On Screw A, on the "inside" of the LONG half, place a flat washer and wing nut & tighten Wing Nut A until both halves against surface. 8. LAST, tighten Wing Nut B towards LONG half until clamping halves are firmly against the clamping surface. 9. Adjust Wing Nuts A/B for best grip. 10. Install both "L" brackets as shown with two 3/8" bolts/wing nuts/lock washers & four flat washers – for antenna pointing up or tilted. 			<p style="background-color: yellow; text-align: center; font-size: small;">VERTICAL Mounting Surface</p> <p style="background-color: yellow; text-align: center; font-size: small;">HORIZONTAL Mounting Surface</p>			<p>What You Get</p> <ul style="list-style-type: none"> • All parts you see here – stainless steel & aluminum • Two ground / counterpoise points • Optional - six (6) interchangeable antenna bases • Bases fit into 3/4" hole with 1/4" panel thickness 		

DETAILED ASSEMBLY STEPS

Refer to the above two photos. Before mounting either of the “L” brackets to the CLAMP, it is generally easier to first mount the CLAMP to your surface with the two 10 inch screws and the two clamping halves. Be sure to place flat washers against the aluminum surfaces, on all screws.

The following steps describe how to fasten the two clamping halves together using the two long screws.

- **Screw "B"** (the one WITH the single standard nut and the end sticking out of the short clamping half is marked **BLUE**):
 - Remove the wing nut, lock washer and flat washer on the end marked **BLUE**.
 - Insert the **BLUE END of Screw B** into the OUTER HOLE (hole nearest antenna) in the SHORTER aluminum channel ("clamping half"), *from the side with the rubber layer*, and on the other side of the clamping half place, in this order, ONE flat washer, lock washer and wing nut. The standard nut should be adjusted so the blue end of the screw sticks out approximately 1 inch on the LABEL SIDE of the SHORT channel. Tighten the wing nut so it and the standard nut are tightly fastened to the short channel.
 - Place a flat washer on the other end of Screw B, against the "backwards mounted" wing nut (the *flat side of this wing nut rests against the rubber side of the LONG half*). Insert this screw into the MIDDLE HOLE in the LONGER CHANNEL, *from the rubber side*. NO other wing nut or hardware is used on this end of the screw.
- **Screw "A"** (the one WITHOUT the single nut and NOT marked blue): from the end that goes into the short clamping half remove the wing nut, lock washer and one flat washer.
 - Place Screw A through the hole near the CENTER of the LONGER CHANNEL (hole farthest from the antenna), on the side OPPOSITE the rubber layer, and then into the second hole on the *rubber side* in the SHORTER HALF.
 - On the end sticking out of the SHORT HALF, place a flat washer, lock washer and wing nut. Screw in the wing nut approximately 1 inch from the end. Do NOT yet adjust or tighten the wing nuts that are against the LONG CLAMPING HALF.

(3) Attaching Main “Clamping Halves” (Main Body) to Your Mounting Surface

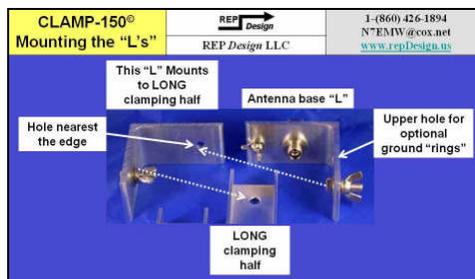
Once the two halves are bolted together loosely, follow these steps to attach the CLAMP to your surface. It is generally easier to do this before installing the two "L" brackets and your antenna. As you try out the CLAMP you will determine what works best for you. The CLAMP can be installed temporarily or permanently (e.g. fixed base antennas in antenna restricted neighborhoods).

