

INSTALLATION INSTRUCTIONS:

BKT-ToyotaTrac-1[®] Slide-In Antenna Mount for Toyota Tacoma With "Utility Track"

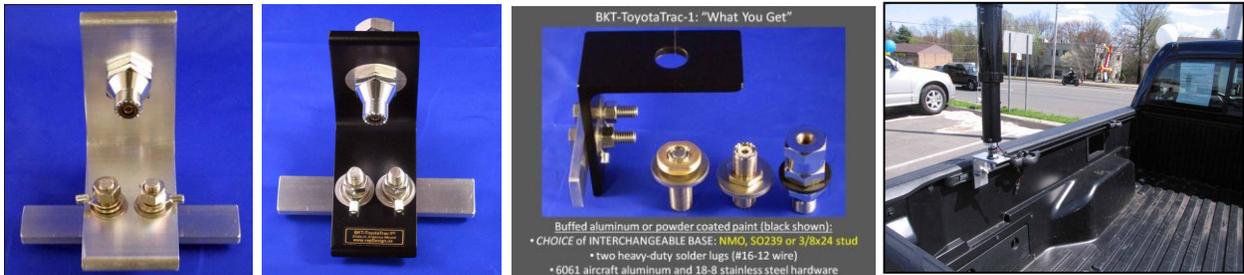
Thank you for your purchase; we appreciate your business and interest in our products.

These instructions describe how to install the BKT-ToyotaTrac-1[®] ("BKT") slide-in antenna mount for Toyota Tacoma pickup trucks with the Toyota "utility slide track", without drilling. The BKT will fit the left, right and front tracks. It's simple and quick to install.

The BKT will support small to large V/UHF mobile antennas and smaller HF antennas, up to short screwdriver/motorized antennas – see list below. In addition to amateur radio antennas, it is well suited for commercial, GMRS and emergency response antennas and many CB (11m) antennas. For multiple antennas you can install multiple BKT's.

The BKT comes with *your choice* of three high quality antenna bases, as shown in the **3rd photo** below. All of our antenna bases are interchangeable so if you buy another type of antenna you only have to order another base for your BKT!

The **left photo** shows the standard hand buffed aluminum BKT, with the included heavy-duty solder lugs that can be used for grounding. One of our five optional powder coat colors is shown in the **2nd & 3rd photos**. The **right photo** shows the BKT with a High Sierra "Sidekick" screwdriver antenna. Larger versions of these photos are on **pages 7 and 8**.



Specifications

- **Material of construction:** 6061 T-6 aluminum.
- **Hardware:** 18-8 stainless steel 3/8 inch bolts; two heavy duty solder lugs for grounding/counterpoise.
- **Finishes:** Standard hand buffed aluminum. Optional powder coat finishes - black, red, white, blue and clear coat. On powder coat finishes we mask off the critical areas around the holes to provide an excellent bare metal to bare metal contact for good grounding and performance.
- **Compatible Toyota pickups:** Tacoma, with the factory "utility track"; other models with same "track".
- **Mounting Method:** slide in, no holes to drill
- **Antenna Bases:**
 - ¾ inch diameter mounting hole with panel thickness ¼ inches
 - choice of interchangeable bases - 3/8x24 stud, NMO and SO239.

Compatible Antennas

The "BKT" will fit a variety of HF/V/UHF antennas listed below. The Toyota "utility track" may not support larger antennas than those listed below.

- **Essentially any mobile VHF – UHF** (6m and above), including GMRS and commercial bands.
- **Small HF:** "ham sticks", Hustler loading coil, Outbacker "wonder lead", manually tuneable (Super Antennas MP1, MFJ-1624), etc.
- **Small HF screwdriver:** Hi Q model 2, High Sierra Sidekick, Tarheel Little Tarheel, Super Antennas MP2, Yaesu ATAS100/120, etc.
- **CB radio** (11m band): mobile antennas including 9 ft. whips.

