

## INSTALLING THE OUTBACKER® PERTHplus

### INTRODUCTION

Thank you for purchasing the OUTBACKER® PERTHplus. Please take a few moments to carefully read these instructions **before** installing your antenna. This will ensure that your mobile setup works and works well!

Like all OUTBACKER® antenna, the PERTHplus is constructed of a very tough, yet flexible, fiberglass core. This core is then helically wound with copper wire, which is hand-tuned to the various "tap" points. A coating of clear epoxy resin is then applied. Finally a layer of colored polyurethane is applied as a protection against the elements. All fittings on the antenna are solid brass and nickel-plated. The 3/8" x 24tpi stud is made of tough, high strength, stainless steel.

### DESCRIPTION OF COMPONENTS

1. FIBERGLASS MAIN SHAFT - Location of helical coils. Base mounting stud is stainless steel with standard 3/8" x 24 threads.
2. BAND SOCKETS - Non-corrosive and silver-plated sockets are clearly engraved with band markings. These sockets are used for selecting a band of operation.
3. WANDER LEAD - Insulated 31" length of stranded wire with banana plug on each end. Used for 75m through to 2m operations. One end should be plugged into the WL-31 socket and the other into the desired band socket. Must be wound (counter- clockwise) from the bottom up, with coils evenly spaced and neither taut, nor hanging loosely. Remove completely from antenna for 80-meter operation.
4. FLY LEAD - Short lead with a green banana plug at one end, this lead is used to match the PERTHplus to the vehicle. Green plug goes into the socket marked "FL" (FLY LEAD). The other end of the FLY LEAD should be connected to ground terminal on your mount.

PLEASE NOTE: The tap marked NC (No Connection) which is located just above the "FL" tap, is used to store or "park" the FLY LEAD when not in use.

5. STINGER / TIP / TUNING ROD or SPIKE - Steel rod which extends up to 31" out of antenna shaft. Used for fine tuning SWR.
6. KNURLED LOCKING NUT - Located at the top of the antenna shaft. Used for holding STINGER in place - **finger tighten only!**

### MOUNTING YOUR PERTHplus

Correct mounting of your PERTHplus is of utmost importance to obtain successful antenna performance. The PERTHplus can be used with the Outbacker® OB360, or any standard 3/8" x 24tpi mount.

#### Trunk Lip and Hatch Mounting

When mounting in either of these types of configurations, please mount the antenna as far from the roofline of your vehicle as possible. Be sure that the surface of the trunk lip and underneath the lip is clean and that there is solid electrical contact from the mount to the trunk lip. Here is an easy way to do that.

Fit the mount in place and tighten its setscrews, then "back out" setscrews and remove mount. Look at indentation points left by setscrews. Use your pocketknife to scrape off paint at those points, exposing shiny metal. Re-install mount, ensuring setscrews fit into scraped-clean-of-paint points and are in contact with shiny metal. Check your mount and antenna occasionally to ensure everything remains *snug*. *OUTBACKER® assumes no liability for antenna lost as a result of loose mounts, or hardware.* An excellent mount recommended by OUTBACKER®, is the Outbacker® OB360C 3/8m. The mount comes with coax harness and will ensure a very strong setup without holes drilled into your vehicle. This mount may be obtained through your Outbacker Antenna dealer.

#### Bumper Mounting

In this configuration, avoid mounting antenna directly beside large areas of vehicle metal like the door on the rear of a van. Make sure that the antenna's mount is electrically grounded to the frame of the vehicle by use of a wide metal strap. More advice to help with the mounting of your antenna follows in the Installation instructions.

## INSTALLATION

The PERTHplus can be installed on cars, trucks, RVs, and for fixed operation (condos, apartments, etc.). As with any antenna system, there are no specific rules to follow. However, here are some helpful suggestions.