- Decide whether to mount the CLAMP vertically or horizontally to your mounting surface:
 - It is slightly better to mount it vertically (but not necessary) as this distributes the weight from the antenna and counterpoise more evenly. This is more important with larger antennas.
 - Typically mount the clamp half with the label (SHORTER half) facing up for horizontally mounted CLAMPs and facing you for vertically mounted CLAMPs. This way the longer ends of the screws are less likely to be in the way. However it really does not matter if you mount the CLAMP the other way. Once you play around a bit you will determine the best mounting configuration for your setup.
- **OPTIONAL - IF THE MOUNTING SURFACE IS METAL:** You may be able to use the metal mounting surface (metal railing, guard rail, fence, table, etc.) as your ground counterpoise. If so, run a short, thin, wire braid from the side 1/4 inch ground point (using provided heavy duty solder lug) on the longer clamp half and extend this over the rubber coating on the longer clamp half, so that the braid touches the metal surface by being clamped between the rubber and the surface. You may need to buff the metal surface to remove paint and ensure a good "DC" ground (e.g. 0.1 ohms or less) from the CLAMP to the metal surface. See **Section (8)** below.
- Tighten the wing nuts:
 - **FIRST**, tighten the **wing nut "A"** (the one farthest from the antenna), until the two clamping halves are slightly tight (near this screw) against your mounting surface.
 - **THEN** tighten **wing nut "B"** - this forces the opposite ends of the clamping halves towards each other to provide a tight grip to your mounting surface.
 - Readjust both of these wing nuts for the maximum clamping pressure. If your mounting surface is curved you can tighten wing nut "B" so the opposite ends of the clamping halves are closer together, as illustrated in the **Group 2 photos** at the end of these instructions. This helps the CLAMP to grip around the curved surface so it cannot slide off.
 - By keeping the wing nuts near the blue end approximately one inch from this end, the CLAMP can be quickly removed for storage or travel.
- Once the CLAMP is securely fastened to your surface, mount the "L" brackets according to **Step (4)** below.

(4) Attaching The Two “L” brackets

Once the CLAMP halves are securely "clamped" to your surface, attach the two "L" brackets.

- **READ THIS BEFORE YOU BOLT THE TWO “L’s”:** Generally it is best to "balance" the "L" brackets so they are as much as possible over the end of the CLAMP, mounted vertically or horizontally. This allows for the best distribution of weight from the antenna to the CLAMP. The diagram below shows which holes in the two “L’s” are used to bolt them together. You can place either side together – visualize before you bolt!



- Attach the first "L" bracket (the one *WITHOUT the antenna base*) to the end hole in the LONGER clamping half. Use one 3/8 inch hex bolt to fasten this bracket - place flat washers on both sides of the clamp body and one lock washer under the wing nut. **USE THE HOLE IN THE "L" BRACKET THAT IS FARTHEST FROM THE END** of the bracket – the holes were drilled so that an optional counterpoise “ring” mounted to the antenna “L” bracket will not hit the first “L” bracket (you can use either hole if you do NOT use the counterpoise “ring”).
- Attach the second "L" bracket (one *WITH the antenna base*) to the first "L" bracket – it can be installed pointing in either direction relative to the first L bracket – use the direction that best meets your needs or locates the antenna nearer the two clamping halves for weight distribution purposes. Use the last 3/8 inch bolt to fasten the two "L" brackets together - place a flat washer on both sides of the bracket and a lock washer under the wing nut.
- Rotate the "L" brackets so your antenna will be vertical - or slanted if you need to clear an overhanging roof, etc.
- Securely tighten both wing nuts on the two "L" brackets. Use pliers if needed, especially for larger antennas, but be careful not to damage the bolt threads.

(5) Installing Antenna Bases

The CLAMP now can be ordered *without any base* or with *any or all of our antenna bases*. Our bases are all heavy-duty and high quality, and come with stainless steel hardware (if necessary) so all can be mounted in the 3/4 inch (19 mm) hole.

To install any of the bases, simply mount them into the 3/4” hole with the provided hardware, such as the large stainless steel washers and heavy-duty, rust proof, nicely machined, nuts for the SO239 and NMO bases. Be sure the base is tightened securely. The **VersaBase** and **WiFi Kit** come with additional instructions; the WiFi Kit also requires attaching a third “L” bracket which allows for “3D” aiming of SHF / WiFi panel type antennas. If you are using the CLAMP-150 during wet weather you should weatherproof the coax connections - the CLAMP-150 is designed to be used in any type of weather.

