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INSTALLATION INSTRUCTIONS:

BKT-Sksp-1[®] Heavy Duty Mount for Shakespeare Model 4245 Antenna Spring Base

Thank you for your purchase; we appreciate your business and interest in our products.

These instructions describe how to install the BKT-Sksp-1[®] (“BKT”) super heavy-duty mount for the Shakespeare #4245 antenna spring base, designed for military and amateur radio HF antennas. The *spring base is not included* with the BKT. The spring base will fit the Shakespeare 16 ft. and 32 ft. vertical antennas and the Hi Q Antennas 5 and 6 series “ruggedized” HF motorized antennas. This is the same spring base that Hi Q Antennas sells. It will work with any antenna that can screw into the Shakespeare 1 inch diameter threaded tenon.

The BKT bolts to a horizontal surface, such as a fixed or receiver trailer hitch, or front/rear bumper, with a ¾ to 1 inch diameter bolt or trailer hitch ball. The BKT can be used mobile while driving at highway speeds or off-road (if antenna is not too long) or even as a fixed base mount.

Options include (more information & photos below):

- (1) AMB-VMA-4 vertical mounting bracket for mounting to a vertical surface or pipe up to 2 inches in diameter (O.D.);
- (2) AMB-SG237-Kit1 mounting hardware to bolt an SGC model SG-237 Smartuner™ (or any other model with same mounting hole dimensions) under the mount;
- (3) SHUNT-100 HF load inductor;
- (4) jumper cables from the spring base connection stud and SHUNT100 to the SO239 on the BKT;
- (5) high quality PL259 Amphenol “TEE” and other connectors; and
- (6) **[NEW Aug. 2011]** AMB-Sksp1-ATU2 adjustable dual-plate mount for medium and large automatic antenna tuners.

The BKT-Sksp-1[®] will support the following types of antennas (with your Shakespeare spring base):

- Shakespeare 16 ft. and 32 ft. military / amateur radio vertical antennas
- Hi Q Antennas “ruggedized” line of HF motorized antennas (Series 5 and 6)
- Other antennas that screw onto the 1" tenon above the spring on the Shakespeare base

The following is what you get standard, with the BKT-Sksp-1[®]:

- Powder coated (5 standard + custom colors) 6061 aluminum or buffed bare aluminum.
- ¾ inch thick x 7 x 11 inches; blueprinted design.
- High quality SO239 barrel connector with rust proof heavy-duty nuts (“not the thin flea market nuts”).
- Stainless steel (18-8) hardware: 3/8x16 mounting bolts for the Shakespeare spring & four 1/4x20 ground points.
- Four ground connections for vehicles or ground counterpoise connections with provided heavy-duty solder lugs.

Left photo: shows what you get standard (“matte black” powder coat shown here).

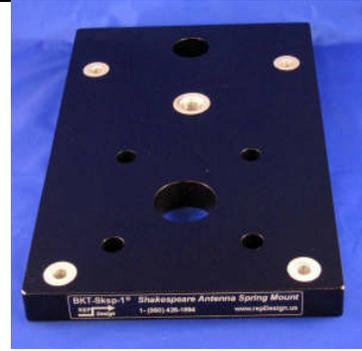


Right photo: illustrates how the Shakespeare spring base mounts to the BKT (hdwr. provided).



The photo to the right shows the high-performance features of the BKT-Sksp-1[®]:

Powder coated “BKT” without any hardware to illustrate how all powder coated versions have the connector and four ground point holes masked off for an excellent bare metal to bare metal “ground”. The large hole is for the coax connection stud at the base of the Shakespeare spring. The four smaller powder coated holes are for mounting the Shakespeare spring base – does NOT require a ground connection here.



Safety First!

Use caution if you are installing your antenna on a vehicle, balcony or other location where the antenna could fall on someone or cause damage if it were to come off. It is solely up to the user to determine the suitability of the BKT with their antenna and mounting situation. As with any antenna installation, be careful around thunderstorms and lightning, 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! These instructions are meant to provide general guidelines but can not 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 BKT, you are not sure, or it does not meet your needs, you may return it for a refund within two weeks (see Warranty for details). **SAFETY FIRST!**

What You Need In Addition To the “BKT”

- Shakespeare 4245 spring (from Shakespeare dealers; same one also sold by Hi Q Antennas).
- Antenna – Shakespeare verticals or Hi Q Antennas “ruggedized antennas (series 5 & 6).
- Bolt or trailer hitch ball for attaching the BKT to your hitch, bumper etc.
- Various options, if needed, for your installation (described below).
- Coax and connections to the provided SO239, including short jumper from spring stud to bottom of SO239.