- 1 Mount as high as possible, and as far away from other vertical metal areas as possible. If mounting in a condo, use a metal balcony rail where possible, or 3" wide copper foil (minimum 20-ft length.) for counterpoise.
- 2 The optimum mounting location for any mobile, is dead center of the vehicle roof. However, since this is not usually practical for most HF antennas, mount your antenna on the driver's side trunk of the vehicle to avoid tree limbs, etc. (see Trunk Mounting section).
- 3 Use high-grade 52-ohm RG-58cu coax, or similar, with at least 95% shield. Marine grade coax is the best. Do not use foam coax as it will deform in heat and absorb moisture. Avoid solid center conductor-type coax as it breaks easily. **DO NOT SPLICE THIS "RUN" OF COAX.** It should be a single, unbroken length from transceiver to antenna mount. Use Coax Seal to protect cable where its wires separate at mount.
- 4 A solid electrical ground is an absolute necessity for proper and successful antenna performance. This is the most important yet often overlooked step in all mobilizing antenna installations. **DO NOT IGNORE THIS STEP AND DO NOT ASSUME THE NEGATIVE LEAD OF A POWER CABLE GIVES AN ADEQUATE GROUND CONNECTION. IT DOES NOT!**

Install a 1"- 3" wide ground strap between a bolt connected to your auto's frame and the ground lug on your HF radio. A ground/frame bolt is usually located behind your auto's dash. Another ground/frame bolt is also used to secure the front seats in place (look under seat for shiny bolt). A large alligator clip on this ground strap will permit quick connection to rig (and easy rig removal).

If you are using a trunk lip mount, a 1" - 3" wide ground strap should also be added from the trunk lip (or from mount's ground connection) to a ground/frame bolt inside the trunk area. This step ensures the trunk lip is electrically connected to the auto's body, rather than insulated by paint. If you are using a bumper mount, adding a similar ground strap is also encouraged (many bumpers are insulated by their crash/shock absorbers). It is also recommended that you ground your tailpipe at the tip to help reduce spark plug noise, etc.

- 5 It is recommended that you run your coax as far away from the ECM (Engine Control Module) and existing vehicle electrical systems as possible.
- 6 Install the PERTHplus on its selected mount. Insert the FLY LEAD's green banana plug into the NC (No Connection) tap. Then connect the opposite end of the FLY LEAD to the groundside of your mount. Cut off excess. Use as short a length of FLY LEAD as possible. Under **no** circumstances extend the length of the FLY LEAD. Doing so will hinder the PERTHplus's performance.
- 7 Plug the green banana plug into the tap marked FL (FLY LEAD). This tap will engage the inductive matching network.

Now use an Ohmmeter to check your work. No Ohmmeter? Clip leads connected to a Code Practice Oscillator, or a Keyer with sidetone can be used to check connections. Remove the ground strap from your rig.

## TUNE-UP AND OPERATION

After following the proper mounting and grounding procedures, which are crucial, as mentioned earlier, you are now ready for antenna tune-up.

1. Route the feed-line to your transceiver, making sure the antenna is properly grounded to the vehicle body at the antenna base.
2. Be sure the green plug or FLY LEAD is in the "FL" tap point.
3. Remove black cap from top of antenna and discard. Set the STINGER to the scribe point, which is marked on the STINGER (length from scribe point to tip of STINGER is 31").
  - a. For operation on 40m, tune your transmitter to 7.250MHz.

- b. Key the transmitter and read the SWR measured at the transmitter. If SWR reads greater than 2:1, go to Step C. If less than 2:1, go to Step D.
  - c. If SWR is greater than 2:1, tune your transmitter to 7.295MHz and check the SWR there. If the SWR increases at this frequency, this indicates the antenna is too long and is resonating "low." You will want to shorten the STINGER about 1/4 inch, by loosening the KNURLED LOCKING NUT and making the adjustment. Then re-tighten **with fingers only**. If the SWR decreases at this frequency, your antenna is too short and you will need to lengthen the STINGER by following the same procedures as for shortening. Continue this process until the SWR, as measured at the transmitter, is as low as possible at your desired operating frequency, on 40m.
  - d. Provided your SWR is sufficiently low, (less than 2:1 at the middle of the 40m phone band), in most cases all that is necessary to do when changing bands, is to move the top banana plug on the WANDER LEAD, into the desired socket for 20m, 17m, 15m etc. Be sure to wrap the WANDER LEAD evenly and counter clockwise, but not too tightly against the shaft. You can make fine-tuning adjustments by moving the STINGER up or down.
4. 80m operation is obtained by complete removal of the WANDER LEAD. It will also be necessary to use the STINGER to adjust for lowest SWR on the desired operating frequency. Check SWR with and without the FLY LEAD plugged into the socket marked "FL" You must adjust the STINGER for the lowest SWR on 75m. With the STINGER set at the scribe point, the resonant frequency is approximately 3.850 MHz. To raise the resonant frequency, push the STINGER in.