The following is a list of our bases that fit the CLAMP (bases with asterisk (*) have a SO239 connector on the bottom):



1. **3/8x24 stud*** - used for many HF “hamstick” and “wonder lead” type antennas, “CB” whips and telescoping whips. It is also used with Buddistick™ vertical antennas. It has a 3/8x24 female receptacle for antennas that have the threaded stud at the bottom. Requires ground counterpoise (see instructions below).
2. **3/8x24 antenna mounting kit, 1-3/4” long bolt** – for screwdriver and motorized antennas that are mounted with a bolt. Includes two insulating washers and stainless steel hardware. Requires ground counterpoise (see instructions below).
3. **NMO*** - used for most V/UHF antennas. Requires ground counterpoise (see instructions below).
4. **NMO* with groundplane radials** – used for most V/UHF antennas (135-512 MHz) where a groundplane is needed, such as for fixed base operation. The radials can easily be removed with the included Allen wrench. This is the same base that comes with the "AMB-Arm2" second antenna bracket, for using two antennas on one CLAMP150 and two or three antennas on some of our other mounts!
5. **SO239*** - used for some HF and VHF antennas. This is a 2 inch barrel connector with stainless steel flat washers and nicely machined, rust proof, heavy-duty nuts. Requires ground counterpoise (see instructions below).
6. **“WiFi Kit”** - for mounting WiFi/SHF panel antennas that can mount to a 1-1/16” diameter mast. This kit includes a 6 inch mast and additional “L” bracket for “3D” aiming of panel type antennas.
7. **“VersaBase”** – used for Buddipole™ dipole antennas that are mounted to their Versatee, which quickly screws onto our VersaBase and allows for horizontal, sloped or vertical “L” configurations. Please note the Versatee is NOT included as this is purchased from Buddipole (www.buddipole.com). For Buddipole users, there is a great

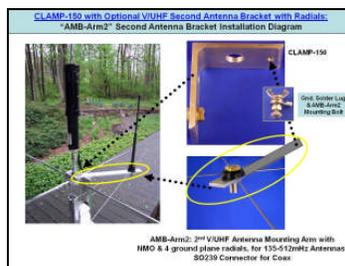
book with practical installation information about Buddipole antennas that can be purchased at www.buddipole.com. Also check out the author's, B. Scott Andersen (NE1RD), web site: http://homepage.mac.com/bsandersen/ars_ne1rd/index.html

(6) Installing Options [Go To Step (7) if you do not have any options]

In addition to our antenna bases, we offer several options that will work with ANY CLAMP-150: a second V/UHF antenna bracket with NMO base and groundplane radials (**AMB_Arm2**), two counterpoise rings (**AMB-Gnd-1**, **AMB-Gnd-8**) and an adjustable, weatherproof, HF shunt load inductor (**SHUNT-100**) if you need to lower the SWR on the low bands for antennas that are mounted close to the ground (does *not* have to be readjusted for each band). Photos are included at the end of these instructions.

Installation steps are summarized below and more detailed instructions come with these options.

AMB-Arm2 ("ARM"): Second antenna bracket with NMO base and four ground radials for 135-512 MHz. Simply bolts to the CLAMP's 1/4 inch ground bolt near the antenna base with the hardware on the CLAMP-150. You can use essentially any size of VHF/UHF mobile whip antenna. The ARM is made of 6061 aluminum.



- On the CLAMP, remove the wing nut, lock washer and one (1) flat washer from the 1/4 inch bolt near the antenna base (leave the other flat washer on the bolt, as this fits under the ARM).
- Place the ARM on the CLAMP bolt, install the flat washer, lock washer and wing nut that were removed. Tighten the wing nut securely. You can use pliers if needed but be careful not to damage the threads.
- The arm can be rotated in any direction, relative to the main CLAMP antenna base.
- Install the four radials: The 5/8 inch hole for the NMO base/SO239 connector with the radial attachments base is *drilled offset slightly* so the Allen wrench can be inserted into each of the set screws *without having to remove the entire base*. Slightly loosen the heavy-duty nut that supports the SO239 bottom connector so the black radial base can be rotated until the Allen wrench can be inserted into the set screw. Insert each radial and tighten the set screw, rotate the black base for the next radial, etc. Once all four radials are attached, rotate the radial base/NMO base with the four radials anyway you want and tighten the SO239 nut.
- Periodically check the wing nut to be sure that the ARM does not come loose from the CLAMP, and check the NMO/SO239 nut to be sure the antenna cannot come loose.

AMB-Gnd-1 (1-4 whips); AMB-Gnd-8 (1-8 whips): Ground counterpoise "ring" brackets ("GNDs") for using your telescoping whip or CB whip antennas that have the standard 3/8x24 thread. You can also use "ham stick", "wonder lead" and Buddipole™ antennas as a tuned counterpoise. These "rings" can be used in place of a simple wire ground counterpoise. Components are made of aluminum with stainless steel hardware. See **Section 8** on counterpoise ideas.