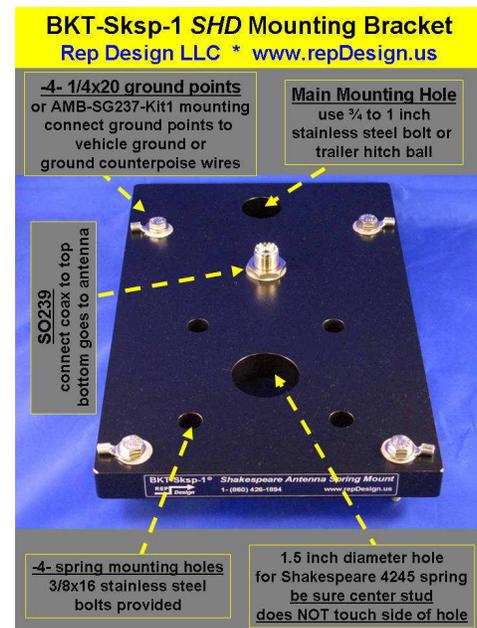
Tools Needed to Install BKT and Options

No special tools are required. A wrench is needed to tighten the mounting bolts.

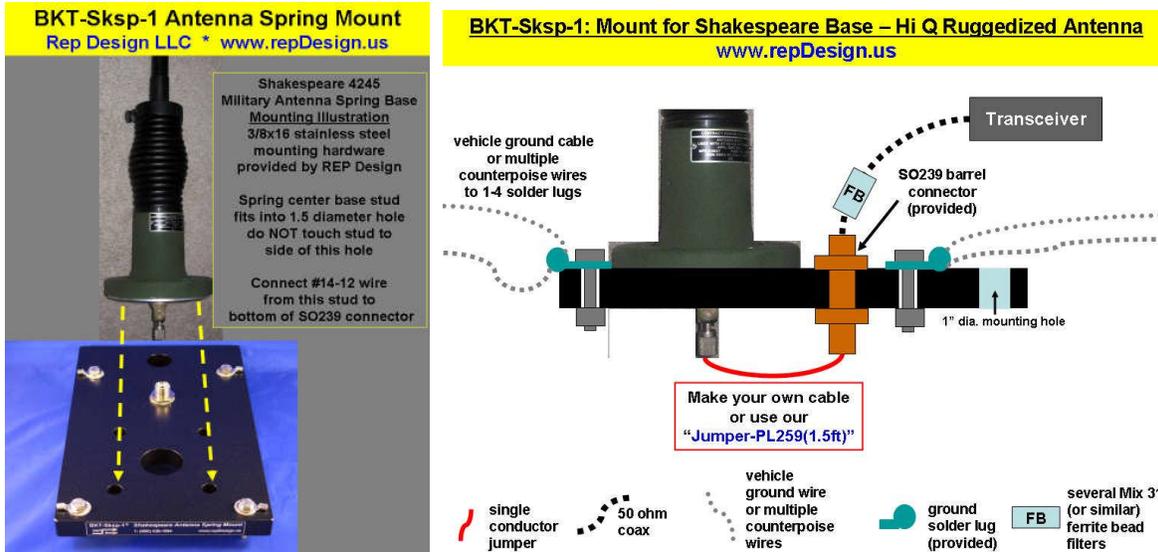
Installation Suggestions

QUICK START GUIDE & INSTALLATION DIAGRAM: The photo to the right illustrates the various features and mounting holes on a standard BKT (black powder coat shown, other finishes available).