#### 5. **FOR 6M BAND OPERATION**

Remove the longest 34" STINGER (with black bead) from the main shaft, and install the shortest 6" STINGER (with red bead) supplied, down into the top of the mainshaft, until the scribe mark, (3" from the tip) on the STINGER is aligned with the top of the KNURLED LOCKING NUT. Adjust for best SWR.

**The FLY LEAD is not required for 6m operation and should be removed from the "FL" socket and stored in the "NC" socket**

#### 6. **FOR 2M OPERATION**

Remove the existing STINGER and install the medium length, 14" STINGER (with green bead) down into the top of the mainshaft until the scribe mark (12" from the top) on the STINGER, is aligned with the top of the KNURLED LOCKING NUT. Adjust for best SWR.

**Do not store FLY LEAD in the socket marked "NC" when using 2m, remove the FLY LEAD completely from the antenna.**

When operating the antenna on 6m, or 2m, the length of the black WANDER LEAD (31"), is a critical factor as it forms an integral part of the antenna tuning.

**Its length should not be altered for any reason.**

### **TROUBLESHOOTING**

**EXTREMELY HIGH SWR** - Check all connections for opens, or shorts. Make sure the WANDER LEAD extends from the WL socket for your desired band of operation. Make sure the WANDER LEAD is evenly spaced as it wraps around the antenna, counter clockwise, from the bottom up. Again, remember, do not wrap too tightly. Also, remember that a quarter wave vertical needs a large span of metal/ground beneath it to act as a counterpoise.

**MODERATELY HIGH SWR** - Make sure the antenna is not unusually close (parallel) to any metal such as the trunk, or side of an RV (see INSTALLATION). Recheck the integrity of your grounding. Try re-tuning the STINGER at the desired operating frequency.

Remember there are more important aspects of mobile installations than having a 1:1 SWR. It is okay and fully acceptable if your SWR should vary from 1:1 to 1:8. Pay special attention to grounding and antenna placement.

### **CARE AND MAINTENANCE**

All OUTBACKER® antenna are fitted with a rubber "O" ring inside the tip to prevent water entering the mainshaft, however, condensation will accumulate on the inside of the shaft, do not be alarmed. This condensation will not harm the antenna, nor will it cause inferior performance. Just remove the KNURLED LOCKING NUT and shake out any water. Check your antenna after heavy rain.

To clean your antenna, wash it with warm, soapy water and wipe dry with a soft cloth. Apply a thin coating of non-abrasive, car wax. Buff the antenna to a shine. Do not use cleaners with an acetone base as this will strip the shiny coating.

**Specifications**

Model: PERTHplus (Cut to American frequencies **Not** for resale outside North America)

Band Coverage: 80m-75m-40m-30m-20m-17m-15m-12m-1 Om-6m-2m

Feed Impedance: 48-52 Ohms

Power : 100 watts (pep)

Construction: Brass-Stainless Steel-Urethane, 1/4 wave helical.

Mounting: 3/8" x 24tpi (UNF) Male thread (Stainless Steel)

Wander Lead Length: 31" Plug tip to Plug tip.

**Supplied with PERTHplus antenna**

**Qty Part# Description**

1 Main shaft (Black)

1 x OBWL Wander lead (WL stands for wander lead, 31" in length)

1 x OBSP90 34" long tapered tuning spike with black bead, (installed in antenna, at manufacture)

1 x OBSP30 14" medium length tuning spike with green bead,

1x OBSP15 6" short tuning spike with red bead.

1 x OBFL Fly lead, black with green plug at one end.

*Please quote Part# when ordering replacements.*

**Optional**

OB360C Trunk mount with spring and cable. (Rotates 360 deg)

OB360s 2 1/2" x 7/8" x 3/16" Steel spring.

OSB Heavy Duty fixed mount.

OBADP 3/8" unf to 1/2" bsw Stainless steel adapter.

OBQD 3/8" TO 3/8" Quick disconnect adapter (brass & stain less)

OBMT M-Type to 3/8" adapter, (brass)

OBKNK Knockdown Knuckle 3/8" to 3/8" unf

*Should you discover your OUTBACKER antenna has been damaged in transit, please notify your supplier, or write to the manufacturer within seven days. Claims made more than 7 days after delivery will not be recognized.*

***We hope you will receive much enjoyment from using your OUTBACKER Joey antenna. For technical assistance in North America contact,***

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