- Either of the “GND’s” bolt into the unused 3/8 inch hole on the "L" bracket BELOW the antenna base (e.g. the hole that is not used to bolt the two "L" brackets together).
- Attach the GND to the "L" bracket using the LONGEST 3/8x24 bolt (one is slightly longer than the others – this bolt may be loosely installed when shipped). Place a lock washer under the longest bolt head, insert the bolt into the GND from the INSIDE of the ring, and insert the bolt and GND into the hole in the "L" bracket. On the outside of the “L” bracket, screw on one of the provided couplers (all couplers are the same). Tighten securely.
- Using the other SHORTER bolts, place a lock washer under each and insert the bolt/lock washer FROM THE INSIDE of the ring. On the OUTSIDE of the GND "ring", screw on and securely tighten the remaining couplers. These may already be installed on the GND when shipped – check to be sure are tight.

SHUNT-100: Adjustable weather resistant shunt load inductor for those installations that have a low impedance on the low bands (160-40m) resulting in a high SWR, especially antennas mounted near the ground. Includes a silver plated coil clip with tightening screw and tin plated solid copper coil. Simply bolts to the CLAMP with provided hardware. See **Section 7**.



- The SHUNT mounts to the ¼ inch ground bolt near the antenna base, or you can use the ¼ inch ground bolt on the side of the CLAMP.
- Connect a short single conductor wire (14 gauge works fine) from the wing nut on the SHUNT to the same point that your coax center conductor connects to – you may want to use a PL259 TEE connector on the bottom of the antenna base. With a TEE, one end goes to your SHUNT cable and the other end goes to your radio coax. We also sell a high quality TEE made by Amphenol and custom made jumper cables for this purpose.

(7) Installing Antenna and Coax

Your antenna screws onto the base mounted into the 3/4 inch (19mm) hole in the CLAMP’s outer “L” bracket.

Most antennas will need some type of ground counterpoise or groundplane – the **Section 8** below for suggestions. You may also need to install ferrite bead filters on the coax, etc. – see **Section 9** below.

Your coax connects to the SO239 connector on the bottom of some antenna bases. This does not apply if you are using our VersaBase (your coax connects to the Buddipole™ Versatee) or WiFi kit (your coax connects to the connector on the panel antenna). If you are using our “AntMtg Kit” with 3/8x24 antenna bolt (1-3/4” long bolt kit) and two insulating wafers with hardware, the coax center conductor connects to a solder lug (sold separately) that goes under the antenna bolt, and the coax shield is connected to either of the two ¼ inch ground bolts by a solder lug (sold separately).

You should apply some type of sealer (coax putty, black electrical tape, self fusing tape, “plastic dip” paint, non corrosive RTV sealer – the type without the vinegar odor, etc.) around the antenna base and around all coax connections to avoid moisture entering the coax and connectors, especially if you leave the CLAMP installed for a long period. It can be left installed as long as you need, even in rain, snow and desert sun.

Here are some other suggestions.

- Coax connection. Generally, RG-58 size coax works fine for portable or fixed-base installations where the length of the coax is typically less than 25 feet, especially if you run 100 watts or less. You should use coax with a 97-100% shield.
- SWR adjusting device (if needed) for HF low bands especially those mounted near the ground, to reduce the SWR to an acceptable level at the antenna resonance point on 160m and 80m, and maybe also on 40m. You may need a shunt load inductor, such as a SHUNT-100, UNUN, or additional capacitance to reduce the SWR. Some of these devices need to be installed at the antenna. Not all applications will need a SWR adjusting device.

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- Tuning an HF screwdriver / motorized antenna. You can tune your antenna using a DPDT, center off, manual switch or one of the automatic tuning devices. Do not confuse these with "antenna tuners", which add capacitance / inductance to match the antenna to the radio - generally speaking these should NOT be used with "resonant" antennas except to fine tune an SWR that is slightly too high and cannot be reduced by improved grounding or using a load inductor. Screwdriver / motorized antenna auto tuning devices run the antenna motor and stop at the point of resonance. There are several available and users report good and bad results. It is best to do your research when deciding on which device (manual or automatic) is best for your setup.
 - Using untuned "whip" antennas. You can use a "CB" whip or telescoping whip (available up to 12 ft. long) which would only be resonant on one frequency. To operate other bands you will need some type of antenna tuner, which selects inductance/capacitance. Such tuners must be mounted directly at the antenna, and not connected by coax to avoid serious losses.