- (1) Mount the BKT using a ¾ - 1 inch diameter bolt/trailer hitch ball, with flat washers top and bottom, lock washer and nut.
- (2) Mount the Shakespeare spring using the longer bolts/hardware we provide (the Shakespeare factory bolts are not long enough for our heavy-duty ¾ inch T-H-I-C-K mount).
- (3) Mount any options (if needed) and attach your antenna to the spring base - it screws on quickly to the spring tenon.
- (4) Connect your coax PL259 plug to the top of the provided SO239 and a short jumper from the spring stud to the bottom of the SO239. Weather-proof your connections.
- (5) Provide a good ground connection or ground counterpoise wires to one to four of the provided solder lugs on the corner ground bolts. The BKT comes with ¼ inch solder lugs and bolts, or 3/8 inch lugs and bolts if ordered with the AMB-Sksp1-ATU2 auto tuner mount with two heavy-duty plates and hardware (see below).



DETAILED INSTRUCTIONS: This section provides installation instructions for the BKT-Sksp-1[®] (“BKT”). The following illustrations show how the Shakespeare spring mounts to the BKT, and a suggested wiring scheme for connecting an antenna to your transceiver. Another diagram for using an automatic tuner with the Shakespeare untuned verticals is shown in the “Options” section below (see “AMB-SG237-Kit#1”).



The general goals for installing a mobile HF antenna are that it resonates well on the desired bands, the SWR is <2.0:1, you can make contacts relatively easily, and the installation is safe and not likely to hit overhead obstructions. Every mobile installation is a compromise but it is better to install an antenna in a less than ideal location that is SAFE than not installing any antenna (no antenna = no contacts)! Do consider antenna theory but remember that the END RESULT is to be able to make contacts. If you can do so then your antenna is a success! Take with a grain of salt what some of the “antenna purists” recommend; if your installation results in good contacts then you have succeeded! Mounting an antenna in the center top of a vehicle is preferred but not everyone has a vehicle that will allow this. Mount the antenna in the best possible location even if it is a compromise. If you are looking for the ultimate HF installation and this is your only goal in purchasing a vehicle, then get a larger pickup and mount the antenna on a bed wall or bed floor. Also consider RF exposure; the FCC requires amateurs to calculate this. The distance from your antenna to you and your passengers is a consideration, especially if you are running high power. A typical 100 watt HF rig with vehicle mounted antenna is not of concern if the antenna is a few feet away from people. The ARRL, FCC and other sources provide detailed information on mobile antenna installations and RF exposure.

- 1) **First**, mount the BKT to your vehicle or fixed-base location, to a horizontal surface. (Or vertical surface or pipe with optional AMB-VMA-4, see below).
 - Decide where you will be mounting the BKT. Be sure that there is clearance for your antenna and you know how to run the coax to your radio. Also be sure that this location is strong enough to support your antenna. If you are mounting the BKT to a receiver type hitch, you may want to purchase a “rise or drop” type of receiver to raise or lower your antenna. Receivers are available with at least 10 inches of rise-drop. Receivers mounted with a standard pin, while secure, allow for some undesired movement. This can be solved by purchasing a special threaded pin with insert for hollow receivers, which very tightly attaches the receiver to your hitch and results in no movement. If you are mounting your antenna to a van or pickup with camper, you might consider mounting to your FRONT bumper, to get your antenna farther away from the metal sides of your vehicle.
 - The BKT mounts with your ¾ to 1 inch bolt or trailer hitch ball and hardware. It can be mounted perpendicular or parallel to the bumper. Be sure to use flat washers on both sides of the BKT, and use a lock washer under the nut. Securely tighten. Check periodically to be sure that the hardware and antenna base are not loose.

2) Mount the Shakespeare military spring base to the BKT.

- The spring base has four holes which line up with the over-sized holes in the BKT for the provided 3/8 inch bolts- the oversize holes allows slight adjustment to center the spring on the BKT. The connection stud below the spring fits into the 1.5 inch hole between the four holes.
- Install the four sets of 3/8 bolts and hardware we provide, *in this order*: insert one flat washer under each bolt head, insert these into the holes from the top of the spring base, insert spring with bolts into top of BKT (e.g. label on end right side up), on bottom of BKT insert one flat washer, lock washer and nut. *Loosely* tighten the nuts.
- Align the spring base so the connection stud (hot part of the base for coax connection) is approximately centered in the large 1.5 inch diameter hole, and the spring base is centered on the top of the BKT. It does not have to be perfectly centered, just not touching the side of the hole and preferably keep at least 1/8 inch between the sides of the stud and hole.
- Securely tighten all four bolts. Periodically check to be sure they do not come loose.