The following antennas are NOT recommended. We have not been able to fully test the capacity of Toyota's factory "utility track" but our observations when designing the BKT indicated that it might not support the following larger antennas under heavy wind loading and under dynamic driving forces. *If you have experience with the "utility track's" capacity we'd like to hear from you about whether larger antennas can be supported.* While the BKT has available antenna bases that would fit these antennas, for now we are **not recommending** the use of antennas listed below **while driving**; they would **work if the mount is used while stationary**:

- Medium and larger HF motorized antennas from Hi Q (series 3-6) (smallest models ok).
- Full sized HF screwdriver antennas from High Sierra and Tarheel (small/short models ok).
- Smaller and full sized Scorpion Antenna models as even the small ones are quite heavy.

Safety First

If you do not feel that you have the ability to safely install the BKT to your vehicle and antenna, please contact us if you would like to return it (within the first two weeks, see Warranty for details). 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. Be sure that your antenna cannot come into contact with power wires – especially if using longer whips. It is the user's responsibility to install a safe antenna and to ensure that the mount and the Toyota "utility track" can safely support their antenna. 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. Safety is always job one, performance is the next priority.

What You Need to Install the "BKT"

To install the BKT you will need a Torx T-27 screwdriver or tip (to remove the ¼" Toyota utility track bolts), standard 9/16" or 14 mm wrench, and pliers. You may need additional tools for your specific antenna and mounting situation. The installation is simple. Since the truck has a composite bed, for HF antennas you may need to install wires across the bed to form a counterpoise (see our suggestions below).

Photos are included throughout these instructions to help illustrate some of the many types of installations that are possible with the BKT. If you'd like to have your photos included on our web site and maybe future versions of product instructions, please contact us - we'd be happy to post your photos!

The latest version of these instructions is on our web site "Downloads" page, and may be more recent than hard copy instructions provided with our products. The version date code is shown at the bottom of each page.

Options

The following options are compatible with the BKT-ToyotaTrac-1.

- **Powder coated paint:** Five finishes available - black, red, white, blue and clear coat. This is a high quality and very strong paint process where paint powder is baked onto the part. The critical areas around the holes are masked off to provide an excellent ground connection!
- **Interchangeable antenna bases:** 3/8x24 stud, NMO and SO239 - shown in the photos below. All have an SO239 connector on the bottom to plug in your coax. The NMO and SO239 include unique nicely machined heavy duty rust proof nuts and stainless steel washers to fit the standard ¾ inch holes in the BKT and other mounts we have.



- **Jumper cables and coax connectors:** we now offer a few coax jumper cables, "real deal" Amphenol PL259 connectors (plug, TEE and elbow) , SO239 2 inch barrel with *unique* nicely machined heavy-duty rust proof nuts, PL259 push-on and PL259 double male connectors.



Installation and Maintenance

READ ALL OF THESE INSTRUCTIONS before you mount anything, to help ensure that your selected mounting location is the best one for your installation. Included on pages 7 & 8 are some larger installation photos which you may want to refer to.

Below is a **Quick Start Guide** for installing the BKT. Also be sure to read our suggestions for grounding and a counterpoise on **page 5**. The BKT can be installed ANYWHERE along the left, front and right “utility tracks”. The diagram below shows it installed on the rear of the left track.

Multiple BKTs can be installed if you have more than one antenna, but it is best to place one or two BKTs per each of the three tracks depending on the size of your antennas; *do not exceed the capability of each Toyota “utility track”*.