(8) Suggestions for Ground Counterpoise / Groundplane

You need to provide some type of ground counterpoise unless your antenna does not need a counterpoise (e.g. ½ wave antennas, panel type antennas, etc.). Our "NMO radial base" with comes with a groundplane for 135-512 MHz. If you mount the CLAMP to a metal surface you may be able to use it as the ground counterpoise if it has enough surface area and horizontal length – think mobile antenna mounted to a vehicle's roof! If the metal surface sticks into the ground it may not work as effectively as if insulated from the ground.

The counterpoise, whichever you use, will work best if elevated ABOVE GROUND and not laid on the ground unless you install MANY radials (20-30) on the ground. A counterpoise even 5 or more feet above the ground works fine on the upper HF bands. The counterpoise should be somewhat horizontal and can slope away from the antenna. If elevated above ground, it is suggested that you use at least 4 counterpoise radials. However, you can use one elevated tuned counterpoise element with good results but this will be somewhat directional. Additional suggestions are below.

For non-metal mounting surfaces you have a few counterpoise options.

- Wire counterpoise - fasten wires to the 1/4 bolt/wing nut located near the antenna base. A wire counterpoise can be made of single conductor insulated wire, or even multi conductor flat cable using one flat cable for each counterpoise, with all conductors attached together at the antenna. The counterpoise can be "tuned" for a specific band but this is not required - think of an HF antenna mounted to a vehicle which is not a "tuned" counterpoise. At a minimum, install four radials that are at least 10 feet long for the higher HF bands (20m and above), and longer wires for the lower bands.
- Optional counterpoise "rings" (AMB-Gnd-1 or 8) – fasten one or more (minimum of four recommended) horizontal whips to the 3/8x24 couplers on the "ring". You can use telescoping whips (available up to 12 ft. long), "ham stick" or "wonder lead" type antennas, or Buddipole™ antennas as part of a tuned counterpoise.
- Optional NMO-radial base - has radials for 135-512 MHz, which can be cut if so desired for a specific band or left as-is for multi band antennas.

For metal mounting surfaces, such as fences, railings and guard rails, you can possibly use them as your counterpoise, if they are electrically connected between sections. You can check this out with a digital resistance meter or VOM. Solder a short thin wire braid to the provided solder lug on the side ground point bolt, and when mounting the CLAMP place this braid between the rubber surface and the metal surface. You may need to remove paint on the surface to provide a good DC ground. This may not work in all situations, but in others may work effectively.

(9) Suggestions for Ferrite Bead Filters

Ferrite bead filters are used to reduce HF antenna tuning problems and help prevent RFI in devices connected to your radio and antenna. For the HF bands, use Mix 31 or other types that are designed to filter the entire HF band. Do NOT use unknown ferrites as they may not filter HF frequencies! You may want to install at least 3-10 ferrites, closely spaced, over your coax / antenna motor cable as close to your antenna as possible. One or more of these should have the coax wound 2-3 times around one of the ferrites (improves filtering at the lower frequencies). Also install ferrites in a similar fashion on your motor/turns counter cable (screwdriver/motorized antennas only), and install one ferrite on the coax near your transceiver. Some installations may require 10 or more ferrites on EACH cable, at the antenna end of the cables. Our DOWNLOADS web page has a ferrite bead white paper that you can view.

(10) Disassembly of the CLAMP

The quickest way to disassemble the CLAMP is as follows.

- First remove your counterpoise, antenna and, if purchased, the AMB-Arm2 (second antenna bracket) and any counterpoise whips attached to the "ground ring". The "ring" can be left installed on the "L" bracket.
- Remove both "L" brackets if needed to place it in your "go bag" (or can be left installed).
- Loosen **wing nut "B"** (see diagram in **Section (2)**) between the clamping halves, and THEN loosen **wing nut "A"** until you can slide the CLAMP from the mounting surface.
- If you need to further disassemble your CLAMP to fit in your "go bag", or to store it, unscrew the two wing nuts NEAREST the ends of the long screws sticking out of the shorter clamping half on the label side, and remove the screws and hardware.
- Place any loose hardware back on the screws they came from.