3) If purchased, you may want to install the OPTIONS now (can also be installed later).

See the detailed instructions below in the “Options” section – options are NOT required for the BKT but may meet your special antenna installations needs.

4) Connect your ground connection (vehicle mounted) or ground counterpoise wires (stationary vehicle or fixed-base).

a) **Vehicle ground connection (using your vehicle as the ground counterpoise):**

- Use one to four of the provided solder lugs to connect a heavy-duty ground cable or copper/metal strap to your vehicle ground. Connecting a good ground connection is one of the most important factors in installing an HF mobile antenna on a vehicle. If your antenna does not resonate or the SWR is not below 2.0:1 on one or more bands, try another type of ground connection or install more than one ground strap or try grounding to the other ground point(s). We provide four ground points but only one may be needed in most installations. The key is to use the shortest and heaviest ground connection that you can install.
- I have found that for some installations, using one ground cable going from the mount to vehicle ground may not work as well as grounding each component of your mounting system together and grounding the forward most part of your mounting components to the vehicle ground using the shortest possible ground cable or metal/copper strap. For example, run a short ground from the BKT ground point to a bare metal point or hole in your hitch, then run a short ground from the forward end of the hitch nearest a good ground point on your vehicle. It's a matter of trial and error; if the first attempt is not successful try another grounding method.
- You may also need to run ground straps across the various components of your vehicle, especially if it is constructed “body on frame”.

b) **Ground counterpoise, for stationary mobile or fixed base (using "long" wires as a ground counterpoise instead of your vehicle as a ground).**

- A ground counterpoise, also know as a "ground plane", is required for all mobile antennas that require a ground, if mounted on a non-metallic surface or for mobile antennas used in a "fixed base" setting. You can also use ground counterpoise wires to augment your vehicle ground, while "stationary" mobile. You are referred to ARRL books and other resources if you would like detailed information. The following general suggestions apply for HF bands from 160 – 6m.
- The main considerations for your counterpoise include how many and how long your counterpoise wires will be, and whether they will be ground-mounted or elevated above ground. This is determined by which bands you would like to operate, how high your antenna is above the ground and how much real estate you have for your counterpoise wires. Some considerations:
 - Ground mounted counterpoise: you will need many, 30 to 40, wires if laid on the ground or just under the ground surface. The ends can be staked to hold them straight.

- Elevated counterpoise: you will need at least four wires if elevated at least 5 feet or more above the ground (the lower the band the higher the counterpoise should be). You will also need to determine how they will be supported on the ends; be sure that they are not in the way of people, obstacles and MOST IMPORTANTLY power lines! Keep the ends off the ground.
- Length of counterpoise: under ideal conditions they can be at least 1/4 wavelength or longer and a pair should be used per band. If you are limited for space you can even use "untuned" counterpoise wires: at least four radials of the following approximate lengths may be practical and result in reasonable RF performance for 80m to 10m: 1-2 wires 60 ft. long, 1-2 wires 30 ft. long, and 1-2 20 ft. long. You can also try a larger number of shorter radials. Use longer wires for 160m.
- Counterpoise wire size: the size of the wire is not too critical, and you can use 18 to 14 gauge insulated, stranded, copper wire. This is easy to roll up if you need to temporarily install the counterpoise.
- Once you've decide on your counterpoise specifications, and have cut the wires, connect them to one to four of the provided solder lugs mounted to the four 1/4x20 stainless steel bolts. You can even use a quick disconnect (not provided) between the provided solder lug(s) and your counterpoise wires. Four ground points are provided to enable the best possible grounding to the BKT; you only need to use one but using all four helps you to distribute the multiple wires equally around your antenna.

5) Connect Coax to the Shakespeare Spring via the SO239 on the BKT.

Refer to the diagram at the top of page 3.