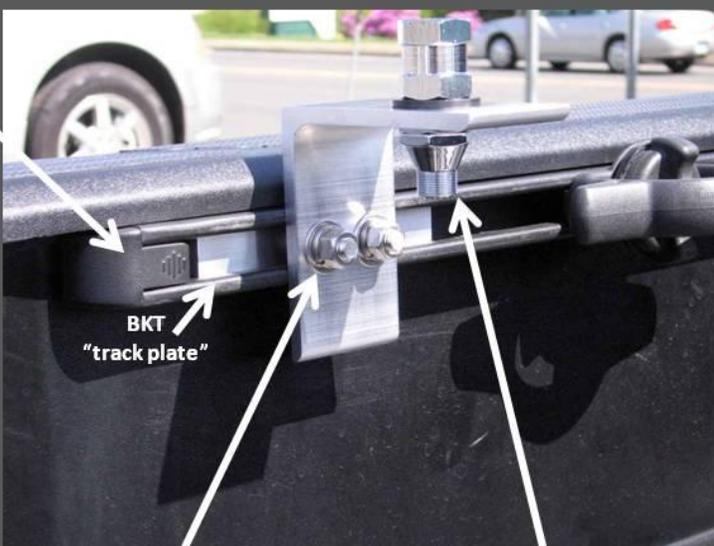
BKT-ToyotaTrac-1: Installation Illustration

LEFT OR RIGHT BED TRACK:

1. Loosely install the BKT “L” bracket on the BKT track plate (do NOT use any flat washers under the two bolt heads).
2. Slide off plastic end cap on Toyota utility track.
3. Remove Torx bolts (1/4” bolts, T-27 tip) from rear of the utility track to the position where you want to install the “BKT” (bolts on BKT track plate can not slide past Torx bolts unless removed, then easy to do).
4. Scrape off paint where BKT track plate contacts the utility track to provide good ground connection at the location you will mount the BKT (all BKT’s have buffed bare aluminum track plate for good grounding but you must remove paint on the Toyota utility track) → see the image illustrating counterpoise suggestions.
5. Reinstall and tighten the Torx bolts.
6. Slide in the plastic end cap.
7. Tighten the two BKT bolts securely.

FRONT BED TRACK:

1. Completely remove the front track by unscrewing the five Torx bolts (size T-27, ¼” diameter).
2. Slide in the BKT and follow the above instructions.



On EACH of two 3/8x16 stainless steel hex bolts, install on outside of the “L” bracket, one:

- flat washer
- solder lug
- lock washer
- nut

CHOICE of interchangeable antenna base – all fit the ¾ inch diameter hole with provided hardware:

- 3/8x24 stud (shown)
- NMO
- SO239 (“PL259”)

(1) **Considerations BEFORE Mounting the BKT to Your Truck Bed Factory “Utility Track”.**

The BKT slides into the factory utility tracks on either side of the truck bed wall and on the front bed wall. You need to remove the ¼” Torx bolts to slide the BKT past their locations, and must remove the entire front track to slide on the BKT. Each track has five bolts – they should be easy to remove with a T-27 Torx screwdriver or tip for your socket wrench. Some considerations for selecting a mounting location include, but are not limited to, the following.

- If mounted on a passenger vehicle, typically the driver’s side is best for antennas as there is a slightly less chance that you will hit something like an overhanging branch along the side of the road. Also, you may be able to see the antenna better and can remove that antenna easier. **DO CONSIDER SAFETY** when removing/installing your antenna in traffic! Generally, the best location may be about ½ way along the bed wall, or the rear end, as this is far enough away from the cab and, with the counterpoise suggestions below, provides a counterpoise front and back of the antenna for HF antennas.

- Determine how high off the ground your antenna will be. In the United States the maximum height your antenna can be is 13 ft - 6 inches for the interstate highways, but it is important to note that some bridges and obstructions are much lower. Also, take into consideration whether you will garage your vehicle at home or park in a parking garage (some have vehicle height limits that can be 6 ft.- 9 inches).
- Be sure that your antenna is securely supported by the BKT and the Toyota utility track - it is the *user's responsibility to install a safe antenna*. SAFETY FIRST! On **pages 1 & 2** above we list types of antennas that work best with the BKT and the Toyota utility track, and examples of larger antennas we do NOT recommend as the Toyota utility track may not be strong enough to support larger antennas.