Maintenance

The CLAMP requires little maintenance. If used near salt water be sure to wash it with soap and water as soon as practical after exposure, as you would your own vehicle. You can "polish" the bare aluminum with #0000 (very fine) steel wool - be sure to completely remove any steel wool debris so it does not short out your antenna - this can be done by vacuuming or wiping with a damp rag. Periodically check the mounting hardware, counterpoise and antenna/base to be sure they are tight.

Spare parts, accessories, downloads and related products.

Let us know if you need spare parts or are looking for something that we do not yet provide – your idea could become a new product! As a specialty company, we are looking for unique ideas to serve the amateur and two-way radio community.

You can find the current versions of product instruction manuals (with COLOR PHOTOS) on our "Downloads" page:
<http://www.repdesign.us/Download.html>

Warranty Summary

All products include a two (2) week "return for any reason" and six (6) month manufacturing defects limited warranty. If you should need to return your product please contact us **IN ADVANCE to obtain a return authorization number. Please refer to the complete warranty that is enclosed with your order and on our web site.**

CLAMP-150 Photos & Installation Examples

Provided below are examples of the CLAMP-150 installed vertically and horizontally on a wide range of surfaces and with our various antenna bases, to help you see how versatile it is and that it can clamp to just about any surface from 0.5 to 9 inches thick. Nothing else works like the CLAMP! The illustrations below are grouped by type of antenna.

GROUP 1: Buddipole™ antennas with our "VersaBase". Shown is a CLAMP-150 with a Buddipole Versatee mounted on our "VersaBase", in "L" and horizontal dipole configurations. The second photo shows how a COMPLETE ANTENNA, Mini Buddipole & CLAMP-150, fits into a standard Mini Buddipole bag – N7EMW's newest "go bag"! The fourth photo (next page) shows our second antenna bracket (AMB-Arm2) – can be use with horizontal or L configurations.





GROUP 2: Small to medium screwdriver/motorized antennas with our 3/8x24 stud base (same setup also used for "ham stick", "wonder lead" and Buddistick™ antennas). These photos show a High Sierra "Sidekick" with extended 12 ft. telescoping whip, mounted to a variety of surfaces. Pretty much any small to medium screwdriver or motorized or other HF antenna can be used! With one of our NMO or SO239 bases, you can mount even the largest V/UHF mobile antenna! The first two photos show N7EMW's "screwdriver antenna" go bag, using a standard sized Buddipole™ antenna bag. This system has been used to work DX with only 5 watts with a Yaesu FT-871 (second photo), modified with an internal DSP and Heil dual microphone elements with audio compressor. Some photos show our counterpoise "ring" brackets and AMB-Arm2 second antenna bracket.



CLAMP-150® Test Setup		1-(860) 426-1894 N7EMW@cox.net www.repDesign.us
	REP Design LLC	

Modified Yaesu FT-817

- DSP custom installed by N7EMW
- Heil dual element mic. + compressor
- Worked DX from Cape Cod April '09
- 5 watts with "tilted" High Sierra Sidekick on CLAMP-150
- -4- telescoping whip gnd. counterpoise radials
- 2nd antenna bkt. with tri-band VHF/UHF (prototype)

Worked DX From Cape Cod, MA April '09

CLAMP-150® Thick Railing Ex.		1-(860) 426-1894 N7EMW@cox.net www.repDesign.us
	REP Design LLC	

The CLAMP-150 really mounts to just about anything

Even T.H.I.C.K Railings

Vertical mounting shown

Also can mount HORIZONTALLY on same railing!

CLAMP-150

- "Gnd. Radial Kit" (gnd. radials not shown)
- High Sierra "Sidekick" HF Screwdriver

CLAMP-150® Bench Examples		1-(860) 426-1894 N7EMW@cox.net www.repDesign.us
	REP Design LLC	

The CLAMP-150 really mounts to just about anything

What a QRP DX location!!