- Short jumper from the Shakespeare connection point to the BKT's SO239. Use a single conductor, one end attached to the Shakespeare connection point and the other end soldered into only the center conductor of a PL259. This jumper should not be shielded. You can use #14 stranded insulated copper hookup wire or better yet make one from RG8 coax: this allows a very firm attachment into the PL259 but remove the outer jacket and shield beyond the end of the PL259. See the diagram on page 8 to make your own or you can order one from us (page 8).
- Coax connection from BKT SO239 to transceiver. 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 under approximately 300 watts. You can use any coax you desire, but 97-100% shielded coax is best. The coax connects to the SO239 connector on top of the BKT. You should install ferrite beads on the coax near the BKT, as described in the next paragraph.
- Ferrite bead filters to reduce HF antenna tuning problems and to help prevent RFI in devices connected to your radio. 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 work at HF frequencies! You may want to install at least 3 ferrites, closely spaced, over your coax / antenna motor cable as close to your antenna as possible. One 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, 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. A white paper on this topic can be downloaded for free from our web page: <http://www.repdesign.us/Download.html>. Also see the diagram on page 3.
- SWR adjusting device (if needed) for HF antennas, especially those mounted near the ground. This will 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, UNUN, or additional capacitance to reduce the SWR. Some of these devices need to be installed at the antenna and if so should be weather resistant (like our **SHUNT-100**; see page 6).

6) Mounting antenna on the Shakespeare Model 4245 spring base.

- Whether you use the Hi Q Antennas ruggedized motorized HF antennas or the Shakespeare vertical antennas, they simply and quickly screw onto the 1 inch diameter threaded tenon that is at the top of the Shakespeare spring. The special Shakespeare spring design allows the spring to be locked in a rigid position or placed in a "flexible spring" mode. Please follow the instructions that come with the Shakespeare spring.

- The following are some quick comments on how to tune your antenna. The Hi Q Antennas models are "tuned" by an internal motor, that you control manually or by an SWR monitoring automatic control to reach resonance on a particular band. The Shakespeare 16 ft. and 32 ft. verticals are "untuned" vertical antennas and need a manual or automatic tuner to resonate on a particular band. Some quick suggestions are as follows.
 - Tuning an HF screwdriver / motorized antenna (e.g. Hi Q Antennas "ruggedized" models that fit the Shakespeare spring base). You can tune your antenna using a DPDT, center off, manual switch or one of the automatic tuning devices that powers your antenna motor and stops at the resonance point. 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 can not be reduced by improved grounding, improving the ground counterpoise, installing ferrite beads or using a load inductor or other device. You will also need to use multiple ferrite bead filters to reduce RF traveling down the motor and turns counter wires from the antenna. These should be installed as close to the antenna as practical. Mix 31 is one recommended type for HF; do NOT use ferrites of unknown type as they may only filter VHF or higher frequencies and will not work on HF.
 - Tuning an untuned vertical whip antenna (e.g. Shakespeare 16 ft. or 32 ft. that fit the Shakespeare spring base). You will need to use an antenna tuner with untuned whips. The tuner can be a manually tuned model mounted near your radio (best near the antenna) or, preferably, an automatic tuner. An automatic tuner MUST be located at the antenna. We provide optional hardware ("AMB'SG237-Kit1") for mounting an automatic tuner directly below the mount, such as the SGC SG-237 Supertuner™.

BKT-Sksp-1 Options & Options Installation

The following is a summary of the BKT options with photos that will help to illustrate how they are installed.

- **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 for antennas mounted near the ground. This is for antennas that need additional inductance and where an "automatic tuner" is not used, such as for HF motorized antennas. A *shunt is NOT needed with a vertical whip tuned by an automatic or manual tuner.* The SHUNT100 includes a silver plated coil clip with tightening screw and tin plated solid copper coil.
 - The SHUNT-100 mounts to any of the four corner ground point 1/4 inch bolts, using the bolts provided with the standard BKT. The flat aluminum mounting plate must be mounted at a ground point.
 - A single wire is connected from the SHUNT stainless steel wing nut to the Shakespeare bottom stud, or to a PL259 "tee" connector installed at the bottom of the BKT SO239 connector, **in parallel with your coax center conductor.** You can use standard, insulated and stranded, #14 gauge wire for this purpose; use as short a wire as possible. We also provide optional high quality cables - see our "JUMPER" cables below.
 - Your coax connects to the top of the BKT SO239 connector (in parallel to the SHUNT). See right diagram.