(2) Mounting the BKT to the Factory "Utility Track".

Refer to the **Quick Start Guide** above and photos on other pages as examples of how the BKT is installed and used. Larger images are at the end of these instructions.

- FIRST, if mounting to either side track, slide out the plastic end cap. The front track does not have any caps.
- Remove the Torx bolts (1/4" diameter bolts, use T-27 screwdriver or tip) from the rear of the track (left or right track), forward to the desired BKT location. If mounting to the front bed track, remove the five Torx bolts that hold the track to the front bed wall, and remove this track from the bed wall.
- Loosely insert the two 3/8x16 stainless steel bolts through the holes in the BKT "track plate", place the "L" bracket over these bolts and loosely install the hardware. Do NOT place a flat washer between the bolt heads and the track plate.
- Slide the loosely assembled BKT along the track to the desired mounting location. At this time you will need to also scrape off any paint, etc., for grounding purposes and consider if you need a counterpoise – see **Step (3)**.
- Once the BKT is at the desired location and you have removed paint for grounding purposes, center the BKT so it is horizontal – the holes in the "L" bracket are slightly larger than the bolt to allow a little adjustment. **SECURELY TIGHTEN THE TWO BOLTS. BE SURE THE "TRACK PLATE" IS CENTERED VERTICALLY IN THE "UTILITY TRACK"**.
 - To tighten the bolts, you may need to slip a wrench or screwdriver against the bolt heads inside the track to keep them from rotating while tightening the nuts. You can also use an open ended wrench on the nuts and hold the ends of the bolt threads with a pliers if the bolts turn when tightening the nuts - be as careful as possible as the pliers can slightly damage the threads although you can still remove the nuts.
 - *FOR POWDER COATED BKT's*: Holes that provide a ground path from the antenna base to the utility track are masked off to ensure an excellent ground from the antenna to vehicle ground, as shown below.



(3) Grounding and Counterpoise Suggestions

Most antennas require a ground counterpoise ("groundplane") for your antenna, since the Tacoma has a composite bed. The metal Toyota utility track WILL provide a counterpoise for V/UHF frequencies and part of a counterpoise for HF frequencies. There are three utility tracks on the Tacoma and they are NOT electrically connected together: left, front and right bed walls. You will need to do one or more of the following steps if your antenna requires a groundplane ("counterpoise"), as almost all mobile antennas do (see the "**counterpoise**" illustration below).

- Do the following for ALL antennas (HF/V/UHF). This should provide a sufficient groundplane for V/UHF antennas and part of a HF counterpoise. Note that the track counterpoise will provide a stronger signal, theoretically, in the front to back directions. To use the metal utility track as a counterpoise, you will need to ensure a good metal contact (“DC ground”) between the BKT’s buffed aluminum “track plate” and the utility track. The utility track is painted and therefore will NOT automatically provide the ground connection, unless you do the following:
 - Scrape off paint where the BKT track plate touches the utility track along the full length of the BKT’s track plate, -OR-
 - If the BKT is located next to a Torx bolt that fastens the utility track to the composite bed wall, run the shortest length of braid from one of the BKT’s solder lugs to the Torx bolt, using another ¼” solder lug (not included) under the Torx bolt head. You will need to remove paint around the Torx bolt hole. Weather proof this area by using “coax seal” putty or non corrosive RTV sealer (type without a vinegar odor) or automotive sealer – you can place this where you removed paint before attaching and tightening the Torx bolt and the BKT bolts as the sealer will “squeeze” around the parts if tightened BEFORE the sealer starts to dry.
 - Check for a DC ground (0.0 to 0.1 ohms) between the antenna base ground and the truck’s utility track, on the end farthest from the BKT.
- For HF antennas you may need an additional counterpoise if the “utility tracks” do not provide this sufficiently. Run 2 to 5 insulated or bare wires, nominally #16 (+/-) wire gauge, from one or two of the provided solder lugs on the BKT to the opposite side of the bed (see illustration below). You can use almost any hookup wire, bare or select an insulation color that matches your truck or compliments the color of your truck! You can fasten the ends of these wires to the ¼ inch Torx bolts on the utility track on the opposite side of the bed, using solder lugs (additional ones are not provided with the BKT but are available at most hardware stores, and we can provide these as well). By grounding these to the opposite track you will add additional counterpoise.