CLAMP-150

- "Gnd. Radial Kit" (gnd. radials not shown)
- High Sierra "Sidekick" HF Screwdriver

[More photos on next page]

CLAMP-150[®] Canoe Examples	REP Design REP Design LLC	1-(860) 426-1894 N7EMW@cox.net www.repDesign.us
<p><i>The CLAMP-150 really mounts to just about anything</i></p> <p>What a QRP setup!</p> <p>You've got your ground plane! (on water even better)</p>		
<p>CLAMP-150 • High Sierra "Sidekick" HF Screwdriver</p>		

CLAMP-150[®] Guard Rail Ex.	REP Design REP Design LLC	1-(860) 426-1894 N7EMW@cox.net www.repDesign.us
<p><i>The CLAMP-150 really mounts to just about anything</i></p> <p>Metal guard rail – there's your ground counterpoise!</p> <p>CLAMP-150 has gnd. point bolt for metal surfaces great ground!</p>		
<p>CLAMP-150 • "Gnd. Radial Kit" – not needed here but shown anyway! • High Sierra "Sidekick" HF Screwdriver, 10 ft. whip</p>		

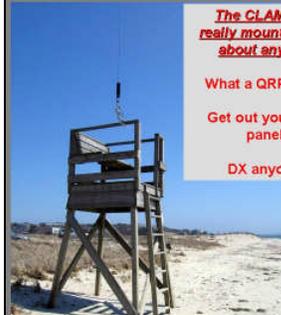
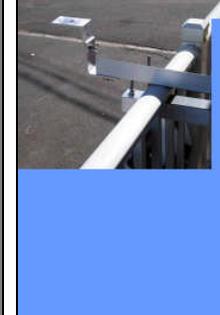
CLAMP-150[®] Railing Examples	REP Design REP Design LLC	1-(860) 426-1894 N7EMW@cox.net www.repDesign.us
<ul style="list-style-type: none"> • LEFT photo: CLAMP mounted vertically, no counterpoise on metal railing with High Sierra "Sidekick". Metal railing can act as the counterpoise. • RIGHT photo: CLAMP mounted horizontally with optional "AMB-Gnd-1" with four 10-12 ft. telescoping whips (counterpoise), on wooden curved railing. Note how the tightening screws are adjusted to tilt the far ends of the clamping surfaces closer together, to help prevent the CLAMP from slipping off of the curved top railing. 		

CLAMP-150[®] Options Examples	REP Design REP Design LLC	1-(860) 426-1894 N7EMW@cox.net www.repDesign.us
<ul style="list-style-type: none"> • BOTH photos: CLAMP150 with optional "AMB-Gnd-1" counterpoise ring adapter, with four 10-12 ft. telescoping whips as the counterpoise. All mounted horizontally on curved wooden railing. Great for antenna restricted neighborhoods! 		

CLAMP-150[®] Glass Table Ex.	REP Design REP Design LLC	1-(860) 426-1894 N7EMW@cox.net www.repDesign.us
<p><i>Don't try this with other mounts!</i></p> <p>Yes, that is a real GLASS table!</p>		
<p>CLAMP-150 • "Gnd. Radial Kit" (gnd. radials not shown) • High Sierra "Sidekick" HF Screwdriver</p>		

CLAMP-150[®] Table Example	REP Design REP Design LLC	1-(860) 426-1894 N7EMW@cox.net www.repDesign.us
<p><i>The CLAMP-150 really mounts to just about anything</i></p> <p>Picnic tables aren't just for eating any more!</p> <p>Sunset DX anyone?</p>		
<p>CLAMP-150 prototype (fall '08 testing...PROVED THE DESIGN!)</p> <ul style="list-style-type: none"> • High Sierra "Sidekick" HF Screwdriver with 10 ft. telescoping whip • Horizontal counterpoise (10 & 12 ft. whip telescoping whips shown) 		

[More photos on next page]

<p>CLAMP-150[®] Lifeguard Stand Ex.</p>	<p>REP Design REP Design LLC</p>	<p>1-(860) 426-1894 N7EMW@cox.net www.repDesign.us</p>	<p>CLAMP-150[®] Metal Railing Ex.</p>	<p>REP Design REP Design LLC</p>	<p>1-(860) 426-1894 N7EMW@cox.net www.repDesign.us</p>
 <p>The CLAMP-150 really mounts to just about anything</p> <p>What a QRP setup!</p> <p>Get out your solar panels</p> <p>DX anyone?</p>		  <p>The CLAMP-150 really mounts to just about anything</p> <p>Left: curved railing Center: horizontal Right: vertical</p>		<p>CLAMP-150 prototype (fall '08 testing... PROVED THE DESIGN!) (courtesy of: Southington Rustic Fence, Southington, CT)</p>	
<p>CLAMP-150 • "Gnd. Radial Kit" (gnd. radials not shown) • High Sierra "Sidekick" HF Screwdriver, 10 ft. whip, WINDY DAY!</p>					