LEFT PHOTO:

SHUNT-100 as sold



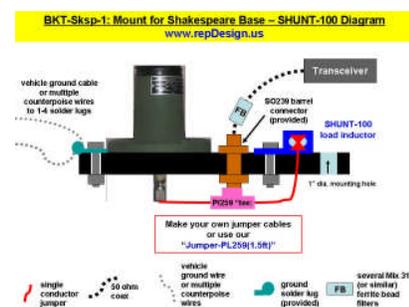
CENTER PHOTO:

SHUNT-100 mounted to one of the BKT ground bolts; fits any of the four.



RIGHT DIAGRAM:

Wiring diagram for the SHUNT, using a coax "Tee" connector. Connect in parallel with antenna and coax.



- **AMB-SG237-Kit#1:** Hardware kit to mount the SGC SG-237 "Smartuner"™ automatic tuner to the bottom side of the BKT, below the Shakespeare spring antenna connection stud. With this tuner, you can tune the Shakespeare 16 to 32 ft. vertical antennas across the HF bands. For details, see SGC web: <http://www.sgcworld.com/237ProductPage.html>

The SGC tuner is mounted with four sets of longer 1/4x20 stainless steel bolts and aluminum standoffs; we provide two lengths of standoffs (four of each) The tuner can be mounted right side up or upside down. The bolts go into the four corner holes on the tuner. The factory holes in the SGC tuner base plate may need to be slightly enlarged - use a 1/4 inch drill bit to enlarge the holes to fit the 1/4x20 stainless steel bolts provided in this kit.

LEFT PHOTO:

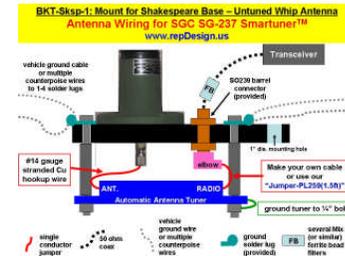
What you get with the "AMB-SG237-Kit#1".



CENTER PHOTO: Shows hardware kit mounted to the BKT (spring base and tuner not shown). The four sets of "loose bolts" are 3/8 bolts for mounting spring base.

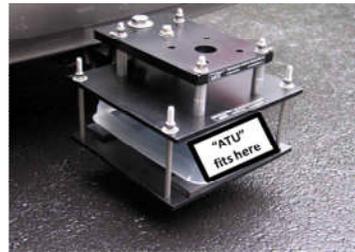


RIGHT DIAGRAM: Antenna connection diagram to and from the SGC tuner, and to your transceiver via the BKT SO239.



- **AMB-Sksp1-ATU2:** Heavy-duty, universal fit adjustable dual-plate mount for medium and large automatic antenna tuners, that mounts below the BKT-SKSP-1 with included 3/8 inch stainless steel hardware. The two plates are THICK (3/8") 6061 aluminum. Available in buffed aluminum or powder coat finishes.

The photo to the right shows the "ATU2's" dual mounting plates bolted below the BKT - your auto tuner fits between these plates. The top and bottom of the tuner is protected by thick weatherproof rubber strips. The vertical four bolts allow you to install tuners with a variety of heights, with tuner widths up to 10-1/4" and tuner lengths up 12 inches (and longer).



- **AMB-VMA-4 ("VMA"):** Vertical mounting adapter for mounting the BKT (and some of our other antenna mounts) to a flat vertical surface or a vertical pipe up to 2 inches in diameter. The "VMA" consists of one (1) heavy-duty (1/2 inch thick x 4 inches wide) "L" bracket with a 3/4x10 stainless steel bolt with hardware. The BKT bolts to the VMA with the provided 3/4 inch bolt. You can also purchase a PAIR (2) of VMA's with one bolt, depending on your installation.

LEFT PHOTO:

"AMB-VMA-4" as sold as a single "L" bracket. Not shown are four 3/8 bolts or two U-bolts. Bare aluminum shown; also available in powder coat.



RIGHT PHOTO:

BKT mounted to "dual" "VMA's" with provided bolt (bare aluminum shown)..