- Additional/optional grounding. The following grounding idea may not be required if you followed the counterpoise ideas above, unless you have engine or car computer noise in your radio or the other ideas are not

working on all bands. If so, you may want to run heavy ground cables or metal/copper foil at multiple locations along the utility track under the BKT, from the Toyota utility track to the truck's metal frame/body that is closest to the track. It should be noted that ONLY using this ground method (without our other counterpoise ideas) will NOT form a sufficient groundplane and may cause problems with tuning your antenna since this would result in your antenna being elevated above the ground plane. You want the groundplane to be more or less horizontal and located just below the base of your antenna.

(4) General Suggestions for Connecting Cables to Your Antenna

You will need to provide the coax and related parts/cables to connect your antenna, and if installing a motorized / screwdriver antenna, to your controller or manual up/down switch. Some basic considerations are provided below but do not cover every detail you may need to get your antenna working. There are some good web sites and books by the ARRL and others that provide detailed information on installing HF antennas. We provide some links on our web site LINKS page.

- Coax connection. Generally, RG-58 size coax works fine in mobile installations where the length of the coax is typically less than 25 feet, especially if you run under 500 watts. Be sure to use good quality, highly shielded coax (at least 97% shielded). Times Microwave, and others, make 100% shielded RG58 size coax (e.g. LMR-200).
- 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 or more of these should have the coax wound 2-3 times around one of the ferrites (improves filtering but lowers the filtered frequency range). Also install ferrites in a similar fashion on your motor/turns counter cable, and install one ferrite on the coax near your transceiver. Also install one ferrite on EACH cable that connectors your radio to an automatic tuner. 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>.
- Tuning your antenna. These suggestions apply to HF screwdriver and motorized antennas. 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 in rare cases to fine tune an SWR that is slightly too high and can not 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 method (manual or automatic) is best for your setup and which automatic device may work best for you, based on comments from others.

(5) Maintenance.

The BKT requires little maintenance as it is made from 6061/T6 aluminum and 18-8 stainless steel parts. If exposed to road deicing materials or sea water be sure to rinse it with water after exposure, as you would your own vehicle. This is more important for the unfinished, bare aluminum, as the powder coated version is very resistant to weather conditions. You can "buff" the bare aluminum version with #0000 (very fine) steel wool - but 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 to be sure that all bolts on the BKT, utility track "Torx" bolts, antenna base and antenna are tight and have not come loose. I generally check antennas on my own vehicle approximately weekly or before the start of a long trip.

Spare Parts, accessories and downloads

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 radio community.

A complete **Products Guide** and **Current Price List** can be viewed and downloaded at:

<http://www.repdesign.us/Download3.html>

Let us know if you would like to post photos or comments about your installation on our web site.

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.**

Additional Photos

The following are larger versions of the photos shown above plus some additional installation photos.

The three views below show the BKT with a High Sierra "Sidekick" HF screwdriver antenna and our 3/8x24 stud base – looks great on this Tacoma!



→ more photos on next page

These two photos show “what you get”: standard hand buffed aluminum and optional black powder coat finish (also available in red, white, blue and clear coat). Shown in both photos is our heavy-duty 3/8x24 stud base but we also have interchangeable NMO and SO239 bases to fit just about any compatible antenna on the market!



Close-up views of the BKT installed on the left bed wall – works the same on the front and right tracks as well!



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