GROUP 3: Large motorized HF antenna. The holding capacity of the CLAMP-150 was tested with N7EMW's LARGE Hi Q 5/160RT 160-10m HF motorized mobile antenna. It supported the antenna fine, even with four 10 – 12 ft. telescoping whips as the counterpoise and the SHUNT-100 HF load inductor. We generally recommend that slightly smaller antennas be used, however, the CLAMP held the large Hi Q fine! It is recommended for the smaller Hi Q models and other brands.

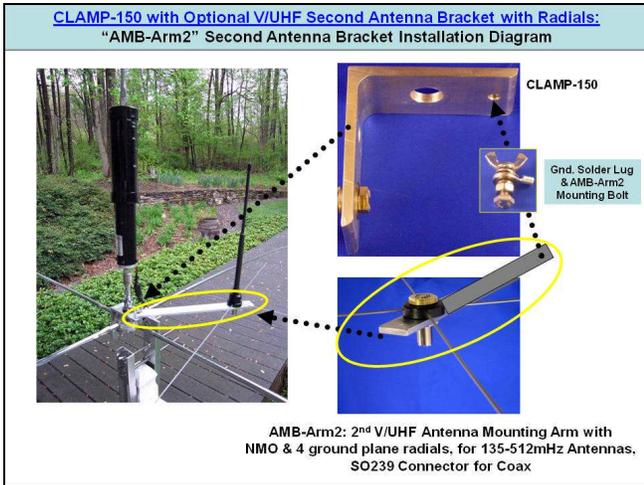
<p>CLAMP-150[®] SHUNT-100 Option</p>	<p>REP Design REP Design LLC</p>	<p>1-(860) 426-1894 N7EMW@cox.net www.repDesign.us</p>
		<p>SHUNT-100 (option) HF load inductor 160 – 10m Simple bolt to CLAMP-150</p>

GROUP 4: Vertical whip with automatic antenna tuner. Shown is a CLAMP-150 with 12 ft. telescoping vertical whip and four 10-12 ft. horizontal counterpoise radials, tuned with an Elecraft T1 battery powered QRP automatic antenna tuner ("ATU") (black box) and balun (gray box). This makes for very quick band changes without having to adjust antenna coils or retune a screwdriver antenna. Of course, if you use an ATU it must be mounted at the antenna and not connected to the antenna with coax to avoid substantial losses. There is always the debate about which is best: antenna tuned with ATU vs. tuned antenna. This is a simple, small and very light weight antenna setup for travelling and works fine on the upper HF bands (e.g 20m and above).



[More photos on next page]

GROUP 5: CLAMP-150 options . These photos show the optional second antenna bracket (AMB-Arm2) and ground counterpoise “ring” brackets (AMB-Gnd-1; AMB-Gnd-8 is same size but has couplers for up to eight whips) that are available with the CLAMP.



GROUP 6: CLAMP-150 “WiFi Kit.” This kit can be purchased with any CLAMP-150 and includes a short mast with diameter of 1-1/16 inch and a third L bracket that allows for full “3D” antenna aiming. The kit is designed for WiFi and other SHF panel type antennas that can mount to a 1-1/16 inch diameter mast. The CLAMP is a great way to mount your panel antenna, temporarily or permanently, WITHOUT having to drill holes!

WiFi Kit for CLAMP-150® Example Installations		1-(860) 426-1894 N7EMW@cox.net www.repDesign.us
		REP Design LLC

WiFi or SHF Antenna on CLAMP-150 mounted vertically
 Antenna can be aimed up/down and rotated – full “3D”
 3 minute installation on almost any surface – railing chair, fence, table, bench - you name it!

WiFi Kit for CLAMP-150® Example Installations		1-(860) 426-1894 N7EMW@cox.net www.repDesign.us
		REP Design LLC

Antenna on CLAMP-150 with “WiFi Kit”
mounted horizontally & on slanted surface
 No matter how mounted, antenna can be aimed “3D”

Thank you for purchasing our products or viewing our instructions. HAPPY DX!