- **Jumper-PL259(1.5ft)-1/4, 3/8 or 1/2" lug:** High quality single-conductor jumper cable to connect from the bolt at the base of your antenna ("hot side" of antenna) to the SO239 connector. Total length of the cable is 1.5 feet (0.46 meters). It is pre-made except for your cutting the cable to your length, trimming insulation and crimping/soldering to the solder lug. Made from high quality Amphenol PL259 and Belden RG-8 coax, with shield removed. Heat shrink tubing is already installed on the plug end. Your choice of ONE heavy-duty solder lug size: 1/4, 3/8 or 1/2 inch. The LEFT photo shows our "Jumper-PL259(1.5)" cable. You can also make your own cable as shown in the RIGHT DIAGRAM. Below.

Single Conductor Jumpers from Antenna to SO239
 Custom made high quality cables 1.5 feet long with your choice of solder lug
 Cut cable to your length, trim end & crimp/solder to lug

Order Part No. { JUMPER_PL259(1.5ft)-1/4 lug (fits SHUNT-100)
 JUMPER_PL259(1.5ft)-3/8 lug (fits "standard" 3/8x24 HF antenna base bolt)
 JUMPER_PL259(1.5ft)-1/2 lug (fits Hi Q Antennas "ruggedized" models)

Amphenol PL-259 plug
 center conductor from Belden RG-8 coax stranded copper (no shield)
 Heavy-Duty Solder Lugs
 1/4"
 3/8"
 1/2"
 heat shrink tubing
 1.5 ft (0.46 m)
 Lug Pins
 Bolt at Ant. Base

Instructions:
 (1) cut end of cable to length needed (1.5 feet max.)
 (2) trim end of cable 1/4 inch to expose center conductor
 (3) insert into solder lug (your choice of one size)
 (4) crimp and solder

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Instructions for Making a Single Conductor Jumper Cable, from RG8 Coax
 The purpose of this cable is to connect the Shakespeare spring base stud to the SO239 connector provided on the BKT-Sksp-1 Mount. It can also be used to connect tuner. This is the same design as our optional "JUMPER-PL259(1.5ft)" that can be ordered with a 1/4, 3/8 or 1/2 inch HD solder lug.

Figure 1
 RG-8 Coax, stranded center
 1/4" 5/8"
 twist cable onto PL259

Figure 2
 RG-8 Coax, Shield Removed
 1/4" solder lug to fit ant. bolt
 use 3/8" dia. x 1" heat shrink tubing to cover black outer jacket area

Instructions:
 Use RG8 coax to make a high quality jumper with excellent high voltage breakdown characteristics.
 See Figure 1
 (1) trim end of cable 5/8" inch to expose center conductor; *lightly* tin with solder
 (2) remove black outer jacket and shield 1/4" back from exposed center conductor
 (3) twist RG8 coax onto PL259 until the center conductor is even with end of PL259 pin
 (4) solder center conductor to PL259 pin; use steel wool to "polish" pin & remove excess solder on pin
 See Figure 2
 (1) remove outer jacket by cutting lengthwise with razor blade, starting 1/4 inch from PL259
 (2) push shield toward PL259 to "loosen it" and remove beyond end of outer jacket
 (3) trim insulation 1/4" to expose center conductor and insert into solder lug
 (4) crimp and solder center conductor to solder lug
 (5) use 3/8" dia. x 1" long heat shrink tubing to cover black jacket/end of shield, at back of PL259

- **Jumper-shunt100:** A 7.5 inch cable made of the same PL259 plug and cable with the other end terminated in a heavy duty 1/4" solder lug already installed, for the SHUNT-100.
- **PL259 TEE connector:** We also have a high quality Amphenol TEE connector ("the real deal"): the middle plugs into the bottom of the SO239, one end plugs into the cable from the antenna and the other end plugs into the SHUNT-100 jumper. Your radio coax then plugs into the TOP of the SO239.



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.

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 terms that are enclosed with your order; this is also included on our web site.**

Changes to These Instructions

We periodically update our instructions. The latest versions (PDFs) with color photos can be found on our "DOWNLOADS" web page, under "MANUALS". The version date code is provided at the bottom of each page.

Submitting Installation Photos

If you would like to have your photos posted on our web site Photo Gallery, feel free to email them to us. We appreciate your photos and they provide independent views of our products in use for other potential users. THANKS!

HAPPY DX!